Public health research: between science and action?

Pesquisa em saúde pública: entre a ciência e a ação?

Gérard de Pouvourville [1]

[1] *Groupe IMAGE. École Nationale de la Santé Publique 14, Rue Val d'Osne, 94410, Saint Maurice, France.*

Abstract *In this text, we first propose a concept of public health research as a multidisciplinary endeavor whose aim is to identify the main determinants of people's health status, analyzed at the collective level. The public's health is thus envisioned as a socially determined reality, in which risk factors include biological phenomena as well as a given community's social and economic environment. Second, we argue that public health research should be applicable research, i.e. that it should be useful to decision-makers. But since the relationship between science and action is conflicting, it is necessary to invent mediatory practices to facilitate interaction between researchers and decision-makers.*
Key words *Epistemology; Health Policy; Public Health*

Resumo *O artigo propõe, primeiro, uma conceituação da pesquisa em saúde pública como um projeto multidisciplinar cujo objetivo é identificar os principais determinantes da saúde dos indivíduos, analisados em nível coletivo. Assim, a saúde da população é vista como uma realidade socialmente determinada, cujos fatores de risco incluem tanto fenômenos biológicos, quanto o ambiente social e econômico de uma determinada comunidade. Segundo, defendemos uma pesquisa em saúde pública que seja aplicável, isto é, útil para aqueles que detêm o poder de decisão política. Entretanto, uma vez que a relação entre ciência e ação é conflituosa, é necessário criar práticas de mediação para facilitar a interação entre pesquisadores e políticos.*
Palavras-chave *Epistemologia; Políticas Públicas de Saúde; Saúde Pública*

My purpose in this text is double. First, I wish to propose a modest but hopefully relevant epistemological investigation into public health research. Why so? In France, but also in Brazil, as I understand it, there is a lingering question about the place of public health research in the constellation of other disciplines studying health. In our French National Institute for Research in Health and Medicine (INSERM), it is well known that somehow, although public health is certainly "necessary and useful", it is less prestigious than perhaps genetics or fundamental research in general. Why does this situation prevail? To put it another way, can we jointly discuss the foundations of public health research and propose a definition that could help stabilize its scientific status?

Second, by so doing, we will find that public health research has an inescapable calling to produce knowledge intended to be used to implement policies for the improvement of the health of populations. This political project actually exists, since in many countries there are not only public health researchers but also public health professionals. I will argue that public health research is *applicable* rather than *applied* research. In France, again, there is endless debate over how research can be useful to policy-making, with researchers inclined to think that their role stops when knowledge is produced and professionals and decision-makers stressing that researchers never answer their questions. We should spend some time thinking about what kinds of more constructive arrangements can be made. In fact, the relationship between knowledge and action is in itself a research issue, a fact I think most social sciences cannot escape.

My background did not prepare me specifically for public health research. I am a full-time research scientist at the Centre National de la Recherche Scientifique and am current research director of a small group affiliated with the French National School of Public Health, the Groupe IMAGE. But I am not an MD. My initial training was in engineering, after which I mastered in economics and did my Ph.D. in administrative sciences. Most of my research thus far has been in administrative sciences, applied to health services but to other activities as well. I have thus had a more or less external view of public health research, and this may justify some form of naiveté in my approach, besides a relative ignorance of the field in all its components.

The epistemological status of public health research

To discuss the epistemological status of public health research, it is only natural to begin by defining public health.

Twenty years ago things were relatively simple in France. Three distinct poles of public health existed, with an accepted division of labor: INSERM researchers doing mainly epidemiology, medical school professors of public health concerned mainly with hospital hygiene and some with social epidemiology, and public health professionals (employed by the national government) implementing sanitary regulations and controlling the qualifications of health services professionals, occasionally participating in planning activities. Throughout that period, public health research was relatively well identified as research done by public health doctors and epidemiologists to establish causal relationships between risk factors and specific health problems. The field's scientific identity was warranted by the relative unity of methods in epidemiology and biostatistics. The link with policy-making was loose, appearing mainly in the way research teams built their research agendas by addressing or overlooking national priorities. But such a link at least requires a set of priorities, and this was not the case in our country. Health policy was mainly a policy of health services supply and financing. Things have changed slowly but surely in this regard.

The picture really got muddled in the 1980s and 90s, for several reasons which I will not cover completely for reasons of space. Throughout these two decades, anything with even a minor relationship to health became public health. Let me point out a few events that changed the status of public health and destroyed its traditional boundaries.

Aids is one, involving two aspects. The first was the emergency that the epidemic represented and the need to rapidly mobilize intellectual resources to help define preventive policy. However, since the disease mainly involved sexual behavior, traditional epidemiological approaches proved insufficient, and social sciences had to be called on to help explain the complex determinants of human behavior. The other aspect of Aids was the transfusion problem, stressing the need for the French state to tighten its controls over health safety matters.

Rationalization of the health care system is another issue that broadened the scope of health policy, and as such that of public health research. Here again, in France, one can rea-

sonably support the idea that traditional public health researchers were not prepared for the challenge, whereas it undoubtedly concerns the people's health, either because of a risk of rationing or through attempts to improve the efficiency of services. Why were researchers ill-prepared? Because most if not all of them lacked not only knowledge on the way health services are managed, but also skills in administrative and political sciences and economics. When they prepared a research protocol, they were not used to including data on service utilization and referral patterns. Their job was to identify physical risk factors for diseases, not to assess how the system's own functioning could create illness.

Because of the economic crisis and companies' changes in their production systems, policy concerns over socioeconomic health determinants gained new visibility. Although it was the Canadians, and particularly the group led by Evans et al. (1994), who were primarily responsible for renewing research on the links between social factors, working status, and health, there had always been a tradition in France of studying inequalities associated with social and occupational status. This tradition has been revitalized, fostering the production of new evidence on the links between, for example, precarious new working conditions and health. This meant that public health issues could be identified outside the health care system itself, and that the search for risk factors had to be broadened to include more complex health determinants.

Another important issue is the emergence of information technology, allowing for the development of information systems not previously available, thus opening new avenues for research. Again, interestingly, initiatives in developing such systems did not come mainly from the traditional public health "sector ", but from the administration in its quest to rationalize health services. Public health researchers are now confronted with novel systems which may not be totally adequate for research purposes.

Thus, in my country, the public health domain has been considerably extended to the point that almost everything can be seen as having a public health dimension. I suspect the same has happened in other countries, including Brazil. Does this evolution help build the scientific identity of a research field? In fact, it is more likely that it may fragment the field into as many specialized domains as there are new health problems and to the extent that more and more disciplines are involved.

Moreover, the association between the terms "public" and "health" is getting fuzzier. In the past, it suggested that some specific health problems required intervention by the state, requiring the training of public health professionals. Public health was basically what public health professionals were doing. Nowadays, extension of the "public health concern" involves diversification of the means by which the state and various other players intervene. In France, both primary care physicians (GPs) and hospital staff are required to become "public health players", so that public health is no longer a professional monopoly. The public health armamentarium has also expanded. For example, it is recognized that financial incentives may have more impact on professional behavior than health regulations and thus have profound effects on the people's health. Public regulatory intervention may be necessary to address the health dimension in the population's welfare, but economics often suggest that an adequate system of incentives can provide an efficient, decentralized way of dealing with externalities.

So, is it possible to build a new scientific identity for public health research that takes this evolution into account? My suggestion is the following. I would like to use an analogy. Four years ago, I was attending a French-British seminar comparing the history of social policies in the two countries. One very exciting lecture was on how unemployment had become a category of public interest in 19th-century England. Traditionally, even trade unions had considered unemployment an individual problem, that of a worker who refused available jobs because of low wages or personal convenience. The lecturer explained how a certain number of researchers (at that time enlightened elites) began demonstrating how aggregate unemployment levels could be explained on a macro-economic basis, revealing global determinants beyond the control of individual will. Somehow the idea emerged that there might be specific aggregate effects of a society's functioning that are not easily perceived by common sense and that require specific methodologies to be demonstrated.

Sociologists may have recognized or will argue that the notion of a "social fact " was first developed by Durkheim (1988). Economists will recognize the issue of externalities, or the issue of the "composite effects" of rational individual behavior, as developed by Schelling (1978) and Boudon (1979) in France.

The public health research domain could thus be defined as the study of the functioning of social systems which have a specific impact

on the people's health, not considered individually, but as specific groups. The domain's specificity would be defined by one very important aspect: the dependent variable would still be health, requiring that to perform such research one must at least be able to measure a given group's health. In other words, we are building a research field on the foundations of traditional public health research, which depends on the identification and measurement of health problems. According to such a definition, health would not be limited to absence of illness, but would include other dimensions of well-being. Social scientists working in public health research would thus have to demonstrate that their explanatory models for social systems help explain significant variations in the health status of various groups. This requirement would serve as an integrating factor for a research community, fated to become much more multi-disciplinary than before. In this regard, I wish to acknowledge the pioneering work of the Canadian school of thought concerning the concept of population health (Evans et al., 1994).

Can this multi-disciplinary approach survive in existing scientific institutions? Specialization of the production of knowledge through diversification of disciplines per se is not a favorable context for multi-disciplinary research. People involved in public health research on the basis of a given discipline (e.g., economics) may be subject to strong incentives to have their work and career evaluated by their peers, i.e., economists in general, thus denying the specificity of a public health approach. Moreover, from my own experience of sitting on scientific committees, people doing interdisciplinary research are paradoxically asked more than people from a single discipline, since they have to prove that they master several disciplines in addition to their own research project. This suggests that it may be necessary to create public health institutes, with the specific requirements that research be oriented towards the understanding of health determinants and that this be the standard by which to judge research work. It may also require that a significant number of public health researchers themselves be trained in two disciplines. Indeed, I contend that to do effective multi-disciplinary research work it is not enough to put people with different backgrounds in the same room. It takes at least some that are familiar enough with two different scientific "languages" to act as translators.

What would be the criteria for good research in this "post-modern public health paradigm"? First, its capacity to relate a social system's functioning to the population's health status. Second, the researchers' capacity to demonstrate how different disciplines contributed to the evidence. Third, as usual, the research design's rigor and relevance.

Finally, use of the term "public" to define this concept of research may be misleading. What is important is to study the emergence of positive or negative health status at the group or population level, which may need to be treated by state intervention. Perhaps because my reference is economics, I prefer to speak of a "collective concern", which may or may not justify public intervention. Moreover, people tend to associate the term with public health professionals, whereas collective health issues now involve a wide range of players, with or without public status.

The relationship between knowledge and action

Let us now focus on the second point, the link between scientific knowledge and decision-making. What is the link with the preceding issue? From my point of view, research in "collective" or public health, as we may decide to call it, promises by definition to be *applicable* research, much closer to the sphere of action than is fundamental research in biology, biostatistics, or theoretical economics. This is all the more true in our institutions, training professionals who will either deal with public health policy implementation or help define such policies.

Most importantly, I wish to address this point because science and decision-making have always had a complex relationship, ripe with unmet expectations. Since, as I suggested earlier, there is an increasing demand for answers to public health questions, there is also a high risk that this demand not be met, producing a backlash in the research community.

The question is not specific to public health. I am merely suggesting that we take it seriously, that it can even be a research topic itself. Actually, it has been addressed by decision-making analysis, mainly in the 1960s and early 70s, when rationalization of public decisions through methodologies like PPBS were developed. Again, I can only provide a few hints in this short paper.

In fact, decision-makers and researchers live in different spheres of reference. This may seem trivial, but they often overlook this fact when they interact. The important differences are the following:

• The relationship to uncertainty: here, I should make a distinction between radical uncertainty (a synonym for ignorance) and risk (where it is possible to construct probabilities). For the researcher, ignorance means more research to be done. For the decision-maker, it does not necessarily mean having to wait to make a decision. The misunderstanding derives from the fact that decision-makers often believe researchers can suggest good solutions in case of radical uncertainty. I will come back to this point later. In risky situations, the difference between researchers and decision-makers is that the latter (again, because action is necessary) have to choose, within the confidence interval, which scenario they think is plausible to construct a policy, whereas scientists' role stops after they define this interval. Of course this does not mean that research is unbiased. To manage this bias, it is important that decision-makers be able to use contradictory debates among researchers to identify major loopholes in the studies.

• Researchers tend to believe that the only legitimate source of knowledge is science, but they then forget that science is far from being able to answer to all the questions, at least for a problem pertaining to resources. Reality also moves faster than the production of scientific knowledge. Pragmatic validation of empirical knowledge is often much more efficient than scientific validation. For example, a few years ago I began an economic evaluation of renal lithotripsy in France, because I felt it was important to gather good evidence on the potential economic effects of this new technology. I went for funding to the Ministry of Health, where I met with the Director of the Hospital Division. He was quick to answer that he was not interested in such a study. From his point of view, there was enough evidence in the clinical literature that the technique was safe and reduced length of hospitalization. The important question for him was how many machines he needed at the national level for the fixed costs of installation to be covered by the reduction in hospital days. This could be answered by a simple "quick-and-dirty" study. And he was right.

• The different construction of systems to observe: For decision-makers, the study problem is one amongst others (which may or may not interact), whereas researchers have to artificially "close" the system under study if they hope to find something. In fact, decision-makers also "close" the system, but their boundaries may not correspond to those of researchers, and for strategic reasons they may be unwilling to disclose this.

• Decision-makers have to anticipate a given policy's consequence for different constituencies, since they have to establish a strategy to convince people that action has to be taken, and then implement the action. This may lead again to specific strategies to demarcate the field of research (so as not to "rock the boat") or, on the other hand, to reach out to other constituencies in order to establish "alliances".

• Decision-makers must integrate different dimensions when preparing policies, whereas researchers often concentrate on only a limited number of dimensions in a problem (the ones they master through their field of expertise). More generally, researchers reconstruct reality through the prism of their intellectual tools, while decision-makers construct reality in an essentially political, empirical, and multi-dimensional way.

• The two preceding dimensions obviously have an impact on the definition of deadlines for decision-makers, and there is no reason why their agenda should coincide in time with that of a research protocol. Two situations may arise. The time frame for research is too long considering political agendas, and this may discourage demand. On the other hand, the political agenda may also change over time, and when the study is finished, the decision is no more a problem.

Finally, there is an ethical question. In principle, public decision-makers are accountable for their actions, hence they must assume the responsibility for decisions made under uncertainty: how far can researchers go in advising the Prince, knowing that their accountability for such expertise/consultancy is not to the public, but to own their research community?

There are thus many reasons to believe that the relationship between decision-makers and researchers is a difficult one, often conflicting, sometimes impossible. Is it possible to improve the situation, and if so, what skills are needed? My argument is that there is a need for an agent, or a function, to act as a mediator between the two worlds. We have worked on such a concept with Etienne Minvielle and have identified the following skills for such a mediator:

• He or she must be able to propose decisions that produce knowledge. If one recognizes uncertainty, then the only way to overcome it is to implement decisions allowing one to learn about it. This stresses the importance of systematically accompanying policy implementation with monitoring devices for collecting data on areas of uncertainty. It is the researcher's responsibility to identify and signal

such areas to decision-makers, helping them prepare this monitoring process. Another aspect of such decision-making is to recognize areas with a high risk of irreversibility, for which temporary solutions must be found.

- He or she must be able to translate not only research into decisions, but also decisions into research. To translate research means that one is capable of explaining scientists' main concepts and methods (and thus a study's expected outcomes and limitations) to decision-makers. On the other hand, the challenge also involves explaining the decision-makers' context (deadlines, constituencies, and value systems) to scientists. This translation process is iterative. What decision-makers want may initially seem unclear, ambiguous, value-laden, and empirical. On the other hand, scientific methods and concepts are seldom perfectly adapted on-the-spot to specific problems. Translation may thus go on for some time before reaching some form of compromise. One important aspect of such a compromise for researchers is that they be willing to accept that they cannot investigate everything. They are not producing knowledge for knowledge's sake, and there will be an explicit trade-off between cost and time on the one hand and expected utility for decision-makers on the other.
- Sometimes it may be sufficient to translate existing knowledge and let decision-makers work with it if they are satisfied. This requires not only translation skills, but also the capacity to quickly bring existing knowledge together. In France, this function has been institutionalized by INSERM under the term *expertise collective*. Such collective expertise has been used recently on such issues as substance abuse, treatment of schizophrenia, and other public health problems.
- He or she must be able to suggest production of knowledge in areas where it may be of great use for action. This skill is more prospectively oriented. It means that a mediator's constant interaction between the two spheres allows him or her to gain useful insights on how long-term research project can either be fully designed to inform future decision-making or where specific questions can be included in existing research at a marginal cost.

Such a function obviously raises important ethical questions. Research scientists do not view themselves as dedicated to the service of specific constituencies. They also feel that limits imposed on the production of knowledge for reasons unrelated to science are illegitimate. They may thus be reluctant to see their conclusions quoted and used by decision-makers as an alibi for expert knowledge. At least two answers can be given. First, research in most countries is publicly funded. Although the expected return on investment is the production of knowledge, it is also legitimate that society have a more short-term expectation towards the scientific community. Of course, not all social groups have equal access to expertise. Thus, it may be necessary to provide a special fund to help specific groups use scientific expertise, just as free legal counsel may be appointed to defend someone who cannot afford it. Secondly, scientists may also be aware that their own work is often subject to funding constraints, and that they must sometimes make arbitrary choices, for example, by demarcating the systems they study.

Another final question is: "how does one learn mediation skills?" Allow me to propose an answer to this question in another paper, since it certainly requires further investigation!

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