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Challenges in Health Research Funding: an opinion

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Several countries in the world are able to support health research. This capability is dependent upon the economy. One measure of economies that is generally used is the country's gross national product (GNP). Thus, it is of interest to ascertain the GNPs of a few countries. The GNP of the USA in 2014 was approximately $17,555.2 billion. For comparison, the GNPs of India, Great Britain, and Japan were respectively, 999,165.15 billion Indian rupees (INR), 438,278.0 million British pounds (GBP), and 518,958 billion Japanese yen (JPY) **[1, 2].**

Countries capable of supporting extensive health-related research generally have institutes that house and support such research as well as support for research outside of such housing. One example is the USA as is mentioned here this month. The USA National Institutes of Health (NIH) is a primary source of funding for clinical and research/development related to public health in the USA as well as world-wide. NIH is composed of about 30 institutes and centers and has an annual budget of approximately $30 billion. **[3, 4, 5].**

Returning to the question of GNPs, it is of interest to consider what percentage of its GNP a country should be expected to expend on public health. The World Health Organization in Geneva (WHO) has published many articles on this question. For example, in a 2003 WHO report, it was stated that certain approaches need to be addressed in answering this straightforward question. This is really a very complex question and the following are some factors recommended by WHO as follows: a). What health problems does each country face? b). What health status is aspired to? c). How effective are the health services, activities, as well as policies? d). What are the prices and costs of input services? e). Are there better uses of funds for other purposes? The problem as to what degree of support should be provided for research itself is even more complex **[6].**

It can be noted that the USA NIH budget is approximately 0.17% of the USA GNP.

How individuals and households organize their expenditures is also a pertinent factor as well as governmental expenditures. In the USA, individual household expenditures in many categories are shown and described in the web-site of the USA Bureau of Labor Statistics **[7].** There is an extensive description and analysis of such expenditures divided into categories including durable goods, nondurable goods, as well as services **[8].** Thus, for example, one of the categories indicates that people in the USA spent close to $60 billion on pet management in 2013 (approximately 0.34% of the GNP) **[9].**

The governmental expenditures on public HealthCare have not been in existence until recently. It is thus of interest what occurred in the USA. Milestones in the advancement in healthcare research in the USA occurred over several years and with many steps. These steps include formation of a National Cancer Institute (NCI) in 1940 by President F. D. Roosevelt. Later, President H. S. Truman laid the cornerstone foundation of the NIH Clinical Center in 1951 **[3].** Today, the NIH has grown further and is constituted by approximately 30 institutes, centers, as well as the National Library of Medicine (NLM). The NIH has a highly complex, multilevel, hierarchical, administrative structure paradigm that includes far-ranging responsibilities such as Women's Health, Budget, Data Analysis, and Ethics. In about 2,500 medical schools, universities, and other research institutions, approximately 300,000 researchers are funded by 50,000 competitive grants in the USA and internationally/globally. In addition, 6,000 scientists are funded for research housed at specific NIH laboratories **[3, 10, 11, 12].**

The administrative and scientific responsibilities of the Public Health Service, NIH, the institutions that receive grants from the NIH, as well as the responsibilities of the recipient scientists themselves are set forth in detail in the USA Federal Register and Code of Federal Regulations (CFRs). A few examples of CFRs are of interest and illustrate the various responsibilities and ethics codified by law for grant recipients **[13, 14, 15].** As summarized by the NIH website, peer review is a central benefit at NIH as a means of optimizing the most constructive outcomes for research and clinical grant support. At NIH, the core values of peer review institute the highest ethical standard levels. This lays a foundation for policies, laws, and regulations by which the process of NIH peer review advances. The grant review process is mandated by statute or law. There is a dual peer review system stated in section 492 of the Public Health Service Act and federal regulations governing "Scientific Peer Review of Research Grant Applications and Research and Development Contract Projects" (42 CFR Part 52h). This grant review process is envisioned to form a basis for a timely, equitable, and fair review of grant applications submitted to NIH, and also bias-free. 1. The first level of review is accomplished by panels of principally non-federal scientists with relevant demonstrated scientific expertise in contemporary areas of research (termed Scientific Peer Review [SRG] group). 2. The second level of review is done by Institute and Center (I&C) National Advisory Councils or Boards. These councils are composed of wider selected individuals (both scientific and public representatives) who have activity, interest, and expertise in matters related to health and disease. Applications designated for funding must be recommended for approval by both the SRG and the I&C. I&C Directors make final funding decisions after this entire process is completed **[16].**

In addition, details of the NIH peer review paradigm are described in other publications as well. Thus, for example, it should be noted that NIH deals with approximately 80,000 applications and involves approximately 20,000 reviewers per year, currently **[17].**

As mentioned in this Editorial, challenges are great and complex in regard to health research/development. The administration and carrying out of objectives for research and clinical grants is a huge and complex task. Due to this complexity as described above, there are some suggestions that could be made. For example, future recommendations would include the increased utilization of computerization. The complex administration of clinical and basic health research and development is exceedingly intricate. Possibly, computerization using 'thinking' computers running supervised learning and neural network capabilities may be tested and instituted in the future. As complexity continually increases and as computer power resources and capabilities correspondingly increase (e.g. the future of quantum computers and nanotechnology), such inventions and resources may be the wave of the future **[18, 19, 20].**

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References:

[1] http://www.bea.gov/iTable/iTable.cfm?ReqID=9&step=1#reqid=9&step=3&isuri=1&903=5 http://www.tradingeconomics.com/united-states/gross-national-product
[2] www.nih.gov
[3] http://www.nih.gov/about/almanac/appropriations/index.htm#thirteen
[4] http://www.nih.gov/about/almanac/appropriations/part2.htm
[5] http://www.who.int/health_financing/en/how_much_should_dp_03_2.pdf
[6] http://www.bls.gov/cex/cecomparison.htm
[7] http://www.bls.gov/cex/cecomparison.htm#PCE
[8] http://www.cbsnews.com/news/americans-spent-a-record-56-billion-on-pets-last-year/
[9] http://www.nlm.nih.gov
[10] http://oma.od.nih.gov/public/MS/organization/Organization%20Charts/OD-NIH.pdf http://www.nih.gov/about/budget.htm
[11] Code of Federal Regulations. Title 42, Public Health, Volume 1, Parts 1 to 399. Revised as of October 1, 2000. From the U.S. Government Printing Office via GPO Access, CITE: 42CFR50.
[12] http://grants.nih.gov/grants/compliance/42_cfr_50_subpart_f.htm
[13] CFR. Title 5. Chapter XLV – Department of Health and Human Services. Part 5501 -- Supplemental Standards of Ethical Conduct for Employees of the Department of Health and Human Services.
[14] http://ethics.od.nih.gov/lawreg/5_CFR_5501_106_109.pdf
[15] http://grants.nih.gov/grants/policy/coi/fcoi_final_rule.pdf
[16] http://grants.nih.gov/grants/peer_review_process.htm
[17] http://grants.nih.gov/grants/PeerReview22713webv2.pdf
[18] http://www.nanotech-now.com/news.cgi?story_id=47080
[19] http://arxiv.org/pdf/1104.3345.pdf
[20] http://arxiv.org/pdf/1409.5185.pdf

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