At last! A Working Model of a Data Ecosystem for Continuous Learning in the Evolving Health Noosphere

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Lawrence Weed noted that while we think in the abstract, we live in the concrete [1]. In their paper "Combining Health Data Uses to Ignite Health System Learning", Ainsworth and Buchan report optimistically on an approach to a very complex sociotechnical domain, health and healthcare systems [2]. This work moves us forward to making operational our abstract aspiration of a learning healthcare system. It involved informatics sitting atop a robust infrastructure of health information and communications technology abetted by sound advice from relevant stakeholders regarding lean, amendable datasets. Ainsworth and Buchan assert that through sufficient foresight and plain hard work we may 'ignite' greater progress utilizing a robust plan while tending to a host of relevant details. Celebrating this moment is in order prior to diving back into the work itself. How did we get to this point, and what is likely to come of it?

Despite clear limitations, healthcare and healthcare systems have made amazing progress over the past 25 years. Impressive developments in health information and communications technology (HICT) including electronic health records (EHR) and EHR systems have been deployed into care practices at both the primary and specialty care levels at considerable expense. Equally impressive is the active movement toward linking healthcare services to other social determinants of health to improve health status and efficiency. At the same time, we've scarcely begun to learn from the information we hold within data repositories. Happily, one senses that public policy in a number of nations is now a bit more understanding and supportive of giving relevant experts, including researchers secure access to personal health information in hopes of achieving step-threshold improvements in health and healthcare.

The road ahead seems rather clear in the broadest sense. Since breaking the code of the human genome, precision medicine at the molecular level is needed wherever it can improve reliably human health and happiness [3]. And within care delivery systems, as Richard Shannon at the University of Virginia has noted, a commensurate precision practice analytics is needed to assure quality and safety in care itself [4]. Parallel exciting work can be expected in public health as it deals with a heavily populated, mobile, and globalized world experiencing new threats such as Ebola and homicidal ideologies amongst the traditional dangers to health.

Like everything under the sun, we rest on the insights of others to help make sense of these changes and to give ourselves a framework for the future. In the 1950s, Teilhard de Chardin posited that humanity as part of creation was in the earliest stages of evolving a Noosphere, essentially a universal brain of collective information and wisdom [5]. Around the same time, Vannevar Bush noted that "the world has arrived at an age of cheap, complex machines and great reliability and something is bound to come of it" [6]. Later, in the 1990s and 2000s, policy statements from the U.S. Institute of Medicine gave us a visions for
‘computer-based health records’ and ways to ‘cross the quality chasm’ [7, 8]. A decade later it helped focus our attention upon assuring that our complex care systems adapt for continuous learning including social determinants of health [9]. The aim is to join carbon, silicon, and fibre into a synergistic evolving environment where we learn from admixtures of cognition, algorithms, and artificial intelligence along with the human attributes of persistence, serendipity, and sheer cussedness.

Five years ago, I wrote an editorial, “Activating a full architectural model: improving health through robust population health records” [10]. I essentially called for what Ainsworth and Buchan now moved into reality. The model will continue to expand. Additions which allow for projecting workforce needs and mixes, assuring professional competence, improving health literacy, and using emerging technologies such as 3D printing to create healthy, inexpensive, and attractive places for living with sustainable energy and environmental protection. While the work is still incomplete, let’s not overlook real progress when we see it. I say “Well done”, and paraphrasing the Australian motto “Advance”.

References