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Responsible innovation in technology for mental health care

The Editorial entitled "This is not my beautiful house", published in the March, 2020, issue of *The Lancet Psychiatry*, about social media platforms and their effect on society, recommends that mental health professionals be vigilant about the promise and perils of these platforms and question how, and why, technology companies operate in the way that they do.[1] We concur. Physical and social distancing imperatives associated with 2019 novel coronavirus disease (COVID-19) further amplified the increasingly ubiquitous and influential role that digital platforms play in our daily lives.[2] We therefore note the genesis and importance of the field of responsible innovation to guide and monitor the implementation of new products and services in mental health. Responsible innovation entails a set of principles and practices in the development of technical solutions for complex problems. It encapsulates collaborative endeavours, in which stakeholders commit to identifying and meeting a set of ethical and social principles, by designing products and services to identify and manage risks to sustainably address the needs of, and challenges faced by, users. How can the mental health field adopt responsible innovation practices?

Responsible innovation is an increasingly prominent initiative. A 2020 Organisation for Economic Co-operation and Development recommendation on responsible innovation in neurotechnology proposed the first international standard in this domain.[3] This recommendation "aims to guide governments and innovators to anticipate and address the ethical, legal and social challenges raised by novel neurotechnologies while promoting innovation in the field". It articulates "the importance of (1) high-level values such as stewardship, trust, safety and privacy in this technological context, (2) building the capacity of key institutions like foresight, oversight and advice bodies,

and (3) processes of societal deliberation, inclusive innovation, and collaboration".

These principles can be usefully adapted to guide the development and implementation of novel technologies to help resolve mental health problems. Hence, in this Comment, we wish to formalise the field of responsible innovation in mental health (RIMH), provide examples of RIMH in action, and provide recommendations for furthering the field.

One useful example of using RIMH for risk mitigation comes from Pinterest, a social media and app company with around 335 million users. Pinterest operates a software system designed to enable people to save and discover information using graphics (known as pins; eg, images and videos), which users find online and save to their virtual pinboards. People can search for pins by theme, save pins that they like, and click on a pin to learn more. Pinterest recognised the commonality and potential propagation and labelling effects of individuals searching for pins relevant to stress, anxiety, sadness, or other difficult emotions.[4] The company then introduced evidence-based cognitive behavioural practices on its platform for users whose search pattern and themes were concerning. Identification and quantification of privacy and user tracking problems were then addressed by a responsible innovation strategy. Specifically, users' interactions with resources relevant to difficult emotions were made private and not linked to their account, tracking was not used, and records of activity were stored anonymously using a third-party service.

However, there are several examples of problematic technology that could gain by incorporating a RIMH approach. For example, most dementia health apps do not have a privacy policy,[5] so similarly, bolstered safeguards and improved communication about privacy protection are needed to facilitate consumer safety and trust in the apps. Other prominent concerns about

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technological innovation and mental health include, for example, social media communities disseminating medically incorrect information or promoting disordered eating habits, social media companies using hidden algorithms to screen user content for suicide threat and create alerts sent to emergency health authorities, suicide contagion occurring via digital and social media, and cybersecurity and the hacking of private data. In the figure we outline actions for RIMH (ie, risk anticipation, risk detection, risk surveillance, and risk mitigation) and principles for fine-tuning these actions that could be applied to the above concerns.

We note several entities supporting the integration of responsible innovation into mental health. Entities supporting leadership and policy in this area include the World Economic Forum's Global Future Council for Neurotechnologies and Brain Science,[6] which explores the strengths and limitations of artificial intelligence in mental health care, and the Asia-Pacific Economic Cooperation Digital Hub for Mental Health, which works to share, develop, scale up, and evaluate innovative evidence-based and practice-based programmes for mental health support. Entities supporting mental health workforce development include the Brainstorm Lab for Mental Health Innovation at Stanford University[7,8] (with courses on leading innovation in mental health and entrepreneurship, technology, and policy) and the Global Brain Health Institute with the Atlantic Fellows for Equity in Brain Health programme. The responsible innovation activities of these entities can be studied, iteratively refined, and emulated.

We also propose that the new field of innovation diplomacy be adapted to promote RIMH.[8,9] Innovation diplomacy includes helping to build academic partnerships with industry, enabling open innovation and collaboration, influencing intellectual property regimes, building global value chains, and developing and scaling innovative solutions to global problems. To this end, we articulated a model of mental health innovation diplomacy,[8,9] which aims to strengthen the positive role of novel technological solutions, and recognise and work to manage both the real and potential risks of using digital platforms. This initiative recognises that technological innovations relating to mental health can have political, ethical, cultural, and economic influences.[8] Adapted from the Nesta (formerly NESTA, National Endowment for Science, Technology and
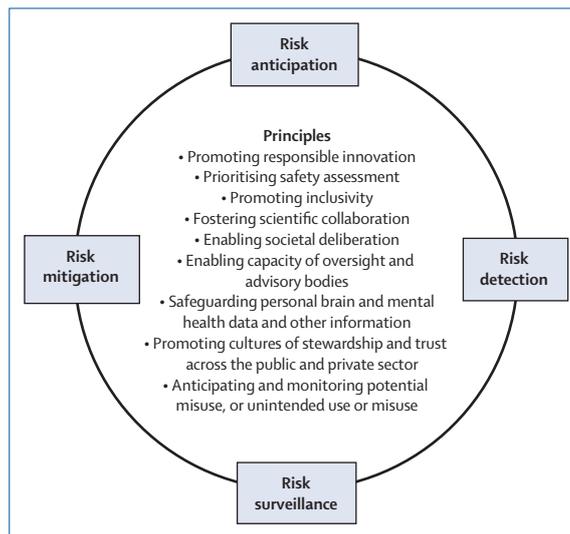
Figure: **Actions and principles of responsible innovation in mental health**
These principles were developed by the Council on Responsible Innovation in Neurotechnology and adopted by the Organisation for Economic Co-operation and Development on Dec 11, 2019.[3]

the Arts) Innovation Policy Toolkit,[10] we elucidated roles relevant to mental health innovation diplomats. Using a focus on responsible innovation practices, the mental health-care field can work collaboratively with technology companies to identify and mitigate risks to users, to build a beautiful house together.

We declare no competing interests.

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For the **Asia-Pacific Economic Cooperation Digital Hub for Mental Health** see https://mentalhealth.apec.org/

For more on the **Atlantic Fellows for Equity in Brain Health programme** see https://www.gbhi.org/programs

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The outsourcing of risk: out-of-area placements for individuals diagnosed with personality disorder in the UK

This online publication has been corrected. The corrected version first appeared at thelancet.com/psychiatry on September 16, 2020

According to the UK Department of Health and Social Care, out-of-area placements occur when a "person with assessed acute mental health needs who requires adult mental health acute inpatient care, is admitted to a unit that does not form part of the usual local network of services".[1] Although for many individuals this can mean a night in the neighbouring trust (an organisational unit within the NHS), for patients diagnosed with borderline personality disorder it could mean years in a distant private psychiatric hospital.[2]

There is increasing concern over the general use of out-of-area placements, for example, from the Care Quality Commission and the media. Specialist personality disorder units are self-designated, as there are no specific quality standards or requirements.[2] They are locked rehabilitation units—another term for which no standards apply—where people are held under the Mental Health Act in restrictive environments. Experience suggests that these locked rehabilitation units are effectively containers for those individuals that the NHS services find troubling.[2] Despite their name, there are rarely any structured interventions available; the specialist element is frequently limited to little else but the sign above the door. The consequences of being compelled to reside in such units for extended periods of time can be profound.

The Care Quality Commission estimates that in total there are 3500 people in long-stay locked rehabilitation wards with scant published data on their demography.[2] 50% of patients in acute psychiatric wards have a diagnosis of personality disorder.[3] These patients are at great risk of being sent for locked rehabilitation, with one study showing that a quarter of people in private locked rehab had a diagnosis of personality

disorder.[4] The validity of this diagnostic construct is contested but for this client group, who will have often been compelled to do traumatic things in the past, the restriction and physical restraint is contraindicated.[5]

National Institute for Health and Care Excellence (NICE) guidelines recommend minimal use of the Mental Health Act and a focus on collaborative working.[5] Both are incompatible with years of detention in highly restrictive environments. We repeatedly see patients who are sent to units with a promise of specialist care. Sometimes the staff believe this, other times they know that this will not be the case, but the patients are not informed and thus cannot consent. NICE recommends a variety of therapies but these are rarely offered or, if they are, the therapies are delivered by unqualified staff.

Dialectical Behaviour Therapy is recommended by NICE, an intrinsic element of which is the acceptance of some degree of risk, balanced with the patient's autonomy.[6] It is impossible to reconcile these elements with institutional care in highly risk-averse and restrictive environments. Furthermore, inpatient treatment incurs a high cost. Placements in private—and supposedly specialist— units last twice as long as those in NHS services,[7] costing up to £250 000 per person per year, based on the authors' experience.

It is reasonable to ask frontline NHS care providers, funding bodies, and professionals why they tolerate treatment for their patients that is incompatible with good practice and is extremely expensive. People with diagnoses of borderline personality disorder are notoriously stigmatised within services.[5] Despite numerous policies, guidelines, and research findings, services continue to act as if this client group is beyond help. These services confidently respond to psychosis,