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Biopolitics and speculative objects in Chilean health projects

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Abstract

'Biopolitics' is a much-used concept in recent academic literature. One of its main fields of application is in the analysis of public health projects. This article analyses the national Explicit Health Guarantees project in Chile from that perspective. However, we criticize the standard invocation of 'biopolitics' by observing that such public health projects require technoscientific operations that establish truths and regimes of obligation for the groups involved -understanding regime both as a set of imposed orders and a set of regulated processes. Specifically, the Explicit Health Guarantees project defines what we call 'speculative objects'. These have two characteristics: (a) They relate highly diverse entities into integrated wholes that are and involve objects of knowledge and uncertainty, and (b) this integration creates regimes of obligation considered as scientific truths on many different groups. We conclude by proposing new questions about the notion of biopolitics and its relationship with uncertainty and speculation.

Keywords

biopolitics, public health, speculative objects, uncertainty

We begin with an excerpt from an interview with a health policy expert in Chile:

> Let us assume that you have a fixed budget that is given to you by a National Health Fund and your goal is to achieve maximum health with that … and with that, you produce 'X' quantity of health. We do not know how much it is, but it is a quantity of health. So tomorrow you have the

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> next challenge: They give you more money, … and you say, 'Well, what do I spend it on?'… This additional dollar that they gave me, do I give it to new technology or leave it here in the health system to continue doing what I know how to do today? … So, you compare. The cost-effectiveness analysis projects the benefits you would obtain if you pay for the new technology …. (Liam, health economist)

The quote has several interesting aspects. First, it illustrates the need for specific cost-effectiveness calculations to define the scope of investment. Second, it shows variability and contingency in the use of such calculations and articulation with other entities, such as specialists' opinions and available evidence. Third, it refers to practices and connections to promote conditions for certainty about the population's biological processes and how to intervene. In a more general sense, we could say that it shows how propositions regarding the population's health are defined and formulated. So, it is referring to a phenomenon that we could call 'biopolitics' if we accept that biopolitics, following Foucault (2004), refers to political calculation and intervention over biological regularities of population, and, following Matthewman (2013) and (Barry, 2013), that it emerges inevitably from situated processes of negotiations linked to population issues. Biopolitics is focused on the management of groups and operates based on contextualized and located practices.

In recent decades, Chile has established several public health projects aimed at improving the living conditions of a variety of groups. The sociological literature on these projects is large (e.g. Bascolo et al., 2018; Bastías & Valdivia, 2007) and tends to focus on their historical origins, the types of governments that promote them and the socio-political and cultural conditions that have enabled them to succeed or fail (Ferrer, 2004; Olavarría, 2011, 2012).

The Chilean public health projects clearly operate as biopolitical projects that seek to act on groups by generating truths and certainties that justify actions on them. The production of these truths is an exercise that deploys a complex technoscientific articulation that involves many different stakeholders and practices. This illustrates two phenomena that have not thus far been well-analysed in the literature on biopolitics, nor in the literature on Science and Technology Studies (STS). The first is that any current biopolitical exercise is rooted in technoscientific operations: the creation and use of objects that make it possible to establish relationships among heterogenous entities to generate effects of certainty and epistemic order. The analyses that turn to the Foucauldian concept of biopolitics tend to emphasize the social, historical, and political conditions of that exercise, and do not pay much attention to crucial technoscientific operations. The second phenomenon is the deployment of these operations in a scenario that is at the same time technical, problematic and uncertain (Ewald & Utz, 2002; Rabinow & Samimian-Darash, 2015).

As illustrated by a variety of studies in STS, coordination between the above elements (that is, technical and calculable objects with problematic and uncertain ones) is achieved through technoscientific objects (Latour, 2005a). In our example, they enable projections of a population's health, beginning with available information on what is known, what is unknown, and what is not possible to know (Muller, 2013). Thus, biopolitics not only entails a relationship with the production of knowledge about biologic rhythms of the

population, but also an exercise of projecting such regularities based on technical entities (Foucault, 2003). However, these entities cannot be construed to be stable agents operating in the same way in any context. As indicated by Law and Mol (2008), they are unstable and their primary characteristic is that they are enacted in the scenarios in which they are operating.

We approach a Chilean public health project as a biopolitical exercise. However, we argue that this exercise requires a technoscientific operation that establishes truths and regimes of obligation for the groups involved. This operation is possible because the projects define what we call *speculative objects*. These have two characteristics: (a) they gather highly diverse entities into larger wholes, and (b) this integration creates regimes of obligation that operate as truths on broad collections of groups.

To illustrate all of this, we describe different public health projects in Chile and how they have been configured into the Régimen de *Garantías Explícitas en Salud* (Explicit Health Guarantees regime; GES regime, for its acronym in Spanish) in Chile – also known in Spanish as AUGE (Universal Access to Explicit Guarantees). We show the emergence of entities that enable the articulation of biopolitics as a local and epistemic activity. Finally, we conclude by arguing that the use of the notion of biopolitics in any analysis should be complemented with the description of the technoscientific elements that enable biopolitical action to have broad effects.

Biopolitics and STS

The approach to biopolitics in the work of Foucault (2003, 2004) relocates politics around new knowledge practices on regularities of life measured and aggregated on the level of populations (Foucault, 2003). Conventionally, populations are understood as collective realities that are autonomous and independent of the practices to describe and characterize it. However, as Foucault (2003) has shown, it is only possible to achieve a population as a real entity or as an object of intervention through devices – such as statistics and epidemiology – that establish its form, regularities and variations. Thus, the notion of population itself has been colonized by concrete practices of statistical measurements and estimates (Foucault, 2003; Legg, 2005). Policymakers know and represent populations through numbers and figures, putting into practice statistics as a critical tool in such activities as the evaluation of government performance (Maldonado Castañeda, 2018; Miller, 2005). Governance based on quantification and evidence relies on a segmentation of social processes, reshaping the relationship between government and citizens (Castillo-Sepúlveda, 2017, 2019), and building on a kind of formal objectivity (e.g. Porter, 1995).

However, most studies using the notion of biopolitics tend to overlook that it depends on something more than the mere idea of a group. Foucauldian studies tend to emphasize broadly visible political and sociocultural effects. This emphasis misses the local and performative nature of any biopolitical exercise. That may be why there are relatively few studies from within the perspective of STS that have turned to the notion of biopolitics as an analytical or explanatory resource.

Some interesting exceptions are the works of Greenhalgh (2009), Meloni (2018) and Pollock (2015). All of these works recognize the endemic disagreement between STS

and the notion of biopolitics, and yet appreciate the analytical interest of full agreement between the two perspectives. Other analyses of biopolitics conducted with STS sensibilities have pursued the approach suggested in this article, viewing it as an exercise based on technoscientific operations. Examples include Desrosières's (2010) sociological analysis of quantification and statistical rationalities of government focused on the practical uses of numbers, Espeland and Stevens's (2008) study of the signification of numbers on networks of practices, Hacking's (1990) examination of the shaping of policy in terms of probability and evidence, and Porter's (1995) study of the construction of expert authority in terms of the production of 'technologies of trust' through the use of numbers and quantitative models to reduce friction in controversies linked to public governance. In the same vein, Jasanoff (2012) argues that governments must organize their discursive technologies to legitimize themselves, making use of different kinds of elements to regulate uncertainty, for example, through rubrics of risk assessment, cost-benefit analysis, and evidence-based policy.

Work in STS has shown how general entities such as populations, and certainties and uncertainties about them, are locally enacted as a composition of concrete entities. As Jasanoff (1999) explains, there is no universal political reason, but only situated political reason. Certainty and uncertainty emerge in relationships between people, objects, and ideas, becoming stable through connections with the same entities. Their extension to all locations may be conceived as an unstable process that always depends on situated practices (Ureta, 2014). Along these lines, Timmermans and Berg (1997) use the term 'local universality' to emphasize 'that universality always rests on real-time work, and emerges from localized processes of negotiations and pre-existing institutional, infrastructural, and material relations' (p. 275). Universality never implies 'a rupture with the "local", but transforming and emerging in and through it' (p. 275). Alternatively, Latour (2005b) uses the term 'panorama' to describe the locally produced image of a totality. As a panorama, the known processes of populations are elaborated as objective through enabling entities that allow relative stabilization of practices and judgments, such as protocols, guidelines, indicators, and calculations (Cambrosio et al., 2006; Davis et al., 2012).

Biopolitics, then, as government exercises conducted on groups, depends on the creation of objects within technoscientific frameworks. These have received diverse considerations in STS. For example, Knorr Cetina (2001) calls them *epistemic objects.* They differ from our everyday notion of objects, which is marked by a sense of solidity and wholeness. Epistemic objects, in contrast, are characterized by a lack of completeness of being (Knorr Cetina, 2001). These objects are in constant change and definition; they are always *in process* without ever getting to be fully themselves. From an Actor-Network Theory (ANT) perspective, objects are an effect of stable arrays or networks of relations: Objects hold together as those relations also hold together. Etymologically, Latour (2005a) points out that the term *thing* comes from the German word *Ding*, which designates an archaic assembly. In that sense, a thing is an entity sustained by and participant in relations. They can be 'in the middle' or 'in between', acquiring agency from their position to affect how processes are undertaken. Objects can act as *mediators*, transforming the course of action of other agents. In this sense, important scientific dimensions, such as evidence, are not a representation or proof of an external objective process that transcends space and time (Robinson & Norris, 2006). Rather, as Rosengarten and

Savransky (2019) describe, evidence is emergent through relational processes, and it could hardly be that it emerges elsewhere. Our work follows Knorr Cetina's and Latour's approaches to the conceptualization of the notion of object and thing, and therefore considers them to be both the result and the cause of collective practices. In other words, they operate as mediators in our everyday relations.

Prioritizing health populations: The Chilean case

In the past 15 years, Chile has continuously designed public health policies aimed at improving the situation of certain groups. Since the early 1980s, there had been two completely separate ways of accessing healthcare: one public, organized by an entity known as FONASA (*Fondo Nacional de Salud* or National Health Fund), and one private, managed by a number of Social Health Institutions (or ISAPRE) (Vergara-Iturriaga & Martínez-Gutiérrez, 2006). However, in the mid-2000s, there was a realignment of the two services, as a series of intentional, sustained, and systematic processes entangled with regional structural adjustments in Latin America guided by the World Bank. In the mid-1990s, the World Bank promoted conservative economic management in developing countries, in the process reducing state investment in health. Based on that, several Latin American countries restructured their health services through the introduction of market incentives and mechanisms for competition among service providers (Bascolo et al., 2018). Such institutional adjustments also involved the political reorganization of assumptions of how public health policy should be addressed and what health problems must be prioritized.

The Régimen de *Garantías Explícitas en Salud* is the result of this process in Chile. This project provides a new regulatory framework that defines a number of prioritized, endemic 'health problems' (Giedion et al., 2014), for which the state (either through its public services or through private care providers) must guarantee services, technologies, financing, and waiting times (Ferrer, 2004; Ministry of Health of Chile, 2004). It creates a hybrid care scheme between public and private health care providers, focusing on the provision of care for specific biological processes. To do that, it promotes four guarantees that can be claimed by any individual. These are the guarantee of: (a) *access* (which ensures a list of interventions or differentiated medical technologies for each prioritized disease), (b) *quality* (the provision of financing to public and private entities accredited in a national registry of health providers), (c) *financial protection* (which ensures financing for each guaranteed medical benefit), and (d) *opportunity* (which establishes maximum times for each medical service, according to parameters organized by evidence and the availability of health network services). At present, 85 diseases are covered and, for each one, there is a collection of diagnostic, clinical and therapeutic services and technologies that are known as 'baskets of benefits'. Both diseases and baskets are prioritized by an Evidence-Based Medicine (EBM) approach, along with local studies that produce indicators of patient preferences and the interventions' cost-effectiveness (Ferrer, 2004; Ministry of Health of Chile, 2004). EBM is also used for the development of clinical practice guidelines for each of the diseases covered by the regime.

The case of GES is a benchmark for Latin American health reforms, being emulated in Uruguay, Peru and Colombia (Giedion et al., 2014). It is one of the policies that have

articulated and applied evidence and explicit cost-effectiveness criteria to define or adjust contents of health services, and that have pioneered prioritizing services that the public can access through legally enforceable guarantees (Giedion et al., 2014). The regimen has required redefining the concept of group health, both understanding and performing it as sets of processes that occupy different positions on assessment scales based on truth technologies such as EBM and cost-effectiveness analysis. The prioritization is updated in entanglements that differentiate the health problems that are part of the regimen from those that are not. Prioritized health problems configure a regimen that articulates human and technological resources that 'guarantee' maximum length of time in care and biomedical elements available, financed by a new hybrid economic framework, supported by public and private funds, and emphasizing the resolution of a diagnosis over the care network with which the person is associated. Meanwhile, non-prioritized diagnoses are enrolled in a temporary non-GES waiting regimen, for which there are no associated funds or control technologies.

Methodology

Our research has analysed, over the course of five years, the health projects related to the GES regime. This process has used different methodologies, such as ethnography, individual in-depth interviews, and focus groups and case studies. The results presented in here are derived from one of these case studies. In it, we analysed the deployment of practices related to the production, handling, and evaluation of evidence in creating and updating the GES. To do this, we used material from focused ethnographies in departments of the Chilean Ministry of Health between late 2014 and late 2017. These include participatory observations of the routine practices of experts in their working contexts and attendance of meetings of advisory committees for updating clinical practice guidelines. We also interviewed nine health policy experts and analysed technical documents (including 80 clinical practice guidelines, laws, and ministerial work material). We also drew on interviews with 31 health professionals who have participated in expert committees convened by the Ministry. In examining the material, we used abductive analysis (Tavory & Timmermans, 2014), which consists of making inferences based on observations or stories that are then signified in a theoretical scenario. The names of the experts appearing in some of the fragments are aliases established between the interviewee and the interviewer to avoid making their identities public.

Biopolitics and speculative objects in the EHG regimen

From the initial stages of our research, it was clear that the GES regime in Chile was much more than a mere public policy project related to health. Both the content and the structuring of articles make it a biopolitical device. Clearly aimed at managing groups and putting into practice truth technologies, it has composed a complex scenario of valued biological functions articulated into a public-private hybrid health system. This has changed, for example, the temporality of diseases for prioritized processes, constituting differentiated trajectories that meet cost-effectiveness criteria. It has also composed a new epistemic scale for the body, enacting differentiated units as tissues, organs, or

biological functions that are guaranteed. The GES regime constitutes groups by creating indicators, data, markers, or banks of data.

However, the action of this device was not possible without intervention through the practices we present below. The first shows how evidence and certainty in the GES is a precarious achievement, derived from the relationship between varied local entities. The second explains how a certain type of object, which we call *speculative*, articulates heterogeneity. The third, based on very specific empirical practices, describes the characteristics of the *speculative objects* involved. Finally, we argue that the articulation of such objects generates a global or total effect with a very specific direction: generating an obligation of truth that is the key characteristic of the biopolitical operation that is the GES regime.

Evidence is an entanglement of local entities

As for any other medical project (Seely, 2013), the production of certainty is GES's first challenge. To meet this challenge, a complex legal arrangement formulates the production of evidence as foundational process in its disease assessment and prioritization processes. As stated in the law that establishes GES regime:

> The elaboration of the Explicit Guarantees in Health proposal will consider the development of studies with the objective of determining a list of priorities in health and interventions that consider the health situation of the population, the effectiveness of the interventions, their contribution to the extension or quality of life and, when possible, their cost-effectiveness. (Ministry of Health of Chile, 2004, Art. 13)

The draft bills connect various epistemic entities, previously not linked in health policy. Indexes such as the burden of disease, economic effectiveness, or potential demand are included in expert practices to establish an epistemic sensitivity in the prioritization process. This prioritization is stabilized through Evidence-Based Medicine:

> They also need to be shown to have effective interventions, all of which is demonstrated through evidence-based medicine: that interventions are cost-effective, that they are a priority for patients and that they can be implemented in the network. (Florence, health policy expert)

EBM is considered a canon from which to evaluate the relationship between a disease and the series of existing medical treatments and technologies. So, only diseases with treatments that include interventions that demonstrate, through EBM, that they are cost-effective will be prioritized. However, in practical terms, this normative orientation is relative to situations and sensitivities of another nature, not exclusively scientific:

> There was a recommended cancer drug, which was very expensive. It started to be sold three or four years ago. And there was a movement, even with a woman who appeared quite a bit in the press who came to ask for access to this drug that delays the development of the disease. The drug was incredibly expensive, but there was no study. I mean, there was indeed a pause in the disease, but there was still no hard study. So, since the government has limited resources, if we still don't know what the effect of this treatment is, or if it is palliative or generates survival, but

> not that much, it should be defined by the technical part, by the EBM. (Pamela, health policy expert)

Here, communicative and political actions affect the rationality of EBM. Moreover, given the high cost of the drug, the evidence is valued differently, putting into practice the different intensities that the types of study (hard studies vs. other studies) acquire. Whether a study is legitimate, (i.e., constitutes evidence about the effectiveness of biomedical treatment) is necessarily linked to the consideration of the treatment's cost or to the economic investment required to treat a given population index. If we recall the interview excerpt that opens this article, we can see how effectiveness and cost are part of a process of argumentation in which one cannot be presented without the other. In this sense, the economic can always be considered as part of the effective, and vice versa.

EBM establishes a framework through which to evaluate concrete actions in relation to diseases. However, while each index, datum, or piece of evidence carries a value relative to such relationships, prioritization practices involve a process of formulating different layers of evidence for each case analysed. The criteria for the prioritization of EBM are not put into practice as sequential operations, but as an entanglement of criteria of different kinds that can affect each other. For example, the following extract shows how criteria of different kinds operate symmetrically with evidence:

> Now, the issue of prioritization does not only necessarily respond to a criterion of efficiency of resource allocation, but could also respond to other social values. So, you could say: 'Look, for example, I am willing to finance a technology that is expensive, that offers few health benefits, but I am willing because it affects two patients in Chile and they are children and they have an ultra-rare disease'. Then you assess it in a special way, and then you do not apply the same rule to it. (Liam, health economist)

Both the social value of a disease – that is, its ethical appreciation, understood as value attribution – and its political aspects, including the influence exercised by patient organizations, can affect the cost-efficiency rationality that EBM permeates. Evidence, ethics and politics are enacted as criteria. In epistemic terms, the complex composition of EBM becomes entangled with other knowledge. In this sense, a heterogeneous entanglement is created, sensitive to variations in intensity between its components:

> In public health, the criterion used is always magnitude – how frequent the problem is. But magnitude alone is not enough, as there are problems that are extremely frequent and not at all serious, such as the common cold for example (laughs) or allergies. It's okay, it's very annoying, but when you have to take public health measures, prevention alone is not enough. You must combine it with the seriousness of the disease. That seriousness has to do with severity, right? … And how do you measure severity in public health? It is measured with death, and with lethality, because lethality is the total number of deaths over the total number of patients with a certain disease …. (Helen, health policy expert)

A single indicator (e.g., prevalence) cannot define the severity or value of a disease for the GES epistemic network. Dimensions considered for prioritization, such as transcendence (i.e., the gravity it acquires), can be acted upon in different ways. Epistemic entities

are practiced in the relationships they establish with other criteria and the scenarios in which they are deployed. So, what counts as a resource to define certainty in a prioritization process is enacted locally. It can operate as a 'magnitude that represents a reality out there', an index of social relevance, or an ethical or political sensitivity. Materials that are not traditionally considered as evidence by EBM criteria can be enacted as criteria for operating in a situation. Evidence is not a thing in itself, but a locally enacted relationship with an entity that promotes its meaning.

As a result, in the GES evidence and certainty are precarious achievements, derived from the relationship between many and varied local entities. We will now explain how a certain type of object, which we call 'speculative', is necessary to articulate this heterogeneity.

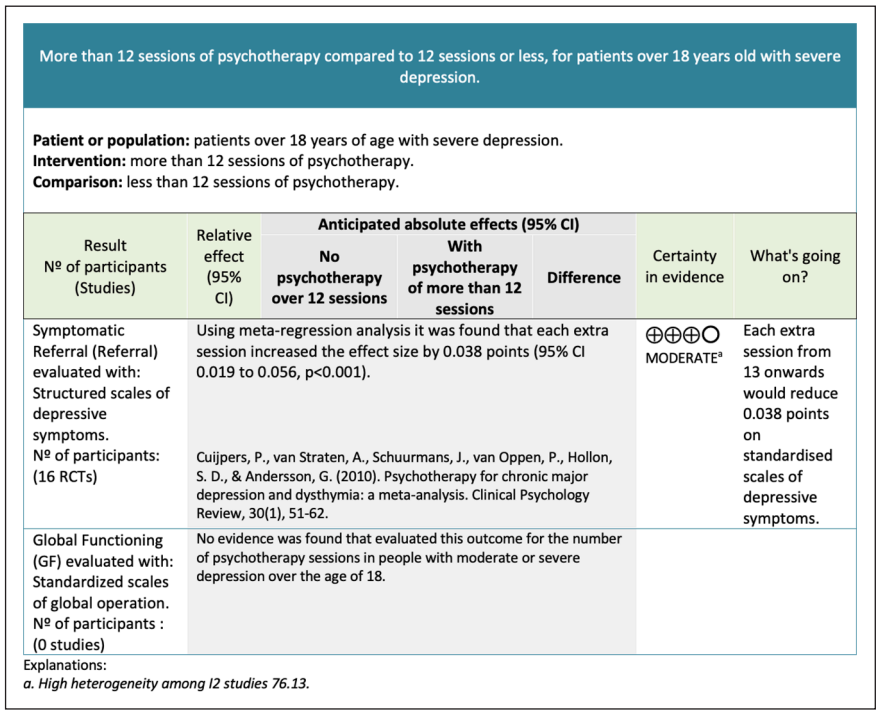
Introducing speculative objects

Despite first appearances, the complex network of different entities that come together in the GES regime when producing certainty and truth is not necessarily a problem. As many authors in the STS tradition (e.g. Knorr Cetina, 2001; Latour, 2005b) have shown, the entities can be articulated through the activity of specific key objects. For example, a chart can be the link between different health variables (weight, height, etc.), types of population, required medication and health care resources available in the community.

The following is an extract from fieldnotes in an expert committee meeting at the Ministry of Health:

> The meeting includes 13 people: 11 mental health experts, one health thematic expert coordinator from the Ministry of Health and a methodological advisor from the same ministry. On the table, there are three filing boxes containing articles organized by colour dividers, including papers and pencils. When we enter, the expert in charge summarizes the process conducted in the previous meeting. To do that, she distributes among those attending a series of sheets that show a table with the scores assigned by themselves and other consulted experts on the value of questions to guide psychotherapy in people diagnosed with depression, according to the PICO format. Although 116 people were contacted, only 12 answered. 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 irregularly), the number of sessions (more or fewer than 12 sessions) and type of psychotherapy (cognitive-behavioural or interpersonal). What interests the coordinator is to define which recommendations are most effective for the remission of symptoms and a decrease in patient abandonment. (Fieldnote, Ministry of Health).

The meeting was aimed at updating of one of the guidelines that are part of GES, the Guide for Depression Treatment in people over the age of 15. As part of the process, a series of scientific articles are made available to the experts. These articles have been reviewed (analysed, summarized …) by the coordinator, according to guidelines predefined by EBM (in this case, from the Scottish Intercollegiate Guidelines Network [SIGN]). Together with this, she presents the results of a survey conducted, which guides the work of the meeting. This is the second meeting and it should generate guidelines for the psychotherapy questions that have received the highest average score.



More than 12 sessions of psychotherapy compared to 12 sessions or less, for patients over 18 years old with severe depression.

Patient or population: patients over 18 years of age with severe depression.
Intervention: more than 12 sessions of psychotherapy.
Comparison: less than 12 sessions of psychotherapy.

Result Nº of participants (Studies)	Relative effect (95% CI)	Anticipated absolute effects (95% CI)			Certainty in evidence	What's going on?
		No psychotherapy over 12 sessions	**With psychotherapy of more than 12 sessions**	**Difference**		
Symptomatic Referral (Referral) evaluated with: Structured scales of depressive symptoms. Nº of participants: (16 RCTs)	Using meta-regression analysis it was found that each extra session increased the effect size by 0.038 points (95% CI 0.019 to 0.056, p<0.001). Cuijpers, P., van Straten, A., Schuurmans, J., van Oppen, P., Hollon, S. D., & Andersson, G. (2010). Psychotherapy for chronic major depression and dysthymia: a meta-analysis. Clinical Psychology Review, 30(1), 51-62.				⨁⨁⨁◯ MODERATE[a]	Each extra session from 13 onwards would reduce 0.038 points on standardised scales of depressive symptoms.
Global Functioning (GF) evaluated with: Standardized scales of global operation. Nº of participants : (0 studies)	No evidence was found that evaluated this outcome for the number of psychotherapy sessions in people with moderate or severe depression over the age of 18.					

Explanations:
a. High heterogeneity among I2 studies 76.13.

Figure 1. Example of presentation of evidence following SIGN. Adapted from Department of Evidence-Based Health and Sanitary Guarantees (2017).

Both processes, the provision of evidence and the development of surveys to define the course of action, follow the rationality that making decisions requires non-human agents to mediate objectivity. Thus, survey results and filing boxes are enacted as objects and agents that mediate the epistemic activities developed at the meeting. In this respect:

> The coordinating expert comments that the search for evidence considered only articles that presented meta-analyses, systematic reviews or reported on international trials and that were associated with the group of questions. Other papers were excluded. (Fieldnote, Ministry of Health).

SIGN establishes a series of criteria to evaluate the available evidence. Specifically, it formulates a checklist to evaluate and assign values to study characteristics. Figure 1 shows an example of how the available evidence is presented in relation to one of the questions asked:

As shown in the image, the search for evidence for the number of psychotherapy sessions recommended in the treatment of depression in patients over 18 years old shows that each extra session reduces symptoms by 0.038 points, according to standardized scales. However, the evaluation of the quality of the study indicates that the quality is

moderate. Finally, this information will end up guiding the flow of decisions to define recommendations:

> The coordinator points out that the meta-search engines PubMed, Epistemonikos and Google Scholar were consulted. One of the experts asks why more specific databases for the type of question, such as PsycINFO, were not used. He himself went to the trouble of searching for information there and found many more articles that could have been analysed. The coordinator indicates that the Ministry of Health has restricted access to certain databases. This is a 'structural limitation'. (Fieldnote, Ministry of Health)

For this process, evidence is the outcome presented by indexed scientific publications, available on the Internet. As expressed in the extract, even applying SIGN criteria not all evidence is considered. Whether or not indexed scientific articles are registered may pose variations to the course that defines the epistemic activities of EBM. While contingent processes operate (of feasibility of access to databases), so do temporary criteria (regarding the validity of the evidence). The epistemic operation is an event that is defined in the interaction of current activities in a specific situation.

In this sense, it is shocking to observe that mathematical models are regarded as incomplete, negotiable, modifiable, and conventionalized objects. Both the models and the objects they produce – such as statistical indexes – are produced by means of conventions or regulations. These regulations specify the population dimensions that are considered in biopolitical definition. For example, the following is an expression of how the factor 'burden of disease', which participates in the definition of the prioritized lists of diseases, is considered.

> We must agree on how we measure it. In cost-effectiveness analyses, we usually measure it as Quality-Adjusted Life Years (QALY), but there are other options, such as years of life and Disability-Adjusted Life Years (DALY), which the WHO has suggested to use. Now, the use of Quality-Adjusted Life Years has to do with the fact that health economists have been feeding in the subject of psychology and the QALY measurement has been constructed through communication between several social scientists and fundamentally by the work of health psychologists; and at some point, that joined with the whole welfare theory of economists. (Liam, health economist)

These objects, the models, are relative to the body of knowledge and regulations that give legitimacy to an epistemic entanglement. In other words, objects connect epistemic perspectives through which they are supported and acquire existence. Beyond transmitting knowledge about a reality 'out there', their objectivity lies in being highly articulated around these epistemic networks, forming part of 'regulatory objectivity' (Cambrosio et al., 2006). However, beyond the regulations, once these objects are put into circulation they participate as entities that define the epistemic course of the prioritization processes. In this vein, it is no longer necessary to know the methods that generate the object, because the object itself is already considered a bearer of knowledge. From this perspective, biopolitical process and objects prove to be inseparable in practice. In the following quotation, the expert gives an account of the consequences of the methods of calculating the burden of disease. However, the need for such an object "burden of disease" is not questioned:

> I have doubts regarding how it is measured …. I would have to review the method that is used because I have doubts about whether they measure it according to years of work lost or also according to life expectancy. That is not clear to me. (Florence, health design expert)

The activities of experts are guided by objects that display information, which operationalize biopolitical dimensions. In this sense, the objects are mediators between eventual biopolitical dynamics and the operation centres in which this political design is generated.

Biopolitical design is speculative insofar as it relates to the pasts, presents and futures of groups, and to possibilities, uncertainties and risks connected to those groups. All of these aspects are projected based on partial data, data connected to the epistemic networks that constitute mediating objects in the first place. Speculation consists, then, of generating a projection from the information we have regarding what is known to us, towards the unknown, thus opening the way to the emergence of reflection and conjectures around different perspectives to think about possible futures (Muller, 2013). Biopolitical design is, in an analogical sense, a handcrafted work. The coordinator of the group of experts meeting, at a later meeting, said:

> The group suggests to you a list of, let's say, eighty actions or health technologies, ranging from a drug to a test. So, you go and take that to the office and start looking, 'Is there evidence for all these things?' Because they can tell you that there is, but actually there is not. And you are going to check the weight that each intervention recommended to you can have …. But even at the moment we were working in a very handcrafted way researching how the panorama was around the world, and whether or not there was evidence for each item on the list. (Nicole, health thematic coordinator)

In this sense, the objects operating in biopolitical action can be considered speculative objects.

Defining speculative objects

To speculate is to refer to something that could exist but it is supposed, or that must be brought about by certain practices or interventions. Speculation is not a property of a text or the exercise of an interpreter. It is the result of an effort, of putting in relation certain practices in which objects that refer to risk and uncertainty prevail. Through the establishment of this relationship, the characteristic of these specific objects that incorporate uncertainty is transmitted to the knowledge about them as a global and general quality of the latter.

We have observed that the common practices enacting GES involve speculative activity. We return to the expert panel and in turn to the updating of a clinical guideline:

> One of the attendees asks about the existence of information on waiting lists for depression care. Another expert attendee replies that database records are only generated for specialist care and not for psychologists. Therefore, there is no database record or information about it. In this regard, another expert asked about the availability of information on the number of cases and associated care times. Another attendee mentioned that the REM system [Monthly Statistical Summaries], which records national care, only shows open cases once, without indicating information on the associated specialist or follow-up. Therefore, costs are unknown and only international

> information is available to make estimates. However, REM makes it possible to determine the target group for care on an annual basis, based on those already carried out, to distribute professionals and resources. The group and estimated care are defined by these statistics. However, there is a lack of knowledge about the total amount of care. Other studies and international information make it possible to focus instruments. (Fieldnote, Ministry of Health)

The creation of a population and its processes involves problematic practices. Quantification devices provide only partial estimates and possible conclusions. To this end, characterizations of local practices and habits are composed in part through estimates generated from national and international information. So, too, are future estimates, through considerations about how populations have behaved in the past. Statistical calculations enable the establishment of monitoring systems. However, monitoring is always conducted by considering individual factors and variables isolated from their connections, which makes it impossible to grasp the complexity of objects. In addition to this, there are the complex and dynamic characteristics of the population processes. Statistics are unable to give an account of social time, being 'inherently determined by the impossibility of being able to follow the flow and circulation' (Blanco, 2009, p. 40). In this sense, these technical tools of governmentality do not enable finished accounts of the current or future states of the processes to which the tools give form; rather they constitute bases for the estimation 'of all the other possible social times', that is, they create new scenarios for future actions (Blanco, 2009, p. 38).

The objects participating in the biopolitical design we studied are important components in justifying decision-making. In public health, much of the work consists of producing certainties or truths about the life of the population. The existence of technical objects enables dialogues and negotiations on the qualities that make up this biological policy. In this respect, Muller (2013) and Domecq (1996) have introduced the notion of *speculative objects* to refer to the existence of elements that enable 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 that is uncertain. For these authors, to *speculate* implies a relationship with the unknown, but at the same time a proposal that organizes an existence. Speculative objects operate on a middle ground between local and global practices. They bridge these two levels of analysis and allow us to understand how local objects and actions contribute to the generation of global effects such as those implied by the biopolitical *dispositif*.

Allow us to provide an example. As Liam, an interviewed health economist, indicated above, the WHO frequently recommends the use of DALY as an operationalization to understand 'burden of disease'. Thus, the prioritization exercise considers the quantification of losses in terms of years of health due to disease, disability, and death, expressed in a unit of measure common to the three states. The DALY makes it possible to generate 'a synthetic indicator used to identify priority health problems' (Ministry of Health of Chile, 2008, p. 10). This leads to tables like the one shown in the following Figure 2, used in discussions, conversations, and technical meetings to define which diseases must be included in the health regimen:

These are the types of objects that appear in our research, organizing local practices in which the biopolitical exercise that is the GES is rooted. They are locally enacted entities that acquire agency in expert networks to bring about a certain order. They generate

Both Sexes	DALY
Hypertensive Heart Disease	257.814
Unipolar depressive disorders	169.769
Biliary tract and gallbladder disorders	157.087

Men	DALY
Hypertensive Heart Disease	134.808
Alcohol dependence	106.739
Liver Cirrhosis	92.393

Women	DALY
Hypertensive Heart Disease	123.006
Biliary tract and gallbladder disorders	114.981
Unipolar depressive disorders	114.400

Figure 2. Example of speculative object. Extract from table: DALYs ordered by magnitude of specific cause and sex. All ages. Chile, 2004 (Ministry of Health of Chile, 2008).

the impression of access to a whole, enabling local conjectures on whole-population processes as if they were inscribed in these processes; they serve as entities to organize local reflections in narratives about biopolitical composition, while carrying uncertainty, ambiguity, and truth in their epistemic compositions. Finally, they emerge and contribute to establish scenarios in which truth is an articulator of practices. In other words, they emerge in a regime of obligation of truth.

The obligation of truth

As we have seen, in the process of prioritization of health concerns, truth is irreducible to relationships established with any single epistemic entity. The production of certainty that makes it possible to define a list of diseases and benefits is a heterogeneous process. Here, prioritization comprises a pragmatic mesh. However, this epistemic network establishes such certainty as a relative entity, sensitive to contingencies.

> So, from the point of view of effectiveness it was obvious to finance them, but the costs were very high. So, in the end, that was taken out of the basket. It might not have been wrong to take them out, but there was no prioritization criteria to justify why this one should, and why this other one shouldn't, and if I compare it with this one .... It was tried, it was tried a lot, but I think the machine (laughs) overflowed all this. The urgency of having a decree made it impossible to do and install something like this in the Ministry today. And I say in the Ministry because it does not have to do with the government of the moment, but with the Ministry as an entity. (Florence, health policy expert)

The temporal frame is important: There is an urgency regarding how prioritization connects with other processes and obligations of a legal nature. This may conflict with the principle that truth should emerge from a process of evaluation according to predefined criteria. The scenario in which prioritization occurs accelerates the emergence of a truth. In addition, specific conditions vindicate this acceleration: The Ministry articulates a need for the truth to appear.

Foucault (2014) establishes truth as a normative act. He defines a *regime of truth* as what forces a series of acts of truth, determines the form of those acts and establishes the conditions of realization and the specific effects of truth. Truth is enacted before becoming the production of justifications in expert discourse. At the same time, Foucault points out that such truth regimes, with their procedures, operators, witnesses and objects, must

take into account a multiplicity of other truth regimes, each of which has specific ways of connecting subjects and objects. Different regimes can operate to define a truth:

> An initial meeting oriented toward defining the list of diseases was attended by the head of the division of that period and my boss. Before that we knew that [the Ministry of Finance] was not going to let one of the diseases pass because it was costly. So, my boss said: 'No, it is necessary to prioritize.' We did not have all the evidence, it wasn't well done, but I tried to argue: 'No, this is not because –,' and gave any argument to: 'No, look at this; not this because everything is bad, so if we put it –.' All with criteria not presented before, with judgements of the moment. And there it was defined. (Florence, health policy expert)

Truth is enacted locally with available resources, entities, and repertoires. The truth is an entity that makes it possible to distribute acts of certainty about the definitions of priorities of care in the health network. It is also locally produced, enabled by socio-material arrangements. In that sense, local and transcendent truth are both assemblages. Therefore, truth's needs are relative to the composition of the complex interweavings that will establish how diseases are ordered in biopolitical regimes. Truth emerges.

The connection between local and global truths is the product of speculative objects, mediations that bring together regulations, activities, temporalities, and objects. It can be enacted in multiple ways, however, in each situation acting as truth. In this sense, truth is not the common element that connects the various actors, but is an empty space shaped by the activities that are constituted around it, forced to make it appear.

Discussion and conclusions: Speculative biopolitics?

The regime of Explicit Health Guarantees (GES) works as a biopolitical *dispositif* because its contents define what we have called *speculative objects.* These have two characteristics: (a) they relate highly diverse entities into integrated wholes that are and involve objects of knowledge and uncertainty, and (b) this integration creates regimes of obligation considered as scientific truths on different groups. We have presented how these objects work in the case of the GES, analysing them through four themes. The first showed how evidence and certainty are precarious achievements derived from the relationship between heterogeneous local entities. The second explained how speculative objects articulated such heterogeneity. The third described the characteristics of these objects. Finally, we argued that their articulation generates a global or total effect that has a very specific direction: creating an obligation of truth that is the key characteristic of the biopolitical operation.

Thus, we suggest that 'biopolitics' refers to a process limited by both local technoscientific practices and regimes. These are inseparable, needing each other to define themselves in their local and global actions. The technoscientific practices link many different areas through the intervention of specific objects: speculative objects. These are locally enacted, but establish patterns of order. They give the impression of constituting wholes that makes sense, that takes the shape of regimes of obligation of truth.

This leads to our first conclusion: It is not currently possible to speak of biopolitical exercises without considering the local technoscientific operations and the objects that make up their substrates. The analysis of the former resides in clarifying the latter. In this

vein, our work also improves the STS literature that explains how small practices, objects and actions configure totalities with political effects. In the case of health projects, these effects can be defined as biopolitics.

It is possible to draw a second conclusion from our analysis, in the close ties established between biopolitical management and the management of ambiguity and uncertainty. Biopolitics implies a relationship with a population that makes it a manipulable object. Nevertheless, biopolitics is relative to very concrete political and epistemic assumptions. These sides of biopolitics are mediated by speculative objects, which shows that biopolitical action is based on the deployment of truths that emerge from the provisional and local articulation of a variety of ranges of ambiguity and certainty. Here the crucial question is, what kind of objects are systematically constructed in everyday practices, including those that characterize scientific activity, to cope with and avoid uncertainty and ambiguity? This opens new lines of research both for analyses centred on the notion of biopolitics and for STS.

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