

The Ethical Conundrums of "Precision Psychiatry"

Gabrielle Di Sapia Natarelli*

Keywords: Precision psychiatry, mental health, trial-and-error, DSM, biomarkers

INTRODUCTION

"Precision psychiatry" is one aspect of the growing field of precision medicine. Precision psychiatry will provide individualized care tailored to certain biomarkers. The patient's unique mental health profile is at the core of advancing machine learning models for clinical practice. Traditionally psychiatrists used a "trial-and-error" approach to standardized drugs, whereas precision psychiatry integrates objectivity with the diagnosis and treatment.¹ The long-term benefits of precision psychiatry include generating effective therapeutic plans for a person, eliminating the emotional burden of the trial-and-error process, and optimizing medications currently on the market for sustained use. To take advantage of the many benefits of precision psychiatry, more mental health practitioners, an effective allocation plan, and the continuation of traditional psychiatry are necessary. Precision psychiatry should not supplant traditional psychiatry as not all practitioners and patients will have access to it.

ANALYSIS

The National Institute of Mental Health is working on the Research Domain Criteria (RDoC) project intending to establish an updated classification system for mental health disorders based on a combination of observational and neurobiological findings.² While this effort is working toward the goal of providing a research-based classification system, the technological tools necessary to arm a physician with a well-endowed toolbox may not be cost-effective in the initial phase.³ To reap the rewards of precision psychiatry, physicians should eventually circumvent the trial-and-error approach to psychiatric care, with its hefty financial burden often thrust upon the patient and family.

a. Emotional and Financial Benefits

The usual course of diagnosis for mental health disorders involves analyzing symptoms according to the Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD) developed by the World Health Organization.⁴ The promising advances in the accuracy of neuroimaging will prove to

* Gabrielle Di Sapia Natarelli, MS Candidate Columbia University

be an asset to the field of precision psychiatry. For example, several studies showcase the increased responsiveness to lithium therapy as a predictor of the efficacy of bipolar disorder treatment.⁵ Ultimately, one of the greatest benefits of precision psychiatry is the ability to predict whether a particular person with major depressive disorder will develop antidepressant resistance by the course of their proposed treatment.⁵ For 30 percent of people diagnosed with major depressive disorder, the treatment trajectory often ends with treatment resistance.⁶ By circumventing the trial-and-error algorithm to psychiatric care, the patient's emotional and financial burden may be reduced.

b. Justice and Access

Successfully implementing precision psychiatry is no easy feat; it requires interconnectedness, including "big data" storage, research analyzing molecular biosignatures, "computational psychiatry," communication with experts in the field of neuroimaging and neuroscience, and electronic health records.⁷ The success of precision psychiatry would revolutionize the field altogether, with the goal being "to improve the diagnostic process and the choice of a specific treatment using biomarkers derived from peripheral blood, imaging...or neuropsychological tests."⁸ However, the success of precision psychiatry is contingent on modifying the healthcare infrastructure, which cannot currently provide equitable access to basic mental health care.⁹

For example, mental health disorders are the leading cause of lost productivity and disability, with the US incurring an economic cost of \$42-53 billion per year.¹⁰ One goal of the Affordable Care Act (ACA) was to increase insurance coverage for mental health care. However, the US still possesses "one of the highest mental health burdens among high-income countries."¹¹ Access and affordability of psychiatric care in the US is already of utmost concern as one in six adults seeks out care; however, due to the lack of affordability, such required care is unattainable.¹² The mismatch between the volume of individuals requiring mental health care and the number receiving it may be due to the relatively low workforce capacity in comparison to other high-income countries.¹³ The US has a staggeringly low number of mental healthcare professionals compared to Canada, including nurses, psychiatrists, psychologists, and social workers, with 105 and 277 professionals per 100,000 individuals, respectively.¹⁴ The gap in mental health care is prominent in the US, where one-third of the indigenous population diagnosed with a mental health disorder does not receive any treatment.¹⁵ Inequity in access to mental health care is still of paramount concern, with basic mental health care needs remaining unmet for many Americans.¹⁶ Precision psychiatry involving advanced technology and interdisciplinary care teams provides individualized psychiatric care, which could prove beneficial. However, the inability to guarantee equitable access to such care calls into question distributive justice and whether the benefits will accrue to those in need.

c. Saves Time

Precision psychiatry is costly, and communities with limited psychiatric resources may potentially become further disadvantaged. If precision psychiatry is readily available to the masses and is used instead of trial and error, the willingness of people to seek mental health care may rise. A faster route to the discovery of medication combinations optimized for the patient would contribute to building trust and rapport. Targeting both the biological and physical manifestations of mental illness not only provide rapid improvement but also decreases the risk of losing patients due to frustration over lack of improvement with pharmacological intervention. Providing precision psychiatry decreases the time required for each person to achieve a successful therapeutic regimen, ultimately allowing the physician to invest time in a greater number of patients. The redistribution of mental health care and eliminating mental healthcare deserts are necessary to reap the benefits.

d. A Humanistic Approach

Establishing rigorous evidence-based criteria for precision psychiatry will not only involve decades of research but may also impact the humanistic aspects of psychiatry. Psychiatry involves a humanistic approach to medical care. Building a trustworthy patient-physician relationship is the foundation of exemplary care. Precision psychiatry provides the crucial benefit of tailoring medical treatments to the predicted response rate of the person.¹⁷ However, one must be wary of falling into the trap that precision psychiatry is the answer for mental health disorders. Without active intercommunication between varying healthcare disciplines, including social work, the person may be "reduced to an object of big data."¹⁸ A humanistic approach will properly include the ongoing relationship with the psychiatrist and may include some trial and error as well to reflect patient preferences based on side effect profile rather than efficacy alone.

CONCLUSION

Reducing people to either their brain or their computed contribution to "big data" will not benefit precision psychiatry. While it is helpful to understand the root of a patient's mental illness through neuroimaging and neurological biomarkers, such intrinsically evidence-based medicine must coexist with traditional psychiatric care. Precision psychiatry could benefit people with treatment-resistant mental illness by integrating neurological biomarkers as a tool for retrofitting existing medications to the person. Used under ethical standards, precision psychiatry is a positive development. Distributive justice should be included in the goals of all health care, especially in the distribution of precision psychiatry as it becomes more finetuned and garners broad appeal. During the phasing in period of precision psychiatry, the gap in equitable access to standard mental health care should be resolved. The US needs to better its mental health diagnosis and treatment options to offer both traditional and precision psychiatry to people in need. Although it may take several years, even decades for a rigorous set of tools capable of foreseeing medication responsiveness to come to fruition for physicians, such precision psychiatry will be a game-changer.

¹ Evers, Kathinka. "Personalized medicine in psychiatry: ethical challenges and opportunities." *Dialogues in Clinical Neuroscience* vol. 11,4 (2009): 427-34.

² Menke, Andreas. "Precision pharmacotherapy: psychiatry's future direction in preventing, diagnosing, and treating mental disorders." *Pharmacogenomics and Personalized Medicine* vol. 11 211-222. 19 Nov. 2018, doi:10.2147/PGPM.S146110.

³ Manchia, et al., p131

⁴ Menke, p 211

⁵ Manchia, Mirko et al. "Challenges and Future Prospects of Precision Medicine in Psychiatry." *Pharmacogenomics and Personalized Medicine* vol. 13 127-140. 23 Apr. 2020, doi:10.2147/PGPM.S198225.

⁶ Manchia, et al., p 131

⁷ Fernandes, Brisa S et al. "The new field of 'precision psychiatry'." *BMC Medicine* vol. 15,1 80. 13 Apr. 2017, doi:10.1186/s12916-017-0849-x.

⁸ Menke, p211

⁹ Fernandes, p80

¹⁰ Williams, Leanne M. "Precision psychiatry: a neural circuit taxonomy for depression and anxiety." *The Lancet. Psychiatry* vol. 3,5 (2016): 472-80. doi:10.1016/S2215-0366(15)00579-9.

¹¹ Tikkanen, Roosa et al. "Mental Health Conditions and Substance Use: Comparing U.S. Needs and Treatment Capacity with Those in Other High-Income Countries." *Commonwealth Fund*. 21 May. 2020, doi:10.26099/09ht-rj07.

¹² Fernandes, p 80

¹³ Fernandes, p 80

¹⁴ Fernandes, p 80

¹⁵ Kohn, Robert et al. "Mental health in the Americas: an overview of the treatment gap." *Revista panamericana de salud publica = Pan American Journal of Public Health* vol. 42 e165. 10 Oct. 2018, doi:10.26633/RPSP.2018.165

¹⁶ Kohn et al., p 165

¹⁷ Fernandes, p 80

¹⁸ Stiefel, Friedrich et al. "Precision psychiatry: Promises made-Promises to be kept?." *The Australian and New Zealand Journal of Psychiatry* vol. 53,9 (2019): 841-843. doi:10.1177/0004867419849482.