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Epidemiology
A science for sale or a science with responsibilities

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2005

English Translation
**EPIDEMIOLOGY: A SCIENCE FOR SALE OR A SCIENCE WITH
REPOSIBILITIES¹**
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In Epidemiology, as in any other scientific discipline, one must constantly adjust research to follow in line with our ever-changing horizons of knowledge and the demands of society. It is the responsibility of the researcher, in academic terms, not only to ensure the validity of knowledge, but also, in ethical terms, to apply public resources required for the research to benefit society as a whole. While theoretically one should not compromise the other, in practice, ethical responsibilities towards society have historically been constrained and are worthy of consideration.

In health, there are two large fields of knowledge and action: *clinical (or individual) health* and *collective health* (conventionally known as public health). These two fields are often fused and thus clinical logic [reasoning] – tied to the most obvious and visible expressions of the health of individuals – displaces, absorbs and distorts public health, which is the field of knowledge of the impacts of social conditions and lifestyles on the health of populations. This kind of confusion seriously limits our ability to discover the most profound roots of health problems because we incorrectly attempt to explain the collective *problematique* using general data based on the logic of individual information and organize the collective praxis on the basis of clinical practice. In the following paragraphs we will expand upon these arguments and how they have resulted in the commercial deformation of scientific research and the growth of a tampered science.

Until a few decades ago, lucrative clinical practice, which considers health a commodity, lay in the natural and exclusive realm of the private sector, while preventive practice and the promotion of public health was nearly restricted to the public realm where, for nearly a century and a half, an epidemiology with a deep sense of social responsibility flourished. But in recent years with the advent of neo-liberal politics oriented towards a real counter-reform of the health sector, we have made out as though the delimitation between “the public” and “the private” has been erased, dismantling, privatizing or introducing a managerial logic to State programmes on the one hand, while on the other hand changing certain social disciplines such as epidemiology into implements intended to perfect business administration. This trend has multiplied a kind of research which businesses need to conceal their harmful impacts on humans and the environment. As a result, it is not surprising that, in an era where “the public” sector has been satanized and discredited and the supposed virtues of “the private” praised, public health programme are losing strength and denaturalizing disciplines such as epidemiology. The

¹ Capítulo para el libro “Salud Por y Para los Pueblos: Determinantes Socioeconómicos” (publicación en francés del CETIM, Centro del Tercer Mundo -Europe Third World Centre – Ginebra, Suiza – en prensa), basado en una conferencia del autor en una sesión de la II Asamblea Mundial de la Salud de los Pueblos, Cuenca Ecuador Julio, 2005

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contemporary influence of this rationale is so strong that even progressive discourse is sometimes penetrated by the dominant logic of entrepreneurial health reasoning, disguised by social terms and categories.

Having established the contrast between the commercial practice of epidemiology and responsible epidemiology, we would say that, traditional epidemiology has arguably positioned itself such that it has to make compromises between the poor, preventive planning and the consolidation of public systems. At the same time, since the end of the last century, epidemiology in many university centres, governments and entities linked to power has undergone a change in orientation, tying it evermore closely to a pragmatic and business-oriented logic – undreamt of in past eras – and to a passive and functional vision of the deteriorated state of health of populations... all of this in full knowledge that there is no database in the world that does not express in some way the damage done to health and the abyss of inequality separating the health of the rich and the poor. Epidemiology in many parts of the world simply plays the game of uncovering destructive industrial impacts, sells its services to businesses and plays the role of mediator in labour and environmental disputes.

The Science of Epidemiology in the Eye of the Hurricane

Unsurprisingly, with buoyant economic growth, epidemiological debates between big business and populations have increased in frequency and intensity. As the debates intensify the argumentations of both sides become more elaborate. But while this debate between competing interests is represented in some form or another in the scientific literature, it is the views and interests of big business, which has the resources to publish in “mainstream” academic journals and in the media, which are generally more powerful.

In spite of this, thanks to the consolidation of more democratic scientific spaces and the strengthening of civil societies, increasingly provocative debates are taking place between researchers defending the principle of caution and denouncing the serious impacts on humans and the environment against the arguments defending the interests of big businesses- arguments which are highly dismissive of facts and intentionally conceal destructive processes.

An Illustrative Case

The recent scientific dispute which has arisen around the Chevron-Texaco – now simply called the Chevron – case brought by the populations of the Amazon in Ecuador allows us to illustrate the disparate visions and compromises of epidemiologists. In this claim, community and indigenous organizations are demanding compensation from Chevron Texaco for the ecological destruction and harm to human health caused over a 20 year period (1971-1992) by this company in Ecuador. During this period, the company discharged into the environment 16.8 million gallons of crude oil and 20 billion gallons of residual toxins.

A key point in the epidemiological debate is establishing whether problems such as cancer (leukemia, gynaecological neoplasmas and breast cancer) and other highly prevalent disorders in communities in the petroleum area are attributable to the high level of environmental contamination caused by this multinational, or whether the correlation lies with the poor hygiene conditions, weak health service infrastructure, malnutrition and contact with agricultural pesticides employed in the region. It is not the aim of this article to enter into the details of this conflict, but to outline some basic arguments related to the theme of this article.

When we analyze the epidemiological proceedings of this debate, we encounter the clash of two epidemiologies. On the one hand, studies conducted by reputable research centres, sensitive to the suffering of the communities, seek to establish evidence of the association between irresponsible oil exploitation and increases in health problems such as cancers, miscarriages and other pathologies.^{3,4,5,6} On the other hand, reports issued by scientists contracted by Chevron Texaco disqualify the scientific validity of these types of findings, discrediting them as inconsistent, biased and inconclusive. They extend their positive logic to annul the correlations found.^{7, 8, 9, 10, 11}

It is not the intention here to reduce this debate to a question of morals. As a matter of fact, many of the renowned scientists who side with multinationals do so in the full conviction of their arguments, basing themselves in the assessment criteria of their own scientific convictions. So the question is: Why do scientists, the majority of whom are

³ Divine BJ, Hartman CM, Wendt JK.(1999). Update of the Texaco Mortality Study 1947-93: Part I. Analysis of Overall Patterns of Mortality Among Refining, Research, and Petrochemical Workers. *Occup Environ Med*, Mar;56(3):167-73.

⁴ Divine BJ, Barron V, Kaplan SD.(1985) Texaco Mortality Study. I. Mortality Among Refinery, Petrochemical, and Research Workers. *J Occup Med*. Jun;27(6):445-7.

⁵ San Sebastian M, Armstrong B, Cordoba JA, Stephens C. Exposures and cancer incidence near oil fields in the Amazon basin of Ecuador. *Occup Environ Med*. 2001;58:517-22.

⁶ San Sebastian M, Armstrong B, Stephens C. Outcomes of pregnancy among women living in the proximity of oil fields in the Amazon basin of Ecuador. *Int J Occup Environ Health*. 2002;8:312-9.

⁷ Rothman, Kenneth (2005). Summary About Epidemiologic Assessment of Three Reports Relating to Cancer Occurrence and Other Health Problems in the Amazon Basin of Ecuador. Eden Prairie: Risk Management Resources, submitted to Chevron Texaco on February 1st. http://www.texaco.com/sitelets/ecuador/docs/report_arellano_en.pdf

⁸ Green, Laura (2005) Analysis of Various Studies of Communities Near the Former TexPet Oil Operations in Ecuador. Cambridge: Cambridge Environmental Inc., January 26. http://www.texaco.com/sitelets/ecuador/docs/report_laura_green_yana_curi_en.pdf

⁹ Hewitt David (2005) Comments Regarding Causal Associations Between Ecuador Oil Exploration and Health Claims. Little Rock, Occupational Health Services for the Center for Toxicology and Environmental Health (CTEH), January 24, http://www.texaco.com/sitelets/ecuador/docs/report_hewitt_en.pdf

¹⁰ Dávalos, Alvaro (2005) Cancer In The Ecuadorian Amazonia (1985 – 1998) http://www.texaco.com/sitelets/ecuador/docs/report_davalos_en.pdf

¹¹ Sever, Lowell (2005). Oil Contamination and Health Effects in the Ecuadorian Amazon Basin: A Review of Recent Reports and Publications. Consultant Epidemiologist, Revised January 20, 2005 http://www.texaco.com/sitelets/ecuador/docs/report_sever_en.pdf

serious scholars, side with companies and come to conclusions in the absence of facts or by rejecting other carefully developed explanations presented to this debate? The most obvious and least creative answer would be to simply conclude that these individuals sell their consciences??? - which in some cases is certainly true. But we would like to believe that the matter is more complex than this. The answer may well lie, fundamentally, with our points of view and reference. In a letter to the editor published in one of the most well reputed journals on occupational and environmental matters, nearly fifty scientists from the world over responded to the propaganda advanced by Chevron Texaco in a full page of one of Ecuador's most important newspapers, wherein it defended the theses of its epidemiological consultants. In their letter to the editor, the scientists replied to the arguments made by Texaco Chevron as summarized in the following points:¹²

[1] It is recognized in the field of science that epidemiological studies, even in applying the most rigorous research methodologies possible, are limited when attempting to demonstrate all direct associations, or so called "causal pathways"; what is important is that this science allows us to establish tendencies and models that conform to an integral body of evidence which forms the basis of precautionary policies. Peer review processes ensure that potential weaknesses in methodologies do not put in doubt the conclusions drawn.

[2] Consultants to the company advance that the problems encountered in the region where Texaco has operations are due to poor hygiene conditions, endemic parasites, the lack of clean water, the poor quality of health services, malnutrition and exposure to pesticides. How is it that epidemiologists contracted by the company acknowledge the importance of these problems and yet forget the converse responsibility of those who have precisely aggravated these problems?

[3] Especially in areas of poverty where populations without access to services and infrastructures, is practically impossible to establish proof of the exact relationship between exposure and effects on health. Requisites of empirical observation (such as details on the population, the environment, on the period of exposure, etc.) in the end turn into strategies in favour of companies trying to escape responsibility.

[4] In all cases, responsibility for the absence of data or adequate epidemiological information should not fall on scientists but on the companies, which should plan a system to monitor and evaluate industrial processes and their potential effects. They should also plan precautionary and preventative measures which must be implemented in parallel.

[5] The latter is especially important in contexts where laws and norms do not require regular monitoring of industrial processes, not only of problems such as harmful toxins and substances, but also of social impacts caused by companies when they enter a region.

¹² Various authors (2005) Texaco and Its Consultants. *Int J Occup Environ Health*, 11(2): 217-220.

[6] Finally, the place to air debates and scientific conflicts are in academic circles and not in a paid page taken out in mass media where only the arguments made by one side are presented.

By this reply, we, a group of researchers from the world over, are denouncing before the international scientific community a new case of conflicts of interests, which demonstrates the weak arguments of the company.

In addition to the arguments made in this letter to the editor, there is another which stands out but which the authors failed to point out, despite the fact that it carries great weight. The relationship between scientific activity and powerful companies has two distinct but complementary dimensions: “external” relations or conditionalities of scientific work of consultants and the company, and what we might call “internal” conditionalities or relations with regards to the construction of knowledge. The ties between science and power have to be analyzed from these two distinct perspectives. On the one hand, the sale of scientific services corresponds to the external dimension. It is significant because it makes evident the possibility of biased research, instrumental to the interests of companies which pay for the service. But this external pressure does not address the intrinsic problem of the logic of research propitious or favourable towards these interests, that is to say a framework which establishes a scientific paradigm that systematically atones for the sins of companies. It is this kind of positivist thinking which underlies the great majority of conventional epidemiological studies, sustained in a linear and reductionist logic in which essential social relations which determine health are dissolved and rendered invisible and which reduces reality to the level of immediately observable empirical phenomena. Reductionist reasoning lies entirely on the premises of so-called causal links or factors of disease (the constant conjunction of supposedly explanatory factors) as the only valid connections in epidemiological research, thereby substituting the integral explanation of processes with the construction of a formal and static model of relations between variables.¹³ We would therefore say that this does not solely consist of testing or not testing the empirical connection between exposure to petro-chemical residues and specific diseases. Nor does this solely consist of separating an “attributable causality” to these residuals as distinct from other determinants that make part of a social process of exclusion, such as poverty, contamination and the lack of resources. Rather, it consists of articulating all of these empirical processes to the complex, hierarchic contradictory and multidimensional movement of social life, which explains the living conditions which mould the exposure and health-disease patterns that epidemiological research uncovers. The health determinant process is multidimensional because it is produced and reproduced not only in the individual dimension, but depends upon typical living patterns that characterize distinct social classes, and these conditions intersect with the movement of personal lifestyles. In other words, the social relations that compound a society as a whole and explain its basic socio structural contradictions, determines the group patterns and these in turn condition personal conducts and lifestyles of individuals, in whose bodies the ultimate consequences of this determination are expressed. This doesn't take place as a mechanical, lineal unidirectional process, but imply an intense

¹³ Breilh, Jaime (2003) *Epidemiología Crítica: Ciencia Emancipadora e Interculturalidad*. Buenos Aires, Lugar Editorial.

interaction between the individual and its group, between the group and societal broader relations, but at the same time this movement allows for individual movements that affect the broader domains of social life. Modern epidemiology must tackle the understanding of social relations, which to a great extent are power relations, in order to understand the exposure and vulnerability patterns of each group and the differentiated health disease patterns which explain the empirical phenomena that has been conventionally called “attributable risk”. The domestication of science is therefore not only an exogenous movement but also an endogenous movement inscribed in the structure of scientific reasoning.

The Domestication of the Science

Let us analyze the multiple facets which provoke what we have called a “domestication of the science”.¹⁴

Research institutes and centres place themselves at the service of powerful interests because they work with interpretive categories, symbolic forms, values, beliefs and compromises that conform to a paradigm – a Kuhnian paradigm if you will – within which interpretive models are designed bound by complex web of relationships with structures of power. As a result, power structures ensure that non-critical scientific models are reproduced, whether it be through financial systems and control of research funds, through the control of educational and training programs (particularly at the level of Masters or doctoral programmes), through the manipulation of cultural spaces and the media, or by overt intimidation or coercion. Their reproduction make viable and visible certain theories and themes in research and education. It also discredits and renders invisible others which question the prevailing social system.

However, as mentioned earlier, linked to these “external” conditions are others – those which are produced “internally” as an output of academic research. Knowledge and information producing institutions and groups of experts prioritize certain inquiries. They make visible certain aspects of reality, extrapolate snippets of this reality to be preserved in memory and, as such, stimulate certain practices and trains of thought and knowledge production. With the passage of time, the evidence sought by structures of power is thus reproduced and accumulated, forming an ever growing “mainstream”, whereas the counter perspectives of the people, or alternative social points of view, are blunted and hidden.

The fundamental problem deriving from this domesticated science is not only that we have blurred the contradictions of reality, but that, in doing so, we have created a real culture of resignation, of fear of profound criticism of capitalism, and of renunciation of equity. One side of intellectual pursuit has thus fallen by the way-side under the pressure

¹⁴ Breilh, Jaime (2004) Domesticación de la Ciencia y Pensamiento Crítico. Quito: VIII Congreso Ecuatoriano de Sociología y Ciencias Políticas, Encuentro de Ciencias Políticas de las Américas, Foro Social de las Américas, julio 26.

of what one may call an “iron wall” built on phobias and renunciations which bring nothing to the inventory of liberation thought which inspired the socialist revolution of decades past.¹⁵ This argument has nothing to do with the defense of any closed orthodoxy.

Finally, there is a divorce of mainstream science and non-academic knowledge and the knowledge acquired from other social sciences a challenge which goes hand in hand with that of improving the linearity of the dominant scientific thought and its Eurocentric construction. In other words, it is not only that the construction of the epidemiological discourse cannot distinguish its own boundaries separate from the collective social discourse, but also that cultures intertwine. This is at the root of a more profound social criticism and we have to create the appropriate conditions and circumstances for the construction of an intercultural and interdisciplinary process. Texaco’s consultants will not listen to the wise voices of the Amazon communities or its agricultural towns. If they had done so, their value-ridden constructions would have been different.

Ultimately, the positivist paradigm of research constituted, without a doubt, one of the pillars of the dominant thought of Modern times and was the source of skepticism surrounding the old epidemiology of the last two centuries. Positivism became the principal discourse of the science of power because its interpretive principles were immediately functional to the capitalist project of accumulation. Firstly, its empirical conception of knowledge as the reflection of phenomena in our minds forged the artificial separation of subject and object from knowledge. This created the fiction that knowledge-building is a task that only certain elite minds separate from the concerned communities can manipulate. Secondly, its interpretation of reality as a fragmented object whose bits and pieces convert into variables to be connected to, or associated with, formal constructions of logic, assumes these variables as identical to reality, thus creating an atomized notion of the world which makes it difficult to unify or integrate the movement of its parts. Thirdly, the separation of knowledge and praxis introduced by positivism leads one to consider actions focused on these fragments of reality or variables, rather than on the profound transformation of the whole.¹⁶

In order to get a better understanding of how these all come about, one must closely examine the characteristics and implications of the positivist paradigm. Epidemiological studies based in the positivist mould are ultimately converted into visions convenient to power structures and tools to obscure or render invisible the destructive impacts of companies which have destroyed human lives and ecosystems. The honesty, talent or good intentions of directors of these companies are mute points.

A remaining point to highlight is that, together with the regressive process of thought on public health as a whole, this kind of vision has become strengthened in recent decades.

¹⁵ Breilh, Jaime (2002). El Asalto a Los Derechos Humanos y el “Otro Mundo Posible”. Quito: Espacios, 11: 71-82.

¹⁶ Breilh, Jaime (2003). Op cit.

In capitalist societies, communities have suffered a century-long process of violations of human rights and loss of equity. This process has erased, at least in countries with marginal capitalism, the advances brought on by the social pact. Along the tortuous path of loss of rights and guarantees we've come to what is known as the era of globalization. Much has been written on the subject of global capitalism, regrettably approached as a problem arising from the globalization of the finance and market system. Unfortunately, this standpoint does not consider the fundamental characteristics of today's capitalism, distinguishable from that of previous eras for instance through the growth of the information highway¹⁷ and changes in the model of capital growth.¹⁸ In other words, we are living the paradox of an intensely informed society but with extreme concentrations and monopolies of resources. In terms of scientific work, this polarization creates extreme tension between potential information resources for science and the monopolization of all media controlled by the empire. In is within this context that independent thought has been straight-jacketed by a colossal machinery of purchased scientific thought - a machinery which epidemiology has not managed to escape.

The era of neo-imperialist plundering signifies the full exploitation of the human being and nature; cold multinational apparatuses operate through instant connectivity as decentralized businesses throughout the world. The most serious implications in terms of health is that this voracious competitiveness has been sustained throughout the dismantling of legal and social rights of communities and their ability to work. Dismantlement has taken place through the relaxation of regulations on hiring and contracting and a large reduction in salaries as well as through the massive exclusion of over half of the economically active population, where under- and unemployed men and women still lack a right to even a miserable - albeit stable - salary and survive in a social and legal underworld where only the laws of jungle rule and where some pitiful programmes offering crumbs of compensation are meant to quell their anguish.

Contemporary globalization has come to be on an absurd dash to destruction. The economic gears mounted by the blind law of accumulation are leading humanity as a whole to self-destruct in its search for riches and power. As I have previously argued: "Capitalist society is no longer the scene of classic exploitation of manpower and simple extraction of profits taking place under basic conditions of labour laws and social well-

¹⁷ Castells, Manuel (1996) *The Information Age: Economy, Society and Culture*. Oxford: Blackwell Publishers.

¹⁸ Harvey en su último libro "El Nuevo Imperialismo" ofrece una novedosa hipótesis sobre lo que él denomina acumulación por *desposesión*. Según dicho autor, la lógica del capitalismo ya no sólo trabaja mediante la extracción de plusvalía y los tradicionales mecanismos del mercado, sino mediante prácticas predatorias, el fraude y la exacción violenta, que se aplican aprovechando las desigualdades y asimetrías internacionales e interregionales, para despojar directamente a los más débiles de sus recursos. Podríamos decir, entonces, que la desposesión, o mejor *despojo*, se produce no sólo desde el poder imperial sobre los países subordinados, sino desde el poder de las clases dominantes situadas en una región más fuerte de una misma sociedad, sobre las que se ubican en los espacios más débiles de la misma.

[Harvey, David (2003) *The New Imperialism*. Oxford: The Oxford University Press].

being. Rather, it has become a system of domination that has degraded subsistence to its minimum and created the structural impossibility for sustainable social reproduction.”¹⁹

But even in hard times such as now, public health can rise from its lethargy and confront, with new conceptual and methodological tools, the consequences of these new forms of aggression and deterioration in the quality of life, supporting the construction of this “other possible form of health” for which responsible humanity is fighting. Public health and epidemiology will have to modify their old models, built on infectious entities in times of classic colonialism, to confront the new impacts which will take place upon changing the model of capital growth, and to propose all the while measures to secure overall health. The short of this means rethinking what was formally the epidemiology of hunger so that it becomes the epidemiology of waste and , developing at the same time, and according to contemporary challenges, this other possible epidemiology.

¹⁹ Breilh, Jaime (2002). *Perspectivas Políticas, Sociales y Éticas de la Investigación en Una Era de Barbarie*. Aguas de Lindóia (S.P.): II Encuentro Internacional de Investigación en Enfermería, Octubre 31.