

Globalized Research and “National Science”: The Case of Peru

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Issues in the area of international health research are insufficiently discussed in Latin America. We examine the practices of stakeholders such as the state and the academic community regarding research policy processes and funding sources in Peru. Our findings showed that research policy development and evaluation processes are poor in Peru, most of the country's academic research is published in English only, and researchers' access to funding is limited. Given that the relationship between local academic institutions and foreign research centers is key in developing a “national science,” there is a clear need to reinforce the state's capacities for management and research oversight and implementation and to encourage the academic community to improve their institutional policies and research frameworks. (*Am J Public Health*. 2009;99:1792–1798. doi:10.2105/AJPH.2008.159236)

In Peru, much-needed debates on the complex relationships between local and global production of health research (particularly in the area of public health) have not taken place. For instance, little attention has been focused on how the research priorities and agendas of global research organizations, along with their funding mechanisms, affect research projects at the local level. In addition, if concepts such as locally defined research questions and national research priorities are continually invoked, the meanings of “local” and “national” must be comprehensively assessed. Likewise, one may wonder what the negotiated stakes are that define a research problem as local or national while still generating the interest of international funders.

Since Cueto's landmark study on the development of research in some of Peru's universities 2 decades ago,¹ little has been published or discussed about the topic. With the recent increase in global research collaboration arrangements,² such discussions are even more urgent. Research, far from being simply a technical activity, involves a series of political, institutional, economic, and cultural variables.³ Such lines of inquiry might be relevant for a number of lower income and middle-income countries where, as in Peru, health research is far from being a priority.

A recent report on health research and development in Latin America noted that,

despite distinct levels of advancement, “there is a need to establish research priorities at the country level in order to develop a national research action programme.”^{4(p13)} However, in explaining the ways in which health research priorities are set, the authors of the report also acknowledged that funding and donor practices shape national research agendas and that inequitable partnerships erode countries' research capacities.⁵

The goals and routes of research development processes cannot be regarded as necessarily equal in all countries.⁶ Thus, here we analyze the development of health research in Peru as a case study. In addition to focusing on the mission of scientific research, particularly studies in the area of public health, we assess the current research context in Peru and examine the roles of research stakeholders. Potential areas of future change are addressed as well.

RESEARCH STAKEHOLDERS AND THEIR MISSIONS

An understanding of the diverse Latin American experience may be useful in assessing the role of the states as a promoter, user, and sponsor of public health research. It is not by chance that in Latin America the countries with the strongest public institutions (e.g., Brazil, Cuba, and Mexico) are also the countries

conducting the most (and perhaps the best) research on public health issues, as indicated by the large number of high-quality, indexed publications and the existence of recognized research centers such as the Fundação Oswaldo Cruz Institute in Brazil and the National Institute of Public Health in Mexico.

The main goal of public health research is to analyze and explain population health status distributions, the factors that determine these distributions, and the social responses organized to address them through collective action.⁷ According to the Council on Health Research for Development, health research must be at the heart of any concerted efforts to reduce the large and widening disparities between the health expectancies of developed and developing countries.⁸

The Pan American Health Organization views public health research as one of the 11 essential functions of public health and has noted that it should include constant innovation (ranging from applied investigations designed to foster changes in public health practices to formal scientific research), efforts on the part of health authorities at various levels to find solutions with assessable effects, and establishment of alliances with academic institutions both within and outside the health sector.⁹ The Pan American Health Organization also identifies public health research as a matter of governmental concern, with 3 distinct practices requiring state intervention: sectoral regulation of health research involving human beings, as a means to protect and warrant individual rights; development of research by health authorities at various specific levels, to be applied in formulating public health policies; and promotion of priority areas of research.

Academic Institutions

One of the core missions of universities and research centers is the production of scientific knowledge (both basic and applied) in

diverse areas of health (e.g., basic sciences, clinical sciences, epidemiology, social sciences, management, and interventions), with the goal of contributing to human well-being and development. In developing countries, universities have been identified as key stakeholders that can aid in correcting the overwhelming disparities in health research whereby very limited resources are being used to address the health problems affecting the vast majority of the world's population. In fact, the Global Forum for Health Research has coined the term "10–90 gap" (see <http://www.globalforumhealth.org>) to capture this major imbalance between the magnitude of the disease burden and the resources devoted to addressing that burden.

Academic institutions often view themselves as supranational constituencies, given the universal connotation of knowledge. This is why their attainment of standards of excellence and their contribution to universal knowledge are more valued than, for example, their commitment to practical national needs. Nevertheless, the purpose of at least some of the research undertaken by these institutions is to inform local or national public policies and decision-making.

Finally, it is also assumed that society values scientific knowledge, funding and promoting its production. To be sure, tensions will always exist between funding priorities and the relevance and pertinence of research, and such tensions are even more noticeable when institutions are weak. The availability of general and research-specific funding plays a key role here, but other factors are crucial as well.¹⁰

Researchers

In general, the profiles and roles of health researchers in the countries of the global south (i.e., poorer developing countries) have not been analyzed, the exception being a few countries, such as Brazil, with well-developed research environments.^{11,12} In Brazil, the main challenge for the country's research system, and the researchers participating in it, continues to be the need for an improved coordinating mechanism between various sources of grant support and the initiatives of the Ministry of Health.^{10,13}

Conversely, a strategic approach has guided the operations of some of the best international research training programs focusing on

countries with lower- to middle-range economic profiles. Recently major donors have engaged in proactive strategies (scientific, political, and economic) to promote the training of researchers from these countries.¹⁴ In Peru, in the absence of a governmental research program (unlike other countries in Latin America that have well-established programs), the university with the leading biomedical research program (Cayetano Heredia University) has been successful in supporting the return of junior faculty members who, after obtaining advanced degrees in countries of the global north (i.e., wealthy developed countries), may be tempted to remain in those countries.¹⁵

THE CASE OF PERU

Given the roles played by government entities (i.e., the Ministry of Health and the state), academic institutions, and researchers as the main stakeholders of health research endeavors in Peru, they exert a significant amount of influence on the development of the country's health research agenda. We discuss these actors and their roles in the sections to follow.

Ministry of Health and the State

In a 2004–2005 study conducted to analyze the status of public health research in Peru and to define national priorities, the authors concluded that severe limitations in the Ministry of Health structure affected the administration and conduct of public health research.¹⁶ Among various Ministry of Health management components, the least developed was that focused on defining policies and regulations and evaluating the research administration process. Moreover, there were few activities in the areas of promotion, planning, identification of needs, evaluation and dissemination of study results, development of institutional capacities, and networking and collaboration with academic institutions. Activities relating to formulation, approval, and implementation of research were found to be most frequent, although usually such research was not the product of a comprehensive plan but represented a response to isolated initiatives. Finally, as a result of an incipient culture of evidence-based programming at the Ministry of Health, there was not a sufficiently clear image of research as a tool for decision making.

The roles of other state research stakeholders, such as the National Council of Science and Technology, have not been consistent over the past 2 decades, probably reflecting different levels of political support for research efforts and the lack of a well-established tradition. Although significant progress has been made (e.g., Peru recently accepted a loan from the Inter-American Development Bank to fund scientific research, implying a decision to increase investments in science¹⁷), funding levels still do not meet research needs. In addition, the extent to which the policies and practices of the National Council of Science and Technology complement those of the Ministry of Health is not sufficiently clear.

The Academic Community

Although formal health research activities in Peru have not been subjected to a comprehensive assessment, certain specific issues have been addressed, particularly in the areas of population and demography,¹⁸ reproductive health (primarily HIV/AIDS),¹⁹ and mental health.²⁰ The number of academic centers that conduct health research and meet the standards of excellence defined by the country is limited to a handful of universities and independent research centers mostly located in the country's capital city of Lima. Moreover, within some of these institutions there are "islands of excellence" (usually based on the roles of specific individuals and their connections with foreign research centers) where nationally or internationally acknowledged research is conducted. These islands of excellence share institutional space with less-developed initiatives, sometimes in a tense environment produced by uneven resource allocations and possibilities for growth.²¹

To our knowledge, an analysis of the relationship between relatively large grant allocations (e.g., US\$250 000 or more) and high-quality health research in Peru has not been conducted. Such an analysis would help clarify questions regarding the effects of funding levels on several potential indicators of research excellence (e.g., number and impact of publications). Other questions of interest include the scope of research (i.e., basic or applied, among other classifications) and, particularly, the extent to which studies respond to local concerns. In a number of the relatively expensive health

studies conducted recently in Peru, the research questions were developed primarily in international research centers or responded to priorities defined by those centers. For example, several studies on HIV and other sexually transmitted infections,^{22,23} gender-based violence,²⁴ and micronutrients²⁵ have been conducted as a part of international multicenter research projects.

In 2006, the attendees (researchers, government officers, and students) at the First Scientific Meeting on Public Health Research in Peru²⁶ presented their research and discussed health research policies. The health research issues addressed ranged from basic science to epidemiology, social science, and the links between research priorities and health policies. Some new areas of focus clearly imply changing trends in public health work in Peru (e.g., an increasing amount of research on neglected diseases²⁷) and reflect elements of an evolving global constellation of research interests.

In Peru, an important number of local health studies are conducted in the form of theses that fulfill academic requirements in undergraduate or graduate programs. The technical limitations and poor utility of these studies (with some exceptions) highlight several problem areas, including an inadequate vision of research as a generalized, rather than specialized, competence to be developed within the country's higher education programs (even among undergraduates); inadequate training of researchers, resulting in lower quality studies; and poor links between training in research and the arena of public policy, leading to studies of limited utility.²⁸

Another visible problem is the limited knowledge among members of local scientific communities of the contributions of their fellow Peruvians. This situation stems from, among other factors, the limited opportunities to publish in Spanish-language publications and the fact that published studies do not always reflect local concerns or priorities. However, the University of San Marcos is host to an important series of general health and medical publications sponsored by scientific societies.²⁹ Together with the *Revista Peruana de Medicina Experimental y Salud Pública* (*Peruvian Journal of Experimental Medicine and Public Health*), these represent the most important scientific publications in

Peru (although, at present, most are not included in *Index Medicus*).

According to Murillo et al., this limited research development may indicate that in Peru, as a result of a

pre-modern assimilation of the positivistic discourse . . . public health was never assimilated into a collective institutional practice and memory that [would allow] it to become a modern discourse.^{30(p46)}

Research applied to the design or improvement of public programs and policies is scarce and generally takes place under the modality of research consultancies or subcontracts, which lead to researchers playing a subordinate role and restrict intellectual property as well as the scope of the thematic approach. These circumstances derive from the absence of an institutional culture in which the information necessary for effective decision-making is available. Frequently there are no clear relationship mechanisms between researchers and health managers as a means to define adequate cooperation schemes. Simultaneously, academic institutions have not set research agendas or generated debates on the research themes to be prioritized, and in certain cases their relationship with funding agencies can be described as semicolonial (i.e., driven by the interests of a foreign power) in nature.³¹

There is still a clear need to strengthen institutional links in Peru among decision-makers and researchers, given that their priorities are not necessarily compatible.³² In fact, only in a few projects has there been a strong relationship between the areas of research and policy. A good example of such a relationship involves one of the studies conducted by the Vigía Project, which was developed by the Ministry of Health with the assistance of foreign funding (from the US Agency for International Development); the goal of this research was to define treatment schemes for use with resistant malaria strains in the Peruvian rainforest.³³

Researchers

In countries with fewer available resources than their neighbors to promote and implement research, most researchers face the continuing task of raising research funds (including

their salaries).¹⁶ This situation affects their ability to devote time to research development. Rather, many of them are overly involved in bureaucratic, teaching, or even clinical tasks, minimizing their dedication to research.²⁰

Another key issue is the positioning of most researchers in terms of the local institutions with which they are affiliated, as well as the "global" institutions where they were trained or with which they have established links. Pharmaceutical companies (and their local representatives), given their extensive commissioning of research, are becoming increasingly influential and powerful in the local research community as well, leading to potential conflicts of interest.³⁴ Better opportunities to accrue funding and networking benefits may in fact lead local researchers to privilege their relationship with international research centers or pharmaceutical companies as opposed to their own institution, with potential effects on the nature of the collaborations they develop and the research questions they generate. (A significant proportion of health research in Peru involves clinical trials that test the efficacy of preventive and treatment interventions, many of which, even if they are proven efficacious, will not necessarily be implemented at the local level as a result of their high cost.) Approximately 90% of clinical trials (mostly phase III trials) conducted in Peru since 1995 have been sponsored by pharmaceutical companies.³⁵

CONDITIONING FACTORS

A number of nonlocal factors influence the relationship between the state, academic institutions, and researchers in Peru, as well as other lower- to middle-income countries attempting to develop a "national science." Two particular factors are the concept of academic centers and peripheries and what is regarded as globalized research.

Academic Centers and Peripheries

According to historians of science, the roles played by research centers (i.e., more-developed members of a network of research institutions that represent the state of the art in science) and members of research peripheries (i.e., less-developed members of such networks that usually have dependent relationships with centers) have seldom

been fixed.³⁶ (Moreover, various “islands” of research excellence, focusing on local issues and problems, exist in these peripheries.) However, if there is such an entity as a transnational scientific institution, in the sense of a system of networks and relationships, then it probably hinges on the institutional mechanisms of technological research centers. For example, the primary publications of a given discipline use the language of these centers (and are controlled by actors from these centers); networks are formed around them; the centers develop and have access to (and frequently influence) major funding resources; and, finally, they define what is relevant and of high quality.

In peripheral countries such as Peru in which there has been only limited development of scientific endeavors based on self-defined priorities that result from clear public research policies (i.e., a national science), researchers’ career progress and access to funding require that they abide by international mechanisms (e.g., grant support mechanisms) in which merit is not assessed neutrally. Success often requires internalization of languages, concerns, and perspectives that reflect what has been labeled “colonized thinking.”^{37(p2)} No doubt, such processes in some cases can be conscious, with researchers identifying themselves more with visiting scientists than with local actors or needs. In any case, this type of internalization can discourage a focus on social determinants of health derived from unequal international relations and emphasize the use of individual behavior or cultural trait models instead. Such situations raise questions about the role of international research training programs and the degree to which they are able to generate independent, critical thinkers among trainees from the countries of the global south.³⁸

Finally, there is nonneutral internalization of different paradigms among actors at the center and at the periphery, and it can even be argued that in both cases differences in access to resources exist according to adherence to a specific paradigm. In high-income countries, most resources are assigned according to a meritocracy that privileges research in the realm of positivism, that is, research in disciplines such as basic sciences and clinical epidemiology, studies in which quantitative

methods are used (particularly those involving an experimental paradigm), and research questions that assume the existence of universal traits to be discovered (e.g., clinical trials evaluating the efficacy of a particular treatment). This is clearly the case in the United States, where until recently health research involving qualitative methods was unlikely to be funded by the National Institutes of Health and where, still, health-related social science studies have limited access to funding.³⁹

Globalization of Scientific Research and Ethical Implications

Despite differences in infrastructure and financial and human resources, there has been a recent increase in the number of scientific studies conducted in peripheral African, Asian, and Latin American countries. However, the 10–90 gap continues between research resources directed toward addressing disease burden and the actual magnitude of that burden.⁴⁰

This emerging influx of research in peripheral countries is related to several factors, among them the value of evidence generated from diverse populations, the fact that these studies often focus on high-risk populations (allowing for small sample sizes and low costs and reducing political risks as well), the use of local resources (also associated with lower costs), and the capacity to influence a country’s agenda and processes (e.g., by emphasizing areas of specific concern or by successfully lobbying for changes in local ethical regulations).⁴¹

The increasing number of clinical trials being conducted in poor countries has become an issue of concern (as described subsequently), even to the point that recent revisions of the Helsinki Declaration have established that clinical trials sponsored by high-income countries in lower income countries must be accompanied by identical studies in the sponsoring countries.^{41,42} Unfortunately, major research funders have decided to restrict the role of the Helsinki Declaration in the regulation of international health research they fund, and thus provisions related to ensuring the highest standard of care among research participants after the completion of a study are no longer valid. Self-defined good clinical practices are implemented instead.³⁸

Potential issues associated with clinical trials conducted in the global south by organizations from the global north include co-option, lack of protection, and insufficient consideration of the risks incurred by research participants and inadequate discussions about the benefits of the interventions under study in the event they are proven efficacious. These issues stem from imbalances between rich and poor countries regarding sources of funding and research governance; the level of development of regulatory frameworks; different views of the individual, the collective, and the balance between these 2 entities; and weaker monitoring mechanisms given that the central country’s existing regulations can be interpreted in a less meticulous way in a study conducted in a peripheral country.⁴³

A concrete example is the recent controversy in Peru regarding revisions in the regulation of clinical trials approved in July 2006. This regulation, in its original version, had been considered exemplary in Latin America, even though it created implementation problems for many local researchers (primarily because it implied that all research participants in clinical trials should be covered by insurance policies, but such policies were not offered by local insurance companies at that time). A draft-revised version, elaborated by a new health sector administration in a process that was not considered sufficiently participatory, generated negative reactions from various civil society stakeholders and institutions.⁴⁴ Subsequently, the Ministry of Health formed an ad hoc commission to determine whether the changes made in the revised version strengthened the protective provisions of the regulation; after 2 months of deliberations, the commission approved a number of changes that, according to some, significantly weakened rather than strengthened these provisions. In all likelihood, this subject will continue to generate controversy in Peru.⁴⁵

Additional challenges in this process are those relating to incipient debates about intercultural bioethics (e.g., elements of informed consent) and to the paradox of a central country setting the criteria for certification of peripheral-country ethical committees. The latter issue continues to generate great concern at the

international level.⁴⁶ According to an article published in the *Bulletin of the World Health Organization*:

The relationship between ethical guidelines and regulations . . . and indigenously sponsored public health research has not been adequately explored. . . . In order to support health research in developing countries that is both relevant and meaningful, the focus must be on developing health research that promotes equity and on developing local capacity in bioethics.⁴⁷

A National Science

Although Peru's academic establishment includes many researchers (with various levels of involvement in the international research system), the issue of whether the country can be said to have a national science remains in doubt, given that there are no well-established debates about research priorities (whether academic or governmental), research results are put to practical use minimally or not at all, and there are no significant investment policies via either local funding or retention or repatriation of researchers. This unfortunate situation results in part from an ideology about research that has not yet been contested. In this ideology, research is seen as a global activity oriented toward the construction of fundamental, universal knowledge; little attention is paid to contextualized, locally relevant research. For that reason, only limited funding resources are available to consider local research issues.

For example, traffic accidents are one of the key causes of premature death in Peru, but until recently no funding was available to study the magnitude, determinants, and effects of this problem and options for its prevention at the local level.⁴⁸ Similarly, various forms of applied research (e.g., health policy research and operations research and evaluations) that play crucial roles as evidence of policy development and adjustment are seldom supported.

MOVING FORWARD

The preceding analysis indicates the need for changes and improvements in the health research environment in Peru. A systematic analysis of potential solutions is beyond the scope of this article, but the ideas discussed in the sections to follow, focusing on the Ministry

of Health, the state, the academic establishment, and researchers, may initiate a much-needed debate.

The Ministry of Health and the State

If public health research is to continue to develop in Peru, clear policies regarding such research must be adopted.¹⁵ These policies might involve a restructuring of the Ministry of Health, consolidation of the research management process (i.e., organization and policies), establishment of appropriate mechanisms for collaboration with universities and research centers, and capacity development with respect to management and implementation of research. Of particular concern should be the development of an effective tier-based system of ethical regulation that ensures sensitivity to societal inequities and sources of social vulnerability and effectively protects individual rights. Adoption of such policies obviously requires strong leadership and a shared vision among government officials.

Moreover, the state as a whole should develop a policy to invest in health research and to make use of the findings of such research. The Ministry of Education and, especially, the National Council of Science and Technology should assume stronger roles and establish better connections with the health sector to define research priorities and ensure appropriate funding. Policies must be established that allow funding of the most important studies and the best researchers, and mechanisms for research dissemination should be ensured through enhancement of economic resources, improved training, and, possibly, provisions for the mandatory use of evidence in formulating and evaluating policies and programs.⁴⁹

The Academic Establishment and Researchers

There is a need for the academic community in Peru to open discussions about institutional policies and frameworks for research. First, improvement of current research training standards is fundamental, with a reduced emphasis on original research as a prerequisite for graduation in professional programs. Second, to enhance relationships between the areas of research and public policy, fruitful exchanges need to take place between decision makers and local communities of researchers.

Third, alternative sources of research funding should be promoted at various levels, including allocating faculty the necessary time to conduct research. Universities themselves, as well as other social actors, should prioritize the funding of academic research as central to their mission. Fourth, there is a need to monitor state action regarding the management of public health research and to further the debate on an agenda of research priorities.

Fifth, efforts should be made in Peru (along with other aid recipients in the global south) to promote a dialogue with countries in the global north offering or supporting health research training for people from the global south, with the goal of ensuring that training programs in fact help develop independent, critical thinkers as opposed to individuals prone to using models of thinking derived from the international research centers. Sixth, promotion of research publications and dissemination of study results should always be given high priority.

Finally, there is a need to initiate more localized debates on how to better develop national or regional research programs. This is particularly true in Peru given that its economy has been steadily growing over the past decade and the country is making efforts to rationally increase social expenditures. Research that can improve understanding of the dynamics of poverty and inequality, both important determinants of health, should be promoted to aid in the development of new social programs.

CONCLUSIONS

Our intention has been to show that although health research ideally involves a rational process oriented toward knowledge enhancement and problem solving, in practice it frequently reflects the weaknesses of public and private institutions and the various forms of inequity that exist in many countries.⁵⁰ Our analysis of the Peruvian experience reveals some important steps forward but also indicates the precarious state of the country's health research environment. In Peru, the state participates in research (including its funding) to only a limited degree and has not, to this point, proposed effective

policies to enhance research efforts in the country. The academic community is very diverse, with great variability in quality; despite the existence of “islands” of excellence, it reflects the absence of a national science.

There are multiple options with respect to changes in the health research environment in Peru, and, if the necessary political support is obtained, positive developments may occur in the years to come. However, if these positive changes are to occur, the state must pursue the legal steps necessary to assume its responsibilities toward promoting the development of a stronger research environment that meets local needs and contributes to the creation of global knowledge. Research institutions must assume their own level of responsibility as well, which will require an accurate understanding of existing problems and the formulation of a national research agenda framed by adequate local policies with the input of the state, the academic community, and civil society as a whole. ■

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Contributors

C.F. Cáceres wrote the first version of the article and, on the basis of W. Mendoza's contributions, completed the first version for submission, and finalized the revised version with input from W. Mendoza. W. Mendoza contributed significantly to the first and revised versions and identified key examples to illustrate the points made.

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