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Authors

Macinko, James
Harris, Matthew J
Rocha, Marcia Gomes

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Brazil's National Program for Improving Primary Care Access and Quality (PMAQ)

Fulfilling the Potential of the World's Largest Payment for Performance System in Primary Care

James Macinko, PhD;
Matthew J. Harris, DPhil, MBBS, MSc, FFPH;
Marcia Gomes Rocha, PhD

Abstract: Despite some remarkable achievements, there are several challenges facing Brazil's Family Health Strategy (FHS), including expanding access to primary care and improving its quality. These concerns motivated the development of the National Program for Improving Primary Care Access and Quality (PMAQ). Although voluntary, the program now includes nearly 39 000 FHS teams in the country and has led to a near doubling of the federal investment in primary care in its first 2 rounds. In this article, we introduce the PMAQ and advance several recommendations to ensure that it continues to improve primary care access and quality in Brazil. **Key words:** *Brazil, Family Health Strategy, pay for performance*

Author Affiliations: *Departments of Health Policy and Management and Community Health Sciences, UCLA Fielding School of Public Health, Center for Health Sciences, Los Angeles, California (Dr Macinko); Department of Primary Care and Public Health, and the Institute of Global Health Innovation, Imperial College London, United Kingdom (Dr Harris); and Inter-American Development Bank, Brasilia, Brazil (Dr Rocha).*

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PAY for performance is a strategy that has been developed to enhance achievement of certain targets and to motivate quality improvements in health care. In primary care, pay for performance has been implemented alone and in combination with a number of other approaches such as provider training through internships and residencies in specific primary care areas (family medicine, internal medicine, and pediatrics), other forms of certification such as provider licensure, and in-service training including

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Correspondence: *James Macinko, PhD, Departments of Health Policy and Management and Community Health Sciences, UCLA Fielding School of Public Health, 650 Charles E. Young Dr. South, Room 31-235B, Center for Health Sciences, Los Angeles, CA 90095 (jmacinko@ucla.edu).*

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detailing and continuing education of providers at each level (McDonnell et al., 2012; Talbot et al., 2009); electronic medical records and screening protocols including methods to enhance standardized prescribing of medications (Campbell et al., 2010; Fernandez et al., 2013); case management techniques, including coordination of care especially for individuals with complex or multiple health needs (Griffin et al., 2004; Joo & Huber, 2012); task shifting (Harris & Haines, 2012); and management techniques to modify the way providers are paid, including developing more collaborative supervision, goal setting, and continuous quality improvement initiatives (Pinheiro et al., 2009; Sicsic et al., 2012).

Some aspects of pay for performance related to successful achievement of program goals include careful attention to the incentives provided, assessing who receives the incentives, the size of the incentive (especially in relation to overall budgets/salaries), and the ways in which the incentives are delivered (ie, whether they are incremental for each percentage point increase or whether they are absolute in terms of reaching a certain threshold to earn a flat payment) (Lester et al., 2013; Li et al., 2014; McDonald & Roland, 2009; McDonald et al., 2009). However, little of this evidence has been generated in lower resource settings such as those experienced in Brazil, a higher middle-income country with a very large population and substantial socioeconomic and geographic inequalities.

This article discusses the Brazilian National Program for Improving Primary Care Access and Quality (called the PMAQ in Portuguese) and its pay for performance components. We briefly describe the primary health care system in Brazil and its flagship initiative, the Family Health Strategy (FHS or ESF in Portuguese) and the PMAQ, and then present a critical analysis of some of the program's features, focusing primarily on process and outcome indicators used in the certification process. We then focus on suggestions for improving some key indicators and describe elements that could be incorporated in ongo-

ing efforts to link the program with improved quality of care and better health outcomes.

THE FAMILY HEALTH STRATEGY: BRAZIL'S MAIN APPROACH TO PRIMARY CARE

In 1994, Brazil introduced the publicly funded and provided FHS as the operating model for delivering primary care, free at point of use, as part of a wider health and social care reform based on the new constitution of 1988. The FHS serves as a primary care provider and gatekeeper to Brazil's national health service (known as the SUS). The FHS is funded primarily through federal transfers but also includes financial contributions from states and municipalities. In Brazil's decentralized national health service, the 5 570 municipalities have primary responsibility for managing and delivering primary care. FHS teams are composed of a general practitioner, a nurse and nurse auxiliary, and 4 to 6 community health workers (Macinko & Harris, 2015). The FHS provides comprehensive, universal primary care to defined geographical catchment areas of between 3000 and 4000 inhabitants. Each team is responsible for its catchment area, with no overlap or gap between them. Residents of each area are registered with that particular team, although in many municipalities multiple teams are located in the same health facility. FHS teams are designed to facilitate access to the health system and to coordinate care provided by other services and providers.

Evidence suggests that the FHS has had an important impact on the health of the Brazilian population and the functioning of its national health service. Several studies have demonstrated that the FHS's expansion since 1994 has been related to lower rates of infant mortality, postneonatal mortality, and deaths in children younger than 5 years from respiratory infections and diarrhea (Rasella et al., 2010b). Expansion of the program has been associated with improvements in the quality of vital statistics (Rasella et al., 2010a), and increased detection and cure rates of both tuberculosis and leprosy (Nery et al.,

2014). The program has also had an important effect on adult health, including reductions in potentially avoidable hospitalizations for the most common chronic diseases (Macinko et al., 2010) and reductions in adult death from cerebrovascular and cardiovascular disease (Rasella et al., 2014). The cost of the FHS is difficult to estimate because there is no single budget item dedicated to all of its components, but pre-PMAQ estimates place it at around US\$50 per capita (Rocha & Soares, 2010). Consequently, the FHS is increasingly viewed as a reference model for primary care in low-, middle- and even high-income countries (Johnson et al., 2013).

Despite these remarkable achievements, the FHS faces several important challenges. These include the need to continue to expand access (the nearly 40 000 FHS teams currently cover only about 60% of the Brazilian population and are present in 95% of municipalities) and to reduce variations in the quality of the care FHS teams provide. These quality variations stem from differences in the availability of basic equipment, to staffing patterns and availability of different health professionals, to management and other institutional support available to teams in different municipalities (Facchini et al., 2008).

STRUCTURE AND PROCESSES OF THE PMAQ

Planning for the PMAQ began in 2010. To date, 3 cycles have taken place in 2011/12, 2013/14, and 2015/16. Participation in PMAQ

is voluntary and the number of registered FHS teams in the PMAQ has increased steadily from about half of all teams in the first cycle to more than 38 000 (nearly 100%) in the latest cycle (see the Table). The table also shows that the PMAQ has led to an increase in federal investment for infrastructure and performance incentives in primary care from R\$770 million in 2011/12 to R\$4.2 billion (about \$US 1.2 billion) in 2014/15.

In the PMAQ, financial incentives are provided against a wide variety of structure, process, and outcome indicators and involve several rounds of self- and external assessment of the FHS teams (Pinto et al., 2014). Assessments are carried out for each FHS team and involve facility assessments, examination of health indicators, and interviews with health care professionals, municipal managers, and service users. Note that, in the most recent PMAQ cycles, other entities such as the Primary Care Support Units (NASF) and Centers for Specialized Dental Care (CEOs) are included in the PMAQ scheme (see the Table). Three rounds of external assessments by independent academic institutions have been carried out so far, collecting information on hundreds of indicators for each of the FHS teams. Given this level of data collection (nearly 100 000 facility assessments and team interviews and more than 200 000 user interviews conducted since the program began), the PMAQ has become a vast repository of publically available data on user experience, structural adequacy of the health centers, clinical outcomes, and processes,

Table. Participation in PMAQ and Resources Distributed, by PMAQ Cycle^a

	Cycle 1 (2011/12) n (%)	Cycle 2 (2013/14) n (%)	Cycle 3 (2015/16) n (%)
Municipalities	3 965 (71.3)	5 211 (93.6)	5 324 (95.6)
FHS teams	17 483 (51.4)	30 523 (77.6)	38 865 (96.4)
Primary care support centers (NASF)	0 (0)	1 813 (46.5)	4 110 (93.2)
PMAQ-related investments (BR\$, in millions)	770	4 200	TBD

Abbreviations: FHS, Family Health Strategy; PMAQ, National Program for Improving Primary Care Access and Quality.

^aFrom the Department of Primary Care, Brazilian Ministry of Health.

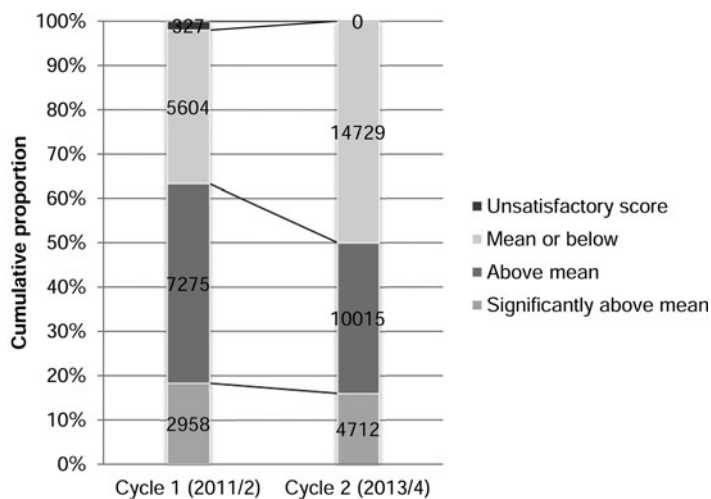
which is just beginning to be explored for research purposes. The microdata from cycle 1 (cycle 2 data are forthcoming) are available for download at the following site: http://dab.saude.gov.br/portaldab/ape_pmaq.php?conteudo=microdados.

To use this data for performance assessment, the Ministry of Health developed a formula (substantially revised in 2015 for PMAQ cycle 3) where teams are awarded an overall score that is a weighted average reflecting their participation in the self-assessment activities (10% of final score), performance on agreed-upon health indicators (10% of the final score), correct use of electronic health records (new in cycle 2 and weighted as 10% of the final score), and results from a set of indicators derived from the external evaluation (70%). Teams are then grouped by the overall human development index for their municipality to create several strata of similar socioeconomic environments. Then, a mean score is calculated for each stratum and each team is classified as being at or below the mean score for their stratum, above the mean, or significantly above the mean (≥ 2 standard deviations). Financial incentives are then allocated as follows: those at or below the mean receive 20% of the total quality bonus, those above the mean receive 60% of the total bonus, and

those significantly above the mean receive 100% of the bonus.

The Figure presents results from the first 2 cycles, showing the number and relative proportion of teams scoring at each level. In the first cycle, about 58% of teams scored above or significantly above the mean, whereas in the second cycle, only about 48% of teams scored above or significantly above the mean. This difference is likely to reflect the fact that, in the first cycle, only about half of all FHS teams decided to participate and those teams seem to have had better performance overall. This selection bias should be eliminated during the third PMAQ cycle because nearly all teams in the country now participate in the program.

To enhance transparency and citizen participation, each team's score is made publicly available via the Ministry of Health's Web site (see http://dab.saude.gov.br/portaldab/cidadao_pmaq2.php). The site allows citizens and health managers to access each team's performance overall, to assess aggregate user recommendations (percentage of those interviewed who would recommend the team to their friends or family) and compare team scores to municipal, state, and national averages. In spite of this ambitious public information campaign, to date, there is little



Numbers represent teams scoring in each category in each cycle.
Data source: Department of Primary Care, Brazilian Ministry of Health

Figure. Performance evaluation of Family Health Strategy teams, by final score and PMAQ cycle.

information on how frequently users access this information or how it might affect their health care use.

Although similar in many respects to other quality improvement initiatives, the PMAQ has several important differences from other international experiences (Harris, 2012). First, the Ministry of Health provides the incentives, but the payments do not go directly to the health care provider or team. Instead, they go to the municipality. The municipality, in turn, does not automatically transfer money directly to the health care teams based on their performance. Instead, the municipality provides salaries, information, technical assistance, supplies, infrastructure, and other factors that may help teams perform better. Some municipalities do provide bonus payments to health providers, but little is known about how many municipalities actually do this, which team members receive the bonuses, or how the bonus payments relate to the total incentive.

Second, the PMAQ relies on voluntary participation and it is the individual health team that chooses to participate, not the municipality. Although FHS teams are the most prevalent type of delivery model in primary care, there is also a "traditional" public primary care network as well as private services (about 26% of the Brazilian population has a private health plan). Because only the FHS and their associated oral health teams participate in the PMAQ, in municipalities with a mix of private, traditional public, and FHS teams, this heterogeneity could be a substantial barrier to assessment of the impact of the PMAQ on health outcomes that are usually calculated at the municipal level.

Third, the current PMAQ scheme has a number of clinical outcome indicators primarily for chronic disease, but some lack a strong evidence base. Cancer is the second leading cause of years of life lost (YLL) in Brazil; however, in the PMAQ existing indicators focus only on breast and cervical cancer. A substantial number of YLL are lost in Brazil because of intentional and unintentional injuries, and although there is evidence that primary care can

help families enhance their personal safety at home and on the road, the PMAQ does not yet address this. Other important diseases such as respiratory conditions are not included in existing indicators. The primary care setting may help identify specific high-risk populations such as youth, pregnant women, and those with chronic diseases who may need additional motivation for smoking cessation therapy (a factor now incorporated into the third PMAQ cycle). Finally, adult vaccinations such as influenza and pneumococcus are not yet part of the PMAQ indicators, although they may potentially have very large impacts on vulnerable populations.

Fourth, municipalities may choose to invest in the teams that are already performing well to move them to the highest possible level of quality. Alternatively, municipalities may choose to invest in those teams that obtained the lowest scores, moving them up to the next level in the quality scale. The question is: Which strategy will the municipality pursue? There are potential unintended consequences of differential municipal participation in the program, and it is possible that the program will increase inequalities. The first strategy might worsen inequalities in health care because it favors improving those teams that are already doing well. The second strategy could decrease inequalities in health care because it favors improving the teams that are doing the worst. However, it might very well be that the municipality would need to invest much more effort in improving teams at the lowest end of the spectrum because they may be facing a more complex situation in terms of the health professionals working there and/or a population that has greater or more complex health needs. These are precisely the types of decisions that at this point are not being explicitly guided by the PMAQ but that will need to be monitored in the future if the pursuit of equity becomes a more central part of quality improvement efforts.

The PMAQ external evaluation includes interviews of 4 randomly selected users within the health facilities about their health care experiences, including the most recent health care screening they have received. One

difficulty with this method is that it only captures people who are physically present in the health unit on the day of the evaluation, meaning that those people who have very poor access and are unlikely to have received such preventive screening are excluded. This could overestimate levels of screening in the general population, and teams could therefore artificially reach quality targets without having an impact on population health. Ultimately, the systematic use of medical records for reporting on quality needs to be linked to greater integration among the country's various health information systems. The most recent rounds of the PMAQ assess teams on their use of Brazil's newly implemented system of electronic medical records, but these electronic records are not yet used to calculate quality indicators.

MOVING FORWARD WITH PAY FOR PERFORMANCE IN BRAZIL

The PMAQ has great potential to expand coverage of the FHS and to improve the quality of the services it delivers. It has already evolved substantially based on experiences from its first 2 cycles and continues to make adjustments in subsequent iterations. Because of its scale and the heterogeneity among Brazil's 5700 municipalities, the program has great potential to inform larger questions about the impact of financial incentives on quality within the context of a public health service in a middle-income country. There are opportunities as well to assess ongoing debates over whether it is the financial mechanism or another mechanism such as comparison among peers that may drive performance improvement (Sicsic et al., 2012). Finally, international experiences show that it is important to be vigilant about avoiding unintended effects. This includes inadvertently increasing inequalities, avoiding ceiling effects whereby teams improve only up until a specific quality goal but not beyond, and avoiding reductions in important clinical activities that have not been included in the incentive scheme (Doran et al., 2011). Few of these phenomena have been well studied in

the context of a large middle-income country like Brazil.

New developments in the third (current) PMAQ cycle include defining in more concrete terms the specific elements required for accreditation of teams, refining the methods for calculating team scores, and performing full external reviews less frequently for teams that have been included in previous assessments. This more streamlined approach will likely allow teams more time to dedicate to quality improvement efforts and free up resources currently being used for data collection every year to allow more time to be spent on data analysis and interpretation.

In addition, the Brazilian context provides important opportunities to test more participatory and systematic approaches to the review, definition, and prioritization of quality indicators in primary care. This is important because the list of indicators included in the external evaluation is considered by many to be overly detailed, with many indicators focused on inputs and less emphasis on processes or outcomes. It will also be important to better understand what can be gained from data collected on user satisfaction and the collection of these data could be integrated with Brazil's existing participatory health councils. As the systematic use of such data is new in most of the world's health systems, it will be important to continue to share national and international experiences and to be flexible in adopting new approaches (Roland et al., 2009).

Finally, quality improvement initiatives such as the PMAQ require a forum for the analysis and dissemination of quality information and best practices, developing and monitoring professional training and continuing medical education, monitoring and evaluation of quality indicators and targets, performing inspection and accreditation functions, performing operations research, systematically evaluating evidence and technology for cost-effectiveness, and the development and testing of clinical guidelines. Because these functions require a critical mass of expertise, a certain level of authority, and some measure of autonomy, several countries have moved

to create institutions dedicated to these functions (Willcox et al., 2011). The scope and practice of each of these quality assurance institutes differ markedly among countries and range from organizations that simply provide leadership in education such as in Australia to those that have regulatory and inspection components such in the United Kingdom and the Netherlands. Given the size, scope, and complexity of the PMAQ program, it may be worth considering how to institutionalize these functions within Brazil.

CONCLUSIONS

Based on the number of teams participating and the more than 100 million users involved, the PMAQ may well be the world's largest pay for performance program in primary care. It has so far been instrumental in increasing investment in primary care in Brazil. It has

been the subject of intensive review in the design and implementation stages by international partners such as the Inter-American Development Bank and the Pan-American Health Organization, and by national experts from the federal and local governments, from universities, and from the international community. The PMAQ offers an extraordinary opportunity to study the effects of incentive mechanisms on primary care performance, and the data it has generated are beginning to be used by researchers and managers alike. Although there is no perfect model for incentive programs, there are ample opportunities to continue to improve the PMAQ. However, the future of the FHS and achievement of its potential will depend on continued financial, technical, and intellectual investments, all of which are dependent on continued political support, which is in doubt given the current political and economic climate in Brazil.

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