Classification Systems in Psychiatry: Diagnosis and Global Mental Health in the Era of DSM-5 and ICD-11

Dan J. Stein[1], **Crick Lund**[1], and **Randolph M. Nesse**[2]

[1]Dept of Psychiatry, University of Cape Town, South Africa

[2]Dept of Psychiatry, University of Michigan, USA

Abstract

Purpose of review—The development of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and of the eleventh edition of the International Classification of Disease (ICD-11) have led to renewed attention to the conceptual controversies surrounding the nosology of mental disorder. This article reviews recent work in this area, and suggests potential ways forward for psychiatric nosology, focusing in particular on the need for improved classification approaches for public and global mental health.

Recent findings—DSM-5 and ICD-11 have taken somewhat different approaches, but both appropriately emphasize the importance of clinical utility and diagnoic validity in psychiatric nosology. The Research Domain Criteria (RDoC) framework provides a useful focus on the individual-level causal mechanisms that are relevant to vulnerability to mental disorder. An analogous approach to societal-level causal mechanisms would be useful from a public and global mental health perspective.

Summary—In their day-to-day work, clinicians will continue to use the fuzzy constructs operationally defined and narratively depicted in DSM-5 and ICD-11. Advances in our understanding of the individual-level and society-level causal mechanisms that contribute to vulnerability to mental disorder may ultimately lead to improved classification systems, and in turn to better individualized care as well as improved global mental health.

Keywords

DSM-5; ICD-11; psychiatric classification; global mental health

Introduction

The recent revisions of the Diagnostic and Statistical Manual of Mental Disorders (1) and the International Classification of Diseases (2) have called attention to the controversies that surround psychiatric classification. Advances in neurobiological methods raise anew questions about how findings from neuroscience can best be aligned with studies of clinical phenotypes (3). This article reviews recent work in this area, and suggests potential ways

Corresponding author: Dan J. Stein, UCT Dept of Psychiatry, Groote Schuur Hospital J2, Observatory 7925, Cape Town, South Africa. Tel: 27-21-406-6566. dan.stein@uct.ac.za.

forward for psychiatric nosology, focusing in particular on the need for improved classification approaches for public and global mental health.

The Diagnostic and Statistical Manual of Mental Disorders

The Diagnostic and Statistical Manual of Mental Disorders has provided a major foundation for nosology ever since the DSM-III defined categories using operationalized criteria that vastly increased diagnostic reliability. DSM-IV implemented changes based on evidence that further increased reliability of psychiatric diagnosis. DSM-III and IV were widely adopted by clinicians, researchers, and regulatory authorities. They defined tentative categories that some expected to be replaced by new categories validated by biomarkers and new knowledge about brain mechanisms (4).

The process of revising the DSM-5 provided an opportunity for re-thinking diagnostic classification systems (1). Several proposals were put forwards, including new approaches to the overall structure (5) and an emphasis on dimensions rather than categories (6). However, the hope that neuroscience would develop to the point that categories were defined by biomarkers has not been realized, so the process of revising the DSM-5 has had to proceed with other kinds of validation evidence. Indeed, in the end, DSM-5 did not implement a paradigm shift (7)(8), but rather it made incremental changes in the overall structure, and in the diagnostic criteria for some categories.

Psychiatric diagnosis continues to suffer from relatively low reliability in clinical settings (9)(10), and diagnoses continue to rely on clinical phenomenology rather than on biomarkers. This has led some to conclude that psychiatry is in crisis or that the descriptions of mental disorders in the DSM do not match clinical observations (11). An alternative conclusion is that we have been hoping for too much from our diagnostic criteria (12).

It seems increasingly likely that many psychiatric disorders are conditions with overlapping fuzzy boundaries with multiple interacting causes acting on multiple brain mechanisms. Instead of essentialized diseases, they are best understood in terms of more central paradigmatic and more peripheral atypical members (13)(14). If this is the reality, then the DSM system may describe it fairly well. The problem is not our diagnostic criteria, the problem is that our expectations are based on an oversimplified medical model in which disorders are each imagined to be discrete with specific causes and biomarkers. Even in medicine, conditions such as congestive heart failure, have many causes and diverse manifestations (12). The difficulty of finding biomarkers for mental disorders will, we anticipate, be resolved by recognizing that behavior is a biomarker just as objective as pulse or cardiac ejection fraction, albeit much harder to measure.

International Classification of Disease

The International Classification of Mental Disorders is the most widely used system of medical classification throughout the world. ICD-10 provides clinicians throughout the globe with a free and accessible classification system that can be used with relative ease by non-mental health clinicians, most of whom work in general medical settings in low and middle income countries. A simple classification system is important for diagnosing mental

disorders, and for addressing the global treatment gap (15) as well as the global research gap (16).

ICD-11 therefore focuses particularly on clinical utility in primary care general medical settings in low and middle income countries by non-specialist clinicians (2). A system for ensuring globally applicable classification and diagnosis of psychiatric disorders is an essential foundation for ongoing efforts in global mental health. Indeed, WHO studies have been key in showing a huge and growing proportion of morbidity and mortality from mental disorders (17), with significant underdiagnosis and treatment compared to physical disorders (18).

Nevertheless, if expectations that resource allocation will match the burden of disease are high, this could again lead to the conclusion that psychiatry is in crisis. Given that there are real resource constraints in low and middle income countries, that evidence-based definitions for psychiatric disorders are still being codified, and that the political will to attend to this evidence base and to address human rights issues in relation to mental health is often missing, ongoing patience is needed. Parity for mental health treatment is increasingly well accepted, but it may be some time before it is achieved (19).

RDoC: Efforts in Cognitive-Affective Neuroscience

Both DSM-IV and ICD-10 have contributed to research on the biology of mental disorders by providing a reliable communication system that has allowed rigorous biological and pharmacotherapeutic studies. On the other hand, critics have emphasized that there is a real gap between neurobiology and clinical phenomenology. For example, there are no single biological system involved in depression, instead symptoms such as insomnia or low motivation involve neurocircuits and neurochemistry that is also present in a range of other disorders (20).

The advent of new neuroscience methodologies has compounded this problem. We have now a huge range of data on structural and functional imaging, genotyping, and proteomics that is turning out to be very difficult to map to defined disorders. One proposed solution is to focus on endophenotypes or intermediate phenotypes; the argument is that instead of focusing, for example, on the neurobiology of anxiety disorders, we should rather focus on the neurobiology of heritable anxiety sensitivity; this would lead to an understanding of the neurocircuitry and neurochemistry that cuts across various anxiety and related conditions (21)(22).

The National Institutes of Mental Health has proposed a systematic framework for research on pathophysiology, especially for genomics and neuroscience, which it hopes will inform future classification schemes (23). The Research Domain Criteria (RDoC) framework conceptualizes mental disorders as disorders of brain circuitry. It assumes that the dysfunctions characteristic of mental illness can be identified with the tools of clinical neuroscience, including functional neuroimaging. And the RDoC framework assumes that data from genetics and clinical neuroscience will yield biosignatures that are useful in clinical practice (23)(24).

Some aspects of this approach seem useful. Nevertheless, like any approach to the complexities of psychiatric classification, it will also have disadvantages. First, clinicians need simple ways to communicate, and systems such as RDoC are going to be complex. Second, the biology of an endophenotype such as anxiety sensitivity is not necessarily any the less complex than the biology of a psychiatric disorder. Third, given the heterogeneity of psychiatric disorders and their multiple underlying mechanisms, it remains an open question whether biosignatures will have sensitivity and specificity. Our expectation, therefore, is that RDoC will remain in the realm of research rather than practice for some time to come (with the possible exception of work in certain areas such as cognitive decline).

Public Mental Health

The inadequacies of the DSM-5 and ICD-11 from a public health perspective are analogous to those from a neurobiological perspective. On the positive side, the use of DSM-IV and ICD-10 categories has made possible rigorous epidemiological studies of psychiatric disorders which have documented the enormous burden of these conditions globally (18). On the other hand, the question has been raised of whether such diagnostic categories really do overlap with the main issues that global mental health must address (25). Certainly, although the "S" in DSM stands for Statistical, the approach is focused much more on the "D" of Diagnosis.

From the perspective of public and global mental health, diagnostic constructs such as "depression" are remarkably heterogenous (26). While it is useful to inform decision-makers that cost-efficient treatments for depression exist (27), public mental health advocates need to differentiate, for example, between depression that is largely due to environmental stressors requiring societal-level preventive and promotive interventions, and endogenous depressions that require individual-level clinical care. Focusing on the complex cross-level mechanisms which underlie psychiatric disorders may not only be helpful in determining their true nature (28), but also in developing equally complex social interventions.

What would a global mental health classification in the area of mental health look like? First, rather than focusing solely on diagnostic constructs, it might focus on key health issues such as interpersonal violence and substance use. If the use of the term "endophenotype" has been helpful in putting attention on the causal mechanisms underlying disorders, perhaps a term such as "exophenotype" will be helpful in placing attention on key public health phenomena that demand attention even when they are not individual disorders. A public health approach to violence has already proved useful insofar as it leads to efforts to assess levels of violence, to determine risk and protective factors, and to investigate optimal interventions for the reduction of violence and its negative sequelae (29). Similarly, a public health approach to substance use may ultimately have large dividends for global mental health.

Second, a global mental health classification might also highlight societal-level risk and protective factors. The gini coefficient is a significant predictor of a range of adverse behavioural outcomes, and so may be a crucial indicator, although not all data are consistent (30). Levels of early adversity and levels of early educational opportunities, are also likely

to be important in determining risk for subsequent adverse behavioral outcomes. Close links between impoverishment, food insufficiency and mental disorders make a focus on breaking the cycle of poverty key (31). The growing set of studies on well-being might lead to a range of other societal-level risk and protective factors for the adverse behavioral outcomes that it should be the goal of public or global mental health to address.

Conclusion

Different conceptual approaches lead to different approaches to classification (32)(33). A "classical" approach is based on the notion of essentialized categories with necessary and sufficient features; such categories have limited practical utility in primary care settings in developing countries, and they increasingly appear at odds with evidence for massive comorbidity and lack of evidence for specific biomarkers. A "critical" approach argues that all categorization is essentially about politics and power, and that there is no rational way to "carve nature at her joints"; this again is not particularly helpful for those interested in improving mental health. Instead of either extreme alternative, we would advocate for an approach to diagnosis like that used in general medicine, one that emphasizes the complexities of classification, with different classifications having different strengths and uses, and with hopes that with advances in theory and data there will be advances in classification.

DSM-5 and ICD-11 are essential clinical tools; the former has emphasized diagnostic validity, and the latter has emphasized clinical utility. Clinical utility is however reliant on diagnostic validity, and there is considerable overlap between the two. In its attempt to increase diagnostic validity, DSM has also emphasized operation definitions. In contrast, with its focus on clinical utility, ICD has emphasized prototypes (34). Once again, in practice there is probably a good deal of overlap, it is quite likely that clinicians who use the DSM nonetheless employ prototypic thinking in approaching diagnosis and evaluation in the clinic.

RDoC provides a useful focus on the individual-level causal mechanisms that are relevant to vulnerability to mental disorder. An analogous approach to the societal-level causal mechanisms that characterize the exophenotype would be useful for studies of adverse behavioural outcomes. Clinicians need to be aware, for example, both that certain heritable temperaments may be risk factors for mental disorder, and that they interact with social phenomena such as interpersonal violence that require a public health approach. In their day-to-day clinical work for the near future, clinicians are likely to continue to use the fuzzy constructs operationally defined and narratively depicted in DSM and ICD. However, our hope is that advances in work on endophenotypes and exophenotypes will ultimately lead to improved classification systems, and in turn to better individualized care as well as improved global mental health.

Acknowledgments

References

1. Regier DA, Narrow WE, Kuhl EA, Kupfer DJ. The conceptual development of DSM-V. The American journal of psychiatry. 2009; 166:645–650. [PubMed: 19487400]

2. International Advisory Group for the Revision of ICD-10 Mental and Behavioural Disorders. A conceptual framework for the revision of the ICD-10 classification of mental and behavioural disorders. World psychiatry : official journal of the World Psychiatric Association (WPA). 2011; 10:86–92. [PubMed: 21633677]

3. Hyman SE. The diagnosis of mental disorders: the problem of reification. Annual review of clinical psychology. 2010; 6:155–79.

4. Kupfer DJ, Regier DA. Neuroscience, clinical evidence, and the future of psychiatric classification in dsm-5. American Journal of Psychiatry. 2011; 168:672–674. [PubMed: 21724672]

5. Andrews G, Goldberg DP, Krueger RF, Carpenter WT, Hyman SE, Sachdev P, et al. Exploring the feasibility of a meta-structure for DSM-V and ICD-11: could it improve utility and validity? Psychological medicine. 2009; 39:1993–2000. [PubMed: 19796425]

6. Kraemer HC. DSM categories and dimensions in clinical and research contexts. International Journal of Methods in Psychiatric Research. 2007; 16:S8–S15. [PubMed: 17623398]

7. First MB. Paradigm shifts and the development of the diagnostic and statistical manual of mental disorders: past experiences and future aspirations. Canadian journal of psychiatry. Revue canadienne de psychiatrie. 2010; 55:692–700. [PubMed: 21070696]

8. Kendler KS, First MB. Alternative futures for the DSM revision process: iteration v. paradigm shift. The British journal of psychiatry : the journal of mental science. 2010; 197:263–5. [PubMed: 20884947]

9*. Regier DA, Narrow WE, Clarke DE, Kraemer HC, Kuramoto SJ, Kuhl EA, et al. DSM-5 field trials in the United States and Canada, part II: Test-retest reliability of selected categorical diagnoses. American Journal of Psychiatry. 2013; 170:59–70. One of the key papers from the DSM-5 field trials. [PubMed: 23111466]

10. Kraemer HC, Kupfer DJ, Clarke DE, Narrow WE, Regier DA. DSM-5: how reliable is reliable enough? The American journal of psychiatry. 2012; 169:13–5. [PubMed: 22223009]

11. Bracken P, Thomas P, Timimi S, Asen E, Behr G, Beuster C, et al. Psychiatry beyond the current paradigm. The British journal of psychiatry : the journal of mental science. 2012; 201:430–4. [PubMed: 23209088]

12. Nesse RM, Stein DJ. Towards a genuinely medical model for psychiatric. BMC Medicine. 2012; 7:5. [PubMed: 22244350]

13. Stein, DJ. Philosophy of psychopharmacology. Cambridge University Press; 2008.

14. Kendler KS, Zachar P, Craver C. What kinds of things are psychiatric disorders? Psychological medicine. 2010; 41:1–8. [PubMed: 20624328]

15. Petersen I, Lund C, Stein DJ. Optimizing mental health services in low-income and middle-income countries. Current opinion in psychiatry. 2011; 24:318–23. [PubMed: 21546837]

16. Collins PY, Patel V, Joestl SS, March D, Insel TR, Daar AS, et al. Grand challenges in global mental health. Nature. 2011; 475:27–30. [PubMed: 21734685]

17. Lopez, AD.; Mathers, CD.; Ezzati, M.; Jamison, DT.; Murray, CJL., editors. Global Burden of Disease and Risk Factors. Washington (DC): World Bank; 2006.

18. Ormel J, Petukhova M, Chatterji S, Aguilar-Gaxiola S, Alonso J, Angermeyer MC, et al. Disability and treatment of specific mental and physical disorders across the world. The British journal of psychiatry : the journal of mental science. 2008; 192:368–75. [PubMed: 18450663]

19. Tomlinson M, Lund C. Why does mental health not get the attention it deserves? An application of the Shiffman and Smith framework. PLoS medicine. 2012; 9:e1001178. [PubMed: 22389632]

20. Van Praag HM, Asnis GM, Kahn RS, Brown SL, Korn M, Friedman JM, et al. Monoamines and abnormal behaviour. A multi-aminergic perspective. The British Journal Of Psychiatry: The Journal Of Mental Science. 1990; 157:723–734. [PubMed: 1980627]

21. Garner M, Möhler H, Stein DJ, Mueggler T, Baldwin DS. Research in anxiety disorders: from the bench to the bedside. European neuropsychopharmacology : the journal of the European College of Neuropsychopharmacology. 2009; 19:381–90. [PubMed: 19327970]

22. Fineberg NA, Potenza MN, Chamberlain SR, Berlin HA, Menzies L, Bechara A, et al. Probing compulsive and impulsive behaviors, from animal models to endophenotypes: a narrative review. Neuropsychopharmacology : official publication of the American College of Neuropsychopharmacology. 2010; 35:591–604. [PubMed: 19940844]

23. Insel T, Cuthbert B, Garvey M, Heinssen R, Pine DS, Quinn K, et al. Research domain criteria (RDoC): toward a new classification framework for research on mental disorders. The American journal of psychiatry. 2010; 167:748–51. [PubMed: 20595427]

24. Cuthbert BN, Insel TR. Toward new approaches to psychotic disorders: the NIMH Research Domain Criteria project. Schizophrenia bulletin. 2010; 36:1061–2. [PubMed: 20929969]

25. Summerfield D. Afterword: against "global mental health". Transcultural psychiatry. 2012; 49:519–30. [PubMed: 23008353]

26. Cramer AOJ, Borsboom D, Aggen SH, Kendler KS. The pathoplasticity of dysphoric episodes: differential impact of stressful life events on the pattern of depressive symptom inter-correlations. Psychological medicine. 2012; 42:957–65. [PubMed: 22093641]

27. Chisholm D, Flisher AJ, Lund C, Patel V, Saxena S, Thornicroft G, et al. Scale up services for mental disorders: a call for action. Lancet. 2007; 370:1241–52. [PubMed: 17804059]

28. Kendler KS. Levels of explanation in psychiatric and substance use disorders: implications for the development of an etiologically based nosology. Molecular psychiatry. 2011; 17:11–21. [PubMed: 21670729]

29. Desjarlais, R.; Eisenberg, L.; Good, B.; Kleinman, A. World Mental Health: Problems and Priorities in Low-Income Countries. New York: Oxford University Press; 1995.

30. Rai D, Zitko P, Jones K, Lynch J, Araya R. Country- and individual-level socioeconomic determinants of depression: multilevel cross-national comparison. The British journal of psychiatry : the journal of mental science. 2013; 202:195–203. [PubMed: 23349294]

31. Lund C, De Silva M, Plagerson S, Cooper S, Chisholm D, Das J, et al. Poverty and mental disorders: breaking the cycle in low-income and middle-income countries. Lancet. 2011; 378:1502–14. [PubMed: 22008425]

32. Stein DJ. Is disorder X in category or spectrum Y? General considerations and application to the relationship between obsessive-compulsive disorder and anxiety disorders. Depression and anxiety. 2008; 25:330–5. [PubMed: 18412059]

33. Stein DJ. Psychopharmacological enhancement: a conceptual framework. Philosophy, ethics, and humanities in medicine : PEHM. 2012; 7:5.

34. First MB. A practical prototypic system for psychiatric diagnosis: the ICD-11 Clinical Descriptions and Diagnostic Guidelines. World psychiatry : official journal of the World Psychiatric Association (WPA). 2012; 11:24–5. [PubMed: 22295001]

Key Bullet Points

- DSM-5 and ICD-11 are essential clinical tools; the former has emphasized diagnostic validity and operational criteria, while the latter has emphasized clinical utility and diagnostic prototypes.

- RDoC provides a useful focus on the individual-level causal mechanisms that are relevant to vulnerability to mental disorder; it provides endophenotypes for further neuroscientific study.

- An analogous approach to the societal-level causal mechanisms that create vulnerability to mental disorder would be useful; we need to characterize the exophenotypes relevant to research on public mental health.

- Advances in work on endophenotypes and exophenotypes may ultimately lead to improved classification systems, and in turn to better individualized care as well as improved global mental health.