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Life Course Approaches in Global Health

Claudine Burton-Jeangros

Contents

Abstract

The life course perspective calls for analyses examining individual health trajectories in their historical, social, and cultural contexts. Initiated as a new approach to human development in the 1960s, it has been applied to the study of health for the last three decades in epidemiology. It expands the social determinants of health framework by stressing the importance of considering health over time, at both individual and collective levels. The potential of the life course approach in global health has been made explicit in national and international policy guidance. However, its application in research still remains limited, as a result of a range of challenges including multidisciplinarity, limited access to data and

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research capacity and a still limited attention to the diversity of local circumstances' impact on health at the global level. To emphasize the contribution of the social sciences, the five principles set at the core of the life course perspective will be used throughout the chapter to present available evidence, the theoretical contribution, the methodological implications, as well as policy relevance of this ambitious approach to human development.

Keywords

Life course, Social determinants of health, Generations, Global health, Social sciences

Introduction

The life course perspective brings to the forefront two central ideas for the understanding of population health: both time and context matters. Individual health is shaped from birth to death by contextual conditions: being born in 2000 in Switzerland or in Mali is associated with contrasted health chances. In addition, being born in 1950 or in 2000, in either country, also affects health chances. The life course perspective aims at addressing the complexity of these temporal and contextual influences.

Along global health's agenda to foster better health, the life course perspective contributes to the study of health inequalities and extends the social determinants of health framework. Taking into account disparities within and across countries, as well as within and across generations, it emphasizes the intersection between social factors and health. With its focus on the dynamic nature of health, the life course perspective is fully aligned with the idea of prevention: the understanding of how health unfolds over individual lives can offer important avenues for the elaboration and application of measures promoting individual and collective health.

Developed in the context of high-income countries, the life course perspective has been picked up by health agencies over the last two decades at both the national and international levels, in the context of growing concerns about the health of aging populations. The 2008 report of the World Health Organization (WHO) commission on social determinants of health indirectly emphasized the importance of the life course with its title "Closing the gap in a generation: health equity through action on the social determinants of health" (WHO Commission on Social Determinants of Health and World Health Organization 2008). WHO's commitment was later made even more explicit with the adoption of the life course as an overarching principle in the global action plan for the prevention of non-communicable diseases (World Health Organization 2013).

However, the meeting of the life course perspective and global health has remained so far fairly timid. Different reasons for this timidity will become apparent in this chapter. They include recurrent tensions across different understandings of health and disease, challenges of interdisciplinary work, and access to longitudinal data on health and its determinants.

This chapter aims at showing the potential of the life course perspective initially developed at the intersection of different social sciences disciplines and later picked up by epidemiology, for the study of variations in health conditions in their specific contexts. The considerations developed here will take stock of the existing literature describing this intersection with the intention to offer more explicit connections between the initial life course perspective developed in the social sciences and issues related to health at the global level.

After two sections describing first developments of the life course perspective and then its integration in epidemiology, the main section of the chapter aims at strengthening the case for the integration of the life course perspective in global health. After discussing factors that support this cross-fertilization and others that hamper it, theoretical arguments emphasizing the contribution of the perspective as well as illustrative evidence confirming its relevance will be presented. Finally, methodological considerations and policy matters will be examined.

The Life Course Perspective

The life course perspective emerged in the 1960s as an ambitious approach to human development, with the aim to understand how individual biographies unfold in their social contexts. First, a presentation of its conditions of emergence and main characteristics will help to grasp the scope and specific features of this perspective. Then, the concepts used to account for the different dimensions of time impacting individual trajectories will be discussed.

Conditions of Emergence and Characteristics of the Life Course Perspective

Developments having taken place in parallel in psychology and sociology progressively converged towards the elaboration of this innovative perspective, bringing together in a new way different theoretical inputs and techniques (Shanahan et al. 2016). Life span psychology, initially focused on the development in children, had extended its scope towards functional capacities over all stages of life with an interest for both continuity and change. At the same time, sociological research had strengthened its attention towards how institutional and structural factors shape the individual life course (Alwin 2012). The life course perspective emerged in the context of high-income countries, prompted by preoccupations related to the aging of the population and social scientists' wish to assess the impact of social and economic changes on the trajectories of successive cohorts. The perspective of the life course thus allowed to consider how major events occurring over the twentieth century, such as the two World Wars, the 1929 recession, the Cold War, or social rights mobilizations in the 1970s, affected individual trajectories in the long run (Elder et al. 2003).

Next to these theoretical developments, life course research has been strengthened by the increasing access to longitudinal data (Bynner 2016). The book "The Children of the Great Depression" published in 1974 (Elder 1974) is often cited as a landmark in life course research. Data collected over several decades for a sample of children born in California in the early 1920s was analyzed to assess the long-term impact of the 1929 economic crash on their growth, passage to adulthood and careers. Following these early initiatives, longitudinal research proliferated across high-income countries after the Second World War, especially in the Anglo-Saxon context. Birth cohorts and studies initiated at different stages of the life course, such as for example household panel studies, collected information from the same persons at repeated occasions, covering important domains of their lives including family relations, education and work trajectories, as well as developments in mental and physical health.

To embrace the multiple dimensions of the life course perspective, a set of principles helping to integrate the importance of time and context in the study of human development has been formulated. These principles are considered to "provide the most concise, yet inclusive, conceptual map of life course theory" (Elder et al. 2003, p. 16). The first principle focuses on the lifelong development of human lives, suggesting that development should be studied at all life stages, connecting early conditions and events with subsequent circumstances as they develop over the life course. The second principle is focused on timing, interested in when life transitions occur and whether they meet socially defined standards, such as the expected age for having children or for becoming a grandparent. The third principle calls for situating individual biographies within their historical and geographical contexts, thus emphasizing that specific conditions shape the experience of successive cohorts. The fourth principle suggests taking into account close social networks: the idea of "linked lives" emphasizes that human lives are embedded in social relationships that affect individual life courses. The fifth principle, referring to individual agency, brings in the idea that individuals build their own life course through the choices and actions they take within the opportunities and constraints of historical and socioeconomic circumstances. These principles will be illustrated later in the chapter with studies related to global health in order to make the contribution of the life course perspective to the study of population health in low- and middle-income countries more explicit. In addition, Table 1 at the end of the chapter will summarize some key conceptual, methodological, and policy aspects discussed in the next sections along these five principles.

From the start, the ambitious program for research formulated by the life course perspective called for interdisciplinary approaches. Next to psychology and sociology, inputs from demography anthropology, history, and economics supported early developments. Epidemiology joined these efforts only in the 1990s, but it is considered that research on health aspects significantly contributed to the growth of the field over the recent decades (Mayer 2009). However, still today concerns related to the actual integration of these various disciplines in the understanding of human development are often voiced; many acknowledge that it remains challenging to take simultaneously into consideration individual and structural factors impacting

Table 1 Life course principles and insights for global health

	Life course principles	Useful concepts	Methodological considerations	Policy implications
Time	**Lifelong development**	Trajectories; exposome; biosocial mechanisms; pathway model; accumulation of (dis-)advantages; social mobility	Prospective and retrospective longitudinal data on health and social circumstances; biomarkers data	Act early; focus on children
	Timing	Transitions; critical periods; life stages; social timetables	Sequence analyses	Support for social and biological transitions
Context	**Temporal and social contexts**	Social determinants of health; globalization; intersectionality	Comparisons across contexts, social groups, cohorts; multilevel analyses; age-period-cohort analyses; spatial life course epidemiology	Multisectoral approach to health promotion
	Linked lives	Biosocial inheritance; generations; gender	Intergenerational studies; household panel studies	Family policies; gender equity
	Agency	Health and illness continuum, capabilities	Qualitative (longitudinal) data	Local actions; participatory governance

individual lives (Mayer 2009; Bynner 2016). Presented as an effort to support the integration of this complex research area, the "life course cube model' further elaborates its three central axes" (Bernardi et al. 2019). First, the time axis encompasses not only past circumstances and actions but also current stable or shifting conditions, as well as anticipation of the future. Second, the context axis situates the individual life course in its different layers of proximate and distal social environments. Third, the domains axis calls for the integration of the different spheres individual lives are constituted of, including work, family, and health. Paying attention to the various interdependencies connecting these three axes is expected to help the analysis of the complex dynamics shaping individual life courses. As will be discussed below, these axes are particularly useful to consider how different social determinants impacting individual health unfold over time while giving room to significant variations across high-, middle-, and low-income countries.

The Importance of Time: Age, Cohorts, and Generations

The temporal nature of lives can be approached at different levels: the individual dimension of time, typically based on chronological age, defines a biographical position between birth and death; the social dimension of time refers to how social

life is organized around age criteria that vary across contexts; the historical dimension of time brings in the role of social change, as a result of specific events or progressive transformations, that impact successive cohorts differently (Elder 1975). In prevision of the integration of these different dimensions of time in global health issues, the concepts of age, cohort, and generation will now be further developed.

While the concept of age refers to an a priori universal and unquestionable individual characteristic, it encompasses different dimensions that need to unpacked (Settersten and Mayer 1997). Chronological age, defined by birth, is typically considered as a proxy of biological development along the growth-maturation-decline curve or successive stages of individual lives. However, variations across individuals show that chronological age and biological age do not systematically evolve simultaneously, with some individuals developing later or growing old faster than others. Psychological age, referring to cognitive development and the ability to adapt to one's environment, also does not necessarily match chronological age. Finally, social age relates to how transitions in the life course can vary across cultural contexts and over time, for example, the expected age for child-bearing covers a very wide age range along variable social arrangements offering contrasted opportunities to young women. In contrast to industrialized and western countries, some societies attribute little value to chronological age (Settersten and Mayer 1997). In many contexts however, chronological age is a central element of social organization, as illustrated by the attribution by institutions of rights and responsibilities based on age, such as entry into school or access to pension. Next to formal rules based on chronological age, social norms dictate age-related expectations regarding specific roles or statuses, such as the proper age to get married or to enter the job market. These expectations, that can be defined either by the average behaviors in a specific society, by a statistical norm, or by collectively defined ideal behaviors, shape biographies. Building on biological stages and mechanisms, such social timetables can prove either supportive or detrimental for individual development. Additional concepts further elaborate the individual dimension of time. The idea of trajectory refers to the succession of social roles and experiences that shape individual lives in the long run, while the notion of transition focuses the attention on changes in social roles or circumstances (Burton-Jeangros et al. 2015). The affiliated concepts of timing, turning points, sequencing, duration, or spacing are also commonly used in the life course literature (Elder 1975). It will be shown below that they not only help to operationalize the life-long development principle of the life course perspective but are also useful in health research in general and global health in particular.

Moving to larger influences, the concepts of generation and cohort point to the role of historical variations in individual lives. The concept of cohort in demography refers to a group of individuals sharing a similar event and is most often defined by birth (Elder and George 2016). Members of a cohort age together and on average go through the normative transitions of the life course simultaneously; they also experience disruptive collective events at the same age. While they share similar opportunities and constraints, these are affected by the size of the cohort and its inner social composition. The succession of cohorts reflects historical time and opportunities for social change, associated, for example, with urbanization, (de-)

colonization, or migration. This means that the experience of each cohort is unique, as a result of its own characteristics – defining specific intra-cohort effects – and position in history, assessed in terms of inter-cohort effects. Next to the concept of cohort, reflecting demography's interest for population flux, the notion of generation is also frequently summoned, but associated with contrasted meanings. First, it is related to the presence of a shared historical consciousness, based on common experiences, visions of the world or moral assumptions, producing a collective social identity (Alwin and McCammon 2003). But it is also connected with family lineage along which individual decisions and events have an impact on trajectories and transitions across generations (Thornberry 2016). Considering that parents and children lives are inextricably linked, for the better or for the worse, has a particular resonance for health research, typically when looking at maternal-child transmission but also more broadly when thinking about the social environments children grow up into.

Together these concepts characterize the different dynamics shaping human development: individual aging results from the combined effects of biological, cognitive and social processes; period effects reflect external events affecting individual trajectories such as a natural catastrophe or political upheaval; and cohort effects represent a combination of the previous influences for a specific group of people. In empirical research, the "age-period-cohort" model has been developed to disentangle the role of these different temporal processes. However, this intention often remains unfulfilled. Intergenerational studies, including successive generations within a family, have been considered as a solution to this difficulty (Elder 1975). Such designs help identify and explain both continuity and discontinuity across generations in regards with different outcomes, including conventional activities of the life course such as education attainment, partnerships or parenting, as well as health issues such as obesity or mental health ailments (Thornberry 2016). Their potential for the study of health inequalities has been emphasized along the concept of biosocial inheritance (Hoke and McDade 2014) that will be developed later in this chapter.

To conclude this first section, the life course perspective's efforts to move away from a narrow understanding of human development as the result of individual factors should be emphasized. This approach keeps stressing the importance of taking into account transformations over time and variations across social and cultural contexts that shape individual lives opportunities and constraints. This ambitious perspective that emerged in the context of high-income countries has so far not much extended beyond. However "the intersection of history and personal biography" (Elder and George 2016, p. 59) provides a useful framework to consider how globalization has transformed the local circumstances of individuals lives in general and their health perspectives more specifically. Before making an explicit connection with the global health agenda, the next section will first present how the life course perspective has been applied to the domain of health.

Developments of Life Course Epidemiology

The initial developments of the life course perspective focused their attention on the intersection between work and family trajectories and interest for health trajectories only emerged later. However the field of life course epidemiology rapidly expanded at the end of the twentieth century, adding a major contribution to the understanding of the unfolding lives of successive cohorts while strengthening health inequalities research. A longitudinal approach to health implies that it can be considered both as an outcome, affected by previous and current social circumstances, and as a resource for future achievements. This indicates how much health represents a crucial pillar in the unfolding of individual lives. After presenting the main features of life course epidemiology, issues related to intergenerational inequalities in health will be developed.

The Emergence and Characteristics of Life Course Epidemiology

Life course epidemiology emerged in the 1990s, acknowledging the potential of the life course developments in the social sciences for the understanding of trajectories of health and illness. Different elements triggered the interest of (social) epidemiologists. First, in light of the extension of non-communicable diseases, new etiological models were deemed necessary: indeed the poor capacity of epidemiological cross-sectional studies to predict the onset of disease was more and more apparent and criticisms towards its narrow focus on individual risk factors measured during adult life multiplied (Kuh et al. 2004). Second, the renewed interest for social inequalities in health contributed to support life course epidemiology developments. While health inequalities had prompted the development of modern public health in emerging industrial societies of the nineteenth century, medical progress promoted the idea that access to healthcare would resolve disparities in health by offering equal chances to all to get cured. However, the persistence of health inequalities in high-income countries independently of the healthcare offered to the population, as emphasized in the last decades of the twentieth century, brought to the front the importance of the social determinants of health; the life course perspective helps to tackle them. Third the new wealth of longitudinal data and the growing expertise in their analysis further supported this new sub-discipline (Bynner 2016).

Developments in life course epidemiology were indeed empirically driven and the availability of longitudinal data led to a plethora of publications in the 1990s (Kuh et al. 2004). As mentioned above, efforts in longitudinal data collection multiplied after the Second World War. For example, the Framingham Heart study initiated in 1948 in the United States recruited over 5,000 adult men and women aged between 30 and 62 in a local town of Massachusetts with the aim to identify factors leading to heart disease. It is worth mentioning that data collection is still ongoing. In the United Kingdom, the "British National Survey of Health and Development" started with the recruitment of close to 14,000 women who had given birth in a specific week of March 1946; following this first national birth

cohort, new cohorts were initiated in 1958, 1970 and 2000 (Bynner 2016). In parallel, the development of national panel household studies, covering a large range of domains including health, occurred over the second half of the twentieth century with national infrastructures set up in Germany in 1984, in the United Kingdom in 1991, or in Switzerland in 1999. The Study of Health and Retirement in Europe (SHARE) set up as an international longitudinal project collects data on health, socioeconomic conditions and family networks of individuals aged 50 and over. Initiated in 2004 and with seven biennial waves completed, data is currently available for 140,000 individuals in 27 countries.

Besides infrastructures in high-income countries, initiatives in low- and middle-income countries also exist and are presented here to anticipate on the potential for the integration of the life course perspective in global health. The Pelotas birth cohort, established in a southern city in Brazil, is considered as the most important study of its kind in low- and middle-income countries. Four successive cohorts of children born in 1982, 1993, 2004 and 2015 have been recruited and data is still collected (Hallal et al. 2018). The Young Lives Study, initiated in 2002 under the lead of the Oxford University, aims to assess the impact of a range of transformations occurring in less affluent contexts, including technological, economic, and social change. Data has been collected with 12,000 children of two age groups (6–18 months and 7–8 years) living in Ethiopia, India, Peru, and Vietnam (Dornan 2016). The World Health Organization Study on Global AGEing and Adult Health (SAGE) initiated in 2002 is a longitudinal study of adults aged 50 and over with four waves of data collected in China, Ghana, India, Russia, South Africa, and Mexico. Despite challenges associated with the continuation of these studies, it is worth keeping in mind that longitudinal data is available, across a large range of contexts.

Analyses of this material have multiplied over time and together concluded that exposures in childhood have an impact for health later in life. An initial step was taken by Barker in the 1980s with results showing for one region in the United Kingdom an association between low birth weight and cardiovascular disease and diabetes later in the life course. With a focus on the importance of fetal conditions for childhood development and later health, this work known under the heading of biological programming (FODA fetal origins of adult disease) hinted at the long reach of detrimental conditions during very early stages of life. Studies on the role played by adverse conditions during early life on health outcomes later in life initially focused on clinical outcomes, notably cardiovascular diseases, diabetes, and mental health issues in relationship with socioeconomic determinants (Ben-Shlomo and Kuh 2016). The studies however later expanded towards a larger range of outcomes, encompassing cancer, musculoskeletal disorders, disability, oral health, injury, infectious diseases, genetic and epigenetic markers, as well as behavioral indicators. Life course epidemiology also expanded towards outcomes assessing good health, in the vein of research on healthy aging (Kuh et al. 2014).

Building up from the interdisciplinary emphasis of the life course, life course epidemiology pushed for the joint understanding of biological, psychological, and social processes in the shaping of health and illness over time. Moving beyond the biological focus of the “Developmental origins of health and disease” perspective

that followed the work in biological programming, life course epidemiology is presented as a broader endeavor taking into account the role of social factors across the different stages of individual lives. Besides, sociologists emphasize the importance to take context level factors into consideration, i.e., social systems that create inequalities reaching out to individuals' biological conditions, thus "getting under their skin" and producing the social gradient in health (Ferraro and Shippee 2009).

The inclusion of genetic factors in life course epidemiology opened up for research looking at the transmission of risks across generations (Kuh et al. 2004). While caution towards genetic determinism has long prevailed among social scientists, recent opportunities are however seen in a more positive light offering possibilities to better understand the two-way interactions between the social environment and biological conditions. As stated by Harris and Schorpp: "Ignoring the black box of biology meant that social scientists were missing the interplay of social conditions and underlying physiological processes related to health inequalities" (Harris and Schorpp 2018, p. 362). Following the genome sequencing advances in the early 2000s, the concept of exposome was proposed to assess all environmental exposures impacting individuals from birth to death, with exogenous and endogenous sources encompassing air pollution, diet, occupational conditions, socioeconomic position, and stress (Vineis et al. 2015). Those calling for the consideration of the dynamics of environmental health determinants stress the plasticity or adaptative capacities of individuals in responding those these challenges, thus moving away from a too deterministic view promoted by genetic research. Rapid developments in epigenetics – showing connections between environmental conditions and genetic makeup – also support this idea of plasticity and biosocial mechanisms. They offer additional opportunities for collaborative work across disciplines.

Different theoretical models are discussed in life course epidemiology to support the interpretation of the potential mechanisms underlying the health inequalities observed across the life course.

Overview: Theoretical Models Explaining Health Inequalities Across the Life Course

1. The sensitive or critical period model suggests that the life course is characterized by a succession of important transitions, for example, entry into adulthood or family formation, during which available resources are likely to affect later health outcomes.
2. The pathway model considers that over time individuals are put on specific paths that will offer them either better or worse opportunities, such as higher education associated with better returns in terms of work opportunities and income, that are likely to impact their health status.
3. The accumulation of (dis-)advantages model suggests that those who have a good start in life, being born in a better off family and more advantageous social contexts, are likely to get access to more resources over their life course, in contrast to those who start their lives in deprived environments and will get exposed to an accumulation of risks (Kuh et al. 2004).

Initially thought separately, these models are now considered as not mutually exclusive but rather complementary, with an emphasis on the fact that these different mechanisms are not limited to childhood and adolescence but rather are occurring throughout the different life stages (Ben-Shlomo and Kuh 2016). In addition to the assumption that health trajectories should increasingly diverge over aging as a result of the accumulation of (dis-)advantages, the age-as-leveler hypothesis posits an inverse trend (Lynch 2003). Since those who are more deprived and in poorer health die earlier than more advantaged individuals, the pool of comparison shifts over the aging process with a selection bias towards the better off. According to that perspective, differences should be narrowing as individuals get older. If all these models are intuitively appealing, it appears however often difficult to test the assumed mechanisms empirically.

The Importance of Time for Health

To further the considerations presented above about concepts related to time developed by the life course perspective, this section will discuss their application in the domain of health.

The life course perspective implies to adopt a dynamic approach to health, thus moving away from the long established WHO definition of health as a "state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity." In the human development approach, the unfolding of health over the life course is typically represented as a succession of growth during childhood and adolescence, followed by a plateau during adulthood and then a decline over aging (Ben-Shlomo and Kuh 2016). The concepts of trajectory and transition are particularly useful to model such a dynamic approach to health (Burton-Jeangros et al. 2015). The former is interested in how health fluctuates at the individual level in the long run, as a result of changing social and physiological circumstances across the life course. Transitions are short-term changes or events, sometimes expected (retirement) and in other cases non-expected (accident), that can have either beneficial or detrimental consequences for health.

Life course epidemiology is also interested in intergenerational health-related mechanisms. Along accumulating evidence about the reproduction of poverty across generations, the intergenerational character of health inequalities has progressively gained attention (Hoke and McDade 2014). The biological programming and "Developmental origins of health and disease" approaches mentioned above promoted a rather narrow perspective on how mothers shaped the future health of their child, with a focus on pregnant women and to what happens "in utero." However, the understanding of the cycle of inequality, including in health conditions, requires a broader scope. A more ambitious approach thus consists in looking at how parental histories in their specific political-economic contexts shape the environments in which children grow and how these elements influence the latter socioeconomic position and health chances later in life. The concept of biosocial inheritance aims at supporting "the integration of political-economic analysis and sociohistorical

variables into considerations of intergenerational health outcomes" (Hoke and McDade 2014, p. 192). Consideration for both social and biological mechanisms, including genes, material resources, social norms, and cultural practices, is deemed necessary to understand how socioeconomic resources and health are transmitted through generations. In that context, warnings are again formulated towards an overly deterministic stance that the biosocial inheritance concept could promote. For a connection with the life course perspective, intergenerational studies, as well as sibling or twin studies, that developed in the health domain can be related to the principle of "linked lives" suggesting that individuals' health trajectories are affected by those they are living with.

Individual trajectories and transitions, related to work, family, and health, are also to be considered within specific biological and social vulnerability conditions at the society level, since their transformations impact differently successive cohorts (Wadsworth 1997). In the case of biological vulnerability, main patterns of diseases change over time, under the influence of multiple factors, for example, the emergence of HIV/aids in the early 1980s; changing health-related behaviors such as smoking; and healthcare progress offering new treatments or preventive measures. As regards social vulnerability, local and global socioeconomic conditions also vary and either positively or negatively impact individual circumstances in specific contexts, including opportunities of upward and downward social mobility across generations. Taking into account these variations is particularly important for a global health perspective, as will be shown below.

To conclude this section, following the emphasis of the life course perspective on the fact that human development is impacted by the environment in which it unfolds, life course epidemiology added the idea that time and context need to be considered when studying health. Such an approach brings to the front that inequalities should be considered as the result of social determinants impacting health outcomes over a temporal framework, rather than be attributed to questions of access to and quality of healthcare (Wadsworth 1997). Like health inequalities research, life course epidemiology developed in high-income countries, mostly in the Anglo-Saxon context. The next section will propose to develop the articulation of the life course perspective with global health in order to emphasize the contribution such an approach could make in the understanding of health variations across contexts.

The Intersection of Life Course Epidemiology and Global Health

While specific attention has been dedicated above to the importance of time in health-related issues, this section shifts the focus on the importance of local conditions and on comparisons across contexts, picking on the push for research that consider human lives in their contexts (Elder et al. 2003). This focus lines up with the global health agenda to address health inequalities across regions of the world. Calls for the integration of the life course perspective in studies on population health in low and middle-income countries have indeed been regularly voiced (Leon et al. 2001; Batty et al. 2009; Defo 2014). After presenting a number of triggers and

obstacles to the adoption of a life course perspective in global health, different arguments emphasizing its contribution will be assessed. To further show its potential, illustrative evidence will be presented along the five principles of the life course perspective thus showing the large landscape that research and policy can aspire to.

Triggers and Obstacles

Globalization has impacted population health (Yach and Bettcher 1998), in both beneficial and detrimental ways. Demographic transformations related to urbanization, migration, and aging of the population have been important in low- and middle-income countries. Economic and trade trends supported development in those contexts but also facilitated access to new commodities detrimental to health. Important changes in health patterns have concomitantly been observed, with globalization impacting both infectious and non-communicable diseases. If the global HIV epidemic had major implications across the world, the health, social, and economic consequences of the COVID-19 pandemic cannot be assessed at this time but are likely to reach an unprecedented magnitude. At the same time, the rising importance of non-communicable diseases in low- and middle-income countries has been emphasized over the last decades, with a call for attention to the double burden of diseases. These multiple changes associated with globalization have impacted all domains of society and clearly lend support to relevance of the social determinants of health framework.

Amidst these transformations, the renewed interest for inequalities in health initiated in high-income countries expanded towards other regions of the world. Initiatives tackling poverty and poor health led to noticeable improvements at the global scale, mostly due to long awaited efforts to protect maternal and reproductive health in poorest populations. But concerns for health inequalities within low- and middle-income countries also emerged (Leon et al. 2001), and the appointment of the World Health Organization commission on social determinants of health in 2005 established the global relevance of this issue. As further discussed below, the life course perspective has gradually been integrated in national and international policy strategies.

Along the social determinants of health framework, efforts to develop interventions promoting health and preventing the onset of disease also justify adopting a life course perspective. While ensuring universal access to healthcare in all countries must remain a priority, threats raised by undue medicalization and disease mongering have also been discussed (Clark 2014). These critics call for a broad and multidisciplinary approach to health; considering it as the result of complex interdependencies between political, socioeconomic, and biological factors and not mostly as the outcome of biomedical achievements. Such an approach is aligned with the agenda of life course epidemiology to develop new etiological models of disease.

In parallel to these triggers, the intersection between global health and the life course perspective has been jeopardized by a number of factors. First, research on

health inequalities is mostly a Global North endeavor. While the volume of research on health inequalities has globally expanded over the last 50 years, it remains mostly focused on high-income countries and even more narrowly on Anglo-Saxon countries (Cash-Gibson et al. 2018). Research in low- and middle-income countries is often conducted under the lead of researchers from the Global North, as measured by their positions in authorship and collaborative networks. Despite some noteworthy developments in Latin America and in India, persisting western and postcolonial biases in that domain of research reveal global dependencies giving too little room to local realities and needs. The adoption of a life course perspective could contribute to redress such biases.

Second, access to health information in general and for life course analyses in particular remains hindered in the Global South by limited infrastructures for collecting longitudinal data or cohort studies (Batty et al. 2009) and by rather weak local research capacities (Haregu et al. 2019). These factors not only raise concerns about research ownership but also limit the capacity to approach health with a life course perspective emphasizing local realities.

Third, the international priority on universal access to healthcare shows that in low and middle-income countries insufficient access to services is still a major issue. The overall improvement of maternal and reproductive health indicators related to better healthcare coverage represents an important success. However, it also keeps the attention away from the major role of social determinants of health and consequently minimizes the potential of a life course approach.

Contributions of the Life Course Perspective to Global Health

Despite these different obstacles, the integration of the life course perspective has been supported by some authors raising critics towards the currently dominant perspectives on population health in low- and middle-income countries. Notably, the value of the epidemiological transition model and the health transition model, both emphasizing health-related transformations over time, is discussed.

The epidemiological transition is often summoned "to both describe and understand local, national and global patterns in demographic and epidemiological profiles within and across societies, given the multiple domains of health" (Defo 2014, p. 1). The original formulation by Omran in 1971 proposed a broad framework to understand the changing demographic and health patterns from pre-industrial contexts to twentieth mid-century, describing along the demographic transition in countries of the Global North the shift from dominant infectious diseases to a new regime of non-communicable diseases. Among the subsequent critics to and extensions of the epidemiological transition model, its relevance for low- and middle-income countries has been questioned over the last decades. Many African countries are not experiencing the same demographic and epidemiological transformations that Western countries did. The "enormous and unprecedented" burden of diseases and shortcomings of healthcare in the Global South are considered incompatible with the epidemiological transition assumptions, thus showing its limited relevance to

compare historical transformations across regions of the world. Instead of extrapolating observations made in high-income countries to other contexts, emphasis should be put on the inclusion of local variations and circumstances (Defo 2014).

The health transition model has been proposed to further address the complex association between health and society by paying attention to political, social, and cultural dimensions of health (Caldwell 1993). The examples of Cuba, Sri Lanka, and the Kerala state in India illustrate the importance of political will in the promotion of population health in low-income contexts. Paradoxically, in richer contexts, access to healthcare and medicalization have fueled expanding aspirations towards health and produced an inflation of morbidity (Johansson 1991). Such observations emphasize the local plasticity of health definitions and of the measures developed to support it. Again, they call for the integration of local realities instead of taking for granted the higher value of high-income countries norms and practices. Considering that, despite their merits, both the epidemiological transition and the health transition models are insufficient to address contextual variations in population health in low and middle-income countries, Defo proposes a "multilevel eco-epidemiological model within a life course perspective" emphasizing the combined role of individual decisions, family contexts, and context-dependent environmental factors in the shaping of health trajectories. It further connects these different layers of determinants by stressing that even though disease is an individual experience, interventions to promote health should be taken at all levels of society.

The renewed interest for health inequalities can also be associated with more serious attention given to the multiple axes of stratification existing in society, as illustrated by the concept of intersectionality. Originally proposed in the context of gender studies, intersectionality brings to the front the intersection of the various social locations occupied by an individual. Indeed, social identities and access to resources are shaped by the combined effects of gender, social position, age, ethnic or migratory background, and sexual orientation (Kapilashrami et al. 2015). The life course perspective is sensitive to these interactions and the role they play at different stages of individual lives while paying attention to how changing public policies can moderate their impact (Raphael and Bryant 2015). More specifically, intersectionality aligns with calls for a more complex analysis of women's health. Indeed, it is regretted that the dominant focus on reproductive and maternal health issues in low- and middle-income countries means that only specific segments of their life course are considered (Mendenhall and Weaver 2014). Local gender norms, supporting social hierarchies detrimental to women, generate specific health risks notably through limited access to healthcare and obligation of care towards others. In addition, intersectionality emphasizes the detrimental role of multiple forms of discrimination, including sexism, racism, ageism, and their interdependencies. These social mechanisms are present in society at large but also within healthcare systems. They are a reminder that local and historical variations in "systems of privilege and oppression" also act as a macro-level determinant of health (Kapilashrami et al. 2015). These variations have particular relevance for the global health agenda.

These critics emphasize the importance of considering issues related to time and place in the understanding of health. Indeed, the shortcomings of existing models and the openings discussed above show the potential of the life course perspective to mainstream a number of theoretical preoccupations raised over the last decades around the social determinants of health at the global scale (see Table 1). To further illustrate how the life course perspective is or should be integrated in global health, empirical evidence will now be presented along the five principles of the life course perspective presented in the first section of this chapter.

The Life Course Principles in the Context of Global Health

The life course literature is focused on high-income countries, and empirical research adopting the perspective in low- and middle-income countries remains limited. However, a selection of recent publications is presented below along the five life course principles. While these have rarely been mobilized in life course epidemiology, they are considered useful to make the case for a stronger life course perspective in global health and for a better integration between the social sciences and global life course epidemiology.

The lifelong development principle suggests that health should be examined in relationship with circumstances encountered throughout the life course. Studies on the effects of lifelong socioeconomic conditions on health trajectories have been conducted in a large number of contexts, including countries which encountered major political and economic transformations over the course of the twentieth century. The following examples show the systematic role of childhood circumstances on health status and health behaviors later in life. A study on self-rated health of Russian men and women aged over 50 hypothesized that the policies and ideology of the Soviet Union would have lessened the importance of childhood factors on health in later life, due to a lesser impact of education on income in adulthood (Nicholson et al. 2005). However, like in high-income countries, findings revealed that childhood social conditions impact social position in adulthood. In addition, adult socioeconomic conditions were strongly associated with self-reported health, with a weak influence of childhood circumstances for men but a strong one among women; for example, going to bed hungry at age 15 appeared to be a particularly strong predictor of adult health. A study conducted in Brazil, experiencing a fast-aging population, similarly found support for the accumulation of disadvantage over the life course (Scazufca et al. 2008). In this case, childhood socioeconomic circumstances were associated with dementia in later life, even though the relationship was attenuated by adulthood social circumstances. Results from the WHO Study on Global AGEing and Adult Health (SAGE) emphasize systematic inequalities in preventive behaviors, as assessed for breast and cervical cancer screening, across the five included countries (China, India, Russia, Mexico, and South Africa) (Akinyemiju et al. 2016). Beyond their own education level showing a positive association with screening, women whose parents were better educated also had a much higher chance of having been screened for breast cancer, emphasizing the

importance of intergenerational mechanisms. In addition, those encountering a declining socioeconomic trajectory were less often screened, pointing out the importance of transitions encountered at different stages of the life course. All these findings confirm the importance of looking at health trajectories over all stages of the life course and confirm the pervasiveness of risk accumulation mechanisms, across contexts and health-related indicators.

The second principle is focused on timing, with an interest for when life transitions actually occur and how this timing is in line with local standards since these transitions can generate either favorable or adverse social pathways. For example, a study on the transition to parenthood in Zimbabwe looked at the association between HIV infection and contrasted sequences of sexual debut, first union and first child (Del Fava et al. 2016). Next to variations between men and women, findings show that the ordering and timing of these successive transitions are associated with HIV risks, these being higher for individuals experiencing parenthood outside a stable union or later in their life course. The declining HIV incidence observed at the national level is attributed to the growth of normative and safer sequences, characterized by later sexual debut and short intervals between the events, among younger birth cohorts. The importance of timing was also examined in a study in China assessing the role on children's weight and height of being left behind by parents who migrate, considering potential benefits associated with remittances as well as adverse psychological and emotional consequences (Zhang et al. 2015). In line with the critical period model, the child's age at the time of parental migration made a difference: boys in pre-school age (1–5) showed the poorest health outcomes while the absence of effect for girls was unexpected, considering the Chinese preference for sons. More generally, the complex interactions between migration and health call for the inclusion of a life course perspective helping to assess the role of timing and duration of migration on health aspects (Xu et al. 2018). Together, these findings show the impact of the timing of both biological and social transitions on individual development.

The third principle of the life course perspective stresses the importance of historical and geographical contexts since individual lives unfold in specific circumstances shaped by macro-level determinants. A study on health inequalities in China highlighted that, next to support for the cumulative advantage theory with larger inequalities in older age groups compared to younger ones, such disparities declined in more recent cohorts (Feinian et al. 2010). This finding, standing in contradiction with observations in the United States, was interpreted at the light of the social distribution of respectively healthy or unhealthy lifestyles. While in the United States, the more affluent groups have adopted healthier behaviors, as regards diet and physical activity, the reverse is true in China: lifestyles detrimental to health, such as a poor diet, excessive smoking and drinking or limited physical activity, are perceived as privileges and consequently more frequently adopted by the better off. Such attention to the context is particularly important in a global health perspective: the rapid expansion of unhealthy commodities, including soft, drinks, processed food, tobacco products, and alcohol, in low- and middle-income countries has been facilitated by neoliberal policies opening new markets to multinational firms

(Stuckler et al. 2012). Their rapid diffusion, occurring at a faster pace than it ever happened in high-income countries, clearly contributes to the rise of non-communicable diseases in those contexts. In addition, environmental exposures, another important dimension of the exposome (Vineis et al. 2015), also depend on local activities and regulations. A framework addressing issues related to migration brings attention to the fact that exposures can vary over the life course, as a result of mobility across contexts, for example, exposing individual to open fires in rural areas and air pollution in large cities (Xu et al. 2018). These elements confirm that place and time definitely matter for population health at the global scale. While biological mechanisms are important, they occur in specific social and cultural contexts that protect or expose individual health in contrasted ways. The integration of a life course perspective can help to bring those aspects in the picture.

The fourth principle of linked lives emphasizes the importance of the people we live with as regards exposure or protection to health risks. For example, the "life course approach to HIV vulnerability" proposed by Mojola et al. (2015) emphasizes how gendered adult trajectories matter for HIV exposure at different stages of the life course, exposing differently members of a couple. Among adults aged over 40 in South Africa, male long periods of migratory work encourage extramarital relationships, and later in life access to a pension was presented as facilitating paid sexual relations between older men and younger women. Such socially organized behaviors expose regular partners to HIV risks. The importance of linked lives can also be approached through an intergenerational lens. An analysis of Demographic and Health Survey data over the period 1970 to 2000 for over 2 million children in 38 low- and middle-income countries highlighted the persistent transmission of poor health across generations (Bhalotra and Rawlings 2011). Across countries and decades, maternal short stature, anemia, and low BMI were associated with adverse consequences for children as measured by their size at birth, mortality, and subsequent growth. An overall decline of these associations was observed over these decades; however progress occurred at differentiated times across regions: next to a consistent improvement in Latin America over the whole period, the situation only started to improve in the 1980s in Asia and in the 1990s in Africa. This large-scale evidence is used to emphasize the responsibility of societies to invest in the health of girls and women in order to interrupt the intergenerational cycle of poor health. From a life course perspective, shifting this reproduction of disadvantage implies to pay attention to how socioeconomic conditions shape gendered trajectories detrimental to women's health throughout the different life stages they go through. Overall, these findings move the attention away from individual factors to show the importance of considering how the resources and everyday practices of people sharing a living affect member of the whole group, either in childhood or in adulthood.

The fifth principle refers to the role of individual agency. It brings in the idea that individuals build their life course through their own choices and actions while they are at the same time limited by the social structure's constraints. Acknowledgement of the interactions between structure and agency in the production and reproduction of health inequalities (Abel and Frohlich 2012) shows the importance to take into consideration people's everyday experiences and interpretations of their

circumstances. For example, a case study in Burundi criticizes the absence of such considerations in international HIV/AIDS policies promoting access to antiretroviral treatment: vertical strategies of implementation typically emphasize the success of such policies while not giving attention to local people's health needs and circumstances (Seckinelgin 2012). These authors consider that Sen's capability approach is important to approach individual actions in a context of structurally organized options: "what matters most is what people are able to do with these goods [antiretroviral treatment and testing]," along their own definition of well-being (Seckinelgin 2012, p. 459). In other words, attention must be paid to the interplay between available resources and individual agency, as a freedom to choose along a range of options. A focus on agency thus implies to take a step back from "taken for granted" definitions, usually medically defined, to give room to the categories and meanings that matter for people. Such alternative views call for considering health and illness as a continuum (Defo 2014) or for challenging the divisions between physical and mental health or even between infectious and non-communicable diseases (Mendenhall and Weaver 2014), along people's own views. Such variations in experiences are particularly important when health is approached at the global level; the life course perspective helps to question the relevance of categories formulated in high-income countries, along anthropological research that repeatedly shows how this fails to represent the experience of health across contexts.

This section has shown the potential of the intersection between life course and global health through a number of studies conducted in low- and middle-income countries. While they replicate some findings reported in high-income countries, they also show how much contexts shape contrasted health opportunities and understandings, along locally defined arrangements and normative expectations. Furthermore, the relevance of these principles for the study of health inequalities in high-income countries should also be emphasized. Overall, they allow for an approach giving room to the complex processes underlying individual health trajectories amidst social and cultural constraints.

Methodological Challenges

The ambitious agenda of the life course perspective in global health calls for locally defined research initiatives allowing for both synchronous and historical comparisons across contexts. Such research raises however a number of methodological challenges discussed in this section.

The life course dynamics of health can be best studied with longitudinal data since these allow to follow individual trajectories over time, while integrating the social and historical dimensions of time in their lives. By contrast to cross-sectional data, longitudinal information also offers opportunities to measure the sequences of different events taking place in individual lives, their timing, and their interdependencies with different layers of contextual factors and with other domains of life (Bernardi et al. 2019). This data's capacity to address causal mechanisms is an asset; it notably helps to assess the importance of "social selection" versus "health

selection" mechanisms in the shaping of health inequalities. Accounting for this temporal dimension can be done retrospectively by asking people to report on conditions and events related to previous stages of their lives or prospectively by following them over time through regular data collection assessing conditions and events in real time. In practice, studies often combine retrospective and prospective data. For example, the Survey of Health, Ageing and Retirement in Europe (SHARE) has implemented a life calendar to collect information the life histories of participants recruited after the age of 50.

To account for influences across generations, intergenerational studies collect information from individuals belonging to successive generations in a family; such a complex design has usually stemmed from an extension to an on-going longitudinal study, such as the recruitment of a second generation in birth cohort studies (Thornberry 2016). For example, the Young Lives Study collects data on the child, but also on his/her household and community. While such projects spanning over decades allow to document historical trends, they raise "problems of equivalence" since institutions, social structures, and cultural context change over time; for example, educational and economic standards transformations is a challenge for comparisons across cohorts (Bynner 2016).

The social determinants of health framework have paved the road for the integration of context in life course epidemiology, both sharing an interest for the multiple levels affecting health, including individual characteristics, social factors related to personal environments, as well as data on cultural and political contexts. In that respect, cross-national studies provide important opportunities, such as the SHARE study currently encompassing 27 countries, to assess how variations in economic development, healthcare conditions and public policies impact population aging. The WHO Study on Health AGEing and Adult Health (SAGE) and the Young LIVES study also allow for comparisons, this time across low- and middle-income countries. In these projects, the analysis of individual trajectories can be enriched by national or regional characteristics integrated in multi-level modeling. However, in this case also issues of equivalence can be important.

Assessing population health is associated with a range of challenges as regard the type of indicators used to measure individual health. Next to self-reported data collected in population surveys, biomarkers emerged recently as an opportunity for more "objective" assessments of health. These biological indicators, informing about the presence of health risks associated with current of future disease (Harris and Schorpp 2018), include blood and saliva samples or DNA genetic coding. This information can help understand the pathways linking the social world and biological bodies, hence illuminating the embodiment process. Repeated measurements help to assess the role of timing, duration, or magnitude in exposure to risk factors (Harris and Schorpp 2018). In that domain, the development of biobanks is presented as an opportunity for comparative research across countries (Bynner 2016).

Technological developments opened further opportunities for health-related data. For example access to individuals' spatial location with geocoded information can be used to map clusters of diseases or exposures. Spatial life course epidemiology can indeed enhance the understanding of temporal, geographical, and social patterns in

the distribution of diseases (Jia 2019). Next data on spatial positions, accurate and regular measurement of a range of behaviors of interest for life course epidemiology, such as physical activity or sleep, is also possible. More and more common devices such as cellular phones or connected watches open important possibilities for research including in low- and middle-income countries (Harris and Schorpp 2018). It is more largely considered that digital epidemiology and big data could contribute to the better understanding of health in a life course perspective. However, caution is also warranted in different respects. First, technological development presents the risk to bias research towards the well-off individuals and contexts and to leave aside more marginal segments of societies. Second, ethical concerns, important with all kinds of health data, are exacerbated by the development of digital health information and geocoded data.

Triangulation of information through the linkage of different sources of data, among which matching survey data with administrative data as used by Scandinavian countries, can expand the scope of available information and supports cross checking (Bynner 2016). However civil registration and vital statistics systems vary a lot at the global scale; their weaknesses in low- and middle-income countries impede the quantity and quality of data available for a life course approach in global health.

Both epidemiology and life course research are foremost using quantitative research methods. However, the contribution of qualitative research designs needs to be emphasized. Along a growing interest for "subjective" assessments of health and well-being, these are particularly apt to clarify the meanings people attach to their circumstances, including their health status. Accounting for the succession of everyday experiences and events in trajectories as interpreted by individuals themselves can shed light on the underlying mechanisms and help to understand how unequal health trajectories are shaped. Besides, qualitative research gives access to rich contextual data regarding physical and social environments as well as patterns of behaviors (Burton and Bromell 2010). Techniques initially included oral history and retrospective narrative interviews. While these are fairly easy to implement they are however impacted by memory biases and by selection since only survivors can be approached (Wadsworth 1997). Techniques of longitudinal ethnography and/or interviews that developed more recently provide data documenting developmental change, across different life stages, while giving insights on how the groups or community individuals deal with are associated with a range of factors that influence their chances of good or poor health (Hermanowicz 2016).

As mentioned above, the still marginal intersection between global health and the life course perspective can be attributed to empirical research challenges. First, the financial cost of infrastructure needed to develop and maintain longitudinal research is high, and the sustainability of such research is even debated in high-income countries. The recent interest for biomarkers is associated with additional costs, related to the data collection, but also laboratory analyses, processing, and storage of biomarkers data (Harris and Schorpp 2018). Second, life course epidemiology projects require an important research capacity, including a multidisciplinary scope to encompass the multiple mechanisms of interest, empirical research, and data

management competencies to collect and store complex databases. Acquiring statistical expertise to conduct longitudinal, multilevel, or sequence analyses is demanding. Investment in low- and middle-income countries by institutions in the Global North is useful to encourage the development of research; however it has been recently observed that strengthening of local research capacity remains limited especially at the institutional level (Haregu et al. 2019). A third obstacle relates to research ownership in a historical context of domination by high-income countries. Such concerns have been made visible by the San Code of research ethics issued in 2017 in Southern Africa, by the most often-studied indigenous groups in the world. To avoid post-colonialist interactions, the leadership of the World Health Organization was indeed hoped for to oversee and support life course research in low- and middle income (Batty et al. 2009).

As an ambitious academic multidisciplinary endeavor, the life course perspective offers a seducing approach to complex health-related processes. However, as discussed above, its application should not be seen as an easy task. First researching the many interdependent processes spelled out by the life course perspective is challenging for empirical research. Second, it requires not only the accumulation of rich data, combining social, cultural, environmental, and biological measures but also technical and statistical competencies that often remain limited, even in high-income countries. In that respect, the "data revolution" debated around the adoption of the Sustainable Development Goals framework should integrate resources to support longitudinal data infrastructures. Along cross-sectional information, they can provide major insights relevant for policy-making (Dornan 2016).

Policy Considerations

The life course perspective brings to the front interventions that can keep individuals and the environments they live in healthy, thus promoting good health rather than treating diseases. While health is an important resource for individuals to conduct their lives in the best possible conditions, population health is also a collective resource that brings benefits to the whole society. Indeed, health and development are interacting: poor health hinders economic growth and limited wealth has an adverse effect on health. Estimations of the return of investments in health suggested that 11% of recent economic growth in low- and middle-income countries resulted from a reduction in preventable deaths (Kuruvilla et al. 2018). The life course approach that acknowledges the "interdependence of people, prosperity and the environment" (Kuruvilla et al. 2018, p. 47) clearly states such a cornerstone role of health in all human activities.

In the nineteenth century, the hygienic movement showed the role that governments can play in the reduction of health inequalities across social groups, proving that actions on the context matter. Policies implemented in a range of low-income contexts over the twentieth century (e.g., Cuba, Kerala in India) confirmed the potential of political action on inequalities. Following advocacy efforts around health inequalities over the last decades, the life course approach has progressively reached national and

international policy agendas. In the review of social determinants and the health divide of the European region (Marmot et al. 2012), this approach is considered as a priority area for action. At the global level, the alignment of the life course approach with the Sustainable Development Goals is emphasized, and Goal 3 formulated as "ensure healthy lives and promote well-being for all at all ages" visibly supports the inclusion of the life course perspective (Kuruvilla et al. 2018).

The WHO Minsk Declaration "The life course approach in the context of Health 2020" adopted by the European region's member states in 2015 emphasizes that investing in health and well-being is expected to support social justice globally. The agenda for action proposed by the declaration highlights three priorities. Actions should be taken early in life to give the best start to children. Measures should support important transitions in the life course, such as adolescence (a time of major social and biological transformations) or entry into adulthood. They should be adopted across all sectors of society in line with the social determinants of health framework. Such an approach is expected to bring benefits across generations and a range of social groups, defined at the intersection of social position, gender, ethnic background, and sexual orientation. As discussed above, while access to healthcare is crucial, the life course perspective highlights that the promotion of health depends foremost on social structures and on access to resources offering protection against adverse exposures throughout the stages of individual lives.

Along international developments over the last years, specific attention to women's health issues could clearly be broadened by a life course perspective (Azenha et al. 2013). Besides evidence related to biological mechanisms, knowledge on the role of gender arrangements should be integrated to mitigate intergenerational processes leading to the reproduction of poor health. Globally, the aging of the population has brought a lot of attention to issues related to the last segment of individual lives, and it can explain the focus on healthy aging, representing a major challenge for societies in which individuals get older and older while suffering from a range of comorbid conditions. Medical progress has indeed allowed people to live longer, as also illustrated by the global aging HIV-infected population. However, this emphasis should not deviate attention and resources from the early life stages during which the health of future generations is set up. As stated by Marmot in 2012: "the highest priority is for countries to ensure a good start in life for every child" (p. 1012). This holds true globally, not only for low and middle-income countries but also for high-income countries. In that respect the potential of the Global Strategy for Women's, Children's and Adolescents' Health adopted in 2015 by the United Nations Secretariat General should be emphasized.

The application of a life course perspective across policy sectors remains however hindered by a number of barriers. In a context in which issues related to health tend to be dominated by medical institutions and hence associated with healthcare, resources and framings are still strongly influenced by professional views. In addition, organizations are defined along specialized areas that are little compatible with approaches considering health in a holistic and dynamic perspective as it is experienced by individuals throughout their life course. Historically, funding has been skewed towards medical treatments rather than health promotion and recent figures suggest that

spending on prevention has even declined in half of OECD countries to the benefit of long-term disease oriented facilities (Kuruvilla et al. 2018). A life course perspective in global health requires a general shift in policy-making that considers health at the center of society rather than within hospitals. Another major barrier to the implementation of a life course perspective relates to the temporality of its expected return. Investing in the health and well-being of children will pay off in several decades only, along a long-term calendar hardly compatible with political mandates, focused on short terms interventions (Ben-Shlomo and Kuh 2016).

Finally, it is lamented that actions taken to reduce health inequalities often increase disparities rather than mitigate them. From a social sciences perspective, positions are relational: the deprived position in society of some is the result of the social hierarchies that concentrate privileges among others. Evidence is typically collected on those who are less well off, but it could also be relevant to "study up" hence examine those who are affluent and capture resources and perpetuate social structures, including ideologies (sexism, racism) and forms of domination, that are beneficial to them (Stephens 2010). This holds true not only within national borders but also across regions of world. In the pursuit of health equity, global health ought to support research and initiatives that not only pay attention to disadvantaged women and children but also that question affluent groups in globally unequal dynamics.

Conclusion

To bring together some key contributions the life course perspective can offer for global health, Table 1 proposes a synthesis of important elements discussed at the theoretical, methodological, and policy levels throughout the chapter. This synthetic view should not be read as an exhaustive account of concepts, analytical options, and policy matters related to the life course perspective applied to global health. However, these elements can help to design new research projects and/or inform policy-making.

The life course perspective developed as an interdisciplinary approach to human development, at the intersection of psychology and sociology. Its initial focus on work and family trajectories later extended to the health domain with the development of a life course epidemiology. The novelty of this approach resided in looking at health in a dynamic perspective, as something that develops from birth to death, while stressing the importance of historical time and contextual circumstances. This perspective shifts the attention towards the factors that influence the distribution of health among the population, and across the different social categories that constitute it.

The large scope of aspects taken into account by the life course perspective requires multidisciplinary efforts to address the central mechanisms of embodiment through which differentiated social conditions turn into contrasted biological conditions. Along its contribution to the understanding of health inequalities, the life course perspective emphasizes that among the complex interdependencies impacting health, specific attention should be paid to age and gender, as social categories associated with privileges and disadvantages that shape opportunities or constraints

to achieve good health and well-being. Adopting a life course perspective thus calls for a paradigm shift in health studies, as the initial life course perspective aimed at providing a new lens to think about human development.

At the same time, research and policy should not strive to embrace all aspects of the life course perspective at the same time, which represent a quite unrealistic goal. Rather this conceptual map should be in the background of more narrow and specific issues, as a reminder of the complexity of mechanisms and interdependence across levels of health determinants. Brought together these limited but manageable efforts can help to bring the expected paradigm shift. In the context of global health, the strengthening of multidisciplinary approaches to health will contribute to widen the scope of issues taken into account and improve the relevance of research and policy for local contexts, based on local needs.

However, far from being needed only in low- and middle-income countries, the life course perspective should also influence the way health-related issues are considered in high-income countries. The costs of the healthcare systems, the blind spots of therapeutic solutions, the persisting difficulties in explaining the causes of poor health, the multiple understandings of health conditions and proper ways to take care of it all call for ambitious research that help to disentangle multiple effects and to describe the mechanisms shaping persistent health inequalities.

The findings collected in the context of global aging are crucial to identify opportunities of actions for future generations. Thus, the accumulation of robust findings on the long arm of childhood circumstances over the whole development of individual lives should foremost direct attention on actions and interventions that can offer better environments for children.

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