

For the sake of the child: The economisation of reproduction in the Zika public health emergency

Paige Marie Patchin 

Geography, University of British Columbia, Vancouver, BC, Canada

Correspondence

Paige Marie Patchin

Email: Paige.patchin@geog.ubc.ca

Feminist work on population governance has tracked its racial dynamics, its varied attempts to expunge the poor from the future, and its violent wresting of control over reproduction away from women. Attention has recently turned to “economised” understandings of possible and proto-life that take the aggregate reproductivity of certain groups of women and girls as a means of shaping economic futures, which emerged as the dominant form of population governance during the Cold War. Underexplored in this incisive body of work, however, is the relationship between the reproductive body and social reproduction. This paper advances feminist work on adjudications of life worth in government policy and scientific expertise, and critical political economic work on global health governance, by exploring experiments in family planning. I do this through a discussion of the Zika virus, the recent re-emergence of which was framed as an economic problem: experts “priced” a single case of microcephaly at US\$10 million or more across a lifetime. Specifically, I examine a programme of contraceptive provision to women in Puerto Rico as part of the public health emergency, which I show to have possible eugenic effects. I argue that in the global politics of public and reproductive health, relatively new neoliberal health metrics have joined up with eugenicist impulses to value life according to future economic contributions. Such valuations of life focalise the reproductive body while abandoning the social reproductive body. The relationship between reproductive labour and social reproduction warrants further scrutiny, for as we careen through uncertain ecological futures, and as discourses about limited Earth for humans amid environmental crisis and limited funding for future children thicken, the reproductivity of certain women and girls is being tinkered with by experts, governments, and private institutions in new ways.

KEYWORDS

climate, empire (Puerto Rico), feminism, political economy of health, reproduction, Zika

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1 | VALUABLE AND UNVALUABLE LIVES

Why are some lives deemed worthy of public investment and others deemed unworthy of being born? Feminist theorists have long explored the differential ascription of life worth in government policy and scientific expertise, which has translated into the persistent delimitation of women's bodies as sites through which the future could be shaped. Across the late 19th and early 20th centuries, demographers, physiologists, soil scientists, and geographers reworked Malthus's prediction of a crisis of overpopulation amid limited Earthly resources (Bashford, 2014; Davin, 1978). Eugenicist projects were carried out in a multitude of geographical contexts to bring the population in line with state needs (Nadkarni, 2014; Stern, 2005), utilising state institutions like the hospital and reservation, as well as private institutions like the women's society, the church, and the plantation (Schuller, 2017). Women's reproductivity was cast as a foremost arena of racial and imperial engineering across these projects.

Casting a critical gaze to confluences of life, earth, and economics in the second half of the 20th century, Michelle Murphy (2017) has recently argued that a new mode of population governance emerged during the Cold War. Experiments in family planning, instead of overt obligations of pregnancy or sterilisation, became the dominant form of state, para-state, and philanthropic management of reproduction. Development-oriented programmes were assembled with the ambition of cultivating future prosperity, and as Kalpana Wilson (2015) argues, they often mobilised liberal feminist conceptions of reproductive choice. Foetuses, girls, and women – as well as the children girls or women *could* have – were classified by their projected impact on the national economy: “a new era of calculative practices designated both valuable and unvaluable human lives: lives worth living, lives worth not dying, lives worthy of investment, and lives not worth being born” (Murphy, 2017, p. 7). The “economisation of life” is concerned not with individuals, but with aggregate would-be life that can be assessed in the lexicon of cash. Women, as the grouped progenitor of future life (“population”), are its point of intervention.

This biopolitics pivots on the notion that some people must not be born so that others might live more affluently in the future. In this way, it can loosely be traced back to Darwin as much as to Malthus: there are always too many beings that are reproduced, so some organisms must die without reproducing in order for other (fitter) organisms to live (Bashford, 2014, p.13). The major question asked in this “biological-spatial” conception of reproduction is this: “in local, national, and global human ecology, which humans died (or would ideally be prevented from being conceived in the first place) to make room for the rest” (2014, p. 13)? The “economisation of life” tracks these questions back in time, before birth, and forward to the future through the language of collective prosperity (or at the very least, stability), focalising women and girls as sites of economic governance. And while the reproductive health projects of the “economisation of life” are distinct from earlier forms of population control that sought to improve racial “stock,” Murphy is clear that the turn from the biological framework of heritability to the framework of future economic potential continued to racialise life and operate in the service of imperial powers. As Sophie Lewis puts it, “Supposedly nonracist, universalist concerns about quality of life slip, easily, into competitive latter-day-imperial worries about being overtaken, overrun” (2019, p. 11).

Where does this leave reproductive governance now, as all manner of healthcare is defined by the “epistemological primacy of cost relations” (Ehlers & Krupar, 2017, p. 39), as feminist debates about population governance are invariably cast through the prism of eco-crisis (Clarke & Haraway, 2018), and as popular culture speculates about the end of reproduction in human extinction (Clark, 2017; Sheldon, 2016)? In other words, how is life being economised in reproductive governance today? And with what effects for the women and girls involved?

In what follows, I broach these questions through an exploration of the Zika public health emergency. Feminist work on population governance has tracked its racial dynamics, its varied attempts to expunge the poor from the future, and its violent wresting of control over reproduction away from women. Underexplored in this incisive body of work, however, is the linkage between interventions in the reproductive body and the everyday reproduction of social life, that is, the relationship between “biological” reproduction – what Lewis (2019) calls “gestational labor” – and social reproduction. I extend feminist work on emergent forms of population governance that posit family planning as a fundamental response to global environmental and economic instability (Bendix et al., 2020; Hendrixson et al., 2020; Wilson, 2017), as well as on the responsabilisation of certain women for the problems of Zika specifically (Patchin, 2020; Rivera Amarillo & Camargo, 2019). Exploring the logics that underpin birth control-focused Zika intervention allows me not only to consider the ways race-, class-, and nation-based family planning experiments have (and have not) changed in recent years, but also to contextualise the unfolding of these experiments in the everyday lives of those women drawn into them.

In detailing how new neoliberal health metrics have joined up with longstanding eugenicist impulses to “price” the future economic contributions of possible or proto-life, I also contribute to critical political economic work on global health governance. As will become clear, this response to Zika was part of a broader regime that judges health interventions based on “cost-effectiveness” (Mitchell & Sparke, 2016; Sharp et al., 2010; Sparke, 2017). Emma Whyte Laurie writes of “the power and persuasiveness of numbers” (2015, p. 84) in global health governance, which devalue entire groups of people

and places: this is the context in which approaches to Zika were engineered and realised. My aim is to theorise contemporary reproductive governance along with social reproduction – those myriad forms of labour that support embodied social life. I posit that “economised” understandings of life separate women's bodies into two parts, focalising the reproductive body while abandoning the social reproductive body.

To do so, I look at a diffuse network of expert knowledge in epidemiology, demography, and health economics that constructed the Zika virus as a reproductive and economic problem. The analysis unfolds in three steps. First, I visit Zika's history and explain how it was “priced” in the United States. This section doubles as exposition on the entwined histories of neoliberal health metrics, racist adjudications of reproductivity, and the incitement to monitor for signs of disability in utero. Second, and because of the intimate relationship between population governance and the politics of empire, I track my analysis to Puerto Rico, a U.S. colony where one-fifth of the population was projected to contract Zika. Here my focus is neoliberal health metrics, though these cannot be separated from the long history of anxiety over Puerto Rican women in U.S. public health expertise. Third, I analyse contraceptive provision in Puerto Rico, outlining its connections to U.S.-mandated austerity. The Zika Contraceptive Access Network (Z-CAN), organised by the U.S. Centers for Disease Control and Prevention Foundation (CDCF), sought to equip women in Puerto Rico with long-acting reversible contraceptives (LARCs) like the intrauterine device (IUD) as a cost-effective way to “avert” costs associated with microcephaly. Z-CAN importantly provided women with their desired form of contraception in a landscape of otherwise sparse options, but, as I show, it was also wrapped up in processes of economisation that hierarchise life.

2 | MICROCEPHALY AND THE “ECONOMISATION OF LIFE”

The Zika virus became a global problem because of its capacity to reconfigure human reproduction. Transmitted by both sex and mosquitoes, its designation as a public health emergency was tied to an emerging consensus on a causal link between a woman contracting Zika during pregnancy and problems in brain development in utero. “Microcephaly” is the term given to babies born with a smaller head size as a result, and because its threat was located in the timespace of pregnancy (specifically the first trimester), the body that could become pregnant was the central site of public health knowledge production and biopolitical intervention.

Congenital birth defects have long been considered tragedies in the United States. The mid-20th century history of rubella, in which 30,000 babies were born with birth defects, played a profound role in constituting them as such (Reagan, 2012). By the 21st century, the narrative of tragedy had become a fundamental strategy of pro-choice activists. “Messaging and storytelling that relied on pre-natal disability diagnosis as a justification for access to late abortion” multiplied, casting “any potential disability as a ‘painful tragedy’ to be avoided at all costs” (Roberts & Jesudason, 2013, p. 323). Such storytelling echoed across the Zika public health emergency, distinguishing it from other recent outbreaks. *New York Times* health reporter Donald McNeil Jr (2017) suggested that media coverage of Ebola – “pictures from Africa showing men in space-suits carrying dead bodies” – induced panic in readers, while coverage of Zika, with the vulnerable baby at its centre, induced a more compassionate response.

However, microcephaly was primarily described as an economic problem in U.S. public culture. As public health reports emphasised, a sudden surge in birth defects would burden state healthcare systems, as well as parents, extended care networks, and private insurance firms. State-funded care for children with microcephaly would fall under the mandate of Early Interventions B-3, a federal health programme that provides care for children under age three with disabilities (Gruendel et al., 2016). Multidisciplinary care would be required for “Zika babies,” including hearing and vision screenings, preventative paediatric care, and neurological assessments. This suite of measuring and monitoring professionals was imagined to be multiplied by the number of microcephaly cases (hundreds? thousands? millions?) and drawn across the lifespan.

The first to quantify the cost of a single case of microcephaly was The first to quantify the cost of a single case of microcephaly was the director of the U.S. Centers for Disease Control and Prevention (CDC), Tom Frieden. CDC director Tom Frieden. At a press conference following the Zika Action Plan Summit in April 2016, which 300 public health experts attended, he gave the figure of US\$10 million, arrived at by birth defects specialists. The figure was later cited by, among others, *The Washington Post* (Sun, 2016), *National Public Radio* (Kelly, 2016), *NBC News* (Fox, 2016), and the *New York Times* (McNeil Jr., 2016a). In the same month, alongside a long list of other organisations, the American Medical Association, American Congress of Obstetricians and Gynecologists, American Nurses Association, and American Pediatric Association signed an open letter to Congress urging the allocation of additional funding for Zika management. “In addition to the human toll on children and families,” the letter proceeded, “the CDC estimates that the average lifetime cost of caring for each child born with microcephaly will likely be millions of dollars per child.”

A key feature of this accountancy was the uncharted character of microcephaly: its long-term effects were unknown; so were its costs (McNeil Jr., 2016a p. 85). Questions abounded: Will children who experience seizures continue to do so across their lifetime, and what kind of medication will they require? What kind of learning or physical disabilities will congenital Zika syndrome produce, and what kind of speech, physical, and occupational therapy will be needed? How often will children require physical exams? A report from personal finance website CBS Moneywatch utilised the language of the insurance firm to explain the predicament of unknown costs:

Children born with microcephaly, which has no cure, will require long-term care if they survive. Some microcephalics can live normal lives, but most suffer from severe disabilities. And while some could die early on from complications, a vast majority will need care throughout their lives. In insurance lingo this is referred to as a 'long-tail' loss because the extent of the damage isn't known and is paid out over many years. For example, children with Down syndrome can live well into their 60s. (Leefeldt, 2016, n.p.)

Later there were attempts to more rigorously price microcephaly. Researchers at the CDC's Division of Reproductive Health arrived at a more precise estimation with the help of Truven Health Analytics' MarketScan, a commercial database of "real-world treatment patterns and costs" utilised by both public health researchers and businesses to assess financial and clinical performance together. Using the average costs of caring for a child with congenital cytomegalovirus as well as the paid and unpaid costs of caring for a child with severe congenital brain injury as two stand-ins for Zika-associated microcephaly, Li et al. (2017) proposed a lifetime cost of US\$3.8 million. Likewise, a team of epidemiologists and systems scientists modelled the potential "economic burden" based on different viral "attack rates." Cost estimates included direct medical costs, such as those associated with the public healthcare programme Medicaid, and societal "productivity losses" incurred from screening for the virus, monitoring the foetus, medical care for babies with microcephaly, and long-term care (Lee et al., 2017). The costs of microcephaly therefore included the lifelong medical care required for people unlikely to be able to join the labour force, as well as the partial or full removal of their primary caretakers from the labour force.

Implicit to all of this is what McRuer calls "compulsory able-bodiedness" (2006, p. 31), a disciplining culture with roots in 19th-century industrialism in which "being able-bodied means being capable of the normal physical exertions required in a particular system of labor" (2006, p. 8). More recent roots can be found in the technical health metrics that have become central to the work of institutions like the World Bank in attempting to quantify the "global burden of disease," as in, for example, the influential 1993 report *Investing in Health*. Such metrics are based on Gary Becker's human capital theory, which his student Michael Grossman (1972) developed by arguing that improving health could make more labour available to the market. In this light, lost productive time can be given a dollar-value. As Katherine Kenny puts it,

Health as a site of investment yields life, here configured as a form of time. The return on investment in health as human capital is an increased dividend of time ... Investing in one's health extends the *duration* of possible participation in market and nonmarket activity, and maximizes the term over which investment in one's health capital can be realized. Premature death represents the foreshortening of the term of investment. Health, on the other hand, extends life. But figuring health as form of human capital results in the reconceptualization of life as a *revenue stream*. (2015, p. 21)

Becker, I should note, was also profoundly influential in the field of demography: his second most-cited work, *A treatise on the family* (1981), connected individual reproductive decision-making, microeconomics, and population governance. Jemima Repo argues that "as a harbinger of our twenty-first century ontology of reproduction, Becker introduced the idea of reproduction as a matter of utility maximization" (2018, p. 250). In the context of "widespread panic about the overtaxed U.S. health care system" (Ehlers & Krupar, 2017, p. 39), microcephaly was constructed as a reproductive problem in terms of the future cost of care and lost productive time, evincing the "economisation of life."

Both women and children were racialised in this arithmetic. For example, after reports that a Honduran woman flew to the United States and gave birth to a daughter with microcephaly, conservative pundit Ann Coulter tweeted: "Honduran woman flies to New Jersey to give birth to Zika baby. Her anchor baby will cost AT LEAST \$1 million to treat." News of the birth made its way through mainstream news conglomerates, as well as white nationalist platforms like Breitbart. Likewise, CNN Moneywatch shepherded the CDC's price tag through a series of gestational, epidemiological, and demographic probabilities, including the number of women in the United States who were likely to get pregnant in 2016, the percentage of those women who lived in places at risk of Zika, and the percentage of children born to women who had had Zika who develop microcephaly:

So here's the speculative—and very speculative at that—math. The Center for American Progress estimates that 2 million women in the U.S. will get pregnant this summer and fall, with nearly half of them living in areas potentially at risk of Zika. It's important to note that the public policy group's analysis isn't based on the actual prevalence of Zika around the country, while even if the virus spreads only a fraction of women are likely to be infected. Still, if even just one in 10 gets Zika, the CDC estimates that up to 13 percent of their unborn offspring could develop microcephaly. If just 13,000 babies are born in the U.S. with this disability or to women who migrated here for better medical treatment, the cost of keeping them alive and providing for their lifetime care could range from \$13 billion to as much as \$130 billion. (Leefeldt, 2016, n.p.)

In similar form, Breitbart mapped costly futures onto a child born with Zika-linked microcephaly in Texas, whose mother was Colombian:

If just 100 of these babies are born in the state, it would cost taxpayers over a billion dollars during the lifetimes of the children. The cost for the 400 pregnant women who have tested positive for Zika in the U.S. to date would total almost \$4 billion. (Shadwick, 2016, n.p.)

Drawing on the persistent linkage in U.S. culture between infectious disease and prospective or already-landed immigrant populations (Markel & Stern, 2002), and on portrayals of state-funded healthcare as unfairly benefitting poor mothers of colour (Hill Collins, 2004), these dystopian scenarios demonstrate the transformation of microcephaly from a clinical term to a site of aggregate economic speculation with latent racial anxiety, in which costs were imagined to enter the nation, spread horizontally across the population through medical care and lost productivity, and reach into the future.

Thus, women in Zika accounting were constituted differently by racial and geographical location. The oeuvre of Dorothy Roberts is key to understanding this. *Killing the Black Body: Race, Reproduction, and the Meaning of Liberty* (1997) examined the U.S. government's longstanding assault on Black women's reproductivity, vitally juxtaposing policies that discipline them for having children that are “costly” in the eyes of the state, on the one hand, and advanced biotechnologies that aid solvent, largely white women in their endeavour to have biological children on the other. Later, Roberts (2005) would reconsider the antagonistic framing of these two reproductive regimes, looking instead to their mutual constitution. With Sujatha Jesudason, Roberts further develops this line of thought by turning to disability, suggesting that impoverished women of colour might now be more likely to undergo prenatal genetic screening than middle-class and elite women, but because they are obliged to do so in an institutional environment that deems both disabled children and the children of poor women a drain on state coffers (Roberts & Jesudason, 2013). This, they note, ironically rescripts the argument Roberts had made 15 years earlier, as well as Nikolas Rose's (2007) influential claim of a historical shift from the eugenicist management of health to the personal management of health specific to one's genetic code.

It should by now be clear that future children in the story of Zika were differentially constituted by racial and geographical location as well. Queer theorist Lee Edelman (2004) has argued that an all-pervasive image of future children plays a central role in U.S. civic life: the Child (deliberately capitalised) serves as “the perpetual horizon of every acknowledged politics, the fantasmatic beneficiary of every political intervention” (2004, p. 3). The Child modulates political discourse by its veneration as a source of meaning in a meaningless world. The nonhuman excess of Zika, with its capacity to shape the Child, adds even more weight to this imagined horizon. The Child – distinct from “the lived experiences of any historical children” (2004, p. 11) – becomes synonymous with the future amidst environmental change and neoliberal health imagineering.

The “Zika baby,” though, is distinct from the Child. The former embodies the openness of the human to infectious disease; the latter is at the centre of discourse around child development and national tragedy. The former is a racialised figure of fear; the latter is to be protected. And crucially, there is a relationship between the “Zika baby” and the Child. In the economisation of Zika, the costs that accrue to the former are seen to compromise the future of the latter.

3 | MODELS AND METRICS OF REPRODUCTIVE COST-EFFECTIVENESS

With Zika accountancy in view, it is easy to see why U.S. government agencies were concerned about the diffusion of Zika in Puerto Rico, a Caribbean island inside the borders of the United States. As U.S. citizens, Puerto Ricans are eligible for Medicaid, which provides medical services for low-income people and people with disabilities. (They are, however, funded at a reduced rate.) Anxiety about microcephaly costs were mapped onto the island, and as soon as the presence of Zika was confirmed in the body of a pregnant Puerto Rican woman in February 2016, aggregate examinations of women and girls proliferated. Tepper et al. (2016), for example, tabulated 138,000 reproductive women who did not desire pregnancy who were not

practising effective contraception. They also reinterpreted an earlier survey of risk behaviour to argue that 50% of teenage girls (15–19 years) were “sexually experienced,” with a birth rate almost double that of the United States overall. Of Puerto Rican girls, Leefeldt wrote, “Preventing pregnancy in this group could prove harder than stopping Zika” (2016, n.p.). Running through this expert knowledge was, as Adriana Garriga-López (2016) has noted, the sexualisation of teenage girls and the stigmatisation of teenage pregnancies, which produced the teenage girl body as the “focal point of control.”

Enter the Zika Contraceptive Access Network (Z-CAN), a programme that sought to prevent Zika-related microcephaly through contraceptive provision. Pharmaceutical corporations like Merck and Bayer donated devices and pill packs for Z-CAN, while the Bill and Melinda Gates Foundation and Pfizer donated funds. Public–private partnerships like this have played a fundamental role in the recent shift to reproductive healthcare in international development (Wilson, 2015, p. 816) and “operate as the main agents of innovation and investment” in healthcare broadly (Mitchell & Sparke, 2016), while the pharmaceutical firms themselves have been a prominent fixture in Puerto Rico since the 1970s (Dietrich, 2013). Funds were channelled through the CDCF, a non-profit which marshals private-sector resources in support of the CDC's public health mandate. The programme trained clinical staff in contraceptive counselling and the insertion and removal of LARCs in single-day sessions, to eventually provide free contraception in 153 clinics across Puerto Rico (Lathrop et al., 2018). Women were drawn into Z-CAN by doctor suggestions and posters in health centres or from friends and family; a Z-CAN website and Facebook page also provided information to the curious.

In June 2016, the CDCF had only raised enough money and trained enough doctors to provide contraception to 700 women. Few of the donated IUDs had ended up in the uteri of the “target population,” bringing the CDCF to call for an additional US\$20 million (Mincer, 2016). However, by August 2016, 102 of the 300 gynaecologists on the island had become officially authorised Z-CAN providers. The Puerto Rican Department of Health assumed greater control over the programme in April 2017, and by August 2017 over 20,000 Puerto Rican women had received contraceptive counselling, with 95% returning home with a new contraceptive method or replenished supply of oral contraceptives at no cost. The vast majority (68%) chose and received an IUD or implant; project organisers highlighted that of the over 14,000 women in whom contraceptive devices had been implanted as part of Z-CAN, almost 11,000 had previously used condoms, withdrawal, or no method of birth control (Lathrop et al., 2018).

Some complexities here necessitate a pause. Considering the difficulty Puerto Rican women face in procuring the kind of contraception they might desire and the cultural setting of abstinence-only sexual education in which girls are socially punished for expressions of sexual agency (Rodríguez-Díaz et al., 2017), the expansion of access to contraception is a good thing. However, the question of reproductive “choice” can never be extracted from the political economic and biopolitical conditions that enfold it. The foremost spectre haunting Z-CAN, which project practitioners acknowledge, is the sterilisation of up to one-third of women in Puerto Rico in the 1970s and 1980s (Dávila, 1990). Laura Briggs argues that reading sterilisation as “social control” is complicated by the fact that many women actively sought the procedure; as she also makes clear, though, sterilisation could at once be “essential to economic survival ... and be women's decision” (1998, p. 46). I want to question why and how the mass implantation of small devices into the arms and uteri of women is intelligible as a public health intervention.

Especially relevant to such questions is the long history in U.S. science and public policy of anxiety over Puerto Rican women's reproductivity. While it moved and turned across the 20th century, this body of expert knowledge was defined by its presentation of reproductivity as costly and dangerous. Public health journals were concerned with “overpopulation” (Briggs, 2002), espousing fears rooted in eugenicist concerns over national biological decline (Hanson & King, 2013, p. 198). Demographers carried this Malthusian-Darwinian ethic into the middle of the century with Puerto Rico as a reference point. *Human Fertility: The Modern Dilemma* (1951), by geneticist, demographer, and eugenicist Robert C. Cook, was a major work of reference in the field of population control during this period, and Puerto Rico was one of the places he described when he wrote of “unbalanced and unchecked fertility ravaging many lands like a hurricane or a tidal wave” (1951, p. 15). Qualitative social science contributed to this imaginary. Oscar Lewis's influential ethnographic study of a Puerto Rican family that bridged island and mainland, *La Vida: A Puerto Rican Family in the Culture of Poverty* (1966), developed the concept of the “culture of poverty,” providing an interpretive lens for policymakers intent on delimiting a reproductive root to poverty. So too did clinical research. In her endeavour to develop oral contraceptive pills for women everywhere, philanthropist Katherine McCormick called for a “cage of ovulating females to experiment with” (quoted in Marks, 1999, p. 263). Though experiments in Puerto Rico were not simply thrust onto a passive group of women, Paul Preciado argues, “The island of Puerto Rico itself was treated as an extended, nonwhite, female body to which the Pill was administered in terms of what Foucault called ‘urban therapeutics’” (2013, p. 180). There is, in sum, a well-worn track in U.S. science and policy of scripting broad social and socio-ecological problems as problems of Puerto Rican reproductivity, which pharmacological expertise could salve.

Z-CAN was also underpinned by contemporary metrics evaluating the cost-effectiveness of birth control provision as a means of addressing Zika. As the virus was constituted as an emergency of future cost, researchers delimited a gap in contraceptive use in Puerto Rico, the primary area of active viral circulation within the territorial borders of the United States. Discussions about filling it focused on the promise of the IUD, a method deemed “highly effective” for ease of use and long-term station in the uterus but employed by less than 1% of women in Puerto Rico. IUDs were scarce on the island and expensive; hospitals, family planning clinics, private medical offices, and community/municipal health clinics were consistently out of stock, and only a limited number of care providers were trained in insertion. Addressing the reproductive faculties of Puerto Rican women and girls amid the Zika emergency would therefore require both a significant increase in the supply of devices and the training of physicians and nurses who could administer them. CDC researchers turned to evaluating the cost-effectiveness of a programme that would do so.

One assessment tool was the decision tree model (Li et al., 2017). Decision-tree methodology weighs the aggregate financial burdens of clinical interventions against one another, delimitating “a point at which the cost differential makes one decision truly superior to another” (Werner et al., 2012, p. 2). The recent rise of decision-tree analysis demonstrates the centrality of market logics to contemporary healthcare decision-making, as well as the broader cultural reduction of lives to economic imprint. The “target population” of this tree was defined as fertile, sexually active women with male partners, not desiring of children within a year and not utilising tubal ligation. The tree measured non-intervention against same-day, no-cost provision of contraception; costs spanned the pills and devices themselves, training and compensation for the insertion and removal of implants, and education materials and media campaigns. The cost of intervention was tabulated at US\$33.5 million, or US\$206 for every individual in the “target population.” One “output measure” of the model was the number of microcephaly cases avoided.

The weighing of costs and benefits does not end with cash-in, cash-out arithmetic in decision-tree analysis. In cases where interventions prove costlier than non-intervention, the value of intervention can be quantified in other ways. Another key “output” measure of the Zika decision tree was Healthy Life Years (HLY) gained. HLY is population health metric that functions as a “disability-free life expectancy indicator” (Robine et al., 2013, pp. 1–2), and it employs an arithmetic very different from that utilised in descriptive epidemiological studies before the 1990s, which looked at brute numbers of deaths resulting from specific diseases. Metrics like HLY try to account for “the impact of diseases and conditions that may not be fatal, but by virtue of their duration and disabling effects contributed to losses in the form of diminished productivity and strain on health systems” (Kenny, 2015, p. 16). The aversion of microcephaly was translated into the years of disability-free life that could be gained, increasing economic productivity and reducing public expenditures on healthcare. Thus, the purpose of utilising HLY in the Zika decision tree was to capture how mass birth control provision could optimise the population, even in situations where the model predicted intervention costs to exceed non-intervention costs. And crucially, it captured intervention benefits in a dichotomous financial register of work (good) and public care expenditure (bad).

In the end, the model predicted the aversion of 25 cases of Zika-associated microcephaly in a single year (16 of which would have resulted in live births), projecting US\$31.7 million in savings in the most likely scenario. Overall, the proposed birth-control intervention was deemed cost-saving in 92.11% of the model's possible outcomes and cost-effective in 98.1% of outcomes. This second figure includes the small percentage of outcomes in which intervention would fail to save money but was still deemed “cost-effective relative to accepted cost-effectiveness thresholds” in adding disability-free years to the population.

For emphasis, it is important these models and metrics not be taken at face value. They constructed not only Zika in a very particular way, but also the relationship between individual and group health, the state, and the future in a very particular way. HLY is similar to Disability Adjusted Life Years (DALY), pervasive in global public health expertise, which presumes “the lived experiences of a disability or ailment would be universally identical, deliberately avoiding the social, cultural, economic and political contexts within which individuals experience ill health” (Laurie, 2015, p. 83). HLY is also similar to Quality Adjusted Life Years (QALY), in which the quality of each year of life is quantified into a “utility” on a scale from 0 (immediate death) to 1 (perfect health), with “utilities” totalled across a lifetime (McGregor, 2003). The use of the word “utility” conjures its lay meaning of a state of being useful or profitable to someone or something, as in, for example, the utility of lives to circuits of production and consumption. However, where QALY assigns utilities on a sliding scale, HLY is a dichotomous metric that slots lives into a 0–1 binary, where 0 signifies disabled and 1 signifies perfect health (Murray et al., 2000, p. 985). All of these metrics literally devalue years of life lived with disability, not over fear of bodily difference, but through projected contributions to or deductions from the economy. Furthermore, implicit to this model is the suggestion of the existence of a point at which investments in healthcare are no longer “worth it.” This is because, in decision-tree modelling, a financial threshold must be agreed on at which gaining a single HLY through healthcare intervention is no longer “cost-effective” in the more expansive sense than dollars in, dollars out. This is the point around which the whole framework operates.

As a final comment, the HLY metric, as Kenny observes of related metrics, “represents an internationally standardized quantum of life measured as a unit of time, that is, time as life-years” (2015, p. 16). This is distinct from disease statistics, which discern the prevalence of a disease across the population, and also distinct from vital statistics, which look at the condition of a single body across a lifetime. HLY measures the optimisation of health through future productive time, eschewing lifetimes for “*life/time*, life-as-time” (2015, p.16). It breaks down lifetimes into units that may be measured against one another, without – and this is key – stooping to the cultural taboo of ascribing brute dollar-values to human life.

Of course, as we have seen, brute dollar-values were recurrently affixed to the “Zika baby.” However, there is a distinction between those price-tags and the use of the HLY metric in decision-tree analysis. The former was more clearly wrought by resurgent white nationalism; the latter was enrolled to rationalise well-meaning attempts to present mass birth-control provision as worthy of investment even if, on the surface, such provision may cost more than the money that would be saved. (HLY is an explicit recognition that public or public-private expenditures on healthcare can be “worth it” even if they are expensive.) But such metrics add weight to the tyrannical framework of cost-benefit analysis, which Matthew Sparke has argued is bound to “healthcare rationing in market-based systems,” foreclosing “ethical invocations of health as a basic human right, replacing them with a de-contextualized and thus methodologically flattened landscape of health services as commodities as metrics” (2009, p. 141).

And it would be a mistake to suggest that this mode of reducing lives to future economic impact is agnostic in terms of race. “Averted birth,” one of Michelle Murphy’s central concepts, names the “better-to-have-never lived” (2017, p. 47), those lives precluded by targeted family planning programmes. In the first instance, Z-CAN may have been a Zika prevention strategy, but it was also a birth aversion strategy. It was sanctioned and celebrated for its cost-effectiveness: care costs across the lifespan would be deterred, forestalled, obviated. The central principle of this logic is that the birth of some humans should be “averted” so that others, in the future, might live more comfortably. Race need not be explicitly named in cost-benefit analysis for it to set racialised adjudications of life worth in place. In step with a range of other programmes led by pharmaceutical multinationals to rapidly distribute LARCs (Bendix et al., 2020), Z-CAN outreach material promoted IUDs and contraceptive implants as the favoured contraceptive methods for their longevity and ease. On the Z-CAN website, IUDs were (paternalistically) described under the heading “One time, that’s it” (*Una vez y ya*) like so:

If you forget even to eat breakfast, these are the option for you. [LARCs] are long-term and highly effective contraceptive methods. In just one visit you can acquire birth control that can last from three to ten years, depending on the type of IUD you choose. These methods are reversible, so if at some point you want to have children, just visit us and we will remove it. All of these methods [hormonal IUD, nonhormonal IUD, implant] are covered by the Z-CAN program; that is, you don’t pay anything. (Z-CAN, 2017; my translation)

In addition to ease, however, the IUD was promoted because its effectiveness in preventing conception translated directly into cost-effectiveness at the level of the population through the aversion of costly lives. In the decision-tree model, CDC researchers noted the sensitivity of Zika’s aggregate future costs to the proportion of Puerto Rican women using contraceptive methods high on established hierarchies of effectiveness. Every time an individual woman selected the IUD over another form of birth control, the lower the incidence of unintended pregnancy and, it follows, fewer Zika-associated microcephaly cases in the population.

In the cost-effectiveness paradigm, LARCs held the explicit promise to reduce aggregate instance of microcephaly, as well as the implicit promise that the mass aversion of microcephaly would enable others to live better. Or, with the wider cast of characters in the Zika public health emergency in mind, we might say that the Puerto Rican “Zika baby” must be averted for the sake of the Child.

4 | THE ZIKA CONTRACEPTIVE ACCESS NETWORK: AUSTERITY, HURRICANE, AND EUGENICS

As the Z-CAN programme was unrolled to avert Zika-induced financial crisis, another crisis was brewing, one which tied Puerto Rico to the U.S. mainland through finance capital. That crisis was a US\$72 billion public debt, which featured prominently in the headlines of U.S. newspapers, like “Zika’s threats come at a time when Puerto Rico is trying to pay off a massive debt” (Cornish, 2016, n.p.) and “the virus has been yet another blow to a debt-ridden island” (Associated Press, 2016, n.p.). Zika, reproductive bodies, and debt became intertwined in deliberations about what the island “owed” finance capital amid a public health emergency, in discussions of whether it was debt or Zika that had overwhelmed the local

healthcare system, in scholarly estimations of what “Zika babies” would cost, and in the question of whether investments in reproductive healthcare services in Puerto Rico would save money. Their fusion was crucial in sustaining the economised imaginary of Zika.

Puerto Rico's debt was born of the same 1917 law that deemed Puerto Ricans U.S. citizens: the Jones Act enabled local governments to fund service provision through the issuance of bonds exempt from U.S. tax (Rodríguez-Díaz, 2018, p. 31). These bonds were cheap and high-risk in addition to being tax-sheltered; investors bought them up, linked them to the pensions of ordinary people across the United States, and charged extremely high interest rates to Puerto Rican municipalities in return (Ora Bannan, 2016, p. 287). Alongside the instantiation of Z-CAN, the legal relationship between Puerto Rico and the U.S. government was being rewritten with profound ramifications for everyday life. The Puerto Rico Oversight, Management, and Economic Stability Act (2016) established a financial control board that could annul any local legislation that would tend to local healthcare, education, infrastructure, or other public services over debt repayment. Z-CAN coincided with the explicit prioritisation in U.S. law of the vitality of mainland hedge funds over life-making infrastructures in Puerto Rico.

In this context, how did Z-CAN actually work? At the most intimate of scales, the devices at the centre of the programme were not merely “provided,” but pushed through the cervical canal and embedded in the uterus, or implanted under the skin of the upper arm. Two critical features define LARCs: they must be embedded in the body, and both that embedment and any removal are supposed to be administered by physicians. The first feature means that the device often lay beyond physical reach; the second means that it is under the control of healthcare professionals. Briggs (2018) has made the point to describe LARCS as “physician-controlled long acting reversible contraceptives” to locate final reproductive control outside the body of the woman in which the contraceptive is embedded. This is not to say that LARCs do not have many benefits, such as the increased autonomy that comes from not having to remember to take daily pills. However, the spatial politics of physician-controlled LARCs means that the well-meaning vision of expanding access to easy, long-term contraception may result in fragmented control of participants over their bodies.

A key point here is that mass LARC insertion was part of an emergency effort that neither sought to maintain nor establish long-term access to reproductive healthcare. Funds and personnel were provided for implants to be inserted quickly, and while the reimbursement fee to be paid out to doctors was bundled to allow for both insertion and removal, many reports contradict the programme's promise of free and easy IUD removal. Z-CAN's “Ante la Duda, Pregunta” (“When in Doubt, Ask”) Facebook page, with a following of over 25,000 people, outlined the procedures for having a LARC removed: return to the same or another Z-CAN provider; make sure to bring your Z-CAN identification number. However, conversations among recipients on the page demonstrate that while many women were satisfied with Z-CAN, many found it difficult to access removal. Several recipients posted about being refused removal or charged several hundred dollars for it. For example, a Z-CAN participant wrote “I went to the same doctors that put in my implant for removal, and they told me they were charging me \$100 to remove it ... I didn't pay anything to get it put in ... I am about to pull it out myself because it's hurting me. I'm crazy to get rid of it.” The device of which she wrote, stationed underneath the skin of her upper arm, was Nexplanon, developed by Merck. Its forebear, Implanon, was the device of choice for the UK's Department for International Development to provide contraception to 14.5 million of the world's “poorest women”; it has been widely criticised and, in some places (including the UK), discontinued for its propensity to “disappear” inside the body. Nexplanon is distinguished from Implanon by its detectability by X-Ray, a technological enhancement that requires access to both equipment and expertise to address any problems that could arise (Wilson, 2015, pp. 816–817). Another woman commented that she too had been quoted US\$100, followed by another who had paid US\$150 for removal because of side-effects. There was also speculation among women about whether free device removal hinged on a minimum one-year tenure in their bodies: many of these posting about prohibitive removal charges prefaced their complaints by saying they had already had the device for more than a year. “Ante la Duda, Pregunta” acknowledged in a post in April 2018 that women should not have been charged for removal, yet reports of financial barriers to removal continued to be posted. This digital archive is not reflective of the experiences of all programme participants, nor does it suggest that Z-CAN was unilaterally oppressive. It does, however, point to the compromises women face in making decisions over contraception and the positioning of their bodies as biopolitical battlegrounds.

Likewise, many recipients reported that their original Z-CAN providers had moved from island to mainland in 2017, owing to the confluence of austerity and Hurricane Maria. The impact of austerity on the everyday lives of non-elite Puerto Ricans has been devastating. Hundreds of public schools have closed; water, gas, electricity, and food prices have skyrocketed; health benefits and pensions have been cut; and public-sector workers have been laid off (LeBrón, 2016). Medical institutions have been hit especially hard. Major cuts and doctor out-migration – one doctor per day was said to leave the island – meant understaffed clinics, often without electricity (Allen, 2016). Sparke calls the ever-present grind of ill health

under austerity “biological subcitizenship,” in which “cost-effective” interventions such as Z-CAN make real but narrow improvements, preserving “political-economic pathologies” (2017, p. 288; see also Bosire et al., 2018). The “sub-” prefix of this formulation also speaks to the incorporation of Puerto Rican women's bodies into economic imagineering of U.S. biopolitics, in which their possible “Zika babies” threaten the wellbeing of Children.

Hurricane Maria, which replaced Zika in mainland news, further destroyed local life-supporting infrastructures: powerlines not just structurally under-resourced, but gone; hospitals not simply understaffed, but gone (Mazzei & Sosa Pascual, 2017). Bundling insertion and removal in physician reimbursement for Z-CAN has had the consequence of structurally disincentivising removal by requiring the time-, cash-, and equipment-strapped healthcare providers that remained on the island to see a patient without further compensation. Though the LARCs at the centre of Z-CAN were not meant to be permanent, and though many women actively chose them, “physician-controlled long-acting contraceptives are in a sense the technological inheritors of the social impulse embodied by eugenic sterilization in an earlier generation” (Briggs, 2018, p. 128). Viewed in this light, Z-CAN may have eugenic effects.

The chronology here matters: the curtains on Z-CAN were drawn in September 2017, the same month the hurricane tore through the island and Puerto Ricans were abandoned by the Trump administration in terms of emergency response (Bonilla, 2017). Public-private response to Zika turned on the relentless counting of reproductive bodies, while in response to Maria, the federal government abstained from counting the lives affected. Among those not counted were those who had been killed in the storm, as well the people discharged from under-resourced hospitals, whose conditions would worsen without proper care (Sosa Pascual et al., 2018). Disabled people – the very category devalued by “economised” understandings of health – figured prominently in this latter group. Furthermore, Z-CAN's programme of “averted birth” cannot be extricated from what Naomi Klein (2018) has called the “depopulation” of the island, as investors seek to transform it into a tropical paradise for global elites. The Federal Emergency Management Agency (FEMA) constructed “airbridges” – transporting Puerto Ricans from the island to the mainland and providing funds for hotels for a few months – in lieu of restoring the island's electrical grid. Of evacuation, Puerto Rican attorney Elizabeth Yeampierre states, “What they [investors] want is our land, and they don't want our people in it” (quoted in Klein, 2018, p. 58). Post-Maria depopulation adds an additional layer to the logic of “averted birth.”

One thing “economised” understandings of potential and proto-life in family planning experiments do is focalise the uterus as the site of life-making, and they do so at the expense of the range of social infrastructures required for actually existing children and adults to stay alive and well. The field of immediate analysis (and thus the field of potential change in protocol) is delimited as the womb, and the womb (or more accurately, a massified group of wombs) serves as the single explanatory frame.

As such, this well-meaning and historically informed programme, premised on getting women fitted with LARCs as fast as possible, cleaved the reproductive body off from the social reproductive body. The former is the body externally defined by potential for “dangerous pregnancies” (Reagan, 2012), an always-potential vessel pointed at economic futures; the latter is the living body that supports their own life and that of others, the “activities that sustain human beings as embodied social beings who must not only eat and sleep but also raise their children, care for their families, and maintain their communities, all while pursuing their hopes for the future” (Arruzza et al., 2018, p. 68). Pluralised, the former is the massified group of reproductive potential (a “population”); the latter is the collective, the commons, the life force that includes and exceeds gestational labour.

5 | CONCLUSION: THE (SOCIAL) REPRODUCTIVE BODY

My ambition in this paper has not been to assess Z-CAN's effectiveness as a public or reproductive health programme. What I have tried to do is move beyond simple judgements of effective or even desired healthcare, pausing instead over the historical significance of the distribution of physician-controlled contraceptives to avert future lives deemed costly, amid the abandonment of infrastructures for social reproduction. For the avoidance of doubt, my own fervent support of the fact that women were able to acquire desired forms of birth control coexists with my wariness of the logic of the intervention. (As Lioba Hirsch (2020) argues, global health interventions under the shadow of empire often conflate care and violence.) I am troubled by the unequal incitements of insertion and removal, when the global system of life-valuation prized the aversion of microcephaly above all other considerations. I am troubled by the linkage of intrauterine and arm implantations for some women in the present to the economic vitality of others in the future. And I am troubled by the enduring logic of working on (and in) the reproductive body as the social reproductive body is deserted.

This is in many respects a recapitulation of a gendered logic that reduces women to biological reproduction, one that intersects with race, disability, and imperialist stratification. What the case of Zika shows is that relatively new health metrics have linked up with the adjudication of life worth according to future economic contribution in the global politics of

reproduction. Such metrics recoup and rework eugenicist anxieties and programmes in all sorts of ways: in, for example, longstanding anxieties about the reproductivity of women of colour in government policy and scientific expertise, the explicit eugenicist rhetoric of “averting” disability, and the possible eugenic effects of a well-meaning programme like Z-CAN. Feminists must keep a vigilant eye on the many different shapes that the racialised endorsement of reproduction for some people, and the obviation of it for others, might take.

It also shows that the desertion of the social reproductive body is part and parcel of the focalisation of the reproductive body in experiments in reproductive healthcare. Social reproduction is a hitherto undertheorised aspect of feminist work on economised biopolitics, and it speaks to the lived reality of being included in “target populations.” The theoretical task for feminism, I think, lies in explicating the relationship between forced or prohibited biological reproduction and the range of forms of labour involved in social reproduction.

For guidance, we might look to the persistent foregrounding of social reproduction in feminist political organising that took place alongside the reproductive health programme I have analysed. Decolonial and anti-capitalist feminist group La Colectiva Feminista en Construcción emerged in the rough waters of the debt crisis and regularly contests the denigration of infrastructures for social reproduction by austerity. Their feminist brigades (*brigadas feministas*) sent out food and supplies in the wake of Maria. They demanded redress for the post-Maria surge of gender-based violence across the island and, having been mocked by the Rosselló administration in a leaked WhatsApp chat, they were central in the movement that saw him removed from office in 2019. And their work in distributing condoms, encouraging dialogue about sex, and connecting pregnant women with medical support is inextricable from their organising for social reproduction.

With this in mind, it is time for a more expansive understanding of reproduction, for as we careen through uncertain ecological futures, the reproductivity of certain women and girls is being focalised and tinkered with by experts, governments, and private institutions in new ways.

ACKNOWLEDGEMENTS

Thank you to Gavin Weedon, Cordy Freeman, Sharlene Mollett, and Steve Legg for their thoughtful readings of earlier drafts. I am also very grateful to Matt Sparke and the three excellent anonymous reviewers.

DATA AVAILABILITY STATEMENT

All the data underpinning the paper are publicly available at the cited sources.

ORCID

Paige Marie Patchin  <https://orcid.org/0000-0002-4470-4590>

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How to cite this article: Patchin PM. For the sake of the child: The economisation of reproduction in the Zika public health emergency. *Trans Inst Br Geogr*. 2020;00:1–13. <https://doi.org/10.1111/tran.12384>