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Jocelyne Arquembourg

Translator: Richard Dickinson

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The paradoxes of antibiotic resistance

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- 1 *The antibiotic paradox* was a phrase first used by Stuart B. Levy in 1992 but it seems more relevant than ever now because everything about these drugs is indeed paradoxical. It was seen as a miracle drug during the whole of the second half of the xxth century and its unrestricted and uncontrolled use led bacteria to develop forms of resistance with the result that today antibiotics are failing in a dangerously increasing number of cases. This usage has led to a situation which some compare to a “shipwreck” (Andremont, 2014). Antibiotic resistance has thus become a subject of concern for the medical world and for patients, for livestock farmers and vets and for the authorities. However this level of concern did not appear in the same way or at the same time in all these sectors. There has yet to have been a large-scale major initiative to fight against the unified problem of antibiotic resistance in all the fields in which it appears. These chains of paradoxes and their complexity are the subject of this issue which applies a multidisciplinary approach to look at how public problems develop from a pragmatic standpoint. The actual aim is to explore the reasons which could explain the slowness of an unfinished development process. It must be noted that in France, in the fields of both human and animal health, the levels of use of antibiotics remain very high in comparison with other European countries¹. The levels of antibiotic resistance are also very high². Recent work and measures taken by the French Ministry of Social Affairs and Health do suggest the advent of a more effective use of treatments but there is still good reason to question the absence of collective awareness of this threat which has affected all sectors of activities for the last 70 years. This issue thus has a dual objective – to study the process of development of a public problem which has only emerged into the public domain since the 2000s and to look at the reasons for the absence of an earlier constitution of this problem.

A social problem and a public problem

- 2 While certain authors use phrases like *social problem* and *public problem* interchangeably, the distinction made by Joseph Gusfield (1996) between these two formulas seems particularly fruitful to us. Of course the author of *Contested Meanings* was studying the issue of drink-driving as a social problem but his insistence on “public responses” (*ibid.*: 171) and on the emergence of groups of people who criticize certain behaviour led him to talk about the “public designations” of the problem (*ibid.*). In this way, he insisted on the public dimension of certain social problems which develops when such issues gain a certain level of visibility and provoke reactions which themselves are public. His definition thus corroborates with John Dewey’s (1927) view of the Public as an “all those who are affected by the indirect consequences of transactions to such an extent that it is deemed necessary to have those consequences systematically cared for”. Thus a public problem emerges when problematical issues become the subject of debate and thus attract public attention including people who are not directly affected but feel concerned because of *something*. This *something* could be a value, a feeling of belonging, a conviction and so forth. This shift from social towards public goes with the idea that the problems in question are not objectively present outside a process of social interactions which defines them as such. This process includes a phase of recognition of the problem and also its categorization, designation, interpretation and conversion into a story along with a search for solutions, demands for public action, etc. It is through these different stages of what Daniel Cefaï (1996) calls “the career of a public problem” that it is recognized and objectified. Also during this process, problems experienced by individuals in the private sphere can acquire new levels of generalization and visibility. The feeling that an individual’s experience is the same as that of people prevails at this point and serves as a lever to redefine or reformulate the situation experienced by this individual. One example would be the work carried out by doctors, magistrates and intellectuals to support and redefine the place of victims of paedophilia as described by Anne-Claude Ambroise-Rendu in her *Histoire de la pédophilie* (2014).
- 3 The case of antibiotic resistance seems rather specific in nature when viewed in the light of these different definitions. This is firstly because researchers carried out a scientific objectification of “the resistance of bacteria to antibiotics” very early on, particularly Alexander Fleming when he discovered penicillin. The first of our paradoxes derives from the very discovery of antibiotics and in what could be called a consubstantial manner. The biological phenomenon was thus identified and objectified very early on but this was not the case for the public problem. The media and researchers alike consider that this problem could arise in the distant future under certain conditions (abusive or uncontrolled usage, not respecting prescribed doses or lengths of treatments, etc.). We therefore needed to distinguish between a biological mechanism which was known to a scientific community as a potential source of concern and a public problem as it is viewed today in the communication of major international bodies such as the World Health Organization or in communication campaigns by associations which are multiplying in the United States and the United Kingdom (for example Pew Trust and Antibiotic Guardians). We shall therefore discuss the different stages of a process which involves a particular kind of timing, phases of

designation and increased visibility and thus makes up the shift from biological phenomenon to public problem in the case of France (Jocelyne Arquembourg).

Problem of public health and public health problem

- 4 Among these stages, the first French Antibiotic Plan and communication campaign in 2002 both played founding roles. These increased the visibility of the problem and led to the first public policies aimed at solving it. These founding actions led to the recognition of the bacteria's growing resistance levels as a problem of public health (Anne-Claude Crémieux). However certain factors indicate that its role had limited effects – there was a restrained reaction from the media (Laurence Corroy and Émilie Roche, Jocelyne Arquembourg) and above all a limited impact in time (Antoine Andremont, Jocelyne Arquembourg). In the same way as it seems relevant to make the distinction between a social problem and a public problem, it is also justifiable to distinguish between a problem of public health and a public health problem (Laurence Corroy and Émilie Roche). Quite clearly the varied initiatives undertaken in 2002 made the resistance of bacteria to antibiotics into a problem of public health. In retrospect, we may consider this to be a specific stage or configuration of what has only recently taken on the form of a public health problem. When looking back at this specific moment in time, we particularly note the “whistle-blowing” role played by those working in the field of hospital resuscitation and the way the problem was sectorially confined (Chateauraynaud, Torny, 2013) and thus the problem was dealt with solely by those working in the medical and human health spheres.
- 5 In parallel, other actors were concerned by uncontrolled uses of antibiotics in intensive farming. Such practices were criticized by journalists towards the end of the 1960s (Jocelyne Arquembourg) and brought up tricky questions of regulations and public policies on livestock farming (Nicolas Fortané) while also leading to the emergence of other problems such as the decoupling of veterinary prescriptions (Nicolas Fortané, Estera Badau). Thus the different facets of an authentic public health problem appeared in an intermittent and unconnected manner. The emergence and dissemination of the *One Health* concept progressively helped impose the idea that political action to solve the issue of antibiotic resistance needed to be linked and coordinated between several ministries and plurality of actors. However it was not until the Carlet report was published (2015) that such an approach emerged despite not getting media attention. Even today, the public configuration of the problem still suffers from what John Dewey (1927) called profound “breaches of continuity”.

Information, communication and interdisciplinarity

- 6 The aim underpinning this issue's standpoint is to rigorously interdisciplinary. It is based on exchanges and questioning involving biologists, infectologists and researchers in the humanities and social sciences. The latter field is not unified and political sciences work (Nicolas Fortané) is included alongside information and communication sciences research. Articles by biology or infectiology researchers specializing in antibiotic resistance enable the evolution of the situation to be retraced on the scientific level, as is the case in the work by Antoine Andremont. They also provide a review of the history of institutional actions in which they were themselves involved as

is the case for professor Anne-Claude Crémieux with the French Antibiotic Plan. However work carried out jointly also derives from a request from the medical field concerning representations, behaviour and discourses. The information and communication sciences are called upon here to help understand representations and beliefs about antibiotics and also to assist with a review of previous communication campaigns and their successes and limitations. They also help pick out and describe discourse viewed as authoritative at a given moment or the dominant interpretations of situations reported by the media while identifying cases of attribution of responsibility and sketching out the actantial configurations involved. Media archives are used as a basis for most of the articles whether from the French national daily press (Jocelyne Arquembourg), magazines (Laurence Corroy and Émilie Roche) or specialist journals (Estera Badau). Severine Barthes's article deals with television series with a dual objective. The first aim is descriptive and studies the way in which series portray antibiotic resistance while the second studies their educational potential from an *entertainment-education* standpoint.

- 7 On the methodological level, the tools used mainly come from the field of the sociology of public problems but these theoretical frameworks are tested on empirical objects, the study of which requires other tools from the field of language sciences (denomination, for example), from the analysis of accounts given and in other cases from the political sciences. Thus in this issue, interdisciplinarity functions on several levels.
- 8 In reality, little research has looked at media discourse as a field in its own right for the analysis of public problems. More work has been carried out on practices (access to sources, how editorial teams function, modes of funding, organization of work travail) and their effects on how news stories are dealt with particularly how their selection, hierarchization and inclusion in the general agenda (Marchetti, 2010; Neveu, 2015). And yet to be coherent as far as the pragmatist approach is concerned (particularly that of Joseph Gusfield (1996)), the necessary means are required to understand a “designation process”, “dominant interpretations”, “symbolic crusades” and their procession of signs. We also need to determine where these representations and “public responses” reveal themselves and how they become visible and noticeable. The media make up one of the possible places this could take place. They are not alone in this but in these processes they play a sufficiently important role to attract the interest of information and communication sciences researchers and require the use of their analysis tools.

The Welfare State and the common good

- 9 Let us quote one last time Joseph Gusfield (1996: 186) who considers that the culture of public problems cannot be dissociated from the Welfare State: “*The development of whole areas of life and entire groups as ‘social problems’, however, implies also that such phenomena have become public responsibilities – objects of improvement and change for public agencies and agents of reform. The rise and enhancement of social problems is thus part of the development of the state as an agent of public goals and of the emergence of professions dedicated to the solution of such problems*”. In many of the cases described by Joseph Gusfield, the State's role consists of assisting or taking care of population categories which are weakened, stigmatized or become actual victims. Érik Neveu's work (2015: 217, 219) tends to show that the culture of public problems is today threatened by the Welfare State being

called into question in various way or by the use of apparatuses for the dissolution of public problems. The question which underpins the implementation of effective public antibiotic resistance policies is different. After decades of people confusing antibiotics' usage value and market value (Ravelli, 2015), the problem caused by the implementation of reasoned, and therefore regulated forms of usage of antibiotics in both the human and animal health sectors actually concerns the management of medication for the common good. Elinor Ostrom's research (2010) into the governance of the common good sheds useful light on thought about this matter along with renewed perspectives.

- 10 Furthermore, the limited effectiveness of public policies in the 2000s also reveals that the battle against antibiotic resistance has an institutional cost linked to the necessity to set up new collaboration projects between territories and services that had not generally been inclined to cooperate with each other (Antoine Andreumont, Jocelyne Arquembourg). These two aspects of the problem – the governance of the common good and the convergence or even the coordination of public policies – also reveal how the Welfare State generally functions and the blockages that may occur therein.

Conclusion

- 11 For practical reasons, most of the studies in this issue do not date from before 2012. This research began in 2014³. It first concentrated on the reasons which might explain why the resistance of bacteria to antibiotics had for so long been considered as a problem of public health in the making or indeed a potential social problem. This brings up a dual question. Firstly why was the problem projected into a hypothetical future when there had been signs of its presence since the 1990s. And secondly why did this problem not emerge into the public sphere? How can we explain that public groups did not get involved earlier to make this issue a subject for debate in an attempt to find solutions?
- 12 And yet more recent events like the discovery of a gene of resistance to last resort antibiotics in a pig farm in China, researchers getting involved because of Jean Carlet's report (2015) and new warning signs from international organizations seem to indicate that collective awareness of the threat is becoming more acute. This project looks at the emergence of a public problem being constituted. New configurations of the problem are emerging and sketching out the contours for other objects for analysis.

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NOTES

1. Today the consumption of antibiotics in the human health field in France is 30% higher than that of neighbouring European countries. Between 30% and 50% of antibiotics are prescribed unnecessarily (Carlet, Le Coz, 2015).
2. According to the Burden survey (Colomb-Cotinat, Lacoste, Coignard and al., 2015) run by the *Institut de Veille Sanitaire* (French Institute for Public Health Surveillance), each year 12,500 deaths are linked to a multi-resistant bacteria from a total of 158,000 cases of infection.
3. See the conference *Les antibiotiques dans les médias et la publicité. Espérances, désenchantement critique et signaux d'alarme* organised at the Sorbonne Nouvelle on November 17th 2014.

AUTHORS

JOCELYNE ARQUEMBOURG

Communication, informations, médias

Université Sorbonne Nouvelle-Paris 3

F-75005

jocelyne.arquembourg@orange.fr