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Editorial

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How Healthcare Can Change Based On Big Data and Biomedical Sciences

Anika Staack

United BioSource, Geneva, Switzerland

***Corresponding author**
Anika Staack, Department of Medicine, United BioSource, Geneva, Switzerland, E-mail: anika.staack@gmail.com

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Abstract

The current prediction is that within the next 30 to 40 years, the global average lifespan will be around 80 years and that personalized medicine will be standard [1]. It is very promising and it seems that it can be reached within this relative short time due to the fact of increased internationally cooperation research as well a better usage of big data [1.2]. And although the technologies are leading to new insights and possibilities, it is not guaranteed that the outcome will be better healthcare for everyone. At the moment, the potential risks, benefit evaluation and outcomes are unknown [3]. In addition, policies require changes in regards to data usage and sharing, access and rights [4]. And consensus needs to be reached about analytic methods and adjustment of research design [4]. Otherwise, the huge amount of data and different approaches without taking into consideration the outcomes might overwhelm us and lead to biased and factually flawed conclusions. And as the techniques and tools are developing so quickly and promising so much, it is time to take a break to think about which direction we want to do, with what kind of risks and uncertainties.

In 2013, the FDA has already introduced a presentation explaining their plan of developing regulatory standards, research methods, and tools, as well introducing the guidance documents they have already in place for facing the challenges [5]. Nethertheless, it has to be taken into account that already 6 years past, the calls for finding standards and redefining processes is getting louder. Are we ready to the future? I think yes, when we take the time to discuss the limitations, risks and benefits and what approaches should be taken. The biggest problem will be that written procedures will be quickly obsolete once they are finalized due to the fast-paced innovations. Maybe personalized medicine requires personalized regulation and processes, but maybe some basic principles can be used.

Points to consider for dealing with the challenges of big data and biomedical sciences to get ready for personalized medicine:

1. Data privacy: How to protect patients' confidentiality and oversight of data use
2. Data structure: How to collect what kind of data fields in which kind of datasets
3. Data handling: How to access & share
4. Data processing: Adjusted research designs and analytic methods
5. Data overload: How to provide tailored information to support physicians with decision-making
6. Disease reclassification: Update disease taxonomy with new biological insights
7. Disease treatment: How to deal with treatment uncertainties

As this list is non-exhaustive other points might be added over time. For the beginning it might serve as a theoretical framework which can be filled with internationally discussed and accepted guidance and policies to define standards. Otherwise, the flood of information might overwhelm and lead to reluctance of acceptance the new possibilities in the biomedical sciences.

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