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EDITORIAL

Title:

The impact of technology on pregnancy and childbirth: Creating and managing obstetrical risk in different cultural and socio-economic contexts

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Abstract

This special issue brings together empirical studies conducted in eight different countries: Brasil, Turkey, China, Japan, Italy, Senegal, Jordan, and Switzerland. Two papers focus on pregnancy surveillance and related technologies while four others tackle the birthing processes in high-technology as well as low-technology settings. The contribution of the collected papers to the existing literature on pregnancy and childbirth risks is threefold. First, the special issue puts the *materiality* of hospital birth environments at the centre of the analysis, by paying systematic attention to the ways different technologies and products have shaped the biomedical model(s) of birth that become diffused around the world. Second, the collected papers provide empirical findings not only from the ‘developed world’ but also from the ‘emerging’ or ‘developing’ economies, with the aim of analyzing the various forms of attachment to technology — and to its capacity to remediate risks— in distinct birth cultures and geographies. Finally, this special issue is composed of studies that pay special attention to the heterogeneous and even sometimes discriminatory forms of care targeting distinct categories of users, such as low SES or working class women, immigrant women or women of advanced maternal age. This special issue thus aims to address what has increasingly been criticized as a western-world-centered or privileged-women-centered literature on childbirth risks. The contributions also provide original evidence on the necessity for considering the role played by technological settings in not only the mitigation of childbirth risks but also their conceptualization, recognition, prioritization and, in some cases, their creation.

Keywords: childbirth; pregnancy; technology; medicalization; North-South

Introduction

This special issue is the outcome of a collective reflection on the impact of technology on pregnancy and childbirth which began during an international conference organized in Paris in October 2016¹, and which we have then pursued within a research program financed by the French National Research Agency². The call for papers invited the authors to reflect on the various ways medical technologies and biomedical products have shaped, or at least influenced, birth processes and the risks associated to them. Our aims were two-fold. On one hand, we sought to analyze the processes of technomedicalization —of “technology colonization” even— in pregnancy and childbirth in contrasting national and socio-economic contexts (‘emerging’, ‘developing’ versus ‘developed’ countries; high SES women versus low-SES or immigrant women, and so on). On the other hand, we wished to examine how these processes shape the way obstetrical risk is theorized, framed, managed, eventually contested, but also *produced* or *avoided*. We thus wanted to highlight the contemporary ways of conceiving and managing childbirth risks (including pregnancy) both from a ‘materialistic’ point of view (as promoted by science and technology studies) and in a transnational perspective. In particular, we have attempted to respond to the following questions: To what extent has risk become a relevant category or tool for managing childbirth in very different settings? What are the different forms of risk that are perceived, taken into account, ignored or contested in medicalized versus demedicalized environments of birth? Do the ways of considering the (positive) role played by technology in making childbirth safer vary depending on whether the patients and the health professionals already have access to that given technology? How does the presence of a technology, an instrument, or a pharmaceutical product shape the medical action on, as well as the imaginaries related to, childbirth and its risks? Does an increased focus on risk necessarily mean an increased recourse to technology, and vice versa? To what extent does access to technology reinforce stratified reproduction (Ginzburg & Rapp, 1995)? How do economic concerns shape different medical and risk rationalities?

In this editorial, we will open a discussion in these directions with the aim of highlighting the contribution of the special issue to the existing and already abundant literature on pregnancy and childbirth risks (Armstrong, 2008; Scamell & Alaszewski, 2012; Rothman, 2014; Coxon, 2014; Löwy, 2018). First, we will briefly review the dynamics of technologization/medicalization of childbirth in different national settings, in order to establish the context in which this renewed enquiry has its roots and justification. We will investigate the collected papers in terms of the not-always-obvious or the sometimes-paradoxical relations between technology, risk and childbirth in terms of what they reveal for the studied national contexts. We will consider for instance that the most high-tech or the most industrialized countries are not necessarily those where

¹ The international conference « Medicalized Childbirth as a Public Problem : Risk Cultures, Gender Politics, Technoreflexivities » was organized by Sezin Topçu and Ilana Löwy at Ehess-Paris on 27th-28th of September 2016. This conference was held thanks to a grant from Labex-Tepsis (Ehess) and a financial support from CEMS (EHESS/CNRS FRE2023/INSERM U1276), Cermes3 (EHESS/CNRS UMR 8211/INSERM U988) and Centre A. Koyré (EHESS/CNRS/MNHN UMR 8560).

² ANR Hypmedpro (Overmedicalization of childbirth as a public problem : material trajectories, public controversies, institutional changes), coordinated by Sezin Topçu (CEMS-Ehess) (2016-2020).

techno-medical interventions in childbirth are (or previously were) the most important. We will then examine the ways by which access to technology or availability (or absence) of high-tech services conditions (or not) risk conceptualizations of women and health professionals. Finally we will tackle the relation between risk colonization and technology commodification, as well as between risk government and economic evaluation and regulation of techno-medical interventions.

This is not the first time *Health Risk & Society* offers space for theoretical and empirical discussion on the construction and management of pregnancy and childbirth risks. In 2014 in particular, the topic was tackled in depth (vol. 16, Issue 1; vol. 16, Issue 6). This special issue enriches these debates in two ways. On one hand, the issue puts technology and technical systems (surgery-oriented maternity wards in western Turkey, non-invasive prenatal diagnosis that diffuses at an accelerated rhythm in China, surveillance centred birth settings pacified with epidural anaesthesia in Switzerland) or their absence (in for instance public hospitals in Senegal or part of Brazil and Jordan, in alternative birth hospitals in Europe, during a natural disaster in Japan...) at the centre of the analysis. The aim here is to provide more sophisticated accounts of the 'biomedical' models which have recently been emerging. On the other hand, we aim to address what has increasingly been criticized as western-world-centered or privileged-women-centered analyses (Dillaway & Brubaker 2006; Coxon, 2014). The six papers brought together in this issue tackle both high-income and middle/low-income economies. Several papers also place at their core the different and even sometimes discriminatory forms of care addressed to distinct categories of users/patients (low SES women or working class women, immigrant women, women at advanced maternal age, for instance). Both "Norths" and "Souths" as well as the contrasting contexts within each of these categories — where women are subject to unequal opportunities and conditions in their reproductive experiences — are thus considered in this publication.

(Over)medicalization of pregnancy and childbirth and related public debates and controversies

The growth of medical technology in pregnancy and childbirth is a well-established phenomenon. During the 20th century, the locus of childbirth shifted from women's own homes to institutional settings managed by professionals, first in the western-industrial countries and especially the US (Leavitt, 1986), and then gradually these technologies were diffused elsewhere (Al-Galiani, 2018). In parallel to the vast movement of hospitalization of birth, obstetrical knowledge, technologies and practices transformed the maternal experience in a radical manner, while at the same time establishing the 'biomedical' or the 'techno-scientific' management of birth. During recent decades, the medical uptake of pregnancy and childbirth has been accelerated via the generalization and even the routinization of various technologies and pharmaceutical products.

Medical interventionism has nevertheless taken diverse forms from one national context to another. In some countries such as Brasil, China, Mexico, Turkey, Italy or the US, C-sections have been more or less normalized as a 'no-risk and no-pain' alternative to 'natural' birth. In others, like France, Canada and UK, epidural anaesthesia is much more generalized. In many contexts, labor induction, episiotomy or ocytocine are routinized.

The 'biomedical model' which became dominant in many contexts, refers therefore not to one but to many different realities and practices (Akrich & Pasveer, 2000), although activists of natural or humanized birth may often mention it in singular terms, thereby contributing to 'blackbox' it, albeit unintentionally. One way of opening the blackbox of techno-medical birth, we argue, is to look at the different technological paths or trends in different contexts.

In the past years, the 'medicalization' of childbirth, and to a lesser extent of pregnancy, has generated a new wave of public criticism and concern in many geographies. Regarding childbirth for instance, the denunciations of 'obstetrical violence' —which have recently gained a transnational dimension as they diffused from Latin America to Asia by passing through several European countries such as France or Italy —constitute one of the most visible examples. Generally speaking, the critiques of 'medicalized birth' or the biomedical birth models, which were present already in the 1950s (Michaels, 2015), currently range from : (i) a radical refusal of technology, medicine and hospital considered to be globally harmful to the birth process (e.g. home-birth movements) ; (ii) to a critique of political-organizational issues, such as the Fordism of the maternity wards or the bureaucratisation of midwifery as a profession ; to (iii) refusal not of medical techniques and instruments *per se*, but rather of their unjustified, routinized, or excessive use.

It should be noted in this frame that obstetrical technologies may be subject to contrasting meanings and framings by women or consumers (Rapp, 2000). For instance, epidural anaesthesia and even caesarean birth may be considered by some consumer or activist groups as empowering for women, from a feminist or a *care* perspective, especially in countries where high inequalities regarding access to technologies and services have transformed the medical suppression of labour pain into a class struggle (Roberts, 2012). In others, like in the USA, some users or feminist groups may refuse them as oppressing, authoritarian or medically dangerous (Dillaway & Brubaker 2006). Such contrasting framings can also come from medical or the regulatory bodies, which may suddenly start or stop promoting a technology or a product when for instance new international scientific evidence or controversies on their risk-benefit balance occur, or when new economic constraints or medico-legal norms are introduced. As a result, very different meanings are attributed today to what is considered as 'medical' or 'too medical' or, on the contrary, 'natural' or 'normal' ; to what is judged as empowering or on the contrary technocratic or colonising ; as safe instead of risky. The goal of the current special issue seeks precisely to highlight such heterogeneous framings and problematisations of the relations between technology, risk and childbirth in different national settings.

Our departing observations are three-fold:

- just as with techno-bio-medicalization, risk is no longer a central tool for governing childbirth in western countries only;
- the recourse to technologies and medication can be greater in 'emerging' economies or in the economically favourable regions of 'developing' ones, in comparison to the 'developed' ones. The case of Turkey usefully illustrates this point, with its high C-section rates (54 per cent at a national level), the systematization of 3D or 4D ultrasounds on a monthly basis in its private clinics,

or the loose character of its regulatory framework on IVF, which allowed the country to become one of the biggest markets of IVF in the world in only a few years.

- more (or less) technology does not necessarily mean more (or less) 'risk colonization', as other concerns (for population control or growth, or optimization of public costs...) can, at least periodically, render these two tendencies incompatible with each-other.

Hightech vs. low-tech management of the maternal body in eight different settings

The articles in the special issue draw on empirical material collected in eight different countries: Brazil, Jordan, Switzerland, Turkey, China, Japan, Italy and Senegal. Two of them tackle risk surveillance during pregnancy while the others focus on the medical management of childbirth. Technologies or products such as non-invasive prenatal testing (NIPTs), amniocentesis, ultrasound, electronic foetal monitoring, epidural anaesthesia, C-section or oxytocin, are objects of the different analyses. Globally, the ethnographic studies presented in the articles were designed and conducted independently from one another. All except one rely on ethnographic work conducted in hospital or medical settings. The authors, either medical anthropologists, or childbirth or risk sociologists or STS scholars, tackle risk in multiple ways, following the framings and problematisations that their field studies concretely revealed or pushed into the frontline. Accordingly, risk perception (including extrasomatic risks, or those associated to invisible powers), risk categorization or risk hierarchisation (between NIPTs and amniocentesis for instance, or between vaginal vs. caesarean birth) constitute a central analytical line for certain authors.

The analytical aim of these papers is far from realising a boundary work (Gieryn, 1983) on real vs. perceived risks, in order for instance to determine the irrationality or the rationality of the social players. Inspired by sociocultural or socioanthropological theories of risk (Douglas & Wildavsky, 1982 ; Lupton, 1999), it is rather to situate biomedical definitions of risk and their reception by paying attention to local notions, grammars, material cultures or new policies that shape the behaviours and symbolic representations of both women and health professionals . The techno-political and the socio-cultural construction of medical risk in relation to other competing risks – organisational risks, economic risks, social risks such as those related to loss of privileges in access to health care or 'external' risks such as the seismic one – is also the focus of several studies. Rothstein (2006)'s theorisation of 'risk colonisation' is effectively mobilized in this frame.

Other studies meanwhile privilege the analysis of strategic reappropriations of risk. Drawing on Foucault and governmentality studies, they tackle risk as a technology of regulation of women's reproductive experiences, that both the expectant mothers and the healthcare providers make use of for their own interests. Regarding the types of actors analyzed too, the collected papers usefully complement one another : some focus on women's perception or lived experiences of risk and of 'situated meaning-making' over it (Chadwick & Foster, 2014 ; Lane, 2015) ; some look through the ways doctors, midwives, policy-makers or the promoters of a given technology categorize or mobilize

risk ; while others tackle both the women's and the healthcare professionals' ways of evaluating and coping up with risks. The special issue offers data on both public and private health sector dynamics of the national contexts being studied, although these are not tackled in a systematic or comparative manner in each study. But in all articles socio-economic inequalities, constraints or economic interests occupy an important place.

Last but not least, the question of the organisation of birth spaces, which play a central role in the establishment of authoritative knowledge and practices (Jordan, 1997), is analysed in an original manner by certain contributions of the issue. Two papers in particular focus on unconventional birth spaces. One of them (Quagliariello, 2019) tackles an alternative birth hospital which set out to position itself as a low-tech alternative to mainstream obstetrics through the specific configuration of its labour rooms. The other study (Ivry et al., 2019) poses the question of what happens when suddenly it may no longer be possible to give birth in a hospital and even not indoors, in the case for instance of a big earthquake.

Thanks to its international focus, this special issue thus provides the opportunity to simultaneously investigate, for instance, what is arguably the world's most high-technology country – Japan– together with some leading 'emerging' economies such as China, Brasil or Turkey, in terms of their obstetrical care dynamics. This exercise reveals striking paradoxes. In Japan, the levels of recourse to obstetrical technologies such as epidural anaesthesia, C-sections or induction of labour are surprisingly low (6%, 19%, less than 10% respectively) (Ivry et al., 2019). In comparison, in 'emerging' economies like Turkey and Brazil, recourse to technology, especially to C-sections, have been routinized, thanks to a medical discourse that reframed vaginal birth as both very risky and too painful (McCallum, 2000; Topçu, 2019). In Jordan too, where hospital birth is the norm and where obstetricians play an important role in childbirth, such a risk discourse could have been influential and could have made childbirth as « technocratic » (Davis-Floyd & Sargent, 1997) as in Turkey or China, but this does not seem to be the case, at least until the last decade (Maffi & Gouilhers, 2019).

These findings imply that 'risk colonisation' (Rothstein, 2006) is not a process that necessarily diffuses (or is exported) from the '(post)industrial' countries towards the 'developing' ones in a homogeneous way. Far from a purely western concept, risk can and does diffuse beyond the 'global North' and, moreover, this occurs in heterogenous ways. Therefore, as Maffi & Gouilhers (2019) put, instead of assuming a global diffusion of the risk paradigm, it is necessary to pay attention to how specific technological, medical, economic and cultural settings facilitate or impede risk colonisation.

Access to technology and the ambivalence of risk

After having become an important political issue in the industrialized countries in the 1970s, risk governance in pregnancy and childbirth gradually allowed the elaboration of a whole set of regulatory tools (safety norms, benchmarking techniques, tools such as partograms, and so on) that started to diffuse beyond western-industrial countries. International regulatory agencies such as the WHO or the development programs or goals such as the MDGs (Millennium Development Goals) played an important role in

this frame. However, the adoption, reappropriation or adaptation of the risk philosophy and risk governance tools in different national-cultural settings, as a technology for managing childbirth, seem to depend on many parameters that go beyond the simple consideration according to which medically and technologically unattended childbirth is risky. The comparative analysis of the Swiss and the Jordanian cases conducted by Maffi & Gouilhers (2019) provides interesting insights into these processes.

While the maternal mortality and morbidity rates in childbirth are much higher in Jordan than in Switzerland (19/100000 against 5/100000), risk remained a relatively marginal concern for women and health professionals in the Jordanian case while having become a central element of concern, discussion and action in the Swiss context. In Switzerland, both the midwives, OGs and the material environment of the highly-equipped public maternity hospitals are there to remind women of uncertainty and risk during pregnancy and labour, and the corresponding necessity to follow them in a systematic way. In comparison, in Jordanian public hospitals, neither surveillance technologies nor pain management techniques are omnipresent. Only acceleration of labour appears to be a generalised tendency. Of relevance in this latter case, perhaps, is that fear of birth pain or risk of suffering seem to have deprioritised the fear or the recognition of birth accident risks. It thus appears that biomedical risk is not necessarily the main focus or tool of childbirth management in contexts where, objectively speaking, levels of maternal and newborn mortality and morbidity rates may still be significant.

Differences in access to technology or high-technology services does seem to condition such risk dynamics to a certain extent: in Jordan and Senegal prenatal tests are not available for everybody (due to their cost), and as a result, risk measurement and relevant risk categorisations and concerns are not widely diffused. Meanwhile access to or availability of a technology does not necessarily imply that it will *de facto* be utilized or desired by women or the health professionals, because of safety or other concerns. As Ivry and colleagues (2019) show in this issue, in Japan for instance, suffering childbirth pain is considered a necessary effort for becoming a 'good' mother, and women's perseverance is socially praised within this cultural frame. As a result, epidural anaesthesia is not automatically seen as a key to making childbirth safer or more desirable, although it can easily be made accessible. Furthermore, giving birth without epidural anaesthesia seems to be considered as a 'natural', and not less safe, way of birthing in most Japanese settings, regardless of whether the women in labour are attached to a gynecological table and to a monitoring device or are under other medications.

Ivry and colleagues (2019) add to these findings, in that they show how, in case of a forced demedicalization, such as during the 11.03.2011 Great Japan earthquake, both women and health professionals effectively discover what non-interventionist or physiological birth is, and more importantly what birthing women's bodies are capable of doing on their own, even for accelerating or slowing down the birth process naturally when *necessary*. The exceptional conditions in which women find themselves seem to push them to reconsider what really *counts*, between access to technology and midwives' attentive care and support. That's why the authors propose to consider disaster contexts also as opportunities that may allow social players to question and even collectively criticize the established technological-medical systems, their utility,

their potential negative externalities.

Even in countries with material/technological precariousness, unlike what some medical organisations, pharmaceutical companies or more fervent feminist critics assume, access to technology is often not considered nor applauded by women or patients as a homogeneous set of opportunities, but rather in a selective way. In this sense no unconditional uptake of technology exists (Callon, 1998). Lay reflexivities vis-à-vis technical innovations do not only emerge in situations of controversy or in those in which one has become directly concerned by their potential harm (Epstein, 1995; Wynne, 1996), but are omnipresent in 'lifeworlds' or in everyday handling of uncertainty and risk (Brown, 2016), as well.

In none of the contexts studied by the special issue authors were techniques or products such as labour induction, active management of labour, or forceps seen by women and their relatives as desirable tools. Some of these have even become a distinct focus of resistance for women. Maffi & Gouilhers (2019) explain how in Jordan, obstetrician-gynaecologists and midwives were gradually made more accountable for the pelvic examinations that they practiced, since in this cultural context they were considered to be harmful both to the women and the foetus. Jordanian women of low or middle SES also appeared to be quite critical about acceleration of labour and episiotomy as they feared their iatrogenic risks, whereas they saw the access to ultrasound or monitoring devices as an entry to modern and state-funded services, and even as a way to be treated as real citizens.

Quagliariello (2019) similarly shows in this issue, drawing on the case of the Senegalese women who migrated to Italy, that they expected and hoped to access to pregnancy and birth technologies such as ultrasound, electronic monitoring devices or epidural anaesthesia. Because these material opportunities can only be afforded by upper class women in their home country, they seemed to consider access to these as luxury health care, but also as a demonstration of the fact that they are being treated normally – that is to say without racist discrimination – in their host country. In contrast, some of the Italian-born (upper-)middle-class women in the same clinic feared the iatrogenic risks of these technologies – particularly that one intervention could lead to another (the boomerang effect), or that technology would render their birth experience too artificial, thus potentially provoking physical as well as psychological trauma. This latter group of women represent however a minority within the alternative birth hospital in Tuscany which itself is a minority case within the Italian obstetrical landscape. Yet the Senegalese women in Quagliariello's (2019) study, most of whom were of low or middle SES, also displayed a critical reflexivity despite their fascination for some of the techniques. They considered amniocentesis in a negative way, as they saw it as risky, either because they had heard about risks of miscarriage associated to it, or because they believed more generally that it can provoke extra-biological risks by attracting the 'evil agents' interested in 'eating' the amniotic liquid.

C-sections were also resisted but for other reasons. Within their socio-cultural environments both in Senegal and within their migrant community in Italy, opting for an elective caesarean was generally seen as a sign of inferiority, powerlessness or loss of prestige for these women because they are expected to prove that their bodies are

capable of giving birth normally. In comparison, in Brasil —where analysts often mention a ‘perinatal paradox’ (Diniz, 2009) in that in rich-urban regions there are too many technological interventions in the birth process whereas in poor-rural ones too little technology is available; with both contexts posing risks for morbidity and mortality —access to caesarean section has for long time been seen as a way of being privileged, modern, secure, *cared for*, and even as a means of belonging to white- (upper) middle-class groups rather than the low- SES black groups (McCallum, 2005).

Risk colonization and the commodification of technical innovations

Women’s uptake of technology, then, is not always or merely catalyzed by concerns for mitigating risks associated to pregnancy and childbirth thanks to techno-scientific innovations (Rapp, 1998), although in some cases, this may be the dominant reason (Maffi & Gouilhers, 2019). They also have to do with the way the imaginaries of technology are socially constructed, as synonym of modernity, or as a sign of belonging to a privileged class, for instance. Beyond, women may adopt technologies not because they are fascinated by them, but because they do not have many other alternatives in front of them. Topçu’s (2019) analysis, in this issue, of the generalization of caesarean births in western Turkey illustrates this point.

Similar to their Jordanian counterparts and unlike those in Switzerland studied by Maffi & Gouilhers (2019), birthing women analyzed in western Turkey do not consider their birth experiences (be it vaginal or abdominal) as a beautiful, special or magical one, but mostly as a ‘technical process’ (*painful* if it is vaginal, *unknown* if it is abdominal—because most C-sections are realized under general anesthesia) to accomplish in order to have their babies in their arms. They opt for caesarean birth, and even pay for it in private clinics, because vaginal birth is also experienced as something technocratic, disempowering, even surgical (episiotomies are massively practiced), and additionally labour pain is not relieved in the latter case. The medical risk discourses, which categorize C-sections as entirely safe and vaginal birth as risky, also play a role in this frame, but they are not the only determinants of such a ‘technology colonization’, that is to say, such a strong control and even domination of childbirth by medical technologies, machines and pharmaceutical products (Topçu, 2019). Recent government policies aiming to regulate the caesarean epidemics in the country, in particular the ban of (elective) caesareans on maternal choice in the public sector, resulted in the establishment of new risks (organizational risks, reputational risks) which now compete with the biomedical ones. At the same time, they resulted in a greater delegation of ‘C-sections on maternal choice’ to the private sector, for which women no longer benefit from health insurance coverage. Caesarean birth, or the maternal choice for C-section, was thus transformed into a commodity to sell, thereby creating new inequalities.

Women may furthermore adopt technologies not because they are fascinated by them or because they consider them as a source of security, but because not doing so may provoke social risks, in particular regarding whether they are able to afford them. The case of the Chinese pregnant women at advanced maternal age, who opt for non-invasive prenatal tests (NIPT) is emblematic of such dynamics. Qiu (2019) shows in this issue how, with the shift to the 2-child policy and the parallel development of the domestic market for prenatal tests, expectant women older than 35 years of age are

widely categorized as “high-risk” by the medical bodies. Risk categorization appears in this frame to be tightly connected to imperatives of medical consumption which, according to the author, became an important element of the maternal experience in China, just like the search for the perfect foetus and child (‘suzhi’). Women are expected to act as rational and responsible players in this frame by choosing the right test, preferably the NIPTs which are not invasive like amniocentesis but are far more expensive. Risk thus serves to create new consumer categories (the AMA women) for new markets (NIPTs), while these new markets themselves create new social inequalities (only middle or high SES women can afford NIPTs) as well as new forms of self-responsibilization for the expectant women.

The case of working-class pregnant women in Brazil, analyzed by Faya-Robles (2019) in this issue, reveals other dynamics however. Different from Qiu (2019), Faya-Robles considers public pregnancy care and management where clients are mostly the working class or low-SES women living in favelas of Rio de Janeiro. Faya-Robles shows that —in a context in which the healthcare services’ economic costs for the state are an important concern, but where the state is at the same time supposed to improve the safety of pregnancies and childbirth, especially among precarious women who are the most ‘at risk’ according to national statistics — *healthisation* replaced *medicalization* as a governmentality tool.

Following Clarke and colleagues (2000), Faya-Robles (2019) tackles healthisation as a way of governing which is less characterized by the preponderance of biomedicine than by the presence of health questions in all levels of daily life, where health has become a value in itself. The self-responsibilization of individuals, or the conduct of their conducts in the name of risk prevention and mitigation (by opting for healthier diets or lifestyles and by avoiding risky behaviours), appears to be central in this frame. The governmental aim behind such a use of risk as a technology of regulation of the reproductive process involves, according to Faya-Robles (2019), the replacing costly medical technologies of pregnancy surveillance (whose generalization, as material technologies, requires important budgets) by those of self-conduct, which are immaterial, and thus cheaper or even free. Faya-Robles (2019) also shows however that risk is not a strategic tool for states, regulatory agencies or health professionals only, but also for women and even those women facing greatest precarities. Risk here becomes transformed into an identity discourse (women can insist on their belonging to a high-risk or fragile category of women, as defined by the public authorities) in order to have access to obstetrical technologies (such as ultrasound) and to proper medical care. The Brazilian case study thus provides evidence that a greater focus on risk does not necessarily lead to a greater technologization of care. Risk can serve as a tool both for technologizing and detechnologizing pregnancy and childbirth, depending on who mobilizes it (government actors versus women) and for what purposes (cost reductions in state care or access to free care).

Conclusion

For the last decades, pregnancy and childbirth processes have been transformed to a great extent under the influence of two historical movements: pathologization of the

maternal body and its techno-bio-medicalization. By focusing simultaneously on the 'material' ('technology') as well as the 'immaterial' ('risk') pillars of these processes, the collected papers sought to analyze their singularity or, on the contrary, standardization ; their complementarity or, instead, incompatibility — at different national settings. This special issue has, however, opened more research questions and paths than it has closed. The women's uptake of obstetrical technologies, more studied for pregnancy surveillance than for childbirth until today (because the former, such as echography, have often been judged 'revolutionary' while the latter, such as labour induction, have been considered routine and thus banal) deserves particular research attention in the future. In this frame, several papers of the special issue provide evidence on the pertinence of tackling the question in an intersectionality perspective, which means being attentive to questions of race, gender and class simultaneously, without falling in the trick of culturalism. The findings of the papers gathered together in this issue also suggest that the multiple meanings of risk in pregnancy and birth management can be best understood by taking into consideration the local reappropriations of risk even when it is 'imported' or when it seems to have been designed as a macro-level governmentality tool. Last but not least, the special issue highlights the analytical relevance of the economic question in the governance of reproductive processes, in that financial or market concerns seem to increasingly orientate the existing as well as the future risk theorizations, discourses and practices.

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