

On the production of certainty in public health: biopolitics and speculative objects

Sobre la producción de certidumbre en salud pública: biopolítica y objetos especulativos

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Abstract

This article analyzes the production of certainty in a health policy shaped by the epistemic scheme of evidence-based medicine: the Regime of Explicit Health Guarantees in Chile. Based on studies on science and technology, the analysis of material produced through focused ethnographies in ministry settings, and interviews with experts and professionals, this study exposes how objects linked to the evidence serve for three purposes in these scenarios: to reduce the complexity of global processes, to connect the local with the global, and to generate a new continuum that links truth with uncertainty. These objects are characterized here as “speculative objects,” highlighting their important role in the articulation of rhetoric that allows the local configuration of biopolitics.

Keywords: Biopolitics; Evidence-Based Medicine; Public Health; Decision Making.

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Resumen

En este trabajo, analizamos la producción de certidumbre en una política en salud configurada desde el esquema epistémico de la medicina basada en la evidencia: el régimen de Garantías Explícitas en Salud en Chile. Con base en los estudios de ciencia y tecnología, el análisis de material producido mediante etnografías focalizadas en escenarios ministeriales, y considerando entrevistas a expertos y profesionales, exponemos cómo en estos escenarios los objetos vinculados con la evidencia llegan a servir para tres propósitos: reducir la complejidad de procesos globales, conectar lo local con lo global y, fundamentalmente, generar un nuevo continuo que vincula la verdad con la incertidumbre. Caracterizamos a estas entidades como “objetos especulativos”, destacando su importante papel en la articulación de retóricas que permiten la configuración local de la biopolítica. **Palabras-clave:** Biopolítica; Medicina Basada en la Evidencia; Salud Pública; Toma de Decisiones.

Introduction

Much of the contemporary processes of governance and health management involve the establishment of close relationship with uncertainty (Gillett, 2004). Still in the introduction to the government's social security techniques associated with general interventions on the human species or biopolitics, the philosopher and historian Michel Foucault (2006) pointed out how the support of material data establishes both the possibility and the impossibility of formulating the probabilities that make up population movements and flows. And this is particularly relevant when we consider how medicine and population health management have changed in recent decades. In that period, important epistemological changes happened, placing increasing confidence in the optimization of processes and outcomes based on the effectiveness of science (Cambrosio et al., 2006), which is evident in three dimensions. First, medicine has started being considered as biomedicine. This consists of the creation of infrastructures and regulations that make the link between biology and pathology inseparable, and the way this relationship is thought of in individual and population terms. Secondly, biomedicine organizes its knowledge production through the coordination between research centers located in different settings, but which together affect local decision-making on health. In other words, the activity associated with healthcare is based on “deterritorialized” judgments (Bourret et al., 2006), which define the course of decisions about human collectives with heterogeneous sociocultural traits. Finally, it produces a new objectivity called “regulatory objectivity” (Cambrosio et al., 2006). According to it, medical truths are based on regulations that depend on the production and use of evidence that is based, in turn, on a set of conventions. These regulations are the grounds for producing objectivity, which is unthinkable without regulations (Cambrosio et al., 2006). The “Evidence-Based Medicine” movement itself would be, in this light, an epiphenomenon of this underlying movement.

The evidence-based medicine movement has been the most important reference when considering how

to properly design health policies. It consists of proposing new methods for linking research evidence and clinical activity, based on the assumption that transparency and clarity in the presentation of such data will have an impact on the way in which medicine is put into practice. Based on its link with clinical epidemiology - the support of clinical decisions based on quantitative epidemiological information - evidence-based medicine lays the foundations for a new understanding of the ways in which population's health should be oriented.

A feature of this relationship refers to the handling with a specific type of technical entities from which both individual and collective biological processes are planned. The basis of this formula consists of the elaboration and/or evaluation of data sets whose final presentation establishes the probability (or improbability) of being part of a segment of the population with a given biomedical trait, or of properly reacting to a given treatment. In this sense, this methodological and epistemic tool (as a way of legitimizing certain forms of knowledge over others) acquires political and ontological connotations, as it demarcates those segments of the population that will be integrated into spaces of healthcare, as well as the traits, qualities, nature of diagnoses, treatments and the meaning and practice of diseases.

This has at least two implications in the order of biopolitics. On the one hand, it establishes a specific regime from which accrual of data associated with research processes are formulated as witnesses of population-related processes that enable both their attention and care, and their exclusion. On the other hand, it defines the scenarios, agents and resources that are considered competent and legitimate to produce, interpret and transmit information and, thus, to elaborate the guidance that will influence how biopolitics and the population itself are thought and practiced.

In this paper we approach both processes from the Science and Technology Studies approach. We analyze routine activities in scenarios specialized in the design of population health, paying special attention to the way in which evidence and data that allow making reference to population processes are acted upon. We particularly consider scenarios for updating the most recent health reform in Chile,

the *Régimen de Garantías Explícitas en Salud* (GES; also known as AUGE), and how these are related with technical elements such as coefficients, statistics and scientific evidence. This case is interesting in that in its legal and practical composition it appeals to the need to carry out or support epidemiological studies, cost-effectiveness analyses and, in short, the consideration and evaluation of national and international evidence that will allow establish which diseases to prioritize and which healthcare processes to guarantee (*Ministerio de Salud de Chile, 2004*). To approach it, we resort to the semiotic-material perspective, which considers how entities of a heterogeneous nature -such as indexes, coefficients and experts- mutually define one another -or relationally-, placing on the same plane the description of the emerging agency in the relationship between human and non-human entities (Latour, 2008).

To this end, we present how the link between biopolitics and knowledge practices has been understood. We specifically point out the approximation of this relationship with science and technology studies. Next, we describe the emergence of the case reviewed, and how the evaluation of evidence is crucial in this case. We then discuss the methodological aspects involved and, finally, expose the emerging epistemic activities in the analysis of the material we have produced.

Biopolitics and knowledge: the population is local at all points

The notion of biopolitics in the Michel Foucault's work (2002) leads to an important disruption in the politics order. On the one hand, it entails the ascertainment of the gradual emergence of an entity that transforms the purposes and means of government: the management and care of features common to the human species, that is, its biology. On the other hand, a set of general but specialized practices of knowledge that enable the above: "The interest will be in principle, of course, in forecasts, statistical estimates, global measurements" (Foucault, 2002, p. 223). According to Lemke (2011), such a link implies dissociation and abstraction of life from its concrete physical

barriers, inscribing it in a new field of epistemic struggles. For biopolitics, life shall not only be regulated, but empowered, articulating a series of technical and normative measures. To this end, the uncertainty of the unmanageable is transformed into a describable intensity, i.e., into something objective and reducible. This makes it possible to define norms, establish standards, design and distribute parameters and indexes. The ambivalent figure of the “population” plays a decisive role in this process (Maldonado, 2018).

Population itself follows a dual nature: it is both a global entity, and the correlate of specialized epistemic activities. For those who operate in the field of policy design, it is represented and known through numbers and figures (Maldonado, 2018). Likewise, statistics is employed as a critical tool in the debates and evaluation of government management. To be legitimated and regulate uncertainty, governments make use of elements such as risk assessment rubrics, cost-effectiveness analysis, as well as evidence-based policies which are rhetorically employed to produce objectivity (Porter, 1995).

Thus, the many ways in which evidence is presented and circulated hardly exclusively obey the representation or demonstration of an external objective process that transcends any space and time. On the contrary, as Rosengarten & Savransky (2018) disclose, evidence results from located practices, created in relational processes, which hardly emerge in other scenarios in the same way. Even if this happens, it will be a product of a coordinated effort. Generalization in public health comes from an abstraction taken as an ontological entity, that is, as a real thing or a thing that is in reality, regardless the practices that unveil it (Rosengarten; Savransky, 2018). Alternatively, science and technology studies show us how knowledge of life itself acquires its meaning in a *seamless weave* between material and social relations.

Science and technology studies have been emphatic in highlighting how global entities, such as population, are locally acted upon as an emergent composition grounded in relations between concrete entities. According to Latour (2007), the global is local at all its points: “Every ramification, every

alignment, every connection is connectable and possesses tracers and a cost at the same time” (p. 171). If biopolitics is based on assumptions about the value of caring for the population’s biological life at a given historical moment, together with the practices that normalize life to provide such care, the ubiquity of biopolitics depends on the alignment of heterogeneous entities, epistemic negotiations and local realizations, which compose a web of technologies, regulations, bodies and their relations. The continuity of these relations ensues from the coordination effort between interests and elements of different nature, both human and non-human.

In this regard, Timmermans & Berg (1997) put forward the concept of *local universality* to emphasize “that universality always rests on the real-time work, and arises from localized processes of negotiations and pre-existing institutional, infrastructural and material relations” (p. 275). In that sense, universality never implies “a rupture with the ‘local,’ but its transformation and emergence in and through it” (p. 275). From this perspective, obtaining universality entails a “context of practice (...) leaving margins for freedom, recollection, long processes of negotiation, diverse interests, etc.” (p. 298). In this way, known aspects of the population - for example, epidemiological data such as birth rates or flows, age composition, prevailing diseases, incidence or severity of diseases in terms of mortality, among many others - are elaborated as real by means of the establishment and activation of entities that allow the relative stabilization of judgmental practices that make visible -and in turn omit - population-based processes. These entities, such as protocols, guidelines, indicators and calculations (Davis et al., 2012), are important to any policy design process, but crucial to those referring to health.

Description of the case: the system of *Garantías Explícitas en Salud* (Explicit Health Guarantees) in Chile

The current Chilean healthcare system results from a series of transformations stated in 1980, tending to the neoliberalization of social security

benefits (Han, 2012; Pressacco & Salvat, 2012; Read, 2009). Currently, it is mainly composed of private entities, called *Instituciones de Salud Previsional* (Isapre), to which the higher-income sectors of the population belong, and a public *Fondo Nacional de Salud* (Fonasa). Nearly 80% of the population participate in the public system, while 19% participate in private entities. Despite this distribution, health spending in both systems is equivalent (Ministerio de Salud de Chile, 2017). A third system corresponds to an independent health management scheme for the Armed Forces and the police.

The GES Regime was established in the early 2000s as a series of sustained processes aimed at transforming the aforementioned configuration of healthcare services in Chile, framed by structural adjustments in Latin America led by the World Bank (1993). In the mid-1990s, the WB promoted economic transformations in developing countries by reducing state investment in healthcare. To that, it mainly focused on four measures: stabilization, liberalization, deregulation and privatization of the economy and healthcare services (Forster et al., 2019). Accordingly, several Latin American countries restructured their health services by introducing market incentives and competition mechanisms among service providers (Bascolo; Houghton; Del Riego, 2018), implying the reorganization of relative assumptions on how population-oriented health policy should be addressed, and which health problems should be prioritized.

El Régimen de Garantías Explícitas en Salud is ruled by Law 19.966 (Ministerio de Salud de Chile, 2004), which defines it as a health regulation instrument that organizes “Explicit Health Guarantees related to access, quality, financial protection and timeliness with which benefits associated with a prioritized set of programs, diseases or health conditions indicated by the corresponding decree shall be granted” (art. 2.º). Specifically, it consists of a package of prioritized health problems - currently 85 - to be covered by law on public and private health system, without

distinction, addressing temporalities, practices and techniques in cases that meet a series of symptoms or indicators that may be verified according to various normative elements updated every three years. It is made up of four guarantees (access, opportunity, financial protection and quality), designed pursuant to certain protocols issued by the Ministry of Health (Ministerio de Salud de Chile, 2004), which provide a new composition to the concrete meaning of health.

This implies the reorganization of assumptions on how health policy should be considered, comprising the prioritization of health problems as a principle. The case of Chile is a reference for these reforms. Chile is one of the few countries that have articulated and applied explicit cost-effectiveness criteria and evidence-based mechanisms. It is also an international pioneer in the prioritization of affordable benefits to the population with permanent -endemic- diseases through legally enforceable guarantees (Giedion; Bitrán; Tristao, 2014)¹. For each health problem covered, several services and technologies known as “benefit baskets” are provided. Both health problems and baskets are prioritized in an evidence-based approach to medicine, jointly with local studies that produce indicators related to the cost-effectiveness of interventions and the patients’ preference (Ministerio de Salud de Chile, 2004).

In this regard, evidence commonly refers to the product of research in the quantitative tradition. However, the evidence is distributed according to different levels of hierarchy, in decreasing order: randomized controlled trials, systematic reviews and meta-analyses, quasi-experimental and multivariate studies, followed by case studies and others with “methodological limitations” to, finally, consider the opinion and clinical experience of experts (Rycroft-Malone et al., 2004). The questions that organize the search for evidence are commonly guided by the P-I-C-O format, facilitating the definition of the Patient, Population or Problem focus of the search, the Intervention considered, the Comparison or alternative contemplated and the Outcome (Chile, 2015).

1 Uruguay, Peru and Colombia have started to emulate Chile’s regime by establishing similar guarantees (Giedion; Bitrán; Tristao, 2014).

These results are commonly found in research published, accessible through meta-search engines, and disclosed as statistical indicators and general statements organized in tables.

The GES Regime implies a redefinition in the concept of health. By putting into practice real technologies such as evidence-based medicine, it makes up a complex scenario of valued biological functions, articulated by a hybrid public-private health system. Likewise, it transforms the temporality of diseases that meet criteria of cost-effectiveness and efficiency of interventions, designing differentiated trajectories for bodies that meet those criteria. The practices of truth, particularly those oriented by this approach, are crucial for the composition and organization of this regime.

Methodological trajectory

To account for the epistemic work involved in the biopolitical design routines associated with the described regime, we have resorted to the analysis of material produced in a case study based on focused ethnographies (Knoblauch, 2005) inside ministerial departments and healthcare centers in Chile, from late 2014 to 2017. This type of ethnography has been proposed as an alternative to the traditional ethnographic approach -which entails prolonged periods of immersion, observation and participation in specific cultural settings-, recognizing the complexities of access to highly specialized and institutionalized spaces, such as hospitals or state apparatuses (Knoblauch, 2005). Thus, focused ethnography is characterized by short-term field visits, production of information on a specific matter of interest, development of background knowledge of the process being investigated based on external sources, considering intensive methods of data collection and recording, heavily relying on interviews and the collection of documentation for further analysis. Similarly, while traditional ethnography focuses on groups and social events, focused ethnography is more concerned with actions, interactions and the social status (Knoblauch, 2005).

We have conducted at least one monthly visit to many ministerial spaces or activities, such as

expert committees, clinical practice guidelines update sessions, results dissemination, among others. In addition, we conducted in-depth interviews (Dicicco-Bloom; Crabtree, 2006) with experts in policy design (n=9), as well as with 31 health professionals who have participated in expert committees organized by ministerial bodies. Interviews were developed grounded in the initial question about the activities usually carried out in their areas of work. Respondents were asked about the technical aspects of their work and the resources or knowledge used to carry it out. Similarly, and mainly to develop knowledge about the technical aspects of the information provided, we considered the review of clinical practice guidelines (n=80, available at the time of the research), laws and ministerial working material.

In order to account for the ways in which evidence and data are acted upon in the case reviewed, we paid special attention to the ethnographic notes of experts' routines in their fields of work, jointly with the records generated in the attendance to expert advisory committees for the updating of clinical practice guidelines. Thus, although we considered the large amount of material produced to support the relevance of evidence, and the rationality of evidence-based medicine in justifying and arguing positions in decision-making committees, and establishing the legitimacy of clinical recommendations or guidelines in health care centers, in this paper we mainly present expert accounts of policy design and situations in which both experts and professionals routinely establish a relationship with data to carry out processes of prioritization of biological procedures or health recommendations.

In this material, we have used abductive analysis (Tavory; Timmermans, 2014), which consists of the identification of elements in the description of processes that are novel, associated with the search for theoretical references that allow us to consider the observed elements. In this way, the descriptions are retaken, proposing new hypotheses that contribute to their understanding. Abduction does not seek to prove or disprove the ideas or assumptions raised, but to generate them in a rigorous manner, introducing a new notion or idea in an interpretative framework (Bar, 2001; Tavory;

Timmermans, 2014). Specifically, based on the ethnographic and narrative material produced, our strategy of analysis consisted of reviewing situations and accounts in which experts and professionals describe or analyze their relationship with technical elements, such as indexes, statistics or scientific evidence, in public health decision-making processes.

The local action of evidence

Routine work in biopolitical design scenarios recurrently refers to the justification of certainty regarding general statements about the population. In the *Régimen de Garantías Explícitas en Salud*, this certainty must be established in relation to which health problems will be associated with medical services baskets that, in turn, are made up of technologies that shall be valued and prioritized in terms, for example, of their cost-effectiveness coefficient. In day-to-day terms, this is linked to the organization of codes and tables, synthesis and grouping of evidence, as well as advising other departments in evidence prioritization processes. To this end, resources are employed to enable the display of value and order in relation to the information available. The production of trust takes place in a concrete scenario that articulates epistemic entities, social processes and contingencies. The same epistemic entities work as such in instances of the presence of uncertainty about the timeliness of the data, their equivalence or even the partiality of the population complexity they seek to understand and address. Certainty is not exempt from contingencies, incompleteness and, in turn, trust. Next, we disclose the experts' reports, and situations that expose routines related to the production of certainty or decisions related to population health. In this regard, regarding the composition of services baskets, one expert points out:

In order to economically value each basket, you have to make clear the medication, but also the dosage, and frequency of administration. That was the

complicated work. I received the information from each department of the Ministry and [faint laugh] all that was done in Excel. So, I received baskets that did not always follow a common format, because each person is a different world [laugh], different structures, etc. And since this is done in Excel, that is already a huge problem. Sometimes I had medications such as aspirin written in different ways, or I could have paracetamol and acetaminophen² in another, and I had to try to make it look the same, which, as I am the one who coordinates, was not always possible. Something different was tried, but... today it is like that. Ah! Also, each basket itself is an Excel, i.e., the possibility of an error there is gigantic, it is gigantic. Because it is not a software, medicines do not have a code. (Fernanda, April 9, 2015)

The expert interviewed reports on the effort involved in coordinating and making different registries equivalent, drawn up according to the criteria that each unit considers appropriate for assessing and organizing what it considers to be a priority and/or appropriate for the treatment of the health problems that have been prioritized. Such equivalence is not always achieved. It is not possible to address the eventual difference between ways of codifying and organizing the totality of processes that make up health policy, which, however, needs to be disregarded in processes in which decision-making must be effective.

In expert scenarios of health policy decision-making, information has a procedural and contingent character. It is produced by concrete activities of search in databases, organizing and updating in the event of finding new antecedents. Likewise, as we have seen, this is carried out on the basis of the availability of technical resources which, articulated with social operations that are also local, allow making some order visible. This is evident in the hierarchization of diseases and services, as well as in the preparation of clinical practice guidelines that allow circulate such orders throughout the healthcare networks.

2 It is another name for paracetamol.

These documents are fundamental for the implementation of the regimen. The following excerpt narrates the beginning of an expert session on the prioritization of recommendations to be updated by health professionals:

The meeting gathered 13 individuals: 11 mental health experts, the expert coordinator from the Ministry of Health, and a methodological advisor from the same ministry. On the table there are three file cabinets containing papers organized by colored dividers. These are scientific articles. When we enter, the expert in charge of the meeting summarizes the process carried out in the previous meeting. For that, she hands out a series of sheets of paper showing a table with the scores assigned by the attendees and other experts consulted on the value of questions to guide psychotherapy in people diagnosed with depression, according to the P-I-C-O format. Although they were sent to 116 individuals, only 12 responded. According to their evaluations, only three questions guided the search for evidence. These questions are related to the recommendation on the frequency of psychotherapy (weekly or irregular), number of sessions (more or less than 12 sessions), and type of psychotherapy (cognitive behavioral or interpersonal). What is of interest is to define which recommendations are most effective for symptom remission and decreased patient dropout. (Field note, October 25, 2016)

The document that brings together the meeting is “*Guías Clínicas AUGÉ para el tratamiento de la Depresión en personas mayores de 15 años:: Actualización en Psicoterapia*”. As part of the process, resources such as scientific articles available in databases or accessible through search engines are used, as well as results of opinion polls that have been answered by some of the guest experts. In both cases, resources are composed based on privileged paths that make certain dispositions visible (specific results on certain effectiveness of interventions, and the opinion of experts who have agreed to answer the questions posed) and make others inaccessible to the analysis status.

The session continues. For the organization of resources, the adoption of predefined guidelines for evidence-based medicine is reported. In this case, the SIGN (Scottish Intercollegiate Guidelines Network) guidelines that evaluate evidence and the development of clinical practice guidelines were followed. Likewise, the results of the survey cited are presented as a table disclosing the average score on the relevance of each question, which should be addressed in the guideline for respondents. The field note refers to the second meeting held by the experts. According to them, guidance for the best scored questions, on average, according to the responses in the survey, are the expected result.

Both processes - the provision of evidence and the development of surveys to define a course of action - follow a rationale according to which, in order to make decisions, it is necessary to have indicators and evidence that mediate the production of objectivity. To this end, objectivity emerges from the articulation between the results of information searches in databases and survey responses, international regulations (the SIGN agenda), and the experts who interpret their relationships. This interweaving makes possible the production of the necessary confidence to draft recommendations to the questions that organize the meeting in which the survey is addressed. However, one may consider that the available information only integrates part of the resources on a given biological or pathological process. The local character of data production and systematization implies the updating of selectivity criteria, which are associated with technical economy, enabling access to certain resources and not to others, as can be seen below:

The coordinator points out that the PubMed-Medline, Epistemonikos and Google Scholar meta-search engines were consulted. One of the experts asks why more specific databases for the type of question, such as PsycINFO, were not used. He went to the trouble of looking for information there, and found many more articles that could have been analyzed. The coordinator points out that the Ministry of Health has restricted access to certain

databases. This is a “structural limitation”. The expert indicates that not everything appears in Google Scholar, and not everything there is up-to-date. This generates a discussion on whether or not to integrate new articles in other databases into the Clinical Practice Guidelines. The coordinator explains that the criterion to be considered is to integrate only systematic reviews: “aggregate information is better than individual information”. Therefore, articles from PsycINFO would not be integrated. (Field note, October 25, 2016)

In practical terms, evidence corresponds to those publications available on the Internet that can be registered by searching reference databases that organize and display indexed published articles. As disclosed in the excerpt, even considering the application of the SIGN criteria, not all the evidence available at a particular time is considered for evaluation. In this case, the Ministry of Health only has access to a small portion of the information available at any given time. Thus, the consideration or not of indexed scientific articles depends on the search practice, and on the technical conditions of access. The registration of some articles over others not only obeys the criteria of evidence-based medicine, but also the material conditions of the scenarios in which this rationality is applied. The epistemic operation is an event that is defined in the interaction of current activities in a specific situation. The key question here lies in the fact that the incorporation or not of articles for the analysis of options before questions about health entails practical implications that derive in how population’s health is oriented. In this sense, the production of certainty complies with the local consideration of segments or portions of data on which one may establish a given analysis. Thus, certainty itself is the product of the configuration of scenarios in which incompleteness and the absence of referents are present, thus limiting the field of vision on the population.

Although the foregoing may be understood based on the scenario analyzed, it is also linked to what Blanco (2009) calls the intrinsic impossibility of processes such as statistics to follow population

dynamics. In this sense, any intention of timeliness is conditioned to the local and temporal elaboration of a series of data that lose their link to the processes they intend to represent in the very process of their elaboration. Thus, certainty and uncertainty do not obey separate entities, but a continuum.

The same is true of the methods used to develop indicators. For example, with respect to the procedures used to prioritize medical technologies according to their cost-effectiveness, one can find how experts recognize in them the progressive adaptation to population conditions:

Yes, it is complex, but then comes the whole mathematical modeling exercise that we do, and there is enough of that, as we have made progress over the last 20 years in agreeing on methods. All those methodological uncertainties are already worked out. There are quite a few methods that have been agreed upon by international criteria. (Íñigo, August 17, 2015)

Mathematical models are considered as incomplete, negotiable and modifiable objects. However, both these and the objects they produce - for example, statistical indexes - manage to become stable through the mediation of conventions and regulations that specify which dimensions of the population will be considered in the processes of biopolitical definition. In this way, events that are part of collective biological dynamics are configured as parameters or vectors that can be approached and intervened. In other words, the models simplify the grammar of population relations.

Both the variables that make up the methods, and the objects they produce (indexes) are articulated in processes of argumentation and rhetorical games that define measures of population health. In this process, health itself is translated in terms of these objects as follows:

Benefit is health, that’s it. Now, we have to agree on how we measure it. In cost-effectiveness analysis we usually measure it as Quality Adjusted Life Years: QALY. Others, such as the WHO, have suggested using DALY, Disability Adjusted Life

Years. Another possibility is to use years of life...
(Íñigo, August 17, 2015).

The technical definition of vital processes translates life as the value expressed by an index. This allows vital processes on their general scale to be objectifiable and manipulable and, in turn, assumptions about the connection between the concrete datum and its referent - a population biological process - to be fully operative in the scenario in which it is used. Once these are put into circulation, they participate as local entities that define transitory truths about the population and, thus, about how to prioritize diseases to be cared. In this sense, it is no longer necessary to know the methods that generate the object, but the object itself is considered as a carrier of knowledge about a biopolitical process. In practice, the object and the biopolitical process are part of the same continuum. In such a way, biopolitics is possible insofar as the processes of life evaluation are objectified - turned into objects - through processes of operationalization:

[...] operationalization is the great [doubt]. How do you make sure that the patient who was complaining there in the Senate with Crohn's disease, whose monthly treatment is worth one hundred and twenty thousand pesos a month, which for him can be catastrophic? (Íñigo, August 17, 2015)

Considering past or present information, these objects are inserted and articulated with practices oriented towards the future of population health processes. In this process, the objects resulting from operationalization, indexes or statistics, turn out to be the elementary component for the production of biopolitics, that is, for the creation of statements about the population and its biology, connecting the local with an alleged globality. Its existence and availability "at hand" is necessary for the development of any measure of this kind, even when its validity may be questionable. Even when they may be not up to date, data provided by the studies are the only references regarding the state of the population, and its likely future. As shown below:

[In the process of choosing eleven new diseases to incorporate into the regimen] I talked to the experts and they told me to take something that had already been done when thinking about the sixty-nine diseases to incorporate into the regimen, since some did not make it into the first cut. The selection of those diseases was supposed to be based on a disease burden study that I believe is from 2004 [7 years ago]. (Florencia, April 9, 2015)

As biopolitical design relates to the past, present and future of population's biology, and as these are planned based on the existence of data worked on and put into operation locally, this has a speculative character. This speculation consists of generating a projection based on the information we have about the known to the unknown, thus opening the way to the emergence of reflections and conjectures about different perspectives to think about possible futures (Muller, 2013). If we are to make an analogy, biopolitical design operates as a craft. As the coordinator of the expert meeting presented at a subsequent ethnographic meeting points out:

The group suggests you a list of, say, eighty health actions or technologies, ranging from a drug to a test. So, you go and you take that to the office and you start looking for, "Is there evidence for all these things," because they can tell you there is, but there really isn't. And you're going to check how much weight each intervention they're recommending might have (...) But even at that point, we were working in a very crafty way researching what the landscape looked like around the world, and whether or not there was evidence for each item on the list. (Nicole, July 25, 2016)

Speculative objects

The successful description of something like population and its biological dynamics is a problematic practice. As has been exposed, numerical devices have the ability to reveal and hide aspects of their referents. In the processes described, it is possible to appreciate that, even

with the presence of data, these are produced in a space-temporality “intrinsically determined by the impossibility of being able to follow the flow and circulation” (Blanco, 2009, p. 40) of population dynamics. It means that, instead of constituting a representation of the current state of biological processes under their watchful eyes, they can only provide a partial image of a moment that is always in the past. The consideration that data always refer to a simplified and, so to speak, schematic aspect of that knowledge to be produced, and that the image they propose is always outdated, shows that the information from which it is intended to delimit, anticipate and plan interference in the future and in the population is always incomplete. In other words, there is always something outside the scope of this information, there is always something missing, and a margin of error (Blanco, 2009), so that uncertainty remains unavoidable (Rabinow; Samimian-Darash, 2015).

In this sense, biopolitics does not account for neither the current state of the processes it shapes, nor of a concrete future state of the same. Rather, it is constituted as a basis for the estimation “of all other possible social times” (Blanco, 2009, p. 38). In other words, although it allows access to always incomplete information on the population’s processes, these data open the way to the elaboration of interpretations on their meaning, and their relationship with the elements not covered by them. They thus become a source of inferences and speculations that seek to account for the mechanisms that allow fill with meaning the social processes outlined in data, and thus to think and plan lines of action linked to the intervention in these processes in the future. The objects involved in this process are very important components to justify biopolitical decision-making. In public health, much of the work consists of producing certainties or truths about the life of the population based on these. Their existence opens dialogues and negotiations about the qualities that make up this biological politics.

In this regard, Muller (2013) and Domecq (1996) have put forward the notion of *speculative object* to refer to the existence of elements that

allow opening conjectures, regardless of the existence of exact information or the totality of the “facts” that make up a situation. They refer to a present or future intervention or to a future temporality, considering that the future itself is uncertain (Savransky et al., 2017). For the authors, speculating implies a relationship with the unknown, at the same time a proposal that organizes an existence.

We recover the notion of speculative object and introduce it into the biopolitical analysis to highlight the local, epistemic character located in the production of this political mode. Considering their specificity in policy design scenarios, we may synthesize their characteristics in three processes. The first process refers to the fact that these objects operate in spaces that *connect certainty with uncertainty*: they enable the generation of conclusions, and are used to fix future yields, while addressing, referring and extending decisions to unexplored areas. Speculative objects serve as entities to organize local reflections and arguments in situations where confidence is required, allowing the articulation of narratives about present and future global scenarios. In the second, they *reduce the complexity* of singularities into a matter locally manageable by technicians and experts. As a result, they generate the impression of access to a whole, a Big Picture or, in Latour’s (2008) terms, a panorama: they allow local conjectures about entire population processes, as if they were inscribed in them. Finally, in the third, the objects described allow the *connection of the local with the global*. Their main quality refers to the reduction or simplification of highly complex and fluid processes or dynamics in the form of tables, indexes or statistics, establishing the impression that they constitute describable, malleable and intervenable processes. In this way, speculative objects are part of the production of biopolitics, translating flows and unmanageable dynamics into operators, transforming uncertainty into an approachable and negotiable field, and, above all, making the population and its biological processes enunciable.

Final considerations

“The great image has no form”³

The relationship with uncertainty in spaces of political design has been relatively left apart from social research. Only in the last five years have we appreciated a renewed interest in the meaning of speculation, and how it is part of our daily routines and, particularly, in areas where accuracy is demanded (Rabinow; Samimian-Darash, 2015; Savransky et al., 2017). Accordingly, addressing epistemic practices and specialized activities not only involves accounting for how they elaborate and constitute facts and realities, but also how these realities are at the same time configured as uncertain; while being captured, they are transformed.

In this regard, in this paper we have sought to account for the intrinsic uncertainty that is part of the definition of activities on processes defined as population-based. This is because population is a product of local elaborations in which quite specific entities participate, making possible its management in epistemic, temporal and spatial terms. In the first place, they make it possible to initiate negotiation processes between uncertainty and certainty, serving as referents to set coordinates for collective action. Secondly, they articulate the past, present and future of the population, making possible projections about a current state and an imagined future. Thirdly, they influence and initiate the process of connection between the local and the global, in turn enabling the creation of the grounding aspects of population.

If biopolitics acquires a general dimension, it is composed of very concrete epistemic practices. In biopolitics, life is mediated, i.e., it is contrasted and related to estimates and calculations that define its status and value. Totality is practiced in the figure of an indicator. The biopolitical management involved in public health formulates a relationship with the population, which turns it into a manipulable object. Thus, the very notion of population is inseparable

from situated and, therefore, partial political and epistemic assumptions.

Our purpose has not been to formulate a critique of the scientificity of the epistemic practices developed, nor to establish that these objects are not necessary in their performance. On the contrary, we have intended precisely to account for the fact that scientificity is intrinsically articulated to uncertainty, being the field in which it inhabits and through which it emerges as a figure. With this, the ultimate goal is to promote reflexivity on the modes of operation of the tools that are currently available to formulate links between political design, biomedicine and science, describing activities, approaching implications and recognizing their limits.

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3 The quote corresponds to the title of the homonym book by François Jullien (2008).

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Authors' Contribution

Castillo-Sepúlveda conducted the focused ethnographies, interviews and documentary review, analysis of qualitative information, composition and theoretical synthesis, and preparation of the manuscript. Bywaters-Collado conducted the qualitative data analysis, theoretical and bibliographic update and synthesis, and preparation of theoretical sections of the manuscript. Gálvez-Ramírez performed the analyses of qualitative information, theoretical and bibliographic update and synthesis, revision and editing of general structure of manuscript.

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