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COMMENTARY

Has psychiatric epidemiology reached a critical juncture?

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Commentary on: B. Cooper (2014) Epidemiology in a changing world: implications for population-based research on mental disorders. *Epidemiology and Psychiatric Sciences* (in press).

As a prelude to this brief comment on Brian Cooper's article (in press), I would like to acknowledge his fundamental contributions to psychiatric epidemiology over the past half-century. Cooper and Morgan published one of the earliest authored textbooks on psychiatric epidemiology in 1973 (Cooper & Morgan, 1973). The next one did not appear until 2006 (Susser *et al.* 2006), although excellent textbooks comprising invited chapters were published during this interval. Space does not allow enumeration of his many other key contributions.

Cooper's proposals for advancing population-based research on mental disorders are sound and should be taken up (quoting from the abstract: 'a new research paradigm of eco-epidemiology' …; 'improved translation of research findings …'; 'adaptation of epidemiology to a globalized economy …'). Nonetheless, I would like to offer a somewhat different perspective on three points: (i) the current state of psychiatric epidemiology, (ii) genetic and epigenetic epidemiology (components of 'biogenetic research' in Cooper's terminology) and (iii) the conceptual framework of eco-epidemiology. I should acknowledge at the outset that my perspectives are based on personal observation of trends in the relevant fields of research. Some statements made on this basis, such as my claim of increasing numbers of publications on certain topics, could be tested by others using systematic reviews or other methods.

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Current state of psychiatric epidemiology

In my view, psychiatric epidemiology has already begun to shed the 'backwater' status to which Cooper alludes. The field has reached a critical juncture and is well poised to break into mainstream epidemiology over the next decade. In the 21st century, we have continued to conduct cross-sectional studies such as the World Mental Health Survey, very significant for establishing the contribution of mental disorders to the Global Burden of Disease. In addition, however, the use of cutting edge methods to study causes of mental disorders has increased exponentially. When writing our book on psychiatric epidemiology (Susser *et al.* 2006), we were hard pressed to find good examples of some central designs for detecting causes that were by then widespread in mainstream epidemiology. These designs are now seen regularly in published papers on mental disorders, in psychiatric as well as epidemiology journals. Further evidence is the increasing number of papers on mental disorders published in epidemiology journals, and the increasing number of presentations related to mental health in epidemiology conferences. For example, the International Journal of Epidemiology will publish in 2014 a series of review papers for the first time, and these will be focused on mental health and disorders; and the 2014 World Congress of Epidemiology will feature a far larger number of symposia on mental disorders than any previous World Congress. At least within the United States, an increasing number of Epidemiology Department Chairs are drawn from psychiatric epidemiology.

Mental disorders are now included more than ever before in new initiatives including large scale and cross-national ones. A good example is found in the large pregnancy cohorts that have been established in recent years. Among the most prominent of these is the Norwegian Mother and Child cohort (or 'MoBa') of more than 100 000 mothers, fathers and babies who are being followed over the life course of the children (Magnus *et al.* 2006). A central thrust of MoBa is

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the study of neurodevelopmental disorders over the life course, including autism, language delay and attention deficit disorders in childhood, and expected to later include adolescent onset disorders as well as psychoses. The same is true, however, for many other such cohorts in high income countries, and to a lesser extent also for some cohorts in low and middle income countries. At the other end of the life cycle, studies of aging cohorts generally feature early signs of cognitive decline and the interrelationships of mental health to other health conditions.

A further impetus for the inclusion of mental health and mental disorders has come from the increasing prominence of a developmental perspective in health economics (Heckman, 2007). Many health economists are now taking the view that early social, emotional and cognitive developments play a central role in shaping the capabilities of adults. Among the most important capabilities is 'mental capital' (Kirkwood *et al*. 2008), within which mental health and disorder are crucial components.

Global mental health has at least begun to break into the mainstream of global public health. A global mental health movement has developed and played an important role in catalysing change (Patel & Prince, 2010), its advocacy nicely captured by the phrase 'no health without mental health'. The inclusion of mental disorders in global health has also begun to benefit from recent UN and WHO initiatives that advocate for human rights and social inclusion of disabled and vulnerable populations, and from legislation in many countries that follow along the lines of these resolutions. It is true, as Cooper notes, that global health programmes still give low priority to mental health, and that parity is still far off. In particular, capacity building for research in low and middle income countries lags far behind other public health domains. However, it is also true that there have been rapid advances in the past few years towards inclusion of mental health in global health initiatives.

Biogenetic research

While I wholeheartedly endorse Cooper's call for studies of societal and global factors that influence mental health and disorders, I do not think that psychiatric epidemiology should extend itself only 'upward' to these levels of social organisation. Genomic and epigenetic epidemiology are increasingly powerful forces within the mainstream discipline of epidemiology. We should not allow them to undermine our primary goal of improving public mental health, but I do not think that they could or should be overlooked in a flourishing psychiatric epidemiology. The approach of 'Mendelian Randomisation' opens a pathway to use genetic information to contribute evidence supporting or refuting interpretations of epidemiologic observational studies (Smith & Ebrahim, 2003). Epigenetic studies offer a pathway for social epidemiology in the search for mechanisms. At the same time, there have been intriguing reports that periconceptional folic acid supplements may have a protective effect for autism and related disorders, and epigenetic mechanisms figure large as potential pathways by which these supplements might influence development. The recognition of the importance of *de novo* mutations in autism and other neurodevelopmental disorders has opened the way to investigations that cut across levels and generations, for example, that consider the influence of societal and cultural factors on paternal age at conception, and in turn, the influence of paternal age at conception on the rate of *de novo* mutations, and the implications for the frequency of these disorders and for public mental health. These genomic discoveries also pose a number of thorny questions about the use of such findings that cannot be overlooked in public mental health. The immediate benefits of biogenetic research for public mental health may be much overrated, but in the long-term, this research will help us understand causes, preventive strategies and much else. It will be far more useful if conducted in tandem with psychiatric epidemiologists (Mill & Heijmans, 2013).

Eco-epidemiology

Cooper discusses a paper by March & Susser (2006) which showed that 'multi-level theorizing' (the term used by Cooper) had deep historical roots, that it was pushed to the side during a period in the 20th century during which 'risk factor epidemiology' was so predominant, and that it was already re-emerging in epidemiology by the early 21st century (this paper also shifted to a historical perspective more in line with Fleck's 'thought collectives' than Kuhn's 'paradigms'; this point may be abstruse for most Journal readers but is noted in response to Cooper's critique of using Kuhnian paradigms). Cooper quotes this paper's summary of the core elements of eco-epidemiology: and argues that the conceptual framework is flawed because it is not possible to include all these elements in a specific investigation. The paper did not suggest, however, that all these core elements could or should be implemented together within single studies. By contrast, in our discussions of eco-epidemiology (e.g. Susser *et al*. 2006), we generally underscore that this would not be possible. What we argue is that all these core elements should be considered legitimate arenas

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of epidemiology, and that when pursuing any one, it is essential to understand the full framework in order to recognise the limitations inherent in omitting the others. We do encourage researchers to attempt studies that can examine the relationships among levels of causation, but at present, it is only sometimes possible to study two core elements at once and rarely more than that. Thus Cooper's call for a pragmatic eco-epidemiology is well in line with the original conceptual framework.

Moreover, there has been very substantial growth of epidemiology in all the core elements of eco-epidemiology in the past decade. They are increasingly represented in published work in epidemiology and public health journals. Some of this research goes beyond a single level, and examines how discoveries at one level intersect with those at another level. Studies of individual level risk factors remain important, as they should, but no longer to the exclusion of other approaches.

Conclusion

Brian Cooper has offered an important call to advance population-based research on mental disorders. His paper merits wide attention, not only because it comes from one of the 'giants' of psychiatric epidemiology, but also because it offers sound guidelines for moving this field into the future within a fast changing world. Though generally in agreement with Cooper, I offer a different perspective on certain points, and suggest that psychiatric epidemiology has reached a critical juncture from which it is beginning to shed its backwater status.

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Conflict of Interest

None.

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

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