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Is SMART the new stupid? Health workers perspectives on producing PBF indicators[1]

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Abstract PBF program designers have traditionally selected and priced service delivery indicators based on public health value, and whether the indicator is SMART (specific, measurable, achievable, relevant, and timely). This approach ignores the providers perspective on the value of inputs and opportunity costs of service provision. We conducted in-depth interviews, focus group discussions, and rank order exercises with health workers to elucidate factors that drive their motivation to deliver PBF incentivized services. Health workers identified three key considerations that drive service prioritization: effort to acquire a patient, effort to treat a patient, and health worker locus of control. Health workers consider multiple factors when prioritizing PBF services to maximize their total reward. In pricing PBF services, program designers must understand inputs' value and total opportunity costs, rather than relying on public health value and the SMART indicator framework alone. When pricing services, PBF program designers should collaborate with health workers to account for the range of factors that health workers consider when making service provision decisions.

Keywords: Performance-based financing. Indicator pricing. Health worker motivation. Health worker perception. Mozambique.

Introduction

Performance-based financing (PBF) or pay-for-performance has demonstrated mixed, but promising

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results in achieving important public health targets (Paul; Remans, 2018; Renmans *et al.*, 2017; Witter *et al.*, 2012). Since gaining traction as a promising health financing tool, the PBF community has focused its attention on how to best design PBF across differing contexts (Ireland; Paul; Dujardin, 2011; Kalk; Paul; Grabosch, 2010; Meessen, 2011; Renmans *et al.*, 2017). PBF schemes entail the payment of financial incentives to health workers based on their performance, measured by the quantity, or number of patients, provided a service (Fritsche; Soeters; Meessen, 2014; Renmans *et al.*, 2016). To date, the majority of PBF programs have used similar performance indicators, focusing primarily on maternal and child health services (Paul; Renmans, 2018; Renmans *et al.*, 2017). This generic replication across programs can perhaps be attributed to single donor dominance or the shared health challenges across the specific contexts of low and middle-income countries (LMICs).

The evidence and dialogue on the design and pricing of PBF incentivized indicators is nascent. From existing programs, the price of similar services varies considerably from context-to-context with little justification for price setting. For example, the price of an uncomplicated facility delivery in Cameroon is $4.76 (USD, PPP and inflation-adjusted), while in Kenya it is $21.00 and $100.32 in Benin (Aedes; Iresco, 2012; Ministère de la Santé, [20?]). The existing recommendations for designing indicators have been limited. Guidance is featured in two of the four PBF toolkits, where the recommendation is for indicators to follow SMART (Specific, Measurable, Achievable, Relevant and Time-bound) methodology; there is no discussion however on how to price an indicator appropriately (Fritsche; Soeters; Meessen, 2014; Sina Health, 2018; The AIDSTAR-TWO Project, 2011; Toonen; Lodenstein; Coolen, 2012). From our experience with PBF programs, pricing of indicators has been based on what program designers or policy makers value or view as being important, without bringing in health workers perspectives.

Existing literature on health worker payment systems in high-income settings demonstrate that health workers are rational agents who act to maximize their total monetary gain, and as such, consider all potential opportunity costs involved in service delivery (Gosden *et al.*, 2000; Pontes, 1995; Simoens; Giuffrida, 2004). For health workers to act on an incentive, the reward must be large enough such that their net profit is sufficiently higher than the value of all production factors, including their associated opportunity cost. To date, there have been no studies to assess what factors make it easier or more difficult to deliver a PBF incentivized service, and how this drives health worker behavior in relation to price.

In this paper, we aim to fill this gap by exploring the role of performance-based indicators in the context of the health workers experience to elucidate the factors that directly and indirectly influence health worker ability and willingness to achieve greater performance.

Theoretical Frameworks

We draw on two basic and fundamental economic theories to inform our analysis: (1) theory of principal-agent relationships, and (2) basic behavioral economic theory.

Under the framework of principal-agent relationships, one person or entity (principal) delegates work to another person or entity (agent), in exchange for compensation (Savedoff, 2010). In PBF schemes, the payer, usually the Ministry of Health or a donor organization acts as the principal, and healthcare workers or facilities, act as agents (Musgrove, 2011; Savedoff, 2010). Agents will only participate if the reservation utility – the minimum level of utility needed to make a contract acceptable – meets an acceptable level of benefit. The concept of a reservation value – the importance of variables such as price, quality, revenue, utility and wage to the agent in performing assigned tasks or making decisions – has been used to analyze questions in many different areas of economics such as family economics (Hatcher, 2002), labor economics (Groot; Oosterbeek, 1994) and natural resource economics (Batabyal, 2009). This concept has important application to PBF programs in helping to understand how health workers are incentivized. To our knowledge, this economic theory has yet to be applied to PBF in health. We use this theory to help to identify the variables such as price, individual level of effort, demand side factors, and clinical environment, that influences health worker perception of difficulty in achieving PBF indicators.

Applying basic behavioral economic theory to the health sector, health workers can be viewed as rational agents who respond to incentives and are driven by maximizing their overall utility (Becker, 1976). To accomplish this, health workers factor in all opportunity costs associated with delivering each service (including allocation of time and resources), and will produce services when the marginal benefit of production is equal to or greater than its cost. Therefore, economic theory suggests that the pricing of PBF indicators must account for opportunity costs associated with service delivery, such as time and intensity of effort. To date, there have been no studies to our knowledge that examine these factors, and most PBF program designers do not consider these factors in a rigorous or meaningful way. We apply this theory to contextualize why health workers act on some rewards and not others, even when the face value of the reward for one service is higher than another.

Study Setting

In early 2011, the President´s Emergency Plan for AIDS Relief (PEPFAR) funded a PBF program in Mozambique in the provinces of Gaza and Nampula. The program is focused on the provision of HIV clinical services, particularly for children and pregnant women.

Program designers and provincial health directorates jointly selected 21 incentivized indicators for the program's PBF component. These indicators were clustered into the following four groups, based on service type: PMTCT, pediatric HIV, adult HIV/ Tuberculosis (TB), and MCH. Payment is based on a service's unit price multiplied by the service's produced quantity. An equity weight was applied to favor facilities in rural and hard-to-reach areas. Health facilities report on PBF indicators monthly and submit aggregated reports on a quarterly basis. The program implementer and the Provincial Health Office (DPS) jointly conduct data verification and payment cycles every quarter. PBF earnings are allocated to facility investment (40%) and salary top-ups (60%).

As of 2015, the PBF program is continuing in the two program provinces in a total of 138 health facilities, 65 in Nampula and 73 in Gaza, equating to 56% and 79% population coverage. The program ended in 2016 and was not actively scaled-up (expansion geographically or population coverage) beyond the two pilot regions.

Methods

To assess health worker perceptions on the difficulty of improving quantitative PBF indicators, we used qualitative methodology, including in-depth semi-structured interviews and focus group discussions. We triangulated our data collection and analysis with facility performance records and verified performance data over time (Rajkotia, 2017). We assessed the perceived ease or difficulty of a subset of 10 quantity indicators (Table 1). We selected this sub-set of indicators based on: the variability in responsiveness (selecting some high, medium, and non-responsive indicators); types of services (selecting some pediatric HIV, MCH and adult HIV indicators); and performance level prior to PBF (capturing the baseline performance of certain indicators). This sample allowed us to explore how these factors influenced performance and what health system or health worker motivation changes accompanied the indicator's success or failure.

The health workers were asked to describe changes they observed within the health facility since the introduction of the program and to reflect on the PBF indicators, explaining what variables or factors drive the level of difficulty. Data was collected at 15 health facilities in Nampula (8) and Gaza (7), 73% of which were primary health centers and 80% which were classified as rural or peri-urban. Facilities were purposively sampled based on size, geographic location (rural, peri-urban, urban), and facility performance data (including a range of poor, moderate and high performers). Each facility had participated in the PBF program for a minimum of 6 quarters (18 months). Health workers on duty and with a minimum exposure of 4 quarters (12 months) of PBF were asked to voluntarily participate in either IDIs or FGDs held at the health facility.

All interviews were conducted and transcribed in Portuguese, then imported into ATLAS.ti Version 1.0.14 for thematic analysis, using Grounded Theory, coded line-by-line and analyzed by two researchers to identify recurrent themes and variations across

responses. Initial themes and sub-codes were organized based on the theoretical model. For the sampled indicators (10), we provided interviewers with performance data on each indicator to better probe on what indicators were performing 'well' and why. We asked each health worker to rank the indicators by difficulty and then explain what factors influenced their ranking. Rank order frequency was calculated using weighted average methodology to determine which indicators were most influenced by PBF. Our analysis also included comparing the health worker's ranking with the results of our impact evaluation (magnitude of effect) which is a metric of impact from baseline compared to control (Table 2).

Table 1. Quantity Indicator Selection

Service Type	Quantity (Performance) Indicator
PMTCT	HIV+ pregnant women who initiate ART
PMTCT	Family planning consultations of HIV+ women
MCH	Facility deliveries
MCH	Post-natal care 3-28 days
MCH	Children fully vaccinated at 9 months
Pediatric HIV	New children (0-23 month) initiating ART
Pediatric HIV	New children initiating ART (2-14 yrs.)
Pediatric HIV	Pediatric patients (0-14 years) alive on treatment 12 months
Adult HIV	Adults (>15 years) alive, on treatment, 12 months after initiating ART
MCH (Non-incentivized)	Well Child visits - 0-4 years

Results

Health workers perceived quantity (performance) indicators as important clinical goals that have a varying degree of difficulty. The results from the rank order exercise are detailed in Table 2, where a lower value rank corresponds to an 'easier' indicator. Our analysis identified three key considerations that health workers used to define indicators as more or less difficult: effort to acquire patient, effort to treat patient, and health worker locus of control (Table 3 has illustrative examples of each driver by indicator, end of document). Overall, health workers rank correlated with the measured performance outputs from the corresponding impact evaluation demonstrating that easy indicators showed the greatest, or most significant, improvements. In Gaza, there are a few notable exceptions between the measured performance (magnitude and average treatment effect) and the categorization of difficulty (fully immunized child, pediatric initiation of ART, and facility deliveries).

Table 2. Rank Order of Quantity (Performance) Indicators, By Difficulty (Northern province)

Indicators	Avg Rank	Price	Performance (Magnitude)	Quarterly Avg. Treatment Effect per Facility
8. Children who received full vaccination for BCG, DPT, polio and measles in the first 9 months	3.33	$1.80	42.2%	98.1***
2. HIV-infected women who received a FP consultation and a modern contraceptive method	3.86	$5	162.6%	13.2***
7. Facility deliveries	3.93	$3	24.3%	66***
1. HIV-infected pregnant women who initiated ART	5	$10	251.6%	9.1***
9.Women who received at least one post-natal consultation 3-28 days after birth	5.08	$1.60	64.4%	185.7***
10. Children who received the recommended number of consultations in the first 4 years of age	5.8	$0	--	--
6. HIV-infected adults (>15 yrs.) alive 12 months after initiating ART	6.29	$8	0.0%	0
3. HIV-infected children 0-23 months of age who initiated ART treatment for the first time	6.56	$7.70	0.0%	0
4. HIV-infected children 2-14 years of age who initiated ART treatment for the first time	7.2	$7	0.0%	0
5. HIV-infected children 0-14 years of age alive 12 months after initiating ART	7.54	$11.20	34.5%	1.21***

Table 2b. Rank Order of Quantity (Performance) Indicators, By Difficulty (Southern province)

Indicators	Avg Rank	Price	Performance (Magnitude)	Quarterly Avg. Treatment Effect per Facility
8. Children who received full vaccination for BCG, DPT, polio and measles in the first 9 months	3.14	$1.80	0.0%	0
9.Women who received at least one post-natal consultation 3-28 days after birth	4.14	$1.60	24.8%	40.7***
4. HIV-infected children 2-14 years of age who initiated ART treatment for the first time	4.14	$7	0.0%	0
1. HIV-infected pregnant women who initiated ART	4.57	$10	194.6%	19.4***
2. HIV-infected women who received a FP consultation and a modern contraceptive method	5	$5	221.7%	58.8***
7. Facility deliveries	5.33	$3	0.0%	0
6. HIV-infected adults (>15 yrs.) alive 12 months after initiating ART	6.16	$8	0.0%	0

3. HIV-infected children 0-23 months of age who initiated ART treatment for the first time	6.62	$7.70	45.2%	3.2***
10. Children who received the recommended number of consultations in the first 4 years of age	6.75	$0		
5. HIV-infected children 0-14 years of age alive 12 months after initiating ART	6.85	$11.20	34.5%	4.2***

Note: Performance (Magnitude) percentages were constructed by clustering the magnitude of average treatment effect estimates.
Level of Significance: * p<0.1; ** p<0.05; *** p<0.01.
Prices are reflective of quarter 11

Patient Acquisition

Health workers identified the process of acquiring patients as a consideration that they accounted for when assessing an indicator's difficulty. Patient acquisition can be broken down into the time required to acquire a patient, and the intensity of the effort. For example, a single day outreach campaign may be high in intensity, but has a short duration, compared to using promotional messages via the radio which are low in intensity, but may take much longer to reach the same number of people. The time and intensity required are in turn a function of demand, knowledge and awareness of clients, disease prevalence, and geography.

Demand for Services

The amount of demand for a service is partially dependent on the degree to which the existing population has already been served. In the ranking exercises, particularly in Gaza, the baseline performance or early performance of specific indicators were mentioned as explanations of difficulty. Improving performance over time, for FP consultation with HIV+ women and facility deliveries, was difficult because many facilities achieved near full coverage (the last mile effect). The average difference in facility deliveries between 2011 (baseline) and 2014 (endline), adjusted for population growth in the seven facilities in Gaza included in our sample was only 9.4%. Health workers in Nampula rarely mentioned previous high performance as a barrier, although as the indicators improved over time they discussed how they were not able to achieve such high increases in number of patients or the resulting overall payment. Health workers reported that some services have reached 'saturation', whereby they felt they could not increase the number of patients eligible for a particular service.

> We always advise pregnant women to give birth in the maternity ward. At our meetings, the Activistas [community-based health advocates] and traditional birth attendants always advise women to come to give birth in the maternity facilities. And PBF has helped our Actvistas focus their efforts on getting patients into the health facility when appropriate, although there

> are only so many women in the community- almost all are coming to the facility for delivery already. (I05, Chokwe, Gaza; Medical chief (managerial) discussing the indicator on facility deliveries).
>
> It's difficult to improve this indicator because... here in the district, HIV-positive women come to the facility only during pregnancy and postpartum. Then they disappear, which makes it difficult to continue to [family planning counseling] with them. (I22, Mabalane, Gaza; health provider discussing the indicator on HIV-infected women who received an FP consultation and a modern contraceptive method).

Knowledge and awareness of patient

Health workers reported that for many of the maternal and child health services, the patients are perceived to be knowledgeable as to which services they need to access at the appropriate time. Many of the health workers reported that maternal patients will show up for these services without much additional advocacy or outreach efforts, meaning norms help to influence patient behavior. PBF propagated this further by influencing health worker behavior to counsel patients on when to return and the importance.

On the other hand, health workers were clear that HIV services and ART initiation and treatment remain stigmatized and often burdensome for the patient to maintain over the long-term, thus these indicators were ranked as most difficult. According to respondents, adult HIV and pediatric retention on ART was considered difficult because 'they don't show up'. Health workers reported that they used PBF facility funds to pay for car repairs and petrol to increase their outreach capacity and frequency to improve the HIV retention indicators, but few facilities have achieved any improvement. In Gaza, health workers ranked initiation of treatment for children 2-14 years (pediatric patients) as relatively easy because, 'mothers were good at bringing in their children for the initial consultation and to obtain ART'. Health workers felt that parents prioritized their children's health over their own for this particular indicator. However, retention on treatment overall remains a difficult indicator given the frequency of visits to the health facility.

> Mothers may be sick, but if the child is not sick they do not come back [just for themselves]. The problem is knowledge, it is knowledge. I still think maybe [we need to present] lectures daily to mothers to explain the purpose of postpartum consultations and why they should return to the health unit. (I36, Murrupula, Nampula; health provider discussing the indicator on postpartum women who received at least one postnatal consultation 3-28 days after birth).
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> "At the prenatal consultation, we educate mothers about the risks facing women during labor and invite them to deliver at the health facility. The number of institutional deliveries appears to be increasing just based on the number of women we have coming and the increasing in midwives assisting deliveries at the health unit. So we are working with all the traditional midwives to build greater awareness." (I34, Melema, Nampula; health provider discussing the indicator on facility deliveries).

Disease prevalence

For several health facilities, there were very low patient numbers for some indicators, and thus increasing the 'achievement' even by one or two patients is difficult. For Nampula, the improvement of ART initiation is due to the low number of eligible patients–less than 10– so increasing the number of patients per quarter by one is a significant improvement (greater than 10%). Moreover, in Nampula the HIV prevalence is significantly lower compared to Gaza (4.6% and 25.1% respectively) (Ministry of Health, 2010), hence the number of eligible patients for HIV testing and treatment are much lower and harder to locate through outreach.

> Now the other issue that may also contribute to this indicators difficulty is that most children under five are already on ART, so the number of children to start on the regimen is very, very small in our communities. It is clear that this child coming in at a higher age than five years it will no longer come through our HIV pediatric program because they have already entered our program before five years, and is in our books. So by this indicator of children 2-14 years, probably will to be reduced because children are already on ART. All children that are eligible for this indicator have already been reached between us and the Activistas. (I15, Chicumbane, Gaza; health provider discussing the indicator on **HIV-infected** children 2-14 years of age who initiated ART treatment for the first time).

Geography

Health workers described population catchment (rural/urban) and geographic spread as factors that make acquiring a patient easier or more difficult. Poor infrastructure and lengthy distances between communities and the facility act as barriers to access; patients may not be able to afford the transport necessary, or the time away from income generating activities. This particular factor was mentioned by health workers, but not discussed in detail as health workers are not generally concerned with the length or degree of difficulty of a patient's journey.

> It's difficult to improve this indicator because... here in the district, HIV-positive women come to the facility only during pregnancy and postpartum. Then they disappear, which makes it difficult to continue to [family planning counseling] with them. (I22, Mabalane, Gaza; health manager discussing the indicator on HIV-infected women who received an FP consultation and a modern contraceptive method).

> It's been quite difficult for these caregivers to bring their children to appointments routinely, initially because of financial constraints, distance, and so on. But when they come to the clinic, we show them we care for them, we try to explain how their child will benefit from antiretroviral treatment, that the child could, for example, attend school, enjoy childhood, be healthier with fewer opportunistic infections... to be sure the child does not abandon treatment. (I15_Chicumbane_Gaza; health providers discussing the indicator on HIV-infected children 0-14 years of age alive 12 months after initiating ART).

Treatment of Patient

The large body of literature on provider-payment mechanisms shows a consistent relationship between payment incentives and provider behavior. Under fee-for-service or case-based payment mechanisms, providers are paid a fee for each service or case they provide to a patient, and thus are incentivized to provide high volumes of services or see high volumes of cases. To accomplish this, physicians tend to favor services/cases that are quick (low time duration) and easy (number of steps and difficulty of providing service). As the Mozambique PBF program has elements of both case-based payment and fee-for-service, we would expect to observe similar behavior.

Complexity of treatment

The complexity, including the clinical protocols, number of steps or tasks for treatment, and intensity of effort to complete treatment or services were all described as ways that indicators can increase in difficulty. Typically, maternal and child services were less complex than HIV services and pediatric HIV. PMTCT, although clinically more intensive than MCH services, was perceived as easier than adult HIV services.

> We always deliver BCG after childbirth, then follow up with the other vaccines when mothers bring their children in for the checkups, and the vaccination takes very little time that most parents agree and remember to bring the vaccination booklet. We also have community campaigns for vaccination which makes it even easier. But there are a few [parents] who do not return with their children to meet the vaccination schedule. (I06, Chokwe, Gaza; health provider discussing the indicator on children who received full vaccination for BCG, DPT, polio, and measles in the first 9 months).

> Initiating and retaining patients on ART is difficult from a clinical perspective. For infants in particular there are many confirmatory testing, counseling for parents and family members, ensuring access to ART medications, and the infant has to return more frequently than adult patients for checkups. An adult can choose to initiate and continue ART, but a child requires the mother's [agreement and participation]. She must take charge of the child's treatment. While the initiation of treatment is easy… after nine months, the initial treatment is finished, [and] the mother disappears. (I33_Mutuali_Nampula; health provider discussing the indicator on HIV-infected children 0-14 years of age alive 12 months after initiating ART).

> PBF has influenced HIV recordkeeping very positively … we test all women who seek our maternity services and record the results and contacts of the tested women. If the test result is positive, [the women] starts treatment immediately. So the system work much better now. It is not complex for us to test every maternity patient, and we have increased our prenatal consultation numbers so these patients count for multiple indicators. (I01, Macia, Gaza;

> health provider discussing the indicator on HIV-infected pregnant women who initiated ART).

Duration of consultation

The duration of consultation is considered a driver of difficulty because health workers felt that their time was limited and workload high. Patient consultations or services that require a high level of time commitment were considered difficult to improve due to the limited time of human resources to dedicate to more patients. Health workers stated that their workload had increased due to PBF without an increase in clinical human resources, thus the time to serve a patient was a limiting factor, and services that take prolonged time to complete like HIV treatment initiation are difficult during periods of peak volume (generally in the morning hours). Facility deliveries were the one exception to the duration of consultation. Facility deliveries have long duration, but due to the demand side factors of mothers showing up accompanied by families, the low complexity (for normal deliveries) and availability of staff allow for facility deliveries to be considered easier than some of the other time intensive services.

> When a new patient arrives, it is true that our mission is to start treatment, but a little counseling is necessary, which is sometimes a challenge to deliver and the patient often has to wait. Once the treatment begins, it is important to follow up, but that requires resources to do it, the Activista or a nurse who can call on the patient. Retaining patients on ART requires working hard to look for them—we know they're out there. (I23, Chicualcuala, Gaza; health provider discussing the indicator on HIV-infected children 0-23 months of age who initiated ART treatment for the first time).

> Woman who complete at least one postnatal visit three to twenty-eight days after birth is easy because it is can happen at the same time as the newborn follow-up. So the mother will bring in her baby and we send her to the maternity department for their postpartum consultation while she is here and it is less time for the MCH nurse to do both at the same time. (I26, Mapai, Nampula; health provider discussing the indicator on postpartum women who received at least one postnatal consultation 3-28 days after birth).

Patient characteristics

Adults were noted to be more difficult to maintain on treatment because of factors such as employment, migration, and stigma. Children on the other hand were more likely to be brought in by mothers. Providers noted that mothers cared more about their child's health than their own, making child HIV indicators easier to achieve.

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> newborn follow-up. So the mother will bring in her baby and we send her to the maternity department for their postpartum consultation while she is here. (I26, Mapai, Nampula; health provider discussing the indicator on postpartum women who received at least one postnatal consultation 3-28 days after birth).

> Often HIV-positive pregnant women are isolated from the rest of the community. When they learn that they are infected, [their] men abandon them, so it is difficult to come to treatment and follow-up. This is more common in rural communities. (I20, Murrupula, Nampula; health provider discussing the indicator on HIV-infected pregnant women who initiated ART).

> Usually when the children become older, especially when the child is already working, coming back to the health center is not easy… so parents will only bring them when they are really sick. It's hard to search for those not already on the drugs, and it's difficult to follow them. Advising the parents is difficult because of the long distances between the health center and some communities. (I12, Murrupula, Nampula; health provider discussing the indicator on HIV-infected children 2-14 years of age who initiated ART treatment for the first time).

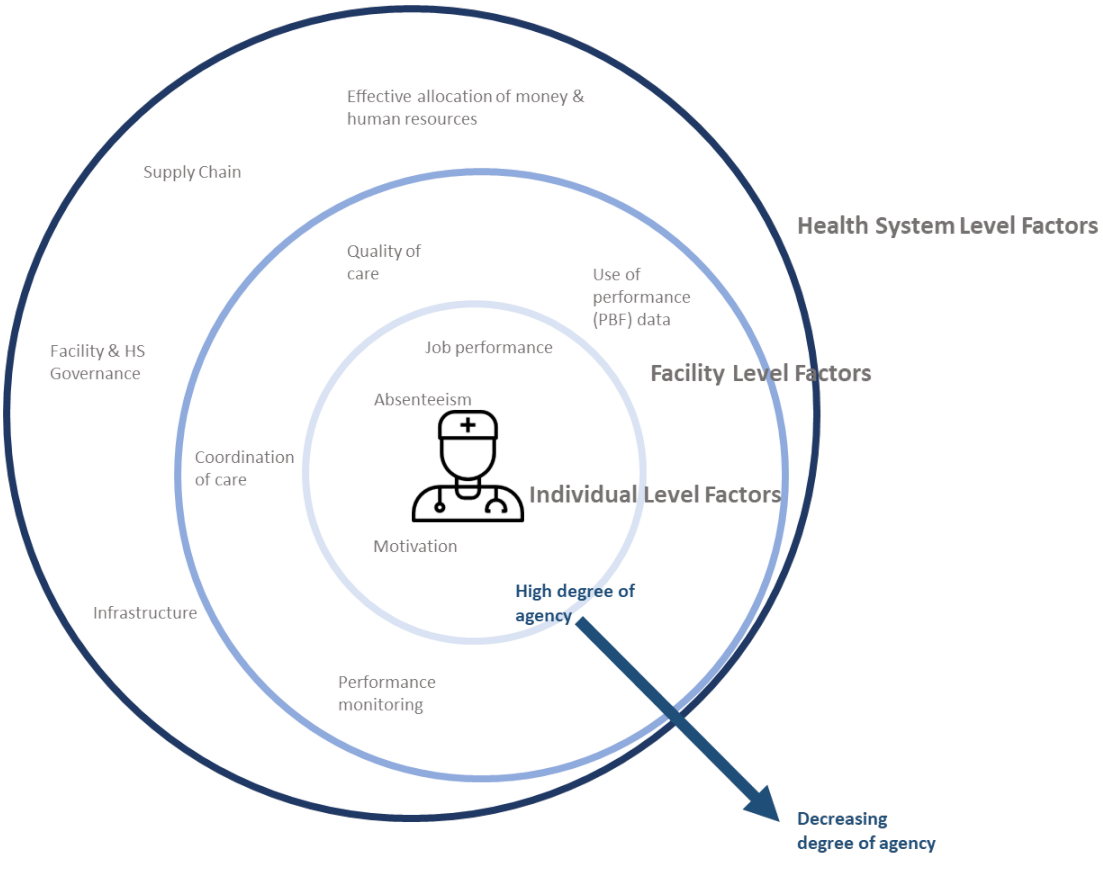
Health worker's locus of control

The level of control a health worker has over an indicator's outcome is dependent on several contextual factors. Our findings indicate that these factors fall into three rings (see Figure 1): factors where health workers felt they had the highest degree of control were those that are a direct product of their own decision-making, thus falling into the closest ring. Factors where health workers felt they had a medium degree of control fell into the second ring, and these were identified as being related to facility level issues. Finally, factors related to the external health system fell into the furthest ring, where health workers feel they have the least amount of control.

Factors falling into the closest ring included absenteeism and productivity, which are directly related to a health worker's individual choices. Health workers can choose to be at the facility or not, and similarly, can choose to operate at a higher or lower level of productivity (to the extent that their environment allows). Factors falling into the middle ring focus on performance management, care coordination, and quality of care. Health workers have a degree of control over such factors; they can exercise choice in whether they follow best practices, or if they coordinate with other health workers to ensure that patients receive comprehensive care. However, they are also constrained by the availability of supportive supervision and training, and whether infrastructure exists to allow for performance data to be collected and used.

Factors falling into the external ring revolve around governance of the broader health system and facility, allocation of funds and human resources to the facility, and supply chain of commodities and pharmaceuticals. Health workers have little to no control over these, yet their ability to deliver services are highly dependent on them. In the case of effective allocation of funds and human resources, both are critical to the ability of health workers to operate effectively. Limited human resource allocation may result in low health worker to patient ratio, restricting health worker capacity to deliver quality care and address complex patients. Poor supply chain may limit availability of drugs and lab test commodities, handicapping health workers in actually treating patients. Finally, poor governance at the health system level results in broader more systemic issues such as corruption, mismanagement of funds, informal fees that deter patients, amongst others.

Figure 1. Health Worker's Reported Locus of Control for Delivering Clinical Services



Price

Our study shows that health workers favored providing higher volumes of 'easier' services, rather than lower volumes of more complex services, even if the unit reimbursement rate for complex services was higher than of the easier ones. In other words, health workers were not driven by the price, but rather by providing a higher volume of services – even if the same bonus could be earned by providing a lower volume of higher priced services. One health worker explained that it was simply impossible to

spend a long time with one patient, independent of the bonus attached to that effort, as long queues of patients were waiting every morning.

Discussion

When prioritizing PBF incentivized services, health workers consider a complex range of factors when pricing indicators. These factors include the total effort (i.e., time and intensity) to acquire and treat a patient. They also include health worker locus of control — the degree to which a health worker controls relevant factors, such as supply chain (low locus of control) or absenteeism (high locus of control). Taken together, these factors reveal that despite global guidance, PBF designers must go beyond the SMART framework (Fritsche; Soeters; Meessen, 2014), recognize that providers will act on their own preferences, and consider the drivers of provider motivation (Lohmann *et al.*, 2017; Lohmann *et al.*, 2018). Before setting indicators and prices, PBF designers should survey health workers to understand their reservation utility, accounting for the political and social drivers that inform these preferences.

Locus of control

Our study demonstrates that there are factors that fall within health workers' control and factors that lie outside it (Figure 1). PBF practitioners must take this into consideration when defining and pricing indicators. When indicator-relevant factors are beyond health workers' control, health workers cannot improve service performance, regardless of the price. As recounted in one example, if health workers are incentivized to test positive partners but test kit stock-outs are common, health workers are unable to complete this indicator (test partners), regardless of the HIV testing indicator's price. On the other hand, when the delivery of services for an indicator involves modifying factors within health workers' control, then they can be incentivized to improve performance (i.e., increase the number of completed services for more patients).

PBF programs attach an incentive to a specific service to encourage greater production, in turn improving a health-related outcome (Fritsche; Soeters; Meessen, 2014). This assumes that health workers overcome constraints within the existing system, without additional inputs or changes. Incentives, however, are not able to influence all factors in the second and third ring. PBF practitioners must understand which factors health workers can control and which they cannot. For factors that cannot be controlled, PBF programs must either deprioritize those indicators (regardless of the price) or provide technical assistance in conjunction as a part of PBF programming to reduce that constraint. Increasing price, regardless of how high, does not solve many of the fundamental challenges that health workers face in their external environment (Lohmann *et al.*, 2018).

Patient acquisition

Health workers must expend time and effort to acquire patients. The greater the amount of time and the more intense the patient engagement, the smaller the net profit for the health worker. Our study finds that time and engagement intensity depends on patient demand, disease prevalence, and the external environment that patients are embedded within.

PBF incentives alone do not enable a patient to seek or access services, nor do incentives address the potential opportunity cost that health workers face when deciding what services to provide (Mabuchi; Sesan; Bennett, 2018). To address this cost, PBF interventions should include demand side strategies that seek to change care seeking norms and reduce access barriers. Bridging the gap between the community and the facility requires far more intentional interventions than simply incentivizing health workers.

Indicators must account for the context in which they are implemented, including other interventions and ongoing programs (Bhatnagar; George, 2016). If the target population has already received services under existing interventions, or if disease prevalence is low, there may be lower patient service demand and a reduced number of available patients. PBF program designers must consider this to implement PBF in contexts where demand exists in the first place.

Patient Treatment

As in acquiring patients, when health workers decide how to prioritize services (and which PBF incentivized indicators to pursue), they factor in the associated costs. From our findings, engagement time and intensity, in relation to treatment, is a function of treatment complexity (i.e., number of steps and clinical protocol), consultation duration, and patient characteristics.

Simply increasing the price of complex services relative to easier services fails to account for the potential costs and external factors that may increase the difficulty for health workers to deliver care. As the health worker payment literature from high-income countries shows, there is ample evidence demonstrating that health workers vary both the intensity and volume of their workload based on payment. Under fee-for-service systems, where health workers are paid per service delivered, health workers are willing to deliver a greater volume and higher intensity of services as long as their net profit is maximized. In the context of PBF, health workers behave in a similar way. In many PBF programs however, such as the Mozambique program, services are priced based on what program designers or policy makers deem important based on their own values or what they view as beneficial to the target population, without considering health worker preferences. This approach ignores the basic concept of reservation utility and does not consider whether the 'contract' is acceptable to the provider.

Going forward, PBF program designers and implementers must consider health workers' perception of indicators and clinical level realities that impede indicator achievement. The current guidance on indicator selection in the PBF toolkit follows the SMART goal-setting formula. The recommendation follows a central planning model that fails to understand provider preferences and motivation for service delivery. Moreover, price setting is often based on the program's budget availability rather than consideration of the costs and difficulties associated with indicator achievement. In other words, indicator selection and pricing are 'system-centered' rather than 'user-centered'.

PBF programs designers and implementers should involve health workers during the indicator selection and pricing process. This engagement should aim to better understand the production factors driving health worker motivation to deliver on incentivized services. With this information, overall reservation utility can be modeled to determine the most effective price for positive results.

Our study demonstrates that health workers are more likely to deliver services for which they can control production factors. When service-related factors are beyond health workers' control but necessary for adequate delivery of care, PBF programs must include supplementary technical assistance programs to support their improvement.

Limitations

Qualitative research is an interpretive form of knowledge synthesis that aims to develop new conceptual understandings. Content analysis, which formed the basis of our three key considerations, is iterative and utilizes an ongoing form of knowledge production (thesis–antithesis–synthesis). Although our team utilized robust analytical techniques, several limitations during data collection arose. First, respondents were selected in collaboration with facility management, which could have led to a biased sample of well-adjusted or positive health workers. Although a third-party evaluator conducted the evaluation, the implementer and occasionally provincial health office staff (DPS) accompanied our data collectors to the facility to support the introduction and coordination of the interviews. The interview guide was open-ended, but all health workers were probed directly on specific indicators and their performance at their facility. When a health worker did not know about a particular indicator, it was excluded from the rank ordering, although given the integrated nature of the services, 94% of respondents sorted all 10 indicators from easy to difficult.

Conclusion

This study is the first to evaluate the factors that influence the difficulty of PBF incentivized services from a health worker perspective. Applying basic behavioral economic theory, we posit that health workers are rational agents who act to maximize

their total reward, after accounting for associated opportunity costs. Specifically, they consider the time and intensity of effort needed to acquire and treat patients, and the degree of control that they have around service delivery-relevant factors. Our study shows that PBF programs must move beyond pricing PBF service indicators based solely on how "SMART" an indicator is and on public health need. Moving forward, PBF programs must work closely with health workers to understand their preferences and considerations, so that prices can be set at an appropriate level to incentivize health worker behavior.

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SMART é a nova onda estúpida? Perspectivas dos trabalhadores da saúde na produção de indicadores de FBD

Resumo

Os formuladores de programas de financiamento baseados em desempenho (FBD) tradicionalmente selecionam e avaliam os indicadores de prestação de serviços de acordo com o valor de saúde pública e com o indicador SMART (específico, mensurável, alcançável, realista e oportuno). Essa abordagem ignora a perspectiva dos provedores sobre o valor dos insumos e os custos de oportunidade na prestação do serviço. Foram realizadas entrevistas, discussões em grupos focais e outras atividades com trabalhadores da saúde para elucidar os fatores que motivam a oferta de serviços incentivados pelo FBD. Os profissionais de saúde identificaram três considerações fundamentais na priorização do serviço: esforço para adquirir um paciente, esforço para tratar um paciente e grau de controle do trabalhador de saúde. Os profissionais de saúde consideram vários fatores ao priorizar os serviços do FBD para maximizar sua recompensa total. Ao atribuir preços aos serviços do FBD, os formuladores do programa devem entender o valor dos insumos e dos custos de oportunidade, em vez de confiar apenas no valor de saúde

pública e na estrutura do indicador SMART. Ao definir preços para os serviços, os elaboradores de programas do PBF devem colaborar com os profissionais de saúde para levar em conta a variedade de fatores que esses trabalhadores consideram ao tomar decisões sobre a prestação de serviços.

Palavras-chaves: Financiamento baseado em desempenho. Indicadores de preços. Motivação dos profissionais de saúde. Percepção dos profissionais de saúde. Moçambique.

¿SMART es el nuevo estúpido? Perspectivas de los trabajadores de la salud sobre la producción de indicadores PBF

Resumen

Los diseñadores de programas de financiamiento basado en desempeño (*PBF* – sigla en inglés) tradicionalmente han seleccionado y valorado los indicadores de prestación de servicios de acuerdo al valor de la salud pública y si el indicador es SMART (específico, medibles, asignables, realistas y especificados en un periodo de tiempo). Este enfoque ignora la perspectiva de los proveedores sobre el valor de los insumos y los costos de oportunidad en la provisión del servicio. Realizamos entrevistas, discusiones de grupos focales y otros ejercicios com los trabajadores de la salud para elucidar los factores que motivan el ofrecimiento de los servicios incentivados por PBF. Los trabajadores de la salud identificaron tres consideraciones clave en la priorización del servicio: esfuerzo para conseguir un paciente, esfuerzo para tratar a un paciente y grado de control del trabajador de la salud. Los trabajadores de la salud consideran múltiples factores al priorizar los servicios de PBF para maximizar su recompensa total. Al fijar los precios de los servicios de PBF, los diseñadores del programa deben comprender el valor de los insumos y los costos de oportunidad, en lugar de confiar en el valor de la salud pública y en el marco del indicador SMART solamente. Cuando se fijan precios a los servicios, los diseñadores de programas de PBF deben colaborar con los trabajadores de salud para tener en cuenta el rango de factores que estos trabajadores consideran al tomar decisiones sobre la prestación de servicios.

Palabras clave: Financiamiento basado en desempeño. Indicadores de precios. Motivación del trabajador de salud. Percepción del trabajor de salud. Mozambique.

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