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Performance Incentives in Provider Purchasing and Contracting Arrangements: Rationale and Experiences

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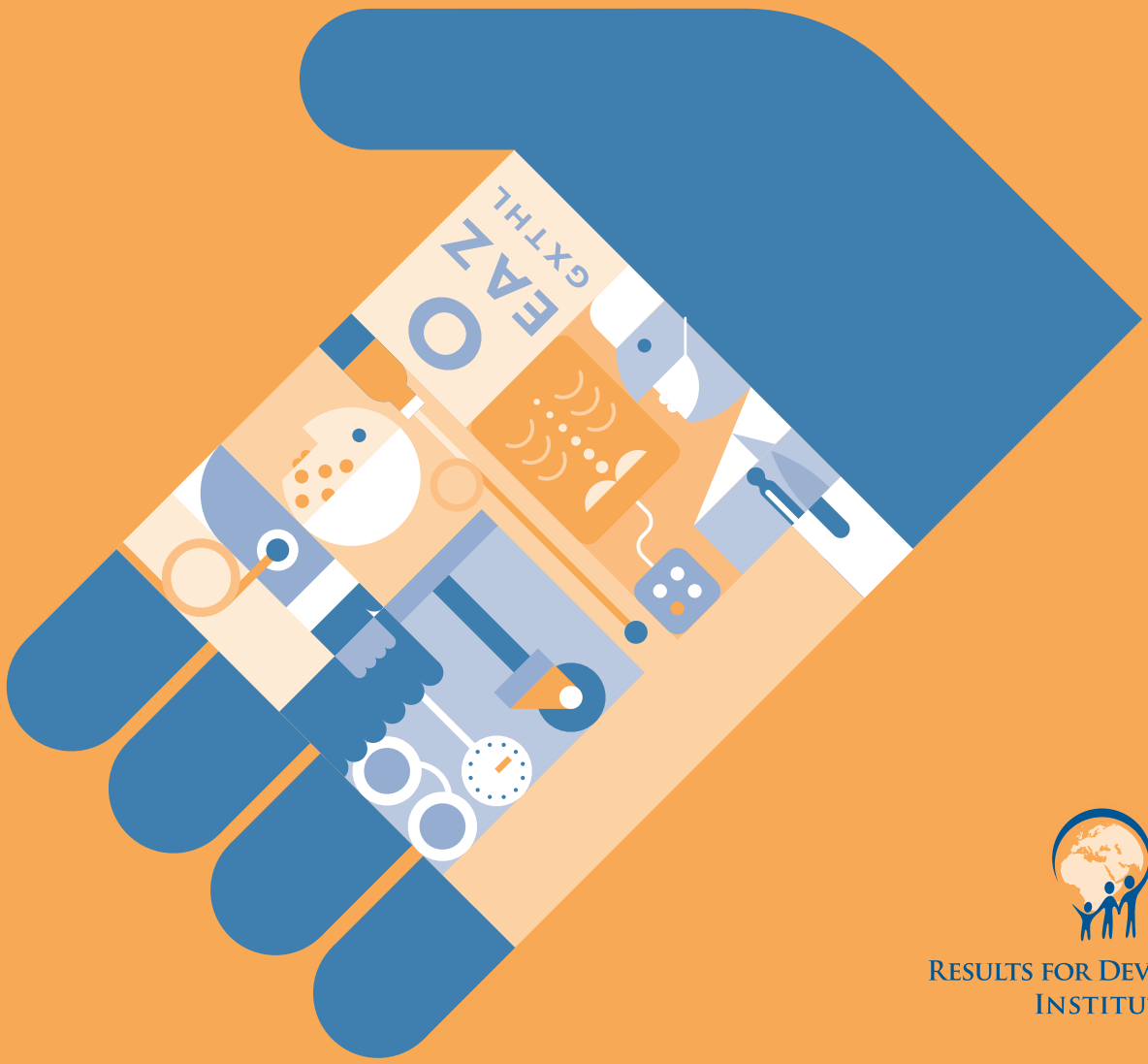

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Contents

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Introduction

As the policy communities in wealthy and poor countries alike search for ways to improve health outcomes, increasing attention is being given to establishing contracts between those who finance and those who provide or consume health services. Contracts are seen as a means of creating a legally binding set of mutual expectations, defining *ex ante* what package of services will be delivered and what the corresponding advance payment or reimbursement will be. They are flexible instruments that can permit public sector funders—for example, ministries of health—as well as social, community-based, or private insurers and nongovernmental organizations (NGOs) to support the provision of services through the private sector, guaranteeing a defined "benefit package" to specific groups.

All contractual arrangements articulate some type of "performance"—that is, what is expected in exchange for the funding. However, in many instances the definition of performance is quite general and the consequences of either succeeding or failing in performance are similarly broad. For example, it is possible to establish fee-for-service contracts in which the funder agrees to pay for a very wide range of services, up to the level at which they are consumed by the population. Only under extreme circumstances is the provider deemed "underperforming" and thus subject to revocation of the contract or some type of financial penalty. Other contractual arrangements—the ones that are addressed in this paper—incorporate explicit performance incentives to achieve health-related aims, and commit the funder to providing rewards or enforcing penalties if particular targets are not achieved. These may focus on contracting with providers and/or with patients or household decision makers.

In performance-based contracting arrangements, key elements include mutually agreed indicators of performance, articulating the numerator, denominator, time period and so forth; the target levels of those indicators that trigger penalties or rewards; mutually agreed means of measurement and verification; and the specified rewards and penalties associated with particular levels of performance. Typically, these are all spelled out in a contractual arrangement. In the case of supply-side arrangements, where a funder is contracting with a service provider or network of service providers, the contract is often a legally binding commitment. In the case of demand-side arrangements, the arrangement is typically not set out in a legal, countersigned document, but instead is constituted as a government program that has particular eligibility criteria. Legally, it falls more within a regulatory framework than a contractual one, although the performance-oriented spirit of the agreement is similar, and so we cover both types of arrangements in this paper.

Starting with a short vignette, this paper first describes the types of problems in low- and middle-income environments that can be (partially) solved with contracting arrangements that incorporate performance incentives. In the second half of the paper, we articulate the reasons that performance incentives hold promise, from a conceptual perspective, and review illustrative experiences with the real-world application of performance incentives.

The paper is based largely on the work of the Center for Global Development's Working Group on Performance-Based Incentives.

Money into Health

Imagine a health clinic, public or NGO, in a rural district in a poor country. The staff working there—perhaps one doctor, two nurses, and some community health workers—make an effort to respond when patients come in with various health complaints. But medicines and bandages are in short supply, the building is in disrepair, salaries are barely above subsistence levels, and staffing is inadequate to meet patient needs. Those who fund the clinic's activities—perhaps the government, perhaps an NGO with headquarters in a distant city—ask few questions about how many patients are being served and whether health conditions are improving, although they require invoices accounting for all funds spent. Staff members struggle to feel motivated in the face of their daily challenges. They know that many of the poorest members of the community find it difficult to obtain the antenatal care and other basic services or treatments they need, but the health team rarely has the wherewithal to organize community health outreach efforts, or to follow up on patients who might be failing treatment for TB or AIDS. Officials in the Ministry of Health wonder what they can do to lower the infant and maternal mortality rates, which are higher than those found in other parts of the country. Frustrated by the conditions at the public clinics, pregnant women flock to the area's private practitioners, despite the additional costs, or simply deliver their babies at home with the help of traditional birth attendants.

Now imagine that something changes: A young official at the Ministry of Health comes up with a revolutionary new idea for a public-private partnership. He has the authority to establish contracts with a range of providers in the area. To increase the number of deliveries in clinics or hospitals, he develops contractual arrangements with a set of public and private institutions that guarantee a set payment for deliveries. The names of accredited public and private delivery facilities are widely distributed and mothers can choose the one they wish to go to. He also figures out how to use the contracting idea to affect the behavior of mothers. Mothers in the community's poorest households are provided with modest payments if they can show that their children's vaccinations are up to date and that the children are being weighed and measured regularly at the local clinic. Terms of subventions between the government and the faith-based organizations that have been providing health services for almost a century are modified so that the funding is no longer transferred as general institutional support; instead, funding is linked to the provision of specific priority services.

What will happen—and why?

Those questions are worth answering, and they are worth answering soon. Policymakers in low- and middle-income countries are searching for ways to improve health outcomes,

as both domestic and external support for the sector expands. Both the pressure and the opportunity to use funding in new ways are most intense in the low-income countries that receive significant amounts of donor funding. In recent years, many billions of dollars have been pledged to prevent childhood death and disease through immunization; and to treat and care for people affected by AIDS, malaria, and TB. Increasingly, donor agencies and philanthropists, as well as leaders in developing country governments, are recognizing that significant sums also are merited to reinforce maternal and child health interventions—and some global health leaders are urging new responses to the rapidly emerging threats of diabetes, tobacco-related ailments, and other chronic diseases in low- and middle-income countries. As new resources are made available, profound questions arise about how best to use them to achieve both specific health goals—for example, the reduction in the disease burden from malaria—and broader strengthening of health system capacity.

The introduction of performance-based incentives is one way to use money and other material goods to affect the actions of those who are delivering and receiving health services. Performance-based incentives are defined as the transfer of money or material goods conditional on taking a measurable action or achieving a predetermined performance target. In the conceptualization we use, performance-based incentives may include those that operate at the level of the health facility (or network of facilities), the individual provider, the household decision makers, and the patients—in other words, on the demand side and the supply side, at both individual and aggregate levels.[1]

Problems to Solve

In the vast majority of low-income countries, health system performance is way off the mark. From a public health perspective, the nature of the problems can be framed as poor health outcomes: high and stagnant levels of infant and child mortality; poor reproductive health conditions; uncontrolled spread of the HIV pandemic, accompanied by tuberculosis co-infection; persistently high (and, in some settings, rising) illness and deaths from malaria; and high levels of undernutrition among young children and reproductive-age women. The Millennium Development Goals reflect and reinforce this view of what "the problems" are, given their focus on specific, measurable changes in health outcomes. Correspondingly, the majority of donor moneys now available in global health are aimed at achieving specific types of health improvements—for example, reducing the number of deaths caused by vaccine-preventable diseases, tuberculosis, malaria, and AIDS. The means to those ends are specific and, in concept, measurable: the proportion of babies and children that are immunized; the detection and effective treatment of TB among susceptible populations; the number of children and pregnant

[1] In our framework, they do not include some other approaches that link financial resources to performance, including, for example, the conditioned payments that donor agencies offer to national governments, such as additional grant monies if and when particular policy decisions are taken.

women who use pesticide-treated bednets to protect against malaria-transmitting mosquitoes; the number of people with HIV who are receiving and adhering to antiretroviral medicines; and the number of pregnant women who receive good antenatal care and who deliver their babies under healthful conditions.

A related, but distinct, way to think about "the problems" is through broad health system performance measures, including utilization and equity, quality, and efficiency.

Problem 1: Underutilization. Preventive, diagnostic, and even curative services are underutilized, particularly by the poor. Take childhood immunization, for example, which is universally regarded as one of the most cost-effective interventions to prevent life-threatening illnesses such as measles and neonatal tetanus. Currently, 27 million infants do not receive all three doses of the diphtheria, tetanus, and pertussis vaccine, an indicator of whether they are fully immunized with the basic childhood antigens. Moreover, within virtually all countries, use of immunization by children in wealthier households is much greater than by those in poorer households. A review of data from 44 Demographic and Health Surveys revealed that the rich:poor ratio for full immunization is 40:57 in the region of the Americas (9 countries), 34:67 in sub-Saharan Africa (22 countries), and 30:64 in South Asia (4 countries) (Gwatkin et al. 2005). The picture is similar for other interventions that are required to prevent or treat common health problems in developing countries, including treatment for dehydration from diarrhea and problems associated with pregnancy and delivery. In the aggregate, these patterns add up to a picture of public resources disproportionately reaching the better-off, rather than the poorest: in a study of health in 21 poor countries, 15 percent of government health expenditures, on average, benefited the lowest income quintile, compared with the more than 25 percent going to the highest income quintile (Filmer 2003, cited in Gwatkin et al. 2005).

A somewhat different type of underutilization also has been seen in AIDS prevention and treatment programs. Voluntary testing and counseling services face the challenge of overcoming social stigma among those they are trying to reach. In Botswana, for example, suboptimal use of testing and counseling occurs despite the availability of free anti-retroviral therapy and widespread public communications campaigns attempting to motivate individuals to learn their HIV status.

In another form of underutilization, individuals under care do not continue a course of treatment for an infectious or chronic disease. The consequences of discontinuous treatment are profound for individuals and for society through the emergence of drug resistance. Tuberculosis treatment has drawn particular attention, because of the potential for the disease to spread more widely and the development of multi-drug resistant forms of the infectious organism when patients do not complete a six-month course of treatment with antibiotics. It is estimated that about 3 to 4 percent of new TB cases are multi-drug resistant (about 275,000 cases annually), a reflection of systemic failure and discontinuity in treatment. Extreme drug-resistant TB, for which virtually no available drugs provide effective treatment, has also emerged in the developing world. A similar issue surrounds adherence to first-line anti-retroviral medications and to the newer anti-malarials.

Inconsistent treatment with first-line anti-retroviral treatment shortens the time before second-line treatment is required to extend life. For the treatment of malaria, where the adaptive ability of the parasite is legendary, there is a need to protect the efficacy of newer artemisinin-combination therapies as they are put into widespread use. Adherence to treatment regimes presents a challenge in the management of non-communicable disease as well; in diabetes management, for example, success depends on patients changing both dietary behavior and taking insulin several times a day, indefinitely.

Problem 2. Poor quality. Quality, defined as "optimizing material inputs and practitioner skills to produce health" (Peabody et al. 2006) is challenging to measure but widely regarded as seriously lacking in most developing country health systems. Even if the observable dimensions of quality, such as waiting times and provider courtesy, are adequate (which they often are not), the technical dimensions that patients cannot observe are not adequate.

One way to get a sense of the magnitude of quality problems is to look at variation from technical norms of clinical practice. A seven-country study, which depended on direct observation of clinical practice, found that 75 percent of cases of common ailments, such as respiratory infection, were not adequately diagnosed, treated, or monitored. Inappropriate treatment, such as antibiotics for diarrheal disease, was offered in 61 percent of cases (Nolan et al. 2001, cited in Peabody et al. 2006). In a more recent study for the Disease Control Priorities Project, an international team used clinical vignettes to measure quality in China, El Salvador, India, Mexico, and the Philippines. The study found vast differences in quality among practitioners within all of the countries.

Low quality is directly related to the problem of underutilization. When patients who make the effort to seek care find that their condition does not improve with treatment, they may be less likely to seek care in the future, or may turn to alternative—if not more effective—services, such as traditional providers or home care.

Problem 3. Inefficiency in production of health services. Life (and health policy) would be far simpler if additional money and other material resources predictably led to better health at the population level, but this is far from the case. A woefully weak relationship exists between health spending and health status, at the national level. Beyond underlying differences in environmental risks (e.g., malaria endemicity) and population characteristics (e.g., age structure), the lack of correlation has been attributed to differences in systemic influences, such as the way resources are allocated toward (or away from) cost-effective interventions, health worker productivity, functioning of the supply chain for drugs and vaccines, and other factors.

Given the labor-intensive nature of health care, a fundamental determinant of the efficiency of the system is the productivity and motivation of health workers, which is a function of their pre-service preparation and the daily decisions they make on the job, as well as the environment in which they work. Although limited systematic information exists about health worker productivity, several small-scale studies provide a troubling picture. Absenteeism averages around 50 percent, from a low of 19 percent in Papua New

Guinea to a whopping 75 percent in Bangladesh (citation from Lewis governance paper). Workers fail to show up on time or leave early, particularly if they are engaged in other income-earning activities; sometimes they do not show up at all. As summarized by Lewis (2006):

> In Mozambique, focus groups of health workers said they missed work or cut short their hours to devote time to other economic activities. In Kogi State, Nigeria, 42 percent of the staff had not been paid their salaries for more than 6 months in the past year, converting staff into virtual volunteers and eroding the credibility of the health system. Another study in Nigeria showed that the greater the lag in paying salaries the more likely health workers were to engage in pharmaceutical sales and seek other employment in the private sector.

Absenteeism is often seen in health systems that are characterized by explicit forms of corruption at the point of service delivery, such as siphoning off medicines for private gain and demanding payments on the side in exchange for services.

A clear relationship exists among low productivity and other system problems. When health workers are poorly motivated and are absent or performing below their capacity, the results are manifested in part in low quality of services and potentially corrupt practices, such as side payments—all of which reinforce the problem of underutilization. A vicious cycle, indeed, and one in which poor health outcomes are an almost inevitable result.

How Performance-Based Incentives Can Contribute to Solutions

Whether the problem is defined in terms of poor health performance or poor system performance, any solution depends on behavior change among a very large number of widely distributed actors. For the sake of simplicity, let's say that four key actors take decisions that are relevant to health outcomes. These are the government or other sources of funding, which might include private insurers; the service manager, who might be the responsible government official at a local level or the manager of a clinic or network of health facilities; the health care provider (again, public or private) who deals directly with patients; and the patient or those who make decisions on his or her behalf.

Relationships among those actors are complex, characterized simultaneously by two factors: First, different actors have different types of information that is relevant to health care decision making. Patients may know whether or not they are taking their medicine, while the provider and the funder may not. Providers may know whether they are doing everything possible to achieve a positive health outcome, while the manager, the funder, and the patient may not. Health services are provided and received by a set of widely dispersed individuals, often operating without direct supervision. No imaginable level of

monitoring could overcome the asymmetries in information that characterize the health sector.

Second, different actors have different objectives and preferences. Funders may wish to obtain the best possible health result for a fixed budget; managers may wish to achieve and maintain a good institutional reputation, as a means to expanding market share; while providers may seek to earn as much money as possible (within some professional constraints), whether through direct service charges or side payments to salaried personnel. Providers, managers, and funders may all want the highest success rate of treatment across the population of patients, while some patients may value the near-term experience associated with unhealthful habits, like tobacco use, more than the long-term benefits of healthful behaviors like exercise and good nutrition.

This is the "principal-agent" problem in health, where a principal wants an agent to provide or use a particular kind of service in a particular way to achieve the principal's objectives—for example, improved health status or lower cost per case treated. The lack of ability to monitor, against the background of competing preferences and objectives of agents, creates a problem for the principal, and one that is not easily solved. The original formulation of the principal-agent problem in health service delivery, which grew out of the groundbreaking work of Nobel laureate Kenneth Arrow (1963) on the role of information in economic behavior, focused on the ways in which the physician is the agent of the patient (as principal). The patient has relatively little information about the efficacy of treatments or the skill of the provider, and yet must count on the physician to act in the patient's best interests at all times. In reality, health care is characterized by multiple "principals" and multiple "agents": One can think of the provider as being the agent of the patient; the provider being the agent of the funder; or the patient being the agent of the funder.

From a public policy perspective, a government or donor agency funder (and sometimes a corporate or philanthropic funder) can be thought of as a principal that has an interest in reducing inequities in health service utilization; promoting optimum consumption of health services that reduce the incidence or severity of infectious diseases and other conditions that harm society; and ensuring the maximum efficiency of health spending. The patients (and potential patients), the providers, and the institutions that may employ those providers (such as NGOs or clinic networks) are all agents of this principal. To achieve these objectives, given the information asymmetries and the lack of alignment among different agents' aims, the principal has a limited menu of options. Strategies that depend on direction from a central authority are extremely unlikely to work. Not only is a central authority unable to know the specifics of a given case, but it also cannot monitor the multitude of provider-patient interactions and enforce norms about how to treat patients with particular conditions, for example. And it certainly cannot ensure that individuals who would benefit from particular kinds of preventive or other health services will make the effort to obtain them.

The classic solution for the principal-agent problem is the introduction of financial rewards and penalties by the principal to create incentives for particular behaviors by the

agent, with independent monitoring as a necessary adjunct. Incentive theory has been elucidated by Laffont and Maritmort (2001), among others, and has given rise to a large number of applications. Most of these have taken the form of contracts, specifying the measurable performance targets, the penalties and rewards, and the method of monitoring. In some cases, the performance aims are vague and represent a low bar; the penalties and rewards may be as simple as termination or continuation of the contract, as is the case for most employment contracts. However, a more narrow definition of "performance-based incentives," and one that we apply, is the following: *monetary payments or other material rewards that are provided on the condition that one or more indicators of performance change and/or that predetermined targets are met*. Because it is impossible to specify every element of service delivery or every behavior that is desired, and the most important "intangibles" of provider-patient interactions cannot be monitored at a reasonable cost, contract design implies identifying proxy measures that can be monitored and that represent a constellation of "good behaviors."

Using their power as purchasers, governments (often with support from donors) and/or private insurers can use financing instruments to encourage patients, providers, and health system managers to behave in particular ways that are associated with better health outcomes. The incentives can be "tweaked" or adjusted in favor of a good outcome.

The principal (the government or other funder) can pay the agents, from patients to providers to managers, on the basis of results: If they behave in ways that lead to better health outcomes, they will be financially rewarded. On the side of patients, this may mean transferring cash or offering food or other material incentives to encourage them to obtain services they otherwise would not, adhere to a treatment regime, or engage in healthful behaviors like exercise or smoking cessation. The transfers can be seen both as incentives and as "enablers," permitting patients to pay for transportation or other indirect costs that might otherwise serve as a barrier to care. On the side of providers, it may mean providing salary increments or fee-for-service bonuses for particular types of services, or for improved quality of care, such as following treatment guidelines. On the side of managers, it may mean conditioning institutional payments under contracts on the achievement of particular targets for service delivery, adherence to quality-related protocols, or even changes in population health.

All of these performance-based incentive approaches have been tried, and all of them have at their heart an effort to fix one or more of the problems associated with financing mechanisms that are disconnected from results and that encourage perverse behaviors. The introduction of performance-based incentives has, at least in concept, a core appeal: In addition to holding the potential for getting better outcomes, funders can move away from the micromanagement associated with accounting for and examining the use of each input, and toward a more "hands-off" approach where what's counted are the desired results.

Perhaps more significantly, well-designed performance-based incentives may be an important way to invest in core capabilities of those who are making the choices that are the strongest determinants of health outcomes. On the demand side, it is argued that when

mothers are paid a monthly stipend on the condition that they take their child for well-child services and growth monitoring, the payments contribute to the accrual of human capital over the long term. On the provider side, when networks of facilities are paid on the basis of results, rather than on periodic budgets, they may establish the well-functioning management information, personnel, logistics, and other systems that will have long-term benefits. Seen in this light, sorting out when and how performance-based incentives can solve key problems in the utilization and quality of health services can contribute to an active discussion about practical ways to strengthen health systems in developing countries.

Solving Real-World Problems with Performance-Based Incentives

When reducing needless death and disease is the goal, and part of what is getting in the way is inadequate behaviors of households, health workers, health facilities, and the systems that knit all these partners together to comprise a health system, performance-based incentives should be considered. In many cases, new incentives on either the demand side or the supply side or both may be needed to complement other system-enhancing interventions (e.g., training, rehabilitated infrastructure, availability of supplies) to achieve health results and strengthen the system that produces them. This section presents evidence to demonstrate how performance-based incentives can contribute to achieving better health results and to attaining the goals of improved equity, enhanced quality, and increased efficiency in health systems.

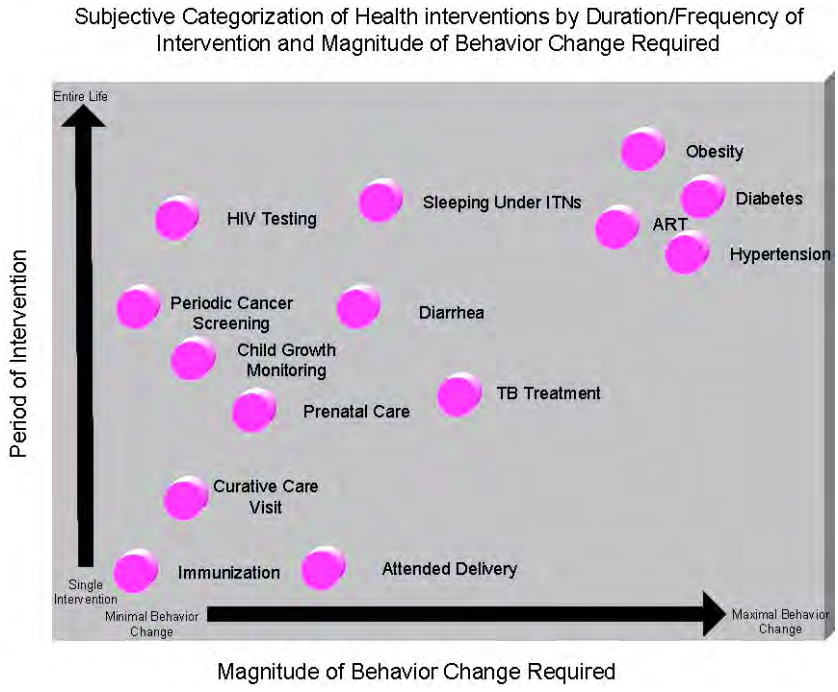
This section presents evidence through two complementary "lenses"; the first focuses on health results for priority diseases or health interventions, and the second on how performance incentives can strengthen health systems. The disease/intervention lens presents evidence from cases that illustrate how performance-based incentives have achieved specific results for diseases such as tuberculosis, preventive care such as child immunizations, and priority services such as safe deliveries. Evidence is categorized to reflect particular incentive challenges common to sets of interventions. The second lens focuses on solutions to constraints to achieving health results faced by the key actors in the health system—the health facilities operating at the community level. Incentive approaches are contrasted with a range of "other" approaches used to address these health systems challenges. Links are made between incentive interventions at each level of the health system and the ultimate system goals of increasing the use of priority services and improving equity, quality, and efficiency. Through both lenses, evidence is presented to show whether performance-based incentives lead to increases in utilization of key services, improved quality, and enhanced efficiency.

Performance-based incentives and disease interventions

Performance-based incentive schemes have been implemented to improve results for a range of interventions from time-limited immunizations to chronic conditions that require

significant lifestyle changes such as diabetes. They have been used to increase use of preventive care interventions such as prenatal care and growth monitoring and to stimulate disease screening to detect cancer and hypertension. They also have been used to attract people to get tested for infectious diseases such as TB or HIV and to encourage continued adherence to long treatment regimens. Time-limited interventions with results or actions that can be measured and that require minimal changes in lifestyle seem to be well suited for performance-based incentives. The most challenging interventions appear to be those for which considerable lifestyle changes are needed, such as stopping tobacco or drug use, or the lifestyle changes needed to manage chronic conditions, such as diabetes. While evidence of the impact of performance-based incentives on results for chronic conditions that require significant lifestyle change is weaker than evidence of the impact of time-limited interventions, the introduction of explicit incentives has the potential to complement other health systems approaches to improve chronic disease outcomes by providing additional incentives to change health-related behavior. This section will begin by presenting this categorization and then will follow with evidence for groups of conditions.

When considering how to design incentives to improve results for preventive or curative services or to manage chronic conditions over a lifetime, it is useful to draw lessons from conditions that have similar attributes. The figure below is a stylized and subjective attempt to categorize interventions based on the duration of the intervention and intensity of lifestyle changes required. Close to the origin, showing discrete or very time-limited interventions and minimal to no lifestyle change, are the “low hanging fruit” of performance-based incentives. Included here as examples are childhood immunizations, deliveries, curative care visits, child growth monitoring, and disease testing. The far right shows conditions that last a lifetime and for which effective management requires significant changes in lifestyle such as for diabetes, hypertension, and addiction. Conditions such as tuberculosis show up somewhere in the middle as treatment does not extend for an entire lifetime and lifestyle changes are concentrated on taking regular medications and presenting to be monitored according to a regular schedule. Managing anti-retroviral therapy is more challenging than TB treatment because it is for a lifetime, but perhaps less challenging than the lifestyle changes needed to reduce obesity or manage diabetes.



Available evidence suggests that the type of health intervention affects the ability of performance-based incentives to improve outcomes. As seen in demand-side experiences in the United States and with conditional cash transfer programs, conditions that require short-term actions, such as vaccinations and routine screening tests, have seen success while chronic conditions that require significant lifestyle changes such as obesity or addiction are more challenging. Supply-side incentives also appear effective at inducing use of services that require short-term actions such as immunizations and assisted deliveries, but have a more varied impact on use of services with a longer duration and that require considerable lifestyle changes. The following sections present the evidence, organized by duration of treatment and degree of lifestyle change needed.

Measurable, time-limited interventions

Good candidates for the application of performance-based incentives appear to be services of limited duration that require minimal if any lifestyle changes and can be measured. Most of the evidence shows that paying for improvements in these short-duration interventions is associated with improved results.

Evidence from supply-side performance schemes demonstrates that ***immunization*** outcomes can be improved through financial incentives. All the examples of supply-side incentives in this paper include immunization coverage targets, and in each case performance-based incentives resulted in a measurable increase in immunization rates compared with the rates achieved by providers not receiving the incentive or compared with the overall immunization trend in the region. For example, among NGOs in the performance-based payment scheme in Haiti, there was a 13 to 24 percentage point

increase in immunization coverage, on average, over performance of NGOs not paid for results (Eichler et al., 2009). In Rwanda, measles vaccination coverage increased by almost 11 percentage points for the intervention group compared to only 1 percent in the non-intervention group (Rusa et al., 2009).

Similarly, a study on the impact of different forms of incentives on immunization coverage rates in the United States (Fairbrother et al. 1999) demonstrated that bonuses to physicians rapidly increased immunization coverage—much more so than subsidizing vaccination fees or providing improved feedback to physicians. The number of children with up-to-date immunizations in the intervention group improved by about 25 percentage points; no significant improvements were seen in other groups. This study cautions that because a major impact of the incentive scheme was to improve documentation of past immunizations for children in the bonus group, some of the perceived impact may be attributed to improvements in data rather than actual improvements in coverage.

Small improvements in immunization coverage in the conditional cash transfer experiences in much of Latin America may be explained by the observation that immunization rates were already quite high, making marginal increases more difficult to achieve (Glassman et al., 2009). That increases appear larger in supply-side schemes, such as those in Haiti and Rwanda, may be driven by the fact that they began with lower baseline coverage rates (Rusa et al., 2009; Eichler et al. , 2009). Nicaragua's conditional cash transfer program, the first to be implemented in a low-income country, used a combination of demand- and supply-side incentives to improve use of key services by the poor (Regalia and Castro, 2009). Providers were contracted and paid based on results, and poor households were provided income transfers conditional on their use of determined health services. Child immunization rates climbed over 30 percentage points in intervention areas, in contrast with a smaller increase in control groups, and larger improvements were seen among the poorest households. It is not possible, however, to determine the distinct contribution of demand and supply incentives, nor to attribute a portion of increased coverage to improved supply of vaccines that occurred simultaneously.

Supply-side incentives may also be used to affect ***child nutrition***. One major cause of malnutrition in the developing world, diarrhea, was addressed with provider incentives to improve the use of ***oral rehydration therapy*** in Bangladesh. Health workers were rewarded through performance-based indicators such as mothers' ability to prepare the rehydration solution. A pilot project showed positive results and was subsequently scaled up (Chowdhury 2001).

Increasing access to ***generic curative services*** is a priority in settings where utilization is low and mortality and morbidity are high. To stimulate use of formal services in Rwanda after the genocide, supply-side incentives were introduced to stimulate production of services (Rusa et al., 2009). Regions where providers were paid partly based on the number of curative care services provided saw an increase in per capita curative care consultations from 0.22 to 0.55. In contrast, providers in a comparison group who were

not paid based on production increased per capita curative care from 0.2 to 0.3. While it is possible to document that the quantity of generic curative services has increased, it is much more challenging to determine whether diagnosis and treatment are of adequate quality. The quality dimension was addressed in Rwanda in subsequent periods.

To improve ***maternal health***, a number of programs provide supply-side incentives to increase ***attended deliveries***. Improvement appears possible in a relatively short period of time while, in contrast, increases in prenatal care appear to take longer to achieve. In Afghanistan, assisted deliveries increased from 4 percent to 12 percent in provinces with supply-side incentives and, in contrast, increased from a base of between 5 to 6 percent to between 8 and 11 percent in provinces without (Sondrop et al., 2009). While this increase encouraged other donors to consider changing payment strategies, a number of confounders make it impossible to fully attribute changes in performance to the performance-based incentive scheme. In Rwanda, institutional deliveries increased from 12 to 23 percent in provinces with performance-based financing, compared with an increase from 7 to 10 percent during the same period in provinces without performance-based incentives (Rusa et al., 2009). In Haiti, NGOs paid based on performance were able to achieve an increase in attended deliveries of between 17 and 27 percentage points over the results achieved by NGOs that received similar assistance and financial support but with no financial incentives linked to results (Eichler et al., 2009).

A performance-based incentive experience in Israel in the 1950s increased *attended deliveries* among Bedouin women when mothers were entitled to maternity allowances if delivering in a hospital. Free hospitalization and a cash grant served as powerful incentives to deliver in a hospital rather than at home or with a tribal midwife as was the custom. While the promise of cash was initially the strongest motivator, the benefits of Western medicine eventually became an additional incentive (Shvarts et al. 2003).

Performance-based incentives appear to be well suited to motivate ***disease screening*** for conditions that affect a large portion of the population. In the United States, supply-side incentives have been used to motivate health plans to reach a large proportion of the people they cover with ***Pap smears, mammograms***, and ***blood pressure screening***.

In 2000, the U.S. managed care plan Touchpoint offered physicians monthly bonuses for achieving improvements in services included in the National Committee for Quality Assurance's Healthcare Effectiveness Data and Information Set (HEDIS). Despite the small monthly bonus of 10 cents per HEDIS measure, the success of Touchpoint is attributed to the use of incentives: competition was stimulated among physicians and an aggressive patient follow-up scheme was implemented, bringing Touchpoint up to the third highest ***breast cancer screening*** rate in the country in 2004. Other results indicate that incentives may have played a role in raising rates of ***screening for breast cancer and cervical cancer*** in plans that used incentives in combination with HEDIS measures, relative to those that used the measures only (Baker et al. 2004). Similar results can be seen across time: In a follow-up study of 27 early adopters of "Pay-for-Performance or

(P4P)[2] in the United States, Rosenthal and colleagues (2007) found that, since 2003, mammography and other indicators eventually were dropped from schemes because of consistently high success.

To increase rates of ***testing for HIV/AIDS*** and to motivate people to return to learn results, people in Malawi were randomly assigned monetary incentives to return to learn results. This demand-side incentive increased attendance at counseling centers by over 100 percent in contrast to a moderate rate of return to learn HIV/AIDS status of only 39 percent among those not offered the monetary incentive (Thornton 2005). In addition to the direct effect of money linked to returning to learn HIV status, monetary incentives may contribute to overcoming social stigma by enabling the perception that the reason for returning to find out one's HIV/AIDS status may be for the money instead of suspicion of a positive result.

Extended-duration, time-limited interventions

Following the discrete interventions discussed in the previous section come interventions that take place over an extended, but finite, time. Included are such services as child growth monitoring, antenatal and postnatal care, family planning, tuberculosis treatment, and the provision of insecticide-treated bednets to prevent malaria. What these interventions have in common is that they require either repeated contacts with health providers (child growth monitoring, prenatal care, tuberculosis) or changes in behavior that affect daily living (sleeping under insecticide-treated bednets, family planning).

Demand-side incentive schemes have succeeded in improving ***child nutrition*** outcomes. Child ***growth monitoring*** is included in nearly all cash transfer programs to monitor nutritional status, and nearly all programs demonstrate positive results. In Mexico, stunting among girls decreased as much as 29 percentage points and programs in Nicaragua and Colombia led to 5.5 and 6.9 percentage point decreases in stunting, respectively (Glassman et al., 2009). Caution, however, must be exercised and programs need to be monitored because they can have the opposite and unintended impact as in Brazil, where researchers attributed decreases in nutritional status to a perception that benefits would be discontinued if the child showed improvements (Morris et al. 2004). Results from unconditional cash transfer programs (Agüero et al. 2007) also show positive impacts on nutritional status, which leads to the question: is it the incentive or additional income that generates the improvement in health? This is an unsolved challenge as too little information exists to determine whether and to what extent it is the incentives or the extra income driving health impact.

It appears to take longer to see an impact of supply-side incentives on utilization of ***prenatal care*** services than of immunizations or attended deliveries. In Haiti, it took two years before performance-based incentives increased the proportion of pregnant women that received all recommended prenatal care visits. Interviews with stakeholders in Haiti

[2] Pay-for-performance, or "P4P," is the common term used to describe provider performance-based schemes in the United States.

suggest that it takes time for service providers to establish the systems needed to attract pregnant women to come for care early and regularly (Eichler et al., 2009). In Rwanda, early evidence showed no significant increase in prenatal care in contrast to the impact of incentives on immunizations and assisted deliveries (Rusa et al., 2009).

In Western Kenya, free ***anti-malaria bednets*** were given to pregnant women as incentives to increase enrollment at a prenatal clinic that provided a range of services including HIV testing. In the program area, utilization of ***prenatal care*** services increased by 117 percent and generated an 84 percent increase in the uptake of HIV testing services by women (Dupas 2005). Using anti-malaria bednets as a reward in this pilot program demonstrates that incentives to improve one health behavior (prenatal care) can be designed to have spillover effects on other health outcomes (malaria prevention).

Conditional cash transfer programs that include requirements for pregnant women to receive prenatal care have shown improvements. In Progresa, poor families received monthly income transfers equivalent to 20–30 percent of income if pregnant women obtained prenatal care, nutritional supplements, and health education (Gertler 2004). Early evaluations of the Progresa program found that the number of women obtaining prenatal care during the first trimester increased by 8 percent (Sedlacek et al. 2000).

Because incentives do alter behavior, attention is needed to ensure that they do not result in unintended outcomes. The application of financial incentives to improve use of ***reproductive health and family planning*** services is one area with the potential for perverse effects that justifies careful monitoring. Programs in Colombia, Mexico, and Nicaragua were associated with decreases in fertility rates, but the Honduras program, which applied a different payment incentive structure, observed a fertility increase. It may be the result of unintentional incentives for childbearing (Glassman et al., 2009). One strategy used in conditional cash transfer programs to improve reproductive health and family planning outcomes that does not generate perverse effects is the requirement to attend health education talks about the benefits of family planning and effective contraception as a condition of payment. In Mexico's conditional cash transfer program, maternal mortality was found to be lower in intervention areas than in control areas, and knowledge of family planning methods was higher in intervention areas as well. In the initial year of contracting NGOs to deliver services and paying partly based on performance in Haiti, providers were rewarded for having a full menu of modern contraceptives available (Eichler et al., 2009). In later years of the evolution of the performance-based incentive program in Haiti, rewards were added for reducing the discontinuation rate of family planning services.

A time-limited and measurable intervention, the treatment of ***tuberculosis*** appears to be a good candidate for performance-based incentive schemes—and evidence shows that it works in practice. Many TB control programs incorporate financial and material incentives for patients, including direct payment, food packages or vouchers, and transportation assistance, to support access to the strategy approved by the World Health Organization for treating TB and enabling increased adherence (Beith et al., 2009). The examples demonstrate that when patient incentives are tied to actions such as regular

attendance at a clinic to take medications, they can positively influence TB treatment adherence and completion. For example, when TB patients in Tajikistan were given food conditional on their adherence to treatment, the treatment success rate was 50 percent higher than without the food incentive (Mohr et al. 2005). Providing a combination of food, travel subsidies, clothing, and hygienic kits if patients did not interrupt treatment in three Russian oblasts resulted in a drop in default rates from 15–20 percent to 2–6 percent. In the United States, a monetary incentive of $5 increased the proportion of homeless people following up after positive tuberculin skin tests to 84 percent as compared with 53 percent without the incentive, and providing regular monetary payments during treatment with directly observed therapy increased treatment completion (Pilote et al. 1996).

Similarly, provider incentives tied to measures such as the number of patients cured had a positive influence on tuberculosis treatment completion, though the majority of identified programs that incorporate performance-based incentives focus either solely on patient behavior or a combination of patient and provider behavior. In Bangladesh, the NGO BRAC implemented a scheme from 1984 until 2003 that motivated both patients and the community health worker who supported patient care. Patients deposited an initial sum of money when beginning treatment with the agreement that part would be returned at the end of treatment and the other part would be given to the community health worker (Islam et al. 2002).

Chronic conditions requiring considerable lifestyle change

About half of the global burden of disease is attributable to chronic conditions and exceeds the burden attributable to communicable diseases in all countries except those with per capita GNI of less than about $900. Addressing chronic conditions such as diabetes, asthma, tobacco and other addictions, obesity, and HIV/AIDS requires significant behavior modification strategies. Performance-based incentives schemes to address these conditions demonstrate potential in developed country contexts. Focusing attention on chronic diseases is particularly crucial in the most impoverished settings because paying for expensive treatment or losing a sole income provider is more economically catastrophic for families with lesser means.

As in TB, performance-based incentives can improve adherence to ***AIDS treatment*** regimens. In the United States, a study showed that small monetary incentives to HIV-infected patients led to an increase from 70 to 88 percent in adherence to anti-retroviral medication in the short term (Volpp and Pauly, 2009). The improvements in adherence were not sustained after payments stopped. As short-term fluctuations in patient behavior can have a negative effect on health outcomes and implications for the development of drug resistance, further evidence on performance-based incentives and long-term treatment regimes would be useful to inform future program design.

Independent Health, a managed care plan in upstate New York, used supply-side incentives in a pilot project as part of a strategy to increase the quality of care given to ***diabetes*** patients. Diabetes was the targeted intervention because diabetics were not

receiving needed preventive treatment, credible measurement indicators exist, and quality care is critical to medical outcomes. Independent Health paid physicians bonuses based on a composite score of output measures (completion of certain tests) and outcome measures (hemoglobin and blood pressure levels) of quality conforming to evidence-based recommendations for diabetic care. A package of interventions to facilitate quality improvements such as training and better communication between the payer and provider accompanied the bonuses. By the end of the evaluation period, the average composite score for physicians in the project increased 48 percent compared with an 8 percent increase among other physicians (Beaulieu and Horrigan 2005). Though the experience is small and exhibits weaknesses in study design, it demonstrates the potential to influence chronic conditions by giving physicians incentives to improve the quality of care.

In 2004, the United Kingdom's National Health Service launched the General Medical Services Contract—Quality and Outcomes Framework (QOF), which gives family practitioners the opportunity to earn an increase in income of as much as 25–30 percent if various indicators are met. Studies evaluating the impact of performance-based incentives on discrete health outcomes in the United Kingdom have been positive: for instance, one study that looked at the effects of performance-based incentives in ***hypertension control*** found that they were successful, but cautioned that outcomes could also be attributable to other interventions that occurred at the same time (Doran and Fullwood 2007). In addition, a modeling study indicated that significant health gains could be realized by using performance-based incentives (McElduff et al. 2004). Although there seems to be a beneficial impact on quality for primary health care in the United Kingdom, there is concern that incentives may be structured in a way that affects quality of care for health issues that fall outside the range of proposed indicators. Likewise, measures not rewarded or those rewarded insufficiently may fail: Evaluations published by physician medical groups in 2005 that were contracted by capitation plus pay for performance through PacifiCare Health Systems in the United States saw a decline on some measures of quality not rewarded as part of the scheme, including appropriate antibiotic usage (Mullen et al. 2006).

Smoking cessation programs in the United Kingdom that include performance incentives for general practitioners have been gaining momentum. After a white paper entitled "Smoking Kills" was released in 1998, the National Health Service formed Stop Smoking Services, the world's largest nationwide stop smoking treatment. The formation of this service has led to changes in policy at the provider level: primary care physicians are now awarded extra points through the QOF for noting patients' smoking status or referring patients to the service. In one study evaluating diabetes patients, QOF had an impact on quit rates for smokers being treated in primary care settings in the United Kingdom between 2003 and 2005, as well as an increase in both documentation and referral of those patients to stop smoking services by physicians. The authors also note that the rate of smoking among diabetics and the general population is roughly equivalent (Millet et al. 2005). In the case of pregnant mothers, it was found that rewards and social support in combination had a significantly greater impact than other interventions on quit smoking rates (Lumley et al. 2004). Gaps in the current research on smoking prevention in general include the need to look at multi-intervention formats and treatment for special

populations, and to assess the long-term persistence of smoking cessation strategies (Ranney et al. 2006).

Demand-side incentives have been introduced to reduce rates of highly addictive behaviors such as ***alcohol, tobacco, or cocaine*** use. Financial incentives are more effective at reducing the use of addictive substances than counseling without incentives, and more money works better than less (Volpp and Pauly, 2009). One consideration is whether and to what extent health improvements will be reversed when payments cease. In the case of demand-side incentives, behavior changes are not sustained. Similar findings are indicated in studies of patient incentives and smoking cessation. Though a systematic review of the literature (Hey and Perera 2005) found some indication of early success, incentives did not appear to enhance long-term cessation rates.

A randomized control trial on the impact of performance-based incentives on ***asthma*** demonstrated that while free medication and transportation assistance significantly increased the likelihood that patients obtained follow-up, the time-limited intervention did not influence long-term outcomes (Baren et al. 2006).

The ability to sustain outcomes is a critical consideration in interventions to reduce ***obesity***. Experimental studies on the impact of financial incentives on improved weight loss demonstrated mixed results in the short term, but no studies assessed long-term or sustained impacts (Goodman and Anise 2006). Though costly, incentives to patients with chronic conditions sustained over a lifetime may, in some cases, be deemed an appropriate intervention.

Strengthening Health Systems: Solving Systemic Problems

In addition to promoting health and preventing and curing disease, health sector leaders, policymakers, and the donor agencies that provide support to developing countries often desire to achieve the overarching health system goals of improving equity, enhancing quality, and increasing efficiency. They may wish to better reach the poor and vulnerable with essential health services, improve the quality of care delivered by the public or private sector, and spend limited resources more effectively. Performance-based incentives can be considered on their own or as a powerful complement to other system-strengthening interventions to help attain these goals.

A particular systemic problem can often be addressed by changing incentives at either the household or service provision level, or both. For example, an underlying problem that affects household ability to use services is financial barriers: households cannot bear the opportunity costs of income lost while spending time to obtain care or the direct costs of seeking care. These challenges are clearly felt more by the poorest so that solutions that effectively benefit marginalized groups, such as conditional cash transfers, will improve equity. Supply-side incentives that reward health facilities for increasing

services provided to low-income communities can also contribute to overcoming barriers on the demand side. Providers may respond with strategies to provide services early in the morning or in the evening, for example, so as not to conflict with the times community members need to work.

The table below provides illustrative examples of how performance-based initiatives contribute to improving equity, enhancing quality, and increasing efficiency by addressing health behaviors at the household and service provision level. Organized to illustrate problems at the household/community (demand side) and service provision (supply side) levels, a sample of performance-based incentive interventions are referenced and then contrasted with other solutions that are not based on performance. In many cases, a combination of both performance-based incentives and other solutions will be needed to address a systemic performance problem.

One contrast jumps out in the comparison between performance-based interventions and other solutions. For the most part, performance-based incentive solutions operate by catalyzing actions of the many individuals and service providers. The new incentives stimulate a bottom-up response that results in stronger health systems. In contrast, most of the other interventions are implemented from the top down by planners and sector managers. In countries with weak regulatory capacity, questionable governance, and spotty records of achieving success with top-down solutions, performance-based incentive interventions may be especially important to consider.

Examples of performance-based incentive and other system solutions to increase use of essential services by the poor and improve quality and efficiency		
Constraint or Underlying Performance Problem	**Performance-Based Incentive Solutions**	**Other System Solutions**

Household/ Community Level ***Information and social norms:*** Lack of information and social norms inhibit seeking recommended preventive and curative care.	• Conditional cash transfer programs often condition payment on attendance at health education sessions. Payment conditional on actions can counteract social norms that may drive households to invest less in females. By conditioning payment on receipt of specified services, household decisions to choose low-cost and low-quality substitutes (e.g., traditional healers) may be altered. • Food support may help overcome social barriers to obtaining care. • Financial rewards to providers for results (and/or penalties for poor performance) can stimulate improved communication and health education that may enhance care seeking by increasing understanding and reducing social obstacles. • National-to-local transfers based on results can stimulate local solutions to increasing knowledge of the value of health interventions and counteract social norms that inhibit appropriate care seeking. • Regulations that require health screening or evidence of good health as a condition of participation in other valued programs can stimulate changed behaviors. A common example is regulations that require full immunization as condition of enrolling in school.	• Behavior change communication provides information to the population to encourage healthy behavior. • Mandated education to consumers by providers can result in increased education about healthy behavior. • Community volunteers can provide information about the value of health behavior close to home.
	can be part of an incentive intervention if payment is based on results. It will also minimize household decisions to consume low-cost substitutes.	

Service Provision Level ***Management challenges:*** Weak technical guidance, program management, and supervision.	• Financial rewards to health service providing institutions for results (and/or penalties for poor performance) can strengthen management by causing service-providing institutions to examine the range of constraints they face to achieving results, and the systems, capabilities, and strategies they need to introduce to achieve them. • Demand-side incentives can stimulate households to hold service-providing institutions accountable for results, catalyzing a process of management strengthening. • National-to-local transfers based in results can stimulate strengthened management through similar dynamics as described in the first bullet. • Social insurance that pays based on results can also stimulate management improvements.	• Training and continuing education in planning, supervision, and management. • Accreditation and quality standards can be instituted and enforced. • Management systems can be designed and implemented—such as health management information systems, financial management, human resources management, and drug management. • Provider report cards can be introduced to report on provider performance to the population.
Service Provision Level ***Drugs and Supplies:*** Drugs and supplies not available; variable quality.	• Contract out drug procurement, storage, and distribution and reward contracted entities based on results. • Performance-based incentives in inventory management and distribution can increase responsiveness by improving management from central to regional to facility levels. • Financial penalties for substandard quality include severe penalties for substandard quality in procurement contracts.	• Improve management procedures and systems to strengthen procurement, storage and distribution to reduce stock -outs and waste. • Improve quality control through drug quality testing.

Increasing utilization among the poor and vulnerable

Improving utilization of services by the poor is one of the central health policy challenges in most countries, and performance-based incentives can contribute to this goal. First, incentives can reward services provided to all people living in low-income communities and for the diseases that most afflict them. If the incentives improve health outcomes and services, it is reasoned, the poor benefit. Second, for preventive services such as immunization and antenatal care, progress toward universal coverage may disproportionately benefit the poor, who have likely had lower utilization of these priority public health interventions. Third, and most directly, either supply- or demand-side incentives can be developed to explicitly reward increases in utilization by low-income individuals. Finally, incentives can be used to attract health workers to serve the poor and to work in neglected regions. Experiences with the third and fourth approaches are described in this section.[3]

Demand-side performance-based incentives schemes are often designed to improve equity by providing rewards conditional on health-related actions taken by poor households that are identified through a certification process. For example, conditional cash transfer programs implemented throughout Latin America improve equity by providing income transfers to poor households conditional upon families undertaking certain actions such as keeping children in school or taking them for preventive health visits (Glassman et al., 2009). The conditions that tie the transfer to whether health actions take place provide an extra incentive to access priority health services. In addition, increased income from the transfers effectively reduces out-of-pocket expenditures and opportunity costs associated with seeking social services. Some researchers question whether the benefits of conditional cash transfer programs outweigh the administrative costs and argue that unconditional income transferred to households leads them to spend on the same priority education and health services as included in the conditional programs (Eichler at al., 2009).

Mexico's conditional cash transfer program (*Progresa* and now *Oportunidades*), had significant positive impacts on health, particularly among the poor. The program increased utilization in public clinics by 53 percent overall, decreased incidence of ill health of under five-year-olds by 12 percent compared with children not in the program, and improved nutritional status in 70 percent of participating households. One study finds that, with *Progresa*, 80 percent of benefits accrued to families among the poorest 40 percent of the population (DFID 2005).

Nicaragua's *Red de Protección Social* (RPS) program also employs performance-based incentives that are particularly targeted toward poor families (Regalia and Castro, 2009). Using both supply- and demand-side incentives that include paying providers to reach coverage targets on the one hand and giving conditional cash transfers to poor households

[3] Most conditional cash transfer programs make use of the first approach, using geographic targeting to identify communities in which to intervene. However, the key to the approach is the application of the performance-based element described in the third approach.

on the other, RPS resulted in significant health gains such as an 18 percent increase in immunization levels among recipient children 12 to 23 months old. As evidence of its pro-poor features, during the first 24 months of program execution, the greatest impacts on health service utilization were observed among very poor households. Though positive impacts of this program are clear, the evidence is unable to attribute success to either the supply- or demand-side strategy or the combination.

A contracting intervention in Cambodia with some performance-based components is one example of where a supply-side intervention designed with specific equity targets achieved significant pro-poor gains in health (Schwartz and Bhushan 2005). Initiated in 1999 with support from the Asian Development Bank, the management of government-provided primary health care services in Cambodia was contracted to NGOs in districts. NGOs were assigned to the program at random to permit systematic evaluation of impact. Some NGOs chose to employ performance-based incentives at the staff level to improve health worker motivation and reduce absenteeism. The contracts with NGOs included an equity goal of targeting maternal and child health services to the poorest half of the population in each district (Schwartz and Bhushan 2005). The results not only demonstrated statistically significant improvements in outcomes (receipt of vitamin A by children and uptake of antenatal care by mothers) in contracting districts compared with non-contracting districts (Bloom et al. 2006), but contracting districts also demonstrated the ability to target the poorer half of the population better than government districts (Gwatkin et al. 2005).

Cases from both developed and developing contexts suggest that performance-based incentives may risk exacerbating geographic disparities in health if not implemented carefully. If the opportunity to earn performance bonuses is greater in areas with higher income populations, health workers will tend to migrate to provide services in affluent regions. If, on the other hand, incentives can be used to attract health workers to serve neglected groups, geographic disparities may be narrowed. This problem was avoided in a pay-for-performance scheme in Rwanda by giving remote facilities an “isolation” bonus to mitigate the perverse incentive to migrate to facilities more likely to receive performance rewards. Studies by Pieter Serneels and others (2005) show that additional payments can motivate health workers to practice in less desirable, but more vulnerable, areas. Rwanda’s experience demonstrates how these non-performance-based strategies can be coupled with performance-based incentives to minimize negative effects on geographic disparities in health while encouraging the effort needed to enhance utilization.

Improving quality of health services

Performance-based incentives hold promise for improving the quality of care as both “optimizing material inputs and practitioner skills to produce health” and “responsiveness” to the population. As evidence accrues about the variable quality of care and about the impact of quality on health outcomes, it can be expected to become an increasingly important goal in developing countries (Das and Gertler 2007). For population-level interventions such as immunizations or routine cancer screenings such

as Pap smears to detect cervical cancer, quality can be measured by counting how many of these services are provided to the right people. For more complex interventions such as antenatal care or appropriate prescription of antibiotics, measures of quality must reflect subtler details such as whether the diagnosis and treatment is appropriate and clinical guidelines followed. This section will review available evidence in both developing and developed countries of experiences in which performance-based incentives were applied to improve quality of care for more complex interventions.

In Rwanda, as in the other known developing country cases, supply-side performance-based incentive interventions began with the primary objective of improving utilization of health services (Rusa et al., 2009). Beginning in 2005, however, the goal of improving quality of care was introduced in some regions and is now being adopted as a national strategy. Each month, district health teams evaluate the quality of services delivered by health centers using a standardized tool that results in a score. If a facility receives a quality score of 73 percent, for example, it will receive 73 percent of its maximum potential performance payments for that month. This approach was designed to ensure that health facilities focus on increasing both the numbers of services provided and their quality. Quality at hospitals is assessed by teams of peers from other similar hospitals, and scores are used to deflate the maximum performance payments received. An evaluation of early results showed that provinces with quality incentives averaged a composite quality score of 73 percent as compared with an average of only 47 percent in provinces without the incentives.

In Haiti, responsiveness was measured as an indicator of quality in the first-year pilot of a supply-side pay-for-performance scheme (Eichler et al., 2009). One target that determined a portion of NGO bonus payments was a 50 percent reduction in waiting time for child visits. Because the lab services offered by one of the NGOs increased wait times necessarily, program implementers determined that the responsiveness indicator was not in fact measuring quality as intended and dropped it from the payment scheme in subsequent years.

The conditional cash transfer program in Mexico was recently evaluated to determine whether improvements in the quality of prenatal care led to the positive child health outcomes attributed to the program. Quality of prenatal care was measured using an index of process measures completed by the clinician during prenatal care visits and reported by the mother. The study found that the 101.7-gram increase in birth weight associated with the conditional cash transfer program was achieved, in part, through the pathway of improved health care quality. Quality improvements were determined to be responsible for increases in birth weight from 82.8 to 93.6 grams, or a 3.0–3.1 percentage point reduction in low birth weight (Barber and Gertler 2007).

Detection and treatment of tuberculosis comprise complex health interventions requiring proper diagnosis of the disease and adherence to treatment through to cure (Beith et al., 2009). A review of the evidence of the impact of performance-based incentives on tuberculosis detection and treatment finds beneficial impacts on case detection and treatment completion. For example, in the Russian oblasts of Orel and Vladimir,

providing patients with material incentives conditional upon adherence to treatment resulted in increased adherence to treatment. As a result of the intervention, standard TB treatment protocol was adhered to 94 to 98 percent of the time, up from 80 to 85 percent prior to the provision of incentives.

Diabetes and asthma require complex patient management regimens. Evaluating the performance of health care for diabetes and asthma patients must take into account quality measures such as screening regularity and appropriateness of treatment. In the United States state of Massachusetts, a health provider network called Partners Community HealthCare, Inc., initiated a performance-based payment scheme that included financial incentives to providers to improve the quality of diabetes and asthma care. Results show that adult diabetes and pediatric asthma scores improved substantially during the intervention period as compared with providers that were outside the participating network (Levin-Sherz and DeVita 2006).

Literature from the United States and United Kingdom frequently cite improving quality of care as one objective of performance-based payment interventions and often include increasing the quantity or utilization of a particular service considered part of a package of quality care. Rosenthal and Frank (2006) discuss seven incentive schemes that tie rewards to all of the following quality measures: childhood immunizations and cancer screenings, chronic-care measures, patient satisfaction, investments made in technology and infrastructure, and utilization of recommended preventive care. Hawaii Medical Services Association—a preferred provider organization that includes about 95 percent of physicians in Hawaii—found in a six-year review (using data from 1998–2003) that quality improved over the period although they could not evaluate whether this trend had begun before the program was implemented (Gilmore et al. 2007). A review by researchers at the University of Minnesota's Evidence-based Practice Center examined nine cases of provider incentives to improve quality of preventive care in the United States and assessed quality as the number of patient charts in compliance with a target outcome such as appropriate cancer screenings, weight loss, or immunizations (Town et al. 2004). These reviews report a very mixed impact of performance-based payment on quality.

Rigorous evaluations have overall been sparse: a RAND study conducted in 2006 reviewing the evidence on pay for performance found only 15 published studies from 1995–2006 that evaluated the effects of directing financial incentives on individual physicians or groups (Sobrero et al. 2006). They found ambiguous messages being sent about pay for performance, with only the six least rigorously designed studies reporting positive results. Other studies have also seen mixed results: a 2007 evaluation by Rosenthal and colleagues of 27 early adopters in the United States found that programs covering 38 percent of enrollees reported gains on clinical indicators, including diabetes care, cancer screening, and inpatient cardiac care, while 42 percent found mixed results and 20 percent found no effect. The authors note that causality cannot be determined because of limitations of the qualitative, cross-sectional nature of the data that came from a small, non-random sample of systematically identified payers. Given the broad and variable measurement approaches, it is difficult to draw lessons about the impact of

performance-based incentives on quality that would be useful for developing country settings.

Increasing efficiency of health services

Efficiency can be defined as the ability of service-providing organizations or individual health providers to deliver more or better services to targeted populations with the same or fewer resources. Performance-based incentives given to individual health workers can motivate them to provide a higher quantity of services through increased effort. At the facility level, incentives have catalyzed changes in how staff are utilized, organized, and motivated, and have led to innovations in service delivery that lead to more efficient and effective service provision. In these cases, providers have implemented innovative, context-specific practices to meet performance targets set by the payer.

In the late 1990s, in São Paulo, Brazil, 16 independent hospitals (Health Social Organizations or "HSOs") in low-income neighborhoods received a global budget with 10 percent retained until it could be verified that quarterly performance targets were reached. A study compared 12 HSOs to 12 hospitals of similar complexity and compared performance data for 2003 and 2004 (La Forgia and Couttolenc 2008). In terms of ***quality*** indicators, general and surgical mortality rates were lower in the HSOs but only marginally significant ($p<0.10$). Pediatric morality was slightly higher in the HSOs (2.8 versus 2.6), but the difference was not significant. HSOs demonstrated significantly better performance on almost all indicators of ***efficiency***. HSOs used about one-third fewer physicians and one-third more nurses than direct administration facilities. HSOs were significantly more productive in terms of general, surgical, and clinical discharges per bed. Key elements of the model included strong decision-making autonomy, accountability through a management contract, and performance-based financing.

Performance-based incentives offer a targeted mechanism to increase motivation and stimulate innovation. In the Haitian pay-for-performance scheme, for example, the potential to earn performance-based rewards motivated individual health workers and inspired efficiency-enhancing organizational change (Eichler at al., 2009). NGOs were provided untied budgets with the flexibility to allocate funds in ways they believed would be most effective plus the opportunity to earn additional funds linked to performance on a series of health targets. The flexibility of funds, in contrast to former line-item budgets, allowed NGOs to concentrate funds on activities that worked and move funds away from less effective inputs or practices. Part of their strategy was to share a portion of the NGO-level performance payments with health workers in the form of individual bonus payments.

The same phenomenon occurred in Rwanda, where facility-level performance payments are partly distributed to staff as payment for performance achieved by the joint efforts of the team working at the facility (Rusa et al., 2009). Interesting innovations resulted from pay for performance in Rwanda such as payment to traditional birth attendants to refer pregnant women for prenatal care and safe deliveries and offers of "mommy kits" consisting of a blanket and diapers to pregnant women as an incentive to deliver in the

health center. It is interesting to note that the supply-side incentives in Rwanda stimulated facilities to offer demand-side incentives to increase utilization and contribute to attainment of performance goals.

Anecdotal experience from some facilities in Afghanistan highlights the importance of motivating individual staff in facility-level incentive schemes to achieve performance goals (Sondorp et al., 2009). When bonus payments to health facilities were retained by management and did not trickle down to health workers, staff experienced little or no increase in their personal motivation. This finding is echoed by a hospital reform effort in Costa Rica where hospitals were unable to distribute financial incentives to individuals because of union resistance, with the result that performance rewards retained by management inspired no change in motivation among staff (García-Prado and Chawla 2006).

Demand-side financing has also been used to increase efficiency (Pearson 2001; Sandiford et al. 2004). A recent voucher program for reproductive health services in Kenya, begun in 2006, incorporated performance-based incentives to encourage providers to become more responsive to patients as well as more efficient. Demand is enhanced by lowering the out-of-pocket price of reproductive health services by subsidizing the price of vouchers for a package of services that includes prenatal and postnatal care and the delivery. Responsiveness and efficiency are stimulated by allowing women the possibility to choose among competing service providers. Participating clinics and hospitals assume financial risk because they are not paid until the woman returns to complete four prenatal care visits. Early findings suggest that the competitive pressures that result from a woman's opportunity to choose which clinic she visits and eventually delivers at result in more attention to marketing and service quality on the part of the provider (Bellows et al. 2007).

A recent research project in Uganda was designed to shed light on the question of whether performance-based incentives increase health service production. The government of Uganda was interested in knowing whether persistent problems of low-quality services and poor access among under-served populations could be improved within the constraints of a limited budget. To answer this question, a group of researchers designed, implemented, and evaluated a rigorous field experiment studying the impacts of performance-based contracts between the purchaser, or the Ugandan government, and private not-for-profit providers of health services (Lundberg et al. 2007).

Sixty-eight private not-for-profit providers were randomly assigned to one of three study arms: two intervention groups and one control group. The facilities were provided a base grant and either told or not told how to spend it depending on the group. Those in one of the experimental groups also could earn a bonus payment equivalent to up to 11 percent of the base grant if they achieved three self-selected targets chosen out of a menu of six that included increases in outpatient visits, treatment of malaria in children, immunizations, antenatal visits, attended births, and uptake of family planning. The researchers found that there is no significant difference between the performance of facilities in the bonus group compared with those in other groups. In fact, for a few

outcomes, the facilities with freedom to allocate funds but not earn the incentive performed better than the others.

Lundberg and colleagues suggest possible explanations for why the performance bonus did not yield a more significant impact than might be expected considering the positive impacts seen in similar interventions in Haiti, Rwanda, and other countries. First, the bonuses were quite small—approximately 5 to 7 percent of a facility's operating revenue. Second, the contract was complicated to understand and it took time to put the systems in place to manage it. Third, the entire scheme was completed over two years, giving facilities little time to respond to new incentives and demonstrate improved results.

The timing of incentives is important: A 2006 review of studies looking at payments made to both physicians and hospitals in the United States found that "end-of-year" payments may have less of an impact on behavior than incentives that were distributed either concurrently or intermittently, while another 2006 study identifies the difference in timing intervals in pay for performance as influencing outcomes (Petersen et al. 2006; Khan III et al. 2006). The structure of payments can be more rewarding to those who are already high performers: A 2005 study evaluating the California-based PacifiCare Health Systems—a health plan that contracts with 300 multi-physician organizations reaching approximately 10,000 enrollees—found that bonuses paid out to medical groups that met or exceeded 10 clinical and service quality indicators went to performers already above the threshold, who received 75 percent of the payments on average across three examined dimensions of quality (Rosenthal et al. 2005).

Conclusions and Policy Implications

The evidence speaks loudly to the possibilities for performance-based incentives to improve health behaviors and strengthen health systems in developing countries. Incentives are powerful but, in some cases, may induce negative or unintended outcomes, so they must be implemented carefully and implementation should include ongoing monitoring. Both supply- and demand-side incentives have been successfully applied to meet the full range of health system goals and to address equally varied types of diseases and health conditions. The evidence suggests that demand- and supply-side options should be considered during program design, and a mix of approaches might change health-related behaviors most effectively.

Experience also has shown that performance-based incentives can work in a variety of health systems and contexts. In countries with stable governments that assume some leadership in the health sector, such as Nicaragua and Romania, performance-based incentive schemes have demonstrated improved outcomes for child health and tuberculosis. In Haiti and post-conflict Afghanistan and Rwanda, where existing state infrastructure was weak and public delivery of health services failing, performance-based incentives have also proven successful. Perhaps it was the lack of government

intervention in these latter cases that opened the door for other actors to implement innovative service delivery schemes such as performance-based incentives.

In each of these instances, the public and private sectors shared responsibility for health service provision and for the implementation of performance-based incentives, in different ways. In Rwanda, performance-based financing was adopted as a national policy enabling the government to make performance payments to both public and private health facilities after donor-driven pilots demonstrated success. And in Afghanistan, external funders entered into performance-based contracts with local NGOs and built the capacity of the national health ministry to oversee them, both yielding positive results. Only NGOs were initially contracted in Haiti using a pay-for-performance model, though ministry of health employees are often part of the staff, but as of 2008, the Haitian government is beginning to adopt the use of performance-based incentives within public sector facilities. Determining the appropriate mix of public and private sector support for introducing performance-based incentives in the health system will ultimately depend upon the existing modes of health service delivery and the capacity of the state in which services are delivered. In states where the central government is weak but local governments are involved in providing health services, performance-based incentive schemes may be introduced on a sub-national level. In post-conflict states where external or private actors are the primary funders of service delivery, public actors may still engage by promoting performance-based incentives or creating a regulatory environment that facilitates their use.

Three high-level policy priorities have been addressed by performance-based incentives—improving equity, quality, and efficiency. But other public health challenges such as fighting drug resistance and stigma may present opportunities for the effective application of performance-based incentives. Finding ways to ensure completion of treatment or adherence to drug regimens is a critical concern with infectious diseases such as HIV and TB, for which non-adherence can lead to both increased transmission and the development of drug-resistant strains. Performance-based incentives have demonstrated success at improving adherence to treatment in several cases. With many diseases, significant stigma is associated with a diagnosis. For sexually transmitted diseases, and particularly for HIV/AIDS, cultural stigma prevents many individuals from getting tested, which then hinders appropriate treatment and counseling to encourage reducing the risk of transmission. Performance-based incentives represent a potential strategy for mitigating stigma because an individual accessing a diagnostic test can justify taking the test on the grounds of receiving a reward. rather than on suspicion of actually having the disease.

A common theme among many of the studies cited was that performance-based incentives are often instituted along with a package of other interventions. The improvements in health outcomes are then difficult to attribute solely (or even primarily) to the incentive. Further studies designed to isolate the individual effects of performance-based incentives or, in the case of Nicaragua, the effects of the supply- versus demand-side incentives would improve future program design. In the meantime, it is important to

recognize that performance-based incentives are not a silver bullet and are often more successful when integrated into a comprehensive strategy to improve health outcomes.

Whether a health minister or donor is aiming to improve a country's health system or combat a certain disease, the evidence shows that performance-based incentives can help. Across the experiences presented, we see a few common themes:

- Performance-based incentives work in all kinds of places.
- Supply- and demand-side strategies are versatile and can achieve similar aims.
- Both private and public entities have implemented performance-based incentives successfully.
- You get what you pay for.
- It's easier to pay for what you can easily measure.

Success in performance-based contracting requires a basic capacity to manage contractual agreements on the part of the funder, including the ability to monitor performance (often through outsourcing to an independent group). However, there is evidence that performance-based incentives can flourish in the imperfect environments that are the reality of health systems in the developing world, and because of the evolutionary nature of performance-based incentives, it is a strategy that can mature as the ability to manage it matures in the most diverse of contexts.

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