More Doctors recruitment program: a new approach to overcome inequalities in human resources*

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ABSTRACT
Despite the 40 years elapsed since the Alma-Ata principles were first declared, a series of challenges persists for the consolidation of primary health care (PHC) as the backbone of health care systems around the world. Among these challenges, especially noteworthy are the issues associated with inequality in the allocation of human resources. The experience of the More Doctors Program (Programa Mais Médicos, PMM) in Brazil is an example of initiatives that tackle the unfinished Alma-Ata agenda. By changing key aspects of physician training, provision, and allocation, PMM proved to be a feasible way to minimize the challenge of physician shortages. Assessments of PMM, though preliminary, have produced positive evidence showing increase in access and improvement of PHC quality in Brazil, a middle-income country. Nevertheless, it is urgent to produce more robust evidence regarding the impact of PMM on PHC performance indicators. The discussion proposed in the present article emphasizes the need to prioritize quasi-experimental studies to measure the impact of PMM on population health. The article introduces a set of guidelines that may become a useful model to address the challenges associated with the shortage of health care professionals in low- and middle-income countries.

Keywords
Human Resources; health care delivery; distribution of physicians; resource allocation for health care.

Forty years ago, the Declaration of Alma-Ata laid out the principles of primary health care, indicating the priorities that countries must address to meet the challenges of health-related issues (1). While many nations have made substantial efforts to operationalize the principles of primary health care (PHC) espoused in Alma-Ata, to date it has proven impossible to fully implement the agenda set out in 1978 (2). Despite the inability to satisfactorily meet the challenges identified in 1978, it should be recognized the situation today is different from what it was 40 years ago at the time of the Alma-Ata conference. There is now a wealth of evidence on the effectiveness and

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efficiency of PHC. Countries with robust PHC systems have better health indicators at a lower cost (2). Lower co-payments, a wider array of PHC services, and alignment of services with the needs of the population are all associated with better health outcomes (3).

This progress has occurred especially in low- and middle-income countries (LMIC), although much remains to be done. Without robust PHC, there is no way to ensure that the current barriers related to poor performance and quality, lack of access, inequities, shortages of human resources, and lack of alignment between the care provided and community needs can be satisfactorily addressed (4).

Expanding access is still a critical need in many LMICs, which have been unable to provide adequate support for initiatives to strengthen PHC (4). The factors contributing to this situation include a scarcity of public policies, poor governance, population growth, inadequate health systems, limited evaluations of PHC initiatives, and the absence of policies for managing human resources for health (HRH). Limited funds for research are exacerbating this situation (4). One review has noted the lack of rigorous evidence to support the implementation of PHC policies and the development of HRH management practices, especially in LMICs (5).

Motivated by the unfinished Alma-Ata agenda and the urgent need to generate evidence to tackle these challenges, this article focuses on an initiative designed to address the situation in Brazil by eliminating inequities in the distribution and supply of physicians: the More Doctors [Mais Médicos] Recruitment Program (PMM). The PMM has proven a viable way to solve current problems in the Americas that were present at the time of the Alma-Ata discussions. Nevertheless, its evaluation has proven a challenge in terms of understanding which indicators actually reflect the PMM’s impact on population health: an innovative program needs innovative types of evaluation.

INEQUITY IN THE DISTRIBUTION OF HUMAN RESOURCES AND STRATEGIES FOR IMPROVEMENT: THE MORE DOCTORS RECRUITMENT PROGRAM

Inequity in the distribution of physicians has been a global problem since the 1960s (6). Another problem is too few physicians, especially in more vulnerable and remote areas (7). These issues have affected poor and wealthy nations alike and, up to now, have been an unmet challenge (8). As late as mid-2013, the situation in Brazil was no different than the global picture.

In recent years, Brazil’s Unified Health System (SUS) has been in the restructuring process, introducing activities that prioritize primary care (9). Although the new initiatives aim at reducing the vulnerability of certain population groups (9), access is still a chronic problem in certain locations. To address this situation, the PMM was designed as a strategy for rethinkign medical training and physician availability through a partnership of the Pan American Health Organization (PAHO), the Ministry of Health of Brazil, and the Government of Cuba.

The PMM was created in 2013 to increase physician availability in the SUS, primarily in areas with few physicians per inhabitant (6). The program has three lines of action: introducing changes in the courses taught in medical school and increasing the number of open positions; reorganizing primary care units (UBS); and increasing the number of physicians on an emergency basis by hiring Brazilian physicians, Brazilians trained abroad, and foreign physicians for a 3-year period (with the possibility of a 3-year extension) to work in locations with a shortage of this type of personnel (6). By mid-2015, 18,240 physicians were working in 81% of Brazil’s municipalities, and provisions had been made to create 11,500 new posts for medical-school graduates (9).

In addition to introducing emergency measures to increase the number of physicians to give underserved populations greater access to health services, the PMM’s three lines of action alter the structure of medical education in Brazil in the medium and long term (10). By restructuring the way physicians are distributed and rethinking medical education, the PMM puts the availability of physicians for PHC squarely at the center of the country’s health policy debate. It also gives HRH managers a leading role in Brazilian PHC policy.

Almost five years after the launch of the PMM, it is now time to demonstrate its effectiveness with respect to expanding access, improving quality, changing medical education, and heightening the impact on population health indicators. The PMM is a key strategy for eliminating social and regional inequalities in Brazil (11). Generating evidence can consolidate the program as a means of tackling inequities, with the potential for application in other regions in the Americas.

URGENCY OF GENERATING EVIDENCE ON PMM RESULTS

The analysis of aspects associated with HRH management in Brazil described in this article indicates a trend toward change in HRH indicators. For example, spatial clustering was employed to examine physician turnover rates, using data from the National Census of Health Facilities (CNES). This exercise revealed a drastic reduction in physician turnover in regions that had exhibited high turnover rates prior to the PMM, coupled with continued low turnover rates in subsequent years (Figure 1). While not exclusively focused on municipalities with the PMM, the analysis shows a change in the country’s situation after the introduction of the program.

Another aspect examined was the average time, in years, that physicians spent on primary care teams. In the years following program implementation, there was a reversal of the trend in the series data. Even taking the necessary precautions to avoid a spurious association, it can be seen that the average time that physicians spent on PHC teams, which had been decreasing, began to increase in 2014 in most regions in Brazil (Figure 2).

Despite this general evidence on the human resources situation in Brazil, other studies sought evidence associated with the PMM. These works looked at training (12), user satisfaction (13), impact in terms of volume of hospitalizations for primary care-sensitive conditions (HPSC) (14), distribution of physicians (15), reduction of inequities, (6) and performance evaluation using a quasi-experimental approach (16).

Beyond the specific results described, the importance of broader evidence-mapping efforts should be emphasized. An article on the scientific output associated with the PMM provided a systematized survey of the results obtained by the PMM (17). This publication identified 82 works on the PMM, analyzing 54 of them in terms of...
FIGURE 1. Spatial clusters of values associated with primary care physician turnover, Brazil

Source: The authors, based on data from the National Census of Health Facilities (CNES).

*Red: spatial clusters with high physician turnover; blue: clusters with low physician turnover; yellow: regions not categorized as belonging to statistically significant clusters.

FIGURE 2. Average time, in years, spent by physicians on primary care teams, Brazil

Source: The authors, based on data from the National Census of Health Facilities (CNES).
Howard White (19) examines the basic principles for demonstrating the impact of public policies. He defines the basic steps as: 1) map out the causal chain; 2) understand context; 3) anticipate heterogeneity; 4) rigorous evaluation of impact using a credible counterfactual; 5) rigorous factual analysis; and 6) use of mixed methods and approaches. The challenge of using these principles to evaluate health policies lies in the difficulty of compiling evidence that will enable each of these steps to be completed (20).

Considering this gap, a parameter can be sought that will permit application of White’s model to the PMM context. Measuring the impact of policies involves comparing the metrics of subjects who have been exposed to the intervention with those of subjects who have not. The complexity of the social environment lends elements of unviability to this task. A simulation of the situation is therefore necessary to determine policy impact (20).

Mapping the causal chain of a program (step 1) involves a detailed analysis of how the intervention should achieve the intended impact. In the case of public policies such as the PMM, this can be done through an analysis of decrees, regulations, and general guidelines that establish how the policy is expected to operate.

Step 2 implies an understanding of the policy’s context. This step requires an examination of social, political, and economic aspects that can influence the policy’s impact (20). In the specific context of the PMM, the sociodemographic characteristics of the regions where the teams operate and the profile of the beneficiary population must be considered and the eventual conclusions adjusted to the present political crisis in Brazil. Herein lies the first operational challenge. Vital statistics and sociodemographic and income data, for example, are published only annually, by municipality. However, there are different neighborhoods within a single municipality—for example, in Belo Horizonte—that have human development indexes (HDI) as different as those of Switzerland and South Africa, but are only a few streets apart (21). Thus, for an approach to adequately provide a context for the different scenarios necessary for an impact assessment, its design must be as detailed as possible.

Step 3 presents another operational challenge. By anticipating heterogeneity, variations in impact can be scaled to the design of the intervention, beneficiary characteristics, or socioeconomic and temporal context (20). Approaches must therefore be developed that examine the available contextual information in the greatest possible detail to anticipate the effects of potential confounding factors that can influence the results obtained.

Steps 2 and 3 are the basis for defining what is stipulated in step 4—that is, satisfactory assessment of policy impact. Defining counterfactuals makes it possible to simulate the hypothetical situation for comparison between people who have and have not been exposed to the intervention. The greater the capacity to define rigorous counterfactuals, the better the chances of identifying pre- and post-exposure differences attributable to the policy being evaluated (20). In order to tackle the challenges between steps 2 and 4, a mixed methodology was developed to determine the association between the PMM and health outcomes, tailoring it as closely as possible to the Brazilian context.

Thanks to the availability of structured information in health information systems, even with some deficiencies, an innovative approach was developed for the definition of rigorous counterfactuals for the PMM. Using data from the National Census of Health Facilities (CNEs), all the country teams that received PMM professionals were geolocated (Figure 3).

By mapping primary care units (UBS), areas of potential coverage were created, reflecting a portion of the territory covered by each UBS in the country. This methodology had already been used with relative success in a study to evaluate equity in access to primary care services (22). Once this area had been identified, data could be obtained from the census sectors of each potential area. Data could then be obtained on basic sanitation, the ratio between the sexes, level of schooling, income, and household composition. This data set is valuable for complying with the stipulations in steps 2 and 3 of the White model.

HPCSC were selected as the outcome measurement selected for evaluating the impact of the PMM, since they offer a synthetic measurement of the quality of primary care services provided to the population (23). Unfortunately, HPCSC figures are disseminated only in aggregate form by DATASUS, making it impossible until recently to link them with the
health teams or health units. To solve this problem, Rocha et al. (24) developed a HPCSC geolocation approach. By applying this approach, and defining a potential coverage area for the teams, the burden of HPCSC can be attributed to a specific UBS. Rocha et al. (24) applied a pilot of this methodology to patients with these conditions admitted to Brazilian hospitals in the state of Goiás (Figure 4).

Spatialization of HPCSC revealed different cluster patterns, indicating the importance of ensuring that the new approach consider the assumptions established in White’s model. By adding information from the surveyed sectors, potential coverage areas, primary care teams, and geolocated HPCSC, it is possible to separate PMM teams from the non-PMM teams for comparison purposes. This comparison by sociodemographic, income, and basic sanitation confounders can be made in a controlled manner to simulate exposure or non-exposure to the intervention. Since the historical series for HPCSC covers the period 2008-2018, a baseline for the situation prior to the PMM can be established and its post-implementation trajectory tracked.

Steps 5 and 6 of White’s model can then be implemented. This would involve geographically superimposing the mapping information on the potential UBS coverage areas and the geolocation of HPCSC. A rigorous factual analysis can be conducted by comparing the outcomes of the PMM primary care teams with those of the non-PMM teams. The steps used for the PMM can be replicated for other PHC initiatives. Translating

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**FIGURE 3. Geolocation of primary care units (UBS) that received professionals from the More Doctors recruitment program, Brazil, December 2015**

Source: The authors, based on data from the National Census of Health Facilities (CNES).

**FIGURE 4. Geolocation of hospitalizations for primary health care-sensitive conditions in hospitals in Goiás, Brazil, 2015 Brazil**

Source: The authors, based on data from the Hospital Information System (SIH).
them to other contexts in the Americas will require them to be tailored to the local situation, but if the sequence of steps outlined is followed, sound approaches for assessing the impact of HRH policies can be developed.

**OUTLOOK FOR THE AMERICAS**

The use of quasi-experimental methodologies for public policy assessment is advisable, since, in many situations, designs based on randomized tests cannot be used. Quasi-experimental approaches are the best possible standard for assessing the impact of public policies. Specific recommendations for conducting evaluation studies grounded in these principles already exist (25). The use of models based on tests with a stepped wedge design has gained popularity due to their ability to include the characteristics of public policies and thus permit quasi-experimental designs.

Dal Poz et al. (26) conducted an interesting study that evaluated HRH management programs in the Americas, noting the fragmentation and segmentation of health systems in Latin American and Caribbean countries—characteristics that are a major barrier to expanding coverage, achieving integrated primary health care, and reducing the inefficiency and discontinuity of care (26). They also indicated that HRH management programs in 15 countries in the Americas have common problems, such as the lack of political and financial support (26). Despite these challenges, the solution recommended in the study involves sharing practices, pre-planning activities, evaluating initiatives, and replicating successful programs.

The approach highlighted in this article includes a number of conceptual and impact assessment measures for meeting the challenges of HRH management. It also notes the PMM’s potential for meeting challenges that have persisted for decades. Without appropriate distribution of professionals with the right training profile and capacity to provide health care where it is needed, fulfillment of the basic parameters defined in Alma-Ata cannot be guaranteed.

The PMM approach and evaluation design illustrated here can be tailored to other regions in the Americas with inequities in the distribution of health professionals. The use of mixed methodologies has created the conditions for meeting the challenges associated with the design of quasi-experimental studies for policy evaluation. The PMM’s success in overcoming difficulties can serve as a lesson for improving practices and contributing to a more effective arrangement of public initiatives for dealing with the shortage of health professionals.

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RESUMEN

Programa Más Médicos: cómo evaluar el impacto de un enfoque innovador para superar las inequidades en recursos humanos

A pesar de que han transcurrido 40 años desde la proclamación de los principios de Alma-Ata, aún persisten desafíos para la consolidación de la atención primaria de salud (APS) como columna vertebral de los sistemas de atención de salud en todo el mundo. Entre estos desafíos, se destacan los problemas asociados con la desigualdad en la distribución de recursos humanos. La experiencia del Programa Más Médicos (PMM) en Brasil es un ejemplo de las iniciativas que abordan esta agenda inconclusa de Alma-Ata. Al cambiar aspectos clave de la capacitación, la provisión y la asignación de médicos, el PMM demostró ser una alternativa viable para minimizar el desafío de la escasez de profesionales. Las evaluaciones del PMM, aunque preliminares, han producido evidencias positivas que muestran un aumento en el acceso y mejora de la calidad de la APS en Brasil, un país de ingresos medios. Sin embargo, urge generar evidencia más sólida sobre el impacto del PMM en los indicadores de desempeño de la APS. La discusión propuesta en este artículo enfatiza la necesidad de priorizar estudios cuasiexperimentales para medir el impacto del PMM en la salud de la población. El artículo propone un conjunto de directrices que pueden convertirse en un modelo útil para abordar los desafíos asociados con la escasez de profesionales de la salud en países de ingresos bajos y medios.

Palabras clave

Recursos humanos; prestación de atención de salud; distribución de médicos; asignación de recursos para la atención de salud.
RESUMO

Programa Mais Médicos: como avaliar o impacto de uma abordagem inovadora para superação de iniquidades em recursos humanos

Apesar de decorridos 40 anos da divulgação dos princípios de Alma-Ata, ainda persistem desafios para a consolidação da atenção primária à saúde (APS) como eixo nor- teador dos sistemas de saúde ao redor do globo. Dentre os desafios ainda presentes, merecem destaque as questões associadas à iniquidade na distribuição de recursos humanos em saúde. A experiência do Programa Mais Médicos (PMM) no Brasil é um exemplo de proposta voltada para a abordagem dessa agenda inconclusa de Alma-Ata. Ao modificar aspectos centrais da formação, provimento e alocação de profissionais médicos, o PMM mostrou-se uma saída viável para minimizar os desafios de escassez de profissionais. As avaliações do PMM, embora incipientes, produziram evidências positivas quanto a ampliação do acesso e melhoria da qualidade da APS no Brasil, um país de médio desenvolvimento econômico. Apesar disso, é premente a geração de evidências mais sólidas a respeito do impacto do PMM sobre indicadores de desempenho da APS. O debate apresentado ao longo deste trabalho discute a necessidade de se viabilizar estudos quase-experimentais capazes de mensurar o impacto do PMM junto à saúde da população. O artigo propõe, então, um conjunto de diretrizes que pode se configurar como um modelo aplicável para abordar desafios associados à escassez de profissionais em países de médio e baixo desenvolvimento econômico.

Palavras-chave: Recursos humanos; assistência à saúde; distribuição de médicos; alocação de recursos para a atenção à saúde.