Subjects at risk in a transhuman and post-clinical world: Reflections on Saramago's *All the Names* and the Wachowski Sisters' *The Matrix*

El sujeto de los riesgos en un mundo transhumano y posclínico: reflexiones a partir de *Todos los nombres* de Saramago y de *Matrix* de las hermanas Wachowski

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ABSTRACT The main premise of this paper is that common social discourse, manifested in the Arts & Humanities, has played a crucial role in the construction of technoscientific languages and cosmologies. I explore this argument in relation to recently established scientific disciplines, such as Epidemiology, through the lens of two works of cultural production: Saramago's novel *All the Names*, and cult movie trilogy *The Matrix*, written and directed by the Wachowski Sisters. Both are allegories that exemplify a virtual world made possible by technoscience. A parallel is suggested between the first social observatories that encapsulated whole populations for systematic observation (allowing improvement of epidemiological methodology) and the "epidemiological dream" – nearly realized through the introduction of electronic data processing, enhanced by the advancement of modeling and simulation strategies and the organization of immense databases on health, disease, life, and death.
KEY WORDS Epidemiological Theory; Risk; Literature; Films.

RESUMEN La premisa principal de este texto es que el discurso social común, expresado en las artes y las humanidades, ha sido crucial para el proceso de construcción de lenguajes y cosmologías tecnocientíficas. Se examinaron los fundamentos y las correlaciones de este argumento tomando como referencia disciplinas científicas establecidas de manera reciente, como la epidemiología, con la ayuda de dos obras de arte: la novela Todos los nombres, escrita por Saramago, y la trilogía cinematográfica Matrix, escrita y dirigida por las hermanas Wachowski. Ambas alegorías son ilustrativas del mundo virtual posibilitado por la tecnociencia. La propuesta consiste, entonces, en establecer un paralelo entre los primeros observatorios sociales que encapsularon poblaciones enteras para su observación sistemática (lo que permitió el perfeccionamiento de la metodología epidemiológica) y el "sueño epidemiológico", casi cumplido con la introducción del procesamiento electrónico de información y potenciado ahora por el avance de estrategias de modelado y simulación y por la organización de megabases de datos de salud, enfermedad, vida y muerte.
PALABRAS CLAVES Teoría Epidemiológica; Riesgo; Literatura; Cine.

INTRODUCTION

My premise is that researchers from every field could resort to arts and humanities so as to better see themselves and their sciences through the mirror of society and culture. The common social discourse, reflected in artistic and cultural products, certainly serves as a very valuable source of images, metaphors and senses for the creation of baseline cosmologies and technoscientific languages essential for sciences, mainly for those created during the modern epistemological formation which Esther Díaz[1] called "post science." Nevertheless, on this path of permanent upgrade of scientific terminology within disciplinary and transdisciplinary languages, the social and symbolic-cultural constructs should not be expected to be represented in an immediate manner or without intervention.[2]

In the health field, especially in the case of epidemiology, the language of risk has been instrumental for the creation of a world of its own, *sui generis*, which is particularly delineated by, mainly, epidemiological objects-models determined by risk functions, risk factors (and markers) and, more recently, risk behaviors.[3] In the scientific field, the foundations of thoughts and language are even more crucial to the extent that the centralization of risk, within the current social construct, increasingly requires epidemiologists and healthcare workers to understand further and provide better answers to the enigmas of health.[4]

Motivated by the then recently published *A Cyborg Manifesto* by Donna Haraway,[5] I wrote in 1991, in Berkeley, a small essay entitled "*O homem dos riscos*" [Man of risks], which was first published in *A clínica e a epidemiologia*,[6] and then expanded and included in a volume regarding epistemological topics of epidemiology, called *La ciencia tímida*.[7] At that time and in that context, I suggested that the epidemiological concept of risk produces discourses able to create fictional worlds formed by abstract populations. I also suggested that the clinical notion of individual risk populates those worlds where people are simulated and defined by its probability to become ill or die as well as added to human groups connected through virtual social media. The central hypothesis was that, in said predicted digital world, the "man of risks" would be materialized in parallel dimensions under particular conditions of production-reproduction of effects on human and transhumant life, through socio-historical processes which would imply a virtual existence and, in terms of health, a corresponding cyborg morbidity. Sevalho[8] and Portella *et al.*[9] revisited the text based on different critical perspectives, and they showed analogies and contrasts regarding the idea of "*homem lento*" [slow man], originally coined by Milton Santos.

Based on the controversies aroused by different critical contributions over almost the last three decades, and considering the new interfaces of epidemiology and the transfigurations of the social formations in the cognitive capitalism,[10] I seek to upgrade in the following pages the original proposition of the "man of risks" to the notion of "*sujeito de riscos*" [subject of risks]. Considering the progress of gender studies and the exceedance of the limits imposed by modernity, it no longer makes sense to use the term "man" to cover the whole of human diversity. By that I mean posthuman and transhuman people, who still are modern and immersed in ecologies of knowledge and practices of prediction, prevention and precaution regarding risks, diseases, sufferings and death as well as of promotion of health and life. In this transCartesian and postclinical world, which creates a dystopia overshadowed by necropolitics, there is room for a new (or reloaded, as seen later) perspective of said subject as a "transhuman being of risks."

To that end, I make my proposal based on two central topics regarding the modern epistemology applied to the epidemiological science: on the one hand, language as an essential element for the creation of scientific worlds; and, on the other hand, the rational knowledge formed by that social practice called science, which is subject to the determinations of a world presumed to be real

and which is becoming more naturalized, even though it is certainly historical.[11,12] At first, such a proposal may sound strange and even incomprehensible, mainly, for the artisan researchers and the "hard" scientists who are used to deal with phenomena of what is commonly known as real life, specific cases, controlled experiments, demographic samples, tons of records and volumes of data. In this essay, I will elaborate and expand this argument with the help of two cultural products from the contemporary Western world: *All the Names*, a novel regarded as a classic of the current Portuguese literature, and *The Matrix* (1999-2003), a movie trilogy that acquired a cult following at the beginning of the current twenty-first century.

ALL THE NAMES BY SARAMAGO

All the Names is a masterpiece written by Portuguese author José Saramago, winner of the Nobel Prize for Literature in 1998. The novel is about the Central Registry of Births, Marriages and Deaths located in an anonymous city which, even though it is set somewhere in Portugal, it could be set in Spain, Brazil, Cuba or any other country of Ibero-American heritage.[13] In 2004, I made the first analysis of the main premise of this text, based on the work of Saramago, which was published in a scientific journal of the epidemiological mainstream[14] and, as it did not have a major impact, I will reaffirm and expand on the topic throughout this work.

The Central Registry is an archetype of traditional bureaucratic organizations, which has almost unknown functions that wholly depend on ancient rules of forgotten origin. Some strict and inflexible officers, which are faceless and almost sinister, govern and overshadow a harsh and conservative institution. As made clear in the first chapters, the protagonist of the novel is the institution which, having a totalitarian nature, puts its weight on human beings. The initial paragraph of *All the Names* is entirely devoted to the entrance of the Central Registry:

Above the door frame is a long, narrow plaque of enameled metal. The black letters set against a white background say Central Registry of Births, Marriages and Deaths. Here and there the enamel is cracked and chipped. The door is an old door, the most recent layer of brown paint is beginning to peel, and the exposed grain of the wood is reminiscent of a striped pelt. There are five windows along the facade. As soon as you cross the threshold, you notice the smell of old paper.[13]

The first chapter of the novel includes a detailed description of the Central Registry, its hierarchical structure, its way of operation and, mainly, its strange architecture. The main hall is wide and rectangular and the room furniture is made out of solid, austere, elegant and somber wood. There are eight desks placed near the customer service front desk used by the assistants of the copier clerk. Out of the eight desks, four of them belong to the sworn copier clerks that supervise the work of the assistants, and two of them belong to the officers that supervise the sworn copier clerks. Centered in the background of the room, "lonely, as it should be," there is the large and dark desk of the chief curator. All of this "arranged according to the hierarchical precedence which is, as expected, harmonious from this perspective and also from the geometrical perspective, and that goes to show that there is no insurmountable contradiction between aesthetics and authority."[13]

A simple principle governs the work of the Civil Registry: the largest possible number of tasks must be completed within each level, and only a minimal amount of tasks can be passed on to the higher levels of hierarchy. Under normal conditions of work, the chief of the Central Registry should not be bothered with routine tasks or daily work problems, so as to guarantee the order, discipline and dignity necessary for the great civic responsibility of the institution.

All the Names is also the story of Mister José, a humble assistant of a sworn copier clerk who, in his first appearance, is introduced to

the reader under the label of "insignificance." In a pathetic and almost heroic odyssey, José gets into big trouble when he breaks all the rules of the cruel and somber institution when trying to discover who the person behind a specific register is. However, the underground life of José is not our interest as researchers, epidemiologists and scientists. Although it can be valuable for other scientific discourses, the identity narratives and the analysis of the power relationships in conservative bureaucracies implied in said allegory are not relevant now.

For our purposes, the most important thing is the function of the strange building, especially the gigantic annex where archived documents are kept. Just behind the desk belonging to the Chief Curator there are five massive floor-to-ceiling shelves extending to the end of the building (even though it cannot be seen due to the enormous size of the construction and the darkness at the back of the hall). "Obeying the law of nature," the files and records are kept in two sections: the living and the dead. The documents related to the living are filed in the first sections of the shelving line, which contains all the corresponding names and signatures. These sections store various documents such as birth certificates, work permits, baptism certificates, marriage licenses, school fees, diplomas, certifications, leave applications due to accidents and diseases, premiums and retirements. The documents related to the dead, that is the death certificates stapled to the files kept when they were alive, are thrown into the farthest sections of the shelves.

As the number of dead people never ceases to increase, the administration of the Central Registry orders, on a regular basis, the demolition of the wall behind the annex to have it rebuilt many meters away. The unexpected construction is already a hundred meters long and, for purposes of greater security and maintenance of the files, it contains no windows or doors. In the past, a certain balance between the files of the living and those of the dead was achieved. Such balance helped absorb the small increase of the living population by physical compression

and, afterwards, by using thinner file covers. The files of newborns are stored at the beginning of the shelving row and the old files are pushed backwards and upwards until they reach the end and the top of the higher shelves. The records of those who die at any moment of their life cycle are transferred from the sections of the living to the beginning of the long rows of the shelves of the dead. For obvious reasons, the files of the living are much more organized than those belonging to the dead.

Given the many efforts to expand the building (already gigantic and filled with huge shelves), multiple stacks of documents that were left on the floor blocked the hallways which created paths and detours that, as a whole, turned the area where they kept the files into a sort of a dark and sinister maze. Before the obligatory adoption of the Ariadne's thread in order to show the way, a scientist who conducted several heraldic research studies got lost for a week "in the labyrinthine catacombs of the archive of the dead."[13]

The Central Registry comprises the microcosms of a whole city and region which encapsulates the entirety of the population, present and past, alive and dead. Each and every inhabitant of the anonymous municipality is entitled to have a file in the archives that contains the detailed record of "all the names" (fathers, mothers, relatives, authorities, godfathers, godmothers, trade partners, spouses, etc.). Such matter implies the parallel existence for each inhabitant within the huge base of documents kept in the maze comprising the shelves, the files and the names, which are nurtured by the care and the neglect of the assistants, the copier clerks and the officers. This parallel existence allows the files and sheets of the real-life beings to have a relatively independent "autonomous life" within the pathetic institution.

THE TRILOGY OF *THE MATRIX*

The trilogy of *The Matrix* (*The Matrix*, 1999; *The Matrix Reloaded*, 2003; *The Matrix*

Revolutions, 2003), written and directed by the Wachowski sisters, gained great popularity at the beginning of this century. The movies of this series have a frenzied and complex narrative where the backdrop is the war between humans and smart robots set in a dystopian future on an unknown date which, however, seems to be uncomfortably near. The machines defeated and now control the human beings, who were turned into the main harvest of farms and biological factories. In those places, billions of humans are cultivated, by keeping them alive inside artificial placentas so as to generate electrochemical energy used to feed a huge computer network. In order to deceive enslaved humans and keep them physically inert and neurologically active (although controlled), the machines created a virtual-real world called "Matrix."

The Matrix is a fantasy world generated by computer, able to produce a "neural-interactive simulation" which involves, in short, an all-inclusive virtual environment. In this environment, some powerful and almost indestructible virtual beings called "agents" prevent dissent, suppress rebellions, and pursue and end any resistance. Most of the humans of the real world have brain connections implanted so as to gain access to the neurologically-induced dream world. When connected to the Matrix, they become cyborgs (that is to say, cybernetic organisms, hybrids made of part machine and part living organism), which allows them to exist in both worlds. Neo, the hero, is a talented hacker who, guided by Morpheus and helped by a group of *cyber-partisans*, "wakes up from his dream of reality." Saved from the hands of the agents, Neo is reborn in a ship belonging to the real world commanded by Morpheus to assume his role as the charismatic Messiah who has been expected for a long time to lead the rebellion of the humans.

The virtual population of transhuman beings shares the environment of the Matrix and, excluding the agents, it is completely representative of a total reference population. Each and every virtual human being within the Matrix is a character or avatar, a customized simulation of a real human being kept inert in a capsule. These virtual humanoid beings, such as the woman in a red dress from the first movie or many characters from the second one (for instance, the locksmith or Merovingian, the leader of a gang), are simulations – a Latin term which means: "something having merely the form or appearance of a certain thing, without possessing its substance or proper qualities; a mere image, a specious imitation or likeness, of something"[15] – with no counterpart in the real world, and, for that reason, there is a limited interaction between them and the humans.

Matrix is an archaic Latin term, etymology of the word *mater* [mother], which originally meant "pregnant female."[16] In Medieval Latin, *matrix* also came to mean "womb" and, in an entirely different connotation, "list" or "registry" of all the names of a group (the verb *matricular* [enroll] derives from the word *matrícula*, or small matrix). In different contexts, the word "matrix" refers to a type of substrate where different beings are born and raised, grow and develop themselves. In the field of mathematics, there is a technical meaning for the word "matrix," which may be defined as any array of numbers and symbols. Regarding the different movies of the trilogy, the word "matrix" refers to both the specific system (machinery and programs) which comprises all the human beings that are vegetated in containers, and the sequence of symbols that codify the virtual environment. In the trilogy, the appearance of things in the apparently real world, that is the Matrix, is an inferior perception; the real environment (the "desert of the real") constitutes the real matrix sequence of symbols.

The movies of the franchise The Matrix are based on a fundamental argument: what we experience as reality is no more than an interactive and artificial virtual environment, which implies some kind of universal systematic camouflage generated by a mega computer directly connected to the minds of each and every inhabitant of the world. However, there is an essential connection between the real world and the computer-simulated

world: the nature of the transhuman body intervened by technological devices, especially vintage telephones or hypermodern smartphones (for the time).

Finally, since in the virtual worlds the sensory organs are still data receptors and processors, the logical (and practical) problem is not that the data is discontinuous but indiscernible. For some obscure reason, the real human beings are able to preserve memories of the virtual world, both within the Matrix and when they go back to the real world. This results in the tragic loss of autonomy for the simulations of human beings within the programmed worlds, which are fully digital dystopias.

Two decades after the release of this techno-pop story, its anticipatory potential cannot be denied, which includes a great number of confirmed predictions such as the use of smartphones as portals between the dimensions of the somber and arid world ("the desert of the real") and the programmed imagination of the current hyper-urban life, including the environments of the virtual reality determined by artificial intelligence algorithms.

The saga was a box-office hit and quickly became what the critics called a cult movie, a representation of subcultures that identify themselves with values of uncertainty, mysticism, fragmentation and techno-scientific idioms. As a whole, these movies create an ambitious story about central topics regarding the Western philosophy with a gameplay aesthetic of martial arts, which are references to the cyberpunk counterculture and some features belonging to the new age culture. For that reason, even after two decades, the allegory of The Matrix continues catching the attention of many critical thinkers belonging to the postmodern or late contemporary scenario.[17]

Immediately after the release of the first movie, Slavoj Žižek[18] suggested that the Matrix would represent the virtual symbolic order of the contemporary human culture, in a non-explicit reference to the Castoriadian notion of the imaginary institution of society.[2] For Manzotti,[19] based on an approach slightly inspired on psychoanalysis, the Matrix is about

a mental network that structures reality for all of us and that needs to stay unconscious, in order to perform its oneiric function.

Hanley[20] defines the Matrix as a fully communitarian virtual environment which is big enough to be universal and which includes the complete inventory of human participants. Bostrom[21] observed in the Matrix a synthesis of dystopian forms of social relationships, virtually interacting in a permanent, radical and comprehensive way. From this perspective, the Matrix seems to be real precisely due to its radical interactivity, enabled by the capacity of virtual environments to respond to any contribution or stimuli from its elements. The virtual environments at the reach of the currently available technology (such as individual devices or micro-environmental simulators of virtual reality) are far from said degree of interactivity.

PLATO'S CAVE AND THE "EPIDEMIOLOGICAL DREAM"

Both the Central Registry and the Matrix can be seen, certainly, as powerful political metaphors. The reduced models of the real world, which are controlled, thoroughly delimited, programmed and disciplined, typical of the universal mega network and of the extremely conservative institution, have a dystopian nature and may well represent the *summa* of the social and psychological control of the bureaucracy and totalitarianism.

It should be considered that Portugal and the generation of Saramago greatly suffered Salazar's dictatorship, the longest fascist regime in history (which started in 1932 and ended in 1974 when, after Salazar's death in 1970, it was overthrown by the Carnation Revolution). As a complement to said political correlations, the novel also addresses human subversion, just as mentioned before, represented by Mister José, who challenges the forces of institutional oppression from within the institution. At the same time, even though it has no immediate political reference, like the fascism of Salazar, the movie series *The*

Matrix is also about the underground and heroic human action that challenges the faceless forces of institutional oppression (or, in this case, with a single face: that of Agent Smith). In this sense, Paura[22] regards the Wachoskian allegory as a revelation of the ideological dimension that gradually defines contemporary cognitive capitalism, in particular, as it has been emblematic regarding conspiracy theories based on pseudoscientific references.

Atkin[23] suggests to interpret the Central Registry and its mazes as another clever reference to the famous allegory of Plato's cave, to the extent that it refers to parallel and dark spaces, joined by the projection of shadows that eventually turn into inert records of a reality that exists in illuminated external dimensions. Even the argument of *The Matrix* was regarded as a clear citation of Plato's cave. [24,25] In this sense, Partridge[25] observes that life within the Matrix represents mental states fully alienated from reality and that, ironically, the scenography of the real world is what resembles the most, in aesthetic terms, the underground part of the cave.

In book VII of *The Republic*, Plato[26] proposed a general theory of knowledge, based on the distinction between the sensitive world and the intelligible world that would become one of the epistemological foundations of the Western culture. As an example, the Greek philosopher described a dark cave inhabited by humans who ignored their prisoner status since birth. The only link they had to the outside world was a vision of shadows projected onto the walls of the cave. Plato suggests that our knowledge about the sensitive world is always uncertain, regardless of what is the source of information. For him, what we can grasp is not what belongs to the sensitive world but what belongs to the intelligible world from which our known sensitive world arises. The only way to know the phenomena of the sensitive world is if we grasp the forms of the intelligible world. To reach the truth of things, then, we should not let ourselves be deceived by our senses. Since the ordinary (real) world is too nebulous and constantly changing so as to enable

a genuine knowledge, being aware of such nebulosity and changeability helps us to determine which perceptions and convictions are relatively more reliable.

Although there are convergences and similarities to the Platonic allegory, in the movies of *The Matrix* trilogy there is a gap between the real and the simulated world bigger than the gap between Plato's cave and the outside world. Partridge[25] also considers that, regardless of the metaphysical differences between the original Platonic thought and the argument of the series *The Matrix*, both converge on the epistemological insecurity of the objective knowledge as well as on the necessity to exceed the limits of the senses with the aim of attaining genuine knowledge. Such comment can also apply to the fictional world represented by the figure of the Central Registry.[23] The most intriguing part is that, after *All the Names*, Saramago wrote a book entitled *The Cave*[27] in which he addresses the loneliness of human beings that are prisoners of their ignorance and alienated from the real world and the control of their own lives.

Nevertheless, I do not think that the series of Morpheus, Trinity and Neo or the obsession of Mister José are a subject of immediate interest for epidemiologists or biomedical researchers, among others. For epidemiologic theory, what matters is to highlight that both the Matrix and the Central Registry comprise reduced models of a whole universe and a whole municipality which, at the same time, codify and enclose entire populations. Each and every inhabitant of these dystopian worlds exists in parallel in the shelves and in the memories of the cyclopean databases and they have connections and networks (between bodies and programs in the case of the Matrix, and between files and sheets belonging to the living and the dead, buried under moldy records, in the case of the Central Registry).

One of the crucial moves for the historical construction of epidemiology, when it was a young discipline in pursuit of a purpose, was the organization of reduced models of the real dynamic of the health-disease

phenomena of society. During the 1950s, the first generation of scientific leaders in our field promoted the establishment of observatories for methodological investigation, selecting entire communities for their systematic and continuous monitoring.[28] The city of Framingham, in New England, is still famous today for having been the scenario of the main epidemiological discoveries regarding the cardiovascular risk factors, discovered by research groups linked to Harvard University. Other schools of public health implemented similar observation sites, such as Alameda County (for the University of California in Los Angeles), Evans County (for the University of North Carolina) and Hagerstown, Maryland (for Johns Hopkins University), among other examples. The population from these towns has been monitored for years (in some cases up until the present day) and their health conditions have been thoroughly studied through regular clinical and laboratory examinations. The samples of fluids and tissues produced during this process were stored for future research. This situation required a huge intellectual and institutional effort in order to shape databases and conservation units into physical analogues bodies of human populations.

As I mentioned in another text,[7] such samples or reduced models of communities or societies (consisting of demographic, biological and clinical samples, fragments of collected, stored and exposed real populations) are still operating and can be seen in different epidemiological research centers all around the world. These observatories, which in an intriguing way are similar to the allegory of the Central Registry of Saramago in terms of shape and function, considerably contributed to the development of research designs and analysis techniques that would eventually become the paradigm of scientific observational methodology typical of epidemiology.[28] However, the limits regarding its physical composition and size, as well as the psychological, social, ethical, political and institutional constraints imposed by the reality of the daily life of specific populations, prevented these experiences from becoming

the "natural epidemiological laboratory" dreamed by the founders of our science, especially Greenwood.[29]

The "epidemiological dream" would become real only in the 1960s thanks to the introduction of computer science, which programming logic made possible the electronic data processing. This situation enabled, as a solution to shape epidemiological realities, the implementation of digitalized simulations, that is, statistical analogues used in specific situations concerning environmental and demographic studies. For the first time it was possible to organize datasets big enough to reproduce ecological and demographic structures with dynamics closer to those of the real populations. Additionally, computerized data control increased the possibilities of production of scientific knowledge due to the combination of observation strategies with subsequent analytical control. When applied to certain research issues (such as health in human populations, an aspect fundamental to the object of epidemiology), said strategies promote the transformation of human individuals and groups (as well as the transformation of their biological, demographic and social structure and dynamic) into records and data, through processes of selection, codification, translation and comprehension of meanings.

Theoretically, these processes become flexible models or artificial devices that enable simulations, fragmentations and recreations which, in practice, understand the real meaning of the analysis on this exclusive field of scientific research. In objective and rigorous terms, the only specific populations studied by the scientists of said research field during their practices are those populations included in the databases. Epidemiological researchers, in fact, do not directly interact with molecules, cells, tissues, organs, or human bodies, but they codify, organize, analyze and challenge artificial groups of observations and data, generally stored in electronic forms. From a rigorous methodological approach, the population subject to epidemiological research (built by daily research practice, through the collection of observations, the codification of data and the

production of information) represents an abstract object, of digital nature. In this sense, such a situation involves, roughly speaking, a programmable, interactive and virtual environment similar to The Matrix, but much less complex (in fact, extremely simpler).

The population of the epidemiological studies comprises a generally remote representation of the so-called reference population (and quite different in terms of content and substance). In other words, the virtual population of epidemiology (or sample) represents a digital simulation of a reference population consisting of flesh and blood people. The term "simulation" is used in this case in a sense partly adapted, as it does not show the mere imitation or empty copy, but rather a simile of each particular case that simply preserves some dimensional attributes selected from its huge biological, ecological, psychological and cultural diversity and complexity (in other words, a case limited to its measure).

The process of observation and data production in laboratory or fieldworks represents the only reliable guarantee of the interrelation between the sample or the study population and the concrete reality. This situation means that it is possible to rely on the fact that an analyzed database has as a reference point or matches with the population from a certain district or city only if we believe that the applied methodology is rigorous and appropriate. This guarantee arises from a process of delicate and complex bargaining, almost a tacit term that arises from the agreement signed by the researchers, members of larger discursive and institutional support networks that act as guarantors of the whole process.[30,31]

Nevertheless, in large population studies, the team which conducts fieldwork is not always the same that analyzes the data, and, often, is not part of the group that will finally give sense to the produced information. There are many recent examples of research where private companies are subcontracted in order to collect data, and consequently the only material thing that researchers receive and process is a dataset that is already digitally available. Furthermore, the epidemiologists, as researchers, do not directly deal with suffering, distress, disease, social pathology, migration, life, birth and death, but they limit themselves to work with data, information and knowledge that are usually translated into risk criteria, standards, estimations and measures and its correlations.

The concept of risk and its correlations can be read as the essential part of the scientific field of epidemiology.[7] Beyond the limits of so-called scientific disciplines, the risk concept is increasingly becoming a fundamental part of the language of biomedical and health sciences.[3,32,33,34] Such fact entails the acceptance that each one of us is a holder of an epidemiological profile that can represent us in the parallel word created by the epidemiological discourse. Said profile basically involves the configuration of risk factors or, if the clinical reduction of the original concept is employed, individual configurations of risk. The alternative of The Matrix created by the discourse and practice belonging to this modality of science may reflect, therefore, merely "epidemiological profiles," personal and general profiles, non-subjective individuals, and trans-humans.

Nevertheless, it is relevant to highlight that the process is not an exclusive discourse belonging to epidemiological science. Other scientific discourses, such as the ecological, economic and sociological ones, also develop their own theories based on the notions of "individual" and "risk." As far as epidemiology is concerned, the difference lies in the fact that such notions, turned into concepts, allowed the construction of a parallel dimension of populations consisting of possible fictional beings, exposed to risks, subject to life and vulnerable to suffering, diseases and death. Thanks to the development of modern statistics, the epidemiological matrices of people and events can be tentatively recognized as virtual and stochastic populations as long as the possibility that their members behave or evolve in a different and particular way is defined by the particular chances of becoming ill or dying.

THE MAN OF RISKS *RELOADED*

At this point, I would like to ratify the suggestion that the epidemiological concept of risk involves a virtual environment inhabited by abstract populations, ruled by operating criteria and regulations, which are analytically manipulated by following specific protocols and predetermined algorithms. Perhaps now, during the age of augmented reality, digital currencies, social networks and artificial intelligence, it may be possible to clearly distinguish such special dimension (almost a parallel universe) formed by the substitutes of human populations consisting of transhumant simulations of human individuals. A probabilistic inferential logic, considerably developed and currently cultivated by different sciences, controls the connection and articulation existing between both levels (the real and the virtual, the analogical and the digital) of techno-scientific inquiry in charge of the technical and practical effectiveness of the epidemiological discipline.[34]

The "epidemiological dream," over fertile ground, would finally have its fitting counterpart in the contemporary social imaginary, powered by a society that is shown as postmodern, consisting of networks, connections, hybrids, clones and copies. It is not surprising, then, that a figurative environment, like the one mentioned before, with its particular social ecology of risks, is becoming increasingly more real, in a sense that a material existence has been granted to said environment. This situation resulted from the fact that, thanks to big data, a parallel dimension is actually being built. That dimension has its own conditions of production and reproduction of the effects on the concrete social and historical life.

Almost three decades ago, when I wrote the essay "Man of Risks," mentioned at the beginning of this article,[6] as a general illustration of that reality I used the credit card, a popular banking option, which was new at that time. I claimed that, when filling the application form in order to have access to the money, people would begin to exist parallely in a database, which would mean a reduction

in the group of economic relationships, and that such existence would be governed only by the simpler economic rationality of debit and credit balance. Consuming without using cash money is getting increasingly easier. Any person can acquire clothes or medicines, do the shopping, hire services or customize products, and pay using a magnetic or virtual card, deducing costs directly from their economic capacity, bank balance or creditworthiness. However, in order to record and process bank and financial operations, the bank credit or purchasing power does not directly belong to the person, but is related to the other of the human individual, the double transhuman or the numeric identifier activated by a password (generally alphanumeric), which is part of the memory banks and runs through the circuits of financial information networks.

In countries with a developed industrial economy, where cognitive capitalism prevails,[10] individuals have been used to said parallel existence for a very long time, which operates in an unreal world of databases that are becoming increasingly interconnected. As mentioned previously, within the professional area, the job applicants are registered in networks of labor market data organized to generate data about skills, work history and professional references, which are interconnected with the human resources areas of mega-corporations. Besides, I mentioned that, in the health field, the value of the premiums and health insurance policies, as well as the treatment conditions provided to those individuals who have acquired these policies, are defined according to the algorithms that calculate specific health potentials based on the chances of getting sick, that is to say, based on the risk profiles of the individuals.[35]

In "Man of Risks,"[6] another theoretical convergence was highlighted about who would be such trans-human, single and manifold. This matter is about the supposed identity of the individual, which emerges out of such discourse, and which finally reveals, as far as pathology is concerned, a being that is not anymore the individual we know. Reference has also been made to the classic *The*

words and the things, where Foucault[36] suggests that the modern man (mythic figure that, by its specificity, made possible the universalizing reference of the scientific discourse) had been created in the eighteenth century. This reference showed that the new individual of postmodernism might possibly be being invented at that moment, as a "one-dimensional man" determined by chances of events.[37] Such new being would no longer be an individual any more, or a modern man in the Foucauldian sense, as it has a non-subjective part (its double or doppelgänger), which resides in information networks, as shown by its computerized registration numbers (of civil, electoral, credit, social security and other nature) and its passwords. From a wide perspective, this new being, half human and half machine, material as well as digital, would be a cyborg, according to the proposal of Donna Haraway, an intellectual muse of Californian postmodernism. As defined by her words,[5] said trans-human would be:

> ...a creature in a post-gender world [...] resolutely committed to partiality, irony, intimacy, and perversity; [...] completely without innocence. No longer structures by the polarity of public and private, the cyborg defines a technological polis based partly on a revolution of social relations.[5]

The cyborg brain works as a network or, when connected, as an avatar or a character of the Matrix, and its subjectivity adopts a different shape in two senses. On the one hand, as human beings are interconnected by language and culture, there is a particular element, symbolically defined, which depends on the shared languages and programs. And, on the other hand, it is basically necessary, especially for human machines, to have a socius that is relationally established and connected online. Through both elements – cultural relevance and ordinary social link – the "reality" is downloaded in each brain. Morpheus portrays this situation as *"having a dream,"* which is the condition of all the beings kept within the Matrix. For his part, Mister José also asks himself how to differentiate the dream world and the real world of Central Registry. This line of questioning appears in many philosophical discussions and literary works that seek to make a distinction between the states of dream and reality, which immediately leads up to problems with the "presentation of the world," so as to use an expression coined by Giannotti.[38]

Nowadays, the necessary connection among the different parts and existences of such new being is determined by diverse and insignificant operations of daily life, such as an ordinary online purchase, a search on the web browser, the use of bank and commercial automated stations or, in a newer and certainly more popular way, through an application in a connectivity device called "smart": the smartphone. These examples show the progressive computerization of our daily life, during which electronic media networks increasingly catch the attention of individuals. Žižek[17] considers that, during such a process, individuals are exposed to the threat of a radical alienation: individuals end up potentially reduced to a pure emptiness, as all of their memories and their own personal experience can be regulated, manipulated, or even erased or stolen, by the "other machine," which can easily be another name for the Matrix. In recent times, Žižek[39] reconsiders this interpretative approach when suggesting that the Matrix represents nothing less but the *big other* from the Lacanian psychoanalytic theory, suggestive of constitutive alienation of the individual in the symbolic order.

The issue of health-disease becomes essential in this historical time of construction of a new mythic figure (the risk-taking man, the trans-human of post-science) just how it was in the context of the invention of man which occurred in *The Birth of the Clinic* during the emergence of modern science. At this point it is verified that the concept of Risk (with capital R, in the structuring sense of transhuman life), with all its symbolic complexity and analytical wealth,[33] ends up revealing, regarding pathology, a human being who is no longer the one we have known for centuries, but the first of a new generation of post-clinical individuals.

In conclusion, such an individual, transhuman, "creature in a post-gender world,"[5] partially digital, computerized and measured, of tallied preferences and prospected desires, is becoming increasingly marked, defined and conditioned by the probability of occurrence of any type of life event, even those related to health. Regarding said types of events, what is shared with other members of the population, in epidemiological terms, is the Risk, a concept apparently coined, developed and personalized in order to talk about the transhuman collective pathology. For all these reasons, the Risk is a founding element of the construction of the cyborg as a mythic figure historically built and conceptually representative of current times.

EPILOGUE: THE MATRIX OF ALL RISKS

In totalizing realities, such as the Central Registry, the Matrix and the "epidemiological dream," it is possible to see a reduction of the systems, forces, agents and actors which are part of complex structures to simple elements and lineal connections, under stricter organization levels. Reestablishing, through theories, analysis and modeling, the chaotic nature and the complexity of the concrete, biological, social and historical world, is an important task for those who build science through their daily research. In fact, these theoretical devices (or models) are essential to methodologically address the oppressive complexity of the "real realities" of the scientific disciplines.[40]

Metaphors (imaginary devices, abstract realities or theoretical environments) are specifically used, which by definition, enable the scientific research process. Such metaphorical operation is not specific to epidemiological science, but equivalent analogies can be applied to demographic, economic, ecologic and meteorological worlds as an effect of the respective scientific disciplines of Demography, Economy, Ecology and Meteorology. Could somebody possibly maintain that "a generation," "the natural environment," "the market" or "the weather" are tangible or material objects, and not metaphorical, abstract or virtual entities?

When reading *All the Names* by Saramago and watching *The Matrix* by the Wachowski sisters, an epidemiological virtual scenery can be discerned, which is more real than it appears to be and more imaginary of what could be thought of. This insight is based on a primary possibility, which is suggested as a hypothesis: the Central Registry and the Matrix represent allegories that can be interpreted as equivalents to virtual worlds built respectively by the modern and post-modern aspects of the epidemiology. Both allegories are illustrative of the virtual world enabled by techno-science, particularly during the process of knowledge production by means of observational and meta-analytic strategies, as in the case of epidemiological science.

In this essay, I examined the consistency and potential validity of this hypothesis, resorting to the first social observatories used by entire populations for their systematic observation, which enabled the emergence of the "epidemiological dream." This dream is now strengthened by the progress of strategies concerning modeling and simulation, and by the organization of mega databases about health, disease, life and death. I suggested an articulation between the epidemiological concept of risk and a conception of environment (metaphorical, virtual, inhabited by abstract populations) typical of epidemiology. I argued that the epidemiologists deal, in their concrete practice, with the imaginary population of their databases. Only the process of data production can grant some reference guarantee to the databases by a process of subtle and complex negotiation which represents an implied commitment signed by the involved researchers. It can be concluded that, in fact, the real reference population is different from the virtual and abstract population built during the daily research practice. The connection between those two levels is governed by the particular inferential logic developed by epidemiology, which is responsible for the technical effectiveness of

such a discipline. Based on this situation, a new social practice, named preventive medicine, emerged with the aim of anticipating the occurrence of undesirable events (basically diseases and death) among abstract populations identified as risk holders. To this end, a huge amount of time and energy has been invested to create new logics (and new ethics) in order to manage parallel realities built from the notion of risk.[41]

When the allegory of the man of risk was conceived, I proposed to distinguish different modalities of the concept of risk: the demographic risk (epidemiological concept in an strict sense), the risk as threat (latent and hidden notion in the ordinary social discourse) and the individual risk (practical concept incorporated by the clinical practice).[6] Since exactly ten years ago, we realized that the future of the concept of risk would depend on its capacity to accompany the conceptual and methodological developments of the new sciences of health, contributing to theoretical models and empirical strategies capable of dealing with the emerging complex objects.[3] In this sense, I proposed to add two extra definitions to the list of risk concepts: the environmental risk (probabilistic, but not individual) and the structural risk (possibilistic). Shortly after, when systematizing new categories of determination in order to renew the epistemological discussion about epidemiology, the idea of contingent risk was introduced to my glossary of risks so as to include singular, accidental or catastrophic events.[34]

As previously mentioned, the "man of risk" will be, certainly, less human. Maybe it is better to name it trans-human. Technically, it will become increasingly harder to recognize what the trans-human – this intangible cyborg – has that is subjective, singular, personal, human, self-defined or particular, and it will be easier to define it from what it shares with all the others. Moreover, what can be shared in this new probabilistic and totalizing world are repertories of the possibilities of events and incidents to occur, recorded from a frequentist perspective, and recognized and predicted in algorithms expressed in programming languages.

Finally, it is relevant to highlight two events that have produced a substantial change in the scenario (although expected) of the "man of risk." On the one hand, the huge increase in the shared capacity of processing and storing among computers and its distributed system networks enabled the emergence of what is known as *Big Data*. On the other hand, the fast progress of the so-called artificial intelligence was verified. Such intelligence is related to the capacity of constant self-adjustment in the programming of electronic devices used for the processing of the information (which, with a reduced degree of semantic rigor, was named automatic learning). In fact, it is about algorithms that formed the machine language, and which are capable of reprogramming themselves or of self-regulating by an operation of analysis of mega databases at an extremely high processing speed (which currently tends to be even higher, with the promising quantum computer science). The increase of the processing speed and the greater capacity to store data and automatize analysis strategies help integrate different types of risk, which in a way revives the "demon of Laplace," master of a totally foreseeable world. Only the inevitable singularities and contingencies will challenge said programmed universe, embryo of a less credible Matrix, but not less dangerous.

Nowadays, a growing interest can be seen all around the world regarding the techniques and procedures intended to improve human individuals, by transforming them into organisms (or cyber-organisms), pure risk profiles, determined by risk functions, factors, markers, behaviors and situations, attributed to non-subjective individuals existing in virtual worlds formed as risk matrices. Such situation implies the acceptance that epidemiology can be potentially regarded as a scientific discourse more powerful than what the majority of our shy epidemiologists are accustomed to, even without the need to take the red pill and to follow the white rabbit (as Neo did) or to copy the file of the unknown woman (as Mister José did). Many people are still intrigued and amazed when they see that epidemiology, as a science and a practice, has become fashionable.

The evaluation of the central hypothesis of this essay strengthens the thesis that, before this trans-human, post-clinic, post-gender and cyborg individual, the epidemiological science is capable of taking a central role equivalent to the one played by the biomedical sciences in relation to the individual of modernity. As properly pointed out by Foucault,[42] clinical medicine was the first technical discourse regarding man in modernity, who tends to fade due to the overcoming of that obsolete individual. In this way, I can here update the proposal that epidemiology – defined as a privileged discourse regarding individual and collective risks, producer of theoretical and technical contributions capable of expanding and deepening the understanding of environmental, structural and contingent risks – meets all the necessary requirements for becoming the essential science of health in the post-clinical era.

To sum up, there is something in our science that makes it a relevant element in the cosmology of times, which was once called the post-modernity. What is it?, "You already have the answer," Morpheus would say. And he would add: "you don't know what it is, but it's there, like a splinter in your mind." This vague perception of discomfort (which implies no more than a feeling) lets us think that this is so since the discourses of the young epidemiological science have a huge power to tune with historical times. This is what enables us to understand why epidemiology was born outside the cavern, got out of the Central Registry a long time ago, and it is now inside the Matrix. Now it is a matter of making the necessary possible: a historical consciousness of the networks of images, senses and knowledge that structure and limit, inside and outside the matrix, a new science of risks in a transhuman world.

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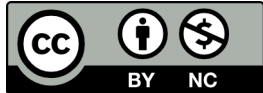6. Almeida-Filho N. A clínica e a epidemiologia. Rio de Janeiro: APCE, Abrasco; 1992.

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