A Systematic Review of the Effect of Payment Mechanisms on Family Physicians Service Provision and Referral Rate Behavior

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ABSTRACT

BACKGROUND: Family medicine is undergoing reforms in several countries. In order to attain the health care objectives such as quality, efficiency and accessibility, different tools are being utilized including legislation, organizational models and financial incentives. The purpose of this literature review is to discuss the impact of different methods of payment to family physicians and general practitioners, quantity of service provision and referral rate behavior.

METHODS: We carried out a systematic literature search in five electronic databases including PubMed, Science Direct, Emerald, Wiley Inter Science, Springer Link and ANNFAMMED published to September 2011. We also reviewed the references of the final selected articles to identify the relevant articles. Search strategy included the following combination of keywords: "payment", "reimbursement", "compensation method", "general practitioner" and "service provision". From 2738 articles that were identified in our first search, eleven articles were included in the final review. We extracted data from the selected articles and performed content analyses in regards to the type of intervention.

RESULTS: In comparison to salary and capitation, fee-for-service (FFS) was associated with 9%-12% lower referral rate presumably because physicians wanted to treat patients and increase their incomes by producing more services. Compared with FFS, capitation payment decreased the number of provided services (14% lower visits in the outpatient settings and 50%-60% lower visits in the inpatient settings) due to budget limitations. We found that referral rate to hospitals and specialists increased up to 20% in capitation.

CONCLUSION: This literature review shows that each payment method for family physicians and health professionals creates a particular set of incentives for physician. While nations act differently and in line with their health system goals and context, international experience suggests some guidance for policy makers. New policies should ensure a payment system that is optimal for local health care delivery structure and compliant with local laws, regulations, and tax system.

Keywords: Payment mechanism, Family physician, Referral rate, Service provision

INTRODUCTION

Health care delivery through family medicine and primary care is undergoing reforms in many countries around the world. Family physicians have a considerable role in health system as gatekeepers [1, 2]. In fact, some evidence shows that the lack of access to family physicians not only adversely affects the health and well-being of the population but also have substantial cost to the society and patients. Conversely, universal access to family physician services is a crucial element of an efficient and effective publicly funded health care system [3, 4]. Health care policy makers generally decide about how much and through which method healthcare providers

should be paid and thus policy makers have the leverage to create powerful incentives that can influence the actions of organizations and individuals within the health care system [4, 5].

There is an emerging interest in using financial incentives. Several countries are in the process of redesigning their health care systems in response to current and expected future needs of their population, and long-term allocation of limited resources. Changing payment method for health care providers is one of the important interventions that are being studied to improve health systems outcomes and to achieve health policy objectives [6, 7]. Payment system includes all payment mechanisms, such as contracting, accountability mechanisms that accompany the payment method and management information systems [8].

Typically, payment schemes can be classified according to the method used to reimburse healthcare providers such as fee-for-service (FFS), capitation, and salary systems. In FFS system, healthcare providers are reimbursed for each service provided. In capitation system, the payment for all services is bundled depending on diagnosis/procedure. Capitation system also includes payments for providing comprehensive care to a patient throughout a defined period of time irrespective of the amount and intensity of services rendered [6, 9, 10].

On the other hand, because of wide medical knowledge gaps between physicians and patients, physicians can positively or negatively manage and affect user's health service demands [5]. Empirical evidence consistently shows that financial incentives are one of the most important incentives that influence family physician behavior [11].

Based on the incentive schemes, salaried and capitation-based paid physician may respond to incentives by reducing costs and by under-treatment of patients whereas FFS physicians are incentivized for over-treatment [12]. Hickson (1987) found that physicians at FFS payment system see more patients than physicians paid through salary [13].

The effects of financial incentives depend directly on the structure, socioeconomic and cultural context of the health care system [14]. Experience gained and results obtained with financial incentives in one country and may not be implementable in another country and may require country-specific modifications [15].

Physician and hospital reimbursement methods have been the subject of much debate over the past many years [16]. Significant theoretical and empirical studies that examined the effect of contract mechanism on physician's behavior are rare and show variable results [17]. Thereby, the purpose of this literature review is to examine the impact of different methods of payments to family physicians and general practitioners on the quantity of the services provided and on the referral behavior.

MATERIALS AND METHODS

Data sources and search strategies: We performed a systematic literature search using five online electronic databases: PubMed, Science Direct and Emerald, Wiley Inter Science, Springer Link and ANNFAMMED. We selected articles that addressed financial-incentive programs. We also reviewed the references of the final selected articles to identify articles that might have been missed in electronic database search. To search articles for review, we used English and Persian language and three themes that were connected with Boolean connectors: (payment, remuneration, reimbursement, compensation method), (service provision, service production, referral rate, referral to specialist) and (family physician, general physician, GP, general practitioner). In some databases, search was performed with methodological filters according to the method of study. Each full-text article was reviewed by two reviewers independently and disagreements between reviewers were resolved by mutual consensus.

Selection criteria: Articles were included if:

- Published between 1985 to2011
- Assessed the effect of three basic types of payment mechanisms (salary, FFS, capitation) on physician behavior
- Addressed the confounding factors (by adjusting for these factors)
- Had adequate response rate (at least 60%)
- Used valid data sources
- Reported quantitative results, effects, or impacts of payment mechanism on family physician program and general practitioners behavior

Study design:

- Prospective or retrospective cohort studies
- Randomized controlled trials
- Controlled before-and-after studies
- Comparative studies

The majority of the included studies were cohort studies due to the lack of randomized controlled trial studies. We excluded program evaluation studies if they attempted to increase or decrease the number of patient referrals to specialist and rate of service production. Reviews, commentaries, editorials, news and policy briefs were also excluded.

Finally, 11 articles that matched with our inclusion criteria were included in our systematic review. We extracted data from selected articles and performed qualitative analyses for the type of intervention. If there were any data missing from a study, this was explicitly stated. Due to different study methods, settings, and objectives, quantitative comparison and pooling of the study results was not possible.

RESULTS

Of the 11 studies included in the systematic review, 3 were from Norway, 3 from Canada and rest were from the United States, England, South Africa, Denmark and Uruguay. Majority of the studies were prospective or retrospective cohort

Table 1: Articles retrieved in primary search

Databases	Number of articles
PubMed	811
Science Direct	623
Emerald	477
Wiley Inter Science	256
ANNFAMMED	28
Scopous	460
Springer Link	83

studies. Six articles compared FFS method with salary, 4 articles compared FFS with capitation and one of them compared salary with capitation/FFS payment methods on physician behavior.

The articles retrieved from the initial search from the 5 databases are included in Table 1.

As Table 2 shows, in Sorensen study that compared FFS with salary payment, physicians with a FFS contract produced a higher number of consultations and other patient contacts than physicians with a fixed salary. This difference was mostly due to longer working hours, but time efficiency is greater as well. Moreover, a part of the difference is due to a selection effect: salaried physicians prefer shorter working hours and prefer to work less intensively. Kristiansen et al found that doctors paid on a FFS basis tended to choose home visits more often than salaried doctors and study indicated that financial incentives may be used to change behavior and encourage home visiting. Similarly, Krasnik et al conclude that introducing a partial FFS system seemed to stimulate the provision of services by general practitioners, resulting in reduced referral rates. Another study found a higher probability of caesarian section in women without risk factors who were treated in private hospitals (25%) than women in public hospitals (11) and authors concluded that the remuneration system explained an important part of this difference. Godsen et al compared salary payment and FFS and found that salaried GPs tended to provide shorter consultations compared with standard contract GPs, prescribed fewer consultations, but referral rates were similar. Lee et al conducted a retrospective study and found that none of the variables showed any statistically significant association between patients who were treated in one or the other model. Budget et al compared FFS and capitation payment system and showed the average number of physician visits was similar for both groups (4.47/year in the capitated program; 5.09/year in the FFS system). However, the average number of hospital admissions per recipient (0.11 versus 0.22 per year), and average

Figure 1: PRISMA Flow Diagram [37]

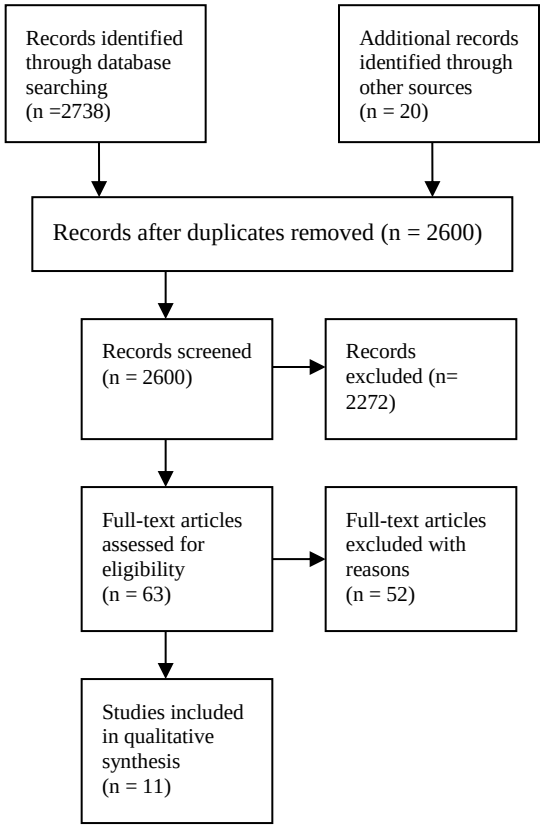

Table 2: Description of included articles (abbreviations: FFS = fee-for-service; GP= general practitioner; CBA = control before after; CAP = capitation; SAL = salary)

Study, Year published, Country	Type of study	Target population	Primary outcomes	Notes
Broomberg [25] 1990 South Africa	Retrospective Cohort FFS vs. SAL	Data from two group of 44324 person for one year	• Patient visited FFS GPs 36% more often than salaried GPs • No significant difference per hospital admissions	- Patient were comparable in age, sex, race and income distribution
Kristiansen [23] 1993 Norway	Prospective Cohort FFS vs. SAL	Documented data of 116 GPs Respond rate: 78.4%	• Average visits for FFS and salaried physician was 71.6 and 56.2 per month • More home visit in FFS method	- Control on physician characteristics, target population
Krasnik [19] 1990 Denmark	CBA CAP vs. FFS and CAP 6 month before and 12 month after	100 physician in the study group and 326 GPs in the control group	• Physician-patient contacts rose to 11387 six month after intervention • Hospital referral decreased from 251 to 226 after intervention • Referral to specialist decreased from 1276 to 1176 six month after intervention	- No information about patients - Two comparable groups
Godsen 2002 England	CBA CAP/FFS vs. SAL	Randomly selected physician with two type of payment	• Referral rate in both method were same • Salary physician provided more surgery consolations and saw more patient in compared with CAP GPs	- Law sample size - Control on confounding factors
Badgett 1997 United States	Prospective Cohort FFS vs. CAP	259866 patient that used physician services with two type of payment	• Average number of visit per year; FFS:5.09 and CAP: 4.47 • Hospital day per 1000 recipient was 5% to 60% lower in CAP	- Large target Population - Low control on standards
Grytten 2001 Norway	Comparative FFS vs. SAL	FFS:1818 SAL:567	• No results for induced demand • Non-financial factor effect such as patient needs, professional norms • No meaningful difference between contract and salaried physicians	- Appropriate sample size - controlled for confounding factors such as age, sex, work experience and physician academic degree
Lee Susan 1994-1196 (3 years) CANADA	Retro cohort SAL vs. FFS	FFS:476 SAL:106	• On average16.7 specialist service and 26.9 diagnostic service during patients last years of life for salaried physician • No statically significant difference in number of services delivered	- Adjusted for cause of death - Small sample size
Richard H 2009 CANADA	Enhance FFS Vs CAP Cohort	Administrative data from physicians	• Mean number of emergency department visit was 0.4 for FFS and 0.5 for capitation physicians • More after hours services	- Adjustment for physician and patient characteristics - Large sample size - Depend on administrative data

			from FFS physicians	
Triunfo 2009 Uruguayan	Cohort FFS vs. SAL	Physician who work in public and private sector in Montevideo	• Caesarean rate was two times higher than in a public hospital (20% as against 39%). • Caesarean rate for women without risk factors was 25%. In FFS.	- Controlled for risk factor - Data on demographic indicator was limited
Sorensen 2003 Norway	Cohort FFS vs. SAL Respond rate: 66%	Norwegian physician in two group	• More patient contact in FFS • 80% more telephone service in FFS • Specialist referral rate in FFS was 12% lower than salaried • Annually, FFS physician worked 182 hours more than salaried	- Appropriate control for confounding factors - Large sample size - high response rate
Hutchison 1996 Canada	Retrospecti ve Cohort CAP vs. FFS	Primary Physician FFS:77 CAP:39	• Hospital utilization rate per 1000 person in FFS 49.4 and capitation 49.6 • Hospital day used decreased after capitation introduced	4 years study - adjusted for demographic factors and type of disease - Hospital budget limitation and bed reduction accrued during study

number of hospital days per 1,000 recipients (461 versus 909 per year) were 5% to 60% lower in the capitated group than in the FFS group. Broomberg et al also demonstrated that providers working in the FFS system are likely to increase the supply of services compared with providers who are salaried.

DISCUSSION

As this literature review shows, each payment method for family physicians and health professionals creates a particular set of risks and incentive for physicians and they respond to the different payment methods in a different but predictable way. The type of payment method has both positive and negative effects on service provision and referral rate behavior of providers.

Our study indicates that salary payment method is associated with low service provision and higher referral rate compared with fee-for-service and capitation methods, because in this method physicians receive wage regardless of the number of provided services [21, 25, 28]. Godsen in his recent study about the effect of salary payment method on physician behavior showed similar results; authors found an association between salary payments and reduced number of services per patient, reduced volume of patients per physician and greater degrees of preventive care compared to fee-for-service [31].

Studies included in our review show that FFS payment method cause higher service production and induced more services to the patient. In comparison to salary and capitation, FFS leads to lower referral rate because physicians may want to treat patients and increase their incomes by producing more services [24, 28, 25, 21]. Grytten published his results in 2001 that were inconsistent with some of the more recent literature in this field. Authors concluded that Norwegian physicians prefer the professional norms to financial mechanisms [20]. Sørensen et al (2003) indicated that physicians paid on a FFS basis produced a higher number of visits, other patient contacts and diagnostic services than salaried physicians, and concluded that a change in physician payment schemes from salary to FFS would increase service production in the range of 20–40% [21].

Due to the knowledge gap between physicians and patients, physicians can positively or negatively affect demand by advising patients on when to come back for another visit, what drugs to take, what specialists to see, and what laboratory tests or surgical treatments to undergo [5].

Compared with FFS, capitation payment decreased service production due to budget limitations [17, 26, 30]. Our study shows that referral rate to hospital and specialist increased in capitation compared with FFS. Some studies examined the effect of capitation payment on provider behavior. Iversen et al (2000) evaluated the impact of capitation on Norwegian GPs' referral decisions. They found a 42% increase in the rate of referral from general practitioners to specialists after Norway introduced capitation

based remunerating system [32].

As countries are governed within highly variable economic, cultural, political, demographic, and epidemiological contexts, forming a firm conclusion is difficult. One difficulty in interpreting the effects of financial incentives is that other factor can also affect health objectives hereby the analysis of the effect of financial incentives cannot be separated from the general context of health care financing system [29].

In order to use available evidence on the effect of financial incentives on physician behavior, future studies should evaluate programs from a more diverse set of countries, in particular from developing countries. In these studies, researchers should attempt to control selection biases as rigorously as possible, using selection models in observational studies and randomized controlled trials where fund providers and policy makers are willing to support such experiments [34].

From the policy maker's point of view, financial incentives are not sufficient to alleviate the family physician system problems. Broader changes in organizational structures, educational systems, and policy must be combined with changes in remuneration methods to improve physician service provision, collaboration, care continuity, and care quality. We cannot expect to rely on payment method per se to resolve health policy problems that require system-wide approaches [35].

In addition, to make the payment system effective, development of an appropriate information system such as electronic medical records is essential for monitoring data as a supporting system [35].

John and colleagues published a book in 2009 about designing provider payment system and indicated that payment systems can help to achieve health policy objectives by encouraging access to necessary health services for patients, high quality of care, and improved equity, while promoting the effective and efficient use of resources and cost containment [8].

The actual impact of payment mechanisms on health care system depends on the context of the system and the combination with other relevant control nubs. Non-financial incentives are social control mechanisms, such as performance monitoring, peer review, practice ownership, education, professional ethics and audits, all affect physicians behavior. These factors can mitigate or even reverse purely financial incentive mechanisms [9, 36].

Non-financial incentives are largely created by the organizational structures of health care. Decreases in professional flexibility, monitoring and regulation all act as motivators towards provision of appropriate care, but might be met with resentment from physicians [33].

CONCLUSION

We believe while nations act differently due to their different health system goals and context, international experience suggests some conditional guidance for policy makers and they must also have a system for ensuring that payment is in compliance with local context such as laws, regulations and tax system.

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