

Title: The Brave New World Of Digital Medicine

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Digital medicine will either be the great hope of the future, or a terrifying Frankenstein, or most likely it will be some of both. The promise is obvious and irresistibly seductive; the horrid unintended consequences more subtle and insidious. Harm reduction through ethical discussion and practical regulation is unlikely to provide much in the way of effective constraint. The exponential technical progress of digital medicine, combined with greedy profit motive, will almost certainly overwhelm efforts to contain its worst impacts.

The good stuff will be very good. Enormous data sets analyzed by super-smart machine intelligence will undoubtedly detect all sorts of relationships beyond the poor capacities of single doctors working off their limited clinical experience and small sample-size research. Computers that can beat the best grandmasters at chess will certainly beat the best doctors at diagnosis and treatment planning. Precision, personalized medicine is now mostly commercial advertising hype, but gradually it will become a powerful reality as everyone is constantly measuring everything about themselves.

But the bad stuff is really bad. Watch for a pandemic of cyberchondria and excessive treatment as incidental outlying values are mistaken for disease. Industrial scale data mining of all the information we provide by social networking, Googling and buying stuff will produce pure gold for the medical/industrial complex, especially drug companies. They already inundate the market (especially in the USA) with constant advertising aimed at convincing people that they are sick and that there is a pill for every problem. The same focused social network techniques that Cambridge Analytica used to sell Trump to voters are easily adapted to help Big Pharma push drugs to people who don't need them. Your

searches, postings, purchases, travels will be analyzed to provide clues on which disease mongering campaigns and drug pop-ups are best suited to convince you to buy the product. Advances in the Brave New World of Big Data mining go far beyond anything Aldous Huxley could have imagined and will soon mean that none of us will feel disease-free or have any semblance of medical privacy.

Medical apps have been hyped as a tool to democratize medicine. Perhaps someday. For now, however, they will more likely be a tool mostly designed to enrich their promoters. The great promise of enabling patients in the identification, monitoring, and treatment of disease will be overwhelmed by the profit motive. Already there is a gold rush of thousands of apps, mostly untested, but not the slightest bit shy in making exuberant claims. The systematic bias of apps will be to over-diagnose, an inherent risk with all screening tools, made worse when false positives are so very good for business. The idea that apps should have FDA approval before marketing is both impossible practically and mostly meaningless (because FDA standards for approval for drugs and devices have so badly degenerated under commercial pressure in recent decades).

I hold little hope that we can contain the worst abuses of digital medicine. The past is a prologue of the future. Experience teaches that the economic and political power of Big Pharma, and other components of the medical/industrial complex, easily overwhelm all reasonable objections to over-diagnosis, over-testing, and over-treatment. And there has thus far been very little discussion of the ethics of digital medicine and no effort at its regulation. The hype and hope drown out doubters and fearers. Big money is pushing digital medicine and there is no money to push back.

Let the buyer beware. There is lots of digital glitter, very little real gold.