

Setting Targets for Results-Based Financing Programs

A Simple Cost Benefit Framework

Yyannú Cruz Aguayo
Sebastián Martínez

Social Protection and Health
Division

TECHNICAL
NOTE N°
IDB-TN-983

Setting Targets for Results-Based Financing Programs

A Simple Cost Benefit Framework

Yyannú Cruz Aguayo
Sebastián Martínez

April 2016



Cataloging-in-Publication data provided by the
Inter-American Development Bank

Felipe Herrera Library
Cruz Aguayo, Yyannú.

Setting targets for results-based financing programs: a simple cost-benefit framework /
Yyannú Cruz Aguayo and Sebastián Martínez.

p. cm. — (IDB Technical Note ; 983)

Includes bibliographic references.

1. Economic assistance-EI Salvador-Cost effectiveness. 2. Medical care-EI Salvador-
Finance. I. Martínez, Sebastián. II. Inter-American Development Bank. Social
Protection and Health Division. III. Title. IV. Series.

IDB-TN-983

<http://www.iadb.org>

Copyright © 2016 Inter-American Development Bank. This work is licensed under a Creative Commons IGO 3.0 Attribution-NonCommercial-NoDerivatives (CC-IGO BY-NC-ND 3.0 IGO) license (<http://creativecommons.org/licenses/by-nc-nd/3.0/igo/legalcode>) and may be reproduced with attribution to the IDB and for any non-commercial purpose. No derivative work is allowed.

Any dispute related to the use of the works of the IDB that cannot be settled amicably shall be submitted to arbitration pursuant to the UNCITRAL rules. The use of the IDB's name for any purpose other than for attribution, and the use of IDB's logo shall be subject to a separate written license agreement between the IDB and the user and is not authorized as part of this CC-IGO license.

Note that link provided above includes additional terms and conditions of the license.

The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.



SCL-SPH@iadb.org

www.iadb.org/SocialProtection

Setting Targets for Results-Based Financing Programs: A Simple Cost-Benefit Framework

Yyannú Cruz Aguayo

Sebastián Martínez¹

Abstract

Development programs that use financial incentives to motivate better performance are increasingly used by governments, multilaterals and private donors as alternatives to traditional input-based financing. One class of results-based financing programs uses pre-defined outcomes, or targets, to measure and reward performance. If established targets are met, then the implementing agency receives a financial bonus. In this paper, we propose a simple cost-benefit framework for setting targets. The basic premise of the model is that targets should be set such that total expected benefits outweigh the cost of the program. We develop the model in the context of the health sector and discuss its application to a health results-based financing initiative in the Mesoamerican region.

Keywords: Results Based Financing, Results Based Aid, Target Setting, Cost-Benefit Analysis

JEL codes: F35, I15, I18, O19, O22

¹Acknowledgements: We received helpful comments from Pablo Ibarra, Francisco Mejia, Maria Fernanda Merino, Ana Perez, Luis Tejerina and Paola Zuniga during the initial development and application of the target-setting model. We are grateful to the Mesoamerican Health Initiative and the Ministry of Health in El Salvador for sharing their data and case study, and we thank the participants in the SPD Brownbag seminar for feedback on earlier versions of this paper. All findings and interpretations in this paper are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its executive directors or the governments they represent.

Authors: Yyannu Cruz Aguayo (yyannuc@iadb.org) and Sebastian Martinez (smartinez@iadb.org): Inter-American Development Bank, 1300 New York Avenue, NW, Washington, DC 20577.

1. Introduction

Results-based financing (RBF) programs use incentives, conditional on the achievement of results, to motivate the provision of more and better services, with the ultimate goal of improving final outcomes such as increased learning among students or better health outcomes for patients.² RBF is growing in popularity among governments, multilateral institutions and private donors as a promising policy tool for improving development effectiveness and achieving objectives such as the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs). In this paper, we propose a simple cost-benefit framework for establishing targets in the context of health RBF programs, though the model can be easily adapted to other sectors.

RBF models are proposed as policy tools for attenuating the principle-agent problems inherent in the contracting of services (Ross, 1973; Savedoff, 2010). The design of an RBF model will depend on the particular development challenge that the policymaker seeks to overcome and must be carefully considered for each context³; however, while many variants of RBF models exist, at the heart of any RBF program is the incentive model that establishes the relationship between incentives offered by the principle and the outputs or outcomes achieved by the agent. In the context of the health sector, one general class of supply-side RBF programs provides payments linked directly to the provision of health services.⁴ Another class of programs provides incentive payments linked directly to the achievement of results and will typically include specific targets for the outputs or outcomes of interest. For example, the agent may be offered an incentive of \$X if child mortality in a particular region is reduced by Y%. Under these models, targets are typically expressed as a change in health indicators that must be achieved in order to trigger an incentive payment. Payments can be “all or nothing,” with providers receiving the full incentive only if agreed upon targets are met, or they can be structured as a function of the level of compliance with the target.⁵

Once a decision has been made by the policymaker to use a target-based model, a key next step will be to define the set of output or outcome indicators that the RBF program will incentivize and to set the targets for each one. Documentation available for existing health RBF programs shows a wide range of approaches to target setting.⁶ For example, some programs used national objectives and international standards, including programs in Belize (Vanzie, Hsi, Beith, and Eichler, 2010), Ethiopia (De, Zelelew, and Eichler, 2010) and Rwanda (Rusa, Schneidam, Fritshce, and Musango, 2009). In other cases, targets were set through negotiations between the payer and service provider, including in Argentina, where targets were negotiated annually (Cortez et al., 2009), and Afghanistan (Naimoli and Vergeer, 2010). Other approaches to target setting outside explicit RBF programs, such as the setting of MDGs and

² For an in-depth discussion of RBF concepts and a glossary of terms, see Musgrove, P., 2011.

³ A discussion of the design of RBF models and selection of appropriate indicators is outside the scope of this paper.

⁴ For example, fee-for-service payments can be adjusted for measures of quality using balanced score cards, measures of compliance with clinical guidelines, or other means of verification. On the demand side, conditional cash transfers pay individuals or households contingent on the use of specified health services.

⁵ These can be continuous or discrete. Under a continuous function, a fraction of the incentive is paid for each fraction of the target that is achieved. Discrete models can take the form of a step function, with portions of the incentive paid for achieving intermediate targets.

⁶ Overall, we found few cases of well-documented, published experiences.

SDGs, involve the use of expert panels⁷ or in the case of Healthy People, a U.S.-based initiative, a hybrid approach including expert judgment, international comparisons, total coverage or elimination targets consistent with other national programs, and “better than best,” a data-driven approach, which aims “to surpass the value achieved for any target group at baseline” (U.S. Department of Health and Human Services, 2000a, 2000b, 2000c).

In this paper, we propose a simple cost-benefit model for setting targets and illustrate its application to the Mesoamerican Health Initiative. In this case, targets were negotiated between the initiative (principal) and recipient countries (agent), so the model provided a quantitative economic framework and starting point for negotiations on program targets. While the model requires a number of assumptions, these can be agreed upon up front by the principal and agent, providing a transparent and replicable process for both parties. We argue that the model proposed here, when coupled with other sources of information and analysis, such as micro-simulations, impact results from similar interventions, power analysis, and expert opinion, can be a valuable input to the target-setting process.

The paper is structured as follows. Section 2 presents the cost-benefit model, and section 3 discusses the data sources needed for estimation. Section 4 presents an overview of verification data requirements. Then, section 5 presents an application of the model to the Mesoamerican Health Initiative, and section 6 discusses how the results of the model were complemented by additional sources of information to reach a final set of targets. Section 7 presents our conclusions. We also make available a companion Excel spreadsheet that comes pre-programmed with the basic cost-benefit model and that can be adapted by the user for specific applications. Appendix 2 provides a step-by-step user guide for the Excel tool.

2. A Cost-Benefit Model for Setting Targets

We use a simple cost-benefit model as the starting point for setting targets. The model equates the total estimated value of benefits generated through the RBF to the cost of the program. We solve the equation for the minimum change per outcome, such that total benefits are greater than total costs. The estimated outcome change is then added to the indicator’s projected counterfactual change (the change that would have occurred anyway in the absence of the program) and baseline level to produce a minimum target level.

Take the set of RBF payment indicators, i , that the program intends to pay for. Typically, this set of indicators is directly related to the key outputs and outcomes that the policymaker or principal wants to achieve with the RBF program.

The basic cost-benefit model is:

$$\sum_{i=1}^n d_i \times N_i \times v_i \geq C \quad (1)$$

⁷ In the case of the MDGs, goals were set by a consensus of experts from the United Nations, IMF, OECD and the World Bank. <http://www.unmillenniumproject.org/goals/gti.htm>.

where d_i is the change in indicator i generated by the program (the program's impact), N_i is the intervention's population size, and v_i is the value or price of a one unit improvement in indicator i . C is the total cost of the RBF program. Equation (1) establishes that the total value of benefits generated by the intervention must be greater than or equal to the cost of the intervention.

The minimum target, T_i , is then equal to d_i plus the current (baseline) level of the indicator, b_i , and the "counterfactual" change, that is, the level of the indicator that would have prevailed in the absence of the RBF program, which we will call h_i :

$$T_i = d_i + b_i + h_i \quad (2)$$

To solve equation (1) we make the simplifying assumption that $d_i = d$, that is, that the magnitude of change (in percentage points) caused by the program is equal for each indicator. A more nuanced model could weight each d_i differently according to the priorities or perceived policy preferences for each particular outcome. The minimum program impact per indicator is given by:

$$d \geq \frac{C}{\sum_{i=1}^n N_i \times v_i} \quad (3)$$

Substituting (3) in (2) we have:

$$T_i \geq \frac{C}{\sum_{i=1}^n N_i \times v_i} + b_i + h_i \quad (4)$$

Thus, the minimum target level for indicator i is a function of the change "purchased" by the RBF program, such that the total benefits of the program outweigh the costs, the baseline level (i.e., the pre-program condition of the target population), and the change in that indicator that would be expected in the absence of RBF.

3. Data

In order to estimate T_i , we will require data for each of the parameters in equation (4). We can measure b_i empirically through baseline data from a representative sample of the target population.⁸ The parameter h_i is the change in outcome i that would have prevailed in the absence of the program at a future date and is an unknown parameter at the time of target setting. We approximate h_i using historical trend data to estimate the indicator's change over a given pre-intervention period, and we assume that in the absence of the program, the indicator would continue on the same trajectory, although more sophisticated micro-simulation could also be done. Alternatively, h_i could be estimated ex-post using a control group (i.e., through a randomized controlled trial) and factored in to the model in the post-intervention period. While estimating the counterfactual through an impact evaluation would be an optimal alternative, it could also be more costly if the impact evaluation requires collecting additional data on a control group.

⁸ These data typically come from existing administrative data systems, population-based surveys with appropriate coverage of intervention areas, or new baseline surveys collected by the program.

To calculate $\frac{C}{\sum_{i=1}^n N_i \times v_i}$, the cost of the program, C , and the number of individuals that are expected to benefit from each sub-component of the intervention, N_i , are known parameters from the program's operational design.

The final parameter needed to calculate the model is v_i , the value or price of one unit of improvement in outcome i . Various methodologies have been proposed to estimate the economic value of improvement in health outcomes, including contingent valuation methods and revealed preferences (Cawley, 2008; Kuhmerker and Hartman, 2007; Trude, Au, and Christianson, 2006). For our application, we propose an estimate of v_i based on a commonly used parameter of disability, the disability-adjusted life year (DALY), valued at yearly gross national income (GNI) per capita. One disability-adjusted life year can be thought of as one lost year of "healthy" life. The concept, considered a measure of the "burden of disease," was first introduced by the World Health Organization (WHO) and the World Bank in 1994 (Murray, 1994). DALYs combine "time lived with a disability and the time lost due to premature mortality" (Murray, 1994, p. 441). An attractive aspect of this metric for our purposes is that it combines the burden of mortality and morbidity (non-fatal health problems) into a single number. Additionally, the concept converts the burdens imposed by all potential health issues into a consistent unit, which allows comparison between the burdens imposed by different ailments. The DALY is widely used by WHO and is the metric of choice for planning decisions by numerous organizations.⁹ In the context of a costing analysis, a DALY represents the number of disability-free years that are gained due to a particular health intervention. Gaining a DALY through an intervention reduces the burden of disease; that is, it is equivalent to averting the loss of a DALY.

To calculate v_i we associate each outcome indicator i with the corresponding WHO estimations of the total burden of disease, in DALYs, for the corresponding sub-population and health condition. We then calculate DALYs per capita as the national burden of disease divided by the total population in the age bracket that would have been affected by that particular ailment in the absence of treatment. In order to obtain a monetary value, we then need to associate a monetary value with each DALY per capita. The cost-benefit literature presents a range of estimates for the value of a DALY. For example, a review of potable water interventions (Edwards, 2010) reports that the value of a DALY fluctuates between two-fifths and five times the gross domestic product (GDP) per capita; however, Edwards also points out that the "standard" (1993) methodology for the DALY is primarily based on the human capital approach, and the formula for the DALY would imply that its monetary value is equal to GDP per capita. Along these lines, a 2001 report (WHO, 2001) from the WHO's Commission on Macroeconomics and Health (CMH) establishes that, conservatively, each DALY saved gives

⁹ See the Disease Control Priorities Project and the Copenhagen Consensus Analysis, among others (Jamison, D., Breman, J., Measham, A., Alleyne, G. Ed., 2006; WHO, 2006). According to the WHO, DALYs for a disease or a health condition are calculated as the sum of the Years of Life Lost (YLL) due to premature mortality, and the Years Lost due to Disability (YLD) for incident cases of the health condition, that is: $DALY = YLL + YLD$, where $YLL = N \times L$ and N =number of deaths and L =standard life expectancy at age of death in years. YLL measures the incident stream of lost years of life, and so this incidence perspective is also used in the calculation of YLD. That is, to estimate YLD for a particular ailment in a specific period of time, the number of incidents in that period is multiplied by the average duration of the ailment, and by a weight that classifies the severity of the condition within a scale between 0 (perfect health) and 1 (dead). So without taking into consideration social preferences, YLD is defined as $YLD = I \times DW \times L$, where I =number of cases, DW =disability weight, and L =average duration of case until remission or death (in years).

an economic benefit of one year's per capita income. Hence, an intervention can be considered highly cost-effective¹⁰ if each DALY averted costs less than one year of average per capita income, while an intervention is cost-effective if each DALY averted costs less than three times the average annual income.

In accordance with these standards, we conservatively equate the value of a DALY per capita to the GNI per capita in the application of the proposed model. Thus, v_i is estimated for each outcome i as the DALY per capita for the associated condition and population times GNI per capita.

4. Target Verification

Although targets will be verified at a future date, the data sources and sample requirements for each indicator should be agreed upon by the principal and agent at the outset. Data sources may include independently audited administrative data, population-based surveys, or other appropriate sources. For indicators based on probability samples, power calculations should be performed to determine the sample sizes required to verify compliance with agreed targets.¹¹

The estimated target, T_i , is the *minimum* level that a target must meet in order to produce a positive cost-benefit ratio. As such, a target will be met if the actual outcome level measured for indicator i is greater than or equal to the established target. For count variables such as the number of patients served in a given time period, this comparison is straightforward. For indicators based on population estimates, such as the prevalence or incidence of a health condition, actual outcomes may fall short of the target but be within the 95% confidence region (or other pre-determined interval). To minimize gaming, we recommend establishing the target compliance rule at baseline using the following guidelines:

1. $Y_i \geq T_i$, where Y_i is sample mean of the actual outcome for indicator i , and
2. $Y_i^* > b_i^* + h_i^*$, where Y_i^* is the confidence region around Y_i when $Y_i = T_i$ and $b_i^* + h_i^*$ is the confidence region around the counterfactual outcome level

That is, a target is achieved when the sample mean of the actual outcome is greater than or equal to the agreed upon target, and the 95% confidence region for the outcome should exclude the outcome level that would have prevailed in the absence of the program. When estimating the population mean, larger sample sizes will result in narrower confidence regions and are thus advantageous to both the principal and the agent in terms of minimizing the probability of false positives and false negatives, respectively; however, the sample size for estimating Y_i should be set such that confidence regions around T_i do not overlap with the confidence region around the outcome level that would have been achieved without the program. Condition 2 has practical implications for the target-setting process, since it implies that in addition to meeting the cost-benefit requirements of equation (4), targets for indicators based on population-based statistics

¹⁰ The Choosing Interventions that are Cost-Effective (CHOICE) project is a WHO initiative developed in 1998 with the objective of providing policymakers with the evidence for deciding on the interventions and programs that maximize health using the available resources. Following the recommendations of the CMH's report, CHOICE utilizes GDP as an indicator to define the following three categories of cost-effectiveness: highly cost-effective interventions (corresponding to less than one GDP per capita); cost-effective interventions (between one and three times GDP per capita); and non-cost-effective interventions (more than three times GDP per capita).

must be estimated using sufficiently large samples so as to distinguish the target from the counterfactual level. If funding for data collection is insufficient to meet condition 2 under the target determined through equation (4), the minimum target will be set above T_i at the minimum level that satisfies condition 2 under the existing budget constraint (or if that level is unrealistic, the indicator needs to be dropped or substituted).

5. Application of the Model to Salud Mesoamerica 2015

Salud Mesoamerica 2015 (SM2015) is a health RBF initiative funded by the Gates Foundation, the Carlos Slim Foundation, and the Government of Spain, and executed through the Inter-American Development Bank. SM2015 seeks to reduce health inequalities by extending coverage and improving the quality of health interventions for the poorest 20% of households in the region, focusing primarily on maternal and child health. As a public-private partnership, the initiative provides grants equal to 50% of the project value, and governments in the Mesoamerican region contribute the other 50%. In addition, the initiative offers governments a results-based incentive payment of 25% of the total value of the funding envelope. Targets are agreed upon with governments for a set of key payment indicators directly related to the priority health outcomes that the initiative seeks to improve. If a weighted average of 80% of targets is achieved at the end of each 18-month funding period, then the government receives the “performance tranche” incentive payment.¹²

We apply the target-setting model to the case of SM2015 El Salvador,¹³ where performance incentives linked to final health outcomes are paid, in accordance to program guidelines, at the end of a 36-month period.¹⁴ Table 1 presents the list of outcome indicators selected by the initiative and government for payment, based on the primary objectives of the intervention in El Salvador.

For each of the 10 indicators, we will apply the target-setting model to calculate the minimum target T_i that meets the condition set out in equation (4). The cost of the program, C , is the total cost of the initiative, including donor and counterpart funding. The population size for each indicator, N_i , was obtained from census data on the number of individuals in the appropriate age range and gender established for each indicator in the municipalities targeted by SM2015, including children, number of births and women of reproductive age. To calculate v_i we use the number of DALYs per condition and age-gender group for El Salvador, as estimated by WHO (WHO, 2004), and GNI per capita data published by the World Bank (World Bank, 2009).¹⁵ For example, in the case of the modern contraceptive prevalence rate (mcp), v_i was calculated as:

¹¹Typical levels of power are 0.8 or 0.9, and significance of 5% is standard. If observations are clustered (for example, by village or health clinic), the intra-cluster correlation can be approximated using baseline data.

¹² For more information, see <http://www.sm2015.org>.

¹³ El Salvador was the first country in the initiative to develop an operation and set targets for its performance framework.

¹⁴ In the case of El Salvador, SM2015 established two funding tranches, at 18 and 36 months from the beginning of the program. Targets presented here are for the 36-month performance payment linked to final health outcomes. Targets for the first 18-month period were based on output and process indicators related to the implementation of the program, with targets linked to acceptable completion (for example, 90%) of the activities financed by the program over the initial 18-month period (not shown here).

¹⁵ World Bank. (2009). “*World Development Indicators*.” <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD>.

$$v_{mcpr} = \frac{(\text{Total DALYs Maternal Conditions 15 – 59 yro}) \cdot (\text{GNI per capita})}{\text{Total female population 15 – 59yro}}$$

where “Total DALYs Maternal Conditions 15-59 yro” is the estimated total burden of disease for all maternal conditions for women aged 15-59 years in El Salvador.¹⁶ Given that health benefits are likely to accrue over the lifetime of an individual, we need to estimate the present value of v_i over some time horizon while discounting future value at a determined discount rate. In the context of maternal-child health interventions such as those supported by SM2015, this could be the expected life expectancy of a child or mother at the time of the intervention. For the present analysis, v_i is calculated assuming a horizon of 20 years and a standard discount rate of 12% percent. Furthermore, we assume that benefits accrue throughout the entire three-year intervention period, though it is likely that the actual accrual period will be shorter given that benefits are only generated once the intervention is operational, with services being delivered on the ground.¹⁷

For the final two parameters in equation (4), baseline values for each indicator, b_i , are measured through a population-based, representative baseline survey conducted in intervention areas, which was commissioned by SM2015. Finally, in the absence of historical data for the specific intervention areas, the counterfactual change h_i is calculated using historical trend data for available indicators from existing nationally representative health surveys for El Salvador, and we assume that in the absence of SM2015, these trends would have continued over the course of the intervention period.¹⁸

Plugging the data into equation (3), we estimate $d = 0.079$. That is, for the case of El Salvador, the interventions financed by SM2015 must cause a change of at least 7.9 percentage points for each final health outcome so that the total value of benefits generated by the program is equal to the total cost. Applying equation (4), we add d to the baseline levels (column 1 of table 1) and estimated historical trends to obtain a target value for each individual indicator. Results are presented in column 2 of table 1. For example, for the modern contraceptive prevalence rate, a target of at least 53% (up from 42% at baseline) should be attained after three years of intervention in order to satisfy the cost-benefit condition required by the model.

We note that some of the estimated targets in this application are over 100%, for example, in the case of the indicator “antenatal care before the first trimester,” for which baseline levels, at 85%, are already quite high. In our experience, at least in the context of health outcomes, target rates much higher than 95% may be impractical (for example, if some sub-populations always

¹⁶ WHO. 2004. *Death and DALY estimates*. Available at http://www.who.int/healthinfo/global_burden_disease/en/. The same value as v_{mcpr} was also linked to the indicator “postnatal care within seven days of delivery.” The value of improvements from perinatal care is calculated using the estimated total burden of disease from all perinatal conditions for children aged 0-14 years old and is associated with the following indicators: “antenatal care before 1st trimester,” “minimum of four antenatal care visits,” and “skilled attendance at birth in an institutional setting.” The value of improvements in nutrition is calculated using the estimated total burden of disease from all nutritional deficiencies for children aged 0-14 years old and is associated with the indicators “prevalence of anemia in children aged 6-23 months,” “MMR vaccination in children aged 12-59 months,” “parasite treatment in children aged 12-59 months,” “proportion of mothers who gave their children ORS and zinc during the last diarrhea episode,” and “prevalence of exclusive breastfeeding.”

¹⁷ Selecting a shorter intervention period would lower the estimate of d .

¹⁸ For indicators for which no historical trend data were available, we assume a change of 1 percent per year, the mode of trends for available indicators.

refuse treatment), and so a ceiling of 95% was agreed upon for all indicators. It is important to note that when putting the model to work, the initial targets determined by the model can be updated in an iterative process, adjusting the relative value of individual d_i 's such that the relationship established in equation (1) is preserved.

6. Target-Setting Process in Salud Mesoamerica 2015

In this section, we discuss how final targets were set in the context of SM2015 El Salvador. SM2015 operational guidelines establish that outcome indicators and targets are negotiated and agreed upon between the initiative and governments. To inform the negotiation process, the initiative commissioned a number of inputs. First, an in-depth review of the literature and international experiences was conducted for each payment indicator to gather the range of impact estimates achieved through different types of interventions. The literature reviews consider case studies and program evaluations from the region (and internationally when relevant), placing emphasis on rigorous studies with internal and external validity that measure the effects of the types of interventions financed by SM2015 on final outcomes. Second, multi-country data sets were used to produce historical trends and levels for relevant indicators, both within the specific country and for countries in the region.

SM2015 guidelines establish that targets for population-based indicators be measured through surveys conducted by an independent third party, and each country has a pre-specified budget ceiling for monitoring and evaluation. In this context, as discussed in section 4, a third important input to the target-setting process is power estimates to determine necessary sample sizes for baseline and endline surveys that would be required to detect statistically significant changes in outcomes. Sample sizes are calculated with a power of 0.9 and significance levels of 0.05 (mean levels, intraclass correlations and design effects are estimated with existing surveys). If the sample size necessary to detect a proposed target was larger than the sample afforded under the initiative, a replacement indicator was sought in order to satisfy the minimum power requirement of 0.8 while remaining within the initiative's budget constraints for data collection.

Finally, the target-setting process incorporated information about the country's specific operational requirements using expert consultations. This process was meant to capture context-specific information and constraints that may not be reflected by the more quantitative inputs described above. Operational considerations include the specific interventions being financed, operational capacity of implementing agencies at the national and local levels, disbursement rate and execution capacity, and other context-specific aspects that might affect the achievable target proposed for a given indicator. In the case of El Salvador, expert consultations were conducted with international RBF experts, government officials from the ministry of health, fiduciary and procurement specialists within the government and the Bank, and Bank sector specialists with extensive experience in the country.

The target-setting process for SM2015 in El Salvador began by agreeing on an initial list of payment indicators. Then, over the course of a two-day meeting held in San Salvador, representatives from the government and the initiative analyzed and debated the various sources of information described above for each indicator until a mutually agreed upon target was established. For each indicator, the starting point of the negotiation was the target

proposed by the cost-benefit model discussed in this paper. The additional information described above was then taken into consideration when arguing for a deviation from the target established by the model. For example, after reviewing international evidence on a specific intervention or considering the local experience of the ministry of health in addressing a specific health condition, the indicator might be adjusted up or down. Of the 10 payment indicators included in the RBF model in El Salvador, final targets for five indicators were set at levels above those established by the model, four were set below the targets predicted by the model (two of these simply brought targets of 100% or more down to the maximum agreed target level of 95%), and one was equal to the target given by the model. As individual indicator targets were agreed upon, the cost-benefit model was updated to ensure that the cost-benefit relationship established by equation (1) was maintained. In fact, the final payment targets negotiated in El Salvador (if achieved) produce benefits that are 1.6 times the cost of the operation.

7. Conclusion

This paper presents a simple cost-benefit model for setting targets in the context of an RBF program. While here we apply the model to an RBF program in the health sector, the basic principles of the model can be easily adapted to other sectors. The ultimate goal of the model is to assist policymakers with establishing an objective starting point for defining targets. The model relies on a number of important inputs and assumptions, including a prediction of the counterfactual change for a given outcome, an accurate valuation of benefits, a time horizon over which benefits accrue, and a discount rate; however, these parameters can be agreed upon up front by the users of the model, and sensitivity analysis can be performed to estimate upper and lower bounds on a target, given more or less conservative assumptions around these parameters. In this sense, we argue that applying an economic cost-benefit framework when setting targets is a useful exercise that provides a quantitative, transparent and replicable process for defining the targets that will ultimately determine whether and how much of an RBF incentive payment is made.

References

- Anand, S. and K. Hanson. 1997. "Disability-adjusted life years: a critical review". *Journal of Health Economics*. 16: 685-702.
- Bashir, H., S. Kazmi, R. Eichler, A. Beith, and E. Brown. 2010. "Pay for Performance: improving Maternal Health Services in Pakistan". Health systems 20/20, P4P Case Studies. Bethesda, MD: United States Agency for International Development.
- Basinga, P., P. J. Gertler, A. Binagwaho, A. L. B. Soucat, J. Sturdy, and C. Vermeersch. 2010. "Paying Primary Health Care Centers for Performance in Rwanda". World Bank Policy Research Working Paper Series No. 5190. Washington, DC: World Bank.
- Busogoro, J.-F. and A. Beith. 2010. "Pay for Performance for Improved Health in Burundi Case Studies P4P Burundi". Health systems 20/20, P4P Case Studies. Bethesda, MD: United States Agency for International Development.
- Cawley, J. 2008. Contingent Valuation Analysis of Willingness to Pay to Reduce Childhood Obesity. *Economics & Human Biology*. 6(2): 281-292.
- Cortez, R., V. Fridman, P. Musgrove, I. Bablumian, V. Camporeale, L. O. Perez, et al. 2009. "ARGENTINA: Provincial Maternal and Child Health Insurance A Results-Based Financing Project at Work". En breve, December 2009, Number 150. Washington, DC: World Bank.
- De, S., H. Zelelew and R. Eichler. 2010. "Launching Pay for Performance in Ethiopia: Challenges and lessons learned". Health systems 20/20, P4P Case Studies. Bethesda, MD: United States Agency for International Development.
- Disease Control Priorities Project. 2008. "Using Cost-Effectiveness Analysis for Setting Health Priorities". Unpublished Manuscript. Washington, DC: Fogarty International Center of the U.S. National Institutes of Health, The World Bank, World Health Organization, Population Reference Bureau, Bill and Melinda Gates Foundation.
- Jamison, D., J. Breman, A. R. Measham, G. Alleyne, M. Claeson, D. B. Evans, J. Prabhat, A. Mills, and P. Musgrove (Eds). 2006. *Disease Control Priorities in Developing Countries*. Second Edition. Oxford University Press and The World Bank.
- Kuhmerker, K., and T. Hartman. 2007. "Pay-for-Performance in State Medicaid Programs". Fund Report. New York: Commonwealth Fund.
- Murray, C. J. L. 1994. "Quantifying the burden of disease: the technical basis for disability-adjusted life years". *Bulletin of the World Health Organization*. 72: 429-445.
- Musgrove, P. May 2011. "Financial and Other Rewards for Good Performance or Results: A Guided Tour of Concepts and Terms and a Short Glossary". Accessed February 14, 2012. <http://www.rbfhealth.org/rbfhealth/system/files/RBF%20glossary%20long%20revised.pdf>.
- Naimoli, J. F. and P. Vergeer (Eds). 2010. "Verification at Glance. A Series of Snapshots of Experiences in Verifying Performance Linked to Financial Incentives for Results-Based

Financing (RBF) Programs from Selected Countries”. Results-Based Financing for Health (RBF). Washington, DC: World Bank.

Nutbeam, D. and M. Wise. 1996. “Planning for Health for All: international experience in setting health goals and targets”. *Health Promotion International*, 11(3): 219-225.

Ross, S. A. 1973. “The Economic Theory of Agency: The Principals Problem”. *American Economic Review*, 63:134–139.

Rusa, L., M. Schneidam, G. Fritshce and L. Musango. 2009. Rwanda: Performance-Based Financing in the Public Sector. In R. Eichler, R. Levine, and the Performance-Based Incentives Working Group (Eds.), *Performance Incentives for Global Health: Potential and Pitfalls* (pp. 189-214). Baltimore, MD: Brookings Institution Press.

Salud Mesoamérica 2015. 2011. “What is the Salud Mesoamérica 2015 Initiative”. Accessed October 1st, 2011. <http://www.saludmesoamerica2015.org/en/salud-mesoamerica-2015/sm2015/salud-mesoamerica-2015-mission-and-objetives,2754.html>.

Savedoff, W. D. 2010. “Results-Based Financing for Health (RBF). Basic Economics of Results – Based Financing in Health”. Results-Based Financing for Health (RBF), June 2010. Washington, DC: World Bank.

Trude, S., M. Au, and J.B. Christianson. 2006. “Health Plan Pay-for-Performance Strategies,” *American Journal of Managed Care*, 12(9): 537–542.

U.S. Department of Health and Human Services. 2000a. *Healthy People 2010: Understanding and Improving Health*. 2nd ed. Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services. 2000b. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services. 2000c. *Tracking Healthy People 2010*. Washington, DC: U.S. Government Printing Office.

Van Herten, L. M. and H. P. A. V. De Water. 2000. “Health policies on target? Review on health target setting in 18 European countries”. *European Journal of Public Health* 10(4): 11-16.

Vanzie, M., N. Hsi, A. Beith, and R. Eichler. 2010. “Using Supply-side Pay for Performance to Strengthen Health Prevention Activities and Improve Efficiency: The Case of Belize”. Health systems 20/20, P4P Case Studies. Bethesda, MD: United States Agency for International Development.

Wismar, M., et al. 2006. Health targets and (good) governance. *EuroObserver*, 8(Spring):1-8.

Wismar, M., M. McKee, K. Ernst, D. Srivastava, and R. Busse. 2008. *Health Targets in Europe: Learning from Experience*. Copenhagen: World Health Organization.

World Bank. 2009. *World Development Indicators* [Data file]. Available from the World Bank Web Site: <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD>.

WHO (World Health Organization). 1991. *Health for all targets: The health policy for Europe*. Geneva: World Health Organization.

WHO. 2001. *Macroeconomics and Health: Investing in Health for Economic Development*. Report of the Commission on Macroeconomics and Health. Geneva: World Health Organization.

WHO. 2004. *Death and DALY estimates [Data file]*. Available from the World Health Organization Web Site: http://www.who.int/healthinfo/global_burden_disease/en/

WHO 2006. *Dollars, DALYs and Decisions: Economic Aspects of the Mental Health System*. Geneva: World Health Organization.

WHO. 2011a. *Cost-effectiveness thresholds [Data file]*. Available from the World Health Organization Web Site: http://www.who.int/choice/costs/CER_thresholds/en/index.html.

WHO. 2011 b. "Metrics: Disability-Adjusted Life Year (DALY). Quantifying the Burden of Disease from mortality and morbidity". Accessed October 6th 2011. http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/.

Appendix 1: Tables

Table 1: SM2015 Payment Indicators in El Salvador

		TARGETS	
		(1) Baseline	(2) Model Estimated Targets
1. Modern contraceptive prevalence rate (mcpr)	0.42	0.53	0.62
2. Antenatal care before first trimester	0.85	1.02	0.95
3. Minimum of four antenatal care visits (in accordance with recommended best practices)	0.49	0.60	0.64
4. Postnatal care within seven days of delivery	0.75	0.86	0.85
5. Prevalence of anemia in children aged 6-23 months	0.43	0.33	0.33
6. MMR vaccination in children aged 12-59 months	0.89	1.00	0.95
7. Parasite treatment in children aged 12-59 months	0.39	0.50	0.60
8. Proportion of mothers who gave their children ORS and zinc during the last diarrhea episode	0.07	0.18	0.27
9. Prevalence of exclusive breastfeeding	0.55	0.66	0.70
10. Skilled attendance at birth in an institutional setting	0.82	0.93	0.90

Appendix 2: Excel Tool

This paper is accompanied by an Excel tool for the calculation of targets according to the simple framework presented. As an example, the case of El Salvador from the Salud Mesoamerica 2015 initiative is used in the file. The sources of information for this particular example were the latest available at the time of the exercise.

Instructions for the tool are presented below.

1. **Calculate v_i .** In sheet “Values,” input the following:
 - a. Number of DALYs per condition and age-gender group for country X. Source: (WHO, 2004), http://www.who.int/healthinfo/global_burden_disease/en/
 - b. Total population in age-gender group. Source: Most recent population census.
 - c. Gross national income (GNI) for country X. Source: (World Bank, 2009): <http://search.worldbank.org/data?qterm=GNI+per+capita+El+Salvador&language=EN&format=>

2. **Calculate d.**
 - a. In sheet “Targets,” fill in your list of indicators and check that the v_i values calculated in the “Values” sheet are properly linked in column B, “Unit Value (v_i).” Column C calculates the net present value of v_i ; the default is a 20-year horizon at a 12% discount rate.
 - b. In column D, input the number of individuals in the catchment area by indicator (for example, number of children 12-59 months old in the area that receive the program).
 - c. In columns E and F, input the length of the program in years and the total cost of the program, respectively.

3. **Calculate targets.**
 - a. In sheet “Targets,” input the indicators’ baseline levels in column H. That is, the indicators’ values for the year prior to the first year of program implementation.
 - b. In column I, input the indicators’ annual change that would have occurred without the program. In this case, this is the historical annual growth rate of each indicator.
 - c. Column J will show the estimated targets in accordance with all of the model’s parameters.