MIND FOUNDATION

Big data in psychiatry: brave new world?

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Every day in the press, but also in the medical literature, the promises of “Big Data,” “Precision Medicine,” and “Machine Learning” for medicine can be found. These proclamations usually begin with sentences such as: “Mental health (including substance abuse) is the fifth greatest contributor to the global burden of disease, with an economic cost of $ 2.5 trillion in 2010, and expected to double by 2030.”1

And then these articles point to the sheer endless possibilities for digitization in medicine. “Big Data” is praised as the solution to all problems in psychiatry: it would supposedly improve not only early detection of mental disorders, but also therapy. These promises sound heavenly: “The emerging field of ‘predictive analytics in mental health’ has recently generated tremendous interest with the bold promise to revolutionize clinical practice in psychiatry.”2 Does anyone really believe that? And more importantly, do we want that?

In my recent blog post “Does Your Phone Know You Better Than Your Therapist?“, I described what “digital phenotyping” means and what great expectations are associated with it. I have also expressed my skepticism. “Big Data” in psychiatry goes beyond that. It purports to infer our state of mind from the pictures we post on Facebook or Instagram. Initial studies have already been published in which an algorithm diagnosed “depression” or “post-traumatic stress disorder” based on Instagram photos or Twitter posts, sometimes long before a clinical diagnosis was made. Very soon, machines should be able to analyze speech in order to derive diagnoses like depression or incipient dementia. There are also claims that the kind of music we hear could allow conclusions about our emotional state. Some hope in all seriousness that by analyzing the troves of data collected about us – and these are not only our digital data traces, but also biological data like genes, epigenetic patterns, hormones, values, and anything which one can “measure” – mental illnesses can be “discovered” so early that they do not even occur anymore.

If you want an idea of what this vision might mean, watch Steven Spielberg’s great film “Minority Report”, in which crimes are prevented before they are even committed. But the future vision of “Big Data Psychiatry”

goes far beyond that, and it raises many questions. Who will make a medical diagnosis in the future? A doctor? Or the machines from Google and Apple? And if the data collectors have found evidence that I'm suffering from depression, who will be informed? A public health system? A higher „authority for mental health"? Will I be contacted by this authority for treatment? And if I do not want that, will I be „monitored" to prevent my possible suicide? What happens to someone whose data suggests he will be diagnosed with psychosis at 90% certainty in the next six months? And if we believe – as some actually do, seeing humans as deterministic biological machines – that this occurs with 100% certainty, then what? Do we treat them prophylactically? Do we even have a right to warn them?

Who will define what is "normal"? When is a "depression" in need of treatment when a machine makes the "diagnosis"? In a thoughtful article, Manrai, Patel (both Harvard University) and Ioannidis (Stanford University) recently asked the question, "In the Era of Precision Medicine and Big Data, Who Is Normal?"3 The concept of the Research Domain Criteria (RDoC), a dimensional framework for the integrative research of mental (dys)function across different levels of information and organization, also suggests that in the future – though this may be a bit exaggerated – one no longer treats the suffering person, but the disturbed brain function. Will there be cut-off values, as is usual in laboratory settings, outside of which one should advise treatment?

Finally, emotions like depression, fear, or despair have their evolutionary meaning. Especially Western industrialized societies tend to regard these as unwanted and want to turn them off at any cost. I am convinced that this is one reason why the use (or perhaps better – consumption?) of antidepressants has increased dramatically in the last twenty years and continues to increase each year. Have we become healthier? The answer can be found in the first paragraph of this post. Big data psychiatry is the answer to social developments. Yet it causes many people at least as much discomfort as these developments themselves.

References:

1. Conway M, O'Connor D. Social Media, Big Data, and Mental Health: Current Advances and Ethical Implications.CurrOpinPsychol.2016;9:77-82.doi:10.1016/j.copsyc.2016.01.004
2. Hahn T, Nierenberg AA, Whitfield-GabrieliS.Predictive analytics in mental health: applications, guidelines, challenges and perspectives. Molecular psychiatry. 2017;22(1);37–43.-https://doi.org/10.1038/mp.2016.201
3. ManraiAK, Patel CJ, Ioannidis JPA. In the Era of Precision Medicine and Big Data, Who Is Normal? JAMA. 2018;319(19):1981-2.doi:10.1001/jama.2018.2009