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Médecine et maladies infectieuses 42 (2012) 569–573

Elsevier Masson France
EM|consulte
www.em-consulte.com

**Médecine et
maladies infectieuses**

Meeting report

Proceedings of the seminar on Emerging Infectious Diseases, November 9, 2011: Current trends and proposals

Major points:

- a permanent experts group, reporting on specific issues and giving suggestions and outlook;
- inquiry stemming from current gaps in our knowledge;
- active cooperation among all parties;
- sharing of information and experience among decision-makers, trusted intermediaries and citizens.

Summary of main proposals:

- to mobilize and bring closer together scientific and political expertise of sufficient diversity, in order to ensure solid interactions between research/training and decision-making/action. Proposal for a permanent group on common expertise and perspectives assuming the task of activating an interdisciplinary network, with priority given to human and animal, and also environmental domains, for a better and more relaxing coordination of institutions under different ministries (health, research, agriculture, environment. . .), simplifying decision-making processes, which would also include a “comparative” approach to consider risks of other nature such as industrial or natural. And to engage in a necessary reflection on the evolution of teaching and training programs in medicine, agronomy and veterinary studies, with common curricula, which encourage integration;
- to share and to pool acquired knowledge with decision-makers, but also with all trusted professional intermediaries, and along all levels of society under diverse forms (awareness programs, education, teaching, training, information and communication campaigns) in view of an unequivocal and supportive reaction on the part of society. Indeed “Communication on public health should be a public matter”;
- to define common essential values based on an acceptance of the principles of relative relinquishment of sovereignty, especially of a given discipline, and commitment to a process of cooperation;
- to continually question and challenge apparent givens, such as “the preeminence of airborne transmission”, or “the impermeable nature of the interspecies barrier”. Identification, without preconceived idea, of knowledge gaps.

1. Introduction

One of the principle recommendations of the report published in June 2011 by *La Documentation française* was the permanent and global surveillance and preparation of the whole society for the risk of the appearance of an emerging infectious disease (EID). These infectious agents, which are the eternal “traveling companions” of humanity, always manage to surprise us.

This document seeks to synthesize updated data and proposals developed during the first annual EID seminar, held November 9, 2011 at the Val-de-Grace School in Paris. The seminar’s goal was to invite researchers, teachers and decision-makers to share new knowledge and ideas in order to prepare a global, united and adapted response to an EID-related alert. Its conclusions will hopefully contribute to enlighten public authorities as well as all other parts of society, and to incite all parties, including those in the field, to participate in this preparation; after all, “should not public health be a public matter?”.

2. News and current events: presentations and debates

2.1. Viewpoints and recommendations from the EID report

Presenters: Jean-Pierre Door (French Parliament), Didier Raoult (Mediterranean University), Philippe Juvin (European Parliament), Roger Salamon (HCSP). Coordination: Catherine Lepout (Paris Diderot University/Inserm).

The report insisted from the start on the necessity of coordinated action against the risk of epidemic, with a reminder of the interest of a permanent multidisciplinary group for expertise and outlook. In order to respond to the distrust of the population, politicians in fact must rely upon such an expert body, which is indispensable if one is to turn scientific knowledge into policy decisions, the economic cost of which can some times be considerable.

Remaining as neutral as possible, observation is the first and all-determining step of scientific method. A revolution is under way in this domain, with new tools, molecular biology and mass spectrometry, used in parallel with more traditional methods, such as cultures, for identifying infectious agents. This leads to “thinking out of the box”, reviewing established ideas: many infectious agents to which humans are host cause people no problems, but also multispecific etiological origin of the same disease, diversity of the human microbial environment, pathogenic role of vegetal-generated infectious agents and of certain infectious agents in chronic illnesses (gastric ulcer,

cancer) considered until recently to be non-infectious. The difficult access to biological, clinical, sociological or environmental data, and the complexity and length of time required for procedures are major roadblocks to constant reactivity and adaptability of research and of action in the fight against EIDs. This battle must take into account new economic and geopolitical balances, and fight its corner in European and international arena. However, building European unity on this issue assumes that all sectors of French society (including research and training) agree to relinquish a degree of sovereignty and to embrace the concept of interdisciplinarity.

EIDs are also the result of new emergence factors, whereas the summary of research and knowledge is most often not available until several months after the beginning of emergence. Model-makers are asked to predict, but it is more their hypotheses than their results which matter. The major points of the EID report published by the HCSP were recalled: an audacious strategy for interdisciplinary research and teaching (particularly drawing together doctors and veterinarians), ranging from basic microbiology to social and human sciences; and the need to bring together research and training to take decisions and action adapted to the level of understanding and competence of each individual. The cooperation of research institutions (ANR, Inserm, ANRS, CNRS, IRD, INRA, IRBA, CEA, the Pasteur Institute, CIRAD), of teaching centres (universities and their research-training units, specialized post-secondary schools) and public health safety agencies should be the impetus for this closer collaboration. Let us by no means forget the National institute for prevention and health education: poorly handled communication leaves this situation wide open to inappropriate attitudes on the part of certain parties and to the irrational fears of the population, to questioning the integrity of experts and to a regrettable skittishness of decision-makers who find themselves under all sorts of hierarchical and media pressure.

A strategy for future training should begin with a no-holds-barred inventory of our areas of ignorance, and should prioritize those, which are to be addressed first. It should target diverse parties, from decision-makers to the general public and the media. It should concern itself first and foremost with health professionals, the essential link to gaining public support for proposed measures. Such a strategy, finally, must implement an array of tactics: awareness campaigns, teaching, training, and communication. Universities with their multiple missions constitute, along with major institutions of public health, one of the primordial settings for these exchanges.

2.2. Risk of infection: environment – animal health – human health

Round-table discussion moderated by Benoît Lesaffre (East Paris University), Jean-François Girard (PRES Sorbonne Paris-Cité), with François Bricaire (Pierre & Marie Curie University), Antoine Andreumont (Paris-Diderot University), Muriel Eliazewicz (Pasteur Institute), Gérard Lasfargues (ANSES), Thierry Pineau (INRA). Coordination: Jean-François Guégan (IRD/EHESP).

One piece of information coming out of this exchange was that the description of new microbes is not enough to declare emergence, and should not be confused with the clinical, epidemiological and causal identification and description of a true EID. The natural history of infectious diseases should in fact be reintroduced in education, which would help foster awareness among health professionals of exchanges occurring between environment, animals and humans. The concepts of the crossing of the species barrier, host-parasite co-speciation, healthy carriers, and transmittability should be re-thought in light of the original work, which transcends all three (environmental or even vegetal, animal and human). Basic postulates such as Koch's concerning the imputability of a disease (often multi-parametric) to a single agent have already been re-thought and should be reviewed and updated. In terms of public policy-making the result would be a better combination of a cause-centered approach and a syndrome-based one.

What is certain today is that the overuse of antibiotics is at the origin of the resistance observed in many bacteria. Their sound use and management are henceforth to be based on policy decisions, which could be confounded by the circulation of resistant bacteria through intercontinental commerce and air transportation. In this respect, the difficulty of implementing multilateral action on a global scale should by no means hinder energetic local, national and if possible Europe-wide measures. Health, agricultural and environmental aspects should be better coordinated, around issues of monitoring and intervention as well as those of training and research.

To conclude, public health should be under interministerial and pluridisciplinary management. The social sciences, all too often "called to the rescue" at the last minute, should be involved earlier on in the program. Bridging the gap between various administrative authorities would facilitate a transversal approach among agronomic, veterinary, medical and scientific research and training processes.

2.3. From one pandemic threat to another: did the H5N1 experience make easier the management of problems linked to H1N1 or not?

Presenters: Jean-Paul Moatti (ISP-Inserm), Didier Houssin (AERES).

At the time of the 2009 pandemic, the need to set up effective prevention provided the frame of reference for public authorities. The risk was known (1889–1890, 1918, etc.), and the authorities dealt with it as they would a natural disaster, a fire or an international conflict. The alert over bird flu (H5N1) has allowed the State to fine-tune its preparedness as well as procedures for international cooperation. Preparedness, however, is also a matter of society and of research.

Social science research brings progress, particularly around the question of public perception, a crucial question for which the public health agencies are currently ill equipped. Unfortunately, social science expertise has not been sufficiently taken into account. Communication occurred much too far down the road from decision-making, whereas it should have entered into the analysis of the situation and become data for

decision-making. Particularly lacking was the consideration of the fact that the population was schematically divided into three large groups: those who think like the experts (risk-benefit) but not necessarily adhere to their recommendations; those who are rather sensitive to any form of discord and could very easily change their mind; finally those who already distrust the “elite” and who are generally the most socially vulnerable. The absence of general practitioners from the operation can only have detrimental effects, especially on the two latter population groups. It would be desirable to set up a databank on risk perception aimed at aiding decision-making, for use by the interministerial crisis centre (Ministry of the Interior).

2.4. Risk of infection: Public health safety, global approach

Round-table discussion moderated by Professor Christian Rabaud (SPILF), with Jean Baptiste Meynard (Army Epidemiology and Public Health Centre), Lionel Moulin (Ministry of Ecology), Patrice Binder (Inserm), Bertrand Schwartz (ANR), Jean-Loup Angot (Ministry of Agriculture). Coordination: Patrick Zylberman (EHESP).

The discussion revolved around the concept of “global approach”. A global approach defines the continuity between diverse natural biological or intentional risks, as much in terms of behavior toward these risks as in terms of research. Highly contested a decade ago, this idea became official via the Government Report on defense and security (2008) and via the creation of the interministerial Health emergencies preparedness and response agency (2007). A global approach goes beyond risk of infection: food, chemical or radioactive contamination, phytosanitary or medication residues as well as transportation, management of natural sites and problems linked to construction, all are included in what is considered a “global” approach (ALLENVI, the French research alliance for environmental sciences which is in charge for environmental crises and risks, is now taking into account those associated with infectious diseases, notably due to an EID).

The French Military Health Service (FMHS) concretizes this “global” image of public health in its multidisciplinary approach focused on field-based infectiology (Military biological and epidemiological investigation unit). Its work is carried out along three lines: surveillance, real-time monitoring, and field investigation. These three levels work in close cooperation with civic organizations, the InVS, the Oscour hospital network and AVIESAN. The FMHS approach includes a political dimension inasmuch as the national organizations are currently merged with NATO.

This round-table discussion was to answer the question, how can we evaluate the danger of an EID early on? The experience of the 2009 H1N1 pandemic is telling in this regard. The risk was taken extremely seriously by the Army high command and the system heretofore described is evidence of its effectiveness. The real-time monitoring of risk of infection (Real-time alert surveillance) exhibited particularly interesting results, for example the dengue fever in French Guiana in 2006, detected by the FMHS five weeks prior to the Health Ministry alert. This example illustrates the interest of increasingly close civilian-military

cooperation. Investigation data, both epidemiological (epidemic or not, means of transmission) and clinical (morbidity and mortality), the existence or lack of treatment and/or available prophylaxis provides useful information for the evaluation of the level and danger of EIDs.

Among the other questions addressed, of note:

- the data sharing platform on animal and plant health for use among public authorities and producers (announced at the public health convention organized by the Ministry of Agriculture in 2010);
- the inclusion of health in land use planning programs with particular care given to the setting out of construction and with optimal use of the contributions of ecosystems (natural barriers, greenways);
- finally, the development and optimization of research financing through various mechanisms used by the ANR: mock programs and “young researcher” programs, partnership bids, joint international programs, “Flash” bidding for urgent research projects, and of course future investments.

3. Summary and proposals

3.1. Research and training

3.1.1. Research

Specific reflection on the interface between surveillance and research concerning EIDs is under way. Prospective scientific surveillance carried out by the various agencies should be coordinated with a common goal adapted to the concept of EIDs (cf CBRN hazards). Sharing of and access to data is a subject under study at the Ministry of Higher Education and Research as part of the 2012 to 2016 strategy, with a committee for Social sciences data (and how INPES can include its own data). The General Secretary for defence and national security could provide the impetus for such a policy.

The decompartmentalization of research has begun, through co-supervision of research programs and through the recognition of science theses co-directed by researchers in biomedical and social sciences fields. This should encourage greater flexibility in programs of study and improve the capacity for adapting to unforeseen developments.

Observation, the founding principle of science and of the development of knowledge, which is expanding in the area of microbiology, should also be recognized and supported in clinical and social sciences fields. It is important to recognize the interest of the use of epidemio-bioclinical cohorts of infected patients to determine the characteristics of a new EID, most particularly its severity, and also of the analysis of perceptions and behavioral determinants of both citizens and professionals toward such events, this information being a major factor in adapting the reaction. It is upon this key step of observation which depends the analysis of determinants and the drawing up of a plan of attack which is adapted to the real events related through such observation, making it possible to distinguish between true and pseudo-emergence.

Transversal programs and bids between supervisory bodies must be put in place. Support for such interaction raises the question of a transversal agency responsible for coordination of finances coming from different ministries. In order to avoid the danger of downgrading the quality of research as can be the wont of an interdisciplinary approach, it should be based on recognized competencies and a strong willingness on the part of all, taking as a given a mutual respect and trust proffered by coordinators and research sponsors.

It is necessary to continue developing partially oriented research (already in place in certain organizations, but as yet underdeveloped in France as compared with other countries), all the while preserving the indispensable freedom in science activities. It is in fact essential to the credibility of EID research that it reinforces collaborative efforts on European and international levels.

Research programming must set the guideposts for research adapted to emergency situations (as opposed to emergency research whose results will hardly ever be available to inform decisions to be urgently taken). This should be prepared through a generic program, which establishes interactions between researchers from distinct fields in the case of both ordinary and exceptional scenarios. It should also be adaptable to a beginning phenomenon. The availability of emergency funds for this purpose is highly desirable.

Those authorities responsible for the authorization of projects (human person protection, administrative authorization, and informatic technology and liberties committees) must be sensitized to the problem of EIDs and to the ethical stakes specific to emergency public health research having an international scope (International health regulations, 2005), research on persons and biological products from these persons. Questions concerning ethical and legal norms for biobanks created during a crisis must be addressed in advance and within the changing context of regulations governing research in Europe.

3.1.2. Training

Cataloguing the different areas of our lack of knowledge and prioritizing the rectification of this lack is a prerequisite to a prospective training strategy in all sectors of society.

The collaboration begun between human and animal health, and social sciences, should be extended to other fields such as mathematics, environmental sciences, or technological development. . . In order to establish effective collaboration with social and human sciences, the various professions with them should be identified: anthropologist, historian, psychologist; and their research teams and approaches must be inventoried. Considerable willpower will be required to maintain these collaborative efforts, whose timelines are rather different.

In a broad sense, training should address and adapt to certain diverse “targets”, from decision-makers to the general public as well as professionals. One of the priorities, on which it is important to insist, is to plan for the training for doctors and other health professionals on EIDs and their management; this could take the form of a common core of initial training followed by enrolment in continuing education programs. The evolution of medical studies should take into account this need, and teach

students to understand and react to an emergence situation, both in their individual responsibility in treating patients and in their collective responsibility as a public health agent. This type of training approach if extended to other involved sectors (agriculture, environment. . .) could be effective in fostering informed involvement of intermediary parties in crisis prevention and management. Along with these health professionals, these intermediaries are in fact the trusted go-betweens for the transmission of knowledge to citizen-health care users, to aid in their understanding of the phenomena at the origin of a potential crisis and in their acceptance of proposed measures.

3.2. Two priorities to promote action: expertise and communication

3.2.1. Expertise

Along with their scientific activity, researchers and teachers are more and more often called upon to reformulate scientific knowledge in order to make it available to policy-makers. This particular mission specifies the role of “expert”. Experts are currently under great demand but also often come under fire, particularly in the area of public health, where their work comes in direct contact with policy-making. The “development of expertise” has been one of the missions of research units and advanced schools in France since the law of April 18, 2006. The government and its services have the right to benefit from the great expertise of their researchers and public educators and from the capital of knowledge available to them in their respective disciplines. This presupposes a system of training adapted to the functions of expertise and in exchange a greater recognition of the expert’s mission, including in the domain of social and human sciences.

The research-training-action connection should be reinforced in order to support decisions and actions adapted to the capacities of the overall society, and not only to the competencies of a privileged group of involved experts and managers. It should be based on a balance of powers between the various parties. The potential interest of establishing an intersectorial network deserves to be explored. Participants in this network would of course come from the world of research and training, but also from within public sector administrations and institutions, and from corporate firms. General public awareness is indispensable to promote popular support for and adherence to prescribed measures. It would be desirable to envisage an organization and means in order to better inform the citizenry. It has been a long time now that sociology has shown that communication and influence wield over the general public through a two-step process in which “gatekeepers” or “style leaders” shape the attitudes and ideas of small groups of followers (such as researchers, teachers, physicians, journalists), who take their cues from these “influentials” and exert their own influence over the public. Such followers and steps should be carefully identified in order for a communication campaign to be more effective. (Influencing health care workers and doctors in view of making vaccination campaigns more efficient is a case in point.) This may offer in addition a robust research program that can be dealt with stressing more specifically EID-related sociological issues.

Let there be no mistake, these types of expert involvement are part of a collective approach, but require that the regulatory and deontological framework (potential conflicts of interest, responsibility, use of sources. . .) as well as the founding values of the mission be clearly and continually maintained as a guarantee of impartiality, which is a major determining factor protecting or restoring public trust in experts and authorities.

3.2.2. Communication

One of the priorities of this expertise is to improve communication with the general public. This in fact wavers between overly austere actions condemned to a low level of effectiveness, and sensationalism, resulting in distorted perceptions of reality:

- during the November 9 seminar, several measures were proposed. One advocates the use of drills with a prepared, credible scenario (either computer-based or through role play or exercises) in order to have the most options available when the time comes. Another concerns polls. In addition to those commissioned by the Governmental Information Service, which serve to promote governmental policy, there should be regular surveys put in place in order to better know the population's volatile perception of risk;
- given its impact in many forms as emphasized by several participants, communication should be a subject of further work and reflection. Programs on the subject should be defined in the areas of research and communication training (public communication, preventive or crisis communication, media). This requires work within a framework that goes beyond French borders;
- in addition, it is of urgent necessity that the difficulties in communicating around the emergence of new diseases be shared with the public. A more pedagogical approach to the decision-making process in this area would help the public better understand and accept the complexity of these realities, which are given to changes and strategy about-faces that can be, at first glance, incomprehensible to the vast majority, and even sometimes to health professionals.

Annual seminar held under the auspices of the High Council on Public Health (Haut Conseil de la Santé Publique – HCSP), the French Military Health Service, the Val-de-Grâce School (Service de Santé des Armées [SSA] – École du Val-de-Grâce [EVDG]), the French School of Public Health (École des hautes études en santé publique – EHESP), the Paris-Diderot University, Sorbonne Paris-Cité, the French Institute for Research in Developing Countries (Institut de Recherche pour le Développement – IRD), the Infectious Diseases Society (Société de Pathologie infectieuse – SPILF – member of the French Federation of Infectiology), the National Institute for Public Health Surveillance (Institut de Veille Sanitaire – InVS), the Institute of Public Health (Institut de Santé Publique – ISP), the French National Institute for Health and Medical Research (Institut National pour le Santé et la Recherche Médicale – Inserm), and the Pasteur Institute.

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Access on website of the Paris Diderot University Foundation: <http://www.univ-paris-diderot.fr/fondation>.

4. Lexicon of acronyms

ANR	French national science foundation
ANRS	Agency for Research on AIDS
ANSES	National Agency for Public Health Safety
AVIESAN	French Research Alliance for Life- and Health Sciences
ALLENVI	French Research Alliance for Environmental Sciences
CBRN	Chemical, biological, radiological and nuclear (hazards)
CEA	Atomic Energy Commission
CIRAD	International Centre for Agriculture and Agronomy in Developing Countries
CNRS	National Center for Scientific Research
INRA	French National Institute for Agricultural Research
IRBA	Military Institute of Biomedical Research

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Received 15 November 2011

Accepted 8 May 2012

Available online 9 November 2012