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# Crowding out or no crowding out? A Self-Determination Theory approach to health worker motivation in performance-based financing

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## ABSTRACT

Performance-based financing (PBF) is a common health systems reform approach in low and middle income countries at present. Although increasing evidence on the effectiveness of PBF and knowledge of principle of good design is available, research is still lacking in regards to other aspects. Among these are a yet limited understanding of the complex role of health worker motivation in PBF and of potential side effects for instance on intrinsic motivation. Our article aims to support meaningful future research by advancing the theoretical discussion around health worker motivation and PBF. We argue that an in-depth understanding of the motivational mechanisms and consequences of PBF at health worker level are of high practical relevance and should be at the heart of the PBF research agenda, and that predominant unidimensional conceptualizations of health worker motivation and descriptive rather than explanatory research approaches are insufficient to fully understand whether, how, and why PBF schemes alter health workers' motivational structures, mindsets, affect, and behavior. We introduce and apply Self-Determination Theory to the context of PBF as a valuable theoretical framework for future empirical exploration. From this, we conclude that PBF interventions are unlikely to have a generally adverse effect on intrinsic motivation as feared by parts of the PBF community. Rather, we assume that PBF can have positive and negative effects on both intrinsic and extrinsic motivation, to varying degrees depending on the specific design, implementation, and results of a particular intervention and on health workers' perceptions and evaluations of it.

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## 1. Performance-based financing and health worker motivation

Enhancing the effectiveness and efficiency of healthcare delivery systems is one of the most important objectives in low- and middle-income countries (LMICs). One health system reform approach currently receives particular attention from governments and development partners: Performance-based financing (PBF). PBF schemes have been introduced to a large number of LMICs all over the world in recent years. In 2013, in Sub-Saharan Africa alone, PBF was scaled up to national level in three countries (Rwanda, Burundi, Sierra Leone), piloted in 17 countries, and in the advanced planning stage or under discussion in numerous other countries (Fritsche et al., 2014). Since, Zimbabwe, Benin, and the Republic of the Congo have scaled up nationally, and further countries have introduced pilots (personal communication).

Many LMIC health systems are characterized by a dominant public sector with centralized, weak management structures, chronic lack of resources, lack of competition between facilities, lack of accountability, and a health workforce largely employed as civil servants with fixed salaries (Mills, 2014). In such systems, health workers have few incentives to work hard to provide good care to all people

in need, at least in material terms. PBF schemes aim to introduce such incentives by injecting cash into facilities conditional on their performance while simultaneously increasing facilities' decision rights on financial and productive resources. To create an environment in which this inspires entrepreneurship and enables high performance, PBF schemes entail further reforms at all levels. From the health workers' perspective, this includes strengthening management structures and creating a sense of competition between facilities by focusing attention on performance, enhancing transparency and accountability, and involving the private sector more strongly (Fritsche et al., 2014). In result, PBF schemes are expected to increase health workers' motivation to work harder, ultimately resulting in higher service coverage and quality and thus in better health outcomes for the communities they serve.

The modalities through which PBF is expected to produce change are usually explained with agency theory (e.g. Savedoff, 2010). Generally, an agency relationship exists when one person or entity – the principal – delegates work to another person or entity – the agent – in exchange for compensation. In PBF schemes, the payer – usually the Ministry of Health or a donor organization – acts as principal, and health care providers – usually health care facilities – act as agents. A major assumption of agency theory is inherent goal conflict between the principal and the agent, which results in an incongruity between the agent's behaviors and the principal's interests. The theory suggests that goal conflicts can be most efficiently addressed by realigning the agent's goals to those of the principal, and proposes financial rewards

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and penalties as the straightforward tool (Sekwat, 2000). In PBF, this is done through performance contracts, in which the principal communicates goals, priorities, and performance expectations to the agent. Compliance with performance contracts is ensured through close supervision and external verification and feedback processes.

In return for respecting their contract with the principal, agents are usually compensated in monetary terms. In PBF practice, several compensation modalities are common, all essentially quality-adjusted fee-for-service payments. Regardless of the approach, in LMICs prices are usually set so that providers do not incur existential financial risk, but rather a risk of loss of additional income in case of underperformance (Fritsche et al., 2014). Some PBF schemes also tie accreditation to adherence to performance contracts. The wish for additional income or retention of accreditation is thought to motivate health facilities and their staff to provide patient care in the principal's interest (Savedoff, 2010). Facilities are ideally completely autonomous in the decision as to how to spend their PBF surplus. Most current PBF schemes, however, prescribe that revenues generated through the intervention are to be partially reinvested into the facility, and partially available for reward payments to staff members (Fritsche et al., 2014).

Following agency theory, one major assumption in PBF is that financial gain is a key work motivator for health workers in low and middle-income settings (Eldridge and Palmer, 2009). Not surprisingly, this is supported by many studies. After all, unlike in other areas of life, 'exchanging' behavior for money (i.e. a salary) and other tangible benefits is an integral part of any job. At the same time, other, non-material factors seem equally important in shaping health workers' attitudes and behavior at work (Henderson and Tulloch, 2008; Mathauer and Imhoff, 2006; Okello and Gilson, 2015; Willis-Shattuck et al., 2008). In settings with low pay and suboptimal working and living conditions, altruistic motives, a sense of responsibility, and favorable effects on reputation have consistently been found to be key motivational drivers. In the economic and public health literature, such types of motivation are usually referred to as intrinsic motivation.

There are concerns that the financial incentives introduced by PBF, while enhancing extrinsic forms of motivation, might inadvertently undermine this intrinsic motivation (Ireland et al., 2011; Kalk, 2011). This effect is referred to as 'intrinsic motivation crowding out' (Frey and Jegen, 2001). Given the importance of intrinsic motivation for health care provision in LMICs, fears are that systematic crowding out of intrinsic motivation might have potential detrimental effects on health worker performance and, consequently, on health systems' functioning.

Concerns about intrinsic motivation crowding out through financial incentives stem from research conducted by psychologists and economists, almost all from Western contexts and scenarios in which individuals are directly rewarded for specific activities (see Deci et al., 1999; Frey and Jegen, 2001; Gagné and Forest, 2008 for reviews). While empirical results are far from consistent, reviews and meta-analyses agree that crowding out of intrinsic motivation through performance-contingent financial incentives is possible, given certain conditions, and can have unfavorable effects on performance. It is unclear to which extent these findings are transferable to LMIC health care settings and applicable to PBF schemes, which go far beyond the mere provision of financial incentives for isolated behavior, and which do not directly reward individual health workers, but operate primarily at the health facility level. To our knowledge, only three studies have explicitly addressed the impact of PBF on health workers' intrinsic motivation in LMICs in real-life settings to date (Chimhutu et al., 2014; Dale, 2014; Huillery and Seban, 2014). Unfortunately, the scope of this body of research is yet too limited to

draw any generalizable conclusions on whether intrinsic motivation is crowded out, as opposed to being unaffected or even fostered ('crowded in') by PBF. However, they substantiate the possibility that introducing financial incentives might shift health workers' attention away from intrinsic work motivation towards a focus on material rewards.

Against this background, the aim of this conceptual article is to invite a new way of thinking about health worker motivation, in the context of PBF and beyond. We hope that this will enable meaningful research contributing to the development of an urgently needed comprehensive theory of change of PBF. Specifically, we will 1) discuss the potential implications, should PBF indeed crowd out intrinsic motivation; 2) discuss how current conceptualizations of health worker motivation need to be expanded to achieve an in-depth understanding of the "PBF black box" at health worker level; 3) introduce Self-Determination Theory (SDT; Deci and Ryan, 1985) to advance the theoretical debate around the motivational mechanisms of PBF; and 4), based on SDT and as input to future research, outline under which conditions PBF interventions are likely or unlikely to result in crowding out of intrinsic motivation, or rather in a strengthening of intrinsic and extrinsic forms of motivation ('crowding in').

## 2. Work motivation in the LMIC health care literature: a motivation intensity approach

Most available research on health worker motivation in the public health literature in LMICs focuses explicitly or implicitly on the overall amount of motivation that drives behavior at work, and on factors determining this overall amount (e.g. Agyepong et al., 2004; Bhatnagar and George, 2016; Chandler et al., 2009; Mathauer and Imhoff, 2006). In psychology, this intensity approach represents only one of several approaches to work motivation. Work motivation is often defined as a "set of energetic forces that originate both within as well as beyond an individual's being, to initiate work-related behavior and to determine its form, direction, intensity, and duration" (Pinder, 2008, p.11). The definition implies that in addition to motivational intensity, work motivation can for instance be approached from its degree of internalization or from its sustainability over time.

The assertion that most health worker motivation research has adopted an intensity approach does not mean that the available research ignores such other aspects. In fact, much research has focused on determinants of motivation and identified a vast number of internal and external drivers of behavior (Henderson and Tulloch, 2008; Willis-Shattuck et al., 2008). The differentiation between extrinsic and intrinsic motivation is common in the policy and academic discourse on health worker motivation (Leonard et al., 2013). Despite the recognition of different types of motivation, however, theorizing and research with an intensity approach to motivation tends to assume, if only implicitly, that all motivation, no matter its origin, is alike in relative value and consequences, pooled, and available to drive any behavior.

The intensity approach to motivation is also implicit in the PBF logic: it is assumed that health workers do not always perform as well as they could (Eichler, 2006). This assumption is supported for instance by Leonard and Masatu (2010), who in a study with Tanzanian doctors demonstrated that health workers do not always perform as well as they could, given their skill level and working conditions. It is further assumed that the reason for this is that their inherent desire to care for their patients competes with other interests, such as need for rest, leisure and family time, or existential worries leading to a desire to supplement meager salaries. In line with agency theory, PBF is thought to close this can-do gap by aligning at least some of health workers' competing interests with optimal patient care. Overall moti-

vation to give one's best at work is thought to increase as energy previously allocated to competing interests is redirected towards one's work (Eichler, 2006; Fritsche et al., 2014).

Research on the impact of PBF schemes indicates that well-designed PBF schemes do have the capacity to enhance overall motivation towards higher-quality provision of PBF-targeted services (e.g. Bhatnagar and George, 2016; Bonfrer et al., 2014; Ssengooba et al., 2012; Witter et al., 2012). Nevertheless, concerns over potential negative side effects, including crowding out of intrinsic motivation, persist. In the following, we will elaborate on why these concerns are worth considering, and why the intensity approach needs to be complemented by another conceptual approach to motivation in order to address them.

### 3. Why studying the intrinsic motivation crowding out effect?

Intrinsic motivation crowding out describes a situation in which motivation with an internal locus of causality decreases, for instance in response to an intervention such as PBF (Frey and Jegen, 2001; Gagné and Forest, 2008). Motivation has an internal locus of causality (DeCharms, 1968) when it is derived from intrinsic task enjoyment or personal meaningfulness of certain behavior and is thus congruent with an individual's goals and values. In contrast, motivation has an external locus of causality when it does not correspond to an individual's set of goals, values, and preferences, but when it results from what an individual perceives as external or internal pressure (e.g. for some desired consequence, out of guilt). Intrinsic motivation crowding out refers to a situation in which motivation with an internal locus of causality loses in relative importance to motivation with an external locus of causality. It thus refers to a qualitative shift in the composition of motivation, that is, in the relative contribution of motivation of different loci of causality to overall work motivation.

We will use internal and external locus of causality rather than intrinsic and extrinsic motivation from here forward. This is in alignment with current motivation psychology which has seen a conceptual shift in the definition and key defining characteristics of intrinsic and extrinsic motivation (Gagné and Deci, 2005). In the classic intrinsic-extrinsic motivation dichotomy as usually used in public health and economics, motivation is categorized as extrinsic or intrinsic based on whether it was or was not induced by some outside stimulus. However, more recent psychological research argues that the presence or absence of an external stimulus is not the criterion most relevant to wellbeing, performance, and other outcomes. Rather, it promotes differentiating motivation based on the extent to which an individual perceives their behavior as congruent with their set of goals, values, and preferences (i.e. locus of causality), whether externally stimulated or not. Externally stimulated behavior might have an internal locus of causality if in alignment with one's goals, values, and preferences. Conversely, non-externally simulated, 'intrinsically motivated' behavior might have an external locus of causality if non-congruent with one's goals, values, and preferences, for instance if performed out of guilt.

From a motivation intensity perspective, shifts in motivation composition bear few practical consequences, at least as long as enough motivation is 'crowded in' so that the desired net change in overall motivation is achieved. As discussed, however, there are concerns that potential shifts in motivation composition might have more complex consequences, including undesired ones (Ireland et al., 2011; Kalk, 2011).

In fact, a large body of research has shown that motivation of different loci of causality cannot be considered completely additive, only varying in quantity but not in nature. Rather, motivation of dif-

ferent origin affects attitudes and behavior at work in different ways, independent of motivation intensity. Previous research has consistently related motivation with an internal locus of causality to better performance as well as to higher job satisfaction, organizational commitment, and well-being (Gagné and Deci, 2005; Miquelon and Vallerand, 2008; Pinder, 2008), which in turn have been shown to affect performance, presence at work, health, and turnover in a large number of settings (e.g. Faragher et al., 2005; Judge et al., 2001; Meyer et al., 2002). Recent research supports the cross-cultural validity of these findings (e.g. Blaauw et al., 2013; Dale, 2014; Gagné et al., 2015).

In addition, previous research has shown that externally controlled motivation tends to be narrowly focused on the rewarded behaviors, while motivation with an internal locus of causality transfers well across situations and behaviors (Deci and Ryan, 2000; Koestner et al., 2008). In a setting as complex as health care provision, it is difficult to explicitly incentivize all behaviors necessary for comprehensive high-quality patient care (Eichler and Levine, 2009; Fritsche et al., 2014). Health workers with high levels of internal motivation are more likely to perform well in a comprehensive way, even on not explicitly rewarded aspects of their work. Previous research has also shown that externally controlled motivation tends to be rather unstable and vulnerable to changes in the environment, while motivation with an internal locus of causality is more robust (Deci and Ryan, 2000; Koestner et al., 2008). Fluctuations in reward payments due to occasional failure to achieve targets are inherent in PBF schemes with performance targets sufficiently challenging to bring about change. Health workers with high levels of internal motivation are more likely to keep up effort and performance even when rewards are sometimes not or only partially obtained.

In conclusion, this stream of research suggests that both the sum of all motivation available (intensity approach) and its composition across different loci of causality (composition approach) are relevant in shaping health worker behavior. Motivation with an internal locus of causality seems generally preferable as the primary driver of behavior, and can be supplemented with, but should not be substituted by motivation with an external locus of causality. Even though the motivational net effect of a PBF intervention might be positive, shifts in motivation composition could yield unwanted side effects if they occur at the expense of motivation with an internal locus of causality. There is thus ample reason to not only be concerned with the motivational net effects, but to also consider and study motivation composition, to understand how different aspects of PBF affect different types of motivation, and the consequences of shifts in motivation composition on health workers' clinical performance, other work-related behavior, wellbeing, and satisfaction. Such research will be highly valuable in informing the design of PBF interventions that both strengthen external motivation and foster motivation with an internal locus of causality, thus maximizing the motivating potential of the approach.

Before introducing Self-Determination Theory as a useful theoretical framework towards this aim, we would like to stress that there is nothing per se wrong with adopting an intensity-based research approach to motivation. Researchers should be aware, however, that different research questions emerge from the two approaches. In an intensity mindset, research questions relate to the extent to which the amount of 'energetic force' available to drive relevant behavior has changed in response to an intervention, and the consequences for behavior this entailed. The internal make-up of this 'pot of energetic force', the consequences of shifts in make-up such as described by the crowding out effect, and the efficiency with which net gains have been achieved are difficult to capture in an intensity-oriented frame-

work. They are at the heart of research conducted in a composition-oriented framework. For instance, researchers adopting an intensity perspective would examine how a nurse's overall motivation to perform a procedure as well as her actual behavior changes in response to an intervention incentivizing this behavior. Researchers adopting a composition perspective would further investigate the motivational structure behind such behavioral changes, trying to unravel the extent to which she perceives the externally induced behavior congruent with her personal set of goals and values as opposed to externally forced upon.

#### 4. Self-Determination Theory: a motivation composition approach

Self-Determination Theory, first introduced by Edward Deci and Richard Ryan in the mid-1980s (Deci and Ryan, 1985), explicitly recognizes the importance of a multidimensional approach to motivation. Apart from its focus on motivation composition, we believe that an SDT lens will add value to the study of the crowding out effect and health worker motivation more generally for a number of reasons. In discussions around the crowding out effect, PBF proponents rightfully point out that PBF is more than just external financial incentives and entails many elements that might foster intrinsic motivation rather than diminish it, such as improved performance feedback or enhanced local decisional autonomy over working conditions as a result of the PBF reward money available to facilities (e.g. Fritsche et al., 2014). Unlike Cognitive Evaluation Theory and other incentive theories which primarily focus on the effects of extrinsic rewards on intrinsic task interest and which continue to be employed in discussions around the crowding out effect (e.g. Friedman, 2013), SDT allows to take account of PBF's complex nature, offering a fundamental explanatory framework for the motivational change mechanisms associated with external stimuli. Rather than representing a competing explanatory approach, however, SDT complements agency theory well. The two theories are linked by the central importance they place on autonomy for individual and institutional functioning. Agency theory, however, while useful as a framework at the systemic level, remains relatively unspecific and descriptive at the level of individual health worker motivation. Here, an SDT-based approach will facilitate a comprehensive understanding of how, why, and under which conditions the various PBF design elements, processes, and results affect motivation. On a more operational level, SDT offers a solution to the conceptual and terminological inconsistencies on intrinsic motivation between different disciplines and strands of research by proposing a taxonomy that differentiates the various concepts associated with the term. Lastly, SDT has generated a large body of theoretical and empirical literature in a vast number of settings – including non-Western ones –, for future research to base on (see Gagné et al., 2015; Gagné and Deci, 2005; Gagné and Forest, 2008; Miquelon and Vallerand, 2008, for reviews in the areas of work, health, and wellbeing). In the following, we briefly describe SDT, focusing on aspects that appear most instrumental to work motivation research in LMIC health care settings. All information on the theory from here forward is taken from Deci and Ryan (2000) and Gagné and Deci (2005).

Similar to earlier needs-based theories of motivation, SDT is grounded in the belief that the fulfillment of basic human needs is of key importance for optimal functioning and psychological well-being. SDT considers three innate psychological needs: relatedness, competence, and autonomy. The need for relatedness refers to a wish for being connected with, loved by, and cared for by others – in the context of health care provision, a wish to be respected, valued, and recognized by clients, community, colleagues, direct superiors, and the broader health system. Closely related to the concept of self-effi-

cacy (Bandura, 1977), the need for competence is defined as an inherent desire to be effective in one's interactions with the environment – in a work context, to feel like one does well in the various dimensions of one's job and has impact on one's work environment. Lastly, autonomy refers to a need for volition, to be able to shape one's experiences and behavior according to one's self, goals, and values – in a work context, to believe in and endorse what one does, and to have the choice, within professional borders, to do as one thinks best.

SDT assumes that people will naturally engage in activities that they find interesting, challenging, and enjoyable, and that thus contribute to the satisfaction of the basic psychological needs. The drive to engage in such activities is termed 'intrinsic motivation'. SDT further assumes that people are unlikely to engage in activities that do not have these intrinsically motivating characteristics for them, unless for specific instrumental reasons (extrinsic motivation).

In SDT, 'external regulation' corresponds to what the public health and economic literature tends to term extrinsic motivation. Externally regulated behavior is driven by the wish to "attain a desired consequence or to avoid a threatened punishment" (Deci and Ryan, 2000, p. 236). For instance, the filling of a partograph could be termed externally motivated if a nurse does it in order to obtain a reward, even if from a clinical point of view, she might not see the value of this activity.

In addition to intrinsic motivation and external regulation, SDT distinguishes three further types of extrinsic motivation: introjected regulation, identified regulation, and integrated regulation (see Fig. 1). The five types of motivation can be arranged along a continuum from an external to an internal locus of causality. In SDT, motivation is called 'controlled' if it is perceived to result from outside contingencies, i.e. if it has an external locus of causality, and 'autonomous' if it originates in one's own set of goals and values, i.e. if it has an internal locus of causality. SDT thus posits that the degree of autonomy or volition in initializing and maintaining behavior is of central importance, whether externally incentivized or not. Behavior resulting from controlled motivation is referred to as 'non-self-determined', behavior resulting from autonomous motivation 'self-determined'.

'Introjected regulation' refers to a state in which the control of behavior does not come from some contingency maintained by others as in externally regulated behavior. Rather, "the contingent consequences are administered by the individuals to themselves" (Deci and Ryan, 2000, p. 236). In the partograph example, the nurse's behavior could be termed regulated by introjection if, for instance, she fills the partograph because she would feel guilty not to comply with clinical protocols, even though there is no value to it in her professional opinion. Regulations are referred to as 'identified' when their underlying value is recognized and accepted by the person. Resulting behavior is considered fairly self-determined. The nurse's filling of the partograph would for instance be classified as regulated by identification if she does so because she recognizes its value for the patient's wellbeing. 'Integrated regulations' are fully congruent with a person's goals and values, having been brought into "harmony or coherence with other aspects of their values and identity" (Deci and Ryan, 2000, p. 236), and are thus fully autonomous. Unlike intrinsically motivated behavior, however, activities stimulated by integrated regulations are not performed out of sheer interest or enjoyment, but because of their instrumental importance to a person. In the example, the nurse's filling of the partograph would be termed regulated by integration if she fully believes in the value of the partograph for her work to the extent that she would use the partograph even in the absence of any external inducement to do so.

The partograph example illustrates that in real life, it is rare that only one type of motivation drives behavior, even when only such a

<b>Behavior</b>	Nonself-determined	Somewhat non-self-determined	Somewhat self-determined	Self-determined	Self-determined
<b>Motivation</b>	Controlled	Somewhat controlled	Somewhat autonomous	Autonomous	Autonomous
<b>Type of regulation</b>	External regulation	Introjected regulation	Identified regulation	Integrated regulation	
<b>Locus of causality</b>	External	Somewhat external	Somewhat internal	Internal	Internal
<b>Motivational source</b>	Reward and punishment	Performance-contingent self-worth, ego-involvement	Importance of goals and values	Congruency between behavior and identity, goals, and values	Interest in and enjoyment of the task/activity itself
<b>Examples</b>	Money, career options, fear of forgoing benefits	Reputation, pride in oneself, feelings of duty	Importance of one's work for patients, wish to make a difference	Being a health worker as 'mission', calling	Enjoyment of tasks, challenges
<b>Extrinsic-intrinsic dichotomy</b>	Extrinsic motivation (i.e. external stimulus)		Intrinsic motivation (i.e. no external stimulus)		

Fig. 1. The self-determination continuum; adapted from Deci and Ryan, 2000, and Gagné and Deci, 2005.

simple, well-defined activity is considered. For instance, the nurse might fill the partograph because it is required by clinical protocols and – with the introduction of PBF – monitored and rewarded, but might at the same time acknowledge its value for the patients and for the organization of her own work. The infinitely more complex ‘activity’ of working as a health worker is clearly not regulated by only one motivational type. Rather, behavior is driven by a combination of autonomous and controlled types of motivations, each contributing to a different extent to overall motivation, composing a person’s motivational profile (Tremblay et al., 2009).

The partograph example also allows demonstrating that behavioral regulations are not set in stone, but can change over time. For instance, the nurse might start using partographs because of a PBF intervention and with the sole purpose of earning a reward payment. In time, however, she might become convinced of their value, to the extent that she might even continue using them if PBF reward payments were stopped. SDT terms this process internalization – the transformation of externally induced regulations into personally endorsed regulations and values. The concept of internalization is grounded in the fundamental assumption of SDT that people naturally strive for inner coherence and harmony by actively aligning outer experiences with personal interests, preferences, and values.

The internalization process is facilitated by the satisfaction of the basic psychological needs. In the above example, the nurse might in time experience that using the partograph allows her to manage her patients better, boosting her self-efficacy beliefs, which positively

contributes to the satisfaction of her needs for autonomy and competence. At the same time, she might appreciate the recognition for her hard work and the opportunity to gain extra income for her facility and herself, with a positive effect on the satisfaction of her need for relatedness.

However, a less positive reaction to the introduction of rewards for filling partographs is also imaginable. The nurse might, for instance, not agree with the new practices from a professional point of view, but feel required to comply anyway in order not to hurt her facility and colleagues by preventing the winning of the PBF reward. This pressure might negatively impact the satisfaction of her need for autonomy. In addition, she might feel that her clinical competency and judgement is put into question, resulting in a negative impact on the satisfaction of her needs for competence and relatedness.

Whether an external stimulus such as a PBF intervention thus positively or negatively contributes to basic needs satisfaction, and consequently fosters or thwarts autonomous motivation, is neither straightforward nor uniform to all individuals. Rather, personality, previous experiences, the working environment, and – of primary importance in the context of PBF – the specific design, implementation, and perceptions of an intervention intended to modify behavior determine the extent to which such external interventions contribute to need satisfaction. The SDT literature has identified a large number of conditional factors that facilitate or impede the internalization of externally induced behavior (Gagné and Deci, 2005; Gagné and Forest, 2008; Miquelon and Vallerand, 2008; Vansteenkiste and Ryan, 2013).

Many of the identified factors seem relevant to PBF, such as the assurance of adequate infrastructure, equipment and material to allow health workers to effectively apply their skills, and the provision of meaningful rationale for change.

We conclude that interventions such as PBF, even if they appear to primarily target external regulations, have the potential of affecting both controlled and autonomous types of motivation – positively and negatively – with potential positive and negative consequences for performance, wellbeing, and other factors.

Before moving on to a discussion of our expectations of the motivational effects of PBF, we would like to make more explicit the value of SDT beyond other composition-oriented approaches, particularly the classic extrinsic-intrinsic dichotomy (see also Fig. 1). Compared to the latter, SDT represents a shift in focus from the presence or absence of an external stimulus as the criterion of primary relevance towards individuals' perceptions of the locus of causality of their behavior. The partograph example illustrates that even if behavior was induced from the outside (i.e. extrinsic motivation in the extrinsic-intrinsic dichotomy), the nurse can feel highly autonomously motivated to fill the partograph if it's congruent with her professional opinion (i.e. intrinsic motivation in the extrinsic-intrinsic dichotomy). If, however, the nurse does not see its value, she might perceive the same behavioral stimulus as controlling, reducing rather than increasing autonomous motivation. By adopting this change in perspective from the actual stimulus to perceptions of behavioral causality, SDT thus offers an explanation to why the same financial incentives and other external stimuli foster autonomous motivation in some individuals and under certain conditions, and thwart autonomous motivation in others. SDT also offers important insight into how external interventions can be designed in ways that support rather than erode autonomous motivation. With the concept of internalization, SDT further offers an explanation to changes in reactions to external incentives over time, which is difficult to accommodate in an extrinsic-intrinsic dichotomy.

## 5. Expected effects of PBF on motivation composition and performance

### 5.1. PBF impact on basic needs satisfaction

From the health worker's perspective, PBF comes with a series of events and processes such as the introduction of the scheme, the setting and process of achieving performance targets, the performance accounting and evaluation process, and the reception and use of financial rewards ('PBF elements'). In addition, as discussed in the introduction, most PBF schemes directly or indirectly induce a number of potentially fundamental changes in the working environment (Fritsche et al., 2014), such as changes in infrastructure, equipment and material, clinical processes, supervisory and performance feedback structures, and financial management and procurement autonomy ('PBF results'). As discussed, the SDT literature has identified a large number of factors that help explain how PBF elements and results support or compromise basic needs satisfaction. Apart from the already-mentioned assurance of adequate infrastructure, equipment and material and provision of meaningful rationale for change, we assume that the following factors play a key role in how PBF affects motivation composition: opportunities for participation and voice (i.e. the opportunity to give input and feedback); transparency; supervisors' support of proactive behavior; constructive, learning-oriented supervision and performance feedback; and perceived performance-contingency of rewards.

Unfortunately, the scope of the article does not allow for a comprehensive discussion of all important PBF elements and results and

their potential consequences for basic need satisfaction. In order to give readers the opportunity to further familiarize themselves with an SDT-based explanatory approach to the 'PBF black box', however, we will elaborate on 'participation and voice' as one exemplary aspect: We expect that health workers' ability to participate and have voice in the entire implementation process significantly contributes to perceptions of ownership of the intervention, and thus to the satisfaction of the need for autonomy. Opportunities for participation and voice are also expected to contribute to the satisfaction of the need for relatedness as they signal to health workers that they are valued and respected by their superiors and the larger health system. To the extent that health worker participation in planning and decision-making processes allows for better tailoring of the intervention to local needs and realities, it will also contribute to the satisfaction of the need for competence as it enables health workers to master the implementation process well and obtain positive results that further foster perceptions of self-efficacy. If intervention modalities do not permit health workers to have their say in the intervention planning and implementation process, however, a negative impact on the satisfaction of the need for relatedness and autonomy is likely, as feelings of ownership are impeded and health workers might feel unfairly treated, disrespected and not valued. In addition, if lack of participation and voice leads to interventions poorly tailored to the local context, health workers are likely to struggle, resulting in a negative impact on the satisfaction of their need for competence.

### 5.2. Changes in motivation composition and performance

In line with the above-discussed theory and research, we assume that if PBF elements and results are experienced in a way that overall contributes to the satisfaction of the basic psychological needs, internalization of behaviors stimulated by the intervention is facilitated. Autonomous work motivation is thus expected to remain intact or increase in relative importance (crowding in). If the intervention is experienced in a way that overall compromises basic needs satisfaction, however, we not only expect that internalization of intervention-induced behaviors is impeded, but also a general decrease in autonomous motivation (crowding out). Following the definition of controlled motivation, we further expect that the extent to which PBF contributes to controlled motivation depends primarily on the instrumental value health workers place on expected consequences of behaviors stimulated by the intervention, such as reward amounts and recognition by superiors, peers, and clients.

Assuming constant objective working conditions and skills, we expect that health workers with high levels of autonomous motivation will demonstrate comparatively higher and fairly robust levels of performance both for incentivized and non-incentivized work tasks. In addition, we expect highly autonomously motivated health workers to experience higher levels of job satisfaction, wellbeing and organizational commitment, which in turn are likely to lead to better health, lower absenteeism levels, and lower turnover. For health workers predominantly driven by controlled types of motivation and with low levels of autonomous motivation, in contrast, we expect comparatively lower performance levels, with large variations as a function of whether specific tasks are incentivized or not, as well as with fluctuations in intervention details, for instance of verification results or reward levels. Additionally, we expect lower levels of job satisfaction, wellbeing, and organizational commitment, which translate to lower health, higher absenteeism levels, and higher turnover.

In line with this reasoning, we thus expect the most favorable performance outcomes if autonomous motivation is sustained or further enhanced by a PBF intervention, as well as supplemented by controlled motivation. In this case, we assume that health workers will

display stable or increased performance levels on non-incentivized tasks, and will improve their performance on incentivized tasks, over and above improvements through enhanced skills and objective working conditions. If autonomous motivation decreases as a consequence of the intervention, we expect a general decrease in performance levels when improvements induced by enhanced skills and improved objective working conditions are factored out. Depending on the intervention effect on controlled motivation, performance levels on incentivized tasks are expected to increase, remain stable, or decrease.

More distal effects and side effects frequently discussed in relation to PBF such as gaming (Ireland et al., 2011; Kalk, 2011) might also benefit from SDT-guided exploration, but a detailed discussion is beyond the scope of this paper. SDT might further prove valuable in exploring the individual-team dynamic in response to PBF, as well as the motivational reactions of other stakeholders (e.g. ministry officials, health system managers, civil society).

## 6. Conclusion

As more and more evidence on the impact of PBF on health service quality and coverage is generated, a number of questions remain unanswered and comparatively untouched by the research community, including the exact mechanisms through which PBF affects health worker motivation, and the consequences of altered motivation. We believe that this is at least in part due to conceptual challenges, and hope that this article has contributed to a more comprehensive understanding of motivation.

Some PBF researchers and practitioners have posited that crowding out of autonomous motivation is of little practical relevance, so long as enough motivation is crowded in for the 'motivational net effect' to be positive. We disagree on the basis that previous research has clearly demonstrated the favorable qualities of autonomous motivation. Should autonomous motivation indeed be reduced rather than enhanced or complemented by controlled motivation in response to PBF, important capacities would be destroyed. We thus believe that further research on this issue is paramount, and encourage the research community to be mindful of the following in future research planning:

Most health worker motivation research in LMIC to date has taken an intensity approach to motivation. Such an approach is not ideally suited to studying certain phenomena, including the crowding out effect. We believe that complementing intensity approaches with approaches focusing on motivation composition will be highly valuable to fostering our understanding of health worker motivation.

The current 'PBF and motivation' research agenda is dominated by the question as to whether autonomous motivation is negatively affected by PBF or not. While there is no doubt of the importance of answering this question, we believe that the PBF community will benefit even more from attempts to not only describe specific interventions and their consequences, but to develop a more fundamental understanding of exactly how, why, and under which circumstances motivation is affected by specific PBF design elements, processes, and results, thus truly opening the 'black box' and supporting well-informed intervention planning. In doing so, we encourage to not only focus on possible crowding out of autonomous motivation, but to pay equal attention to PBF's potential to strengthen autonomous motivation ('crowding in').

More than 70 years of research in motivation psychology have resulted in a vast body of theorizing and empirical evidence to draw from. Of the diverse available theoretical approaches, we believe that Self-Determination Theory will be particularly useful as a theoretical

foundation to achieving the above. Unlike theorizing based on the classic extrinsic-intrinsic motivation taxonomy, SDT offers a framework that allows explaining how external interventions can both positively and negatively affect autonomous motivation. We hope that our contribution will fuel discussions among PBF researchers and practitioners and prove valuable in guiding future research to further our understanding of how PBF affects health worker motivation in general, and autonomous motivation in specific.

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