

Implementation Research

An Imperative for Improving Global Health and Health Inequities

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Give light, and darkness will disappear of itself
—Desiderius Erasmus (1466 to 1536)

The ultimate goal of translational research—the process of applying ideas, insights, and discoveries generated through scientific inquiry to the treatment or prevention of human disease [1]—is to deliver evidence for population health improvement. However, despite decades of success in fundamental scientific discoveries, we are reminded that some research findings may never see the light of day in practice, and that the minority of evidence that makes it into practice may take an average of 17 years to do so [2]. Furthermore, in a high-income nation like the United States, the populace receives an average of one-half of the recommended preventative, acute, and long-term quality health care [3]. This chasm between the goal of translational research and reality is underpinned by a paucity of evidence-base needed to achieve the ultimate goal of population health impact. Under the current 4-step (T1 through T4) conceptual construct of the translational research spectrum, T1 and T2 steps encompass pre-clinical translational research, whereas T3 and T4 steps comprise clinical and post-clinical translational research, respectively. In this regard, it is important to remark that the terminology “post-clinical” does not imply beyond the clinical context; rather, it is meant to embrace the notion that the interactions and partnerships between clinicians and patients occur in the framework of social, ecologic, economic, public health policy, and geopolitical factors, which therefore should be understood and leveraged in an effort to achieve optimal clinical outcomes. The evidence generated in the T3 and T4 space focuses on external validity, dissemination, and implementation. Relative to the abundance of evidence from pre-clinical translational research, there is darkness in post-clinical translational space; this darkness has profound ramifications for population health for which illumination is now imperative. Increasing consensus in this understanding has begun to galvanize efforts to enhance post-clinical translational research activities in order to generate evidence on how best to disseminate and implement evidence-based interventions and the contextual elements of implementation.

This theme issue of *Global Heart* provides insight on post-clinical translational research activities in some regions around the world. In addition, it highlights the relevance of nontraditional research methods or approaches for answering contextual questions, showcases the need for multidisciplinary teams, and arguably positions post-clinical translational research at the center stage of the global health

and health inequities discourse, especially with respect to cardiovascular diseases (CVD) and noncommunicable diseases (NCD) in general.

Huck et al. [4] employed qualitative research methods to identify health behaviors, attitudes, and health system factors in a socioecological model that facilitate or militate against monthly injections of benzathine penicillin for secondary prophylaxis of rheumatic heart disease. The report by Denman et al. [5] highlights the importance of behavioral and psychosocial factors as key intervention targets, and how intervention on such targets can be facilitated by community health workers (CHW) as part of the strategies for preventing NCD in low- and middle-income countries. However, Abrahams-Gessel et al. [6,7] provide perspective on the training and fieldwork experiences of CHW conducting population-based cardiovascular screening by reporting the importance of cultural competence training and delivery tools as essential components of effective CHW preparation for CVD screening in community settings. In addition, the importance of CHW role definition, career development, adequate remuneration, resources, and political will were also noted to be important factors for growth and sustenance of CHW programs.

Some of the challenges that plague post-clinical translational research are apparent in the commentaries and reviews in this theme issue of *Global Heart*. Similarly, the importance of partnerships and the relevance of economic issues are brought to the forefront of diverse considerations that typify the post-clinical translational research space. In their discussion of the challenges and opportunities for the implementation of interventions to prevent and control CVD in low-resource settings in Argentina, Rubinstein et al. [8] highlight the importance of capacity building and infrastructure for implementation science to facilitate achieving the ultimate goal of translating research evidence into policy and practice. Barbero et al. [9] introduce evidence-based policy as an important strategy for reducing the burden of CVD and other NCD in both developing and developed nations. In this regard, they dwell on the need to assess the evidence for health policy components and proceed to discuss the Quality and Impact of Component Evidence Assessment, a new and pragmatic approach for appraising the evidence that underpins the components of health policy interventions. However, evidence-based policy recommendations for CVD prevention are not enough especially in low-resource settings where poor economic conditions and human development have substantial impact on the success of implementation

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efforts. To this end, Pena and Bloomfield [10] remind us of the importance of a multipronged approach to CVD treatment and prevention wherein post-clinical translational research is intimately linked with an economic and human development agenda (particularly in low-resource settings), innovative disease prevention models, and attention to health care delivery and financing. Miranda et al. [11], Johnson et al. [12], and Bloomfield et al. [13] collectively sensitize us to evolving platforms for translational research that epitomize the importance of networks, partnerships, and consortia involving local and international institutions, and governmental and nongovernmental agencies, which are needed to effectively confront the various resource challenges encountered in the post-clinical translational research arena.

The articles in this issue highlight in various ways the importance of post-clinical translational research and the challenges and opportunities it presents. However, it is important to articulate a unifying perspective regarding why post-clinical translational research now matters more than ever before. The fundamental determinants of health are the same across diseases. In the context of CVD, the confluence of social determinants and drivers (e.g., globalization, urbanization, housing, aging, income, and education) and behavioral risk factors (e.g., unhealthy diet, tobacco use, physical inactivity, and harmful use of alcohol) act in concert with metabolic risk factors (e.g., high blood pressure, obesity, diabetes, dyslipidemia) to precipitate CVD. This implies that addressing any population health imbalance entails the appropriate deployment of evidence-based interventions targeted at the key determinants, drivers, and/or risk factors implicated in the imbalance. If there were no imbalance in the distribution of health and well-being, then there would be no global health or health inequities agenda. Herein lies the rationale for why post-clinical translational research is important, because assessing the effectiveness of efficacious interventions and generating the evidence base for their dissemination and implementation fall within the domain of post-clinical translational research. Therefore a failed post-clinical research agenda has profound ramifications for global health and health inequities. Arguably, the persistence and worsening of health inequities and global disease burden is emblematic of a poor report card for post-clinical translational research; however, we must also note that a differentially or inappropriately applied successful post-clinical translational research agenda could similarly perpetuate or exacerbate current challenges in global health and health inequities.

The combination of social determinants and drivers, behavioral, and metabolic risk factors that may underpin CVD and other NCD suggests that multilevel and multifactorial interventions are needed to address population health maladies or reshape the trajectory of health in many communities in countries and regions around the world. This is precisely why post-clinical translational research is complex, demands a lot of resources, and needs a multidisciplinary team effort. Furthermore, it requires mixed-method approaches, pragmatic study designs, and flexible statistical approaches;

employment of real world data; and the development of measurement metrics. In addition, success in this space will depend immensely on collective efforts by way of consortia and academic partnerships, private-public partnerships, and multisectorial and interagency collaborations. In the same vein, success will hinge on the collective knowledge and input of basic and applied sciences from disciplines such as anthropology, sociology, business and social marketing, economics and finance, policy, psychology, epidemiology, political science, behavioral science, cognition, and communication. This notion is apparent from the spectrum of articles in this issue of *Global Heart*; however, it is also clear that we have a long road ahead of us. Consequently, our path requires substantive illumination to mitigate darkness, thus the need for strategic and tactical approaches to grow the field of post-clinical translational research within the context of a comprehensive agenda for success.

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