from 1.9 for lifetime nicotine dependence to 19.3 for current generalized anxiety disorder). Although individuals with probable PTSD reported the poorest functioning (d range from 0.31 for health rating to 1.45 for mental health), veterans with subthreshold PTSD also reported significantly worse functioning than veterans with no/low PTSD symptoms on all SF-8 measures (d range from 0.12 for health rating to 0.41 for mental health and social functioning). A similar pattern of findings was observed in analyses of past-month subthreshold and probable PTSD.

The results of this study suggest that a strikingly high proportion of U.S. veterans – approximately one in three – experience clinically significant PTSD symptoms in their lifetime. They further suggest that subthreshold PTSD is associated with an elevated burden of comorbid psychiatric disorders, as well as decrements in mental and physical functioning. While the field has not reached a consensus regarding the operationalization of subthreshold PTSD, these results underscore the importance of assessment, prevention and treatment efforts in targeting veterans and other trauma-affected individuals with PTSD symptoms below the diagnostic threshold.

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Big Data in mental health: a challenging fragmented future

Big Data has been a buzzword in almost every possible field during the last few years. The rapid integration of massive amounts of information from diverse sources fed the hope for a new era also in health sciences. Following its impact on other fields (i.e., marketing and commerce), many authors hypothesized that, by dynamically merging diverse datasets and a mining process, groundbreaking conclusions would be obtained in almost every medical specialty. This would, allegedly, represent a paradigm shift on how research is performed and, as a consequence, a dramatic change in clinical practice¹.

Neurosciences were not out of this wave of – somewhat grandiose – expectations over the Big Data potential, given the increasing need to bridge the gap between brain structure/function and behavior. This complexity requires a comprehensive, holistic perspective in order to fully understand the course of an illness². However, one of the most important limitations in brain research is that it has so far yielded partial, diverse and not generalizable results, which can hardly be directly transferred into clinical practice. Moreover, psychiatry research has not been able to link the current taxonomy and brain functioning³, so that psychiatry is apparently doomed to remain one of the few medical branches in which nosology does not relate to etiology. Therefore, the Big Data promise seemed like a hand in a glove to get the full picture of psychiatric disorders and fill the gap between biomedical and behav-

ioral data. Yet, as years went by, Big Data stood still as it was first born: a promise failing to bring significant integrative answers to neurosciences.

While Big Data relies on numerous and different sources of information, the wide availability of mobile technologies is, out of doubt, amongst the most significant factors that boosted its potential. Mobile devices with hundreds of sensors and powerful processors are carried ubiquitously all day long by more and more people, for multiple and seamless purposes. This is gradually surpassing personal computers usage as a source of information for Big Data. In addition, there is an increasing preference of consumers to integrate mobile technologies and the data they can offer into their own personal health care. Physical activity, sleep patterns and location tracking data sets are easily obtained from either increasingly cheaper smartphones or newer, discrete and affordable wearables. Big technological corporations did not miss this opportunity, offering a number of devices and cloud services which could store and integrate all the health data generated (e.g., Apple's Health, Google Fit). Likewise, some of these companies grew progressively interested in health research through their promising platforms (Apple Research kit and Google Study kit, respectively).

These technologies can bring many advantages over traditional research methods in mental health. For instance, ecological momentary assessments allow a continuous and real-

time data collection in the subject's own environment⁴. Additionally, users' interactions with their mobile devices and their respective sensors could provide passive, objective information about their behavior patterns⁵. In theory, this kind of information has the potential to help designing newer prophylactic strategies as well as allowing personalized treatments⁶. Moreover, integrating behavioral and biomedical data (i.e., genetics, biomarkers, neuroimaging, etc.) and analyzing these datasets could ultimately allow the development of new predictive models, and the identification of previously unsuspected etiopathogenic factors and possibly new treatment targets⁷.

However, in practice, big challenges lie ahead in the pathway of translating the above promises into reality alongside the expected barriers of age and education level. One problem affecting not only behavioral sciences, but all mobile technologies which could provide an essential component of Big Data, is that of fragmentation. The market fragmentation of current mobile operating systems (Android, iOS, Windows Phone, Blackberry, etc.) and smartphones ownership represents a still unaddressed and growing issue in the field. According to the International Telecommunications Union, in 2015, around 95% of the worldwide population had a subscription for a mobile-cellular telephone, but less than 50% of these devices were connected to the Internet⁸. Among smartphones users, Android and iOS together have 96.4% of market share according to the International Data Corporation, with 78% of this amount pertaining to Android⁹. The fragmentation in the market of wearable devices is much more problematic, with more than 20 companies offering these products, which are continuously feeding information to independent databases.

Hence, the promising future of the components of Big Data provided by mobile devices might be severely hampered by the companies' aim of selling their own products with data collected through non-open platforms. In other words, any smartphone or wearable provides relevant information to data-

bases owned by these companies, not available for being exported or integrated with clinical information¹⁰.

In order to obtain significant results from the promised potential of Big Data, it may seem that fragmentation is a small technical problem in comparison to other relevant issues, such as ethical and sociological aspects. However, keeping in mind that the ultimate goal of the Big Data promise is to integrate data from multiple sources and that mobile technologies play a key role in this process, fragmentation should not be underestimated. This problem can be overcome on the long run, providing there is a true effort of both public and private sectors to altruistically collaborate towards an open health science, which could ultimately improve health research and as a result have a significant impact on public health.

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Specific anxiety disorders and subsequent risk for bipolar disorder: a nationwide study

Anxiety disorders are highly prevalent in people with bipolar disorder¹ and substantially worsen the course of the illness as well as treatment response²⁻⁴. Anxiety disorders typically precede the onset of bipolar disorder^{2,5,6} and might therefore represent markers of risk for subsequent bipolar disorder. However, anxiety disorders are heterogeneous, and large-scale studies delineating their relationship to bipolar disorder are scarce.

We conducted a large population-based study in order to determine which specific anxiety disorders increase the risk of developing bipolar disorder. We also assessed whether patients with anxiety disorders are more likely to transition from unipolar to bipolar disorder, and which specific anxiety disorders in parents increase their offspring's risk for bipolar disorder.

Using the Danish Civil Registration System⁷, we selected a cohort of 3,379,205 people born in Denmark between January 1, 1955 and November 31, 2006. We identified all patients diagnosed with bipolar disorder (ICD-8: 296.19 and 296.39; ICD-10: F30.00-F31.90) based on the Danish Psychiatric Central Register⁸ and the Danish National Hospital Registry⁹. Next we singled out individual and parental diagnoses of anxiety disorders leading to in- and outpatient contacts (ICD-10: F40.00-F40.20, F41.00-F41.10, F42.00-F42.99, F43.10; covering agoraphobia, generalized anxiety disorder (GAD), obsessive-compulsive disorder, panic disorder, post-traumatic stress disorder, specific phobia, and social phobia) and psychiatric case history in general (ICD-8 codes: 290-315; ICD-10 codes: F00-F99).