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The new trial communities: challenges and opportunities in preconception cohorts (<http://somatosphere.net/2021/birth-cohort-studies-new-communitites-pentecost.html/>)

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This article is part of the series: Excavating and (re)creating the biosocial: Birth cohorts as ethnographic object (<http://somatosphere.net/series/birth-cohorts-ethnographic-object/>)

The [Excavating the Biosocial series](http://somatosphere.net/2019/introduction-excavating-and-recreating-the-biosocial-birth-cohorts-as-ethnographic-object-of-inquiry-and-site-of-intervention.html/)

(<http://somatosphere.net/2019/introduction-excavating-and-recreating-the-biosocial-birth-cohorts-as-ethnographic-object-of-inquiry-and-site-of-intervention.html/>) has so far focused on birth cohorts as ethnographic object (Gibbon and Pentecost 2020). In this post, I explore the expansion of interest in the early life period, particularly for Developmental Origins of Health and Disease (DOHaD) research, to include ‘the preconception period.’ Recently, interest in this period has produced new kinds of trial communities in the form of preconception cohorts.

In the 21st century, scientific research has fundamentally challenged the view that an individual’s health and well-being are programmed into their genetic code. Human development and health are now understood in terms of plasticity: the notion that the developing human is profoundly shaped in early life by environmental conditions. The association between early life nutrition (in utero, and in early childhood) and the likelihood of obesity and metabolic disorders in adulthood has been especially compelling, and has generated significant public health interest in early life interventions as obesity prevention strategy.

The pre-maternal body – a new biosocial subject?

A key research and policy target of such interventions is the under- or overweight maternal body (Warin et al 2012; Pentecost and Ross 2019), driven by implicit assumptions of the ‘causal primacy’ of maternal effects for DOHaD outcomes (Sharp et al. 2018). While undernutrition in pregnancy is the focus of research programmes that seek to understand potential DOHaD effects of macro-and micronutrient supplementation in pregnancy (da Silva Lopes et al. 2017, Hsu and Tain 2019), obesity in pregnancy has been the subject of a significant investment in researching behavioural change interventions in pregnancy. The specific investment in maternal obesity research and interventions reflects a public health interest in preventing

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gestational diabetes and decreasing the incidence of large-for-gestational-age infants and childhood obesity. However, behaviour change interventions during pregnancy have shown little evidence of efficacy in preventing these outcomes (Dodd 2014, Poston 2015), which has led to increased interest in *pre*-conception behaviour change interventions that might improve the health of prospective parents *before* pregnancy. A 2019 systematic review and meta-analysis demonstrated a 264% increased likelihood of childhood obesity in the context of pre-pregnancy obesity (Heslehurst et al. 2019), supporting a shift to intervene 'before the beginning' (Stephenson et al. 2018) to secure intergenerational health. To encompass all pregnancies, regardless of intention to conceive, the preconception population is broadly defined to encompass any individuals of reproductive age thus reframing preconception care as a population public health concern (Stephenson et al. 2018).

These new epidemiological approaches raise important theoretical and methodological questions. New trials testing the preconception intervention hypothesis – how interventions in the reproductive population before conception shape inter-generational health – require large-scale trials of complex public health interventions that commence before pregnancy and track individuals and their potential offspring for long periods to assess intergenerational health impacts. The manner in which social context is understood and accounted for in preconception trials has the potential to amplify or diminish attention to the social drivers of health inequities. Moreover, early life interventions focused on pregnancy have produced a highly gendered discourse of responsibility for health outcomes (Richardson 2015) and the expansion of the preconception period as a target for intervention has the potential to skew further gendered allocation of responsibility and the biomedicalisation of female bodies. Indeed, the temporal framing of 'pre-conception' configures all adults of reproductive age as 'pre-pregnant' and may encourage a form of 'anticipatory motherhood' (Waggoner 2013), at odds with women's own imagined futures for themselves. Finally, the 'preconception' focus reinforces some of the problematic aspects of the individually-focused behaviour change interventions for obesity that have not proved efficacious in pregnancy.

Given the potential for research and policy investments in the 'preconception period' to shape the way we understand the biosocial – and its subjects – we must pay attention to how this period is being imagined and expanded in public health (Pentecost and Meloni 2020). To this end, we call for continued active interdisciplinary collaborations that harness the positive potentials of an intergenerational health lens for embedding social justice. Studies that commence with preconception and track participants for long periods to assess intergenerational health outcomes present an opportunity to deepen understanding of the mediating factors that account for different life trajectories. If obesity risk and child development are better viewed as outcomes of biosocial interactions that promote pathways to health or disease, then it is vital to understand the mediating pathways that might account for different trajectories.

Trajectories

To this end, in collaboration with colleagues at the University of the Witwatersrand and the Graduate Institute, Geneva, I have launched a new UKRI-funded research programme, *Trajectories*, which will partner with the Healthy Early Life Trajectories Initiative (HeLTI), a World Health Organisation-supported study with 4 international funding agencies (Canadian Institutes of Health Research; National Natural Science Foundation of China; South African Medical Research Council; Department of Biotechnology of India). *Trajectories* will measure outcomes for a preconception intervention to prevent childhood obesity. HeLTI is a multi-

country study with cohorts in Canada, India, China and South Africa; *Trajectories* partners with the latter, hosted by the SAMRC Developmental Pathways for Health Unit at the University of the Witwatersrand. Our collaborative project will investigate the social and ethical implications of public health interventions in the early life period from preconception to early childhood; and develop innovative qualitative methodologies for studying the social factors that shape life trajectories. The HeLTI intervention is a complex public health intervention that includes micronutrient supplementation, health literacy and monitoring, and a suite of behaviour change interventions that involve diet, exercise, and other lifestyle factors, such as sleep, screen time and mental health promotion. The primary outcome of the trial is childhood adiposity at age 5; secondary outcomes relate to early childhood development. For HeLTI South Africa, the trial setting is Soweto, Johannesburg and the study will recruit approximately 6800 women aged 18-28, which predicts for 1750 pregnancies in the trial period (Draper et al. 2020).

HeLTI South Africa: Soweto, Johannesburg

Soweto is the largest township in South Africa and the historical product of apartheid legislation that segregated racial groups in South Africa. It is 200 square kilometres with a population of 1.3 million people, thus high density living in heterogeneous housing – a mixture of brick housing and zinc dwellings. The socioeconomic profile of the township and household structure is characterised by legacies of structural racism and poverty, a migrant labour system for mining in South Africa, and persistently high rates of racialised inequality in the democratic era. Soweto in many ways encapsulates the paradoxes of South Africa: it is both a story of successful social mobility for a burgeoning middle class, and a story of on-going hardship for many more people. For the health profile of Soweto and South Africa more broadly this translates into what is called a quadruple burden of disease: some of the highest rates of HIV and its opportunistic infections in the world; high rates of trauma and gender-based violence, a dual burden of under and overnutrition, and concomitant non-communicable disease (Coovadia et al. 2009). In addition, the mental health burden in this context is significant (Herman et al. 2009). This picture reflects in the country's maternal and child health profile: 1 in 3 women presenting for antenatal care are HIV positive and 2 in 3 are overweight or obese (SADHS 2016). In addition, in Soweto 1 in 3 women score highly on stress and depression risk scores (Redinger et al. 2018). Alongside this, 15% of infants in South Africa are born with a low birth weight (for comparison, in HICs this is between 5% and 7%) and 27% of children under five are stunted (SADHS 2016), an exceptionally high prevalence for a middle-income country.

Unsurprisingly, initial qualitative research in the pilot for the HeLTI study has found that women's primary concerns relate to securing employment and educational opportunities. They cite their circumstances as constrained by poverty, unemployment, limited access to healthy food or safe opportunities for exercise, as well as the challenges of living with HIV (Draper et al. 2020). These challenges translate into and are worsened by material and relational difficulties in participants' home environments, including precarity, gender and intergenerational conflicts, (Cohen et al. 2019), and participants expressed a need for interventions that focused on mental health as opposed to the physical health strategies initially posed for HeLTI (Draper et al. 2019). In sum, early work with the HeLTI-SA cohort has shown that 'interventions to improve the health of young women before conception must consider the broader contextual environment in which young women operate to understand their capacity and opportunity for specific health behaviours' (Ware et al. 2019). *Trajectories* will include a program of qualitative longitudinal research that seeks to integrate the biosocial interactions that

shape health and life outcomes. The project will use a suite of methodologies that centre participants as co-creators of knowledge, building on interdisciplinary research in the DOHaD field that espouses community engagement, a capacious frame for understanding life environments (Penkler et al. 2018), a postcolonial approach to understanding sites of DOHaD knowledge production (Pentecost 2018) and a critical feminist praxis for collaboration (Warin et al. 2012, Muller and Kenney 2020).

If a policy focus on preconception aims to promote rather than undermine health equity, we must recognize the environmental, social and structural factors that shape health and life. As insights from preconception trials begin to influence global health policy on maternal and child interventions, it is crucial to understand of how social context is translated into science and how knowledge across sites is rendered comparable. The utility of the preconception frame will hinge on whether it can be harnessed to reflect a broader set of social concerns that do not centre on women of reproductive age in isolation or as the target of individual interventions.

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