



Personalized health in a public health perspective

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The completion of the Human Genome Project signaled the advent of genomic medicine, which was enthusiastically anticipated to make ‘personalized health’ a reality. The term ‘personalized health’ connotes a complete focus on the individualization of health care, implicitly prioritizing the individual benefit over the public one. On the other hand, modern public health has been conceptualized as any form of collective action that focuses on the improvement of populations’ health (Porter 1998). The seeming contradiction has triggered a fervent public debate between proponents of the complementarity of the two notions, who argue that personalized approaches are an essential element of modern public health and sceptics, who argue that personalized medicine will not remedy, but rather increase existing health inequalities (Brand et al. 2016; Bayer and Galea 2015). In this sense, the conference of Public Health Switzerland 2017, titled ‘Personalized Health from a Public Health Perspective’, lies at the heart of the contemporary discourse.

Putting personalized health in a public health perspective requires an apprehension of the current and future public health challenges. In an era of unprecedented technological developments, differentially changing demographics, globalization and massive international immigration flows as well as environmental issues, old problems take new forms and new ones arise. Maternal and child health (including vaccine preventable diseases), violence-free environment, healthy lifestyle, and mental and emotional well-being remain among the main traditional areas of interest. On the other hand, new challenges that are partially produced by the new technological developments, such as climate change, equity-related issues and deprivation, health transition, and the increased importance of non-communicable diseases, even in low-income environments, also call for action. Notably, the new technological developments have also given rise to a series of ethical concerns ranging from organ and tissues transplant to genetic engineering and cloning. Not least, issues related to the protection of patient data and the emerging new markets of biomedical products and services need also be considered (Anish and Sreelakshmi 2013). It is within this evolving context and changing priorities that one should study the impact of personalized medicine on public health.

Not surprisingly then, one of the main arguments against the potential benefit of personalized medicine for public health derives from the changing scope and funding priorities of the health agencies in favour of the former. As numerous studies have revealed the importance of social and economic determinants for the health of the population, shifting the focus to personalized health could result in setting aside efforts and traditional interventions that have been proven to work well in the struggle against ubiquitous, constitutional causes of poor health (Navarro 2009). Furthermore, practical concerns about the efficacy

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of personalized medicine as such have also been raised. Relying extensively on reductionism and overemphasizing the role of genetic determinants and targeted therapies ignore the complexity of the diseases and the impact of emerging properties on the realized phenotypes. Research results have revealed the inability to infer and extrapolate causality from in-depth studies of individual observations. Moreover, a lack of evidence regarding the identification of disease predictors, coupled with the fact that communicating genetic risks is not expected to motivate adaption of health behaviours, also undermine the expected benefit of such interventions (Hollands et al. 2016).

Why then the enthusiasm that has already led to long-term investments in personalized medicine in an era of fiscal constraints? The tensions between the two views can be resolved if we indeed put personalized medicine in public health perspective and call attention to the complementarity of the two approaches. Directing preventive efforts to populations most at risk for certain diseases could be more effective if guided by stratification based on genetic information. New-born screening and hereditary cancer syndromes are prominent examples of successful programs based on the large-scale, targeted approaches for public health purposes. Vaccines, a traditional tool in the armamentarium of public health, are becoming individualized and adjusted to the genetic background of the patients as in the case with personalized cancer vaccines. Furthermore, besides the common view that personalized medicine is limited to genetic determinants of disease and targeted therapies, the new technologies have also applications that have a direct impact on public health. The use of ‘-omics’ technologies allows for timely detection of infection outbreaks, rapid identification of the infective agents and even targeted approaches based on elaborate tests on the genetic resistance of pathogens to antibiotics. Remarkably, Big Data and the new ‘-omics’ technologies, upon which personalized health approaches are based, transcend nominal barriers and have far reaching effects, beyond their immediate applications in medicine. Their role in the new bio-economy as well as in citizen empowerment, when it comes to patient data management, are examples of their indirect impact on public health (Hafen et al. 2014).

It has been argued that ‘...precision public health can be simply viewed as providing the right intervention to the

right population at the right time’ (Khoury et al. 2016). We would like to expand this view arguing that personalized medicine is an integrative element of public health with the potential to radically transform its methods and character. This transformation requires an improvement of Big Data and ‘-omics’ approaches to address current and future public health challenges and an increased participation of diverse populations both in research and clinical applications. Moreover, it requires the integration of social and economic determinants of health with ‘-omics’ research programs that will allow for new scientific discoveries and large-scale targeted interventions. This way, scientific developments in ‘-omics’ (‘from the cell...’) will be effectively and reliably translated into public health practices for the benefit of the health of diverse populations (‘...to society’) (Brand 2011).

With the turn of the new century, we find ourselves in the eve of a new era for public health, where personalized health becomes public and we are convinced that the conference ‘Personalized health in a public health perspective’ of Public Health Switzerland 2017 will offer valuable new insights into a bright future.

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