

Viewpoint Article

What is going wrong in health research investment? post-pandemic lessons and the need for change

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Abstract:

The emergence of a new dimension of consciousness after the COVID-19 pandemic might provide an opportunity to highlight gaps and inequalities in health research investment and to mobilize scientific and public opinion to change the way things are done. This analysis considers some lessons learned from the pandemic crisis concerning the priority of global health research, research in prevention and well-being, and international research cooperation. The question raised by these issues concerns the un-fairness of health research funding, mainly dominated by the pharmaceutical and device industries. However, evidence shows that these companies shifted funding to late-phase clinical trials and away from innovation activity and global health priorities. On the other hand, public institutions continue to invest in basic science, with the majority of funds still focused on basic research and innovation. This direct relationship between industry and biomedical research disrupts the reliability of findings and biases the evidence. Several initiatives and efforts are shaping pathways towards health research independence from industry funding. We can propose the idea of industry funding without a direct relationship with researchers through a common pot managed by an independent international agency. Nevertheless, to promote publicly funded research, the scientific community must strengthen its position compared to industry-funded research through transparency and the scientific value of publications.

Keywords: COVID-19, Post-pandemic, lessons, Tunisia

Background

Despite the difficult times during the COVID-19 crisis, people have hope and believe in the post-pandemic new world. It is a global awakening moment that reminds us that health and research remain as vital as ever. However, the failure to ensure against this pandemic is also a moment to consider health research's capacity to develop diagnostics, vaccines, and treatments to address global health issues and emergencies. The emergence of a new dimension of consciousness is perhaps an opportunity to identify and highlight gaps and inequalities in health research.

What lessons can be learned from the COVID-19 pandemic for health research?

1. Setting the priority of global health research

Biomedical research has achieved remarkable success and advances with a significant worldwide impact on life expectancy and infectious diseases, such as poliomyelitis.

However, several issues and questions must be raised. We should have seen this pandemic coming because we were warned long ago about the imminent risk of the emergence of a new coronavirus [1]. Why did this call, which should have required more investment, go unheeded? This is also the case for research projects on universal vaccines against the influenza virus, a major public health condition accounting for more than 400,000 deaths worldwide each year [2]. Moreover, it should be recalled that we have long been waiting for effective results from research on the poor's infectious diseases. Globally, 4 million people are infected with AIDS, 300 million with malaria, and 2 billion with tuberculosis [3].

Each year, hundreds of billions of dollars are spent on health research, but only 5.0% is applied to what is commonly and truly known as "neglected tropical diseases" of low-income countries, where 93.0% of preventable deaths occur [4]. The first lesson learned from the COVID-19 pandemic is that diseases do not distinguish between borders, races, or rich and poor people. There is now a clear challenge for the global community and world leaders to focus on research on global public health needs.

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2. Prevention and well-being

The second lesson is the wide success of the promotion of basic preventive measures, such as hand-washing. It is now obvious that through the power of media and societal mobilization, we can take significant action to prevent many health issues. Imagine if we applied the same focus and sense of emergency to preventing road accidents or promoting healthy food and physical activity. To do so, we need more evidence to prove the impact of preventive measures on health and well-being. Currently, research investment is more focused on diseases and drugs than prevention and well-being. The problem begins with the World Health Organization's definition of health as "complete" well-being. This definition has been widely criticized because of the absoluteness of the word "complete," leaving most people unhealthy most of the time; this contributes to expanding the scope of the disease, health care technology, and drug industry [5]. The need for a new definition of health has been widely expressed. The best proposal is the concept of "health...as the ability to adapt and self-manage [6]. This new formulation could stimulate research on individuals' capacity to cope and adapt to their environment and limitations. In this regard, do not expect that the drug industry would invest in this nonprofit field of research.

3. International research cooperation

The global community understands that the only way to defeat the virus somewhere is to defeat it everywhere [7]. The "me first" approach embraced by some political and scientific leaders should be banished from the area of scientific research. This is another window of opportunity to highlight the crucial need for cross-border international scientific collaboration to develop global health solutions. It is time for researchers and policymakers to step forward to support global open access and the ongoing sharing of scientific information [8] and create a global space for more creativity and innovative ideas worldwide.

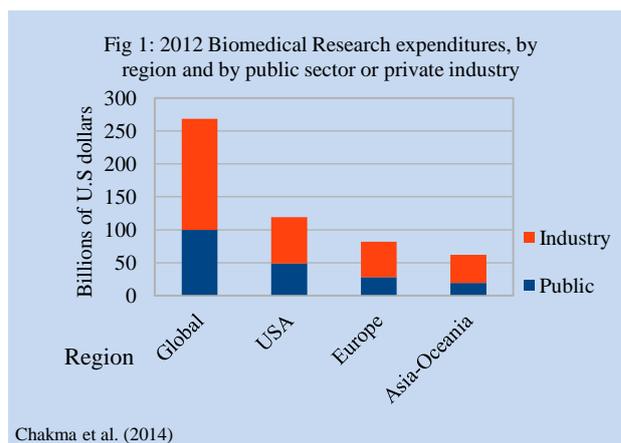
Why does it seem to go wrong? Health research funding, sources, and expenses?

The above lessons learned from the COVID-19 crisis have revealed public opinion that health research seems to be taking the wrong track, missing global public health priorities due to a lack of international collaboration, and focusing more on drugs than prevention well-being. The question is why, and in what research are we investing?

In fact, it is all about money and the way it is spent on health research and development (R&D). Global investment is a difficult metric to obtain because of the diversity of funding sources. Public sources include government agencies, academic institutions, and charitable organizations, whereas industry sources include biotechnology, medical devices, and pharmaceutical firms. Chakra et al. reported in 2014 a global mapping of these funds according to regions and sources; in 2012, the total amount spent on biomedical R&D reached 268.4 billion US dollars, with an approximately 10.0% growth rate each year from 2007 to 2012 [8]. The US leads the amount of expenditure by far, and the largest contributor to R&D spending is an industry, with 64.0% of global funds (Fig.1) [9]. This supremacy of industry in biomedical research funding was also highlighted by Moses et al. [10] in their famous study on the

"anatomy of medical research" in the US. The authors found that pharmaceutical companies shifted funding to late-phase clinical trials and away from innovation activity. These companies' investment in prehuman/preclinical activities ranges from 10.0% to 15.0%. On the other hand, public institutions continue to invest in basic science, with most funds still focused on basic research and innovation [10].

Marcia Angell, former editor-in-chief of the *New England Journal of Medicine*, wrote a book in 2004 [11] denouncing what has come to be called "Big Pharma" the most profitable sector in the last decades, with more than 400 billion US dollars of sales in 2018 [12]. Angell noted several issues, such as favoring investment in producing more expensive "me-too drugs" that are merely variations of older drugs created to prolong patent rights, neglecting drugs for tropical diseases, and spending double on marketing what they spend on R&D, with all the ensuing conflict of interests' issues. Furthermore, growing evidence indicates that industry is the most important driver of overdiagnosis through the promotion of minor "dysfunctions" labeled "custom-made diseases", leading to further tests and drugs [13]. This promotion can include the funding of patient and advocacy groups [14]. Consequently, "Big Pharma" has trapped biomedical research and taken control of evidence trends and priority setting.



The evidence is biased as a consequence of industry influence

A clinician is asked in daily practice to answer questions that matter to patients. Evidence-based medicine that combines the best research evidence with clinical expertise and patient values is the fundamental tool to make decisions. However, for many reasons, including bias, trustworthy evidence is becoming rare. The main bias often identified by authors is "sponsorship bias" [15,16], which may be the most trustworthy evidence that industry funding leads to more favorable efficacy results of a sponsor's products [17].

Furthermore, new evidence has identified sponsor involvement in the design and reporting of research [18]. There are major discrepancies between unpublished detailed clinical data and what is reported in medical journals [19] in some industry-funded studies. Recently, author participated as an investigator in a multicenter international prospective, double-blind, randomized study comparing two drugs for the same problem. The study design and methodology seemed to be of a high standard. The study was co-funded by an academic

institution and a pharmaceutical company. However, author discovered the findings of the study has published in a prestigious medical journal, and they favor the sponsor's product. Moreover, the sponsor was cited at the end of the article as co-founder without specifying in what proportion. Author would have preferred this information to be clearly presented at the top of the article, with more precision on each funder's share. Author admits that he do not entirely trust these findings, because the direct relationship between industry and biomedical research disrupts the reliability of the findings. For-profit companies and health research are two different entities with different ethics and may have contradictory goals, such as profit versus low-cost healthcare.

Time to free health research from industry influence: some ideas to change the rules

Several initiatives and efforts are shaping the pathways towards health research independence from industry funding. An example is the efforts of the British Medical Journal with influential researchers and advisers [15]. They have highlighted some successful models of either full public funding or models involving industry funding and public regulation, such as the Italian government, which has taxed drug companies to fund public interest research [20]. In the same vein, we proposed in 2011 an idea involving industry funding without a direct relationship with researchers [21]. Companies and other stakeholders (government, charitable organizations) would contribute to a common pot managed by an independent international agency. This agency would launch proposals for research projects to which re-searchers could respond to funding requests for projects developed by researchers worldwide. Projects would be accepted or rejected by an independent scientific committee. This system would involve no direct interaction between companies and researchers and preserve consistent industry financial support [21].

On the other hand, to promote publicly funded research, the scientific community must strengthen its position compared to industry-funded research through transparency and the scientific value of publications. A strategy of transparency and a disclosure policy for conflicts of interests are important and necessary steps but remain insufficient to mitigate bias [22]. Other ideas can be proposed to favor and pro-mote independent research, such as the following:

- Revisit the method of assessing the level of evidence of a published study by adding a weighting co-efficient that considers the funding of the study in favor of publicly-funded studies:

- Revisit the evaluation of the notoriety of scientific journals. For example, for the impact factor that considers the average number of times that a journal is mentioned in recent articles published in a given year, we can propose the inclusion of only independent publications: -
- Exclude industry-sponsored trials from systematic reviews and meta-analyses.

British Medical Journal (BMJ), the Cochrane Foundation, and many other organizations have already begun to move in this direction and advocate for independent research. The above ideas require further discussion to join a broad stream of research towards creating the groundwork for global cooperation for health research independence.

How might the COVID-19 crisis be used to catalyze change?

This hoped-for change requires a strong mobilization of scientific and public opinion to stand up to the power of Big Pharma. The COVID-19 crisis provides a new opportunity to popularize the problem, shed new light on the situation, and change the rules for funding and evaluating health research.

With collective power and global awareness, a clear challenge is emerging. The global community, scientists, and policymakers must rebuild "healthy" health research:

- a. based on relevant and trustworthy findings,
- b. focused on global health needs, basic science, and well-being,
- c. that is more innovative and open to global exchange.

The main way to achieve this goal must be through health research's financial independence from industry influence. It is time to relaunch a public call to "heal" health research from money "sickness".

Abbreviation

COVID-19: Coronavirus; R&D: Research and Development; USA: United States of America; BMJ: British Medical Journal; AIDS: Acquired immunodeficiency syndrome

Declaration

Acknowledgment

None

Funding

The author received no financial support for the research, authorship, and/or publication of this article.

Availability of data and materials

Data will be available by emailing ramzibouzidi1968@gmail.com

Authors' contributions

Ramzi Bouzidi (RB) is the principal investigator of this manuscript (Viewpoint). RB is the responsible author for the study concept, design, writing, reviewing, editing, and approving the manuscript in its final form. RB has read and approved the final manuscript.

Ethics approval and consent to participate

Author conducted the research following the Declaration of Helsinki. However, Viewpoint Articles need no ethics committee approval.

Consent for publication

Not applicable

Competing interest

The author declares that he has no competing interests.

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Article Info

Received: 28 October 2020

Accepted: 60 December 2020

Published: 24 December 2020

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