CHAPTER II

RELATED LITERATURE REVIEW

The chapter is composed of three main parts: incentives of health insurance payment mechanisms, Situation of payment incentives in Thailand and impacts of the 30-Baht Policy implementation, and standard and quality of diabetes care. The relevant empirical evidence was reviewed to comprehend the importance of payment incentives and quality of care.

Studies on Incentive of Health Insurance Mechanisms

Numerous studies have also shown differences in care services, especially in drug use and lab test ordered, concerning different payment mechanisms of health insurance. Clancy and Hillner (1989) pointed out that patients in the Health Management Organization (HMO) with capitation payments obtained less optional diagnostic tests, than the patients in the fee-for-service system but the same equivalent rate of recommended diagnostic tests ordered was come across. The cross-sectional data collection of diagnostic test performed or ordered from 273 new patients' chart was collected. The foremost constraint of the study was that a cross-sectional study was limited to observe long term consequences of the payment mechanism.

Hutchinson and Foley (1999) revealed that the fee-for-service physicians prescribed higher antibiotic rates than salary physicians. The prescription rates were calculated form 153,047 antibiotic prescriptions from 476 general practitioners in 1-year period. The physicians, both salary and fee-for-service ones, with more number of patients they took care also tended to prescribe more antibiotics. However, the scarcity of data in the studied database like proportions of vulnerable patients to higher rates of infection that might affect the antibiotic prescription rates may perhaps affect results of the study.

Shih (1999) reported that Medicare beneficiaries with end stage renal disease (ESRD) who had no secondary insurance tended to be prescribed less medications than who had one or more secondary insurances. This result was analyzed using clinical, demographic, and claims information from the Dialysis Morbidity and Mortality Study (DMMS) waves III and IV data by means of negative binomial models. Generally, patients with this disease require many medications like for kidney transplantation, treatment of anemia, and others. In some cases, drug coverage of the Medicare ESRD program which had some limitations could be possibly insufficient as a consequence of graft failure or prolong anemia.

Accordingly, the Medicare patients without secondary insurance(s) may be put at risk of under treatment. Anyway, the overuse of medications in patients with one or more secondary insurance(s) may also be possible.

Chaix-Couturier (2000) reviewed literature systematically from six databases including Medline, Embase, Health Planning and Administration, Pascal, International Pharmaceutical Abstracts, and Cochrane Library with 4 search terms including health professionals and type of practice, type of incentive, methodology, languages English or French from January 1993 to May 1999 were appraised and summarized in the study. Risks of financial incentives which limited the therapeutic choices to the quality of care were suggested as follows:

1) Constraint in continuity of care, especially in chronic diseases
2) Decrease in range of services provided, especially in prevention and psychological support
3) Under-use of improper use of emergency services leading to delayed treatment and related medical complications
4) Decrease in confidence of the patients
5) Risk of ethical conflicts
6) Decrease time for teaching and research
7) Multiplicity of guidelines from different plans recommending different courses of action for the same conditions
8) Conflict of interest between the physicians and the patients across all of the population, including both low-risk and high-risk patients.

Insurance schemes with capitation payments or fund holding were likely to diminish the total volume of prescription by 0-24%, and hospital days by up to 80% compared to fee-for-service schemes. However, some confounding factors were age of physicians, training, specialty, place and type of medical practice, previous sanction for over prescribing, and type of patients treated – e.g. number and type of disease, acute or chronic, diagnostic or therapeutic procedures, patients' sex and ability to pay.

Shireman, et al. (2002) found that fee-for-service recipients had overall prescription use levels 25-218% and prescription costs 23-311% higher than recipients of Medicaid managed care with capitation payments. A retrospective cross-sectional design for 6-month period of claims data analysis was a research design of this study. Co-morbidities and age of patients were considered to be adjusted variables of the effects. The major limitation other than the normal limits of administrative claims database is a lack of incentive to report all claims under a capitation system of the managed care. Nevertheless, the quality of care should be evaluated in further research.

On the other hand, some reports have indicated controversies. Yesalis III, et al. (1984) showed discrepancies of drug use levels and pharmacists dispensing behavior under capitation and fee-for-service schemes in a pilot study in two counties. The generic substitutes were increased in capitation Medicaid scheme and cost saving was initiated. Conversely, no differences were found in the expanded study in 64 counties. A before/after of experimental/control design which is interrupted time

series design was used for the 10-month observation of prescription audit. The data was collected from the Medicaid Management Information System (MMIS), the Medicaid eligibility files, and the Master drug pricing.

Lurie, et al. (1994) found that outcomes of diabetic care – general health status, physical functioning, mental health status, activities of daily living, visual acuity, blood pressure, and glycoselated hemoglobin – between elderly Medicaid beneficiaries with capitated health plan and fee-for-service care was not diverse. The study design was a randomized controlled trial for 800 beneficiaries with at least 65 years old. The subjects were interviewed at baseline and one year after the 35% of them were randomly assigned to the capitated prepaid schemes. The major limitations of clinical outcome measurements in the study are short follow-up period, which did not represent long term effects, and sampling error of blood pressure and glycoselated hemoglobin test at the base line and the follow-up, which was likely to be a confounder.

To give explanation of the review succinctly, the findings of incentives of health insurance payment mechanisms on drug use and care are summarized in Table 2.1 Most of the literature compared the effects of the fee-for-service payment with the capitation payment.

Table 2.1 Summaries of incentives of health insurance payment mechanisms

Authors (Year)	Outcome variables	Study design / Data sources	Payment incentives
Clancy and Hillner (1989)	– physicians; order for diagnostic lab test	cross-sectional (3 months) / medical chart review	Recommended lab test: – less orders in capitation than in fee-for-service Optional lab test: – no differences
Hutchinson and Foley (1999)	– rates of antibiotic prescription	cross-sectional (1 year) / administrative database	less antibiotic prescription rates in capitation than in fee-for-service
Shih (1999)	– number of medications prescribed for ESRD patients	cross-sectional (4 years) / database of the United States Renal Data System	less number of prescription drugs in capitation only (without secondary insurances)
Chaix-couturier, et al. (2000)	– total volume of prescriptions – hospital days	systematic review of the literature (6 years of published literature) / a literature search of pertinent renowned databases	less volume of prescriptions and hospital days in fund holding or capitation than in fee-for-service
Shireman, et al. (2002)	– Prescription use levels – prescription costs	retrospective, cross-sectional (6 months) / administrative claims databases	less overall prescription use levels and costs in capitation than in fee-for-service
Yesalis III, et al. (1984)	– drug use levels – pharmacists dispensing behavior	before/after of experimental/control, interrupted time series design (10 one-month periods) / Medicaid Management Information System databases	Pilot study (2 counties): – more generic substitutes and cost savings in capitation than in fee-for-service Expanded study (64 counties): – no differences
Lurie, et al. (1994)	– general health status – physical functioning – mental health status – acitivities of daily living – blood pressure – visual acuity – glycosylated haemoglobin	randomized controlled trial (1 year) / Medicaid and Medicare claims, client self-report, and patient interview	– no differences

The majority of studies regarding payment incentives on health care services employed cross-sectional design and used secondary data from claims or research databases. In general, variables in those kinds of database include demographic data, health insurance eligibility, claims data such as prescriptions or lab tests, etc. Comprehensive clinical variables, normally, do not incorporate in the database because they are not related to the claims process. Accordingly, only care processes like drug use or order of lab test could be analyzed but the quality of care analysis which required lots of pertinent clinical outcome information. This momentous limitation impedes investigations of payment incentives on quality of care. Moreover, lacking of decisive clinical variables like disease severity or co-morbidity data in the database may confound results of influence of payment mechanisms over health care service quality. Therefore, the controversy among the studies review may be an effect of these confounders.

The overall incentives of capitation payment have had a propensity to diminish health care costs on the basis of reduction in health care resources use. Concomitantly, quality of care under this payment method may jeopardize the under-treatment. On the side of fee-for-service payment, health care costs seem to be inflated due to escalation of resources use. At the same time, a tendency for over-treatment of this payment approach, which may or may not be considered as a quality care, is more distinctive than other payments. Nevertheless, to deduce that which payment mechanisms provoke superior quality of care, the prudent study design on clinical outcomes need to be pondered.

Situation of Payment Incentives in Thai Context and Impacts of the 30-Baht Policy Implementation

Before the penetration of universal health care coverage policy to Thai milieu, the four major health insurance schemes were 1) medical welfare scheme with global budget payment, 2) health card scheme with global budget payment plus 500 baht out-of-pocket per family, 3) social security scheme with capitation payment, and 4) civil servant medical benefit scheme with fee-for-service payment. The rest individuals paid for private health insurance with various payments or paid out-of-pocket on their own. In 2001, the immense change of health insurance system in Thailand was the 30-Baht for every disease Policy implementation. Subsequently, the foremost health insurance schemes were changed to 1) the 30-Baht Policy with mix payments of capitation for outpatients and DRG case payment with global budget for inpatients, 2) the same social security scheme, and 3) the same civil servant medical benefit scheme. Thus, payment mechanisms of interest are capitation, fee-for-service, global budget, and DRG case payment. Related studies in circumstance of Thailand have been reviewed.

Bryant and Prohmmo (2005) found that fee-for-service patients had higher prescription costs than capitation patients controlling for age, sex, diagnosis

and social-economic status. When cost per item of drug was taken into account, fee-for-service patients tended to obtain higher cost drugs, especially patients with diseases of the circulatory system. The prescription data from treatment records of outpatients aged 60 or over in four community hospitals, size 30-90 beds, during 1998-1999 (except for one hospital with only first 3 months of 2000 available data) was randomly selected. The variables recorded into the research database for analysis were date of visit, age, gender, payment scheme used, diagnosis, medicine received, and payments to the hospital. Important limitations of data available in the treatment records were as follows:

1) Incompleteness of data availability, for example some hospitals terminated treatment records (or medical records) after certain period of time, like every 5 years, due to limitation of space in data backup systems.
2) Diagnosis data was recorded very brief and nonsystematic. Therefore, transforming to ICD-10 code by experience nurse was needed and multiple classifications of co-morbidity were not allowed.
3) Exact brand name of drug dispenses was not able to identify because brand name wrote in the prescriptions may not mean the same brand name of drug dispensed. Accordingly, only levels of generic name, dosage form, and strength of drugs were able to analyze.

Srisuphan, et al. (2004) pointed out that CSMBS patients with fee-for-service payment had a higher possibility to get high cost drugs which was not on the 1999 National Lists of Essential Drugs than low income and social security patients with global budget and capitation payment respectively. A group of non-steroidal anti-inflammatory drugs (NSAIDs) was a tracer drug group to explore the differences of the possibility in this study. Electronic prescription data, in fiscal year 2000-2001, from four regional hospitals was analyzed. An estimate for cost saving of about 4.5-7.6 million baht by substitutions of NSAIDs in the lists was made. Nevertheless, appropriateness of drug use was not evaluated.

Chansung, et al. (2003) stated that switching to lower price drugs was found in patients with capitation insurance schemes, including the 30-Baht Policy and the social security schemes, but in patients with fee-for-service scheme after the 30-Baht Policy implementation in regional and general hospitals in the study. Diabetes mellitus was an indicator disease to compare quality of care before and after the implementation because it is a chronic disease with characteristics of

- high prevalence in people with every socioeconomic status,
- every level of hospitals can provide care to patients,
- existing of clinical practice guidelines, and
- wide ranges in cost of drug use, especially in terms of original or generic drug products

Standard and Quality of Diabetes Care

One of the renowned standard treatment guidelines for diabetic care with an acceptance in endocrinological area has been recommendations of the American Diabetes Associations. Concerning processes of diabetic care, some essential laboratory tests and physical examinations for monitoring of disease progression and co-morbidity and complications have been required for every diabetic patient in certain frequencies, as mentioned in Table 2.2 (American Diabetes Association, 1999 and 2003). Regarding the guidelines in Thailand, the Endocrine Society of Thailand established diabetic care guidelines for physicians who took care of diabetic patients in 2000. Standard practices for required laboratory tests and physical examinations were also shown in Table 2.2.

Table 2.2 Recommendations of minimum frequencies of the essential laboratory tests and physical examinations provided on yearly basis

Laboratory test and physical examination	**Recommendations yearly minimum frequencies**		
	ADA guidelines, 1999	**ADA guidelines, 2003**	**Guidelines of the Endocrine Society of Thailand, 2000**
1. HbA1C test	Twice[a]	Twice[a]	-
2. FPG test	Optional	-	-
3. lipid profile test	Once	Once	Once
4. serum creatinine test	-	-[b]	-
5. microalbuminuria test	Once	Once	Once (if no macroalbuminuria)
6. dilated eye examination	Once	Once	Once
7. foot examination	Once	Once	-
8. blood pressure measurement	Every regular diabetes visit	Every regular diabetes visit	Four times

Note: [a] twice yearly for patients with stable glycemic control and a goal of treatment met and quarterly for patients with changed treatment and a goal of treatment not met

[b] for calculating of estimated glomerular filtration rate (eGFR) and staging the patient's renal disease