# Translational research in public health: challenges of an evolving field

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> Translational research means different things to different people, but it seems important to almost everyone.
> Steven Woolf[1(211)].

**THE TRANSLATION OF THE ACHIEVEMENTS FROM BASIC SCIENCE** into everyday clinical practice remains an important issue in contemporary health, and is addressed through the new subject of translational research, which aims to bridge the gap between basic research and its application in health. At first, it connected bench (basic) to bed research (clinical applications), which is also known as benchside-to-bedside research[2]. The definition of translational research has evolved over time, ceasing to be a field linked to clinical research, with perspectives that were mainly focused on the development of new health technologies.

There is an emerging consensus on four perspectives that comprise different stages of translational research in their broad scope based on their different purposes. The first phase involves processes that bring the ideas and the discoveries of basic research at an early stage to their application in human beings. The second phase involves the establishment of efficacy in humans and clinical guidelines for the incorporation of the clinical knowledge into practice in health systems and services. The third phase focuses mainly on implementation research and the dissemination of the application of knowledge. The fourth phase focuses on results on patients and population effectiveness, as well as equity-related issues, in order to verify whether the expected effects of technologies introduced into the health system were different across population groups.

Currently, the European Society for Translational Medicine defines a broader scope for translational research as: an interdisciplinary branch of biomedical research supported by three pillars: bench, bed, and community research, whose goal is to combine subjects, resources, knowledge, and techniques, in order to promote advances in prevention, diagnosis, and therapies, aiming to significantly improve the global health system[3].

The extension of the concept to health systems seems so obvious that one wonders why translational research has only recently caught the attention of health policy managers[4]. The field of translational research encompasses laboratory studies, clinical demands, public health and health management, policies, and economics. It is crucial in the evolution of contemporary biomedical science, and its interventions follow political-economic, ethical-social, and educational-scientific approaches. Translational research may progress by reorganizing academic teams translationally. New translation-oriented academic positions are urgently needed[1]. One of the reasons for the distance between basic research and its applications may lie in the increasing compartmentalization of science. Basic research, which seeks to discover the underlying principles of the natural world, is fundamentally different from applied research, which seeks to find ways to influence or control the world. Basic and applied research

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scientists not only differ in their training and in the tools, they bring to solve research problems, but also in the way they plan the health research process.

Aspects related to policy implementation and the development of other technology modalities, other than drugs and diagnostic testing, have gradually attracted the attention and interest of the academic community and decision-makers around the world. Increasingly, translational research also means translating knowledge into political and organizational praxis.

In order to move forward in this direction, translational research has broadened its scope and built connections to align itself with the translation of knowledge. It is defined as a systematic and transparent process of synthesis, dissemination, exchange, and ethical application of knowledge to improve results and strengthen public policies and health systems, as well as population health, encompassing all the phases in between production and effective application of scientific knowledge, in its various modalities and epistemological and methodological perspectives, in order to support more beneficial results for society.

Universal health systems, such as the Brazilian Unified Health System (SUS), which are complex in their governance, financing, service provision, and implementation arrangements, face numerous challenges so that advances in both in the field of translational research and translation of knowledge are consolidated. If the barriers to translational research are related to the availability and efficient allocation of financial, technical, and political resources for continued and sustainable development, translation of knowledge faces organizational gaps to effectively support the incorporation of the scientific knowledge available for decision-making processes of public health policies, in their stages of formulation, implementation, and evaluation, in a systematic and transparent manner.

Over the last decades, translational research has become a priority in many countries. The National Institutes for Health (NIH) have funded translational research centers in the United States and launched the Clinical and Translational Science Award (CTSA) program in 2006. In 2012, there were 60 CTSA-funded academic centers, strengthening the national effort to integrate the infrastructure needed to promote and accelerate translational research, as well as education actions in this field[5]. In 2016, CTSA's budget was US$ 685.41 million[6]. In addition to academic centers, foundations, industry, disease and hospital-related organizations and individual health systems have also established translational research programs. In Europe, translational research has become a centerpiece of the European Commission's health-related research budget of € 6 billion, and the UK has invested £ 450 million over five years to establish translational research centers[1]. At least two US journals, 'Journal of Translational Medicine' and 'Translational Medicine', are devoted to translational research. The European Society for Translational Medicine offers certificates such as Professional Certification in Translational Medicine, in addition to maintaining the Academy of Translational Medicine Professionals.

In Brazil, the Ministry of Health has been making investments in the field, which have already yielded some results. For the first time in Latin America, doctors at the University of Sao Paulo have successfully performed CAR-T cell therapy to treat a patient with advanced lymphoma. The successful accomplishment of this treatment in Brazil means scientific, economic, social, and public health advances. The current Brazilian capacity is one treatment per month at the Cell Therapy Center (CTC) of the Ribeirão Preto Medical School[7]. The National Cell Therapy Network and its CTC are funded by the Department of Science and Technology of the Ministry of Health.

The periodic 'Health in Debate', with its characteristic pioneering spirit, has welcomed the proposal of the thematic issue 'Translational research in public health: from the bench to the SUS'. This issue, which was financed by the University of Brasilia Post-Graduate program in Public

Health, brings together articles that present interdisciplinary research, involving biomedical, technological, and clinical research, but also epidemiological research and research on health programs and policies. The articles discuss and broaden the understanding of the relationship between the concepts of translational research and translation of knowledge for the SUS, as well as its importance for the Economic and Industrial Health Complex, including the presentation and the analysis of mechanisms and tools to facilitate and to mediate the applicability of scientific research results in health policies, and the investigation of how governmental strategies can encourage the development of translational research that has been taking place in Brazil.

## Collaborators

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