Identifying strategies to reduce the Peruvian rural physician deficit and promote health equity: A multiphase exploratory study

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ABSTRACT

Introduction:

It is recognized by all countries that health inequities exist, regardless of economic development. Rural communities tend to be underserved, with a low number of trained health workers and professionals tending to their needs. Evidence in high-income countries would suggest that certain strategies of recruitment and training work to increase rural health coverage; however, it is unclear whether low- and middle-income countries (LMICs) have the same barriers and opportunities, and thus may employ the same strategies.

One such country is Perú, a middle-income country located in South America, with an uneven distribution of healthcare coverage affecting its rural areas. This study seeks to understand why physicians in Perú may or may not decide to practice in rural settings. We conducted a Mixed Methods Research (MMR) study to generate information relevant to policy-makers, as it is important to understand what factors most of the future physicians focus on and why and how they feel affected by said factors, to better direct resources into effective solutions.

Methods:

We used a multiphase exploratory study design consisting of: 1) a literature review, 2) a qualitative research study, and 3) a quantitative survey. The literature review was used to identify key strategies for rural recruitment and retention used internationally, though the evidence-base for LMICs is relatively sparse and transferability of these strategies to the Peruvian setting is unclear. Therefore, a qualitative study involving focus groups and in-depth individual interviews with physicians and experts in Perú was used to better understand the reasons for physicians to

remain in the urban areas and what can be done to improve healthcare access in the underserved rural populations. Purposive sampling for maximum variation was used to recruit physicians and experts with a varied set of characteristics. The emerging themes from the literature review and qualitative study informed the elaboration of a survey administered to the graduating medical students in their 6th year of medical studies in Perú to quantify what proportion share similar concerns and what strategies would most likely be effective.

Results:

From the literature review and qualitative study, 6 main themes and 19 sub-themes emerged regarding factors that influence physician rural recruitment and retention internationally and in Perú, as well as potentially effective strategies for addressing these. The scientific literature suggests strategies regarding the recruitment of specific applicant profiles for medical school and their education in and for the rural areas. Interview and focus group participants in Perú prioritized the safety of the practitioners when travelling and working in the rural areas, followed by the fulfillment of basic needs such as shelter, water and adequate food. To promote rural recruitment, Perú must first surpass certain basic hurdles that are largely absent in high-income countries with more developed social security nets and national policies and systems for the redistribution of wealth, and thus strategies for fulfilling or at least mitigating many of these basic needs at the base of Maslow's hierarchy are not emphasized in international literature.

Conclusions:

For higher-income countries, strategies focused on improving the profile of medical recruits and educating them to respond to the social needs of the country, while securing higher

needs like professional development, family considerations and social and personal fulfillment should help reduce the inequities in the rural regions. This study has shown that for Perú, and potentially other LMICs, it is necessary to first ensure the basic needs and safety of professionals, and that may prove difficult to achieve with low economic resources to distribute. Strategies including the development and deployment of teams to healthcare posts with dedicated, secure and well-maintained living quarters could help surpass some of these barriers, among other possible solutions, while also finding ways to redirect resources into the improvement of the general conditions of the rural areas.

RÉSUMÉ

Introduction:

Tous les pays, quoique soit leur niveau de développement économique, reconnaissent l'existence d'inégalités en matière de santé. Les communautés rurales en particulier ont tendance à être mal desservies, avec souvent un faible nombre de professionnels de la santé qualifiés disponibles. Les données récentes provenant de pays à revenus élevés suggèrent que certaines stratégies de recrutement et de formation contribuent à accroître la couverture sanitaire en milieu rural. Cependant, il n'a pas été démontré que les mêmes stratégies fonctionneraient dans les pays à revenu faible et intermédiaire (PRFM).

Le Pérou est un pays à revenu intermédiaire situé en Amérique du Sud avec une répartition inégale de la couverture de santé, au désavantage de ses zones rurales. Cette étude cherche à comprendre les raisons qui poussent les médecins au Pérou à pratiquer en milieu rural ou urbain. Nous avons utilisé des méthodes mixtes afin de cerner les divers facteurs qui influencent les médecins afin que les futures politiques puissent mieux diriger les ressources nécessaires dans des solutions efficaces.

Méthodes:

Nous avons utilisé un modèle d'étude exploratoire multiphases comprenant: 1) une revue de la littérature, 2) une étude de recherche qualitative et 3) une enquête quantitative. La revue de la littérature a été utilisée pour identifier les stratégies clés de recrutement et de rétention en milieu rural utilisées au niveau international, bien que les bases factuelles pour les PRFM soient relativement rares et que la transférabilité de ces stratégies au contexte péruvien ne soit pas claire.

Par conséquent, une étude qualitative impliquant des groupes de discussion et des entrevues individuelles avec des médecins et des experts au Pérou a été conduite pour mieux comprendre les raisons pour lesquelles les médecins restent dans les zones urbaines, et ce qui peut être fait pour améliorer l'accès aux soins de santé dans les populations rurales mal desservies. Une stratégie d'échantillonnage dirigé a été utilisée pour recruter des médecins et des experts présentant un ensemble varié de caractéristiques. Les thèmes émergents de la revue de la littérature et de l'étude qualitative ont servi de base à l'élaboration d'un questionnaire administré à des étudiants en médecine de 6e année au Pérou pour évaluer la proportion de préoccupations similaires, ainsi que quelles stratégies seraient les plus susceptibles d'être efficaces.

Résultats:

De la revue de la littérature et de l'étude qualitative, 6 thèmes principaux et 19 sous-thèmes ont été relevés concernant les facteurs qui influencent le recrutement et la rétention des médecins en milieu rural au Pérou et au niveau international, ainsi que les stratégies potentiellement efficaces pour les résoudre. La littérature scientifique suggère des stratégies comme le recrutement de profils de candidats spécifiques pour les facultés de médecine, ainsi que leur formation dans les zones rurales. Les participants aux entrevues et aux groupes de discussion au Pérou ont abordé la délicate question de la sécurité des médecins lorsqu'ils voyagent et travaillent dans les zones rurales, ainsi qu'aux besoins fondamentaux des professionnels de la santé tels que le logement, l'eau et une nourriture adéquate qui ne sont pas nécessairement présents en milieu rural Péruvien. Pour promouvoir le recrutement en milieu rural, le Pérou doit d'abord surmonter certains obstacles de base qui sont largement absents dans les pays à revenu élevé dotés de filets de sécurité sociale plus développés et de politiques et systèmes nationaux de redistribution de la richesse. Les besoins

fondamentaux à la base de la hiérarchie de Maslow ne sont pas soulignés dans la littérature internationale.

Conclusions:

Pour les pays à hauts revenus, les stratégies visant à améliorer le profil des recrues dans le domaine médical et à les former pour répondre aux besoins sociaux du pays, tout en répondant à des besoins plus élevés tels que le développement professionnel, les considérations familiales et l'épanouissement social et personnel, devraient contribuer à réduire les inégalités en santé en milieu rural. Cette étude a montré que pour les PRFM, il est nécessaire d'abord d'assurer la couverture des besoins de base et la sécurité des professionnels, ce qui peut s'avérer difficile à réaliser avec les ressources économiques actuelles de ces pays. Des stratégies comprenant le développement et le déploiement d'équipes sur des postes de soins de santé dotés de locaux d'habitation dédiés, sécurisés et bien entretenus pourraient aider à surmonter certaines de ces barrières pourraient être envisagées. D'autres solutions pourraient également passer par l'allocation de ressources à l'amélioration de la situation générale de la population en zones rurales.

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LIST OF ABBREVIATIONS

CME/PD	Continuous Medical Education/Professional Development
IMG	International Medical Graduate
IRB	Institutional Review Board
HRH	Human Resources for Health
LMICs	Low- and Middle-Income Countries
NOSM	Northern Ontario School of Medicine
SERUM	Urban-Marginal and Rural Service
WHO	World Health Organization

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NOTES ON MANUSCRIPT-BASED THESES

The following paragraphs are quoted from the Faculty of Graduate and Postdoctoral Studies at McGill University Manuscript-Based (Article-Based) Theses (updated 2017-07-30).

As an alternative to the traditional thesis format, the thesis research may be presented as a collection of scholarly papers of which the student is the author or co-author; that is, it can include the text of one or more manuscripts, submitted or to be submitted for publication, and/or published articles reformatted according to the requirements described below. Manuscripts for publication are frequently very concise documents. The thesis is expected to be a more detailed, scholarly work than manuscripts for publication in journals. A manuscript-based thesis will be judged by the examiners as a unified, logically-coherent document in the same way a traditional thesis is judged.

A manuscript-based thesis must:

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In the case of multiple-authored articles, the student must be the primary author. Multiple-authored articles cannot be used in more than one thesis. In the case of students who have worked collaboratively on projects, it may be preferable for both students to write a standard format thesis, identifying individual contributions. (See Intellectual Property re: required permissions/waivers.)

For this thesis, I have followed the McGill requirements for thesis preparation.

CONTRIBUTION OF AUTHORS

As a MSc candidate and first author on the manuscript, I was responsible for designing and adapting the research protocol, conducting the literature review, conducting the focus groups and individual interviews, overseeing the data transcription, conducting the data analysis, synthesizing the findings and interpreting these considering the existing evidence.

The overall concept of the research, as well as the original protocol and interview guides, was developed in collaboration with my supervisor, Dr. Anne Andermann, and was reviewed by the thesis committee. I was solely responsible for writing the outline and first draft of both the thesis and the article, as well as incorporating iterative suggestions for improvements made by my supervisor and the members of the thesis committee.

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1. CONTEXT

1.1 INTRODUCTION

Health equity is a concern for all countries, regardless of their level of economic development [1,2]. Retention of health workers, especially for rural and remote populations, has proven challenging in both high-income and low- and middle-income countries (LMICs) [1,2]. In 2010, the World Health Organization (WHO) emphasized the necessity of improving access to qualified Human Resources for Health (HRH) and compiled a set of strategies and recommendations to reduce the differences in quantity and quality of health workers in rural and underserved areas [3].

Perú, located in South America, has an uneven distribution of physicians between the urban and rural settings in its territory, with 60% of the medical workforce residing in the Capital [4,5]. The WHO recommendations state that there is enough evidence in high-income countries to apply some known strategies, but further research is required to solve the issues in LMICs [3]. There is little literature exploring the barriers and facilitators that exist in these countries, despite an abundance of data reflecting the lack of physicians in the rural areas [4-7].

1.1.1 Human Resources for Health: A global challenge

Resource-sharing has long been inequitable in most of the world, and health-related resources (human or not) persist as one of the most unevenly distributed in both high-income countries and LMICs [1]. As the latter also suffer from economic and educational disparities, the

differences become even more apparent. The rural areas of these countries usually lack infrastructure, road access, economic investment and other basic requirements [1]. In terms of HRH physicians and other health workers tend to settle in the urban areas, with only a small percentage practicing in the rural setting. In 2010, the WHO compiled a report stating that 50% of the world population lived in the rural areas, while only 25% of the physicians serve these regions [3]. Adding to the problem, in 2015 the International Labour Organization reported that 56% of the global rural population lacks health coverage [1].

While global urbanization has increased through the years, reflecting in an improvement of health coverage and access, further analysis has shown that this does not translate to the rural areas [1,2]. While there are less rural areas in the world, those that remain are still as underserved as they were in the last decade. The WHO even states that plans for urban expansion may work against attracting health workers to the rural locations, with them instead favoring settling in the cities, where opportunities for career improvement and other advantages usually exists [3]. Policies must be developed to respond to the health needs of the population, but more importantly, the government must understand the workforce they are trying to recruit. The WHO document, which compiles several recommendations to improve rural retention of health workers, specifies:

"The choice of interventions should be informed by an in-depth understanding of the health workforce. This requires, at a minimum, a comprehensive situation analysis, a labour market analysis, and an analysis of the factors that influence the decisions of health workers to relocate to, stay in or leave rural and remote areas." [3]

1.1.2 Physician density and distribution in Perú

Perú is a democratic country on the central western coast of South America. According to the World Bank, it is considered an upper middle-income country. Its total population is 32,165,485 habitants, of which 22.28% live in the rural areas (7,166,470) according to the latest statistical information (INEI 2017). From that same database, it is estimated that 44% of the rural population lives in poverty (and 12.8% in extreme poverty). The healthcare system is composed of different sectors: The Ministry of Health delivers a national, tax-funded public care; EsSalud offers a payroll deducted funded insurance; the private sector, with many different entities spread in the country; and an insurance dedicated to the military forces (FFAA) and another to the police (PNP). Additional funding comes from NGOs, external loans and user fees.

Data available for Perú is numerous but unorganized, with information spreading across the years, making comparisons unreliable, if not challenging; national, regional and local records sometimes do not match [5]. There is no integrated database, so analysis of this information requires comparing different sources. For example, by 2015, 80% of the Peruvian population had some sort of health insurance (across the different ones provided by the mixed system). Yet in 2014 (given that these statistics were not available for 2015), it is known that there were 2,856 physicians from MINSA covering the rural areas, for a population of 7,269,800. No data from the other healthcare providers was available for rural areas in those years, making it difficult to understand how underserved were the rural areas.

The WHO objectives set the number of HR required as a mix of Health Care Professionals and not only physicians [1], but world standards set the minimum number of doctors needed at 10

per 10, 000 habitants [7]. By 2007, 9 out of the 24 departments in Perú were below that threshold, which was around 37% of the Peruvian population or roughly 10 million habitants. When the scope was focused at smaller populations (provinces with less than 70, 000 habitants), there were some in critical situations, with less than 3 physicians per 10, 000 [7].

Between the year of 2004 and 2009, the approximate density of doctors was of 9.4 per 10,000 habitants across Perú [6]. This number was amongst the lowest rates in South America and many rural regions in Perú had lower cyphers. Huancavelica, Ayacucho and Apurimac were three departments (the administrative regions by which Perú is divided) that had some of the lowest rates of physicians per population for many years. Huancavelica had 0.43 physicians per 10,000 habitants compared to Lima, the capital, which had a ratio of 5.91. By 2009, Lima had 15.4 physicians per 10,000 against Huancavelica, which had increased its ratio to 4.3 [6,8]. Other regions face similar problems, as Lima concentrates almost 60% of the medical workforce [5] and 23% of the country's hospitals.

1.2 BACKGROUND

1.2.1 Rural physician recruitment and retention in the world

Before addressing what further Peruvian strategies are needed to deal with inequity in HRH, we should have some understanding of how the rest of the world manages this problem. There are many approaches that have been tried [2,9,10], but the WHO finds the recruitment of medical student from rural backgrounds to be a decisive factor [3]. It has been stated that it could be the single, most strongly associated, factor for promoting rural practice [1,11].

Some countries have developed and established universities and programs for this purpose, and with great success. The University of Tromso [12] (Norway), Memorial University of Newfoundland (Canada) and the Northern Ontario School of Medicine (NOSM) (Canada) are distinctive models of this approach, as much as programs like the Rural Generalist Pathway (Australia) [13]. South Africa also has three schools training "medical assistants," which are professionals dedicated to cover the shortage of HRH [13].

In 2010, the Chinese government began providing financial aid to students with rural backgrounds. They would offer coverage for 3 years of medical education, requesting that graduates would be employed in rural health entities for six years. Between 2010 and 2014, China has admitted around 5000 students per year through this method, although its effectiveness has not been assessed yet [14].

A study in 2010 showed that around 70 countries around the world use compulsory services for exercising health equity, but most lack a proper assessment of their effectiveness [10]. While compulsory services increase the physician availability in underserved areas while raising awareness among health workers, they are far from ideal. One of its main problems is an inherent high turnover in health centers. The new practitioners have little experience in managing the needs of the rural population, and not enough time or interest to have an impact on the area. Examples of countries that employ compulsory services with some type of incentives are: Australia, Bolivia, Norway, Vietnam, Kenya and Perú [10].

1.2.2 Existing strategies for rural recruitment and retention in Perú

The SERUM (Urban-Marginal and Rural Service) was established in 1981 [5] and restructured in 1997 to reduce the differences in primary health care between Lima, the capital, and the most undeserved regions of Perú [4]; mostly in rural and remote areas of the country. A compulsory service was established whereby medical graduates were required to complete one year of service. Those who complete a year of rural and remote service also have access to additional incentives, like bonus points for access to specialty programs based on the remoteness of the duty station, or job opportunities to apply for jobs in governmental institutions.

Originally, physicians were assigned to rural posts by random allocation, but now the posts are chosen in order of merit (according to the Medical National Exam). Because of the poorest and furthest posts yielding higher points in the Residency National Exam (which grants access to the Residency Programs) and higher paygrade, it has increased the coverage the rural areas receive [5]. It was again restructured in 2008 to improve its services and it is widely recognized as a major factor in the increased coverage in the rural areas of Perú. While not a perfect indicator, 89% of the Peruvian districts (the subdivisions of each department) in state of extreme poverty had a health center with a SERUM physician available by 2011 [6]. The departments that had the worst coverage (Huancavelica, Ayacucho and Apurimac) increased their access to these healthcare centers to 95-97% of their population [6], however that cypher did not reflect the number of physicians per population, which remained below the international standard, at 3.6, 4.7 and 5.9 per 10,000 [4].

The SERUM has helped in covering the inequities that exist in Perú, but it is not a perfect solution and definitively not a permanent one. The compulsory service has its flaws, as the high

physician turnover may reduce the quality of service, and the education incentives usually imply the professional leaves the area for urban settings after their year is concluded [3,10]. The WHO recommendations established that every country, especially the LMICs, should research on the proper incentives and regulations that they each require for their realities, with emphasis on understanding their workforce [3,9]. This study aims to determine what determinants and strategies could possibly be relevant and effective in reducing the health inequities that exist in rural areas of a LMIC like Perú.

2. LITERATURE REVIEW

A literature review was conducted to determine what barriers are prevalent in the world and which strategies do the various nations employ to address the shortage of HRH in the rural areas. Through a thematic analysis, several sub-themes emerged and were organized into 6 main themes.

2.1 RURAL PIPELINES

Rural pipelines constitute one of the main strategies for generating rural practitioners. It refers to the recruitment of students with rural backgrounds and exposing them during their training to rural practice environments [3,15,16].

2.1.1 Recruitment of medical students from rural settings

Numerous studies in high-income countries highly accept that recruiting students of rural origin or background into their medical programs generate physicians likely to return and work in the rural areas [15-26]. Strategies in these countries aim to attract these students via high school outreach programs [15], reserved seats [15,18,20,27], and admission committees to improve diversifications [15].

A study in Australia discusses that reducing the standards of entry and generating alternate pathways of access for rural applicants could generate physicians that meet the needs of rural communities. Rural applicants are no more likely to fail than other medical students, though they might have lower performances on written examinations. Current selection screens based on score

merit might weed out applicants who would answer the social needs of the rural areas [18]. A Canadian study stated that outreach programs might require improvement. Most rural medical students recruited by them were already interested in medical school instead of attracting unmotivated students to apply [24].

In the reviewed literature from LMICs, strategies regarding recruitment of rural applicants were not found. A study in Iran [28] had testimonies about rural populations having greater acceptance of urban practitioners than aborigine ones, despite them having social and language barriers in rural settings.

2.1.2 Exposure to rural practice settings during medical school and residency

High-income countries also accept that exposing students to rural practice settings during their medical training and post-graduate years increase their interest in moving and working in the rural areas [16,17,19,21-23,25,29].

A study conducted in graduates of the Memorial University of Newfoundland concluded that studying and training in the rural local settings, especially family medicine, had a stronger impact than having a rural origin or background [21]. Two studies in Australia supported that clinical training in rural areas have positive impact in rural intention [20,22].

2.2 WORKING CONDITIONS

In the absence of a proper work environment, professionals are less attracted to move to the rural areas. Different factors are included in this section, and most strategies found aim to provide and ensure these conditions to the rural workers.

2.2.1 Work load

A high work burden is vastly recognized in LMICs as a barrier to attract physicians to the rural settings [30-39]. This is mostly due to the high number of patients in an area compared to the small number of practitioners [31,40].

A strategy discussed to minimize this barrier is the development and deployment of teams, as to reduce the work load by distributing responsibilities [19]. Task shifting is another solution employed in certain high-income countries, with non-physician workers assuming certain responsibilities [32]. Other measures are to ensure fewer or no nights on-call, avoid after-hours scheduling [23] and have available relief coverage [23,41].

2.2.2 Financial considerations

Salaries need to be enough to cover for the living expenses of physicians and their families. This is a recognized determinant in several LMICs [30-35,38,39,42-44] and some high-income countries [16,20,24]. Living costs may be lower in rural areas [40] but they also have fewer sources of income, being unable to settle a private practice in the area or work multiple posts [30].

Popular strategies include reimbursements, loan repayments, scholarships and grants [9,19,45,46]. Financial incentives [16,23,38,40,46] are also a common measure, but it is possible they are good for recruitment, yet insufficient for long-term retention [46]. Increasing the financial support to township hospitals [31,47] could lead to salaries increasing, and making rural practitioners full-time faculty members or preceptors for educational programs would provide another source of income [15].

2.2.3 Infrastructure

High-income countries have seemingly overcome this problem, but it is a predominant barrier in LMICs [30,31,33,37,40,43,48-50]. The main challenge for LMICs is to find the time and money to improve these conditions [44]. Certain programs have sought to overhaul the infrastructure of healthcare posts with varied degree of success [37,45]. Increasing the financial support to township hospitals to improve the infrastructure could possibly increase retention too (Mburu, Chen) [31,40].

2.2.4 Management

Diverse problems concerning management and organization were identified in LMICs literature [28,30,31,33,35,37,39,40,43,44,50-52]. One of the main issues regarding management in these countries is corruption and mishandling among administrators, with post assignation favoritism [35,43] and arranging patients appointments [43]. Another issue of managers is their apparent indifference towards their workers, which leads to bad relationships in the workplace [30,40,50].

One strategy found was the development of policies to ensure transparency among managers and supervisors, particularly for transfer and placement of physicians [51]. Other policies should be placed by local governments depending on their needs.

2.2.5 Resources

High-income countries can provide rural posts with the required resources, but LMICs have difficulties providing supplies and drugs to the more remote locations [30,37,49], as well as equipment for treatment and diagnosis [33,37,49,50].

2.2.6 Professional support

Professional support improves work performance of rural practitioners and has a positive effect on satisfaction [9,12,15,16,19,30,34-36,40,41,45,47,49,53], thus possibly improving retention. For rural practitioners, support can be accessed through information resources via partnership with provincial libraries [15] and networking strategies, providing they have time to rotate in rural hospitals and family medicine clinics [12,40,45].

Deployment of professional teams ensure support, but also reduce isolation and workload, impact social wellbeing, distribute responsibilities and are attractive to potential rural practitioners [19,30,47]. Relief coverage, available practice partners and physician extenders are important for retention [41]. Another great tool to provide professional support is telemedicine, but it is hard to implement due to other barriers (lack of telecommunication networks, of interest from physicians, and of funding by governments) [35,48].

2.3 LIVING CONDITIONS

2.3.1 Housing

When moving to a rural location, physicians appreciate adequate housing, be it with discounted price, regular or free [30,40,51]. It should have the basic services for living, some amenities and, if possible, be geographically well located [46]. Some countries have programs where they provide housing, supplies and provide transport for moving in [37,45]. In LMICs, the housing provided can be in bad conditions and cause physician to complain, due to the indifference of providers on fixing the facilities [38,43].

2.3.2 Safety

Practitioners' safety is commonly covered in high-income countries, thus no discussion of it was present in the literature review. However, it is a major concern in various LMICs [34,38,43,52,54]. Workplace violence in China was explored by a study that determined most victims were female. Both physical and psychological violence were described, though reporting was considered impractical due to the organizational indifference and shame of the victim [52]. That same study proposed that having safe facilities for after-hours care and training for managing danger were potential measures to improve safety [52].

Pakistani female practitioners had family members worried about their safety [43]. Personal safety is also a relevant concern in India [38,51]. LMICs should account for tribal areas that could be unsafe, conflict or extremist groups [38,43,51]. Government insurance should be provided to rural practitioners, but it is not guaranteed, or it can be delayed [54].

2.3.3 Road access

Rural locations can have an inherent difficult access, especially the more remote locations [30,37,43,45,51]. References of programs providing transport for relocation and for medical activities were found, though sometimes that transportation can be limited or could be improved[30,37,45]. Certain regions have rugged mountains and limited road systems which may discourage physicians to consider those locations [50]. While not a solution to the problem itself, compensations in the form of financial incentives or easier access to specialty programs could be granted to the more remote locations practitioners [45].

2.3.4 Family considerations

It is widely accepted that single physicians are more available and open to relocate to a rural area than those married and/or with children, be it in high-income countries [19,20,55] or LMICs [33-35,38-40,43,44]. Even among those married, those with rural spouses consider rural practice more frequently than those with urban spouses [20]. For moving to a rural location, a practitioner considers spouse job opportunities [19,20,33,35,46]. When spousal considerations and adequate children education are not fulfilled, work-family conflicts rise and lead to dissatisfaction and lack of motivation [39,43]. In many countries, a rural location can relate to lower quality of children education (compared to urban schools) [35,44,55].

A strategy considered in Timor-Leste was to deploy practitioners close to their families' locations, though it was referred that this measure should be coupled with other incentives [49]. High

income countries can focus on improving the overall quality of rural schools [41], and though lacking in resources, this should also be the aim of LMICs.

2.4 SOCIAL & EMOTIONAL WELLBEING

2.4.1 Emotional support

Various studies in high income countries and LMICs state the negative impact of isolation and burnout, and the relevance of providing support to the rural practitioners to motivate them and promote retention [16,31,34,38-40,42,46,55]. Different countries have a high turnover of rural physicians due to emotional burnout, stress, frustration, lack of support, job dissatisfaction and work-family conflicts [30,31,34,39,46,56]. That experience is translated to other professionals, and even if that impression is incorrect, it affects the practice choice of those new potential recruits [30].

Working in teams with meaningful professional relationships is a common recommendation to promote a healthy emotional wellbeing [19,47]. Good relationships with superiors are also impactful for job fulfillment [34,36,39,46]. Telemedicine has also proven to reduce isolation and promote peer support [48]. Communities should aim to provide physicians with a sense of appreciation and rewarding relationships. Acknowledgments, thankfulness and appreciation promote the sense of duty and responsibility in practitioners for their community [31,46].

2.4.2 Community characteristics

The rural communities should try to present themselves as attractive options to improve recruitment [17]. Outdoor recreations [41,46], warming populations [30,31], social and cultural facilities

[33,46,55] and religious centers [41] can all promote recruitment and retention of rural physicians. However, rural communities can have language and cultural differences [47] that may conflict with a practitioner's practice or life. While language barriers can be overcome, the tendency of rural communities to use curative services over preventive ones [37] can force the rural physician to change and adapt their practice [50], something that may not suit every professional.

2.5 UNIVERSITY COMMITMENT

Educational institutions play a key role in every country in defining the healthcare system. When analyzing and developing strategies to improve rural recruitment and retention, nations must assess how universities will impact their strategies, and what modifications in the educational system will be needed to reduce healthcare inequities.

2.5.1 Proper preparation

Preparation during study years must motivate rural interest and line up with the characteristics of such practice [18]. It is common that graduates consider their training lacking for rural settings, as most of their studies are oriented to basic sciences, hospital practice and specialty training [28]. This increase in specialty training also leads to a decline in interest in primary care and rural practice [19,29].

Community-based education increases interest in primary care and rural practice [29]. Medical programs should emphasize the development of skills for rural practice, such as management, leadership and communication skills, along as nourishing the values, ethics and morale of their students [28].

2.5.2 Practice characteristics

The education system must be aware of what demands exist in the rural areas as to provide them with clinical graduates that have the necessary skills and competencies [28]. Rural practice is unique and defining, as it is holistic, professionally autonomous and has an expanded scope of care [19,46]. It usually demands pseudo-specialist skills [28,40] but lacks complex-procedural work [55]. This lack of complexity but great variety of work might be frustrating for some practitioners[55], but attractive to others [30,31,43].

Practitioners need to be prepared to adapt to an environment where patients do not seek preventive measures [40] or consult para-medical services and traditional healers along the medical practice [44]. Rural physicians may find that they need to modify their learnt strategies and medical approaches to the community they serve [50]. They might need the support of policy-makers to implement those measures, so medical schools are encouraged to provide the organizational training required.

2.5.3 CME/PD

There is a lack of opportunities for career development in the rural areas, both in high-income countries [20,46] and LMICs [35,38-40,43,44,54]. Physicians seek promotions and career development, even in the rural areas [33,42], but as they grow older, it is possible they lose interest in learning or keep themselves updated [38]. This leads to an erosion of skills which affects the community [38,43]. Despite the requirement of various skills, there is not enough training provided once on site. Strategies to aid in this regard are making rural physicians into preceptors or full

faculty members to train other generations [15], rotation periods in hospitals and clinics [45], and provide courses during rural programs [37]. Finally, telemedicine can give access to remote medical education [35].

2.5.4 Medical offer

Many countries face outmigration of physicians, with them moving to countries with better living and working conditions [33,46,57]. For LMICs, this adds to the internal migration that occurs from the rural areas to the wealthier urban locations [45]. In countries with an important private health sector, there can also exist a high vacancy rate of public posts [40]. Developing programs and universities to cover medical demand is possible for certain countries but tougher for LMICs [23,35,57]. In Timor-Leste, medical recruits were sent to a foreign country to train and return to cover the social needs of the country. International agreements like this could be a potential strategy for LMICs that can't provide an adequate solution in the short term [49].

2.6 GOVERNMENT COMMITMENT

2.6.1 International medical graduates' collaboration

Physicians that move from foreign countries are more akin to consider rural posts to work in [22,37,40,53], even if there are cultural and language barriers [40]. Foreigners usually have no family which tend to be a consideration to work rurally, as previously discussed. Measures should be taken to overcome language and cultural barriers.

2.6.2 Compulsory services

Return of service (compulsory or not) is a common strategy to deliver physicians to the rural and remote areas of a country [9,10,22,29,40,54]. However, compulsory services may not provide permanent or the most adequate solutions [44]. Strategies that would improve this method is the offering of grants [9,46], contracts with the physicians involved [29], paid medical residency after taking these services [45] and have bonded scholarships [9,20,45].

2.6.3 Other policies

Other strategies found in the literature include deploying itinerant multidisciplinary teams [47], funding to hire physicians in these rural areas and train non-physician clinicians [32], as well as influencing student selection and medical curricula [18].

In Norway, the National Centre of Rural Medicine was founded to promote rural practice, research and networking. Among its multiple actions towards achieving those goals, it organizes national conferences and provides digital networking facilities [12]. In Australia, a government funded action enables medical schools to enroll 25% of their students from a rural background [18,20]. As previously mentioned, Timor-Leste had students trained in a foreign country that would suit the needs of their nation, given that they had fewer medical schools than needed to cover the demand [49].

Telemedicine could provide support to cover various topics discussed, despite it not being enough to attract physicians to the rural area. Telemedicine reduces isolation, promoted education, facilitates networking and improves medical practice quality [35,48]. However, some LMICs may

lack the telecommunication system to support this strategy. Another strategy is promoting task-shifting through the training of non-physician clinicians, mid-wives, and other health care professionals, allowing redistribution of responsibilities [32,51].

3. RESEARCH QUESTION AND OBJECTIVES

3.1 Research Question

What strategies could influence Peruvian physicians to practice in the rural areas that policy-makers could use to further promote rural recruitment and retention of health workers?

3.2 Research Objectives

- To identify the various programs and initiatives already implemented in the international setting to improve physician recruitment and retention in rural areas that could potentially be adapted and implemented in the Peruvian context;

- To understand the context-specific challenges and opportunities for physicians to provide greater access to quality and continuity of primary health care in rural Perú;

- To explore what levers Peruvian policy-makers could use to promote rural recruitment and retention of physicians including context-specific and more broadly used strategies.

4. MANUSCRIPT

4.1 Preface to the manuscript

This article was written with the intention of being submitted for possible publication in the *Journal of Rural Health* (JRH), which is a peer-reviewed international journal devoted to advancing research related to rural health. Therefore, the article was formatted according to JRH requirements for research articles. Word count should not exceed 4,500 words (excluding abstract, references, tables and figures). Authors should include an unstructured abstract of no more than 250 words, which contains purpose, methods, findings and conclusions.

The study explores the factors and strategies that influence physicians to practice in rural areas, providing access to primary health care and continuity of care for citizens in rural settings. Through the understanding of the existing challenges and possible solutions, countries should identify the interventions that could yield results for their specific settings, aiming to reduce the inequity in rural primary healthcare access.

Authors' contributions and acknowledgements:

Dr. Anne Andermann and Dr. Jose Morales conceived the study design. Dr. Morales developed the data collection materials, conducted the recruitment, data collection and analysis and drafted the initial manuscript. Dr. Andermann, Dr. Van Gurp, and Dr. Risør edited drafts of the manuscript and agreed on the final version.

4.2 Title page

Identifying strategies to reduce the Peruvian rural physician deficit and promote health equity: A multiphase exploratory study

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4.3 Manuscript abstract

Purpose: Rural communities tend to be underserved with below-average physician-patient ratios, poor local infrastructure and difficult-to-reach populations. While several strategies for promoting rural recruitment and retention of physicians have been developed, it is unclear whether these are transferable to low- and middle-income country (LMIC) contexts. This study explores the similarities and differences in promoting rural practice in high versus LMIC settings using the Peruvian health system as a case example. **Methods:** We conducted a multiphase exploratory mixed methods study involving 1) a thematic analysis of the international scientific literature, 2) qualitative interviews and focus groups with health workers and policy-makers in Perú, and 3) a survey to better understand factors influencing choice of practice settings among final-year Peruvian medical students. **Findings:** High-income countries increasingly rely upon rural pipeline programs and rural medical schools to promote rural recruitment and retention or focus on incentives relating to professional development and ensured opportunities for spouses and children. Perú must first overcome hurdles like physician safety when travelling and working in rural areas, as well as access to shelter, water and food for the workers and their patients. **Conclusions:** High income countries are focused at the top of Maslow's hierarchy of needs, Perú must first ensure the basic needs and safety of health professionals deployed to rural areas. Other LMICs might face similar issues than those found in Perú and should assess their own barriers and strategies.

4.4 Introduction

Health equity is a global concern; retention of health workers in rural and remote areas have proved challenging in both high-income and LMICs [1,2,58,59]. While evidence in high-income countries support certain strategies, the WHO recommendations in 2010 reflect on the lack of evidence to support the same strategies in LMICs [3]. One such country is Perú, located in South America and the focus of this study.

The rural areas of Perú usually have worse conditions than those of high-income countries and thus require a different approach to improve rural health equity. We require a proper understanding of the workforce and their needs to influence their decision to work in rural and remote areas. There is a dire need in certain areas that have less than 3 physicians per 10,000 habitants; meanwhile, the capital concentrates 60% of the medical workforce with a ratio of 15 physicians per 10,000 [4-8].

The main strategy implemented in Perú, the SERUM (Urban-Marginal and Rural Service) has alleviated part of the problem, but what was intended to be a temporary measure has proven ineffective in solving the inequities of the country after decades [4,5]. It is a compulsory service for graduated healthcare professionals, enabling them to work for public positions, including medical specialty training.

While not a perfect indicator, 89% of the Peruvian districts (the subdivisions of each department) in state of extreme poverty had a health center with a SERUM physician available by 2011 [6]. The departments that had the worst coverage (Huancavelica, Ayacucho and Apurimac) increased their access to these healthcare centers to 95-97% of their population [6], however that

cypher did not reflect the number of physicians per population, which remained below the international standard, at 3.6, 4.7 and 5.9 per 10,000 [4].

International literature has findings that vary according to countries, implying that culture, economic development, healthcare system and other factors (age, sex, place of birth, etc.) determine the relevance of barriers towards health equity as well as the strategies better suited to tackle this issue [2,6,9-14,58-60].

Some evidence exist that rural practitioners mostly do not want to practice in the rural setting [5,61]. However, this does not fully reflect the facilitators and barriers that physicians may have to move to rural and underserved areas of Perú. For example, physicians with tenure in rural centers have a different appreciation and expectations than urban medical graduates or highly specialized professionals. The experience gathered in Peruvian studies helped organize topics of discussion in focus groups to explore how physicians with different characteristics prioritize these barriers and facilitators.

It is important to compile the experience in Perú to improve rural health care, to understand the reasons for physicians to work in the rural areas of the country and to bring these results to experts who have experience with policies and programs, to determine what options Peruvian policy makers have for the future.

4.5 Methods

4.5.1 Study design

This is a sequential multiphase exploratory study involving 1) a literature review of the international scientific evidence to provide a global perspective on existing strategies for promoting rural recruitment and retention in rural areas, 2) qualitative interviews and focus groups with health workers and policy makers from Perú to identify perceived barriers and facilitators to rural recruitment and retention in Perú, and 3) a survey among final-year medical students to explore factors influencing physician choice of practice setting at graduation.

Data integration occurred with the qualitative results informing the survey data collection tool, and during the final analysis stage of all three phases to triangulate results. The findings of the quantitative survey provided insight into the qualitative data, with the latter giving context to some of the quantitative findings.

4.5.2 Participant recruitment and data collection procedures

For the literature review, three different databases were examined using key word searches. Titles and abstracts were scanned for relevance and selected articles were retrieved, appraised and data was extracted and systematically reviewed with qualitative synthesis of findings due to homogeneity of studies found. In total, 446 out of 1762 PubMed articles were included, 6 out of 77 SciELO library articles, and 2 out of 141 BVS library articles. We conducted a thematic analysis

which achieved data saturation after 47 articles (approximately 10%) and included studies from different LMICs and different years.

For the qualitative phase, semi-structured interview guides were used for interviews and focus groups. We used maximum variation sampling to select participants to maximize heterogeneity. Study participants were not compensated. In total, 15 physicians participated in 3 different focus groups (5 per session). 5 participants (33%) were female, 3 participants were family physicians. 5 participants had been or were teachers in medical schools and one had a master's degree in Family Medicine. Only 2 participants had no rural experience, with the rest having at least one year of rural medical service. There were also 2 interviews were performed in Lima. One with a Medical School director, another with an ex-director of the Human Health Resources Ministry of Health Department. There were also 2 more interviews pending but due to time restrictions, could not be completed: One with an Ex-minister of Health from Perú and another with a foreign director of a medical school.

For the quantitative phase, final-year medical students attending an urban medical school in the capital Perú were contacted to participate via an email invitation with a survey link to a SurveyMonkey questionnaire.

4.5.3 Study setting

The study took place in different locations of the city of Lima, Perú. A focus group was performed in the city of Arequipa, Perú. All activities were performed face-to-face except one interview which was conducted by phone.

All respondents were given an informed consent letter that was verbally reviewed prior to the interviews. The letter outlined the voluntary and anonymous nature of the interview, that the interview was being recorded and would be used for publications, and the nature of the study. All notes, consent forms, journals, contact forms and recordings are being kept secured and with the research team, protected and keeping anonymity of participants.

The survey was implemented via the internet using SurveyMonkey and participants remained anonymous. Participants came from the same urban university.

Study procedure was approved by two separate IRBs. The St. Mary's Hospital Research Ethics Committee in Montreal and the Universidad Peruana de Ciencias Aplicadas' Ethics Committee in Lima.

4.5.4 Data analysis

A thematic analysis was conducted on selected articles. Due to the low number of results from the SciELO and BVS databases, all articles retrieved from those searches were reviewed. Articles were reviewed until thematic saturation was achieved, and information, topics and themes identified were registered in journals.

Recordings of focus groups and interviews were transcribed verbatim and a thematic analysis was performed upon the transcriptions. Topics and emerging themes were recorded in a

spreadsheet. These results were compared with those from the literature review in an inductive-deductive process. The emerging themes were organized into the results presented.

Information from the survey was imported into R software for analysis. Descriptive statistics were obtained. The data was insufficient to run any ordinal regression analysis.

4.6 Results

4.6.1 Comparing the literature review with the Peruvian experience

The following main themes emerged from the international literature on rural recruitment and retention of health workers, and were compared with the Peruvian experience based on the qualitative interviews and focus groups with health workers and policy-makers from Perú to identify similarities and differences in contextual factors and identify whether internationally used strategies are likely to be transferrable to and effective in promoting rural recruitment and retention in LMIC settings in light of the different local reality.

4.6.1.1 RURAL PIPELINES

Rural pipelines constitute one of the main strategies for generating rural practitioners. It refers to the recruitment of students with rural backgrounds and exposing them during their training to rural practice environments [3,15,16].

4.6.1.1.1 Recruitment of medical students from rural settings

Numerous studies in high-income countries highly accept that recruiting students of rural origin or background into their medical programs generate physicians likely to return and work in the rural areas [15-26]. Strategies in these countries aim to attract these students via high school outreach programs [15], reserved seats [15,18,20,27], and admission committees to improve diversifications [15].

Peruvian participants in focus groups and interviews consider that students coming from a rural area have not enough incentives for them to return to practice rurally after graduation, and many prefer to stay in the big city (i.e. Lima) since several other factors such as salary, safety and family concerns outweigh the rural connection. Some even consider that rural pipelines can have a negative association with future practice in rural areas, since these candidates are acutely aware of the challenges in these areas and may be even more motivated to use their new credentials to secure a career in the more affluent urban setting.

Both the international literature and Peruvian study participants agree that students admitted from rural communities demonstrate greater resilience, sense of duty, and social commitment as compared to those from large urban centers [19,28].

4.6.1.1.2 Exposure to rural practice settings during medical school and residency

High-income countries also accept that exposing students to rural practice settings during their medical training and post-graduate years increase their interest in moving and working in the rural areas [16,17,19,21-23,25,29]. In contrast, study participants from Perú considered rural exposure

during their training is generally counterproductive, discouraging trainees from choosing to practice in rural areas, or at least failing to attract anyone new who was not interested in rural medicine already.

Table 1. Rural pipelines
Recruitment of medical students from rural settings
"That is true, I can see it in my case. I'm from a province, Huaraz, and when I went back, I did it because I was from there. And I know people who go back during their internship year or SERUMs. And after my SERUMs I went back because I had made connections there. But you need chances to grown up (professionaly) or it doesn't justify to reunite with your family." Female physician, 29. *"I have many friends that… in Arequipa I would hear that it's better to go to Lima and study any career, not just Medicine, but any career, because there's more opportunities, because everything is centralized in the country. So, when I was a kid, it was like the dream to move to Lima." Male physician, 29.*
Exposure to rural practice settings during medical school and residency
"But that's a big negative in Perú, because if you have been to a place where you witness so many bad things, you are not going back. The feedback is negative. I believe that happens a lot in SERUMs." Female physician, 29.

4.6.1.2 WORK CONDITIONS

4.6.1.2.1 <u>*Work load*</u>

A high work burden is vastly recognized in LMICs as a barrier to attract physicians to the rural settings [30-39]. Strategies to minimize this barrier have been minimizing after-hours scheduling [23], implementation of telemedicine [35] and deployment of multidisciplinary teams to distribute responsibilities [19].

In Perú, rural physicians may be required to care for a larger population than the one officially assigned, for instance due to population migration for seasonal work or because a large proportion of the population may not be formally registered or counted.

4.6.1.2.2 Financial considerations

The international literature emphasizes the importance of physician salaries which need to cover the living expenses and incentivize physicians to work in more rural and remote areas [30,31]. While the living costs may be lower in the rural areas, physicians also have fewer sources of income [40], for instance, being unable to establish a private practice or work in multiple posts [30]. Popular strategies include reimbursements, loan repayments, scholarships and grants [9,19,45,46]. Financial incentives [16,23,38,40,46] are also a common measure, but it is possible they are good for recruitment, yet insufficient for long-term retention [46].

In Perú, due to the high number of physicians and relatively few numbers of medical jobs, the salaries can be low in the urban areas, especially for general practitioners. Increasing the rural salaries could attract underpaid workers from the cities, especially if they can cover for family expenses. Some participants referred certain rural posts paid well and attracted them, exemplifying this point.

4.6.1.2.3 Infrastructure, management & resources

The main problems identified in the international literature include poor and unsafe workplace conditions, lack of basic services and indifference towards improving infrastructure conditions by government and other responsible organizations [37,49]. Inadequate resources are

another very common problem for rural physicians, with issues in supply, management and distribution [30,40].

There is an overall lack of supervision and support [40], there are also situations involving inequities and corruption [35]. LMICs may experience more corrupt management in their systems [43]. Planners should study the transition of personnel to the rural areas to ease this process [37,62]. Peruvian study participants consider that this reflects the reality in their local contexts.

4.6.1.2.4 Professional support

In the international literature, there is an emphasis on networking to increase professional and specialist interaction [9,49]. Teamwork reduces isolation and workload, as well as promoting loyalty and shared responsibility [19]. Some strategies for consideration are to facilitate periods for rural practitioners to rotate in regional hospitals to improve networking [15,40]; implementation of telemedicine programs [35,48] and measures to reduce discriminatory behavior by any local organizations [43].

A related strategy discussed by the Peruvian study participants was the creation of multidisciplinary teams and their posterior deployment to the rural areas, rather than have those teams formed by the sum of the individuals who arrive. They proposed that these actions would improve the performance, safety and conditions of the workers.

Table 2. Work conditions
Work load
"[…] so, these places are now understaffed; and this shouldn't happen, but they are making us have night shifts […] and that's killing me, the SERUM was already a shock." Male physician, 26.
Financial considerations
"You finish studying a costly career after a long time and you value having a salary. Because, during your intern years, some get some, some don't. The salary then is almost void." Male physician, 29. *"I'm not a specialist; as soon as I finished university and completed my SERUM, I got married. I didn't have kids for 3 years, but I had responsibilities, so salaries matter. Medical school is 7 years long, so it is frustrating not to earn good money. Where can you get good offers? Periphery. I started making choices according to finances." Male physician, 42 years. 8 years of rural practice.*
Infrastructure, management & resources
"I had many friends who had troubles with the population or with management and the Regional Direction always neglected them. Many chose to move away despite having family there, as they understood that if anything happened they wouldn't get support." Female physician, 29. *"I believe if you go as a practitioner, let's say, from this generation, who is updated, as we have begun to learn, and practice based on evidence, then you grow tired because you say 'Well, I can't work because someone, who is my superior, can't see, there's no analysis.'" Female physician, 29.*
Professional support
"Then you butt heads with the population. With your coworkers too, and with management who is above you, then at the end you earn the animosity of many. […] and if you don't have a team that supports you, it's terrible. Male physician, 27. *"I think the goal should be not to just movilize the physician, but movilize a team to the rural areas. For example, 5 workers who know each other previously, who know how they work and accept to work as a team." Female physician, 29.* *"They were itinerant teams of physicians, dentists, obstetricians, etc. They had a [higher] salary. They worked 20, 23 days and rested 7 […] We left the management, and I don't know why it was stopped." Ex-ministry worker. Human Resources department.*

4.6.1.3 LIVING CONDITIONS

4.6.1.3.1 Housing

When moving to a rural location, physicians appreciate adequate housing, be it with discounted price, regular or free [30,40,51]. It should have the basic services for living, some amenities and, if possible, be geographically well located [46]. Some countries have programs where they provide housing, supplies and provide transport for moving in [37,45].

In LMICs, the housing provided can be in bad conditions and cause physician to complain, due to the indifference of providers on fixing the facilities [38,43].

4.6.1.3.2 Safety

Practitioners' safety is commonly covered in high-income countries, thus no discussion of it was present in the literature review. However, it is a major concern in various LMICs [34,38,43,52,54]. In many situations, practitioners are at risk of accident and illness [40,54].

Workplace violence, physical or psychological, is another issue faced by rural physicians. Female practitioners may look for familiar and secure environments to avoid risks [29,33,36,43]. Peruvian study participants strongly agreed that the rural areas are in general unsafe and the more remote the location, the riskier it is to live there. It is very common to hear about driving accidents when attempting to access the most remote locations, but there have also been reports about physicians being raped, being the victim of beatings from locals, receiving threats and other problems regarding physician safety.

4.6.1.3.3 Road access

Rural locations can have an inherent difficult access, especially the more remote locations [30,37,43,45,51]. References of programs providing transport for relocation and for medical activities were found, though sometimes that transportation can be limited or could be improved [30,37,45]. Climatic conditions, distance from cities, bad roads and no help moving to these locations are other factors that discourage traveling to remote locations, according to participants.

4.6.1.3.4 Family considerations

Singles tend to consider rural practice, and from among practitioners with couples, those with rural spouses consider rural practice more often [19,39]. This is related to spousal employment [38,46] and child education [19,35]. In many countries, a rural location can relate to lower quality of children education (compared to urban schools) [35,43,44,55]. These factors can lead to work-family conflicts that may discourage rural practice choice and motivate migration to urban locations [34].

The main concerns presented by participants aligned with the findings in international literature. A case discussed by some participants was how oiling companies provide job positions to spouses and take charge of children's education.

Table 3. Living conditions
Housing
"Chiluyo is a location that has a jail and an army barracks. It is very close to the border between Chile, Bolivia and Perú. And it's terrible. Cold, cold, cold. No Internet, no… no motor to produce energy." Male physician, 42 years. 8 years of rural practice. *"If I move to the capital of a province, there will be institutes and you can keep studying. If you move to 4000, 5000 meters [mamsl], there's nothing. No electricity, no water, and you will be outdated by 5 years, at least." Male family physician, 5 years of FM practice.*

Safety
"In my town they didn't want police officers. […] Because in the area there was coca plantations, illegal miners, white slave traffic… so they had peasant rounds. If a cop planted a foot in there, he got stoned, literally." Male physician, 29. *"And the risks, right? The idea is not to be a martyr. […] It's not that the statistics show an increase in deceased every year and you think 'Well, it's only one' or you are told 'It's really 0.16', because we are not numbers. There should not be that many casualties, so I do believe it's a factor, the risk one takes moving to these posts. From those risky to extremely risky." Male physician, 28.*
Road access
"If it's a remote location where I must go by horse, and repeat that for 5 years, that would be complicated. Considering I have family in the city, then I would need to be here and there, and I don't feel motivated to do that." Female physician, 27 years.
Family considerations
"We had the same passion for medicine, me and my husband, and we traveled together. We moved with our two kids. I had my third child there. But when I had to consider their education, the schools were not what I hoped for. My kids would be at a disadvantage. So I came back." Female physician, epidemiologist, Master in Family Medicine and Primary Healthcare. *"Oiling companies ask you to come and they give you everything, but the state… nothing, it's just a dream." Male family physician, 5 years of FM practice.*

4.6.1.4 SOCIAL & EMOTIONAL WELLBEING

4.6.1.4.1 Emotional support

Stress and frustration are common occurrences in rural physicians [40]. Workers require rewarding relationships with the community they serve, their superiors and their co-workers [34,43]. Other negative factors include cultural tensions, feelings of underappreciation, misunderstanding the rural role, and professional isolation [30,31,34,39,46,56].

Some strategies to further help in this area include providing practitioners with club memberships and amenities in the communities [46], foster relationships with colleagues [47], implement personal support programs [9], bonding schemes [9,20] and reduce prejudice from local habitants towards doctors and their work [9].

Participants made more emphasis on the social interactions. The main source of satisfaction was the impact on the patients' lives, bonds formed with patients and their families, and bonding with coworkers.

4.6.1.4.2 Community characteristics

The rural communities should try to present themselves as attractive options, with possible outdoor recreations, warming populations, cheap costs of living and offering of incentives [41,46]. Certain barriers presented can be language differences, cultural differences [47] and predilection for alternative curative services [37].

Participants defined that there are communities with some prejudice towards physicians, who would want and try to change habits and traditions. Also, for this reason, some communities prefer to visit a shaman or try alternative methods.

Some Peruvian rural communities are involved in illegal activities such as drug trafficking, prostitution, tree felling, and gasoline trafficking. These populations have been defined by participants to be more dangerous, yet also in dire need of attention.

Table 4. Social & emotional wellbeing
Emotional support
"I feel the worst moments I had were precisely those when I felt lonely, isolated from a team, even a small one, a team that could feel like you are working together." Male physician, 27 years.
Community characteristics
"I'm used to live in the city, and then I move to a rural community and there are new… other habits, a change of scenery, travel, trying new food, meet different people…" Male physician, 29 years. *"It's hard to change a behaviour of centuries. In my case, the women had pulmonary emphysema in a higher percentage. Why? Because their only way to scare off snakes was smoking. And they smoked a lot. I would tell them to burn the leaves in a can, instead of smoking and they would stare at me, like… (mimics annoyance)" Male physician, 29 years.* *"My community had an irrigation ditch, that fed a big reservoir. The health worker would put three chlorine drops, because he couldn't afford more, OK? And that fed the entire population. […] I went to talk with the mayor, to try and get a water system. He told me the community didn't want that and for me to ask. In a reunion, I mentioned that the diarrheas were caused by this lack of system. Their answer was they didn't want to pay for it. So, no" Male physician, 29 years.*

4.6.1.5 UNIVERSITY COMMITMENT

4.6.1.5.1 Proper preparation & practice characteristics

Preparation during study years must motivate rural interest and line up with the characteristics of such practice [18]. It is common that graduates consider their training lacking, oriented to hospital practice and specialty oriented [28]. Rural practice is holistic, preventive and demands pseudo-specialist skills [28,40].

Participants had the opinion that the professional begins to learn about the rural practice requirements after arriving on site. They compete with alternative curative methods (shamans) and

this is dismissed during medical school. They also pointed out that there is a lack of managerial training, which is needed when organizing a rural post where one is in charge.

4.6.1.5.2 CME/PD

There is a lack of opportunities for career development in the rural areas, both in high-income countries [20,46] and LMICs [35,38-40,43,44,54]. Strategies to keep physicians updated include rotation periods in hospitals and clinics [45], and provide courses during rural programs [37]. Hiring rural physicians as preceptors or full faculty members helps training other generations [15].

Participants agreed that practitioners tend to travel to the capital or big cities for the best courses. They consider that there are no capable tutors in the rural areas, believing most rural practitioners have outdated knowledge.

4.6.1.5.3 Medical offer

Developing programs and universities to cover medical demand is possible for certain countries but tougher for LMICs [23,57]. Many countries face outmigration of physicians, with them moving to countries with better living conditions [33,46,57].

In Perú, there is the perception that there are too many medical schools privately funded that produce a great number of practitioners, with questionable training quality. Despite the predatory competition in the urban areas, which leads to low pay grade, there are still not enough motivators to move to the rural setting. There is also a competition with private healthcare companies to attract workers.

Table 5. University commitment
Proper preparation & practice characteristics
"Well, you arrive and the management education you get in universities, you get there and no, it's a different world, no? Not only concepts. There, truly, papers come and there's no capacitation, truly. You arrive and auto capacitate or try to… and you get papers you have no clue about… you read them and… the nurse is the one who teaches you […] I think there's a lot to improve in the administrate part." Male physician, 25. *"You can't tell them 'If you go to a post, you are wasting yourself', or 'You have the chance to be a neurosurgeon of high caliber and work at Hopkins and operate like a Da Vinci'. You have to show that in the health posts you save lives and prevent patients from being referred. That's also our function." Dean of Faculty of Medicine.* *"They didn't need specialists with 3 or 4 years of practice, but a doctor with competencies, two or three, in infectiology and the rest. There was work coordinated with the societies […] that agreed in capacitate the physicians. It was started… but after our administration, I don't know why it wasn't continued." Ex-ministry worker. Human Resources department.*
CME/PD
"The other topic is non-financial. In Perú, people agree that the further away you move, less is the chance to develop personally, of learning, training and other things, or promote retention through a defined health career progression, that Perú lacks." Male family physician, 1 year of rural practice.
Medical offer
"The medical career is the faculties' vedette. Every university opens [medical] faculties. So now our workforce has become really cheap. People don't realize that in exchange for the cheapness, there's many unqualified practitioners." Female physician, 29. *"…from those 12 or 15 psychiatrists, there's probably 2 serving the regional program, 4 in EsSalud, and the rest in the private sector. From a Hospital in Chiclayo, in the last 10 years there were 25 anesthesiologist that completed residency, but 23 went to the private sector or migrated or went on to do something else" Ex-ministry worker. Human Resources department.*

4.6.1.6 GOVERNMENT COMMITMENT

4.6.1.6.1 International medical graduates' collaboration

Physicians that move from foreign countries are more akin to consider rural positions [22], even if there are cultural and language barriers [40]. Measures should be taken to overcome these barriers.

Peruvian participants felt IMG get easier access to the system, given that they tend to accept lower salaries. They were upset on allowing IMG to take specialty training after one year of service in the SERUM.

4.6.1.6.2 Telemedicine

Telemedicine has been referred to reduce isolation [35], foster teamwork, provide support [48], improve work conditions, facilitate learning and reduce work load [35]. However, telemedicine alone is not enough to improve rural recruitment [35].

Peruvian participants felt they had no experience with Telemedicine to give proper feedback about it.

4.6.1.6.3 Compulsory services

Return of service (compulsory or not) is a common strategy to deliver physicians to the rural and remote areas of a country [9,10,22,29,40,54]. Strategies that would improve this method is the offering of grants, contracts with the physicians involved, paid medical residency after taking these services and have bonded scholarships [9,20,45].

Peruvian participants perceived the SERUMs as a stalling measure to not change the system. It offers no continuum of care, forces practitioners into a situation that has all the problems mentioned above, and usually deters anyone to consider rural work.

4.6.1.6.4 Other policies

Other strategies include deployment of itinerant multidisciplinary teams [47], funding to hire physicians in these rural areas and train non-physician clinicians [32], as well as influencing student selection and medical curricula [18].

Specialty programs should be regulated to answer the social needs of a country. Participants agreed that there's a general need of family physicians and other specialists (or generalists) for the rural areas, but there is very little benefit in increasing the number of these professionals without better conditions.

Table 6. Government commitment
International medical graduates' collaboration
"The idea was for them to go to the provinces that Peruvian physicians didn't want to go, OK? To provide. […] That lasted less than a year. Right now, in the periphery, there's not a single Cuban doctor. They are all in the big cities and doing their specialties. Because they did their SERUM and… nothing else." Male physician, 42 years. 8 years of rural practice.
Compulsory services
"For me, it shouldn't exist [SERUM]. Sure, it provides healthcare, but what quality? One year is not enough to understand and relate to the community. We should bet on forming physicians for primary care and give them lasting contracts. […] It is a comfortable solution for the government to send SERUM practitioners once a year because that population requires care, instead of betting for a long term solution that finally improves the population's quality of care." Female family physician. 2 years of rural FM practice.

Other policies

"In the current system, each university defines their specialty spots, what and how many. Independently of what the country needs. […] Adding up, you end with many specialists that don't get hired." Ex-ministry worker. Human Resources department.

"The communities didn't require specialists, but specialized care. Doctors with aptitudes. We worked with the Tropical Infections Society to get practitioners trained, because specialists wouldn't travel so far. That was a strategy that… I don't know why it stopped." Ex-ministry worker. Human Resources department.

"Medical schools are promoting medicine as highly complex, instead of primary care. They aren't showing what's beautiful of it. They show it as a social service or a responsibily one has to take." Dean of Faculty of Medicine.

4.6.2 Quantitative Phase: Survey among students

A total of 82 students were provided by the university with the link to the survey online and given one month to answer it. From those students, 30 logged in and responded to the survey (37% response rate), with 11 male participants and 19 female participants (see **Table 7**). All participants had just completed the 6th year of their medical school training and had concluded their exam period.

Table 7. Demographical information

	Male	Female
Age		
Median	22	22
SD	1.601	1.258
Family Number		
Median	5	4
SD	6.563	1.249
Born in rural area		
No	10	18
Yes	1	1
Lived rurally		
Never	10	15
<5 years	0	1
5-9 years	0	0
10+ years	1	2
Plans to start a family within 5 years		
No	8	10
Yes	3	9
Rural exposure		
None	7	10
Rotation rural area	4	9
Worked rurally	0	0

Of the study participants, very few (13.3%) were born or had lived their childhood in the rural areas. Almost half of respondents (40.0%) had plans to start a family in the next 5 years, most of them female. While almost half of study participants have been exposed to a rural practice setting during their training (43.0%), this only occurred during medical school rotations and none have worked in rural areas.

The reasons that graduating medical students cite for choosing to work in a rural versus urban area is summarized in **Table 8**. Almost half (46.7%) consider that financial incentives are not enough to convince them to work in rural areas, and a third (36.7%) consider that universities don't prepare students for work in rural areas, and even the SERUM program does not motivate them to do so. Their main concerns that prevent them from choosing to work in rural areas are the lack of infrastructure and resources (96.7%), that it is dangerous for physicians to work in rural areas (93.3%) and there are insufficient opportunities for continuing professional development (93.3%), followed by salary concerns (83.3%).

Table 8. Likert scale survey results

	Agree	Neutral	Disagree
1. Lack of infrastructure & resources	29	1	0
2. Dangerous to go rural	28	1	1
3. Not enough CME/PD opportunities	28	2	0
4. Need a satisfactory salary	25	3	2
5. Enables an integrated practice	24	5	1
6. Strengthens relationship w/patients	21	8	1
7. Rural background motivates rural	19	5	6
8. Allows to do certain kind of research	19	8	3
9. I would feel recognized by population	17	11	2
10. SERUM motivates return to rural	12	7	11
11. Provides management experience	12	15	3

12. Curricula responds to social needs	11	12	7
13. There's less competition for rural	11	12	7
14. Financial incentives are enough	10	6	14
15. Universities prepare us for rural	8	11	11

Among participants who have not considered any kind of rural post, 83% had been exposed to a rural post. That was a higher proportion than the one found among participants who had considered rural jobs for the future (33%). Half of participants who have considered doing SERUM do not think rural jobs are viable. 80% still plan to do SERUM as a required service to be eligible for specialty training programs, not because they want to work in rural areas in future.

90% of participants who considered the actual financial incentives as good enough did not consider establishing a family in the following 5 years. Only 8.3% of participants who had considered establishing a family in the following 5 years considered the current salaries adequate.

All female participants agreed that the rural areas were unsafe. 2 (18%) of the male participants were neutral or in disagreement about rural areas being unsafe. All respondents who had considered rural work as well as those who would not go rural agreed on the unsafety of the rural areas.

4.7 Discussion

This study reveals some prominent factors that influence physician's choice of practice location in Perú. It also indicates potential differences between high-income and LMICs, as some barriers, facilitators, and strategies from the international literature may not apply to every low- and middle-income country.

The results are not representative of every region in Perú, nor other LMICs. Yet, the developed themes can be employed to conduct situational analyses to provide specific results and adequate strategies for other settings. The quantitative phase would have benefitted from inclusion of rural universities, or more urban universities. Most medical schools are in the urban locations of the country, so results could still reflect on most targeted recruits.

The main finding is the difference between the description of rural background and exposure in international literature compared to the Peruvian experience. Studies in high-income countries have demonstrated that having a rural background and being exposed to it, the branded rural pipeline, will improve the chances of these graduates to move back to the rural areas [15-26]. However, this may not be the case for Perú, perhaps for LMICs in general.

While rural origin is considered a positive factor for rural job consideration, according to Peruvian participants, the more one acquires experience in the rural environment, the less desirable working there becomes. This is related to hardships from the environment and characteristics from the rural practice. The survey findings support this, with a substantial proportion of medical students not considering rural posts having previous rural exposure. Medical students may have a

naïve opinion of rural posts and are more interested in those options, but once they are exposed to rural training, become dissuaded from choosing that type of practice after graduation.

Many factors may discourage physicians to go back to the rural areas after being exposed. In LMICs, the rural areas may lack the conditions to satisfy the basic needs of physicians. In terms of basic needs, certain regions of Perú have limited access to potable water, proper food and shelter. Physicians appreciate adequate housing, be it at a discounted price, regular or free [30,40,51]. Safety was generally considered to be lacking in the rural areas for physicians, in both qualitative and quantitative phases of the study. Literature indicates that female professionals feel more insecure when moving to unfamiliar areas [29,43]. Female participants considered rural work risky and most male participants agreed, as shown in the focus groups and survey results. Most participants would still apply for the SERUM despite the lack of safety, indicating that other factors have a stronger influence in the participants choice. Through the discussion, it appears that safety does not influence short-term recruitment (e.g. SERUM) but it discourages recruitment and retention for long-term plans.

To understand and motivate practitioners to move to the rural areas, the findings of this study align with the hierarchy of needs proposed by Abraham Maslow [63]. According to it, the Peruvian setting currently does not satisfy the "physiological" needs of practitioners in the rural areas (Water, Food, Shelter, among others) and "safety" needs. Participants focused mostly in the physical and health safety aspect, followed by concerns about emotional, personal and financial security. Maslow's hierarchy would indicate that it is hard to advance onto higher levels of need before covering the physiological and safety needs, which high-income countries tend to have

covered. This difference would explain the focus of high-income countries in strategies that cannot be translated to this country's setting.

Global recommendations focusing in education: emphasis on the rural pipeline [3,15,16], CME/PD opportunities [20,46] in rural areas and matching universities curricula to social needs [18] might be adequate for circumstances like those in high-income countries. For the Peruvian scenario, it is more important to focus into satisfying the basic requirements professionals have: Physician safety when travelling and working in rural areas [34,38,43,52,54], and access to shelter, water and food for the workers and their patients. International literature has mentioned that teams improve work and general conditions; for Peruvian participants, being deployed in established teams would also improve their sense of safety in a rural location, amongst a population they are new to. Rural healthcare posts with dedicated, secure and well-maintained living quarters also provide a safe environment and improve their living conditions. These could prove to be important first steps while improving the overall conditions of rural communities.

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5. THESIS DISCUSSION

5.1 Summary of the key results of the thesis

The WHO referred there was a lack of evidence to promote rural pipeline strategies in LMICs [3] and the findings in this study indicate that these strategies are not optimal for a country like Perú. According to the interviewed participants, there are many instances where either a rural background or exposure may discourage physicians in taking rural posts. The main concern of Peruvian physicians is the unsafe conditions in which they live and work in the rural settings. Perú must focus on developing strategies and taking measures to overcome barriers that high-income countries have surpassed years ago. Even with the knowledge developed in those countries, it is not possible to mimic certain strategies due to the lack of resources and cultural differences. For other LMICs, they will have to identify their own barriers and reassess and modify strategies that exist, as well as develop new ones, if they are to reduce the inequities that exists in the rural health care setting.

5.2 Discussion of the main findings in line with current evidence

According to participants' testimonies, rural origin could favor rural practice, but it is outweighed by other factors. The poorest areas of the country may not generate opportunities for rural candidates to take any higher education. Less poor areas may generate candidates that view moving into the urban areas as an opportunity to improve their life and do not wish to return. In an ideal scenario, they would be able to practice and live in the rural areas the same as they would in the urban areas.

Participants agreed that rural exposure during training had mostly a discouraging effect on physicians. Most commented that working in the SERUM posts was a necessary step towards getting residency posts in urban hospitals and the rural exposure reinforced their desire to work in an urban environment. Among survey respondents, a high proportion of those who had not considered any kind of rural practice had have exposure to the rural areas compared to those considering rural posts. This could mean that having some rural exposure does discourage from taking future rural posts, that experiencing work in rural conditions promote working in urban areas. A high proportion of those exposed would still do SERUM, mostly because it is relevant for specialty programs access.

This indicates that the conditions to practice in the rural areas are lacking. Rural born physicians would like to work in the rural areas but, just like urban physicians who have been exposed to the rural areas, understand that practicing in the urban areas is more attractive.

The main concern of participants is the unsafety of rural areas, be it accidents, crime or illness . Medical students taking the survey agree that these are existing risks, especially for those who have considered having a family in the coming years and for any female practitioner. This findings line up with the evidence of the international literature [34,38,43,52,54].

Despite the consensus on safety issues, a great proportion of medical students would still take the SERUM. The one year rural program, being the doorway for specialty programs and work in public positions, has great success in pushing professionals into serving the rural areas

temporarily. 80% of survey respondents who do not believe rural jobs are viable still aim for a SERUM position.

For participants, some measures and strategies to improve the safety were the formation and deployment of multidisciplinary teams, instead of forming such teams in the place of work. By developing a relationship with the team members, trust and cooperation would improve the safety of every member while living in the rural areas. Certain areas of the country have very poor police presence and quick access to a representative of the law would also help practitioners who might feel threatened. Finally, while it was not discussed by participants, the health posts could be adapted to include also living quarters for the hired professionals. This would also insure coverage of the physiological needs of the workers: water, basic nourishment, electricity, perhaps phone and internet access, plus a secure location to live with the other team members. After rotating or leaving the post, it could be used by new teams.

Discussion among participants was not definitive about the financial considerations, with some thinking salaries were enough and others referring that for some practitioners, especially those married or with children, it is less than needed. This reflects on the quantitative data, with the Likert questions regarding salaries having spread responses. However, candidates who have planned on forming a family in the next 5 years do think it would be insufficient for their needs. For those who feel salaries are insufficient, a possible consideration is to rotate to rural post for a couple of weeks every 3 months, as expressed in the survey results.

Universities play a big role in defining the preferences of participants [18]. Comments on the qualitative phase were related to universities being focused on hospital training and management training being lackluster, which diminishes interest in primary health care. This is backed up by findings in the international literature [19,28,29]. Survey participants who felt that universities prepared them properly for rural settings had a good proportion of medical students considering rural posts. Going back to the discussion in focus groups, it is possible that this opinion changes after being exposed to the SERUM or any other rural practice exposure, where one has many more duties and responsibilities and may feel overwhelmed. These results still highlight the relevant influence educational institutions have, and when gearing their training towards the rural setting and primary care, more students would probably feel encouraged to take rural posts besides SERUM.

With or without the SERUM, rural conditions should be improved to encourage physicians to take part on the one-year service, and further apply for official posts in the long-term. In line with the hierarchy of needs proposed by Abraham Maslow [63], this study shows that the basic requirements (the physiological needs) of physicians are not being covered in the rural areas and thus there is insatisfaction in most of the professionals designated for those posts. Food, water and shelter are usually paid by the physician, not granted or facilitated by the state. The lack of safety is a lingering problem that discourages practitioners, especially those with families or plans to have one. Data across the qualitative discussion and the survey would indicate that factors like salary, continuing medical education, medical curricula based on social needs, among others, are not a priority in the considerations Peruvian physicians have, with their focus set on securing their physiological and safety needs.

5.3 Study limitations

The results are not representative of every region in Perú. They are not representative of every country in Latin America or the world. However, the purpose of this analysis has been to structure a map of themes that can serve as a starting point for other countries to develop their own situational analysis through mixed studies that provide specific and adequate strategies for their settings.

The quantitative phase only included students from a single urban university, and only 30 out of 82 students answered the survey. This could bias some of the data, such as the reason participants had for taking a rural post; altruistic participants could be more likely to contribute to a survey and be more likely to work in the rural areas. Having participants from other universities (rural or public) could provide a better sample but it is worthy to note that most medical schools are in the capital and have the highest number of students, so the sample we had could reflect on our target recruits. The information gathered also provided insight into the discussion from the focus groups and interview and data of the literature review, contributing to the mixed method analysis.

5.4 Implications

The first line of change should come in providing the safety participants expect when bringing their services to rural communities. While it may not be the sole determinant, it is a barrier heavily discussed by participants and literature from LMICs. It is implied that the main reason the

focus group participants and survey respondents are doing the SERUM is the conditional access it provides to specialty programs, and that without such condition they would avoid taking any rural post.

While the system would not likely be able to handle a sudden cancelation of the SERUM, as it still provides healthcare coverage to an otherwise underserved population of Perú, it is discussed that what was once developed to be a temporary solution has ingrained itself in the system and justifies policy-makers to not push new strategies and improve healthcare in rural communities.

Physicians in Perú should be trained as generalists, aiming to provide a wide arrange of services to the general population, rather than set their aim towards hospital settings and an urban, specialty-focused practice. Currently, the system itself pushes physicians towards these goals, with the SERUM not allowing more than one year of practice in the rural setting (the wage of SERUM is generally higher than regular practitioners in urban and rural areas) and being directly linked towards specialty program access. There is no general promotion by the government or educational entities towards community practice. While the knowledge of medical graduates might be proper to take a generalist position in a primary-level health care center, they are not attracted to them (urban or rural) because the conditions are not satisfactory. Further research should be conducted to understand the factors that determine why physician training in Peru leads to hospital specialization and what can be done to shift this direction towards community service.

A theory proposed by Abraham Maslow to understand human motivation determines a hierarchy of needs [63], which indicated that an individual's motivation rises and progresses through the fulfillment of different degrees of needs. The most fundamental level of needs is considered that of "Physiological needs" and it includes food, water, shelter, among others. Human beings would first fulfill these needs before pursuing higher levels. Topics discussed in the international literature and this study can be related to these needs. In the rural Peruvian setting, shelter, food and water are usually unsatisfactory. The struggle to ensure these and in good quality leads to a general displeasure of physicians considering moving to the rural areas, as these needs are easily satisfied in the urban setting. The government should strive to facilitate these to the rural areas, both to workers and local habitants.

After partially or completely fulfilling their physiological needs, humans strive to satisfy the following level, considered the "Safety needs". These are fulfilled by achieving security in personal, emotional, financial and health dimensions, and protection against accidents/illness. This is perhaps the most discussed topic in our research, and the main barrier for Peruvian practitioners to consider rural posts. Safety needs not only cover the physical safety of the human being, but for participants this was the most obvious and urgent fault to solve before financial or emotional concerns.

The Peruvian system does not secure their rural practitioners' safety, and it can be evidenced in the sub-themes developed through our study: Emotional support, Safety, Financial considerations, Professional Support, Work load, etc. Maslow's theory would imply it is hard to advance onto higher levels of need before covering these Safety needs, and it would explain how

LMICs like Perú cannot use strategies developed in high-income countries, where these needs have already been fulfilled and insured.

The need of "Social belonging" lies atop the previous needs, and further ahead the need of "Self-esteem". Peruvian participants commented on the isolation, loneliness and denigration that one can experience in the rural environment. The family considerations, community characteristics, teamwork, inability to properly perform their job, management conflicts, the medical offer that predates itself or favours international graduates all affect these needs, but clearly take a secondary seat to the previous problems discussed. In contrast, strategies in high-income countries seek to fulfill the interpersonal and personal feelings of rural workers.

Finally, Maslow sets the "Self-actualization" and "Transcendence" needs in the top of the pyramid. Developing talents and abilities, pursuing further goals in life, and seeking happiness are requirements that Peruvian physicians do not see fulfilled in the rural areas, but are also low in their priorities. For participants, you cannot further your career when working in the remote areas. Discussion about professional development and education was concentrated to how it is non-existent for rural practitioners, and other troubles are more urgent to deal with than this. High-income countries meanwhile seek to provide rural practitioners with opportunities to keep themselves educated and progress through their career, get promotions, conduct research and achieve fulfilling goals.

The compulsory service that exists in Perú predates on the needs of physicians, subverting the pyramid structure and ignoring foundational levels. The promise of access to a specialty career

is used as leverage to ignore other base level needs, as this temporary sacrifice will lead to enough financial resources to sustain a family and oneself in the future. The choice of rural or urban practice is not relevant here, because the system and its members picture it as a progression instead of two similar career paths: For a physician to satisfy their needs, a one-year service is required where they surrender all those needs. Asking for more years of service without securing all those needs in the rural areas would be impractical, and the system understands the limits physicians are willing to sacrifice.

It is relevant to point out that the many needs physicians find lacking also apply to the general rural population. The lack of adequate housing, water supply systems, police presence and safety measures, adequate education for children and proper work conditions can be problems present in many regions of the country, with the poorest locations being the ones in direst need of medical presence, yet the least attractive for physicians to move to. The national and local governments have also tried to improve the general situation of these regions with relative success, the poverty index in Perú has been reduced in the last decade from 42.4% to 21.7%, according to The National Institute of Statistics and Informatics (INEI) in 2017. Yet, while urban areas had a poverty index of 15%, rural areas had a 44% rate of poor habitants. In broad terms, change has not been substantial for the rural areas of the country. 73% of the rural poor have no access to a public water system, and 50% have only reached a primary school level of education. With metrics like these, recruitment and retention of physicians should be a secondary reason to promote living conditions in the rural areas.

Policies need to be restructured and take in consideration the needs of the public and the workers. If a rural community has no access to running water or police presence, it is not a matter of adjusting policy to provide them with a physician that will surrender to those conditions, but rather provide that community with water, police presence and medical presence.

The SERUM has shifted from its temporary status into a long-term partial relief, and participants agree that it is a scapegoat for real change to be developed. The first changes should address the basic needs of physicians: Living conditions in general. Ensure their shelter, diet and safety. Aim to improve those same conditions for the communities served, as it would be not fair for only the HRH to have their needs covered. If achieving these conditions requires a long-term plan, then implement other measures to partially fulfill physicians' requirements. A favorable factor towards rural retention was the integration of the practitioner into a team, with the benefits of improving work conditions and professional development. Peruvian participants built upon this notion by suggesting the development of interprofessional teams in the cities and their deployment to the rural areas after they have cultivated professional and social bonds, instead of the professionals arriving and begin to constitute a team in the rural areas or being the new lone member in a rural post. According to them, teams not only improve working conditions through distribution of responsibilities and tasks, but also benefit the emotional and social wellbeing of all its members and provides a basic degree of safety when inserted in a rural community. While there has not been evidence of this in the literature, it was a suggestion made by many participants from different focus groups, which could set precedent for future policy consideration. Another strategy that could follow the deployment of teams is that health posts could be adapted to include living quarters for the hired professionals. This would also insure coverage of the physiological needs of

the workers: water, basic nourishment, electricity, perhaps phone and internet access, plus a secure location to live with the other team members. After rotating or leaving the post, it could be used by new teams.

5.5 Conclusion

Compulsory services are not an optimal measure to provide rural areas with HRH. High income countries complement this strategy with other measures that promote physicians' fulfillment while working in the rural settings. LMICs must surpass several hurdles that high-income countries overcame in the past, ensuring the safety and basic needs of rural practitioners, such as housing, food supplies and water. In the case of Perú, many driving accidents occur while moving to and from the rural areas due to the rugged mountains and poor road system. The reason physicians still travel to these areas is mostly to complete their SERUM program, allowing them to have future access to specialty programs; otherwise, many practitioners would not take those temporal positions. A strategy to improve safety of physicians traveling to the rural areas was not found among participants, but to improve safety in the rural areas there was a positive discussion about developing and deploying teams instead of single workers to those posts. Working conditions should be improved next, followed by financial, emotional and personal measures to promote rural retention of HRH. It will require a long time and great effort to improve the general conditions of the rural areas, but national and regional governments should aim to achieve that through a mix of the strategies discussed in this study, adapting the most adequate to the local settings.

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7. APPENDIXES

Appendix 1

CONSENT FORM FOR FOCUS GROUP

Study Title: Identifying Evidence-Based Interventions and Factors to Reduce the Peruvian Rural Physician Deficit and Promote Health Equity: A Multiphase Exploratory Study.

Brief Description of Project: The purpose of this study is to understand the barriers and facilitators that Peruvian physicians encounter to move and work in the rural areas of the country.

Contact Details of Principal Investigator (PI): Dr. Anne Andermann, McGill University, Montreal, Quebec. Canada. Email: anne.andermann@mail.mcgill.ca. Telephone: +1 514 345 3511

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Contact Details for Peruvian Representative: Dr. Raffo Escalante Kanashiro, UPC, Lima, Lima. Perú. Email: raffo.escalante@gmail.com.

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Ethics Committee Contact Information: Sulays Arias Mostacero, UPC, Lima, Lima. Perú. Email: sulays.arias@upc.pe.

Telephone: +51 982 508543 /or/ +511 313-3333 Extension 2701

Participation in this research study involves completing a focus group meeting which should take approximately 60-90 minutes. Discussion will be about your experiences and beliefs on what are the barriers and facilitators to practice medicine in the rural settings. Whenever possible, you should provide insight into why you consider a factor to be a barrier or a facilitator and we are also interested to know in how you prioritize them. There will be no direct benefit to you from participating in this research, but the aim is to publish the results and share them with Peruvian authorities for developing new policies.

This study is entirely confidential. Neither your name nor information that could identify you personally will be used in the data analysis, publication or presentations of this study. Your identity will be kept confidential by the following method: You

will be assigned a number and your name will not be recorded. All recording material, transcriptions of the discussion and signed consent forms will be kept in a secure locker for up to five years. Electronic data will be kept on a password-protected computer. All data will be destroyed after the conservation period.

Your participation in this study is completely voluntary. You may refuse to participate or withdraw your consent or discontinue your participation in the study at any time without penalty or loss of benefits or rights to which you might otherwise be entitled. In case of a withdrawal, all data obtained from you will be destroyed.

If you have any questions about this study, you should feel free to ask them now or anytime throughout the study by contacting the research coordinator, Dr. Jose Morales Oliva (Email: jose.moralesoliva@mail.mcgill.ca), or our Peruvian representative, Dr. Raffo Escalante Kanashiro (Email: raffo.escalante@gmail.com). If you believe that your rights have been violated in any way, please contact the research ethics committee through their representative, Mrs. Sulays Arias Mostacero (Email: sulays.arias@upc.pe).

This study has obtained approval from:

St. Mary´s Hospital Ethics Committee, Montreal, Canada.

Comité de Ética de la UPC, Lima, Perú.

By signing this consent form, you are indicating your consent to participate in the present study evaluating the barriers and facilitators for Peruvian physicians to practice in the rural areas.

Signature of participant: _____

Date: _____

Signature of researcher: _____

Date: _____

Appendix 2

CONSENT FORM FOR INTERVIEWS

Study Title: Identifying Evidence-Based Interventions and Factors to Reduce the Peruvian Rural Physician Deficit and Promote Health Equity: A Multiphase Exploratory Study.

Brief Description of Project: The purpose of this study is to understand the barriers and facilitators that physicians encounter to move and work in the rural areas of Perú or other countries

Contact Details of Principal Investigator (PI): Dr. Anne Andermann, McGill University, Montreal, Quebec. Canada. Email: anne.andermann@mail.mcgill.ca. Telephone: +1 514 345 3511

Contact Details of Research Coordinator: Dr. Jose Morales Oliva, McGill University, Montreal, Quebec. Canada. Email: jose.moralesoliva@mail.mcgill.ca. Telephone: +1 514 804 5532

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Ethics Committee Contact Information: Sulays Arias Mostacero, UPC, Lima, Lima. Perú. Email: sulays.arias@upc.pe.

Telephone: +51 982 508543 /or/ +511 313-3333 Extension 2701

Participation in this research study involves completing an interview which should take less than 45 minutes. Discussion will be about your experiences and beliefs on what are the barriers and facilitators to practice medicine in the rural settings. Whenever possible, you should provide insight into why you consider a factor to be a barrier or a facilitator, we are also interested to know in how you prioritize them. There will be no direct benefit to you from participating in this research, but the aim is to publish the results and share them with Peruvian authorities for developing new policies.

This study is entirely confidential. Neither your name nor information that could identify you personally will be used in the data analysis, publication or presentations of this study. Your identity will be kept confidential by the following method: You

will be assigned a number and your name will not be recorded. All recording material, transcriptions of the interview and signed consent forms will be kept in a secure locker for up to five years. Electronic data will be kept on a password-protected computer. All data will be destroyed after the conservation period.

Your participation in this study is completely voluntary. You may refuse to participate or withdraw your consent or discontinue your participation in the study at any time without penalty or loss of benefits or rights to which you might otherwise be entitled. In case of a withdrawal, all data obtained from you will be destroyed.

If you have any questions about this study, you should feel free to ask them now or anytime throughout the study by contacting the research coordinator, Dr. Jose Morales Oliva (Email: jose.moralesoliva@mail.mcgill.ca), or our Peruvian representative, Dr. Raffo Escalante Kanashiro (Email: raffo.escalante@gmail.com). If you believe that your rights have been violated in any way, please contact the research ethics committee through their representative, Mrs. Sulays Arias Mostacero (Email: sulays.arias@upc.pe).

This study has obtained approval from:

St. Mary´s Hospital Ethics Committee, Montreal, Canada.

Comité de Ética de la UPC, Lima, Perú.

By signing this consent form, you are indicating your consent to participate in the present study evaluating the barriers and facilitators for physicians to practice in the rural areas.

Signature of participant: _____

Date: _____

Signature of data collector: _____

Date: _____

Appendix 3

INTERVIEW GUIDE FOR FOCUS GROUPS OR INTERVIEWS WITH PHYSICIANS FROM PERÚ

[Prior to starting, complete the consent form for each participant]

Thank you for having signed the consent form and agreeing to participate in the interview. Are there any last questions? [Pause]

Okay then, I will now turn on the audio recorder and we will begin.

My name is XXXXX and I will be your facilitator/interviewer. The purpose of this discussion is to find out what barriers and facilitators exists for Peruvian physicians to move and work in a rural practice for an extended period (i.e. more than 1 year). There are no right or wrong answers, as each of you may have a different experience and opinion regarding this subject.

1. Have you ever practiced medicine in a rural area in Perú (or elsewhere)? If yes, for how many months or years? What was the best thing about that experience? What was the worst thing about that experience? Describe an example of a time working in a rural area that brought you the greatest joy. Describe an example of working in a rural area that brought you the most frustration or sadness. Would you suggest to others to work in a rural area? Why or why not?

2. What conditions would need to be in place to make it worthwhile? What was the main factor that brought you to work in a rural area? Was there something in your medical education that influenced your decision of whether or not to practice in a rural area? Please

describe. IF YOU NEVER WORKED IN A RURAL AREA – please explain why you have never worked in a rural area? Was there something in your medical education that influenced your decision of whether or not to practice in a rural area? Please describe. Is this something that you might consider in future? Why or why not?

3. In your view, what benefits do you feel working in a rural area can provide for health workers? What factors would make YOU consider working in a rural of Perú for an extended period (i.e. more than 1 year), if anything area? In your view, what are the down-sides or disadvantages of working in the rural areas of Perú? If you had to choose the worst aspect, what would that be and why? Is there something that could compensate for this and still make it worthwhile for health workers to move and work in a rural area an extended period (i.e. more than 1 year)?

4. Do you consider that there are certain health workers who might be better suited to work in a rural area? For instance, according to factors such as gender, whether they have children (stage of life), where they come from, philosophical convictions, etc.? What factors are less well suited to working and living in rural areas of Perú? Can any of these factors be influenced or changed? What could make it easier to encourage more doctors to work in rural areas regardless of these factors?

5. Who do you think are key actors in promoting access to doctors in rural areas? For instance, universities, government, medical associations, physicians, rural populations? What can these actors do that would be helpful?

6. Finally, what do you think the government or other actors should focus on first to make the biggest impact on rural recruitment and retention of doctors? Explain what should be done and why?

Thank you again for your participation, we appreciate your valuable insight and we are eager to analyze the information you have helped us collect. We are proud to have worked with you, remember if you have any question afterwards, you can contact us via e-mail.

Have a great day.

Appendix 4

SEMI-STRUCTURED INTERVIEW GUIDE FOR INTERVIEWS WITH EXPERTS

[Prior to starting, complete the consent form for the participant] Thank you for having signed the consent form and agreeing to participate in the interview. I will now turn on the audio recorder and we will begin.

1. In your experience, what do you consider the major hurdles for physicians to move and work in rural and remote areas? Are these the same hurdles as trying to promote health workers to practice in urban areas with underserved populations? What are the similarities and what are the differences?

2. What do you consider the most effective interventions or approaches for promoting doctor **recruitment & retention in** rural and remote areas? Are there some interventions that are more effective for recruitment and others for retention? Which work for both?

3. Were you involved in the implementation of a strategy, policy or program to improve recruitment & retention in rural and remote areas? Please describe the approach used, the history of how this was implemented and what were the outcomes or markers of success?

4. What were the main hurdles that were faced in implementing this approach and how were these hurdles overcome?

5. What were the main indicators used that measured the success? What else was measured?

6. What do was the role of local and national governments and how were they encouraged to support this approach? Could this have happened without government involvement? What facilitated the government involvement?

7. What do you think is the role of universities? How can one encourage the involvement of universities in adopting this approach? What facilitators and barriers do they have to overcome to improve rural physician recruitment and retention?

8. Beyond the main approach for promoting recruitment and retention that you just described, did you also implement any other approaches? Whether simultaneously or one after the other? What were these approaches? Did they help?

9. Finally, if another country sought to implement similar actions to promote rural recruitment and retention of doctors, what would be your main advice or suggestions for ensuring success?

Thank you again for your participation, we appreciate your valuable insight and we are eager to analyze the information you have helped us collect. We are proud to have worked with you. Remember if you have any question afterwards, you can contact us via e-mail. Have a great day.

Appendix 5

CONSENTIMIENTO INFORMADO PARA FOCUS GROUPS

Título del Estudio: Identificando Intervenciones Basadas en Evidencia y Factores para Reducir el Deficit de Medicos Rurales en Perú y Promover Equidad en Salud. Estudio exploratorio multi-fase.

Breve descripción del Proyecto: El propósito de este estudio es entender las barreras y facilitadores que los médicos Perúanos encuentran para mudarse y practicar en las áreas rurales del país.

Contacto con Investigador Principal (PI): Dra. Anne Andermann, McGill University. Montreal, Quebec. Canadá. Email: anne.andermann@mail.mcgill.ca. Teléfono: +1 514 345 3511

Contacto con Investigador Coordinador: Dr. José Andrés Morales Oliva, McGill University. Montreal, Quebec. Canadá. Email: jose.moralesoliva@mail.mcgill.ca. Teléfono: +1 514 804 5532

Contacto con Representante en Perú: Dr. Raffo Escalante Kanashiro, UPC, Lima, Lima. Perú. Email: raffo.escalante@gmail.com.

Teléfono: +51 969 858228

Contacto para Comité de Ética: Sulays Arias Mostacero, UPC, Lima, Lima. Perú. Email: sulays.arias@upc.pe.

Teléfono: +51 982 508543 /o/ +511 313-3333 Anexo 2701

La participación en este estudio de investigación lo involucra en completar una reunión de Focus Group que tomará alrededor de 60-90 minutos. La discusión tratará sobre sus experiencias y creencias sobre cuáles son las barreras y facilitadores para practicar medicina en condiciones rurales. Siempre que sea posible deberá tratar de proveer perspectiva sobre por qué un factor le parece una barrera o facilitador y también tenemos interés sobre como prioriza estos factores. No habrá beneficios directos para los participantes en esta investigación, pero nuestro objetivo es publicar estos resultados y colaborar con la formación de nuevas políticas de parte de autoridades Perúanas.

Este estudio es totalmente confidencial. Ni su nombre ni la información que provea que pudiera identificarlo será usado en el análisis, publicación o presentaciones de

este estudio. La confidencialidad de su identidad será mantenida mediante el siguiente método: Usted será asignado un número y su nombre no será guardado. Todo el material de grabación, transcripciones de la discusión y los documentos de consentimiento informado serán guardados en un lugar seguro por hasta cinco años. La información electrónica será guardada en una computadora bajo contraseña. Toda la información será destruida al finalizar el periodo de conservación.

Su participación en este estudio es completamente voluntaria. Usted puede negarse a participar o retirar su consentimiento o discontinuar su participación en este estudio en cualquier momento sin penalización o perdida de beneficios o derechos que a usted le pertenecen. En caso de retirarse, la información obtenida de usted será destruida.

Si tiene alguna pregunta sobre este estudio, tenga la libertad de preguntar en este momento o posteriormente mediante el contacto con el coordinador, Dr. Jose Morales Oliva (Email: jose.moralesoliva@mail.mcgill.ca), o nuestro representante en Perú, Dr. Raffo Escalante Kanashiro (Email: raffo.escalante@gmail.com). Si cree que sus derechos han sido violados de alguna manera, no dude en contactar al comité de ética a través de su representante, Sra. Sulays Arias Mostacero (Email: sulays.arias@upc.pe).

Este estudio tiene la aprobación de los siguientes comités de ética:

St. Mary´s Hospital Ethics Committee, Montreal, Canada.

Comité de Ética de la UPC, Lima, Perú.

Al firmar esta forma de consentimiento, usted está indicando que consiente con participar en el presente estudio evaluando las barreras y facilitadores que los médicos Perúanos tienen para practicar en las áreas rurales.

Firma del participante: _____

Fecha: _____

Firma del investigador: _____

Fecha: _____

Appendix 6

CONSENTIMIENTO INFORMADO PARA ENTREVISTAS

Título del Estudio: Identificando Intervenciones Basadas en Evidencia y Factores para Reducir el Deficit de Medicos Rurales en Perú y Promover Equidad en Salud. Estudio exploratorio multi-fase.

Breve descripción del Proyecto: El propósito de este estudio es entender las barreras y facilitadores que los médicos Perúanos encuentran para mudarse y practicar en las áreas rurales del país.

Contacto con Investigador Principal (PI): Dra. Anne Andermann, McGill University. Montreal, Quebec. Canadá. Email: anne.andermann@mail.mcgill.ca. Teléfono: +1 514 345 3511

Contacto con Investigador Coordinador: Dr. José Andrés Morales Oliva, McGill University. Montreal, Quebec. Canadá. Email: jose.moralesoliva@mail.mcgill.ca. Teléfono: +1 514 804 5532

Contacto con Investigador en Perú: Dr. Raffo Escalante Kanashiro, UPC, Lima, Lima. Perú. Email: raffo.escalante@gmail.com.

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Contacto para Comité de Ética: Sulays Arias Mostacero, UPC, Lima, Lima. Perú. Email: sulays.arias@upc.pe.

Teléfono: +51 982 508543 /o/ +511 313-3333 Anexo 2701

La participación en este estudio de investigación lo involucra en completar una entrevista que tomará menos de 45 minutos. La discusión tratará sobre sus experiencias y creencias sobre cuáles son las barreras y facilitadores para practicar medicina en condiciones rurales. Siempre que sea posible deberá tratar de proveer perspectiva sobre por qué un factor le parece una barrera o facilitador y también tenemos interés sobre como prioriza estos factores. No habrá beneficios directos para los participantes en esta investigación, pero nuestro objetivo es publicar estos resultados y colaborar con la formación de nuevas políticas de parte de autoridades Perúanas.

Este estudio es totalmente confidencial. Ni su nombre ni la información que provea que pudiera identificarlo será usado en el análisis, publicación o presentaciones de

este estudio. La confidencialidad de su identidad será mantenida mediante el siguiente método: Usted será asignado un número y su nombre no será guardado. Todo el material de grabación, transcripciones de la discusión y los documentos de consentimiento informado serán guardados en un lugar seguro por hasta cinco años. La información electrónica será guardada en una computadora bajo contraseña. Toda la información será destruida al finalizar el periodo de conservación.

Su participación en este estudio es completamente voluntaria. Usted puede negarse a participar o retirar su consentimiento o discontinuar su participación en este estudio en cualquier momento sin penalización o perdida de beneficios o derechos que a usted le pertenecen. En caso de retirarse, la información obtenida de usted será destruida.

Si tiene alguna pregunta sobre este estudio, tenga la libertad de preguntar en este momento o posteriormente mediante el contacto con el coordinador, Dr. Jose Morales Oliva (Email: jose.moralesoliva@mail.mcgill.ca), o nuestro representante en Perú, Dr. Raffo Escalante Kanashiro (Email: raffo.escalante@gmail.com). Si cree que sus derechos han sido violados de alguna manera, no dude en contactar al comité de ética a través de su representante, Sra. Sulays Arias Mostacero (Email: sulays.arias@upc.pe).

Este estudio tiene la aprobación de los siguientes comités de ética:

St. Mary´s Hospital Ethics Committee, Montreal, Canada.

Comité de Ética de la UPC, Lima, Perú.

Al firmar esta forma de consentimiento, usted está indicando que consiente con participar en el presente estudio evaluando las barreras y facilitadores que los médicos Perúanos tienen para practicar en las áreas rurales.

Firma del participante: _____

Fecha: _____

Firma del investigador: _____

Fecha: _____

Appendix 7

INVITATION TO PARTICIPATE IN FOCUS GROUPS AND INTERVIEWS

Dear Colleague,

We hope this letter finds you well. We write to you with the intention of having you participate in the qualitative research we are conducting to reduce the Peruvian rural physician deficit. To promote health equity in the country, it is important to provide physician access to every population, especially those in rural and underserved areas. For this purpose, we are collecting the experiences and opinions on what are the barriers and facilitators that exist to work in the rural setting.

Participation in this research in completely voluntary and would involve your participation in a group activity or individual interview. Your views on the issue would be greatly appreciated and helpful in developing future policies. Please contact Jose Morales if you were willing to participate in these activities as to schedule a date.

Thank you in advance for your time and consideration.

Yours sincerely

Dr. Anne Andermann & Dr. Jose Morales

Anne Andermann, MD, MPhil, Dphil, CCFP, FRCPC

Faculty of Medicine, McGill University

anne.andermann@mail.mcgill.ca

Jose Morales, MD

MSc Candidate – Department of Family Medicine, McGill University

jose.moralesoliva@mail.mcgill.ca

Appendix 8

SURVEY FOR 6TH YEAR MEDICAL STUDENTS

1. Edad

2. Eres:

- Mujer
- Varón

3. Consideras que naciste en una locación rural?

- Si
- No

4. Consideras haber crecido en una locación rural?

- No
- Menos de 5 años
- Menos de 10 años
- 10 años o mas

5. Con cuantos miembros familiares te criaste?

6. Estado civil

- Soltero/a
- Casado/a
- Divorciado/a
- Comprometido/a
- Viudo/a

7. Has considerado establecer una familia en los siguientes 5 años?

- ○ Si
- ○ No

8. Alguna vez has tenido una rotacion en un centro de salud rural o trabajado en un area rural?

- ○ Si, rotación
- ○ Si, trabajado
- ○ No

9. Has considerado trabajar en un area rural en el futuro?

- ○ Si
- ○ No
- ○ Solo por SERUMs

10. Si marcó (Si) o (SERUMs), cual es su mayor motivador?

11. Consideras que la practica medica rural es viable en Perú?

- ○ Si
- ○ No

12. El motivo principal que le prevendria de trabajar en un area rural es

- ◉ Mi pareja no quisiera vivir allá y/o no quisiera separarme de mis hijos
- ○ No me siento entrenado adecuadamente para la practica rural (Manejo de traumas, parto complicado, etc)
- ○ Quiero continuar mi educación y/o perseguir una especialidad y eso no es disponible allá
- ○ Other (please specify)

13. Si hay algo que me convenciera de trabajar unos cuantos años en el area rural sería

- ☐ Un buen salario y que se cubra mis gastos (vivienda, transporte, educación para mis hijos)
- ☐ Ir 2 semanas, cada 2 o 3 meses, pero vivir y trabajar en el área urbana
- ☐ Disponibilidad de desarrollo continuo profesional y educacion continua en las areas rurales
- ☐ Acceso a especialistas para consultas telefonicas y transferencia de casos complejos
- ☐ Reconocimiento especial por mi contribucion a la sociedad y reduccion de mis deudas/pagos tramites de especialidad
- ☐ Other (please specify)

14. Por que quiso ser Medico?

- ☐ Poder trabajar en el area rural
- ☐ Para ayudar a otros
- ☐ Para hacer dinero
- ☐ Para mudarse a otro pais
- ☐ Para viajar fuera de Perú
- ☐ Other (please specify)

15. Como calificarias los siguientes factores para considerar laborar rural (No contando SERUMs)

	En fuerte desacuerdo	En desacuerdo	Neutral	De acuerdo	Muy de acuerdo
Tendría acceso a un salario satisfactorio	○	○	○	○	○
Enriquecería mi capacidad para desarrollar la relación médico-paciente	○	○	○	○	○
Me permitiría practicar medicina de manera integrada	◉	○	○	○	○
Me sentiría reconocido por la población	○	○	○	○	○
Me permitiría realizar otro tipo de estudios/investigación	○	○	○	○	○
Me permitiría obtener experiencia en áreas administrativas	○	○	○	○	○
Hay menos competencia por esos puestos	○	○	○	○	○

16. Califica estas afirmaciones a tu parecer

	En fuerte desacuerdo	En desacuerdo	Neutral	De acuerdo	Muy de acuerdo
Los incentivos económicos son suficientes para atraer a rural	☐	☐	☐	☐	☐
El SERUMs motiva a buscar volver a áreas rurales	☐	☐	☐	☐	☐
El nacer/crecer en áreas rurales podría aumentar el interés en esos puestos	☐	☐	☐	☐	☐
Las universidades nos preparan para enfrentar las situaciones rurales	☐	☐	☐	☐	☐
La curricula y procesos de selección de las universidades se alinean con las necesidades sociales	☐	☐	☐	☐	☐
No hay suficientes programas de desarrollo profesional en rural	☐	☐	☐	☐	☐
Mejoras en infraestructura y equipos atraerían mas labor rural	☐	☐	☐	☐	☐
Es muy peligroso trabajar en rural (Rutas, crimen, enfermedad)	☐	☐	☐	☐	☐

Appendix 9

SEARCH STRATEGY

Inclusion criteria

- Publications related to the study of factors influencing physicians' decision to practice in rural areas.
- Studies that includes physicians.
- Qualitative, quantitative or mixed methods studies.

Exclusion criteria

- Publications not related to the study of factors influencing physicians' decision to practice in rural areas.
- Studies that do not include physicians.
- Studies that are not qualitative, quantitative or mixed methods studies.

Limits

- Studies in English and Spanish. Studies in Portuguese may be included.*
- Studies from 2000 onwards.**

* Articles in Portuguese will be included if they have an English/Spanish version or their abstract is in English/Spanish and report potential topics for the literature review.

**The WHO begun to strongly recommend the focus on rural health coverage around 2004; before the 2000's, publications related in PubMed are rarely more than 30/year and are less likely to provide topics not found in latter publications.

The key concepts of search include elements from the research question, which answer the WHO? WHERE? And WHAT? of our interest.

WHO: Physicians

WHERE: Rural area

WHAT: (Barriers/Facilitators) (Medical Practice)

MeSH descriptors and keywords (searched as Text Words) will be used in the searches according to each database engine.

Concepts	**Barriers/Facilitators**	**Rural area**	**Physicians**	**Medical practice**
MeSH 1		Rural Health Services	Physicians	Professional Practice
MeSH 2		Medically Underserved Area		
MeSH 3		Rural Population		
Keyword 1	Factor	Rural	Physician	
Keyword 2	Barrier	Underserved	Doctor	
Keyword 3	Facilitator	Remote	Practitioner	