

Impact of Behavioral and Social Sciences on medical and intelligence studies.

In answer to Call for White Papers: Social and Behavioral Sciences for National Security: A Decadal Survey.

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Abstract:

Combination of experience in medical and intelligence studies is a large issue and can be explored through known examples. However, the contribution of Behavioral and Social Sciences and their involvement in the above issue is a special theme and requires special focus and attention through different examples such as clinical trials, different types of illnesses and diseases, and approaches applied.

Keywords: Healthcare records, medical devices, cyber security.

“Messieurs, c'est les microbes qui auront le dernier mot.”
(Gentlemen, it is the microbes who will have the last word.)

—Louis Pasteur

While Louis Pasteur, the famed 19th-century microbiologist, may have literally spoken the truth, individuals, communities, and nations expect governments to use all the available tools of science and public policy to combat the threat of infectious disease. And where such tools are lacking, or poorly used, responsible leaders are expected to take action, plugging the gaps and enhancing execution. Clinical trials in the first sight do not have connection to Behavioral and Social Sciences. However, different studies show that different approaches to treatment, such as concentration of patients on good values and contrary give more effective results and vica versa. (“Preface “The Neglected Dimension of Global Security: A Framework to Counter Infectious Disease Crises”)

“Contains Nonbinding Recommendations The Agency wishes to promote collaboration among the medical device and Health IT community to develop a shared understanding of the risks posed by cybersecurity vulnerabilities to medical devices and foster the development of a shared understanding of risk assessment to enable stakeholders to consistently and efficiently assess patient safety and public health risks associated with identified cybersecurity vulnerabilities and take timely, appropriate action to mitigate the risks.” (“Guidance for Industry and Food and Drug Administration Staff Postmarked Management of Cybersecurity in Medical Devices Issued 12/28/16

According to Leapfrog medical mistakes contribute to 1,000 deaths daily[12]. Last year cost of data breach for companies with data breaches of less than 10,000 records was \$4.9 million, and \$13.1M for more than 50,000 records with nearly 80% of organizations in the US being victims of cyber attacks. The email compromise cost was \$3 billion. The average cost of stolen record was \$158 and in healthcare \$355. The estimate for ransomware is \$1billion, and prediction for businesses is \$400 billion due to hacking with the cost of cyber defense, cyberforensicsand, and cyber insurance industries estimated to \$200 billion.[13]

Relation of clinical trials to cyber security can be seen from the recent hacker attack which targeted many medical groups. It was even predicted “according to Experian’s *2014 Data Breach Industry Forecast*, that the healthcare industry will be among the most susceptible industries to publicly disclosed and widely scrutinized data breaches.” Against millions of online health records being exposed or stolen on a monthly basis AAMI has released a new technical information report (TIR)[15].

There are different guidance developed for dealing with possible problems in cybersecurity , which are also related to medical devices. However, none of the mentioned considers the collaborative efforts as a way for the solution of the problem. For the introduction of a complex approach which can lead to collaboration can be considered the following argument. As different measures considered to be applied one of the approaches can be considered, in which the targeted group of computers or networks are considered as patients having some common disease, such as multiple sclerosis that without isolating conditions can be progressive(PMS) or (RRMS) that affects vision, hearing and different brain functions, such as memory etc... RRMS (in contrast to PMS) is “the most common disease course” with “clearly defined attacks of new or increasing neurologic symptoms. These attacks are followed by periods of partial or complete recovery (remissions) with no “progression of the disease during the periods of remission.”

Along with the problem with medical devices that was widely discussed in many recent articles, such as “Review of weekly enforcement reports identified 1,845 recalls; 605 (32.8%) of these included computers, 35 (1.9%) stored patient data, and 31 (1.7%) were capable of wireless communication” Kramer et al., there is still present an effect of errors that come from the loss of memory devices, involuntary disclosure of information by sending patients data to the wrong address, etc... According to Jeff Kabachinski, ARAMARK the higher your awareness is, the more security is on your mind, the more likely you are to notice something strange[14].

Collaborative approach to clinical trials not only helps in combining experience from different areas of study, but also makes relation to cyber security and intelligence on more cognitive and well understood basis.

Collaborative approach to studies and in particular to medical or health related studies is highly supported by the Behavioral and Social Sciences of the National Academy of Sciences, Engineering, and Medicine with the recently published Report.

Collaborative approach to studies in health related area not only combines contributions of researchers from different areas of scientific research, but also attracts:

1. Public attention;
2. Different researchers from uninvolved areas in the particular study;
3. Different sponsors of the studies.

The first can be reached through different approaches for turning public attention, such as:

- a. Different Public Lectures(Such as Annual Sackler Lecture: The Challenge of Reproducibility in the Biomedical Sciences by Randy Schekman, Nobel Prize Winner, University of California, Berkeley given in National Academy of Sciences Building, Washington, D.C.)

- b. Different Meetings , Symposiums, and Conferences with notification and attendance of interesting individuals;
- c. Different Workshops and Studies including Webinars, etc...

The involvement of researchers from other areas can be reached through previously mentioned methods and additionally through:

- a. Different publications (articles, books, and special reports);
- b. Different professional Seminars;
- c. Different professional Lectures;

As an example can be viewed number of Lectures organized for the Alumni of Rutgers University with participation of President Robert Barchi, who is a Member of Academy of Medicine and other professors and authors. The subjects range from questions of Global Warming to Cyber security.

In the conclusion it should be stressed that application of complex approach that would promote collaboration between different areas of study is expected to show better results in cyber security of medical devices and healthcare records.

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