

# Output-based payment to boost staff productivity in public health centres: contracting in Kabutare district, Rwanda

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**Objective** In many low-income countries, public health systems do not meet the needs and demands of the population. We aimed to assess the extent to which output-based payment could boost staff productivity at health care facilities.

**Methods** We assessed the performance of 15 health care centres in Kabutare, Rwanda, comparing productivity in 2001, when fixed annual bonuses were paid to staff, with that in 2003, when an output-based payment incentive scheme was implemented.

**Findings** Changes to the structure of contracts were associated with improvements in health centre performance: specifically, output-based performance contracts induced sharp increases in the productivity of health staff.

**Conclusion** Institutional configurations of health care organizations deserve more attention. Those currently in place in the public sector may not be the most suitable to meet current challenges in health care. More experiments are needed to confirm these early results from Rwanda and elsewhere, since risks associated with output-based incentive schemes should not be ignored.

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Une traduction en français de ce résumé figure à la fin de l'article. Al final del artículo se facilita una traducción al español.

الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

## Introduction

Public health systems in low-income countries do not always live up to expectations. Poor performance in terms of coverage of needs, equity, quality of care, responsiveness to users and efficiency has been extensively documented.<sup>1-3</sup> Without major changes, especially in the delivery of primary health care, the health status in most rural populations will not achieve the significant improvements that are needed to meet the Millennium Development Goals.<sup>4</sup> A lack of funds reaching the health sector has been the usual explanation for this poor performance.<sup>5</sup> Without denying that funding bottlenecks need to be tackled, several authors have stressed the need to reconsider how public health systems are operated.<sup>6,7</sup>

While there are undoubtedly factors to be fixed at the system level (e.g. risk-pooling), one should not shy away from the fact that a fair part of the poor performance of these health care systems is due to faults within the health facilities themselves.<sup>8</sup> Before poor performance can be addressed, the extent to which the problems can be remedied by staff at the health facilities should be ascertained. Obviously, some aspects related to the

quality of services are not within their short-term control: for example, their level of education and the equipment available set limits on what a health professional can accomplish. However, staff may have some control over many other aspects that affect service delivery, such as poor management of resources, absenteeism, disrespect for users of health services and a disinterest in quality improvement.

Before trying to tackle a problem, it is appropriate to view it in a broad context. One must be fair towards the health staff. Many problems that are observed at the level of the public health facilities are also reported in other government-run bodies such as schools and the civil administration.<sup>3</sup> Some pro-market proponents may see these problems as an opportunity to discredit any role for the state in service provision. Opponents to this argument may instead place blame on poverty and limited capacity within the country; they will invite us to have patience and, in the meantime, to accept that some problems have their roots beyond the health sector.

In this paper, we discuss a third way for problem resolution, exploring the extent to which the performance of public

health facilities could be enhanced by reform of some key institutions that establish them as organizations. We focus on only one dimension of performance, that of staff productivity and present results of the performance initiative, an output-based payment approach currently being trialed in the Kabutare district of Rwanda.

## Methods

### Institutional configurations in health care

Institutional arrangements, contracts and organizations have been very dynamic fields of research for economists in the past 40 years. Today, economists have a much better understanding of the influence of factors such as asymmetry of information, transaction costs and property rights on institutional shape and performance of organizations.<sup>9-12</sup> Rich in coordination problems, the health sector has been a particularly good setting for both theoretical exploration and policy applications.<sup>13,14</sup> In high- and middle-income countries, this new knowledge has been used extensively to restructure public health systems.<sup>15,16</sup> However, changes occur much more slowly in low-income countries. In these

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settings, there may be a need for a better understanding of theoretical foundations and more sharing of experiences.

As far as institutional arrangements are concerned, there are probably two key factors that determine the performance of a health care organization.<sup>1</sup> First, there is the whole set of contracts that establishes the way an organization accesses the physical resources necessary to produce health services (hereafter called “physical resource contracts”). There has been much written about methods by which an organization accesses its cash income (e.g. fees-for-service, capitation, budget-line items).<sup>17</sup> Yet, cash is only one of many types of resource. For example, receiving standard drug kits free of charge is not equivalent to paying the full price for drugs that one has ordered.<sup>2</sup> The second key determinant of performance is the set of contracts that establishes the way in which those who hold discretionary authority over the allocation of resources mainly the owner, manager and health staff are remunerated by the organization (hereafter called the “governance and employment contracts”).

The combination of both sets of contracts establishes a nexus that makes up the institutional configuration of the health care organization.<sup>10,18</sup> This institutional configuration establishes incentives that will determine the behaviours of those holding discretionary authority and, ultimately, the performance of the organization.

There are as many possible institutional configurations as there are possible combinations of different contracts. Yet, from the perspective of the organization's stakeholders, some configurations are better than others, which explains why some configurations occur more frequently than others. One must note that creativity is not limited to the design of contracts; the distribution of roles is also a variable.

An illustrative case is that of the single private practice, characterized by an individual who occupies the positions of owner, manager and employee. This arrangement has not occurred by chance: economists have shown that such an institutional configuration solves several problems that arise when one party (e.g. an employer) engages another party (e.g. an employee) to act on their behalf and in their interest — the so-called “principal-agent problem”. This configuration contrasts with the situation of public

health centres, which are owned by the state (with the citizens as the ultimate owners), managed by a civil servant affiliated with the ministry of health and operated by other civil servants with fixed salaries.

There is no miracle solution; each configuration has its advantages and disadvantages. Typically, a configuration will be particularly well suited for one dimension of performance (e.g. the efficient use of resources) but less suited for another (e.g. quality of care). The existing literature on provider payment contracts has brought attention to this trade-off. Yet, the existence of trade-offs should not mean acceptance of the status quo. Our intuition, not only as researchers but also as workers who have been directly involved in the operation of public health systems, is that the configurations in place today in many low-income countries have more disadvantages than advantages. We wonder whether more powerful incentives for the health staff could provide the way forward to improved services in health care. We use the case of an experience in Rwanda to illustrate our proposition.

### The performance initiative in Rwanda

#### The intervention

While Kabutare had been one of the most dynamic health districts in the three years following the 1994 genocide and war, its performance (in terms of coverage rates) declined in the period from 1999 to 2001. To reverse this trend, the Rwandan Ministry of Health and its operational partner, the international non governmental organization (NGO) HealthNet International (HNI), decided to reformulate their support strategy for health centres in 2001. In early 2002, they launched a contractual approach called the performance initiative. The general background, initial analysis,

institutional arrangement and results of the experiment have been reported elsewhere.<sup>19</sup>

Before the introduction of the performance initiative, staff at the 15 health centres had benefited from a fixed-bonus system (in addition to salaries). This system, inherited from post-war reconstruction strategies, had been taken over by HNI from the previous NGO that was supporting the district. The rule was that health centres received a budget that was calculated according to the number and qualification of employed individuals. Under the new scheme, individuals kept their base salaries (paid by the government or the health facility with revenue raised through user fees), but an output-based remuneration to the health centre replaced the fixed-bonus system. Payments for services were set for some key services delivered by the health facility (see Box 1). Table 1 summarizes key features of the two sets of contracts before and after implementation of the performance initiative.

### Formalization and the data source

With some simplifications, we can use a mathematical formulae to compare the two institutional configurations. We have limited our analysis to the health centre (we did not analyse the whole health system and institutional changes at that level). Furthermore, our focus is on the two contracts that have changed significantly: (1) the support in cash funds provided by the NGO to the health centre; and (2) staff remuneration. We have simplified these contracts to their core logic (i.e. we do not formalize the complementary rules and restrictions in the actual contracts). To avoid the issue of differences between individual staff members with respect to bonuses, we have used average amounts per worker at each centre.

#### Box 1. Fees paid to health centres under the performance initiative

The performance initiative remunerates the health centres on a payment-for-service model (with a purchaser that is different from the user).

In 2003, the payments for purchased services were as follows:

- RWF 40 per consultation (new case);
- RWF 250 per pregnant woman who received between 2nd and 5th dose of tetanus toxoid (TT);
- RWF 1 000 per new acceptor of family planning;
- RWF 500 per fully immunised child;
- RWF 2 500 per assisted delivery.

Table 1. Comparison of contractual arrangements before and after initiation of the performance initiative

	Initial institutional configuration	Performance initiative configuration
<b>Physical resource contracts</b>		
<b>Drugs</b>	The health centre buys them from authorised suppliers (mainly the health district medical store) with its cash income.	No change.
<b>Vaccines and vertical programme items</b>	They are supplied for free by the national programme.	No change.
<b>Cash</b>	The health centre charges users for (i) drugs (with a mark-up), and (ii) for curative consultations and acts.	(i) and (ii) no change. A third-party payer (a "steering committee") pays a fee-for-services for a limited list of curative and preventive services (see Box 1); the scheme is established by a contract that sets clear obligations upon the health centre; an independent agency checks the reality of reported figures.
<b>Equipment</b>	Accessed mainly through donation, free utilization by the health centre.	No change.
<b>Building</b>	Owned by the government, a congregation or the parish; free utilization.	No change.
<b>Other</b>	Bought on the market by the health centre with its cash income.	No change.
<b>Governance and employment contracts</b>		
<b>Ownership and constrains on the owners</b>	A health centre is a combination of multiple owners. The land and the building are owned by the main owner (the government, a congregation or the parish). Equipment, drugs and financial assets are owned by the "health committee" (a community body). All health centres are run as non-profit organisations. The Rwandan Ministry of Health oversees all of them.	There has been no formal change of this set-up. Yet, a new "management committee" has been established. It empowers the staff and put them in a position to take and enforce decisions to boost health centre performance.
<b>Management</b>	(i) The health centre is headed by a head nurse. (ii) He is expected to implement policies made by the Rwandan Ministry of Health.	(i) The same, but higher involvement of staff (see above). (ii) The health district authorities leave more discretion to the health centre team for initiatives.
<b>Labour</b>	(i) Salaries of some qualified staff are paid by the government. (ii) Salaries of some qualified and all non-qualified staff are paid by the health centre with its cash income. (iii) Fixed bonuses are paid to most of the staff by the NGO.	(i) and (ii) no change. (iii) The NGO <sup>a</sup> does not pay a fixed bonus. The (variable) monthly revenue collected from the performance initiative scheme is shared among the staff. An individual share is fixed by a grid that takes into account qualification, responsibility and presence at work. Bonus cuts can be used as a disciplinary measure.

NGO, non-governmental organization.

In general terms, one could then say that yearly income for the health centre team  $j$  is:  $Y_j = n_j \cdot (w + \beta) + \alpha \cdot (p \cdot Q)$ ; where  $n_j$  is the number of staff members,  $w$  is the average individual wage paid by the government or the health facility,  $\beta$  is the average individual fixed bonus paid by the NGO,  $p$  is the vector  $[1 \times k]$  of prices for the vector  $[k \times 1]$  of services  $Q$ , and  $\alpha$  is the share of the output-based income distributed among the staff.

As there have been no major changes in the policy of the government with respect to wages, we can assume that this element of the equation is constant and not relevant in our comparison. Then we can define  $Y'$  as the income paid to the health centre team by the NGO. The situation before the performance

initiative can then be expressed as:  $Y'_{F,j} = n_j \cdot \beta$  (with  $F$  as "fixed bonus") and the one after the performance initiative as  $Y'_{PI,j} = \alpha \cdot p \cdot Q$  (with  $PI$  as "performance initiative").

This formalization allows us to identify the two behavioural assumptions behind the performance initiative: (1) that health staff would value higher average individual incomes, and (2)  $Q$  is partly determined by the behaviour of health staff.

Our analyses are based on the data used by the NGO to monitor the performance initiative. We will make the simplifying assumption that all the changes observed in the production of the health centres stem from change to the contracts. Although a strong causality

has already been shown, we acknowledge that this assumption is somewhat excessive.<sup>19</sup> For the exchange rates, we have used the average over the period 2001–03 (US\$ 1 = RWF 483).

## Results

During preparations for the new scheme in early 2002, different scenarios were considered and financial simulations were performed accordingly. The main goal was to determine the prices that would be used for buying the health centres' outputs (eventual prices are shown in Box 1).

The rules were as follows: (1) no fixed bonuses ( $\beta$  was set to 0 for each individual  $i$ ); (2) the parameter  $\alpha$  was

Table 2. Comparison of 2001 yearly income with the two incentive schemes

Name <sup>b</sup>	Ownership	Staff (n)	Income from the NGO <sup>a</sup>		Gain for the facility		Average individual bonus <sup>a</sup>	
			$Y'_F$ (2001)	$Y'_{PI}$ (2001)	Absolute <sup>a</sup>	Relative	Average $\beta$	$Y'_{PI} / n_j$ (2001)
Mbazi	Ministry of Health	10	1 990	821	-1 169	-59%	199	82
Matyazo	Sister congregation	17	3 744	1 644	-2 101	-56%	220	97
Gisagara	Sister congregation	16	3 881	1 937	-1 944	-50%	243	121
Rango	Ministry of Health	9	2 554	1 300	-1 254	-49%	284	144
Sovu	Sister congregation	8	2 494	1 260	-1 234	-49%	312	158
Maraba	Ministry of Health	7	1 292	1 130	-162	-13%	185	161
Gishamvo	Ministry of Health	9	1 796	1 584	-213	-12%	200	176
Ruhashya	Ministry of Health	8	1 779	1 413	-366	-21%	222	177
Save	Sister congregation	16	3 993	2 911	-1 082	-27%	250	182
Cyanhinda	Catholic Parish	9	2 102	1 849	-253	-12%	234	205
Simbi	Sister congregation	10	2 554	2 127	-427	-17%	255	213
Karama	Sister congregation	12	2 507	2 580	74	3%	209	215
Kabilizi	Ministry of Health	6	1 245	1 308	63	5%	207	218
Rubona	Ministry of Health	8	2 407	1 839	-569	-24%	301	230
Nyantanga	Protestant church	6	1 245	2 150	905	73%	207	358
<b>Total</b>		<b>151</b>	<b>35 583</b>	<b>25 852</b>	<b>-9 731</b>	<b>-27%</b>	<b>236</b>	<b>171</b>

NGO, non governmental organization.

<sup>a</sup> Figures in US\$.

<sup>b</sup> Listed in ascending order of productivity.

simulated as being equal to 1 (i.e. all of the scheme's revenue was allowed to be distributed to health centre staff); and (3) the vector  $p$  was calculated in such a way that  $\Sigma Y'_{PI} < \Sigma Y'_F$ , if  $Q_{PI,j} = Q_{F,j}$ . This last constraint means that as an aggregate, the 15 health centres had to achieve greater production in order to realize the same income they had received under the previous system in 2001.

This arrangement is illustrated in Table 2. The  $Y'_F$  (2001) column lists the fixed bonus received by health centre teams. The  $Y'_{PI}$  (2001) column is hypothetical: it indicates what the health centre teams would have received under the performance initiative fees with their output level during 2001. The next two columns show the challenge conveyed by the new scheme: without a strong increase in production, income at most of health centres was projected to fall. This was especially true for the health centres without maternity wards: Matyazo, Mbazi and Sovu.

The fixed bonus system is based on the number of staff working in the health centre (with consideration for qualifications). The average annual bonus earned by a staff member in 2001 was US\$ 236 per year (Table 2). Differences in average bonuses between the health centres are explained by differences in their qualification mix (with Sovu as the

most qualified team). The last column in Table 2 shows the average individual bonus to be received under the new performance initiative system, assuming constant production and staff numbers. A decrease in bonuses was projected for most health centres.

There is another way to interpret this last column. If the different fees are taken as relative weights for an output index, the last column is in fact a monetary valuation of the outputs delivered on average by a staff member.<sup>3</sup> We have ranked the 15 health centres according to this productivity indicator. In 2001, differences between the health centres were huge: Nyantanga staff were four times more productive than the team at Mbazi. Two main lessons stemmed from these simulations: the fixed bonus system could be seen as unfair and there was great potential for productivity improvement in many health centres.

Table 3 shows change after the performance initiative in 2003, when the scheme had been fully implemented.

The  $Y'_{PI}$  (2003) column in Table 3 shows the amount that each health centre received from the NGO in 2003. The next column lists the absolute gain for the health centre staff following the change from the fixed bonus to the output-based system. We see that two health centres (Gisagara and Sovu) had a drop in income. Most made a gain,

sometimes quite significant. The cost of the new scheme required a 31% increase from the previous budget, a rise that was acceptable to the NGO. In population terms, the increase per person was very small (around US\$ 0.03).

The goal of measuring output gains is to assess whether the NGO received value for money. Output gain ( $Y'_{PI}$  (2003) -  $Y'_{PI}$  (2001)) gives a monetary value to the increase in outputs (along the fee-based index). Our data show that incentives do make a difference: all health centre teams have increased their outputs, even those that experienced a drop in income. The relative increases in output shown in Table 3 are impressive - 80% on average. Interestingly enough, we notice that those that made the biggest relative increase in their outputs are those that were least productive in 2001.

A comparison of simulated average individual bonuses due with 2001 production (Table 2, last column) with data on the average individual bonus paid in 2003 (Table 3) reveals a sharp increase in individual productivity. Whereas simulations for 2001 data showed that only six health centres would have been above the US\$ 200 threshold under the fixed bonus scheme, all but two health centres exceeded that threshold in 2003 under the performance initiative system. Staff members made efforts to increase health

Table 3. Yearly income under the performance initiative

Name <sup>b</sup>	Staff (n)	Y' <sub>PI</sub> (2003)	Gain for the facility		Output gains		Individual staff member <sup>a</sup>	
			Absolute <sup>a</sup>	Relative	Absolute <sup>a</sup>	Relative	Y' <sub>PI</sub> /n <sub>j</sub> (2003)	Average gain
Mbazi	10	2 231	241	12%	1 410	172%	223	24
Matyazo	19	4 199	455	12%	2 556	155%	221	1
Gisagara	15	3 365	-516	-13%	1 428	74%	224	-18
Rango	10	3 097	543	21%	1 797	138%	310	26
Sovu	11	2 006	-489	-20%	745	59%	182	-129
Maraba	9	2 786	1.494	116%	1 656	147%	310	125
Gishamvo	10	3 432	1.636	91%	1 849	117%	343	144
Ruhashya	9	2 348	569	32%	936	66%	261	39
Save	18	4 185	192	5%	1 274	44%	232	-17
Cyanhinda	11	4 053	1.951	93%	2 204	119%	368	135
Simbi	12	3 754	1.200	47%	1 627	76%	313	57
Karama	20	3 456	949	38%	876	34%	173	-36
Kabilizi	7	2 306	1.061	85%	998	76%	329	122
Rubona	9	2 399	-8	0%	561	30%	267	-34
Nyantanga	8	2 971	1.726	139%	821	38%	371	164
<b>Total</b>	<b>178</b>	<b>46 589</b>	<b>11 006</b>	<b>31%</b>	<b>20 737</b>	<b>80%</b>	<b>262</b>	<b>26</b>

<sup>a</sup> Figures in US\$.

<sup>b</sup> Listed in ascending order of productivity in 2001.

centre production (at least with respect to outputs remunerated by the NGO). For the whole district, average individual productivity increased by 53%. When this productivity is combined with the 18% increase in staffing, we reach the 80% increase in total valued output observed.

The last column in Table 3 shows the difference between the actual average bonuses in 2003 and 2001. We see that the shift from the fixed bonus system to the performance initiative was beneficial for staff in 10 of 15 health centres. The gain per individual was quite limited: on average US\$ 26 per year.

## Discussion

Data from our trial of the performance initiative system in the Kabutare district in Rwanda lend support to observations made elsewhere: the contracting of primary health care outputs is a feasible option in low-income countries.<sup>20,21</sup> The “minimum package of activities”, a standard approach for defining the mission of health centres in low-income countries, seems to be, to a large extent, contractable.

This study on staff productivity indicates that public health staff have much more control over the quantitative production of their health centres than was previously thought. If incentives are revised, staff productivity can be much higher. In many poor countries, the

scarcity of health workers places tight constraints on primary health care.<sup>22</sup> High staff productivity will be a necessary step if significant progress is to be made in the reduction of unmet health care needs.

Yet, the concern for increasing coverage rates of primary health care activities should not be a reason for neglecting other dimensions of the overall performance of the health care system. What are the possible risks associated with an output-based payment strategy, such as the performance initiative?

In Rwanda, five major risks have been identified at the health centre level. By remunerating a given list of key services, the performance initiative establishes incentives for staff to: report an inflated rate of delivery of these services; induce unnecessary demand by the users for the remunerated services; provide remunerated services, despite a lack of the required competence or inputs; neglect activities that are not remunerated; and increase quantity to the detriment of quality. Table 4 (available at: <http://www.who.int/bulletin>) describes these risks, the underlying causes, the dimensions of performance in jeopardy, the strategies to keep the risks under control and some key observations from Rwanda.

At the stage of designing the scheme, and later in its follow-up, it is crucial to keep a health system view in mind. Un-

desirable effects can indeed take place outside the health centre. Articulation with the hospital is particularly crucial. In the Kabutare district, for example, payment for delivering babies had desirable public health effects, mainly because there was an ambulance available and referral hospitals with enough reserve capacity to accommodate the increase in the number of transferred mothers in labour. Conversely, the fact that the performance initiative scheme did not extend to workers at the referral hospital was perceived as unfair by staff there.

This leads us to the last category of effects that an output-based payment may have: the undermining of other institutions. To coordinate themselves, actors within the health sector rely on a larger set of institutional mechanisms than merely contracts. Indeed, one cannot specify everything into contracts and, at a certain stage, some trust is necessary.<sup>23</sup> Internalized norms such as medical ethics and an ethos of public service are crucial, especially for the services that are characterized by attributes that are difficult to specify in a contract (e.g. nutritional rehabilitation). Some observers have raised the concern that buying outputs may induce a shift in staff values or expectations (e.g. create the perverse perception that any behaviour deserves a specific payment). To avoid this problem, the bonus contracts in Kabutare clearly refer to medical

ethics and describe possible sanctions that would be imposed in case of fault. Another key rule is to resist temptation to use performance-based payment for any frustration encountered. For some problems (e.g. commitment to quality care), intrinsic motivation is probably more relevant than the crude extrinsic motivation of performance payments. One should still allow some space for processes of behavioural change that require time and investment.

Eventually, it should be ensured that during implementation, output-based payment does not negatively affect or “pollute” other approaches. Some coordination must be found. A recent debate that took place in Rwanda illustrates this problem. While one agency advocated that district supervisors should be in charge of assessing the quality of activities to be remunerated and verifying that they had actually been performed, we recommended a clear split between the functions of supervision and monitoring. Our point was based on the view that the monitoring and inspection function is inspired by distrust, while empathic supervision and coaching can not be realized without high levels of mutual trust. While both functions are necessary, there is an obvious clash of motives.

Output-based payment and performance-based payment are not magic bullets. They can only tackle some of the problems encountered by health systems in low-income countries. Moreover, they convey risks of different natures. We would contend that some risks (e.g. patient safety) deserve more attention than others. At the design stage, a general recommendation to policy-makers is to secure some critical reviews by individuals such as clinical doctors and experts in quality assurance. At the launch of the scheme and later in its operation, it is crucial to remind people and to demonstrate that this is just one strategy among many.

## Conclusions

Poor performance of the public health system in many low-income countries is probably due, to a large extent, to inadequate institutional arrangements. The Rwandan experience shows that contracting primary health care outputs is a feasible option in low-income settings. Although the strategy is associated with some risks, its potential benefits are

appreciable in settings where health care needs are not being met and there is a scarcity of health care workers. In view of our results, we make a plea for greater boldness in the trialing and development of similar approaches. However, boldness does not mean haste or adventurism. There is a whole body of knowledge to build in the field of institutional analysis of public health systems in low-income countries. Our personal analysis is that previous “theories” and “models” that still dominate health policy today have largely ignored institutions, incentives and contracts that establish access to resources.<sup>7</sup> As Le Grand has discussed in a recent review of public sector policies in the United Kingdom, it is possible that previous organizational models were based on certain behavioural assumptions — e.g. a widespread commitment among civil servants to subordinate their own interests to the benefit of the population — that might not be as valid now as they once were.<sup>24</sup> We suspect that this analysis could be transposed to many low-income countries: since independence, there have been marked changes to the prevailing ethos in the general population and among civil servants. Policies must take this new “human environment” into account.

We also need to know more about the design and implementation of such reforms. In fact, there is a whole body of best practices to set up, both in terms of science and policy.<sup>25</sup> Scientific challenges range from the development of new ethical requirements in the case of an experiment, methodological issues related to the design and validation of causal links, to the need for clear documentation of contexts and the embedding institutional environment. Securing critical reviews will also be extremely helpful.<sup>26</sup> We have identified a few policy challenges with respect to design and implementation. A key issue will be how to involve stakeholders — especially health staff — and secure their support for the reforms. New arrangements that link higher income to higher performance may be one way forward. To address this issue and many others that remain unresolved, we believe that more experience needs to be accumulated.

## End notes

1. The reductionist view of an organization that we use here is necessary for our analysis. Institutions, defined by North

as “the humanly devised constraints that structure human interactions”, are much broader.<sup>27</sup> Later in the paper, we discuss the importance of internalized norms such as codes of conduct and medical ethics.

2. It is important to note that for institutional economists, resources are not seen from a physical perspective, but rather in terms of the property rights attached to them. To use the example of drugs, a health centre that is allowed to send back unnecessary drugs to the wholesale dealer and receive repayment as compensation has more property rights than does a health centre that is not allowed to do so and, moreover, must meet the costs of destroying the expired tablets.

3. Use of the prices paid by the NGO to value the health centre production raises several normative issues that are common to any composite index. De facto, it means that non-remunerated activities have a nil value; this is a questionable approach, but not specific to this study (many social science studies do not report on side-effects, externalities and impacts that were difficult to measure or to attribute). Providing qualitative information to the reader is then crucial (see Table 4 (available at: <http://www.who.int/bulletin>)). An alternative approach would be to develop a more comprehensive index not constrained by the non-desirability or unfeasibility of contracting the valuable health activities (the main reasons why some outputs were not remunerated by the performance initiative). A Delphi technique with national public health experts would then be a possible option. However, we believe that our pragmatic approach to the relative weights is acceptable for at least three reasons: (1) it gives information about the NGO’s willingness to pay; (2) the process that established the prices was a very participatory one that was ultimately under the responsibility of the Provincial Health Department; and (3) the prices reflected what were perceived by public health experts as priority problems to be addressed by a pilot output-based approach. ■

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## Résumé

### Rémunération en fonction des résultats en vue d'accroître la productivité du personnel des centres de santé publics : contractualisation dans le district de Kabutare au Rwanda

**Objectif** Dans nombre de pays à faible revenu, les systèmes de santé publique ne répondent pas aux besoins et aux demandes de la population. Nous avons tenté d'évaluer dans quelle mesure une rémunération en fonction des résultats pourrait augmenter la productivité du personnel au niveau des établissements de santé.

**Méthodes** Nous avons évalué les performances de 15 centres de soins de santé du district de Kabutare au Rwanda, en comparant leur productivité en 2001, époque à laquelle des primes annuelles fixes étaient payées au personnel, avec celle atteinte en 2003, après la mise en place d'un schéma incitatif de rémunération en fonction des résultats.

**Résultats** Les modifications apportées à la structure des contrats

ont conduit à une amélioration des performances des centres de santé : plus précisément, la mise en place de contrats tenant compte des résultats dans la rémunération du personnel de santé a entraîné de fortes hausses de la productivité de ce personnel.

**Conclusion** Les schémas institutionnels régissant les organisations de soins de santé méritent une plus grande attention. Ceux aujourd'hui en place dans le secteur public peuvent ne pas être les plus appropriés pour surmonter les difficultés rencontrées dans ce domaine d'activité. Il faut pousser plus loin les expériences de rémunération en fonction des performances pour confirmer les premiers résultats obtenus au Rwanda et ailleurs, car les risques associés à ce type de rémunération ne doivent pas être négligés.

## Resumen

### Remuneración basada en los resultados para estimular la productividad del personal en centros de salud pública: contratación en el distrito de Kabutare, Rwanda

**Objetivo** En muchos países de bajos ingresos los sistemas de salud pública no responden a las necesidades y demandas de la población. Decidimos determinar en qué medida puede la remuneración basada en los resultados estimular la productividad del personal que trabaja en los centros de atención.

**Métodos** Evaluamos el desempeño de 15 centros de atención de salud de Kabutare, Rwanda, comparando la productividad en 2001, cuando se pagaba una bonificación anual fija al personal, y en 2003, año en que se implantó un plan de incentivos mediante sistemas de remuneración basados en los resultados.

**Resultados** Los cambios introducidos en la estructura de los contratos se asociaron a mejoras del desempeño de los centros

de salud: concretamente, los contratos basados en los resultados aumentaron de forma pronunciada la productividad del personal sanitario.

**Conclusión** Hay que prestar más atención a la configuración institucional de las organizaciones de atención sanitaria. Las que ya forman parte del sector público pueden no ser las más apropiadas para afrontar los retos que hoy plantea la atención sanitaria. Es necesario realizar nuevos estudios para confirmar estos resultados preliminares de Rwanda y otros lugares, pues no se deben pasar por alto los riesgos asociados a los sistemas de incentivos basados en los resultados.

## ملخص

### دفع الأجور المرتكز على الحاصلات لدعم إنتاجية العاملين في مراكز الصحة العمومية: التعاقد في مقاطعة كابوتار، رواندا

المراكز الصحية، فقد أدت عقود الأداء المرتكز على الحاصلات بشكل خاص إلى زيادة حادة في إنتاجية العاملين الصحيين.

**الاستنتاج:** تستحق الهيكلية المؤسسية لمنظمات الرعاية الصحية المزيد من الاهتمام، فالهيكليات الموجودة حالياً في القطاع العام قد لا تكون هي الأكثر ملاءمة لمواجهة التحديات الراهنة التي تواجهها الرعاية الصحية، وتتمس الحاجة لتوكيد هذه النتائج الباكرة من رواندا ومن مناطق أخرى غيرها، نظراً لوجوب عدم تجاهل الأخطاء التي تترافق مع خطط الحوافز المرتكزة على الحاصلات.

**الهدف:** لا تلبية النظم الصحية للقطاع العام في الكثير من البلدان المنخفضة الدخل احتياجات ومتطلبات السكان. وهدفنا تقييم مدى ما يمكن لدفع الأجور المرتكز على الحاصلات أن يقدمه من دعم لإنتاجية العاملين في مرافق الرعاية الصحية.

**الطرق:** قِيمنا أداء 15 مركزاً للرعاية الصحية في كابوتارا، في رواندا، بمقارنة الإنتاجية في عام 2001 عندما كان يدفع للعاملين الدائمين مكافآت ثابتة، مع الإنتاجية في عام 2003 عندما نُفِدت خطة الحوافز بدفع الأجور المرتكز على الحاصلات.

**الموجودات:** لقد تترافق التحول إلى هيكلية التعاقدات مع تحسُّن في أداء

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Table 4. Main possible effects of output-based payment on other dimensions of health centre performance

Incentive	Reasons why the risk exists	Dimensions of performance put at risk	Strategies to limit the risk	Observations from experience in Rwanda
<b>To inflate records for the remunerated activities</b>	Asymmetry of information between the health centre and the purchaser on the reality of the outputs.	<i>Efficiency:</i> if there are ghost patients, paying for them is a waste of resources. <i>Equity among health centre staff:</i> if a health centre gets income from activities it has not produced, it is unfair to other health centres.	(1) Consolidate honesty and probity within the health centre staff (e.g. by establishing transparency, co-management and internal regulation that will empower honest people versus colleagues tempted to cheat).  (2) Dissuade cheating by establishing credible sanctions. This relies on: (i) independent verification of registers and patients' files; (ii) random visits to households; (iii) clear rules on what can be sanctioned; (iv) a high penalty; (v) and enforcement of sanctions.	No fraud has been reported. However, there was a need for patient records to be better recorded in the relevant registers. Rwanda is a tightly administrated country in which sanctions are enforced. This surely is a favourable contextual factor.
<b>To induce unnecessary demand for the remunerated activities</b>	Asymmetry of information on the actual needs and demands of individual users.	<i>Efficiency:</i> if deviation from appropriate care induces an unnecessary cost. <i>Patient safety:</i> if deviation from appropriate care creates new risks to the patient. <i>Patient centeredness:</i> if the provider presses the user to use a service that does not meet her preferences. <i>Financial accessibility:</i> if the induced demand increases costs for patients.	<i>Efficiency:</i> avoid remunerating activities prescribed by the health centre itself (e.g. laboratory exam). <i>Safety:</i> adopt a cautious approach. Do not remunerate acts for which advantages appear lower than possible disadvantages. <i>Patient centeredness:</i> accumulate more knowledge on patient preferences (e.g. surveys). For family planning, some independent follow-up through home visits could be an option. <i>Accessibility:</i> reduce financial burdens on the households. If referrals are remunerated, then the ambulance should be free, or largely subsidized.	Under the performance initiative, it was decided there would not be remuneration for hospitalization at the health centre level for patient safety reasons (despite the fact that the health centre is the favoured choice of households for treating severe malaria).  In fact, it is difficult to identify induced unnecessary demand. The lack of gold standards for many services is particularly limiting (e.g. what is "over-referral"?). Moreover, a deviance from the norm or the mean may have its origin elsewhere (e.g. limited clinical capacity). Training and support are then the relevant responses. Interestingly, the Rwandan experience revealed that induced demand could be beneficial. Since the performance initiative, continuity and integration of services is much better. Health centre staff use antenatal consultation to convince mothers to deliver at the health centre; at the delivery, they remind them of the importance of childhood immunization; and during immunization sessions, they explain to the mothers that contraceptives are the best way to achieve birth spacing.
<b>To deliver the remunerated activities in spite of insufficient capacity</b>	Asymmetry of information on the technical capacity of the health centre.	<i>Patient safety:</i> if the health centre delivers services that are dangerous to the patient's health because of a poor production process. <i>Effectiveness:</i> if the health centre delivers services that are ineffective because of a poor production process.	(1) Ensure that health centres have the technical capacity to deliver activities that are remunerated. If necessary, require some accreditation process before entry into the scheme.  (2) Monitor that capacity is sustained.  (3) Develop complementary strategies to consolidate technical capacity.	Activities purchased by the performance initiative were all in the normal package of activities to be delivered by health centres. Yet, analysis of the routine health information system data has shown that health centres without maternity or with very low numbers of deliveries experienced a higher perinatal mortality during the first few months after they entered the scheme. <sup>a</sup> This could be an indication that technical capacity was not sufficiently present at the outset. In response, the project developed a list of key prerequisites before remunerating deliveries at the health centre level.

<sup>a</sup> Meessen B, Musango L, Kashala J-P. *The Performance Initiative* [In French]. Kigali: HealthNet International; 2004.

(Table 4, cont.)

Incentive	Reasons why the risk exists	Dimensions of performance put at risk	Strategies to limit the risk	Observations from experience in Rwanda
<b>To neglect activities that are not remunerated</b>	Asymmetry of information on the exact present and future needs of the covered population.  In the production process, some activities are in competition with others for the scarce inputs (e.g. time or effort by the staff).	<i>Coverage of needs:</i> if health centres neglect some population's needs, as the services addressing them are not remunerated (e.g. because of the difficulty to measure or plan for them).	(1) Remunerate as many activities as possible.  (2) Specify in the contract that non-remunerated activities should be continued.  (3) Monitor the general production of the health centre through a supervisory body that is not directly accountable to the purchaser.  (4) Strengthen a knowledge-based central body in charge of public health orientations.	Sources of incentive are numerous. For example, while hospitalization is not remunerated by the performance initiative, hospitalized patients are charged by the health centres, which could explain why admissions have increased over the period from 2001–2003. Another possible explanation for the increase is that since outpatient consultation is the entry point for many admissions, the increase in the former (partly thanks to the performance initiative) has induced an increase in the latter. In a multitasking set-up, the complementary or substitutive nature of the activities is a key determinant of organizational behaviours. <sup>b</sup>
<b>To neglect quality attributes (on the basis that only quantity matters) of the activities that are delivered</b>	Asymmetry of information on the exact attributes/ characteristics of the delivered services.  The production of attributes such as quality consumes some resources; alternatively these resources could be used to increase the output quantity.	<i>Technical quality of care (including patient safety, effectiveness, patient centeredness):</i> if the staff adopt lower standards in production processes to maximize the quantity of outputs (e.g. spend less time with individual patients).	(1) Specify in the contract that payment will be interrupted if it is observed that quality of care is not ensured.  (2) Maintain clinical and paramedical supervision, coaching and training.  (3) Establish new quality assurance mechanisms.  (4) Consider including quality attributes in the contract (see the next column for a listing of the difficulties in doing so).	There has been considerable debate in Rwanda about whether the contracting of quality indicators was a relevant strategy to tackle poor quality of health care. Our reluctant stance on the issue is based on the following arguments: (i) many key attributes of health care are not contractable; (ii) for many attributes, direct observation is the only reliable method of control – however, this approach is very costly and if poor compliance to quality process is really a perverse result of the output-based payment, it will reappear once the controller has left the health centre; (iii) to a large extent, the poor quality of care in Rwanda has its roots elsewhere (e.g. inadequately trained staff) and these problems are probably better tackled through other strategies; (iv) to some extent, the objectives are aligned and many of the problems surrounding quality will be addressed by staff in their effort to increase production (e.g. drug stock management, data administration).

<sup>a</sup> Meessen B, Musango L, Kashala J-P. *The Performance Initiative* [In French]. Kigali: HealthNet International; 2004.<sup>b</sup> Holmstrom B, Milgrom P. Multitask principal-agent analyses: incentive contracts, asset ownership, and job design. *J Law Econ Organization* 1991;7:24-52.