

* Original Article

What researchers think about the health research system in Brazil: a pilot study

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Abstract

This article presents the perception of researchers, formulators of science policy and users of research results regarding the operation of the health research system in Brazil. A survey was conducted through a probability sample of researchers and an intentional sample of (formulators of) science policy formulators and users of scientific knowledge as well. Only 17% of responders consider the country's health research system as a good system, pointing out that the most relevant components are (:) the vision, a set of priorities and the guarantee of financial resources for the research. The components less valuable were : evaluation of the system itself, incorporation of results to the public policies and their dissemination to the public opinion. The main targets of the system must be: improvements in the population health, advancements in knowledge and promotion of equality. These responders would inject a greater proportion of resources in practices like induction for basic, epidemiological and clinical research. They appreciate current health problems, the persistent ones and the forecast of future problems, the service to vulnerable groups and also prevention and cure strategies for diseases as criteria for defining priorities. All opinions suffered some changes due to age groups, the responders' position (researcher, manager, user) and area of expertise.

Key-words: health research system, researchers perception, health research, science policy, components of the health research system

INTRODUCTION

International cooperation agencies have been highlighting the importance of science and technology systems on health in order to achieve the objectives of national Health systems. According to the actual perspective, the scientific knowledge must be considered as an input for actions of the national Health policy. (GLOBAL FÓRUM FOR HEALTH RESEARCH,2005; PANG; PABLOS-MENDEZ; JSSELMUIDEN, 2004)

WHO defines the Health Research System as a set of "people, institutions and activities whose primary purpose is to generate high-quality knowledge that can be used to promote, restore or keep the health status of populations" (PANG et al, 2003). The systemic approach tries to overcome fragmentation in research activities and the usual difficulty of communication among researchers and users of research products.

One of the proposed strategies of The World Health Organization was the Health Research System Analysis (HRSA) in order to implement activities related to the strengthening of health research capacity in the member countries, as a tool for information generation as well as for the evaluation of their health research status. Brazil was one of the countries which participated in the pilot study for the instruments development.

This article presents some of the data obtained on the survey carried out as a sample of researchers, formulators of science policy and users of results regarding health research. The survey has covered four topics: responders features, evaluation of the research environment in the country, evaluation of the health research system and research production and utilization. In this article, only results regarding the evaluation of the research system will be presented, since due to the amount of available information it is not possible to present all evaluation topics in one article.

METHODS

A survey was conducted by using a probability sample of researchers and an intentional sample of formulators of science policy and users of scientific knowledge. Data were obtained through interviews with individuals, carried out in 2003, with an analysis of exploratory and descriptive type.

The questionnaire, developed by WHO, was translated into Portuguese and afterwards submitted to election by selected consultants that were supposed to analyse those questions with the aim of homogenizing concepts and categories. Validation and reliability studies were performed by WHO team after modifications suggested by local teams. The instrument consists of five modules, with the first one being destined to socio-demographic features of responders, the second one regarding the evaluation of the research environment, the third one intended to the evaluation of the health research system, the fourth meant to the description of scientific knowledge production and utilization and the fifth focused on the evaluation of the instruments used in the survey.

Since modules 2 and 3 present five versions each (A, B, C, D, E) due to vignettes, a systematic and random distribution of the version on the responders sample was done. That way, each version of these modules was answered by 1/5 of the sample.

The vignettes consisted of little statements that intended to calibrate the responder perception, that is to say, taking into consideration that most of the questions of blocks 2 and 3, respectively regarding the work environment in research and the components of the national system on health research, depended on the responders perception. The vignettes were inserted as a way of evaluating the objectivity of such perception. Each formulation intended to portray the different nuances for each of the aspects considered relevant to the work environment or for each component of the health research system. This was the most criticized part of the questionnaire and the responders considered statements as too simple and obvious, as well as tiring, due to their repeatability.

From the 280 individuals who were part of the sample, only 193 answered the entire set of the questionnaires (68,9%). Other 36 answered some parts and 51 (18,2%) refused to participate, claiming mainly lack of time. Decline rates were equivalent among researchers, formulators and research users.

Further details about the methodology can be obtained in other article (SILVA et al, 2007).

Health Research System in Brazil

According to Guimarães (2006), Brazil is part of the developing countries group, responsible, at a national level, for the production of around 6% of the health research.

In the number of articles indexed by *Thonson Institute*, Brazil is currently classified in the thirteenth position. In the same base, its production in Collective Health, for instance, is in the eleventh position.

The census of Brazilian research groups carried out by CNPq 2006 registers 6.825 groups devoted to human health research, corresponding to 32,46% of total research groups. These groups gather 18.838 researchers (56,6%), from which 10.653 have doctor degrees. The science and technology productions of such researchers correspond to 14.276 articles published in national journals per year and 11.910 in international journals. In terms of *per capita*, on a yearly basis, 1,27 articles are published in national journals per researcher and 1,06 in international journals.

Still according to Guimarães (2006), Brazil allocates a significant volume of financial resources for health research, being 1,5% of national expenses and 3,3% of public expenses destined to health. Almost all research financing comes from the public sector and only 3,5% of resources derive from international financing, which demonstrate the native capacity of maintaining the health research system. Research production is concentrated in Universities and some Research Institutes (LETA; GLANZEL; THUS, 2006).

In the set of areas that compose Health Sciences, medicines respond for the majority of groups and researchers (18,7%), followed by Collective Health with 8,7% of research groups.

The system is characterized by a large regional concentration, with most groups located in institutions from south and southeast areas, that is to say, the most developed of the country.

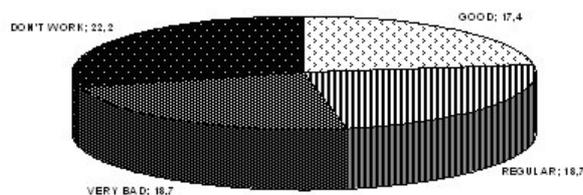
An Academic Production Analysis of 1994-2003 period, performed by Meneghini and Parker, has identified 25 excellency cores in the country. From the 11 studied themes, five are from health field: cardiovascular surgery, neurosciences, infectious diseases, human genetics and reproductive health (MENEGHINI; PACKER, 2006).

As of 2004, with full development of the Science, Technology and Innovation Department of The Brazilian Ministry of Health and by the approval of The National Health Sciency, Techonology and Innovation Policy, there has been a significant change in the scenario of health research in the country. Data from this pilot study may serve as a basis for future evaluations regarding such policy, once they were obtained in a moment immediatly prior to its implementation.

System Operation

The evaluation about the system operation of Health Research in the country has divided the opinion of responders. No responder has considered that it works properly. All other options were marked by around 20% of responders (Figure 1).

Figure 1: Operation of the health research system in Brazil, 2003



Among the responders that work with clinical research, Collective Health and R&D, the evaluation of a regular operation was predominant, while for the ones of the basic research area the vision of a precarious operation has prevailed.

For managers, producers and users, the operation evaluation was similar, with the idea of a precarious or regular operation also predominant. The same behaviour was noted in all age groups.

As the main challenges for the proper operation of health research systems, D'Souza and Sadana (2006) point out the lack of coordination among research institutions, lack of integration among producers and users of scientific research, lack of demand from the health policies formulators and lack of access to research funds.

The evaluation of the survey participants reflects their dissatisfaction arising from the comparison between the conditions existing in the country and the ones present in countries of high incomes. Comparatively to countries with the same income rates, the evaluation would likely be better, once the restrictions regarding researchers capacity building, access to internal and external financing, as well as database and institutional capacity are minor in the country (GUIMARAES et al, 2006).

Health Research System Components

As the system components, it was considered its general vision or conception, priorities definition, financing, allocation and responsibility in the use of financial resources, scientific merit, system monitoring, research infrastructure, ethical criteria, communication of the research results to the public opinion, incorporation of knowledge regarding the formulation of policies and health practices.

Among these items, the most important ones for health research system were the conception or vision about the system (38,7%) the setting of priorities and the guarantee of financial resources for health research (18,3%). Following that, the allocation of resources for relevant projects and the responsibility for their use, the infrastructure for research and the capacity of producing valid results were mentioned. The components less recognized by responders were the system monitoring (aiming its improvement), the incorporation of results to the creation of health policies, the use of such results for health practices and the communication of the research results to the public opinion.

In accordance with the bibliography about the subject, the three components marked by responders as the most important ones demonstrate their perception regarding the need of a clearer definition of a policy for science and health technology, the creation of a priorities set able to guide this field initiatives and the guarantee of a proper and continued flow of resources, in order to maintain the activity (THE STATE, 2008; LOPEZ, 2008).

The approval of the Health Science, Technology and Innovation National Policy (CT&I) and the National Agenda for Health Priorities during the Second National Health Conference held in 2004, have met the request of the Brazilian Scientific Community (GUIMARAES et al, 2006; BARRETO, 2004).

When applying the research results, as well as disseminating it to the non-expert public, the firmly academic type of the Brazilian Science is seen as the less important factor by the responders. The minor importance attached to communicational aspects contrasts to the huge interest of the printed, spoken and broadcasted media about national science.

According to responders, the evaluation was satisfactory only regarding ethical criteria. Such perception surely is part of the valorization of the work performed by the National Committee of Ethics in Research of the National Health Council, as well as the creation of Ethics in Research Committees inside institutions participating the system.

Mission and Targets of the Health Research System

As basic targets for the National Health Research System, the advancement of scientific knowledge and its use for improving the rates of population health and creating equality were presented. The knowledge advancement was considered as an important issue by 91.3% of responders and its use for improving health by 95,6% of them. The equality promotion, however, was pointed as very important by 89,1%. ($p=0,026$)

Responders who work in the Collective Health area considered equality promotion as important as the other targets. Responders working in R&D area have given less value to the knowledge advancement as a target for the system.

Managers, producers and users have valued the three presented targets, yet managers and producers emphasized the use of knowledge for improvements in health and users highlighted the knowledge advancement. The group that valued equality promotion the most was the one of the managers.

The ones under 60 years old valued knowledge advancement more than equality promotion, while the older ones valued both targets in the same way.

Regarding vision, mission and targets of the system, the proper alternatives considered by the vignettes presentation were the ones where such aspects were defined together with researchers, service providers associations, National Research Council and Health Ministry, being the later one in charge of their implementation. Situations where no definition of vision, mission and targets for the system was done, or the discussion about such issues was independently performed by the Health Ministry, National Research Council or by researchers, were considered inappropriate.

The use of scientific knowledge for improvements in the population health conditions, pointed out as the main mission of the health research system, reflects the profile of the scientific community and the value assigned to health in the country. Scientists often consider that the research system mission is to create new knowledge, being the concern with uses and applications left for low priority. (PÉREZ-TAMAYO, 2001)

Managers play a key role in the decision about in what level the results of scientific or technology research will be added to the Health Policy (CHOI et al, 2005). The direct interaction between scientists and managers has been highlighted as the most influential facilitator for ensuring application (HAINES; KURUVILLA; BORCHET, 2004; PITTMAN; ALMEIDA, 2006; SOUZA; CONTRANDIOPOULOS, 2004)

Some authors indicate that the knowledge production can present practical unfolding that, despite health status improvement (previously stressed), includes costs reduction in the health system through innovation and regulation (BARRETO, 2004; BUXTON; HANNEY; JONES, 2004).

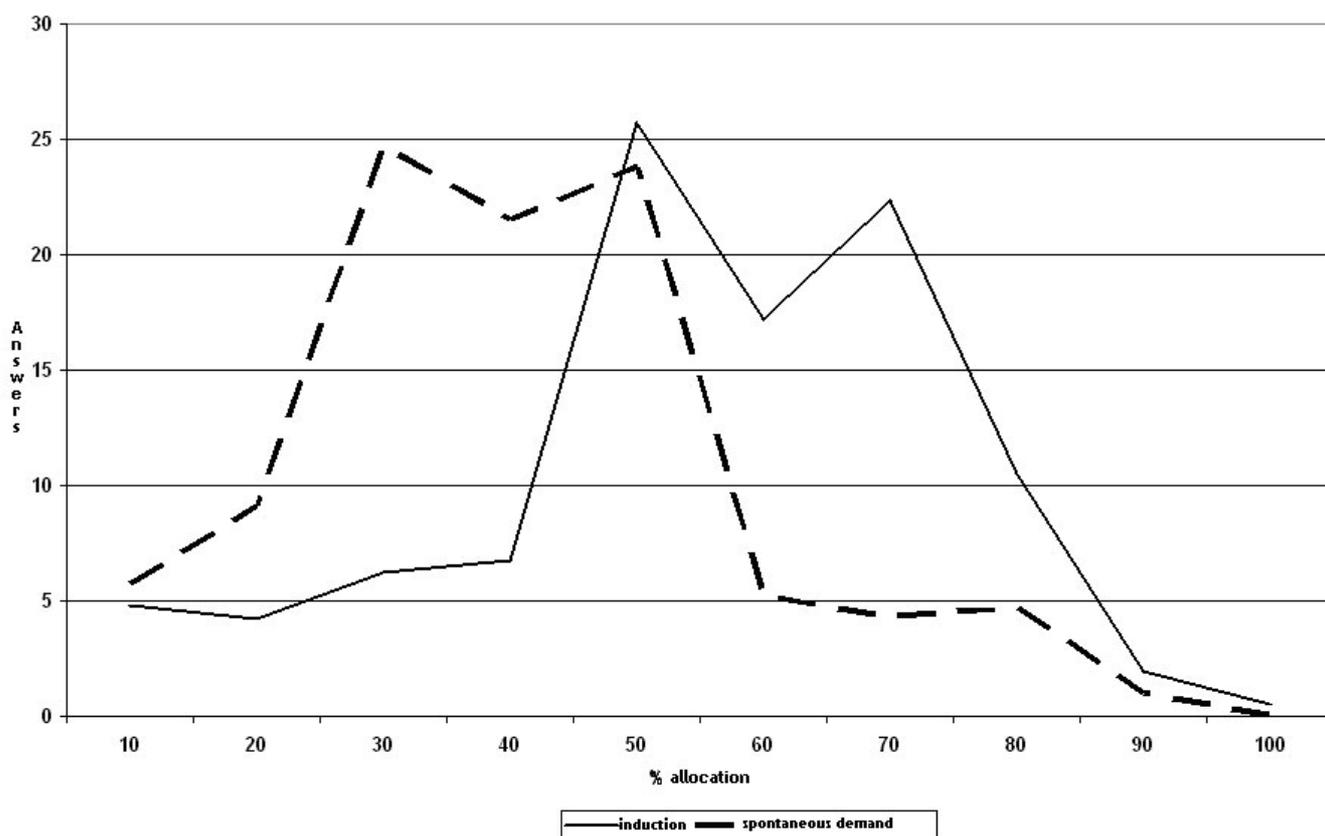
Although social inequalities in health strongly exists in the country, part of responders did not consider equality as one of the targets for the research system. Such attitude may be a consequence of the difficulty of taking into account the science role regarding inequalities reduction.

Sanders et al (2004) find that the health research focus must be the growing debt on health and richness, existing between the rich and the poor realities, as well as in the gaps between the scientific knowledge and its effective application in order to solve problems, specially in poor countries. In Brazil, a middle income country, yet with important social inequality levels, the health research system will have to mandatorily consider the search for equality as one of its main missions.

Forms and criteria for resources allocation

Responders indicated the resources percentage that would be allocated for research induction and spontaneous demand service. In average terms, the distribution pointed by responders was 60% for induction and 40% for spontaneous demand. Generally, researchers of R&D areas, users representatives and individuals with less than 40 and more than 60 years old would increase the allocation for induction, proposing rates between 60 and 70% (Figure 2).

Figure 2: Cumulative distribution of resources allocation percentages of second type, Brazil, 2003



According to responders, the minor resources proportion would be allocated to health systems research and to the Science and Technology research system itself. Both would receive around 17% of resources, in an average of 15%. The basic and epidemiological researches would receive around 20% of resources, each. Clinical Research would receive the best portion, with an average of 26% of resources.

The minor valorization of results application also appears in the minor proportion of resources that would be destined to systems and health services researches. Such position is at a certain extent contradictory to the fact that improvements in the population health is the main target to be sought by the health research system.

Apparently, responders believe in the science potential itself in order to solve health problems without giving proper value to the mediation performed by organizations that aim to face problems up. Researches related to organizational ways and intervention models are not considered necessary.

The fact that the amount destined to basic research is similar to the one indicated for epidemiological research, suggests that responders are aware of the differences between this two types of know-how and recognize their contribution for reaching the system targets. Further proportion of purposed resources for clinical research allows us to make two kinds of interpretation. From one side, the recognition of the relatively weak position of this area in the country and the high costs that such researches involve. On the other side, an overestimation of the expected results for such research kind, regarding health improvements at a population level.

Criteria for Identifying Priorities

A health research set of priorities is an important instrument for guiding research financing, for an informed choice regarding research options and for conducting it into a national strategic interest (LENAWAY et al, 2006).

For 17% of the responders, there are no rational criteria for identifying priorities for health research in the country. For less than 1% no Identifying Priorities criteria are necessary.

They indicated ideal criteria for Identifying Priorities, which are current health problems (50%), continuous problems (47,8%), future health problems, that is to say, forecasted ones (34%), policies geared towards the service to vulnerable population (22%), policies for large-scale implementation of prevention strategies, control and treatment (18%) and new basic knowledge(17%).

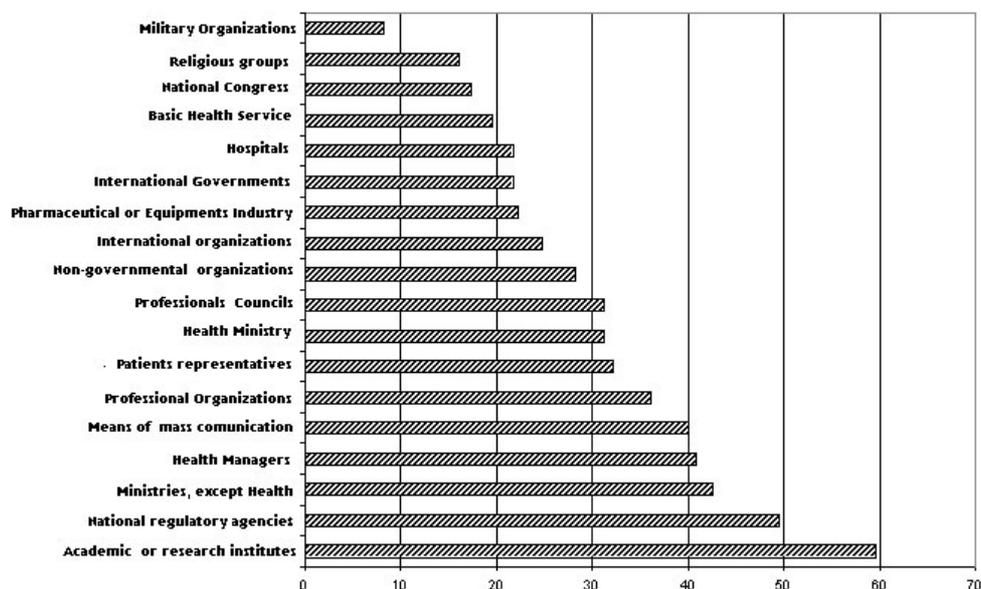
The criteria considered by responders as ideal show that they prioritize needs dimension more than political influences. Somehow this attitude coincides with the minor importance given to dissemination of research results for the general population. (IHE, 2008) Responders seem to consider that the scientific activity is for the exclusive use of the technical field, not supposed to be influenced by the political field of social life. In this respect, even responders working in the area of Collective Health, commonly crossed by political issues, gave precedence for such needs of criteria. Sanders et al (2004) consider that health research priorities must include the determinants of health, health system implementation and strategies of social changes for modifying the distribution of social determinants.

Almost all responders indicated that the existence of a clear set of priorities is important. Such stance coincides with the induction appreciation previously pointed out. However, almost 20% thought there were no rational criteria in use for identifying research priorities in the country. Other responders believe that priorities are set from the existing epidemiological profile, groups of interests of civil societies, represented by the actuation of pathology carriers associations (in the case of Brazil), by non-governmental organizations, by social movements and by the pressure of political and international groups. Such criteria list shows that responders believe that the process of priorities setting is influenced by political aspects more than by health needs.

The process of setting priorities for health research conducted by the Health Ministry have started in mid-2003, coinciding with research performance and it was totally concluded by mid-2004 (GUIMARÃES et al, 2006). Hence, when answering the questionnaire, responders had no knowledge about the process to be adopted in Brazil.

For **priorities setting** in research, the situation in which the formulation of the agenda, jointly with Health Ministry, National Research Council, researchers, professional associations, production sectors and civil society representatives was considered excellent, taking into consideration actual and futures health problems. The very bad picture was portrayed by the absence of priorities setting or by this process done only by The Health Ministry, or even in an independent way by the different actors (Figure 3).

Figure 3: Cooperation among the main agentes of the research system in Brazil, 2003



Evaluation of the Other Health Research System Components

The other system components were evaluated through the vignettes. Regarding **Ethical Guidelines**, the best picture was marked by the one in which there are national ethical guidelines, laws and regulations. All institutions require ethical analysis of projects involving human beings. Besides, at least 95% of projects are effectively analysed and at least 90% of the individual surveyed have signed the informed consent. The picture of nonexistence of ethical guidelines, as well as unregulated ones, was considered as pretty bad.

With respect to the **system evaluation**, the existence of an organization in charge of monitoring and assessing the reserach production conditions, demands and results that gather information about the production and the use of results was indicated as appropriate. The pretty bad picture was portrayed by the inexistence of any evaluation, as well as by the existence of the production evaluation only, without taking the use into consideration.

With regards to the health research **financing**, the appropriate picture was the one in which there are clear criteria for financing, based on scientific merit. Only 10% to 15% of resources are distributed following personal relationships; 10 to 20% for junior and average level researchers and 75 to 90% of researchers report the accounting of the obtained resources. Pictures in which 25 to 50% of resources are distributed according to personal relationships were considered pretty bad, and only 25 to 50% of researchers report the accounting of the

obtained resources. The extreme picture, declared as pretty bad by 83% of responders, was the inexistence of clear criteria for financing and the absence of accounting report.

Regarding the system components, the values expressed by responders on the vignettes analysis show commitment with democratic principles of enhanced participation, respect to ethical guidelines, responsibility on the use of financial resources, merit defense and a clear competition over financing, as well as the perception of the follow-up importance and the performance assessment.

Neglected Research Topics

Around 75% of responders indicated that there are research topics neglected by the country. For 18%, specific diseases such as AIDS, Chagas disease, leishmaniasis, ageing diseases, osteoarticular diseases, genetic diseases, amongst others were mentioned as neglected. In the second place, issues related to policies, health actions and programs (11%). Following that, applied research, technology development and clinical research were mentioned.

The indication of neglected research topics reflect the identification of few researches about certain diseases considered important to the national surveillance framework. Technological development was only pointed out by responders working in the field of R&D, by managers and individuals over 60 or more. Collective Health Research was pointed out by individuals working with collective health and in the field of clinical research, as well as by users. Practically all groups indicated the lack of researches in health policies, practices and actions. Such attitude contrasts with the indications of less financial resources exactly for this topic, previously pointed.

Cooperation with other Health Research System Agents

The most frequent cooperations mentioned by responders were the ones with academic or research institutes, national regulatory agencies, Health Ministry and other ministries, managers of the health system and means of mass communication.

The cooperation with these agents came through the participation in projects, advisories, technical advisory committees and academic activities.

The cooperation of researchers from the basic research field was more frequent with academic institutions or research institutes, regulatory agencies and other ministries. Researchers of the clinical research field presented a pretty diversified cooperation, including mainly from academic institutions and research institutes, regulatory agencies, mass communication, professional organizations, groups of patients and consumers, professional councils, health system managers, Health Ministry, other ministries and health professionals. For researchers of the Collective Health field, cooperations were concentrated in academic institutions and research institutes, health system managers, regulatory agencies, Health Ministry and other ministries. Finally, researchers from the technological development field cooperated mainly with academic institutions and research institutes, regulatory agencies, industries, Health Ministry and other ministries, means of mass communication and non-governmental organizations.

For the fields of basic, clinical and technological development research, the cooperation was given by the participation in projects, advisories or technical and advisory committees. In the field of Collective Health, besides the participation in projects and advisories, community activities were regular.

The long cooperation of responders with a various agents that compose the health research system is partially a result of the pattern inserted in the sample selection and partially a peculiar tradition of the country. Even the academic research presents a relatively high level of articulation with governmental sectorial organizations. Given the strategical nature of the health research field, it is strongly articulated among policies formulators, service providers and knowledge producers. On the other hand, the fact that the research financing is predominantly public facilitates the establishment of such mutual dependency relationships.

Identifying Successful Experiences

The most successful experiences mentioned on a regular basis were regarding the components of ethical criteria (17,4%), technological development (13,9%) funds (9,1%) and formation of human resources (9,1%).

With regards to ethical criteria, the successful cases mentioned were the Ethics in Research Committees, the creation of rules and the general improvements of the ethical standard on national researches. About the technological development, national policies with strong technological or scientific components were mentioned, as well as developments on immunobiologicals and the enhancement of the state regulatory actions.

Positive aspects related to the science and health technology policy were also identified, with emphasis in the promotion of national conferences, support to specific projects, the creation of the Science and Technology Department (DECIT) of The Health Ministry, the formulation of a priorities agenda on research and the directory of research groups of CNPq (National Research Council).

For research funds, the creation of sectorial funds, incrementation on financial resources for health research and the support to specific projects were mentioned. Researchers education has also been worth highlighting, mainly regarding the evaluation by CAPES of Post-Graduation courses, the enhancement on the training capacity and the growing qualification of professionals.

Less frequently, other experiences were also mentioned, such as access to scientific information (BIREME, CAPES Website), university-enterprise partnership and the cooperation between academic institutions, infrastructure for research, quality of scientific publication, increased dissemination of results for the general public and incentive to networks formation.

Identifying Negative Experiences

Several negative experiences were mentioned and the most cited ones were regarding deficiencies in financing. Less references were made to system operation problems, difficulties with the results utilizations, absence or problems in the priorities setting, difficulties with the evaluation of projects and researchers, deficiencies on human resources, lack of investments in public universities, political troubles, problems with the evaluation of projects by Ethics in Research Committees, limited technological development, difficulties for projects submission and networking, as well as for dissemination of results to the public.

Although 13% of responders consider that such negative experiences did not lead to any learning, the others think that they allowed some lessons to be learned, amongst which the highlights are the adoption of fairer and clearer ways of financing, greater commitment to research, importance of partnerships and cooperation, the need of priorities setting, more efficient ways for disseminating knowledge, ethical responsibility on research conduction, assessment of losses caused by discontinuity, assessment importance, the need of using technological advancements, the importance of fixing researchers and the need of improving knowledge diffusion. Among international experiences, indicated as interesting, due to the regular basis on which they were mentioned, some initiatives that aimed to increase the knowledge production can be highlighted, as well as ways of granting financing continuity and increasing research resources; support to research best adjusted to the needs of the country, focused on the reduction of disease burden over the population and more efficient ways of research organization, in order to increment results.

CONCLUSIONS

Responders were divided according to the health research system in the country, however 83% found it regular or bad, demonstrating a hypercritical attitude, once health research conditions in Brazil are reasonably good when compared to countries of equivalent income and development. Researchers from the basic area were the ones who presented greater dissatisfaction.

There is a set of contradictory attitudes in the perception of responders. At the same time they give less importance to dissemination of research results to society in general, as well as to the incorporation of results in health policies and programs, they point the improvement on the population health as the main mission of the health research system.

The minor importance attached to such aspects suggests an elitist and academic attitude from the responders, having as a counterpart the lack of interest on the national scientific production from the means of mass communication, and huge political weakness regarding budgets negotiation for research and technological development in the legislative power jurisdiction.

As targets for the system, only researchers of the Collective Health field give equivalent importance to the reduction of inequalities, to improvements on the population health and to knowledge advancements.

Responders demonstrate a conservative stance regarding financial resources allocation, pointing out that an ideal scenario would be a fair sharing between induction and spontaneous demands and a greater volume of resources for clinical, basic and epidemiological research, with less volume to technological developments and research investments on the health system.

Responders consider that the proper operation of the system depends on the need of counting with a policy of science and technology in health, with a priorities set and also a regular financing guarantee in an enough volume.

Regarding the priorities setting, they defend democratic and participatory procedures for definition, pointing however that the ideal criteria are the ones based on the assessment of health needs, denying legitimacy to political pressures resulting from different social groups.

Through the use of vignettes, it was possible to identify the valorization of ethical aspects, the approval of evaluation and follow-up systems regarding the research activities by the bodies in charge, the transparency in financing, academic merit in the projects selection and the commitment with the accounting report regarding the obtained financial resources.

Among topics indicated as neglected by health research in Brazil, the highlights are for some diseases, research about the health system, technological development and clinical research.

Results demonstrate the wide and diversified cooperation of researchers, formulators and users, with different agencies and institutions from both the science and technology and the health systems, besides the cooperation with entities of civil society.

At a national scope, the successful experiences were the ones related to the institutionalization of the system for the control of ethical aspects in health research, some governmental initiatives of fostering technological development, the creation of sectorial funds for the research financing and the quality of the Post-Graduation system, destined to form researchers.

As negative experiences, various problems were mentioned, related to research financing, both regarding the relation with the resources volume and the discontinuity and irregularity of the release.

Generally, responders were very critical about the operation of the different components of the system, pointing out, however, the clear need of organization and implementation of measures that may effectively grant the existence of a health research system in the country.

Conflict of Interests

Authors have declared they have no conflict of interests.

Authors Contributions

JCN has substantially contributed to the conception and the drawing; TRS and FZ have substantially contributed to the conception, data collection and to the text critical review; RBB has substantially contributed to the text writing and the analysis and interpretation of data. All authors have granted final approval to the submitted version.

Gratitudes

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