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Performance-Based Financing in the heath sector in low- and middle-income countries: Is there anything whereof it may be said, See, this is new?

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Abstract

Whereas Performance-Based Financing (PBF) is now developing fast in the health sector in low- and middle-income countries (LMICs), and is presented an innovative approach – concomitantly, subject to a separate research stream – it shares many features of the "managing-for-results" (MfR) and performance-based budgeting (PBB) currents that have existed for decades. In this paper, we first argue that PBF as currently developed in the health sector in LMICs shares many features and thus can be viewed as an avatar of MfR and more precisely PBB. Secondly, we draw lessons from the literature on MfR and PBB so as to (i) better apprehend PBF conceptually and (ii) avoid pitfalls and better design PBF schemes in practice. We argue that the lessons from the theoretical and empirical literature on MfR and PBB offer interesting insights to feed into a "theory of change" of PBF, enabling to analyse critical aspects and better design PBF schemes. Moreover, it is hoped that just like MfR processes have been demonstrated as having the potential to boost individual performance not only through links with financial incentives, but also through acting on other sources of motivation, one can demonstrate more accurately by which mechanisms the various elements of the PBF package can help improve health sector results.

The thing that hath been, it is that which shall be; and that which is done is that which shall be done: and there is no new thing under the sun.

Is there anything whereof it may be said, See, this is new? it hath been already of old time, which was before us.

There is no remembrance of former things; neither shall there be any remembrance of things that are to come with those that shall come after.

Ecclesiastes 1:9-11 King James Version

1. Introduction

In the past decade, Performance-Based Financing (PBF) in the health sector has gained momentum in low- and middle-income countries (LMICs). When narrowly defined, PBF is a financing mechanism that consists in a remuneration scheme wherein health providers (individual staff or facilities) receive financial incentives when certain predefined targets or outputs are achieved and their reality and quality are verified. A broader and more correct definition of PBF recognises that it is a strategic purchasing reform package based on some or all of the following principles: increased spending autonomy for the facilities, specific focus on planning, strict monitoring, involvement of the community, a split of functions, contracting-in [1;2].

The first country to have scaled PBF up to the national level in Sub-Saharan Africa was Rwanda [3;4]. From then on, PBF extended to the rest of the continent displaying many different designs. The introduction of the Health Results Innovation Trust Fund managed by the World Bank facilitated the further expansion and brought some similarity between many PBF designs. However, important differences remain even within similar PBF approaches; going from small projects to large scaled-up schemes, from broad reforms (especially Rwanda) to small interventions.[*]

Following PBF's increasing presence in the field, it has been subject to a growing number of studies and a fierce debate. Although there has been recent advancement, more research is needed on the relevance, efficiency, impact, and the context related enablers of PBF in LMICs as the results in general remain mixed [6-10]. Causes of disagreement notably stem from the lack of a clear and thorough analytical framework and robust scientific research, but also the underutilisation of findings and lessons from other fields of study, other theories and similar programmes [2;11;12].

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[*] See, for instance, the database built by the USAID-funded "Translating Research into Action" (TRACtion) project, together with University Research Co., LLC, presenting the main features of 32 programmes of Performance-Based Incentives to Improve Quality of Care for reproductive, maternal, neonatal and chid health (Landscape Analysis) which notably shows the coverage, PBF scheme/model, and formula for calculating PBF payment [5].

Indeed, surprisingly, PBF in the health sector in LMICs has developed as an innovative, independent approach. Similar currents of the literature relating to performance management, worker motivation and the provision of financial incentives in the public sector are insufficiently explored. The isolated development of health PBF in LMICs is felt at two respects: on the one hand, research and evaluation of PBF developed as an independent current, separate from what has been studied in other fields of study; on the other hand, on the ground, to our knowledge, PBF in the health sector has to date mostly (always?) been introduced in isolation from other possible government-wide public sector reforms (e.g. decentralisation, civil service/human resource policy, information technologies, budget reforms, etc.).

However, in this paper we argue that PBF in the health sector in LMICs mainly revisits the principles of public sector management currents such as managing for results (MfR) and performance-based budgeting (PBB) which already have a long history in high-income countries like the United States, United Kingdom, New-Zealand or Australia. Put in other words, we view PBF as an avatar of MfR and PBB, propelled by the "results-orientation" agenda promoted by the Paris Declaration and other pressure for demonstrating results of development aid.

Therefore, we argue that research on and the implementation of PBF would much benefit from taking into account the lessons from the various experiences of implementing MfR and PBB in the public sector. This way, we put ourselves firmly in the tradition of realist evaluation, which looks for "generic programme mechanisms" and "common conceptual ground" between different programmes from different sectors in order to discover the programme theory of a particular programme (See Pawson[13]).

Below, we first elaborate on the concepts of PBF and MfR/PBB after which we discuss their many resemblances, and some distinguishing features. We then draw lessons from MfR/PBB experience as for (i) from a methodological point of view, guiding research on and evaluation of PBF; and (ii) from a practitioner's perspective, better designing PBF schemes.

2. Methods

This paper is based on a critical comparison of two different currents of literature: on the one hand, the one on PBF in the health sector in LMICs (we mostly rest on the literature survey performed by Renmans et al. [8]); and on the other hand, the one on public administration, managing for results (MfR) and performance-based budgeting (PBB) (based mostly on Robinson [14], including the literature review on motivation and incentives performed by Paul et al. [15], as well as the World Development Report of 2015 [16]). This is complemented by authors' observations from the field (mostly in Western Africa and Uganda), participation in the debates of the Harmonization for Health in Africa community of practice (CoP) on performance-based financing, and by interviews of key resource persons, specialists of either PBF or PBB.

Then, based on the lessons from MfR and PBB, we draw a number of lessons as for (i) analysing and apprehending PBF conceptually, through an appropriate "theory of change"; and (ii) avoiding pitfalls and better designing PBF schemes.

3. PBF, managing-for-results and performance-based budgeting: same wine, different bottle?

3.1 Performance-based financing

On a conceptual basis, PBF was initially promoted as a paradigm shift away from traditional input-based financing methods, so as to align incentives of health workers and improve health system performance (narrow definition). However, it is now widely acknowledged that PBF is much broader and encompasses a series of reforms that can have system-wide effects [2;17].

A first objective is to raise the motivation of health workers through incentives and consequently improve health systems performance. Secondly, it can be used as a strategic purchasing reform [18]. It guides attention and resources towards certain quantitative and qualitative indicators that are seen as important and cost-effective. Thus, the incentives also carry a message about what is important and what not ('salience effect') [19].

Some of the reforms that accompany financial incentives are: increased autonomy for the health facilities to use the PBF funds, introduction of specific business and quality improvements plans, increased monitoring and verification of the remunerated indicators, training, community involvement through an increased role of health committees or patient satisfaction surveys.

3.2 MfR and PBB

We argue that PBF in LMICs is basically akin to what has often been referred to as managing-for-results (MfR). The latter can be defined "as the use of formal performance information to improve public sector performance. […] Often, this is linked with broader strategic planning models incorporating significant elements of private sector corporate planning practices" [14]. Two crucial elements of MfR are maximum clarity about the outcomes which government is attempting to achieve through the ex-ante stipulation of performance expectations for agencies, work units and individuals through the use of performance targets and standards; as well as extrinsic (financial) incentives based on performance and increased autonomy for managers [14].

Historically, MfR is rooted in reform attempts initiated decades ago in industrial countries, such as the (narrowly defined) "performance budgeting" system advocated by the 1949 Hoover Commission, the Planning, Programming and Budgeting System introduced in the US federal government in the 1960s, or the UN Manual for Program and Performance Budgeting (1965) [14]. Aimed at making public management systems more focused on effectiveness and efficiency, MfR encompasses a number of reforms related to various aspects of public management such as performance-based budgeting, performance accountability mechanisms and strategic human resource management – all reform areas that need to be underpinned by better performance information [14].[†]

[†] Note that more recently (1990s), an akin movement has gained momentum through the New Public Management (NPM) initiated in the UK. NPM does not replace older frameworks but adds a new approach to public sector governance, i.e. contractualism [20].

One particular avatar of MfR to which health PBF is very much akin is Performance-Based Budgeting (PBB), which can be broadly defined as "public sector funding mechanisms and processes designed to strengthen the linkage between funding and results (outputs and outcomes), through the systematic use of formal performance information, with the objective of improving the allocative and technical efficiency of public expenditure" [14]. Like PBF, PBB entails two dimensions and objectives: improving allocation of resources between different purposes, and improving agency performance [21].

Robinson [14] identifies four fundamental mechanisms used in PBB systems: (i) programme budgeting, which uses information about the costs and benefits of the objective-based ("programme") expenditure categories for expenditure prioritisation; (ii) funding-linked performance targets, which seek to link the level of funding to results targets—that is, to quantitative statements of the output and/or outcome the agency is expected to deliver; (iii) agency-level budgetary performance incentives, which aim to motivate agencies to perform better by rewarding agencies financially for good performance (this, in a sense, represents an application at the agency level of the notion of individual performance pay); and (iv) formula funding, in which intra-public sector funding provided is made an explicit (algebraic) function of measures of expected and/or actual results, in view of boosting performance and/or improving allocative efficiency. The three last of these mechanisms actually also characterise PBF.

A particular type of formula funding (mechanism 'iv' above) is case payment, which consists in reimbursing agencies according to locally quantified outputs, in the form of the number of service users and (where appropriate) their risk characteristics. The fundamental objectives of case payment methods are (i) to encourage local agencies to increase the number of service users and (ii) to implement efficiency improvements so as to reduce unit costs – however, case payment can also provoke perverse incentives [22] (see below).

Health is one of the sectors that has seen the most substantial long-term efforts to develop performance-based management and funding [21]. Perhaps the most long-established example of the success of sectoral PBB systems is the "diagnosis related group" (DRG) or case-mix system of hospital funding. As a formularised output-based purchaser-provider funding arrangement incorporating the principle of payment for results, it was an important factor in stimulating broader interest in "internal market" models within governments. From the late 1970s, DRGs began also to be used as the basis of hospital funding systems, first in the US, and later in many other parts of the world [21].

Overall, available survey results – however subject to the risks of self-reporting bias – suggest a significant impact of MfR on effectiveness and public programme efficiency [21].

3.3 Similarities

Just like MfR/PBB covers a wide range of possible "à la carte" systems [14], there are no two similar PBF models in LMICs [2]. However, existing schemes share a number of defining core characteristics. Below we develop a number of common features between the PBF approach as currently developing fast in the health sector in LMICs, and the MfR/PBB approach, so as to strengthen our thesis that the former is actually an avatar of the latter.

3.3.1 Conceptual fuzziness

Both MfR/PBB and PBF are subject to a lack of clear-cut, consensual definition, including overlapping terms and concepts, leading to difficulties in comparing different experiences and drawing general lessons about their performance. Robinson [14] reckons the existence of various but dissatisfying definitions of performance budgeting in the literature, and clarifies the concept; to him, PBB is the subset of MfR which specifically concerns budgeting, and particularly uses performance information to strengthen the link between funding and results, in order to improve performance (interview Marc Robinson, June 2016). As for PBF in the health sector (also called results-based financing, pay-for-performance), there is equal confusion about what it entails. While the payments based on performance (defined as a mix of quantitative and qualitative indicators) are certainly central to it, they are only one element of what can be seen as a strategic purchasing reform package based on earlier mentioned principles. Despite this broad definition, the existing literature is predominantly focused on the payments based on performance. The role of the other components and the interlinkages between these components and the payments are hardly ever mentioned let alone researched. This narrow focus is clearly at odds with how PBF is being implemented and how it is being conceptualised in more theoretical accounts on PBF [2].

Consequently, both MfR/PBB and PBF suffer from a lack of an analytical framework enabling to evaluate their performance – all the more since they can pursue various objectives. There is not any developed methodology or conceptual framework which can be used to evaluate the results of PBB; rather, the evaluation of PBB should proceed by taking the stated aims of the specific form of PBB (i.e., is it focused on improving technical efficiency, or on effectiveness, or on allocative efficiency) and then assessing whether it actually had that effect (interview Marc Robinson, June 2016). A similar remark can be made concerning PBF, despite the merit of the conceptual framework created by the Health Results Innovation Trust Fund [23] research reported on in the peer-reviewed literature are not yet informed by the comprehensiveness of the framework. Moreover, the processes leading to the reported (lack of) outcomes are severely under-scrutinised [8].

3.3.2 Common objectives

Second, as argued above, PBF and PBB share two main common objectives, that is, (i) improving agency performance through providing appropriate incentives and (ii) improving the allocation of resources (in PBF referred to as ‘strategic purchasing’). The first one is the most obvious in PBF: facility level financial rewards for performance – which are often in turn partially distributed among staff – are at the heart of the “theory of change” of PBF [1]. Nevertheless, the strategic purchasing function of PBF (i.e. looking for ‘cost-efficient’ services to purchase) is increasingly being put forward by promoters and practitioners (see for instance discussion in the PBF community of practice, Bertone and Meessen and Fritsche et al.[1;18]). Note however that in PBF the concern for resource allocation between different purposes is not at the ‘inter-programme’ level, but at the level of health services (e.g. encouraging long-term to short-term contraception, that is considered less efficient).

Note also that both MfR/PBB and PBF has drawn criticisms for being (overly) framed as market-based, hence allegedly trying to let the private sector take over. However, not all forms of MfR/PBB and PBF are influenced by market ideology. For instance, programme budgeting – which is a very influential and enduring form of PBB – rather has historic roots in the central planning tradition (interview Marc Robinson, June 2016). As for PBF, the way the several earlier mentioned principles are being interpreted across countries differs

strongly. Whereas Burundi limits the community involvement to the filling in of patient-satisfaction surveys [24]; one of the two PBF models implemented in Benin empowers platforms of health service users to counter-verify results [25]; and Cameroon revitalises the health committees and gives relatively more power to the community [26]. The latter is more akin to a communitarian-based logic than to a market-based logic. The same goes for the extent that the private sector, community-based organisations or government agencies are being involved in the purchasing, provision, monitoring, and verification of services.

3.3.3 Linking funding to results

If in all known cases, PBF financial premiums come on top of input-based financing, still they are calculated according to a – more or less complicated – algebraic formula. Two cases may arise: either financial premiums are calculated based on a fixed price set for each quantitative indicator (e.g. number of outpatient attendance, of skilled attended deliveries), times the level reached per indicator, which relates to case payment (4th mechanism identified by Robinson[14]); or PBF financial premiums are granted if the facility reaches a progress target set for each indicator (2nd and 3rd mechanisms [14]).[‡] In addition to quantitative results, PBF also entails qualitative indicators that often lower the payment when performance on them is insufficient (see below). Note also that other elements may be included in the PBF formula funding – for instance, so-called equity premiums to compensate facilities facing adverse conditions.

3.3.4 Same concerns as for performance information

By linking funding to performance, PBB and PBF face the same concerns as for how to measure performance. One lies in the *choice of performance information* to which to link funding. Although both approaches aim to improve outcomes, measuring them can be difficult. Moreover, the time lag between services and outcomes, the lack of attributability of outcomes, and the various confounding factors make outcome indicators inappropriate to appreciate the performance of a single agency. Therefore, outputs are often preferred. Whereas the quantity of outputs is relatively easy to capture, this is not the case for quality, especially when the outputs are services which can only be evaluated at the moment of delivery [14]. Anyway, an important criteria prevailing at the choice of performance information is relevance to decision and processes [14].

A second concern lies in *how to measure* the selected performance indicators. As pointed by Robinson [14] as for PBB, "If performance indicators are not subject to external checks, data manipulation will be the inevitable result. Verification and attestation require appropriate internal control procedures, and also good external audit." To respond to that preoccupation, PBF models put a lot of emphasis on data verification and control/counter-check mechanisms, typically by creating new bodies and institutions such as independent verification agencies and entrusting civil society or community-based organisations with counter-verification of measured outputs e.g. [1].

A third common concern lies in the *cost of performance information*. Indeed, performance information is not free, and the marginal cost of additional performance information can be

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[‡] See for instance the TRAction project's landscape analysis [5].

substantial, both in terms of financial cost and in terms of the use of scarce human capital.[§] Therefore, the cost-effectiveness of performance information must be an important consideration in deciding in what manner to seek to link results and funding [14]. Concerns regarding the cost of getting performance information and consequently the cost-effectiveness or 'value-for-money' of PBF more generally are increasingly raised [6;10;27], all the more since due to imperfections in national health information management systems, PBF schemes often rely on parallel systems.

3.3.5 Incentive effect of financial premiums

Financial premiums inherent in PBF and in some types of PBB/funding formulas entail strong incentives for the recipient of funds – some of these are intended and virtuous, and serve to promote the payer's objectives; while others are unintended and adverse, and may thwart such objectives. Incentives typically provided by case payment-type formula funding include: increasing activity (maybe unnecessarily, and sometimes at the expense of taking preventive measures); cream-skimming patients (over-servicing low-cost patients while under-servicing the relatively high-cost patients); cost containment and increasing technical efficiency; skimping on service quality; up-coding and manipulating data (fraud), thus generating fundamental requirements to check on the validity of the local data, and the appropriateness of the services being delivered. Besides, another disadvantage of that system is that the payer does not know in advance the total service activity, and thus may not be able to control aggregate expenditure satisfactorily [21;22]. The payer will therefore wish to reinforce the intended incentives and abate the adverse responses; to some extent this can be achieved by using mixed payment systems, and also by augmenting payment mechanism with other regulatory instruments (e.g. quality-oriented regulatory structures in the form of monitoring regimes to detect inappropriate conduct; public reporting of local performance data; offering public service users a choice of services within a local market of providers) [21;22]. Concerns for behavioural distortions due to performance targets and measures are well-established in both theory and practice, and have been raised as a criticism of PBF [6;28]. PBF schemes however smooth the presumed effect of financial premiums by also relying on other ancillary components (see below). Anyway, given that the "existence of such perverse effects is uncontroversial" (Pidd, 2005: 483; quoted in Robinson [14]), the real question at stake is whether their *magnitude* is such as to throw into doubt the very efficacy of MfR-related PBB/PBF systems – a question that has been the subject of vigorous public controversy in some countries [14].

3.3.6 Need for more management freedom

Contrary to traditional public budgeting, which provides detailed line-item budgets and restricts the shifting of budgets by the management but tend to give rise to inefficiency – see Robinson et al. [21] – "almost all forms of performance budgeting have […] an emphasis on the importance of managerial freedom in budget management. The performance budgeting focus is upon accountability for results produced, rather than on control of how those results are produced" [14]. Similarly, "performance-based financing takes a radically different approach to the health system, giving organizational units substantial decision rights over their resources

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[§] Particularly in developing countries where financial resources and skilled personnel are in much shorter supply and therefore have a higher opportunity cost [14].

(i.e. autonomy)" [29]. Most PBF toolkits therefore recommend increased autonomy of health service providers, even if this is often limited to funds coming from PBF.

3.3.7 Large set of ancillary components

Finally, both approaches do not come in isolation, nor are limited to linking funding and results. They intend to bring system-wide reforms, including at the level of governance arrangements. To do so, they include a large set of "ancillary components" such as: strengthening of information systems; capacity building activities; discussions about agencies' priorities and performance targets; human resource management reforms; attempts to increase transparency over results (e.g. towards the Parliament, beneficiary populations).

3.4 Distinguishing features

While the MfR/PBB and PBF approaches share a number of core characteristics, some distinctive features between the two may also be identified – yet they depend from each individual scheme's design – among which:

- *Level of implementation:* PBF as we understand it is designed at the health service provider / facility level – plus possibly at the level of hierarchical structures (e.g. district or regional health management teams, and possibly central level), while MfR and PBB can be broader in scope and apply similarly to all sectors;

- *Proportion of funding:* Formula funding systems may determine the full budget of agencies, or only consist in agency-level "bonus" funding in supplement to core funding [14]. By contrast, to our knowledge, no country bases the financing of the health sector on PBF alone and typically, PBF comes as extra incentives, granted ex post, complementing core input-type funding. PBF incentives hardly ever account for more than 50% of the budget/salary.

- *Setting of unit prices:* As a corollary, some formula funding systems like DRG intend to assess the "right price" (mean cost) to be given to each indicator and henceforth put pressure on agencies to be efficient; while PBF does not. Core financing is assumed to be sufficient to recover the costs, thus premiums are not directly linked to cost, but are set based on the importance and relevance of the service (strategic purchasing function). Hence, the pressure for improved technical efficiency is reduced. Moreover, PBF is a selective financing mechanism in which some services are incentivised while others are not, whereas the DRG system is intended to be comprehensive.

- *Role of quality measures:* PBB systems such as DRG put a lot of emphasis on quantitative indicators – and try and cover all possible cases, which makes it very complex – while quality control is dealt through extra measures; on the contrary, PBF schemes only use a limited number of quantitative indicators, and many put a lot of emphasis on quality measures (see e.g. Lagarde et al. [30] for the case of Benin), which are incorporated in the funding formula.

- *Behavioural incentives:* In turn, the possible perverse incentives inherent in financial premiums is also influenced by the differences pointed above: in case-payment and DRG-like systems, the risk of reduced health service quality originates in an attempt to save money from mean costs per case ("Case-mix creates significant financial penalties and rewards for hospitals based on their success or failure in delivering outputs at a cost

below the prevailing DRG "price."" [21]); while in PBF the risk rather lies in task trade off due to the focus on certain indicators (tasks) at the expense of others.

- *Financial sanctions:* Some PBB systems may entail budgetary sanctions for under-performing programmes, while with PBF facilities do not "lose" money in absolute terms – they may only not get a financial premium.

- *Use of country systems:* PBB systems initiated by the central level (Ministry of Finance, Cabinet) usually rely on – by strengthening them – domestic systems for information collection, verification and control; whereas PBF schemes put a probably stronger emphasis on data verification and control (counter-verification) mechanisms, typically by creating independent bodies [1;31] rather than relying on existing bodies such as national audit institutions.

4. Discussion: Lessons for PBF

From the above, we conclude that PBF is a particular case of a wider MfR/PBB approach and thus argue that PBF would benefit a lot from better building on the existing knowledge and experience from PBB – both from a methodological point of view (currents used to analyse MfR/PBB can also be used to apprehend PBF conceptually) and from a practical point of view (to improve design of PBF schemes based on decades of experience with MfR/PBB).

Two general remarks must be made beforehand. First, as unquestioned in social science, "systems thinking" [32] and realist evaluation [33], context matters in determining whether and how an intervention will or has produce(d) effects. This is obviously the case of PBF [8;12]. A number of contextual factors influence the way PBF schemes are *designed* (e.g. national policies, pressure from stakeholders to incorporate their priorities) that may get them depart from the otherwise "optimal contract" predicted by theory. Other context factors influence the way PBF are *implemented*, for instance, in some LMICs, enforceability of sanctions may be questioned. Therefore, it is important to consider PBF not in isolation, but in coherence with other ongoing processes – especially those aimed at improving government performance such as MfR and PBB reforms, for example, programme budgeting (as is the case in the Western African Economic and Monetary Union) or decentralisation (as is the case in many African countries) – as well as with the full set of incentives health workers are facing. For instance, a case study in Sierra Leone confirms that the remuneration of health workers is complex and interrelated so that the different financial incentives cannot be examined independently from one another [34]. Second, since many public sector reforms, including PBF, comprise a package of interventions and related incentives, it is important to better understand how PBF actually works, disentangling the linkages between the different elements of the PBF package – for instance, improved management and planning of health facilities, increased autonomy and participation, improved monitoring and supervision, interaction with/feedback from communities and thus strengthened accountability, capacity building, or additional resources.

4.1 Lessons feeding into a PBF theory of change

As argued above, one of the main objectives of MfR/PBB and PBF is to motivate public agencies (e.g., a health centre or hospital) to perform better in terms of effectiveness and/or operational efficiency and/or improve general resource allocation (strategic purchasing) through a number of incentives comprising financial incentives (for PBF, but not necessarily for MfR/PBB) but also other incentives such as clarified roles and objectives, performance

scrutiny and feedback, or increased managerial autonomy. Note that "agency-level performance measures and targets may potentially have significant motivational effects even when they are not linked strongly to individual incentives. They may, at least under certain circumstances, be important sources of information to public employees about the extent to which they are successful in achieving objectives to which they have strong internalized commitment" [15]. This said, for agencies to perform better, one has to consider incentives at the level of individuals comprising it. As put by Paul et al. [15], "to ask about the motivational impact on agencies is really to ask about the motivational impact *upon individuals* of objectives, measures and targets specified for the agency as a whole." In that vein, there has been considerable expansion in the use of performance incentives in the public sector down to front-line service delivery, including in LMICs through PBF. However influential it is, the proposition that the key to better public sector performance is stronger individual performance incentives is also controversial, notably because of perverse effects it can provoke [15;16].

Analysing the "transmission mechanism" through which PBF can succeed in inducing better health facilities' performance is really about building and testing a "theory of change" of PBF. Indeed, since PBF is obviously a very complex reform taking place in a complex system, no linear causal relationship between PBF inputs and outcomes on population health can be assumed – hence the most appropriate approach to analyse PBF lies in so-called theory-based (or theory-driven) evaluation, aimed at identifying the different mechanisms that are initiated when PBF schemes are implemented [33;35;36]. This approach necessitates building an initial PBF theory of change and then testing it. We argue that this can benefit from the existing comprehensive reviews performed on the motivational effects of individual and agency-level incentives in the context of MfR and PBB (Paul et al. [15]) or on human behaviour in general [16]. The theory-based initial framework developed in this way can then be tested and improved progressively.[**]

Even if that economic current is based on narrow assumptions, PBF may be conceptualised as a principal-agent relationship where health service providers may be modelled as agents of a "principal" or financier, e.g. the Minister of Health, donor, or purchasing agency[39]. According to this theory, the agent's effort (activity) yields results for the principal so that the latter seeks to motivate the agent to deliver the best results possible. Yet, the existence of an information asymmetry between the principal and the agent is assumed, entailing that the agent is generally more knowledgeable about the situation and his own efforts and capacities than the principal. This leaves the door open to so-called "moral hazard" and "gaming" by the agent. To compensate for effort put on, the principal offers the agent a remuneration scheme comprising financial incentives and sanctions in case fraud is detected. The principal-agent theory calls for designing and solving an optimal "contract" according to which the principal intends to maximise its objective function (comprising the health sector outputs or outcomes) at the minimal cost. Agent remuneration may, in principle, be based on effort, on output, or on some mix of the two. Remuneration is more "high-powered" the more strongly and more directly it is linked to worker results and is more "low-powered" the weaker and more indirect that link. The principal needs to decide on how "high-powered" remuneration

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[**] Note also that correctly apprehending PBF and its effects necessitates controlling whether the scheme got implemented as planned, since the implementation of PBF schemes has an impact on the way it does or does not motivate health workers [37;38].

should be, depending on (i) what measures are easily observable, and (ii) the incentive effect over agents [15]. Because in many instances, the principal cannot readily observe and measure precisely the agent's effort, the principal-agent theory recommends linking pay with some measure of performance so as to aligning the agent's objective function with the principal's (increasing outputs or outcomes). This is a determining element of PBF.

However, the literature warns against a number of possible perverse behavioural responses ('rent seeking behaviour') to high-powered incentive schemes, which should be investigated as part of the theory of change of PBF. These are:

- Gaming: agents take "actions that increase pay-outs from the incentive contract without improving actual performance" [40];

- Cherry-picking: only patients that make it easier to reach the target are being treated or work in rural and poorer health centres is being refused;

- Task trade-off: the payment scheme "direct[s] the allocation of the agents' attention *among* their various duties" [41] (*original emphasis*) and among the different aspects of their duties (e.g. between quality and quantity) [41;42];

- The blatant manipulation of information: Campbell's law states that "the more any quantitative social indicator is used for social decision-making, the more subject it will be to corruption pressures" [43];

- Free riding: this occurs when a team member is trying to take advantage of a team effort without contributing to it (e.g. in the case of targets at the level of the health facility) [39;44], which may lead to reduced motivation among other health workers.

The general empirical evidence with respect to the motivating power of money is relatively consistent, and shows that financial incentives are associated with higher performance—at least with higher quantity. Yet, the available literature on impacts on performance quality is inconclusive. Furthermore, the literature on dysfunctional responses—perverse effects and gaming—to compensation schemes in a private sector context provides some evidence that these effects are real – however, this empirical evidence is quite limited [15].

However, the basic principal-agent model is clearly not sufficient to correctly apprehend the complexity of MfR/PBB and PBF due to its narrow assumptions and elusion of ancillary components beyond financial premiums. That is why Paul et al. [15] have also explored the lessons from behavioural economics, public administration, sociology and social psychology, which enable to revise a number of assumptions and apprehend real-world situations more realistically compared to the simplistic approach of mainstream economic models. These lessons can also be incorporated in a theory of change of PBF.

First, PBF involves many stakeholders beyond the "main principal" and a "representative agent". Those agents are many, all the more since in some PBF schemes, interconnected contracts are designed all along the health pyramid, with for instance the financial premiums of district (resp. regional) health management teams depending on the performance of health centres and district hospitals (resp. regional hospitals). The populations receiving health services are important actors too, who can be viewed as additional, "benefitting" principals [45]. Integrating them in a principal-agent model complicates it through transforming it into a so-called "multi-principal" agency problem. The role of populations goes beyond expressing

their preferences; in many PBF models, client satisfaction is measured and integrated as a qualitative measure into health agents' remuneration scheme, and communities are surveyed in the process of counter-verification of results. They may even take up the role of 'decision-maker' at facility level through health management committees having a voice in decisions over PBF funds. Other actors involved in PBF are, inter alia, verification officers and organisations in charge of counter-verification. They all are interlinked in a network of relationships that are characterised by asymmetric information, thus opening the door to strategic gaming and collusion. Other stakeholders may as well influence the PBF contracts, such as donors pushing to reward their priority indicators. It is especially important to assess how PBF modifies the relationships between the different stakeholders – including their respective powers, and possible collusion.

Second, the principal-agent theory assumes the principal can directly observe the results from agents' work at no cost. This assumption is totally unrealistic; as developed above, results information used in MfR/PBB and PBF alike is irrevocably costly, and imperfect, especially since it is most of the time initially collected by the agents. This opens the door to data manipulation, gaming, uncertainty, perverse behavioural effects. This also calls for giving attention to how the monitoring and evaluation system is designed, and to the resulting cost-effectiveness of information. Indeed, the economic literature points to important measurement and uncertainty problems which limit the scope for paying workers on the basis of results, especially in the face of multitasking (which exacerbates dysfunctional behaviour and gaming), difficulty to measure individual agents' contribution to outcomes in case of teamwork, and uncertainty of remuneration. The economic literature concludes that the less measurable are worker results, and the greater the uncertainty about the relationship between worker effort and the results measures available, the less use should be made of high-powered incentives. The principal should, in general, trade-off the increase in incentives and the problems associated with them, that is, risk and distortions [46]. Furthermore, the special characteristics of the public sector mean that the problems affecting the use of high-powered incentives tend to be particularly severe, and that financial performance incentives may therefore optimally be absent or very low-powered. Indeed, output measurement difficulties tend on average to be more severe in the public sector, because of the service nature of public goods, and because government agencies pursue multiple social welfare objectives which frequently conflict (for example efficiency vs. equity) and which must therefore be traded off against one another [15]. Besides, the cost of performance information is obviously a factor in determining the appropriate role of high-powered incentives: the higher the costs of performance information, the smaller the appropriate role for high-powered incentives, other things being equal [15].

Third, it is also obvious that the assumption used by the principal-agent theory,- according to which agents are (de)motivated only by financial rewards and sanctions (or their monetary equivalent) does not appropriately reflect reality [47;48]. Paul et al. [15] distinguish between the following sources of workers motivation: materialistic (including financial but also non-financial, such as due to work environment) vs non-materialistic – the latter comprising social motivation on the one hand, and internal motivation (including moral and intrinsic) on the other hand. The psycho-social literature helps understand how different kinds of motivators (and not exclusively financial incentives) can act upon different types of motivation. Moreover, it shows that the interrelationship between different kinds of motivation is complex (for example, some authors argue that using financial incentives crowds out intrinsic motivations, while others hypothesize that non-materialistic motivations reduce the potential for perverse behaviours associated with financial incentives), hence the

importance of considering the full package of motivators or "motivational system". Each PBF scheme is different and can be based on an infinite variation of the main elements of its package – governance and monitoring and evaluation arrangements, matrix of indicators and quality measures, financial incentives and their time schedule, dispute settlement mechanisms, and ancillary components [45]. Each element may impact to varying degrees on the different sources of motivation of health workers: the financial one of course, but also social (through peer pressure, social recognition), moral (through external accountability) and intrinsic (through increased participation for instance) motivations [15;16]. In particular, the effect of rent seeking behaviours predicted by theory may not be undervalued and asks for specific research designs that incorporate qualitative research methods like observation, focus groups and interviews. Yet, the real empirical question is not so much whether perverse effects exist, but rather what is their magnitude, whether ancillary components manage to limit or even avoid them, and whether their costs (in conjunction with other problems) outweigh the benefits of incentives. A related question is how they can be mitigated, be it through additional constraints (supervision) to secure quality and/or other types of motivation [15;16].

The in-depth analysis of the complex incentive system facing health workers is necessary in all contexts. In high-income countries, evaluations of the DRG/case-mix funding system show that financial incentives delivered efficiency gains without any demonstrable adverse effect on quality and outcomes, at least unless it was combined with severe funding cuts. Part of the answer lies in the quality-oriented regulatory structure which has accompanied case-mix funding systems, but the other relevant factor is that financial incentives do not operate in isolation, but instead interact with other behavioural drivers, including value-based drivers. In the health sector, professional ethics play a very important role, so that perverse effects may be substantially mediated by the presence of an altruistic commitment to the maintenance of service quality. That is, workers will not take advantage of imperfections in performance measures to the extent that pure self-interest might suggest [21]. The complex nature of incentives in the context of PBF is also increasingly investigated in LMICs. For instance, in Sierra Leone, Bertone et al. [34] find that the views of health workers on PBF bonuses are positive, especially compared to the negative views on salary, because PBF is seen as a complement, with less sense of entitlement compared to the official salary. In Cambodia, Khim [49] concludes that PBF is more likely to succeed when income, training needs, and the desire for a sense of community service are addressed and institutionalised within the health system. In Nigeria, Bhatnagar et al. [48] conclude that PBF strategies can succeed in motivating health workers by bringing about a change in incentives and working conditions, yet such programmes need to be aligned with human resource reforms including timely recruitment and appropriate distribution of health workers to prevent burn out and attrition. A number of other studies find interesting results but fail to explain them. For instance, a qualitative study suggests that the PBF intervention in Benin had a positive impact on quality of care and responsiveness towards patients, but had no significant impact on clinical productivity [30]; a systematic review of the effect of pay-for-performance on quality maternal and child heath in LMICs finds some evidence of positive effect of it only on process quality of antenatal care, but also a few negative effects on structural quality; it concludes by pointing that further research is needed to understand PBF's impact on health outcomes and their causal pathways [9].

4.2 Improving design of PBF schemes

Beyond informing on how to better apprehend, analyse and evaluate PBF through an appropriate theory of change, lessons from MfR/PBB may also be welcome so as to avoid pitfalls and better design PBF schemes. It is important to bear in mind that LMICs are characterised by special features and constraints and therefore deserve special attention. First, a number of characteristics worsen the so-called agency problems: performance information may be less available or more difficult to measure, and at the same time, direct monitoring of work effort may also be more difficult. Second, the predisposition of workers for various sources of non-materialistic motivations is probably different, especially due to the low level of civil service pay and nepotism which results in many civil servants not considering themselves as fairly treated and recognised; and in intrinsic motivation being hampered by demotivating factors and external constraints such as a poor working environment. Finally, a series of contextual constraints may hamper the use of incentives and sanctions, such as wage bill caps and inadequate administrative and judicial systems making it harder to enforce contracts and to punish deviant behaviour. Therefore, motivational strategies adapted to industrial countries cannot be blindly exported in LMIC settings [15].

In such contexts, insights from MfR/PBB can help avoid pitfalls when launching a PBF scheme in the health sector. As a systemic reform, it involves changes at various levels of public management and, perhaps, representing a "cultural change" within the government sector. Its breadth and depth point to a lengthy implementation process and one that must advance on a number of fronts. Its scaling-up typically requires parallel changes in the organisational and administrative structure of government and the legal framework in which it operates. Important lessons have been drawn from a review of implementation problems encountered with PBB experience, which can inform PBF design [50]. First, whatever the chosen mechanism, different institutional aspects must be in place and preconditions within the public expenditure management system must be met for MfR/PBB reforms to be effective. Notably, the existence of at least some local autonomy regarding how the local public service is delivered is one of them [22]. This precondition is also pointed out in PBF handbooks [1;31;51;52] but is often insufficiently met in practice. In particular, effective PBB but also PBF requires flexibility in the use of human and other resources at the micro level. However, in many LMICs, decisions on hiring, firing, transfers, promotions, and compensation of staff are typically decided by a central ministry or high-level commission. Therefore, it is not obvious that wage spending in LMICs is sufficiently flexible to ensure that PBB or PBF can be effective. Furthermore, in many countries the basic salary of a civil servant is a relatively minor proportion of their overall remuneration. Complex systems of allowances and entitlements in cash (e.g. hardship, task-based, cost-of-living allowances), in kind (free transportation and housing), and of an intangible nature (status, job security, access to power and rent-seeking opportunities) significantly increase compensation over the basic wage [53]. This is an important challenge for PBF because it will determine how financial performance premiums interact with other incentives in place and impact of health workers' motivation. For instance, in Cambodia, [49] reports that financial incentives under the PBF scheme account for a significant part of health workers' income (42% of the average total income) and are associated with higher job motivation; in Sierra Leone, Bertone et al. [34] find that PBF contributes about 10% of their total income, but still are valued by health workers; by contrast, in Benin, [38] report that health workers perceived that PBF premiums are too low and "blurred" among many other allowances to have a "mechanical" incentive effect.

A second precondition to PBB lies in the existence of adequate data, available on a consistent basis across all local agencies, to which can be applied an algebraic formula determining (at least part of) the level of funding to be allocated to those agencies. The data should of course be verifiable and timely [22]. Health sector experience in various countries seems to confirm that to introduce performance management and budgeting without a large investment in improved performance information is to invite disappointment, while developing performance information takes time. However, experience has indicated that even quite imperfect performance measures may be useful —while, of course, still be improved over time [14;21]. PBF schemes in LMICs often skirt this by developing a parallel, independent data verification system, which can be costly however.

Other general lessons from MfR/PBB experience, which can inform on PBF schemes, point that: (i) in order to ensure efficiency, it is important that PBF schemes are perfectly integrated within existing systems and avoid unnecessary duplications (e.g. integrate supervision/monitoring/verification missions as much as possible without losing sight of their unique characteristics and needs; use national audit institution); (ii) especially, PBF design must ensure coherence with other reforms such as decentralisation/devolution (avoid conflicts of interests; such an issue has been identified in Benin by Paul et al. [38]) and universal health coverage (for example, PBF may come in opposition to cost limitation mechanisms promoted in the context of UHC, possibly through capitation payment); (iii) the choice of indicators should be carefully assessed; indicators should of course respect usual quality criteria (e.g. being SMART) but in order to avoid donor pushing priorities, their choice should be based on government's priority outcomes in the health sector – hence the importance of involving the Ministry of Finance and other government bodies [14]; (iv) the question of whether to fix quantitative indicators' "price" in relation to cost or not must be balanced; the first option rather incentivises technical efficiency, while the second rather acts to increase motivation to produce more outputs; moreover, it is important not to fix too high a price and over-incentivise some activities – like it can be the case in some countries to C-sections for instance; (v) as already argued, cost-effectiveness of the whole system must be carefully balanced and before developing a complex PBF system, a first step may be to remove the factors which demotivate health workers – such as unfair pay or poor working conditions [15]; (vi) beyond being the basis for calculating financial premiums and enabling to clarify organisational priorities, various PBB experiences indicate that PBF could be "upgraded" so as to further use information on results as a basis for resource allocation: on the one hand in the context of budget negotiations with the Ministry of Finance, and on the other hand as a basis for redistributing resources between healthcare providers; (vii) finally, successful implementation of MfR/PBB reforms has required careful planning and organisation, hence the importance of the sequencing and pace of the reforms [50].

5. Conclusion

In this paper, we first argued that PBF as currently developed in the health sector in many LMICs shares many features and thus can be viewed as an avatar of MfR and more precisely PBB. Therefore, instead of reinventing the wheel, in a second step, we draw lessons from the literature on MfR and PBB so as to (i) better apprehend PBF conceptually and help design a "theory of change" of PBF; and (ii) avoid pitfalls and better design PBF schemes in practice.

Regarding the first point, theory-based evaluation is probably the most appropriate approach to evaluate and do research on PBF in order to reveal the mechanisms at play after the initiation of a PBF programme and move closer to a programme theory of PBF. We believe

that the lessons from the theoretical and empirical literature on PBB offer interesting insights to feed into an initial theory of change of PBF, enabling to ground it on a comprehensive theory, in view of testing it and enriching it from field observations. This way we hope to open the black box of PBF schemes to find out what works, when, where and why.

We have also pointed to the complex motivational relationships that are present in a health facility environment – much more complex than the linear, financial, one principal-agent kind of relationship that is sometimes being assumed. It is hoped that just like MfR – defining objectives more clearly, and measuring performance and setting targets – has been demonstrated as having the potential to boost individual performance not only through links with financial incentives, but also through acting on other sources of motivation [15], one can demonstrate more accurately by which mechanisms the various elements of the PBF package can help improve health sector results in a cost-effective way.

At this respect, it is worth insisting on the lack of evidence as for the cost-effectiveness (or value-for-money) of PBF [10]. This question should be investigated by looking at the costs of monitoring, the performance premiums, and the transaction costs due to increased administrative burdens and possible other economic or opportunity costs [6;27], while at the same time, accounting for the relative effects of all ongoing reforms in a package of incentives. Thus a thorough cost-benefit analysis may be an important tool to compare the efficiency of a PBF with other strategies that aim to improve health sector performance [6;15;54;55]. However, it should also be noted that not all costs or benefits are easily quantified or translated into financial gains or losses (e.g. increased or decreased trust levels, teamwork, perception of fairness, equity, etc.). Therefore it is essential that any cost-benefit analysis is accompanied by a qualitative assessment.

Finally, note that before considering launching or scaling up a PBF scheme, a question to wonder in the first place is whether PBF is the relevant response to the most salient performance issues in the sector. It is common sense that “there is no need of a gun to kill a fly”. PBF is very time-consuming and costly, largely due to the necessity of verifying data collected by health facilities. Financial premiums may be a good instrument to incentivise increased workload and boost quantitative indicators; yet, if the most important problems to tackle are, say, absenteeism, staff shortage in disadvantaged area or poor healthcare quality, there may be more cost-effective instruments than PBF – for instance, community controls, area premiums or accreditation. Thus the entire motivational system must be taken into account, bearing in mind that the effectiveness of each type of motivator is almost certainly subject to diminishing returns [15].

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