

EXPLORING KNOWLEDGE, PRACTICES AND MEANINGS OF EXPOSURE IN THE DEVELOPMENT OF A SWISS BASED “PRECISION PUBLIC HEALTH” STUDY

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Developing in the aftermath of the Human Genome Project, precision medicine has initially focused on the role of the genome in understanding the causes of disease and a search for predictive biomarkers enabling to stratify and target better preventive and therapeutic interventions. However, advances in so-called -omics, as well as in IT and big data analytics, have opened up the prospect of enhanced understanding of the role played by “non-genetic” factors in the modulation of gene expression and the trajectories in health and disease. Drawing on a long tradition of studying the impact of these factors on health, public health researchers have seized these opportunities to develop data-driven “precision public health” (PPH) approaches which combine the advancements of precision medicine with the goals of public health (Khoury, Iademarco, and Riley 2016). In molecular epidemiology for example, the concept of the exposome, which “encompasses life-course environmental exposures (including lifestyle factors), from the prenatal period onwards” (Wild 2005:1848), has been coined to complement genomic approach and draw the attention to the need of research on environmental exposure over the lifecourse. The concept conveys a broad understanding of exposures, including internal factors (metabolism, ageing, microbiote), specific external (chemical pollutants, lifestyle, occupation), and general external ones (social position, financial status, urban environment), the latter having been in the domain of expertise of medical humanities and social sciences for a long time. Populational, prospective, large cohorts and biobanks, such as UK Biobank, the Constances cohort in France, or the EXPOsOMiCs EU project, are key for such research. The prospect of improving knowledge on non-genetic factors and their interaction with genetic ones through a better integration of -omics and big data tools for the sake of public health and the “good” of the population is recognized (Meier-Abt and Egli 2016). Yet, the collection and analysis of data enabling to account for environmental exposure remains challenging (Cui Yuxia et al. 2016). The risk of overlooking socio-economic factors, that have been part of public health core mission, as well as the way these results may be translated into PPH measures are also debated (Chowkwanyun, Bayer, and Galea 2019; Cornuz et al. 2016; Horton 2018; Olstad and McIntyre 2019). Moreover, the ethical, legal, social, economic, and political issues discussed more generally about precision medicine initiatives are also at stake in PPH. These issues concern mainly the clinical labor required from cohort participants when they provide data and biological samples for research (Mitchell and Waldby 2010; Tutton and Prainsack 2011), general consent (Barazzetti et al. 2020), data protection and privacy (Hobbs et al. 2012; Vayena and Gasser 2016), the return of research results and incidental findings to participants (Dickenson 2013; Prainsack 2018) and solidarity in healthcare (Prainsack 2018).

In order to address such concerns, public engagement strategies have been implemented in order to explore the opinion of research participants in the context of biobanks and precision medicine initiative (Avard et al. 2009; O’Doherty and Burgess 2009). In contrast, empirical knowledge focusing on people’s lives is underdeveloped, especially in the emerging domain of PPH. However, documenting in-depth the experiences, meanings and knowledge of environmental exposure could both reinforce the institutional responses to these concerns and improve the understanding of living under such condition. To fill this gap, humanities and social sciences provide indispensable insights. Long established ethnographic methods have explored how people live, what people think and know, and what they do in regard to health risks associated with environment and pollution (Altman et al. 2008; Douglas 2003; Shapiro 2015). In addition, humanities in environmental health and biomonitoring are especially enlightening. They have shown how local expertise of environment might both enrich scientific expertise and conflict with it, as understandings and experiences of toxic risks and their mitigation might diverge drastically (Brown 2007; Little 2012). The significance of biomonitoring results for individuals, the way these results reconfigure notions of risk and impact their vision of reproduction and health (Arendt 2008; Bates et al. 2005; Brody et al. 2009, 2014; Washburn 2013, 2014), as well as how they may (or not) be appropriated and used politically (Murphy 2017; Roberts 2017), provide also key indications for understanding the challenges of research on environmental exposure, which draw the attention to the symbolic, practical, and social implications of living with toxic risk and its mitigation measures. Bringing together humanities and social scientific scholarship on precision medicine/public health and environment, this project anticipates the ethical, social, moral and political issues possibly raising from a PPH study. It provides an ethnography of environmental exposure in specific professions known for being exposed to pollutants: the community of agricultural/wine workers in the Canton de Vaud. This professional community has been selected for its regular contact with pesticides and potential other endocrine disruptors and chemical sources of toxicity, as well as the concern some of them express in regard to environmental exposure (RTS.ch 2016). The increasing number of agricultural/wine professionals who turn to “organic” practices (Schürch 2019), as well as emergent propositions to turn to smart viticulture indicate also that a significant number of them is concerned by the intensive use of crop protection products and their chemical impact on the ecosystem and human health. As pesticides infiltrate soils and food, they end up circulating broadly, exposing in this way the whole population. This specific group might therefore serve as a useful magnifying glass of the implications of living with environmental exposure and toxic risks which might be found in the population.

The main objective is to investigate the local knowledge, practices and meanings of environmental exposure for farmers, winemakers and other agricultural workers. More specifically, it aims at:

1. Exploring knowledge of toxicity and environmental exposure => What do they know about toxicity?
2. Investigating practices generating and/or mitigating risk => What do they do (or not) to protect themselves and their relatives from environmental exposure?
3. Documenting how people make sense of being at environmental risk and how it changes their daily life activities, their vision of health and the lifecourse, as well as their expectations towards public health research and policy => What does it mean to be at environmental risk?

This will reinforce qualitatively the production and translation of the study results and PPH measures and give a crucial insight into their impact on exposed individuals’ lives.