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A typology of pay-for-performance programs in publicly funded primary health care systems

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Abstract

Background: Over the last decade many systems have introduced pay-for-performance (P4P) programs in primary care with the goals of enhancing health care service delivery. The design and implementation of such programs has been fragmented across jurisdictions, and the individual resultant programs vary in nature and in nomenclature. Comparisons across these programs are challenging given the distinct lack of a standardized unifying framework.

Methods: We review policy documents and conduct a systematic review of associated literature of seven pay-for-performance systems in four Commonwealth countries which seem to have similar philosophies and histories regarding publicly funded primary health care. These countries are: Australia, Canada, New Zealand and the United Kingdom.

Results: We create a typology of P4P programs in primary health care in the context of public funding. Our typology identifies four key dimensions of P4P programs, each of which is further divided into categories. The dimensions are: type of service targeted, nature of target, nature of reward, and budget implications. The typology is applied to the seven case study systems to illustrate how it can facilitate comparisons between programs.

Conclusions: A standardized typology of P4P program is an important first step in the gaining of a comprehensive understanding of the mechanisms underlying these programs, and their effectiveness in a variety of contexts.

Keywords: Pay-for-performance; Primary health care; Typology; Standardized comparative analysis; Publicly funded health care systems; Physician incentives

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Introduction

The cornerstone of critical thinking is an agreed upon vocabulary."

[Stephen King in Dolores Claiborne, 1993]

In the last decade, both public and private health care systems have introduced bonus payments for primary care physicians that are added to base remuneration mechanisms. These differ in goal, in structure, in focus, and in nomenclature. Their unifying characteristic is their add-on nature. These programs have been introduced relatively recently though at different points in time across jurisdictions, and typically in isolation from one another. The lack of consistency in terminology and in conceptualization makes comparisons between these programs, judgments about their appropriateness in specific contexts, or drawing generalized conclusions about their effectiveness difficult. Reviews of evaluative studies of the effectiveness of P4P programs have shown that the evidence of effectiveness in inconclusive. A solid understanding of the value of P4P in primary health care is not yet established. The questions asked in the literature vary, the methods of inquiry differ and the evidence does not point in any one particular direction. We cannot say with confidence that P4P

programs have proven effective or worth the investment. We are not even sure how to measure the desired effects [1-7].

The key argument of this paper is that the examination of P4P programs needs to be systematized, allowing researchers to work toward the solution of a puzzle, rather than the equally important, but insufficient creation of its pieces. A first step in systematizing the inquiry around P4P is to create a solid understanding of the object of inquiry – in other words a description of what P4P programs are.

In order to introduce consistency in terminology and in conceptualization, we have developed a typology of bonus payments for primary care physicians. The development of a typology is one process for the classification of phenomena that has been used as an analytic framework in policy studies [8,9]. The purpose is to provide consistent and objective criteria for the assignment of specific cases, in our case payment programs, into distinct categories. Such a typology provides a systematic basis for comparative analysis that aims at identifying which configurations of payment system elements perform best in which contexts [9,10]. This kind of conceptualization is the only approach policy analysts have to overcome the limitations inherent in case-study methods [11].

The nomenclature for add-on bonus payments varies in the literature [12-14]. Due to its popularity in the literature we adopt the term pay-for-performance (P4P) as the over-arching name for all bonus payments added to regular sources of primary care physicians' incomes. The term originated in the U.S., but has been applied to the systems in Canada [3,12-14], and in the U.K. [15-22]. We de-construct the variety of P4P schemes by goal, target and reward structure, and the types of services for which P4P payments are offered.

Data

Data used in the creation of the typology were policy documents (printed and web-based) speaking to the types, structure and design of P4P programs in the Commonwealth countries of Australia, Canada (including information from four provinces), New Zealand, and the U.K., as well as academic scholarly articles about P4P programs in these jurisdictions. These countries share philosophies and histories regarding health care. An additional advantage is that the selected case studies are all from P4P programs in English speaking and publicly funded health care systems[1]. Most of the documents were found using web-based searches of publicly available documentation, with particular focus on official documents published on the websites of health ministries, the National Health Service, or private insurers in the U.S. Documents from two Canadian provinces (Nova Scotia and Manitoba) were obtained from the respective Ministries of Health directly, as online documents were not available. Academic scholarly publications were found using the Scopus and EbscoHost databases.

Methodology

A typology in the traditional sense of the term refers to a conceptual construction of categories, which may be thought of as "ideal types" [9,23]. They are theoretical constructs that draw together observable elements into an intellectually consistent framework [24]. Categories are constructed from the general to the increasingly more specific concepts, decreasing in generality [8]. An alternative approach to classification is by taxonomy. Taxonomies are hierarchical in structure and rigid in the definition of categories. Typologies work better for our purposes as their more loosely structured constructs allows for both hierarchical and lateral relationships between concepts.

Our framework is constructed using case studies of P4P programs in English-speaking publicly-funded systems. The resultant construct is a typology with elements of empirical observation. The approach is not quantitative, as would typically be applied to the construction of taxonomies. Rather we construct a conceptual framework that is based on a sample of seven case studies and extended to incorporate an exhaustive set of conceptually plausible scenarios.

The process of category and sub-category creation was iterative. Initial observation of P4P programs facilitated the creation of ideal type characteristics, in part supported by the economic literature on contracting [25-27][2] and economic literature on incentive design in health care (see next section). These were refined with further observation of additional P4P programs and careful deliberation about the assignment of additional case studies to specific elements of the framework. The typology is populated using the case studies from the health systems of interest, while some possible P4P types are conceptual and not exemplified with particular case studies. The approach taken blends elements of exemplar/prototype theory and the traditional idealized theory [28]. Categories are based on prototypical exemplars, and their definition is extended to include conceptually necessary and sufficient conditions to satisfy a category. The assignment of new entries into categories is therefore based on both the necessary and sufficient conditions, and comparison with prototypes or exemplars within that category. In addition, we have incorporated other characterizations offered in the literature, including [7,12] into the analytical process.

Previous categorizations

We have identified three existing studies that contribute to the classification of P4P programs. Pink et al. (2006) provide a descriptive what they refer to as taxonomy of government sponsored P4P programs in Australia, the United Kingdom, and the United States, as well as a large private P4P program in the United States [12]. Their classification describes these programs in terms of their goals, the date of initiation, the included providers,

[1] The choice of case studies from certain Commonwealth countries is based on two factors: (i) the underlying health systems are relatively similar, yet their P4P programs have variation sufficient to create a typology. An important step to the global understanding of the effectiveness of P4P programs is the assessment of program options in relatively similar settings. (ii) There are other publicly funded systems with P4P programs that we did not consider because we are not able to analyse government documents in non-English speaking countries.

[2] This literature discusses various aspects of contracting, such as for example the responses of workers to various types of contracts, the impacts on quality, and the choice between competitive and non-competitive program

quality measures, financial incentives, and program evaluation to date (2006). Our typology is focused on primary health care providers only, and includes Canadian examples. We provide a more detailed classification of quality measures, whereas Pink et al. distinguish between process and outcome measures. We classify financial incentives into categories, whereas Pink et al. provide descriptive examples. A main improvement over Pink et al. is that our typology provides an analysis of the behavioural incentives created by the design options of P4P programs, whereas Pink et al. do not offer an assessment of how providers might or do react to the P4P programs.

Van Herck et al. (2010) conduct a systematic review of evaluation studies that assess the effectiveness of P4P programs in terms of clinical effectiveness, access and equity, coordination and continuity, patient-centredness, and cost-effectiveness, with special attention to mediating contextual factors [7]. The development of a typology is a secondary goal that is used to support the ordering of results of their study. Nonetheless, a useful categorization of the design choices of P4P programs emerges. Design choices are classified into quality goals and targets, quality measurements, P4P incentives, program implementation and communication, and evaluation. The classifications are used primarily to organize evaluative study results. Targets are divided into process and outcome indicators, but a description of the two types is not given. Quality measurement is identified as the data collection method (e.g. chart audits, claims data, etc.), whereas we categorize by type of indicator. Incentives are dichotomized as competitive and non-competitive. We offer a more detailed categorization and discuss the mechanisms of action through which specific payment types affect behaviours.

Christianson et al. (2008), in their review of the effects of P4P programs, describe the structure of payment arrangements in terms of their size relative to provider revenues, the number of measures on which rewards are based, risk-adjustment of P4P payments, the sources of funds, and the participation costs incurred by providers [2]. These are mediating factors that influence the extent to which P4P programs take an effect. A broader categorization of P4P programs, including mechanisms of action, types of targets, measures of quality, or other characteristics is not offered.

Economic theory of provider remuneration methods

A large body of social science literature highlights and tests the theoretical predictions of how providers of health care react to financial, and at times non-financial, incentives. Economists have taken the lead among the social scientists in speculating how physicians respond to various forms of remuneration. Remuneration types are most commonly classified into fee-for-service, salary, capitation models, and blends of any of the three, and the additional P4P programs.

These types can be fit along a variability spectrum. The spectrum is a variation of the typology of provider payment systems in health care as proposed by Jegers et al. [29]. Jegers et al. offer a four dimensional classification, where payments can be fixed or variable, and prospective or retrospective. The spectrum is a modification that reduces the number of dimensions, but introduces a continuity aspect to the fixed versus variable types of payments [30]. Fee-for-service, where providers receive a payment for every unit of care, is the most variable remuneration type. The physician's revenue depends on the number of patients and the number of services delivered to those patients. Capitation is a less variable payment method, as the revenues of the physician vary with patient numbers, but are fixed regardless of the number of services delivered to those patients. Salary, a payment per time period, is the least variable, as the revenue of the physician does not vary with patient numbers of the volume of services.

Empirical literature is typically rooted in economic theory of incentives and resultant physician behaviours, and specifically on the quantity of services provided, the acceptance of patients, the provision of preventive services, the quality of care provided, comprehensiveness of care, and the collaboration with other providers. Elsewhere, we describe in detail the framework of incentive effects on provider behaviours [30]. The theory suggests that higher variability of payment methods is associated with higher quantities of care provided, and higher acceptance of risky patients, however lowers to incentive to provide preventive care, invest in care continuity, or collaborate with other providers. In comparing the fee-for-service system with the capitation system, for example, the fee-for-service system creates an incentive to provide as much care as possible to all patients, potentially to the point of overprovision. Preventive care is motivated only, if the preventive service is billable. The capitation system, on the other hand creates an incentive to accept large numbers of patients, but provide as little care to them as possible. Furthermore, the capitation system discourages the acceptance of risky, or less healthy, patients, whereas the fee-for-service system makes no distinction between high and low risk patients. For a thorough discussion, the reader is advised to consult Wranik and Durier Copp 2011 [30].

The bulk of empirical and theoretical literature examines core remuneration methods, with less focus on P4P type models. A systematic database search of the economic literature (Appendix 3 for methodology) coupled with a manual search of bibliographies identified list published studies relating to the effects of core remuneration on primary care physician practices [31-78]. A smaller number of studies related to P4P programs specifically [2,5,6,12,14,17,20-22,79-90] The synthesis of literature on core or other remuneration methods is provided elsewhere [1,7,91,92].

The results of empirical studies assessing the effectiveness of P4P programs are inconclusive. It is not clear, whether these programs are effective in terms of improving quality of care, access to care, care comprehensiveness or continuity, or cost-effectiveness. Individual case studies focus on a variety of questions using different methodological approaches in different contexts. Generalized conclusions to date have not been possible.

Results – Description of the Typology

P4P payments are typically the result of a broader policy of reform, and as such are often packaged with other types of financial incentives. The typology developed in this paper applies

to the P4P portion of financial bonus incentives; the "location and organizational bonuses" and "information technology bonuses" are included in the appendices in order to set context.

Our typology classifies P4P programs into two different broad types of programs: target based payments, and enhanced fee-for-service (FFS).These two types are then delineated by their characteristics along four dimensions: (i) type of service being rewarded; (ii) nature of the target; (iii) nature of reward; and (iv) budgetary implications (**Table 1**).

The typology can be used as a descriptive tool, or alternatively as a decision making framework. As a decision framework, each dimension and the goal statement (described below) can be viewed as a decision node. When viewed this way, the dimensions become questions to the decision maker, e.g. "What type of service should be rewarded?" or "How should the reward be structured?" We therefore describe some of the conceptual/theoretical implications of each decision, as is described in the literature.

Goal of the P4P program

We have identified two distinct possibilities for the statement of goal of a P4P program (**Table 1**). These are: (i) to use financial incentives as a tool for the management of health care service provision; and (ii) to offer a fair reward to physicians for the services they deliver by adjusting relative fees. Goal statements of the seven case study jurisdictions are provided in **Table 2** - Examples of goals.

First, the goal statement is in part a reflection of the division of power between two stakeholder groups: physicians and the payer (government). A goal statement from the government is politically more palatable when the physician groups are relatively more powerful in this bilateral relationship. A goal statement that implies management of service provision is acceptable only in a situation where the physician group is relatively less powerful. The goal statement therefore only partially identifies the intentions of the payer (government).

Stated goals in Canadian provinces generally fall into the second category. Authorities in Australia, New Zealand and the United Kingdom are able to make explicit reference to improvements in care and/or reductions in disparities, all of which are versions of service management.

Second, the two types of goal statement correspond to two different categories of P4P payments, target based payments and enhanced-fee-for service, as shown in **Table 1** above. Enhanced-fee-for service payments essentially operate within an existing payment scheme and shift focus toward specific services. Target based payments are managerial in nature, where the achievement of specific targets is rewarded explicitly. The latter is more likely in situations where physician groups are relatively less powerful.

Table 1 Basic typology of P4P programs.

P4P Programs	
Target based payments Goal:	**Enhanced fee-for-service Goal:**
To use financial incentives as a tool for the management of health care service provision	To offer fair rewards to physicians for services they deliver by adjusting relative fees.
Other Defining Features	
Type of service being rewarded Nature of the target Nature of the reward Budgetary implications	

Table 2 Examples of goals.

Jurisdiction	Goal statement
British Columbia	Not explicitly stated.
Manitoba	To stabilize funding and to support quality primary care.
Ontario	Not explicitly stated.
Nova Scotia	To fairly reward physicians for work that has not been remunerated to date (personal interviews).
United Kingdom	To reward practices for the provision of 'quality care' and to help fund further improvements in the delivery of clinical care.
Australia	To encourage general practices to improve the quality of care provided to patients.
New Zealand	To improve the health of the enrolled populations and reduce disparities in health outcomes through supporting clinical governance and quality improvement.

Nature of service

The dimensions or decision nodes explained above are practical in nature. Dimensions and goals help the program designer prioritize and rank health conditions under the P4P program. Document and literature analysis reveal the following service areas as common foci of P4P programs at the primary care level:

- Preventive care (vaccinations and screening)
- Chronic disease management
- Maternal/newborn care
- Promotive care (counselling and lifestyle advise)
- Mental health care services
- Access to care
- Other specialised services

These service areas are not exhaustive, in that theoretically other service areas could be emphasized. To some extent the service area of focus dictates the choice of target or reward type. The area of focus is primarily a function of health policy priorities. These stem from, among other factors, a perceived gap in motivation of specific services via standard physician payment methods.

Nature of target

All P4P programs set targets for providers to meet in order to qualify for payment. In other words, "performance" in a pay-for-performance system is measured by the achievement of targets. Targets can be differentiated along two dimensions: target type (**Table 3**) and target level (**Table 4**).

Two types of targets are possible: process/output and outcome. A process or output target is one set in terms of the activity performed by the provider. Examples include the administration of tests, such as the HbA1c test for diabetic patients, or the a

Table 3 Examples of output and outcomes target types.

Jurisdiction	Process or output target	Outcomes target
British Columbia	Development and documentation of a patient's mental health plan.	Not used.
Manitoba	Creation of a patient asthma action plan.	Not used.
Ontario	Influenza vaccine for patients 65 years of age and over.	Not used.
Nova Scotia	Management of an annual cycle of care as per guidelines for a chronic condition.	Not used.
United Kingdom	A record of neuropathy testing in the past 15 months for diabetic patients.	Blood pressure tested in the past 15 months is 140/85 or less.
Australia	Deliver cervical screening to target population.	Not used.
New Zealand	Targets for clinical process indicators that vary by region.	Not used.

Note: This table is constructed on the basis of policy documents from the above jurisdictions.

blood pressure measurement for hypertensive patients, or the Pap test for all eligible female patients, and the provision of specific services, such as vaccinations, nursing home visits, or well baby visits. The target can also consist of a basket of services that need to be provided as a package to qualify for an incentive, such as a full cycle of care for a diabetic patient, which is defined by clinical practice guidelines.

An outcome target is expressed in terms of a patient health indicator, for instance a desired score on a test. Conceptually, health outcomes make good targets. In practice, however, it is difficult to attribute changes in health outcomes to the behaviour of providers, since other factors influence patient outcomes. Providers have direct control over the services they provide, but less control over patient health outcomes. Therefore, a reward based on service provision appears to be the more reasonable option. See **Table 3** - Examples of output and outcomes target types.

Tying physician payments to performance indicators can lead providers to focus activities on target achievement while neglecting other aspects of care. Physicians focused on outcomes might be reluctant to accept more severely ill patients, who are less likely to achieve good outcomes. However, physicians focused on service level targets could neglect provision of services not included in the target. The latter is problematic, unless the P4P system is all inclusive in terms of targeting patient population needs.

The target level refers to whether the target is set at the patient population level, a service quantity level, or in terms of individual patients. Targets set at the population level identify the desired percentage of an eligible population who receive a service, or who achieve an outcome. Targets set at the service quantity level identify the desired volume of specific services to be delivered in a specific time frame. Targets set at the patient level identify the desired services (or package of services) to be delivered to individual patients. See **Table 4** - Examples of three levels of targets.

Nature of reward

The "pay" in a pay-for-performance system can be offered in a variety of forms. The reward is characterised by its level of application, as well as by the existence of competitiveness between providers.

A de-constructed reward is one offered per item of service. Increasingly more composite rewards are those offered per patient, or as a lump-sum. A reward offered per item of service strongly resembles a fee-for-service base payment; although it may or may not be offered for the same type of target as a fee-for-services payment (we discuss this further in the next section). A composite reward can also be offered per-patient, which resembles a capitation base payment, or it can be offered as a lump sum per period of time. The per-patient payment ties the reward to the size of a practice, whereas the lump-sum payment does not vary by practice size. See **Table 5** - Examples of rewards.

Payment schemes can be competitive in nature, which means that the accomplishment of a provider is evaluated in relation to other providers. Only the top x percent are eligible for the reward, as measured by one of the performance indicators of service. A competitive program offers budgetary predictability, since the number of providers to receive a reward is pre-determined. An extreme version of a competitive program, where bottom performers are penalized financially in order to reward top performers, can offer budget neutrality. Competitive schemes are currently not used in any of the jurisdictions discussed here, but are used in some of the private P4P programs in the United States.

Aside from the budgetary implications, the literature identifies several advantages of competitive models in terms of their likelihood of improving care. First, the competitiveness offers an additional layer of incentive and results in continuous improvement, particularly among high performers. Second, a competitive model is more likely to result in overall improvement, when there are no baseline measures of performance against which to set targets. Disadvantages of competition in the P4P context are that the motivation is highest for high performers; low performers face a low probability of success (outperforming others) and therefore a low motivation, yet are arguably the ones in greatest need of improvement [25-27,79,88].

Budgetary impact

The implications on the budget from the perspective of a public payer and from the perspective of the provider of a P4P program depend on its size and structure. The potential reward must be large enough to encourage providers to participate in the program, since participation requires time and effort. The size of the pool designated for rewards as a proportion of the payer's provider payment budget is of interest, as it offers contextual information surrounding the P4P program.

Table 4 Examples of three levels of targets.

Jurisdiction	Population level	Service volume level	Patient level
British Columbia	Not used.	At least five obstetric deliveries in the past 12 months.	Provision and monitoring of a complex care plan for a patient with two or more chronic conditions.
Manitoba	Physical activity advice given to 20-100% of the population (stepwise target*).	Not used.	Not used.
Ontario	Mammogram given to 55-75% of the eligible population (stepwise target*).	Palliative care to four or more patients in past year.	A smoking cessation dialogue was held with a patient who smokes.
Nova Scotia	Not used.	At least 15 obstetrical deliveries and 35 maternity/newborn visits in past year.	A complex care visit of 15 minutes or more with a patient with three or more chronic conditions.
United Kingdom	Percentage of eligible patients with atrial fillibration who were treated with an anti-coagulation drug therapy or anti-platelet therapy.	Not used.	Not used.
Australia	Percentage of eligible patients who have received a cervical screening test.	Number of services delivered in Residential Aged Care Facilities.	Provision and completion of a cycle of asthma care.
New Zealand	Percentage of eligible patients who receive the recommended vaccines.	Not used.	Provision of services to patients with a terminal illness.

Note: This table is constructed on the basis of policy documents from the above jurisdictions.
*There is overlap in targets between jurisdictions. Different examples are presented for illustrative purposes.

Table 5 Examples of Rewards

Jurisdiction	Per item of service	Per patient	Lump-sum per period
British Columbia	An obstetrical care bonus payment of 50% of the FFS fee up to 25 times per year.	Complex care management for patients with two or more conditions; payment of $315.00 per patient.	A payment of $7,500 for serving at least 10 chronic patients, or performing at least five deliveries in past 12 months.
Manitoba	Up to $1.50 for each of the preventive services indicators for which a patient is eligible.	Up to $9.50 for the creation of asthma action plan for each patient with asthma.	Not used.
Ontario	Influenza vaccine for patients aged 65+; payment of $6.86 per vaccine.	Congestive heart failure management; payment of $125.00 per patient.	Care for 10+ patients with bipolar disorder; payment of $2000 one-time per year.
Nova Scotia	A 25% premium on eligible services offered during evenings and weekends.	Management of an annual cycle of care for one chronic condition; payment of $80.00 per patient.	A one-time per yer payment of $700 for the achievement of service thresholds in three service areas.
United Kingdom	Not used.	Not used.	Annual total of points for achievement of all targets valued at ca. £130 per point.
Australia	Cervical screening incentive in part consists of a $35 fee per each Pap test performed.	$3.00 per patient is added to the cervical screening incentive if at least 50% of eligible patients are screened.	The provision of 140 or more aged care services, rewarded with a $2500 bonus per year.
New Zealand	Not used.	$1.01 per patient with two or more chronic conditions, terminal illness or other complexities.	Achievement of vaccination targets (80% to 90% of patients) rewarded with a fixed bonus payment.

Note: This table is constructed on the basis of policy documents from the above jurisdictions.

The payer's budget can be fixed in two ways. A competitive program allows administrators to predict the number of providers eligible for fixed sized rewards. Non-competitive programs are flexible in the size of rewards available to each provider, the rewards all come from a fixed pool that is then divided by the number of qualifying providers. When the desire is to offer predictable rewards to all providers who meet their targets, the budget must be flexible.

Discussion

The results of our work highlight the five dimensions along which P4Ps vary: (i) the goal, (ii) the nature of the service, (iii) the nature of the target, (iv) the nature of the reward, and (v) the impact on the budget. The simplest application of our framework is to provide a descriptive comparison between systems as a preliminary to analytic comparison. **Table 5** - Examples of a populated descriptive typology, shows a descriptive comparison of seven P4P systems in public payer health care systems.

The type of services targeted is divided into seven possible categories. These correspond to our description above. We

assess the extent to which each category of service is supported in each of the six P4P programs. The assessment is based on the approximate percentage of the total bonus earnings possible through the P4P that is available for this particular service. The scoring is subjective and does not apply a strict algorithm. The rankings of high, medium, low or none are relative to other services within the same P4P program. An assessment of "varies" indicates that different providers are offered different incentives.

One of the most emphasized service areas is the care for and management of chronic diseases. Support is high relative to other services targeted by P4P programs in Australia, New Zealand, Nova Scotia, and the U.K. Support is medium in Ontario and relatively low in British Columbia. This prioritization suggests that chronic disease management is a significant policy area. It also suggests a perception among policy makers that standard remuneration methods (FFS, capitation, salaries or blends) do not adequately promote chronic disease management, and that additional financial incentives are needed. Economic theory also suggests that chronic disease management is not motivated by capitation or salary payments, and only then by fee-for-service payments, when billing codes for specific chronic care procedures exist. All three systems lack the capacity to incentivise the completion of cycles of care or to ensure continuity [30]. A P4P system is able to target both aspects of care by offering bonus payments upon completion of care cycles.

Targets are set at the population level in five jurisdictions, and only at the patient level in Nova Scotia. The U.K. relies on population level targets exclusively, while Australia, New Zealand, British Columbia and Ontario have set targets at both the patient level and the population level. While all jurisdictions set health services delivery targets, only the U.K. has set targets for specific patient health outcomes, such as blood pressure levels, and cholesterol levels. The linking of physician rewards to patient health outcomes is politically risky, since patient health largely depends on factors outside of a physician's control [30]. The National Health Service in the U.K. however has sufficient clout to implement these kinds of indicators, but only in conjunction with health service output indicators.

None of the six jurisdictions studied relies on P4P structures that introduce competition and punitive measures. Although theory suggests that competition stimulates continuous improvement, competition is not acceptable among most physician groups. Similarly, punitive 'rewards' are a hard sell in contract negotiations with physicians. It appears as though the P4P programs in publicly funded systems do not make full use of the incentive options available. This could be attributed to the political unattractiveness of competitive or punitive models, and the resistance of professional bodies representing primary care physicians toward these types of models.

Finally, the budget is flexible in the U.K., Australia, and British Columbia, capped only by the possibility that all physicians achieve all possible targets. The Nova Scotia budget, on the other hand, is fixed. Several incentive payments are such that physicians do not know the size of the payment until the end of the budget year. See **Table 6** - Examples of a populated descriptive typology.

Our typology expands on other classifications used in the literature (Appendix 3) and provides a comprehensive framework. It is created with the explicit purpose of facilitating comparison and accommodating all possible P4P designs. Previous studies aim either to guide program development and decision making [3,5,6], or to categorize empirical evidence of effectiveness [1,2,4,7,12]. Neither approach yields a comprehensive typology incorporating existing and hypothetical program characteristics. Our typology expands on the details not contained within other classifications, provides additional and different categories, and incorporates possibilities that are currently not in existence.

Conclusion

The typology provided highlights the many dimensions along which P4P programs can differ. We have used as case studies only P4P programs in English speaking and publicly funded health care systems. P4P programs are also offered by many private insurers in the United States, and in a number of non-English speaking countries. Already the rather homogeneous group of systems studied here shows great variations in the P4P programs that are offered.

The explication of this variability leads to two important conclusions. First, P4P programs cannot be treated as comparable entities in reviews and analyses, but must be decomposed according to the unique combinations of features. Second, planning and design of P4P programs must be based on a full understanding of programming options, including both theoretical and empirical considerations of effectiveness. The typology provides a framework for both.

The Cochrane Review of target payments in primary practice [41] yields inconclusive results with respect to the question of the effectiveness of bonus payments offered for vaccination targets. A recent review study [7] of the effects, design choices and contexts of pay-for-performance in health care concludes that P4P programs result in a "… full spectrum of possible effects…" which largely depend on the details of the program structure and the contextual factors. The variability of empirical results further supports the need for a systematic approach to evaluation and categorization of results.

A recommended application of the typology to research practice is to categorize evaluative studies in accordance with the categories presented in the typology. Studies of target based payments of programs that offer lump sum amounts for the achievement of population level targets in chronic care should only be compared to other studies in this category, while studies that reward individual service delivery levels should be compared to those with the same typology.

Authors' Contributions

DW was responsible for the systematic search of databases and the identification of relevant policy documents and scientific literature. DW carried out the initial review and analysis and compiled the prototype version of the typology. Jointly, DW and AK critically revised the initial version of the typology and jointly approved the final version. AK provided detailed information about Manitoba.

Table 6 Examples of a populated descriptive typology.

	Jurisdiction	U.K.	Australia	New Zealand	British Columbia	Ontario	Nova Scotia	Manitoba
Type of services targeted	Support for preventive care	Medium	Medium	High	None	High	Low	High
	Support for chronic disease management	High	High	High	Low	Medium	High	High
	Support for maternal/newborn care	Low	None	Varies	Medium	Low	Medium	Low
	Support for promotive care	Medium	None	Medium	None	Medium	None	Low
	Support for mental health care services	Low	None	High	High	Low	None	None
	Support for access to care	Medium	High	Low	None	High	None	Medium
	Support for specialized services	Low	None	Varies	Low	None	Medium	None
Nature of target	Population level target	Yes	Yes	Yes	No	Yes	No	No
	Patient level target	No	Yes	Yes	Yes	Yes	Yes	Yes
	Health services output target	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Health outcomes target	Yes	Yes	No	No	No	No	No
Nature of reward	Per patient per service	No	No	No	Yes	Yes	Yes	Yes
	Per patient per period	No	Yes	Yes	Yes	Yes	Yes	Yes
	Lump sum per period	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Competitive (versus non-competitive)	No	No	No	No	No	No	Yes
	Punitive (versus reward only)	No	No	No	No	No	No	No
	Physician level	No	Yes	No	Yes	No	Yes	No
	Clinic (physician group) level	Yes	No	Yes	No	Yes	No	Yes
Budget	Fixed budget (versus flexible budget)	No	No	Not clear	No	Not clear	Yes	Yes

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