

Decentralization in Indonesia: lessons from cost recovery rate of district hospitals

Asri Maharani,^{1,2*} Devi Femina² and Gindo Tampubolon²

¹Medical Faculty, University of Brawijaya, Indonesia. ²Institute for Social Change, University of Manchester, Humanities Bridgeford Street Building, Oxford Road, Manchester M13 9PL, UK

*Corresponding author. Humanities Bridgeford Street Building 2nd floor, Oxford Road, Manchester M13 9PL, UK.
E-mail: asri.maharani@postgrad.manchester.ac.uk

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In 1991, Indonesia began a process of decentralization in the health sector which had implications for the country's public hospitals. The public hospitals were given greater authority to manage their own personnel, finance and procurement, with which they were allowed to operate commercial sections in addition to offering public services. These public services are subsidized by the government, although patients still pay certain proportion of fees. The main objectives of health sector decentralization are to increase the ability of public hospitals to cover their costs and to reduce government subsidies. This study investigates the consequences of decentralization on cost recovery rate of public hospitals at district level. We examine five service units (inpatient, outpatient, operating room, laboratory and radiology) in three public hospitals. We find that after 20 years of decentralization, district hospitals still depend on government subsidies, demonstrated by the fact that the cost recovery rate of most service units is less than one. The commercial sections fail to play their role as revenue generator as they are still subsidized by the government. We also find that the bulk of costs are made up of staff salaries and incentives in all units except radiology. As this study constitutes exploratory research, further investigation is needed to find out the reasons behind these results.

Keywords Cost recovery rate, decentralization, district hospitals, Indonesia

KEY MESSAGES

- Twenty years after decentralization, the public hospitals still rely on government subsidies in Indonesia.
- Most cost recovery rates of commercial sections in service units are less than one after decentralization.
- The bulk of costs in service units other than radiology consist of staff costs.

Introduction

Hospitals are important providers of both inpatient and advanced outpatient services, and raising hospital efficiency and service quality has thus become the major concern among policymakers and researchers around the world (Preker and Harding 2003). This is particularly evident in the case of public hospitals, where there are often serious weaknesses in the provision of services, including low utilization, low patient satisfaction and service inequity (Chawla *et al.* 1996; Govindaraj and Chawla 1996). The main contributors to this weak

performance are bureaucratic rigidity, lack of management capacity and inappropriate incentive schemes (Preker and Harding 2003). Recognizing these problems and having successfully devolved authority in other areas of government, many policymakers turn to the health sector and apply decentralization there (Preker and Harding 2003; Lieberman *et al.* 2005; Minh *et al.* 2010). There are four types of decentralization: deconcentration, devolution, delegation and privatization (Mills *et al.* 1990; Bossert *et al.* 2003a,b). Deconcentration shifts both authority and responsibility for

providing healthcare services from the Ministry of Health to offices at lower levels of government (such as district level). Devolution shifts the authority and responsibility to district or municipality government, while delegation transfers them to semi-autonomous agencies. Privatization transforms the public entity to one of complete private ownership.

Two decades ago, the government of Indonesia launched decentralization in the health sector, a process that started with the autonomization of public hospitals (creating 'swadana' hospitals) (Lieberman and Alkatiri, 2003) followed by devolution to the district government (Lieberman *et al.* 2005; Heywood and Harahap 2009; Rokx *et al.* 2009). In 1991, autonomization promoted the capacity of Indonesian public hospitals to recover their costs by allowing them to retain and utilize the revenue obtained from patient fees. These autonomous public hospitals (which include those at district level) were thus encouraged to operate a commercial section alongside their non-commercial section (Government of Indonesia 1991). The permitted maximum allotment of beds to the commercial section is 25% (Ministry of Health Republic of Indonesia 1995). Here patients are charged a higher rate for better room facilities, and the revenue thus obtained is used to supplement hospital operating costs. The expectation on the part of the central government is that this will reduce the government subsidy. However, hospital management may choose to spend the additional revenue either to pay higher incentives to doctors serving the commercial section (Suwandono *et al.* 2001) or to buy additional supplies for the hospital. Obtaining revenue from its commercial section does not therefore automatically translate into a district hospital having a reduced dependency on the central government.

Hospital autonomization has produced mixed results in Indonesia. Gani (1996) found that after autonomization, patient satisfaction in one public hospital in West Java increased. However, this was not reflected in a commensurate improvement in the hospital's financial performance. Lieberman and Alkatiri (2003) found that autonomization failed to reduce government subsidies for public hospitals and Bossert *et al.* (1997) went further by concluding that 5 years after autonomization, the need for government subsidies to public hospitals had in fact increased. Ten years after autonomization, Suwandono *et al.* (2001) analysed the cost recovery rate of inpatient units in three autonomous hospitals in East Java and found that in all three, establishing a commercial section enabled them to cover only 60% of their costs. Elsewhere in the world, studies of this type of decentralization also present mixed results. For example, early in 1987, Kenya granted higher managerial autonomy to one of its public hospitals, Kenyatta National Hospital. According to Collins *et al.* (1999), this improved hospital efficiency, increasing bed occupancy rate and leading to a lower average length of stay. Inspired by this success, in 1997, the Kenyan government extended the reform to other provincial and district hospitals. In Tunisia, Achouri and Jarawan (2003) investigated the reform of 22 teaching hospitals carried out in 1992. They found that granting greater autonomy improved access to these hospitals by not only reducing both length of stay (which in turn increases bed availability) and admission waiting lists, but also significantly increasing resource flows that reduce each hospital's deficit allowing them to increase patient care activities.

Going beyond autonomization, in 2001, Indonesia devolved the responsibility of health services delivery from central to local government, giving public hospitals at provincial and district levels more authority to manage personnel, finance and procurement (Lieberman *et al.* 2005; Heywood and Harahap 2009; Rokx *et al.* 2009). In doing so, the central government put pressure on each hospital to self-finance, thus reducing the government subsidy. However, there is no evidence that the central government may reduce the subsidy for the hospitals after devolution.

Devolution as a form of health sector decentralization has produced conflicting trends. Colombia and Chile provide examples of successful devolution, indicated by increases in both quality and equity of healthcare services (Bossert *et al.* 2003a,b). The effects of devolution in Papua New Guinea (Campos-Outcalt *et al.* 1995) on the other hand have been negative. With a politically decentralized system of government, the responsibility of most of Papua New Guinea's health service administration is devolved to its 19 provinces. For example, in 1991, Western Highland province implemented a sub-provincial decentralized system, handing over responsibility of health to the district authority. Campos-Outcalt *et al.* (1995) presented negative opinions of decentralization held by health workers in the province and at the same time found that it resulted in a decrease in Bacillus Calmette-Guérin (BCG) immunization coverage among children under a year.

In a cross-country study, Khaleghian (2004) posited that devolution of the health sector has a positive effect on low-income countries and a negative effect on middle-income countries. For example, in decentralized low-income countries, measles and Diphtheria, Pertussis, and Tetanus vaccine (DPT3) immunization coverage are higher than in centralized ones, while in decentralized middle-income countries, the opposite is true. In light of such contradictory outcomes, further research is needed to ascertain the effects of health sector decentralization more conclusively.

Decentralization is also aimed at raising efficiency, by enabling local governments to respond more effectively to local demand. In the health sector, government performance is best assessed by examining the performance of the public hospitals using cost recovery rate as one of the key indicators, since the largest proportion of healthcare expenditure is absorbed by hospitals in both developed (Borowitz 2010) and developing countries (Mills 1990). Several studies address this, with Liu *et al.* (2000) reporting the average hospital cost recovery rate in China to be only 50%, while Minh *et al.* (2010) found that in three district hospitals in Vietnam, revenue from hospital fees was significantly lower than the costs of the services provided. Neither of these studies, however, examines cost recovery in public hospitals in countries under decentralization (the focus of this article).

Our analysis examines five service units found in all three of the public hospitals studied: inpatients, outpatients, the operating theatre, laboratory and radiology. Each inpatient unit had several departments (or wards) according to the category of patient (e.g. paediatrics, obstetrics and gynaecology, internal medicine and surgery), and as a result of autonomization, each department in each district hospital now has both a commercial and a non-commercial section. The latter provides

better room facilities (a private room, an en suite bathroom, television and air-conditioning) for patients who are able to pay. This study, however, also includes four other service units and examines the opportunity they provide to achieve better cost recovery rates. Although in these four service units the quality of services is similar in both commercial and non-commercial sections, in the commercial section the rates are higher. Moreover, these service units contribute a significant amount of revenue for the hospital (Minh *et al.* 2010).

This article represents the first attempt to measure the success of decentralization using financial indicators, focusing on the lessons to be learnt from the failure of decentralization in Indonesia's healthcare system. Its evidence from detailed study of three district hospitals however needs more extensive and in-depth research to be confirmed. It is often implicitly assumed that when authority is devolved, given time, quality will follow. However, in Indonesia, two decades after decentralization, its central aim is still unachieved.

The remainder of the article is organized as follows: the Data and methods section describes the data and methods used to examine hospital performance in each of the districts surveyed. In the Results section, we present the results obtained from descriptive and cost recovery analyses. In the Discussion section, we discuss the lessons learned and in the Conclusion section we conclude.

Data and methods

Data

We collected data from three district hospitals in East Java province in 2009. There were a number of reasons for selecting these particular hospitals. First, they are typical district hospitals in terms of size, staffing and organization. Second, they provide most of the services stipulated by the Ministry of Health Republic of Indonesia (2010a,b,c). Third, they were willing to provide performance and financial data.¹ We also use full-time equivalents (FTEs) per doctor, based on doctor's real visit time (recorded by nurses and based on one day of activity in four inpatient departments: paediatrics, obstetrics and gynaecology, internal medicine and surgery).

Calculation

We measured both cost and revenue for each of the three hospitals. We calculated cost recovery rates in those five service

units which make the highest contribution to revenue in each district hospital (inpatients, outpatients, operating theatre, laboratory and radiology). Four of the five (excluding outpatients) service units in each of the three hospitals have both commercial and non-commercial sections, and costs were calculated separately for each section. We also included general administration costs, kitchen, laundry and the central sterile support department (CSSD) costs, since these units support other service units. As can be seen in Figure 1, we distributed the costs of these supporting units to the service units in two steps, using the standard step-down method (Suwandono *et al.* 2001; Shepard *et al.* 2003; Young 2003; Conteh and Walker 2004;). First, we allocate general administration costs to the kitchen, laundry, CSSD and service units. Next, we assigned kitchen, laundry and CSSD costs plus the additional costs allocated to them from the first distribution to the service units. The total costs then had several components, namely, recurrent costs and investment costs. They are discussed below, followed by a description of the revenue composition.

Recurrent costs

Recurrent costs comprised staff salaries and incentives, and non-salary costs. For staff salaries, we used actual salary paid to nurses, support staff and doctors. Nurses and support staff are assigned permanently to a particular unit, which then becomes the basis of their salary allocation. Doctors, however, are responsible for both commercial and non-commercial sections in all units, and we use FTEs per doctor as the basis on which to allocate their salaries. All salaries are paid by the government.

Unlike salaries, incentives are paid out of patient fees, of which there are two categories: hospital service fees and doctors' visit fees. In inpatient units, doctors' incentives are calculated to be 90% of the doctor's visit fees, while nurse and other staff incentives are paid from hospital service fees. In other units, incentives for all staff (including doctors) are paid out of hospital services fees. Non-salary costs cover items such as disposable medical materials, stationery and other consumables.

Investment costs

Investment costs comprise the depreciation costs of the hospital buildings (calculated by multiplying the area of the building's floor space by the price per square metre of similar buildings in each district in 2009) and medical and non-medical assets

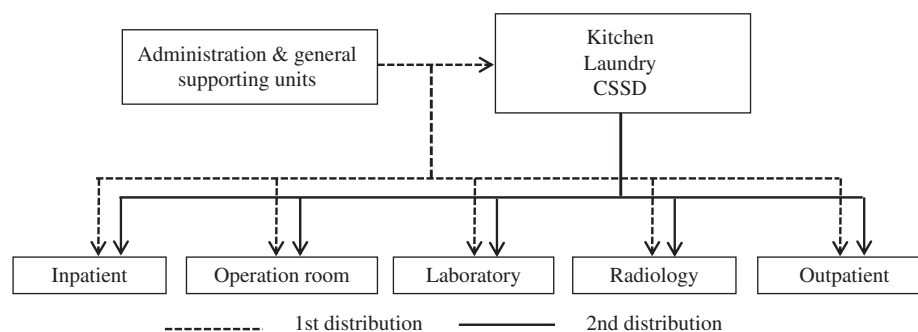


Figure 1 Scheme of double distribution of recurrent cost.

(assessed using the straight line method, using the initial purchase price, procurement time and expected lifetime) (Minh *et al.* 2010). The expected lifetime of the majority of these hospital assets is 5 years (Suwandono *et al.* 2001).

Revenue

Total hospital revenue is made of hospital service fees charged across all units and doctors' visit fees in inpatient units. Each hospital sets its own fees, and these require the approval of the district government.

Analytic strategy

We examine the data in two steps. First, we describe the characteristics of district hospital and their respective districts in terms of area, population and number of hospital and then analyse hospital performance using the number of procedures and bed occupancy rate as efficiency indicators. Second, we analyse each hospital's financial performance using revenue, costs and recovery rates.

As stated earlier, total revenue is made up of hospital service fees and doctors' visit fees. For example, inpatient units obtain revenue from both fees, while other units accrue only hospital service fees. Costs are broken down into net costs (incentives and non-salary costs), recurrent costs (net costs plus salaries) and total costs (recurrent costs plus investment costs). We calculated various cost recovery rates to assess each hospital's viability (Suwandono *et al.* 2001). The recurrent cost recovery rate (total revenue divided by recurrent costs) and the net cost recovery rate (total revenue divided by net costs) indicate short-term viability. The total cost recovery rate (total revenue divided by total costs) indicates long-term hospital viability.

Results

Hospital utilization is mostly affected by the epidemiological changes in the population each serves. Table 1 shows that infectious diseases continue to dominate epidemiological changes in East Java in 2008–10, alongside a general trend of shifting towards more chronic degenerative diseases (e.g. diabetes mellitus and hypertension). However, we do not

have case-mix data from each district hospital or epidemiological data from each district and these are needed to evaluate the consequences of case-mix on hospital costs.

Table 2 presents the characteristics of each of the three district hospitals and the districts in which they were located in 2009. Each hospital serves a similar number of people. All districts have a public–private mix of healthcare service provision at hospital level, with one public hospital and several private hospitals in each district. Inpatient units have almost the same number of beds in all hospitals (between 185 and 215 beds). There is a policy limit of 25% on the number of beds which can be allocated to the commercial section and each hospital in this study allocates less than this (10–18%). We use bed occupancy rate as the utilization indicator of an inpatient unit. The bed occupancy rate of hospital B is 81% (almost twice as much as the other two hospitals); strikingly, the commercial occupancy rate of hospital C is 50% higher than its non-commercial section. The other two hospitals have more balanced occupancy rates.

Turning to the other indicators, we used number of procedures as the indicator of utilization in the four service units studied (i.e. outpatients, operating theatre, laboratory and radiology). These four service units have similar facilities in all three hospitals. For example, the radiology unit in each uses X-ray, dental X-ray, ultrasound scanning, mammography and Computerized Tomography (CT) scanning to provide diagnostic imaging services. At the same time however, a considerable variation in the number of procedures exists between hospitals. For example, hospital B carries out twice as many procedures as the other two hospitals. The number of procedures also varied considerably among service units within a hospital. However, also to be taken into consideration (as an influencing factor of utilization) is the length of time needed to perform the procedures: the laboratory unit requires relatively little time and thus has the highest utilization of all other service units in every hospital.

Table 3 presents cost recovery patterns in both commercial and non-commercial sections. Although cost recovery rates are higher for the former than the latter, in all three hospitals the commercial sections fail to recover their costs. This is indicated by the fact that the majority of total cost recovery rates is below

Table 1 The 10 most common diseases in hospitals in East Java

No.	2008		2009		2010	
	Disease	%	Disease	%	Disease	%
1	Diarrhoea	33.06	Diarrhoea	21.58	Diarrhoea	19.76
2	Dengue hemorrhagic fever	23.75	Dengue hemorrhagic fever	14.15	Dengue hemorrhagic fever	18.75
3	Dengue fever	8.38	Traffic accidents	11.57	Traffic accidents	9.60
4	Pneumonia	6.70	Tuberculosis	5.43	Dengue fever	6.04
5	Tuberculosis	6.47	Pneumonia	5.05	Hypertension	4.89
6	Typhoid	5.45	Hypertension	4.20	Tuberculosis	4.21
7	Hepatitis	3.06	Dengue fever	4.12	Pneumonia	4.04
8	Suspect tuberculosis	2.69	Diabetes mellitus	3.93	Diabetes mellitus	3.11
9	Tetanus	1.99	Suspect typhoid	3.35	Typhoid	2.99
10	Influenza	0.82	Typhoid	3.35	Diabetes non-insulin dependent	2.81

Source: Ministry of Health Republic of Indonesia (2010c).

one. A comparison of all five service units shows that the radiology units have the lowest total cost recovery rate (ranging from 0.39 to 0.64), while that of the inpatients units is only slightly higher (0.47–0.64). Interestingly, the radiology units have much better recurrent cost recovery rates than the inpatient units, since they have the highest ratio of investment costs to total costs. But the operating theatre is the only unit in all three hospitals where hospital revenue meets total

costs incurred and which achieves positive recurrent cost recovery rates.

Turning to the non-commercial sections of each hospital, the total recovery rates of two of the three inpatient units are <50%. Better total recovery rates (>60%) appear in the operating theatres and laboratory units; laboratory units in two hospitals (hospital A and C) even manage to recoup their total costs. The financial performance of those outpatient units

Table 2 Basic characteristics and activity statistics of district hospitals in 2009

Characteristics/statistics	Type	A		B		C	
		No.	%	No.	%	No.	%
<i>District characteristics</i>							
Area (km ²)		963.21		1 182.64		56.67	
Population		1 747 343		1 009 618		1 291 330	
Number of hospitals	Public	1		1		1	
	Private	7		3		4	
	Total	8		4		5	
<i>District hospital characteristics/statistics</i>							
Beds	NC	187	87	176	82	166	90
	C	28	13	39	18	19	10
	Total	215	100	215	100	185	100
Bed occupancy rate (in %)	NC		41		81		53
	C		51		83		80
	Total		43		81		56
Outpatient visit		34 722		110 055		44 735	
Operation procedure		1 102		2 782		1 574	
Laboratory test		59 082		140 056		64 218	
Diagnostic imaging		8 278		16 165		7 991	

Source: Statistics Indonesia (2010), Ministry of Health Republic of Indonesia (2010a), hospital data. C: commercial section; NC: non-commercial section.

Table 3 Cost recovery for commercial and non-commercial section in 2009

Unit	Hospital	Net cost recovery rate		Recurrent cost recovery rate		Total cost recovery rate	
		C	NC	C	NC	C	NC
Inpatient	A	1.18	1.16	0.64	0.39	0.53	0.33
	B	1.13	0.88	0.70	0.46	0.64	0.42
	C	0.91	0.63	0.52	0.27	0.47	0.25
Operating room	A	2.16	1.88	1.79	1.35	0.96	0.57
	B	1.37	1.19	1.05	0.88	0.75	0.61
	C	1.73	1.06	1.46	0.79	1.37	0.71
Laboratory	A	1.96	1.91	1.26	1.18	1.13	1.05
	B	1.91	1.10	0.98	0.88	0.82	0.73
	C	1.99	1.89	1.49	1.35	1.20	1.06
Radiology	A	1.70	1.51	1.01	0.82	0.51	0.39
	B	1.06	0.96	0.73	0.66	0.50	0.44
	C	1.78	1.63	1.32	1.16	0.39	0.30
Outpatient	A		1.95		0.58		0.48
	B		1.32		0.59		0.45
	C		0.69		0.23		0.20

Source: Author's calculation based on hospital data. C: commercial section; NC: non-commercial section.

with no commercial section is weak, with total cost recovery rates being <0.5 in all three hospitals. The fees from these five sections are used only for salary incentives and operations; the government continues to pay for capital expenditures, even after decentralization. Table 4 indicates that in radiology, investment costs account for the largest part of total costs, while staff costs (salaries and incentives) consume the largest proportion of the total costs of the other four service units.

Discussion

Decentralization has significantly affected public hospital management in Indonesia during the past two decades (Suwandono *et al.* 2001; Lieberman *et al.* 2005; Heywood and Harahap 2009; Rokx *et al.* 2009). It was designed to allow public hospitals to operate a revenue-generating commercial section and to exercise higher management authority, aiming to reduce government subsidies by improving cost recovery rates (Government of Indonesia 1991; Ministry of Health Republic of Indonesia 1995). This study explores to what extent this has been achieved by assessing cost recovery rates in three district hospitals in East Java, Indonesia.

It appears that decentralization has failed to achieve its major financial objective. All three hospitals have low total recovery rates in commercial sections, meaning that their dependence on government subsidies is still high. This dependency indicates that the commercial sections consume a portion of the subsidies assigned to servicing the poor in the non-commercial sections. In contrast, most non-commercial sections which it was thought would recover only the salary component of their costs have exceeded this expectation: fees paid by patients in the non-commercial sections cover both salary and non-salary components. In other words, patients in the non-commercial sections pay more than they are supposed to. In this sense, decentralization has failed to protect the poor.

These findings are consistent with Bossert *et al.* (1997) and Suwandono *et al.* (2001). Bossert *et al.* (1997) found that autonomization alone provides little incentive for hospitals to shift dependence on subsidy to dependence on their own fee revenue. Suwandono *et al.* (2001) found that in 1998, public

hospitals in Indonesia could not even recoup their recurrent costs in the inpatient commercial section. It seems that 20 years after decentralization, hospital financial performance remains weak. Little or no 'learning by doing' has taken place after decentralization and no meaningful change after decentralization.

Suwandono *et al.* (2001) posit that failure to achieve an adequate cost recovery rate is because of two factors: first, the inability of hospital managers to set realistic bed fees, and second, the failure of the hospital financial system to provide timely data required to inform management decision making. Both factors push management into continuing to practise the pre-decentralization system of managing hospital finance. Routine financial performance evaluation is absent, and without this, hospital financial performance is unlikely to improve.

Applying a decision space lens to the range of choice available to decentralized decision makers (regarding management functions such as human resources, finance and service delivery) may be useful to consider the dimensions of control available to hospital managers (Bossert and Beauvais 2002; Bossert *et al.* 2003a,b). One plausible explanation of the failure of decentralization in Indonesia to reach its goal in the health sector is that hospitals, despite their new degree of autonomy, have limited decision space (Bossert *et al.* 1997). Although managers may set service fees to enable each hospital to become entirely self-financing or to recover their costs, they still need the approval of the local government as the higher authority. In addition, there is also a degree of centralized control over each hospital's planning and budgeting process, as this is part of government planning and budgeting at national, provincial and district levels. This incorporated budget then determines the size of government subsidy received by each hospital. Clearly then, the decision space of hospital managers is constrained by the supervision and control exerted by the local authorities and the Ministry of Health.

Meanwhile, Heywood and Choi (2010) stated that successful implementation of decentralization has been held back by the failure of political and bureaucratic leadership, both at district and national levels. In other words, decentralized entities may not have the capability to manage the new system. With greater authority over healthcare service provision under

Table 4 Cost composition of hospital services (as percentage of total costs)

	Salary and incentives			Non-salary			Investment		
	A	B	C	A	B	C	A	B	C
<i>Commercial section</i>									
Inpatient	68.3	73.1	65.0	15.0	17.7	25.5	16.7	9.3	9.5
Operation theatre	47.7	46.7	69.5	6.0	24.9	24.3	46.4	28.5	6.3
Laboratory	77.6	48.1	68.4	12.3	35.1	12.2	10.1	16.8	19.4
Radiology	41.2	40.9	23.1	9.6	26.8	6.3	49.2	32.3	70.6
<i>Non-commercial section</i>									
Inpatient	75.0	71.2	66.7	11.8	18.9	24.3	13.2	9.9	9.1
Operation theatre	34.4	42.5	51.6	7.5	26.8	38.5	58.1	30.7	9.9
Laboratory	76.3	45.3	64.9	13.0	37.0	13.5	10.6	17.7	21.6
Radiology	37.6	38.7	20.0	10.2	27.8	6.5	52.2	33.5	73.7
Outpatient	77.7	60.1	67.3	5.5	15.9	21.4	16.8	24.0	11.3

Source: Author's calculation based on hospital data.

decentralization, local governments are expected to have (but are still yet to demonstrate) a commensurate ability in managing these services, including the provision of support to public hospital management. Part of the role of local governments is thus to prepare managers to exercise their increased decision space. However, our findings suggest this to be non-existent. This lack of bureaucratic leadership together with the lack of management ability has contributed to inadequate financial performance on the part of hospitals, and in this sense, the implementation of decentralization in the health sector can be considered a failure.

Hospital financial performance should take into account several factors, including resources used, bed occupancy rate and category of patient (Minh *et al.* 2010). The resources used are within the control of the hospital management, while bed occupancy rate and category of patient are not. The three district hospitals examined by this study are of similar type and size, as indicated by the number of beds and facilities. Despite this, they demonstrate huge differences in their performance. For example, only one hospital has a good bed occupancy rate (81%), while the rates of the other two hospitals are low (43% and 56%, respectively). Previous studies have shown that hospitals with low bed occupancy rates have higher total costs per procedure in their inpatients units (Flessa and Dung 2004; La Forgia and Couttolenc 2008; Minh *et al.* 2010).

Similarly, the number of procedures in other service units also varies between hospitals. Various factors such as insufficient demand, maintenance problems, lack of necessary inputs or inefficient clinical management may trigger a low number of procedures (La Forgia and Couttolenc 2008). For example, a low number of procedures in the radiology unit results in a tendency towards inefficiency since this unit bears sizeable equipment and personnel costs as a result of frequent staff downtime and expensive equipment under-use.

The bulk of costs in service units are personnel costs, which range from 40% to 78% of total costs (an exception is in radiology, where costs range from 23% to 41%). A recent study reports a similar picture in Thailand (Riewpaiboon *et al.* 2007), Vietnam (Flessa and Dung 2004; Minh *et al.* 2010), Bangladesh (Alam and Ahmed 2010) and South Africa (Olukoga 2007). Healthcare personnel are still considered to be a costly and scarce resource and thus must be used efficiently. Similarly, the study in Bangladesh suggests that using the time of health personnel more efficiently may reduce the cost of providing hospital services and recommends more efficient and effective personnel management to reduce operational costs.

Our findings in this report are subject to at least three limitations. First, this study is exploratory in nature, and thus there is little guidance available from previous research regarding our approach of using cost recovery rates to measure the effect of decentralization in the health sector. Second, the study does not measure costs incurred by intensive care units. These vary extensively, but can be up to five times greater than those of general wards (Oostenbrink *et al.* 2003; Tan *et al.* 2012). Further research may usefully look into these, and the results may have considerable impact on cost calculation in inpatient units. Third, the step-down method assumes that patients are homogenous, while in fact there are always variations in the patient case-mix. This method is, however,

used widely because of its simplicity and applicability (Conteh and Walker 2004).

Conclusion

Indonesia's aim in embarking on health sector decentralization was to improve the efficiency and financial performance of public hospitals, an aim which has not been fulfilled. This study demonstrates that operating a commercial section does not improve the cost recovery rates of a hospital, suggesting that the Indonesian government even subsidizes the commercial section service delivery after decentralization. The increased authority provided by decentralization does not necessarily improve either a hospital's financial performance or its utilization, although this study's sample sites operate at different levels of efficiency, as measured by bed occupancy rates and number of procedures. Since this is an exploratory study, further research is needed to unpack the reasons for the low cost recovery. There are three areas to be explored: first, a comparison of quality of care in commercial and non-commercial sections; second, the extent of supplier-induced demand; and third, case-mix and public-private mix differences between district hospitals. An analysis of the findings would assist further understanding of the cause of efficiency differences between these hospitals.

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Endnotes

¹ We convert the financial data into US dollars using the Central Bank middle rate as on 31 December 2009 United States Dollar (USD)1 = Indonesian Rupiah 9400; (Bank of Indonesia, 2009).

References

- Achouri H, Jarawan E. 2003. Autonomous structures-with incomplete autonomy: Unusual hospital reform in Tunisia. In: Preker AS, Harding A (eds). *Innovations in Health Service Delivery: The Corporatization of Public Hospital*. Washington, DC: The World Bank.
- Alam K, Ahmed S. 2010. Cost recovery of NGO primary health care facilities: a case study in Bangladesh. *Cost Effectiveness and Resources Allocation* 8: 1–10.
- Bank Indonesia. 2009. *Exchange Rates on Transaction by Bank Indonesia*. <http://www.bi.go.id/web/en/Moneter/Kurs+Bank+Indonesia/Kurs+Transaksi>, accessed 2 October 2012.
- Borowitz M. 2010. Value for money in health spending. *Technical report*. The Organisation for Economic Co-operation and Development (OECD). <http://www.consorti.org/accesos-directes/patronal/documents-i-publicacions/articles-i-publicacions-d2019interes/value%20-for%20money%20in%20health.pdf>.

- Bossert TJ, Beauvais JC. 2002. Decentralization of health systems in Ghana, Zambia, Uganda and the Philippines: a comparative analysis of decision space. *Health Policy and Planning* **17**: 14–31.
- Bossert T, Chitah MB, Bowser D. 2003a. Decentralisation in Zambia: resource allocation and district performance. *Health Policy and Planning* **18**: 357–69.
- Bossert T, Kosen S, Harsono B, Gani A. 1997. Hospital autonomy in Indonesia. Data for Decision Making Project, Harvard School of Public Health. <http://www.hsph.harvard.edu/ihsg/publications/pdf/No-39.PDF>.
- Bossert TJ, Larranaga O, Giedion U, Arbelaez JJ, Bowser DM. 2003b. Decentralization and equity of resource allocation: evidence from Colombia and Chile. *Bulletin of the World Health Organization* **81**: 95–9.
- Campos-Outcalt D, Kewa K, Thomason J. 1995. Decentralisation of health services in Western Highlands Province, Papua New Guinea: an attempt to administer health service at subdistrict level. *Social Science & Medicine* **40**: 1091–8.
- Chawla M, Govindaraj R, Berman P, Needleman J. 1996. Improving hospital performance through policies to increase hospital autonomy: methodological guidelines. *Technical report*. Cambridge, MA: Data for Decision Making Project, Department of Population and International Health, Harvard School of Public Health. http://pdf.usaid.gov/pdf_docs/PNABZ207.pdf.
- Collins D, Njeru G, Meme J, Newbrander W. 1999. Hospital autonomy: the experience of Kenyatta National Hospital. *International Journal of Health Planning and Management* **14**: 129–53.
- Conteh L, Walker D. 2004. Cost and unit cost calculations using step-down accounting. *Health Policy and Planning* **19**: 127–35.
- Flessa S, Dung NT. 2004. Costing of services of Vietnamese hospitals: identifying costs in one central, two provincial and two district hospitals using standard methodology. *International Journal of Health Planning and Management* **19**: 63–77.
- Gani A. 1996. Improving quality in public sector hospitals in Indonesia. *International Journal of Health Planning and Management* **11**: 275–96.
- Government of Indonesia. 1991. *Presidential Decree Number 38*. Jakarta: Government of Indonesia.
- Govindaraj R, Chawla M. 1996. Recent experience with hospital autonomy in developing countries – what can we learn? *Technical report*. Cambridge, MA: Data for Decision Making Project, Department of Population and International Health, Harvard School of Public Health. <http://www.harvard-school-of-public-health.com/ihsg/publications/pdf/No-32-2.pdf>.
- Heywood P, Choi Y. 2010. Health system performance at the district level in Indonesia after decentralization. *BMC International Health and Human Rights* **10**: 1–12.
- Heywood P, Harahap NP. 2009. Public funding of health at the district level in Indonesia after decentralization. *Health Research Policy and Systems* **7**: 1–14.
- Khaleghian P. 2004. Decentralization and public services: the case of immunization. *Social Science & Medicine* **59**: 163–83.
- La Forgia GM, Couttolenc BF. 2008. Hospital performance in Brazil: the search for excellence. Washington, DC: World Bank Publications.
- Lieberman SS, Alkatiri A. 2003. Autonomization in Indonesia: the wrong path to reduce hospital expenditures. In: Preker AS, Harding A (eds). *Innovations in Health Service Delivery: The Corporatization of Public Hospital*. Washington, DC: World Bank.
- Lieberman SS, Capuno JJ, Minh HV. 2005. Decentralizing health: lesson from Indonesia, The Philippines, and Vietnam. *East Asia Decentralizes: Making Local Government Work*. Washington, DC: The World Bank. http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2005/11/22/000160016_2005112216411/Rendered/PDF/344010PAPER0Ea101official0use0only1.pdf#page=167.
- Liu X, Liu Y, Chen N. 2000. The Chinese experience of hospital price regulation. *Health Policy and Planning* **15**: 157–63.
- Mills A. 1990. The economics of hospitals in developing countries. Part I: expenditure patterns. *Health Policy and Planning* **5**: 107–17.
- Mills A, Vaughan JP, Smith DL, Tabibzadeh I. 1990. *Health System Decentralization: Concepts, Issues and Country Experience*. Geneva: World Health Organization.
- Minh HV, Giang KB, Huong DL et al. 2010. Costing of clinical services in rural district hospitals in northern Vietnam. *International Journal of Health Planning and Management* **25**: 63–73.
- Ministry of Health Republic of Indonesia. 1995. *Guideline for Proposing and Managing the Vertical Unit 'Swadana' Hospital*. Jakarta: Government of Indonesia.
- Ministry of Health Republic of Indonesia. 2010a. *Indonesia's Hospital List 2010*. Jakarta: Government of Indonesia.
- Ministry of Health Republic of Indonesia. 2010b. *Regulation of Ministry of Health No.340/Menkes/Per/jiii/2010*. Jakarta: Government of Indonesia.
- Ministry of Health Republic of Indonesia. 2010c. *List of the Most Diseases in Hospitals in Indonesia*. Jakarta: Government of Indonesia.
- Olukoga A. 2007. Unit cost of inpatient days in district hospitals in South Africa. *Singapore Medical Journal* **48**: 143–7.
- Oostenbrink JB, Buijs-Van der Woude T, van Agthoven M, Koopmanschap MA, Rutten FF. 2003. Unit costs of inpatients hospital days. *Pharmacoeconomics* **21**: 263–71.
- Preker AS, Harding A. 2003. *Innovations in Health Service Delivery: The Corporatization of Public Hospitals*. 1st edn. Washington, DC: World Bank.
- Riewpaiboon A, Malaroje S, Kongsawat S. 2007. Effect of costing methods on unit cost of hospital medical services. *Tropical Medicine and International Health* **12**: 554–63.
- Rokx C, Schieber G, Harimurti P, Tandon A, Somanathan A. 2009. Health financing in Indonesia: a reform road map. *Technical report*. Washington, DC: World Bank.
- Shepard DS, Hodgkin D, Anthony YE. 2003. *Analysis of Hospital Costs: A Manual for Manager*. 1st edn. Geneva: World Health Organization.
- Statistics Indonesia. 2010. *Mid-year Population Projection by Regency/City 2008-2011*. Jakarta, Indonesia: The Central Bureau of Statistics Indonesia.
- Suwandono A, Gani A, Purwani S, Blas E, Brugha R. 2001. Cost recovery beds in public hospitals in Indonesia. *Health Policy and Planning* **16**: 10–8.
- Tan SS, Bakker J, Hoogendoorn ME et al. 2012. Direct cost analysis of intensive care unit stay in four European countries: applying a standardized costing methodology. *Value in Health* **15**: 81–6.
- Young DW. 2003. *Management Accounting in Health Care Organization*. 1st edn. San Francisco: Jossey-Bass.

Appendix

Table A1 Revenue and costs for commercial section in 2009 USD equivalents (USD1 = Rp 9400)

	Inpatient			Operating room			Laboratory			Radiology		
	A	B	C	A	B	C	A	B	C	A	B	C
<i>Revenue</i>												
Doctors' visit fees	49 806	106 378	41 226	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hospital service fees	98 605	150 556	88 340	117 703	89 961	93 651	42 575	77 747	27 704	26 870	34 363	26 893
Total revenue	148 411	256 934	129 566	117 703	89 961	93 651	42 575	77 747	27 704	26 870	34 363	26 893
Total revenue per procedure	28.53	21.84	23.40	686.62	174.11	403.78	4.63	2.99	2.93	20.87	11.45	22.84
<i>Costs</i>												
<i>Salary</i>												
Doctors	11 286	19 457	5 986	2 094	2 400	794	785	659	331	785	902	1 297
Nurse and other staff	55 077	77 812	46 144	5 571	11 810	6 558	3 205	5 366	1 540	6 932	5 065	1 063
Administration	39 801	40 987	54 200	3 794	5 948	2 685	8 221	8 550	2 817	3 162	8 550	2 902
<i>Incentives</i>												
Doctors visit	44 826	95 740	37 103	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Medical services	39 442	60 222	35 336	47 081	35 984	37 460	17 030	31 099	11 082	10 748	13 745	10 757
Non-salary	41 800	71 116	70 062	7 310	29 910	16 589	4 642	33 358	2 817	5 041	18 535	4 354
Investment	46 532	37 270	26 235	56 938	34 292	4 289	3 796	15 905	4 483	25 850	22 337	48 987
Net costs (recurrent costs minus salaries)	126 068	227 078	142 501	54 391	65 894	54 050	21 672	64 457	13 898	15 789	32 280	15 112
Recurrent costs	232 232	365 335	248 832	65 850	86 053	64 086	33 883	79 033	18 586	26 668	46 798	20 374
Total costs	278 764	402 604	275 067	122 788	120 345	68 375	37 680	94 938	23 069	52 518	69 135	69 361
Total cost per procedure	53.59	34.22	49.69	716.29	232.91	294.80	4.10	3.65	2.44	40.78	23.03	58.90

Source: Author's calculation based on hospital data. Note: n/a: not applicable.

Table A2 Revenue and costs for non-commercial section in 2009 USD equivalents (USD1 = Rp 9400)

	Inpatient			Operating room			Laboratory			Radiology			Outpatient			
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
<i>Revenue</i>																
Doctors' visit fees	52 356	115 020	84 029	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Hospital service fees	187 653	284 673	107 722	301 327	295 061	176 694	203 763	283 036	127 265	104 628	125 686	117 116	277 037	293 578	293 578	95 181
Total revenue	240 009	399 693	191 751	301 327	295 061	176 694	203 763	283 036	127 265	104 628	125 686	117 116	277 037	293 578	293 578	95 181
Total revenue/procedure	8.50	7.75	5.99	323.81	130.25	131.66	4.08	2.48	2.32	14.97	9.55	17.19	7.98	2.66	2.13	
<i>Costs</i>																
<i>Salary</i>																
Doctors	63 058	58 467	40 262	11 361	10 538	4593	4260	2845	1917	4260	3893	6148	74 344	78 158	46 248	
Nurse	271 328	246 986	208 452	30 230	50 965	37 931	17 395	23 157	8908	37 616	21 858	6148	223 927	136 049	157 067	
Administration	80 771	104 562	143 973	20 591	25 668	15 532	44 614	36 897	16 293	17 159	35 293	16 788	40 642	63 436	74 809	
<i>Incentives</i>																
Doctors' visit	47 120	103 518	75 626	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Medical services	75 061	170 804	43 089	120 531	118 024	70 678	81 505	113 214	50 906	41 851	50 274	46 846	110 815	117 431	38 072	
Non-salary	84 829	181 426	186 106	39 671	129 071	95 955	25 190	143 952	16 293	27 357	79 985	25 187	31 619	104 674	100 833	
Investment	94 432	95 080	69 687	308 989	147 982	24 808	20 603	68 636	25 931	140 284	96 391	283 352	97 278	157 619	53 064	
Net costs	207 010	455 747	304 821	160 201	247 095	166 633	106 695	257 167	67 199	69 208	130 260	72 033	142 434	222 105	138 905	
Recurrent costs	622 167	865 763	697 507	222 383	334 085	224 688	172 964	320 066	94 316	128 243	191 304	101 116	481 347	499 748	417 029	
Total costs	716 599	960 843	767 194	531 372	482 067	249 496	193 566	388 702	120 247	268 527	287 695	384 468	578 625	657 367	470 093	
Total costs/procedure	25.38	18.63	23.95	571.01	212.81	185.91	3.88	3.41	2.20	38.41	21.86	56.43	16.66	5.96	10.51	

Source: Author's calculation based on hospital data. Note: n/a: not applicable.