Psychiatric Epidemiology: Descriptions and Challenges Across the Lifespan
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Course Introduction

According to Kessler et al.'s review, mental disorders are among the most prevalent of chronic “diseases” with a life-time prevalence that approaches 50 percent of the population and with 12-month prevalence rates in the 15-25 percent range. Actually, the extent of mental disorders is unclear. Social desirability factors, nay saying, or even lying may bias psychometric attempts to gather accurate epidemiological data. Unfortunately, many people who seek treatment for a mental disorder describe a course of treatment that even minimally satisfies current, existing treatment guidelines. This, added to the fact that new information regarding mental disorders is constantly being revealed, increases the need for clinical practitioners to keep abreast of psychiatric epidemiology. This course provides an update on information concerning mental disorders among children, adults, and older persons.

Learning Objectives

Upon completion of this course, you will

- Aspects of child, adult, and elder mental health epidemiology
- About determinants of psychiatric illness
- Developmental aspects of psychiatric epidemiology
- Aspects of primary mental health care
- About determinants and barriers to help-seeking behavior

Course Content

Article: Psychiatric Epidemiology: Recent Advances and Future Directions, pages 3-28

Epidemiology is a public health discipline concerned with understanding and controlling disease epidemics. This is done by investigating the associations among variations in exposure to disease-causing agents, host resistance to disease-causing agents, and resistance resources in the environments of exposed individuals (Susser, 1973). Investigations of these associations are usually carried out initially by examining naturalistic variation. The typical steps are that a disease first is identified as a major public health problem because of the number of cases, the severity of the disease, the risk of its spreading to others, and the public cost of treating or controlling it. Descriptive information then is collected, often retrospectively from known cases or in a retrospective case-control design. Hypotheses based on the analysis of these data then are tested provisionally in naturalistic, quasi-experimental situations with matching or statistical controls used to approximate the conditions of an experiment. When the hypotheses stand up to these preliminary tests, they are evaluated in interventions aimed at preventing the onset or altering the course of the disorders.

Observational methods provide clues not only about how to intervene, but also about when and where to intervene to prevent or control disease. For example, changes in policies about when and where to intervene to prevent the progression of early-onset mental health problems (Burns, Hoagwood, & Mrazek, 1999) began with the observations that most mental disorders have very early ages of onset and that most children and adolescents who receive mental health care get it in the schools, not from primary medical or specialty mental health care providers (Burns et al., 1995).

Descriptive Psychiatric Epidemiology

Child and Adolescent Community Epidemiologic Surveys

The modern epidemiology of child psychiatric disorders began to evolve in the 1950’s with studies focusing on the prevalence of “maladjustment” or “disturbance.” Not surprisingly, these early studies produced widely variable prevalence estimates (Gould, Wunsch-Hitzig, & Dohrenwend, 1981). The DSM–II (American Psychiatric Association, 1968) system, in use at that time, had only two categories of disorder specific to childhood. Only with the DSM–III (American Psychiatric Association, 1987) did a detailed taxonomy of child psychopathology for psychiatric use begin to emerge.

Descriptive epidemiology of childhood disorders presents challenges over and above those of psychiatric epidemiology in adulthood. First, developmental change in the age range 0–18 is so profound that the taxonomy of disorders needed a great deal of work. For some age groups, notably infants and 3- to 6-year-olds, much of the work remains to be done. At the other end of childhood, more work is still needed on the transition to adulthood. For example, little is known about the developmental transition from conduct disorder in the
adolescent years to antisocial personality disorder in adulthood. However, child psychiatric epidemiologists have the enormous advantage of nearly a century of existing careful scientific work in developmental psychology that provides basic descriptive data on normal and abnormal developmental pathways and processes (Cairns, 1983). Work of this sort is largely unavailable to researchers in adult psychiatric epidemiology.

A second challenge for child psychiatric epidemiology is whom to ask and whom to believe. As with some adults with mental disorders, young children may not have the words or concepts to express the symptoms they endure, or their judgment of their own behavior may not be reliable. For example, children with hyperactivity disorder are poor judges of their own hyperactivity (Costello, Edelbrock, Dulcan, Kalas, & Klaric, 1984). Consequently, additional information from parents, teachers, and peers often is needed to accurately evaluate these children. The vexing questions of which informants to query and how to reconcile discrepant reports are sources of considerable controversy in child psychiatric epidemiology. Most child researchers have adopted the clinical approach of accepting a symptom as present if any informant endorses it, but new mathematical models are being developed to improve the process of aggregating multi-informant data (Horton, Laird, & Zahner, 1999).

**Adult Community Epidemiologic Surveys**

Starting with the Epidemiologic Catchment Area (ECA) study in the United States (Robins & Regier, 1991), descriptive psychiatric epidemiology has experienced unprecedented growth during the past two decades. An important innovation of the ECA was the use of a fully structured research diagnostic interview known as the Diagnostic Interview Schedule (DIS) (Robins, Helzer, Croghan, & Ratcliff, 1981). Methodological studies demonstrated that the DIS yields reliable and valid diagnoses (Helzer et al., 1985), a very important result in promoting the ECA-DIS methodology in subsequent general population surveys. This result also led to replication surveys based on the ECA in numerous other countries throughout the world.

Beginning in the mid-1980’s, the World Health Organization (WHO), in collaboration with the U.S. Alcohol, Drug Abuse, and Mental Health Administration, expanded the ECA-DIS methodology to include International Statistical Classification of Diseases (ICD) criteria for research and to produce versions of the instrument in many different languages. The resulting instrument, the Composite International Diagnostic Interview (CIDI) (WHO, 1990), first became available in 1990. WHO technical support led to an unprecedented number of major epidemiologic surveys using the CIDI in countries as diverse as Brazil (Andrade, de Lólio, Gentil, Laurenti, & Werebe, 1996), Canada (Offord et al., 1994), Germany (Wittchen, Essau, von Zerssen, Krieg, & Zaudig, 1992), Mexico (Caraveo, Martinez, & Rivera, 1998), the Netherlands (Bijl, van Zessen, Ravelli, de Rijk, & Langendoen, 1998), and Turkey (Kýlyýç, 1998).

In 1997, WHO created the International Consortium in Psychiatric Epidemiology (ICPE) to coordinate the comparative analysis of these data (Kessler, 1999). The ICPE also provides technical assistance to researchers planning new CIDI surveys. The WHO World Mental Health 2000 (WMH2000) initiative grew out of these technical assistance activities. WMH2000 is coordinating general population CIDI surveys in 20 countries in the year 2000. Participating countries are in North America (Canada, the United States), Latin America (Brazil, Colombia, Mexico, Peru), Europe (Belgium, France, Germany, Italy, the Netherlands, Spain, the Ukraine), the Middle East (Israel), Africa (South Africa), and Asia (China, India, Indonesia, Japan, New Zealand).

Several important results consistently emerge from the DIS and CIDI surveys (ICPE, in press): (1) mental disorders are among the most prevalent classes of chronic diseases in the general population, with lifetime-to-date prevalences often close to 50 percent of the population and with 12-month prevalences typically in the 15–25 percent range (Robins & Regier, 1991); (2) mental disorders typically have much earlier ages of onset
than other chronic diseases, with median ages of onset in the early to late teens for anxiety disorders in most of these surveys, and median ages of onset in the early to mid-20’s for mood and substance use disorders (ICPE, in press); (3) mental disorders are among the most impairing of all chronic diseases (Kessler, Mickelson, Barber, & Wang, in press); (4) respondents with the most severe and disabling mental disorders usually meet lifetime criteria for a number of different ICD and DSM syndromes (Kessler et al., 1994); and (5) only a minority of the respondents in these surveys who meet criteria for a mental disorder report that they received treatment in the preceding year (Alegria et al., 2000).

The measures of disorder severity included in these epidemiologic surveys consistently are associated with probability of obtaining treatment, likelihood that treatment is in the specialty sector, and intensity of treatment (Alegria, Bijl, Lin, Walters, & Kessler, in press). These findings suggest that there is some rationality both in help-seeking and in the allocation of treatment resources. However, the surveys also show that only a minority of patients describe a course of therapy that even minimally satisfies current treatment guidelines (Katz, Kessler, Lin, & Wells, 1998). There is a great deal of work still to be done in disseminating treatment guidelines for mental disorders and in developing quality assurance mechanisms to guarantee that these guidelines are followed.

The high rates of disorder found in these surveys have led some commentators to question the plausibility of the prevalence estimates (Regier et al., 1998). As clinical reappraisal studies clearly show that the prevalence estimates in CIDI surveys are not higher than those obtained in blind clinician re-interviews (Kessler, Wittchen, et al., 1998), concerns about the high prevalence estimates focus largely on the underlying validity of the ICD and DSM systems. In response to these concerns, clinical significance criteria were added to nearly half the diagnoses in the fourth edition of the DSM system. The goal was to address the perceived problem that the previous diagnostic criteria led to over diagnosis of disorder among people with clinically insignificant symptoms. However, this approach has generated controversy regarding the legitimacy of including these new criteria (Spitzer, 1998).

Irrespective of the ultimate resolution of the threshold issue, concerns about high prevalence have led to a new interest in the assessment of severity and impairment in psychiatric epidemiologic surveys, as well as a view that dimensional assessments of mental disorders and global assessments of case-level psychiatric morbidity are more useful than fine-grained evaluations of many separate ICD or DSM disorders. The new WMH2000 surveys include structured versions of standard, disorder-specific, dimensional clinical severity scales and assessments of the functional impairments and disabilities associated with current mental disorders in order to obtain this sort of dimensional severity information. WHO also developed a new interview to carry out a multidimensional assessment of impairment and disability for this purpose, the WHO Disability Assessment Schedule (Ustun & Chatterji, 1999). Importantly, the WMH2000 surveys also will carry out identical assessments of the functional impairments and disabilities associated with a representative sample of physical disorders in order to provide comparative information.

**Adult Clinical Epidemiologic Surveys**

The technology developed in the ECA study to carry out fully structured psychiatric diagnostic interviews more recently has been extended to primary care settings. The first of these studies was the Medical Outcomes Study. This study investigated a series of chronic diseases, including depression, and documented that depression is associated with levels of functional impairment in a wide range of life domains that are comparable to, if not greater than, those found among patients with physical disorders such as hypertension, diabetes, and arthritis (Wells et al., 1989). Subsequent clinical epidemiologic surveys attempted to evaluate the impairments
associated with a broader range of mental disorders in primary care samples. The largest and most influential of these is the WHO Primary Care Collaborative Study (Sartorius & Ustun, 1995). These surveys document that mental disorders are highly prevalent among people who seek help from family physicians, that these disorders are associated with substantial impairment in role functioning, and that most of these disorders go undetected by primary care physicians. A series of innovative programs based on these surveys have been developed to help primary care doctors detect and treat mental disorders (Katon et al., 1995).

One of the most important findings of these clinical epidemiologic surveys is that untreated comorbid mental disorders might complicate the treatment and management of physical disorders. For example, one study (Roose & Glassman, 1994) documented that comorbid depression is a powerful predictor of early mortality among survivors of first heart attacks. Based on this finding, new interventions screen for and treat depression among cardiac patients. A number of related, but as-yet-unpublished, clinical epidemiologic research initiatives currently under way are investigating the effects of comorbid mental disorders on the onset, course, and management of other physical disorders. Preliminary studies suggest that at least some of these investigations will yield important practical results (Stoudemire, 1995).

**Surveys of the Elderly**

Geriatric epidemiologists must grapple with concerns about the accuracy of assessment, based on the fact that a focus of inquiry in geriatric studies is the cognitive functioning of respondents. Other important complications include difficulties in vision, hearing, and physical functioning, which influence both willingness to participate in surveys and the ability to participate completely. A number of special research diagnostic interviews, both for use by clinicians (Copeland, 1994) and for use by lay interviewers (Henderson et al., 1993), have been designed to address these problems. Surveys based on these instruments show that early stages of dementia are quite common among elderly people in the community (Gallo, 1995). A practical problem in studying these disorders in community samples is the frequent difficulty of distinguishing between normal behaviors and early cognitive decline. Methodological research continues to refine instruments to sensitively detect early cognitive problems in community samples.

Important epidemiologic research is being done on modifiable risk factors for dementia among elderly people. Recent studies have shown that many of the same variables that are risk factors for cardiovascular disease are also risk factors for dementia (Breteler, Claus, Gorbbee, & Hofman, 1994; Ott et al., 1998). There has also been a great deal of interest in the widely replicated finding that the apolipoprotein E genotype is a risk marker for Alzheimer’s disease (Farrer et al., 1995). In addition, there is some evidence that the rates of Alzheimer’s disease and dementia are lower in ethnically similar individuals in less-developed countries than in developed countries (Hendrie et al., 1995). There are many plausible risk factors that could explain these differences, including higher rates of smoking, exposure to lead-based paint, and fatty diets in developed countries. Expansion and replication of research on cross-national differences are needed to systematically evaluate the effects of these and other risk factors.

Another issue of interest in studies of the elderly is depression. There is a great deal of concern about geriatric depression among clinicians. Yet, epidemiologic studies have found surprisingly low rates of major depressive disorders among elderly respondents (Beekman, Copeland, & Prince, 1999). The discrepancy between expectation and the epidemiologic evidence has raised concerns that the low rates of depression in epidemiologic studies may be due, at least in part, to methodological artifacts. Consistent with this concern, community studies using dimensional measures of depressed mood and related symptoms show increases among the elderly (Kessler, Foster, Webster, & House, 1992). Furthermore, latent trait analysis shows that the
symptoms of major depression change with age (Gallo, Anthony, & Muthén, 1994). Ongoing methodological studies are attempting to resolve the continuing confusion in this area.

**Systematic Underreporting**

The methodological advances surrounding development of the DIS and other fully structured measures of disorder and severity address many of the measurement problems that previously limited progress in psychiatric epidemiologic studies of adults. Empirical data produced by the new generation of surveys initiated by the ECA study also have stimulated healthy debate about deeper conceptual issues regarding the validity of the ICD and DSM classification systems. However, formidable challenges remain on the measurement front. The fact that mental disorders are highly stigmatized conditions causes many people to keep them private because of embarrassment or fear of discrimination, which means these conditions can only be defined on the basis of clusters of symptoms reported by these same people.

In the case of patients seeking professional treatment, there is reason to believe that self-reports will be fairly complete and honest. However, since this is not the case in epidemiologic surveys, it is not surprising that there is rising concern that underreporting is a very serious problem in surveys of this sort (Lee & Renzetti, 1990). Consistent with this concern, methodological studies have shown that reports about mental disorders, substance use problems, and other topics—such as abortion, criminal behavior, and homosexuality—are extremely sensitive to subtle variations in context and to mode of questioning (Turner, Ku, Rogers, Lindberg, Pleck, & Sonenstein, 1998).

An important implication of these findings is that the prevalences of emotional problems reported in epidemiologic surveys should generally be considered lower bound estimates rather than accurate reflections of the true prevalences in the population. This is true even when interviews are carried out by clinicians, as methodological research shows that some respondents decrease their disclosure of embarrassing information when they are aware that their interviewer is a mental health professional (Reissman, 1977). This problem can bias estimates of correlates if there is systematic variation in willingness to disclose symptoms as a function of a putative risk factor. This differential willingness hypothesis has been proposed as a plausible explanation for the widely observed finding that women report higher rates of anxiety and depression than men (Kessler, 2000).

Grappling with the problem of systematic under-reporting is a major challenge for the future of psychiatric epidemiology. The problem is exacerbated in studies of children, where we have to grapple with the issues associated with combining data from multiple informants, some of whom (the parents) may wish to avoid blame for the problems of the children, while others (the children) may sometimes want to brag and exaggerate some problems that they see in a positive light (e.g., substance use and some aspects of juvenile delinquency). One way of tackling these complex difficulties is to build on the work of survey methodologists, who have developed a number of strategies to increase the accuracy of responses to embarrassing questions. Variation in responses can also be studied as a function of question sensitivity in split ballot experiments built into epidemiologic surveys that manipulate wording, anonymity, mode, or other aspects of the question-answering situation in an effort to investigate sensitivity of responses to these manipulations. Finally, it is possible to include standard psychometric measures of social desirability, nay-saying, or lying in epidemiologic surveys and to use responses to these measures to investigate the possibility that risk-factor effect-size estimates are biased because of their associations with these measures.

**Small-Area Estimation**

Descriptive epidemiologic studies are often used by public health agencies to estimate the magnitude of
untreated disorders and to study barriers to receiving treatment for purposes of planning future changes in outreach and treatment activities. However, these planning activities are usually carried out much more frequently (typically on an annual basis) than epidemiologic surveys (typically no more than once a decade). Furthermore, planning decisions are usually made at a much lower level of geographic aggregation (typically towns, health districts, or States) than the epidemiologic surveys (typically national). It is infeasible to carry out expensive general population epidemiologic surveys more frequently or at the levels of geographic aggregation where health resource allocation decisions are made. Therefore, some other approach is needed to increase the usefulness of epidemiologic surveys for resource-allocation planning purposes.

A good deal of work along three lines is currently under way. First, a number of short, fully structured measures of psychopathology have been developed to screen for clinically significant mental disorders (Sartorius & Ustun, 1995). These instruments can be self-administered in less than 10 minutes and yield fairly accurate assessments of overall psychopathology (i.e., the likelihood that the respondent has any clinically significant psychopathology) as well as useful provisional information about differential diagnoses. The short administration time and the ability to implement by self-administration make these screening instruments much more feasible to use in ongoing local data collections than the more comprehensive interviewer-administered instruments like the DIS and CIDI that are typically used in epidemiologic surveys.

Second, a number of ongoing data collection systems that make use of these screening measures have been developed and implemented for purposes of screening individuals in need of treatment and for charting aggregate trends in the prevalence of unmet need. Systems of this sort are available as part of periodic health risk appraisal surveys carried out by employers and managed health care organizations. The expense is minimized by using one of several low-cost data collection methods that include (1) paper and pencil self-administration (typically in mail surveys) coupled with optical scanning of responses; (2) computerized self-administration (typically carried out in a doctor’s office); and (3) interactive voice response administration (in telephone surveys) using a digitized voice to ask questions over the telephone and a telephone touchtone keypad to enter responses.

Third, statistical methods are being developed to make small-area estimates of disorder prevalences and of the unmet need for services from large-scale population surveys (Schaible, 1996). These methods blend the direct small-area data collected in ongoing screening surveys with more in-depth periodic data collected in large-scale epidemiologic surveys. There has not yet been an attempt to develop integrated systems that would coordinate the collection and integration of these two types of data, although proposals along these lines have been advanced (Kessler, Berglund, et al., 1998). The development of such systems represents an important challenge for the future of descriptive psychiatric epidemiology.

**Analytic and Experimental Psychiatric Epidemiology**

**Modifiable Determinants of Illness Onset and Course**

Analytic epidemiology is the part of epidemiology that uses nonexperimental data to generate, refine, and provisionally test causal hypotheses (Mausner & Bahn, 1984). Experimental epidemiology, as the name implies, is the part of epidemiology that tests hypotheses by evaluating the effects of interventions on the prevention or amelioration of disease outcomes. Analytic and experimental psychiatric epidemiology are much less developed than in most other branches of the discipline because of conceptual and measurement problems. Another contributing factor is that the causal mechanisms involved in the onset of mental disorders are related much more strongly to broad measures of environmental adversity than to the comparatively narrow and easily modifiable risk factors (e.g., diet, exercise, smoking) that increase the risk of such chronic physical illnesses as cancer and heart disease.
Important work is emerging in analytic psychiatric epidemiology focused on modifiable risk factors for particular disorders. Examples include work linking obstetrical complications to risk of childhood-onset schizophrenia (Nicolson et al., 1999), exposure to famine during childhood to risk of antisocial personality disorder (Neugebauer, Hoek, & Susser, 1999), and early-life lead exposure to risk of both childhood behavioral problems (Needleman, Riess, Tobin, Biesecker, & Greenhouse, 1996) and late-life Alzheimer’s disease (Prince, 1998). Despite these examples, the greater complexity of environmental etiologic agents in studies of psychiatric than physical disorders has led many psychiatric epidemiologists to focus much of their analytic effort on broad nonspecific risk factors. There is a special interest in exposure to stressful life experiences, including various types of childhood adversity and adult stressors, which are consistently linked to a wide range of child, adolescent, and adult mental disorders. There is also a great deal of interest in stress-buffering factors such as social support and active coping.

As it is difficult to devise interventions that prevent exposure to stress, most experimental interventions aimed at preventing mental disorders are designed to increase access to stress-buffering resources either in total populations or in high-risk population segments. There are quite a few promising interventions of this sort (Mrazek & Haggerty, 1994). Unfortunately, psychiatric epidemiologists generally do not play central roles in these interventions for two reasons.

One reason is that most psychiatric epidemiologists are more interested in descriptive and broad-gauge analytic epidemiology than in the fine-grained analytic investigations required to target and shape preventive interventions. For example, while a great many epidemiologic studies have been done on the stress-buffering effects of social support, only a few of the researchers who did these studies have taken the extra step to refine their evaluations of social support in order to investigate the active ingredients that should be included in preventive interventions aimed at supporting socially isolated people at risk of mental disorder (Harris, Brown, & Robinson, 1999a, 1999b).

A second reason psychiatric epidemiologists are generally not involved in preventive interventions is that the community psychologists and other human services professionals who have taken the lead in most mental health preventive interventions come from clinical backgrounds and rely on their clinical experience to design and implement their programs. They see little need for the input of psychiatric epidemiology. This is a mistake, but it will take much more effort on the part of psychiatric epidemiologists to reach out to preventionists in order to make them see this mistake. A major challenge for the future is to integrate psychiatric epidemiologists into these efforts.

It is important to realize that there is another class of intervention programs, much larger than the ones discussed above, that also represents an opportunity for epidemiologic collaboration. This class comprises the many government entitlement programs that exist in most developed countries, such as public assistance for the unemployed, social security for retired people, and aid to single mothers with dependent children. While these programs are much more than mental health preventive interventions, they have enormous implications for mental health. These programs predominantly are designed by economists and implemented by social workers and other human service professionals; they, therefore, would profit from the input of psychiatric epidemiologists.

Developmental Psychopathology

Drawing on other branches of developmental science, child psychiatric epidemiology is beginning to apply developmental principles to better understand risk for psychiatric disorders. Developmental principles can
usefully be applied both to modeling the development and clustering the symptoms and to improving our understanding of risk and of the timing of risk factor effects.

Focusing first on the development and clustering of symptoms, converging evidence from studies of adults (Christie et al., 1988) and children (Bardone, Moffitt, Caspi, Dickson, & Silva, 1996) shows that the first symptoms of disabling adult psychiatric disorder can appear very early in life. Once established, the course of psychiatric disorder from childhood to adulthood presents examples of both homotypic and heterotypic continuities. Pure emotional disorders in childhood appear to be associated only with emotional disorders in adulthood in both sexes (homotypic continuity) (Harrington, Fudge, Rutter, Pickles, & Hill, 1991). Behavioral disorders in boys show similar homotypic continuity (Robins, 1974), but behavioral disorders in girls are associated with a wider variety of adult disorders including personality disorders and somatizing, depression, and anxiety disorders (both homotypic and heterotypic continuity) (Zoccolillo, Pickles, Quinton, & Rutter, 1992).

Turning to timing and risk, the use of temporal relationships to unearth causal mechanisms is an approach that child psychiatric epidemiology borrowed from the epidemiology of cancer and cardio-vascular disease (Breslow & Day, 1980). Age at exposure to risk, duration of exposure, and intensity of exposure are different aspects of risk exposure with significance for etiology. Studies of divorce, for example, show that a child’s age when parents divorce predicts later problems differently for boys and girls. Boys appear most distressed when the divorce occurs before the child’s puberty, and girls after their puberty (Wallerstein, 1987). Other studies, in comparison, show that persistence of family adversity is an important differentiating factor in predicting the long-term effects of early adversity on adolescent (Offord et al., 1992) and adult (White, Moffitt, Earls, Robins, & Silva, 1990) disorders. Dose-response relationships have also been documented between childhood adversities and both child (Rutter, 1979) and adult (Kessler, Davis, & Kendler, 1997) outcomes.

There are now close to a dozen longitudinal studies around the world that provide the necessary observational data for us to begin formulating hypotheses about the developmental course of mental illness across the first two decades of life (Sameroff & Seifer, 1995). These studies show clearly that the rates of most psychiatric disorders and symptom patterns within disorders both change with age. For example, below the age of 10, suicidal thoughts and behaviors are rare, while these rates increase dramatically during adolescence (Shaffer & Piacentini, 1994). Loeber’s synthesis of the research literature on antisocial behavior in boys proposes that there are three different developmental pathways involving antisocial behavior (Loeber, Green, Lahey, Christ, & Frick, 1992): an early authority conflict pathway; a covert, rule-breaking pathway; and an overt, aggressive pathway. If a cross-sectional view is taken of children’s behavior, those who pursue any of the three pathways share many characteristics. Longitudinal studies, however, reveal distinct patterns and prognoses over time, with the worst prognosis for those in the third, overt, aggressive pathway.

It is also becoming increasingly clear that rates of disorder change differentially in boys and girls. Emotional disorders (anxiety and depression) show considerably more persistence for girls than boys, while the opposite is true for behavioral disorders (conduct and oppositional disorders, substance abuse and Attention-Deficit Hyperactivity Disorder) (McGee, Feehan, Williams, & Anderson, 1992). Early anxiety disorders have a higher probability of remission than other disorders during adolescence (Costello & Angold, 1999). Although the evidence is limited, these differential patterns of continuity and discontinuity may extend back into the preschool years. For example, over activity and restlessness in 3-year-olds (more common in boys) is associated with antisocial behavior 5 years later, while the presence of multiple fears at age 3 (more common in girls) is unrelated to emotional disorder 5 years later (Richman, Stevenson, & Graham, 1982; Stevenson, Richman, & Graham, 1985).
Geriatric epidemiologists have also begun using a life course perspective. They chart the impact of scheduled normative developmental events (e.g., retirement) and unscheduled normative events (e.g., widowhood) on mental health (Umberson, Wortman, & Kessler, 1992). There is also a new interest in successful aging (Rowe & Kahn, 1998) and in the positive aspects of aging, such as the development of wisdom (Baltes & Staudinger, 2000).

Primary Mental Health Care

One triumph of public health throughout most of the world is the drop in infant and childhood mortality and morbidity, along with their adult sequelae, associated with the spread of primary medical care for children (Shelov, 1994). There is no country in the world with an equivalent system of primary mental health care. Conceptual work to develop the observational, theoretical, and experimental guidelines for such an approach to the prevention of mental illness is only just beginning. Given the evidence that few risk factors are disorder-specific, this broad-based approach to risk reduction might be more appropriate than an approach based on specific risk factors, such as the focused drug-use and suicide prevention programs now being implemented in the United States.

One epidemiologic observation potentially of great importance in this regard is that the vast majority of adults with serious mental disorders experience a series of comorbid psychiatric syndromes that often include a combination of panic, generalized anxiety, depression, phobia, and substance abuse (Kessler et al., 1994). These syndromes differ substantially in their ages of onset. Anxiety, oppositional-defiant, and attention-deficit problems are typically the component syndromes with the earliest ages of onset. Assuming that this cumulation of disorders is of causal significance—a hypothesis desperately in need of evaluation—intervention efforts among children and adolescents to prevent the cumulation of multiple psychopathological syndromes hold out great promise for reducing the prevalence of serious mental disorders (Kessler & Price, 1993). The analytic investigation of patterns and determinants of this cumulation of syndromes is a critically understudied area in developmental psychiatric epidemiology.

Genetic Epidemiology

In a paper on the future of psychiatric epidemiology, Lee Robins (1992) suggested that the greatest hope for breakthroughs in our understanding of the etiology of mental disorders comes from the methods of genetic epidemiology, a discipline that examines the extent to which genetic and environmental factors contribute to disease etiology. Designs that hold constant either the environment while allowing variation in genetic factors (e.g., monozygotic vs. dizygotic twins reared together) or the genetic background while allowing environmental variation (e.g., adoptees) provide a powerful set of tools to gain understanding of the complex interactions between genes and environment in disease etiology. In addition, genetic epidemiologic studies can inform the diagnostic nomenclature (Tsuang, Faraone, & Lyons, 1993).

The genetic epidemiology of psychiatric research moved through several developmental stages with startling rapidity. Early work focused without much success on efforts to identify major genes for such diseases as schizophrenia, bipolar disorder, and autism. At the same time, adoption and twin studies documented (something we tend to forget was an open question only a few years ago) that there is a major heritable component to a number of psychiatric disorders (Rutter, Silberg, O’Connor, & Simonoff, 1999). The major impediments to progress have been limited knowledge at both the levels of the genotype and the phenotype. Inspection of the relative risk of the major psychiatric disorders in populations reveals that most are characterized by complex modes of inheritance, including gene-environment interaction, oligogenic
or polygenic inheritance, and/or the similar phenotypic expression yielded by numerous major genes. With increasing focus on the identification of “endophenotypes” or those components of disorders that are transmissible in family and twin studies, more homogeneous definitions of psychiatric phenotypes will increase our ability to identify both genetic and environmental factors underlying the development of psychiatric disorders.

Based on these early results, current field epidemiologic studies concentrate on gene-environment interactions and correlations (Rutter, 1994). These studies ask what we can learn, especially from developmentally informative studies, about the times and situations that encourage or inhibit gene expression in light of the fact that genes require environments in which to express themselves. For example, recent work has shown that the increase in the rate of depression in girls more than boys after puberty is due to an increased heritability of depression in postpubertal girls and, more specifically, to an increased genetically controlled emotional vulnerability to stress (Silberg et al., 1999). Other research on a related topic has shown that the female increase in depression with puberty is related to increasing levels of testosterone and estrogen rather than to age per se or to other aspects of development (e.g., Tanner stage or social factors) (Angold, Costello, & Worthman, 1999).

Meanwhile, completion of mapping the whole human genome has begun to change the nature of genetic psychiatric epidemiology. With increased knowledge regarding the specific neurobiologic factors involved in the pathogenesis of psychiatric disorders and identification of susceptibility genes, epidemiology will become central to the study of the population distribution of such genes. Future epidemiologic studies will focus on careful identification of cases from the general population, so that the transmission of candidate genes from parent to child can be examined in unbiased samples using new statistical methods for association studies (Hauser, Boehnke, Guo, & Risch, 1996; Risch & Merikangas, 1996; Uhl, Gold, & Risch, 1997). It is likely that DNA will be collected routinely in epidemiologic studies, so that as new candidate genes appear, their contribution can quickly be evaluated in well-characterized, representative samples. Moreover, epidemiologists will be better able to identify environmental conditions that promote or protect against gene expression using case-control designs based on genetic markers. Innovative designs, such as the “children of twins” approach, will tease out some of the remaining problems in partitioning genetic and environmental effects. However, from the point of view of intervention, the interest for the next decade or two will lie in working on when and how to intervene at the environmental level to inhibit the expression of genetic predispositions to disorders and to support the expression of the beneficial effects of genes associated with low risk.

**Barriers to Help-Seeking**

Retrospective epidemiologic studies of speed of initial treatment contact show that it often takes many years for people with anxiety, mood, or substance disorders to seek professional help after first onset of their disorder (Olfson, Kessler, Berglund, & Lin, 1998). Furthermore, epidemiologic studies of more recent service use show that only a minority of people with a recent mental disorder obtain treatment (Alegria et al., 2000). These are disturbing results, especially in light of clear evidence that treatments for most common mental disorders are both safe and effective.

Studies of the determinants of help-seeking in the United States show that financial barriers are important impediments to treatment and that treatment rates increase substantially when these barriers are removed (Frank & McGuire, 1986). At the same time, a recent comparative study of help-seeking in the United States and Canada found that the same low proportion of people with mental disorders seeks treatment in the two countries even though Canadians enjoy free access to mental health treatment while people in the United States do not (Kessler, Frank, et al. 1997). Investigations of reasons for not seeking treatment found that the typical person...
with mental illness not in treatment reports a number of reasons for not seeking help, including perceived lack of efficacy of treatment, believing that the problem will eventually go away by itself, and feeling that he/she wants to handle the problem himself/herself, without outside help.

These and related findings strongly suggest that misunderstandings about the nature of mental illness and perceived stigma continue to interfere with the help-seeking process. Public education campaigns have been launched in some countries to address these problems, but these efforts are too recent to have developed a solid knowledge base regarding effective communication messages or channels or to have tested emerging hypotheses about other effective outreach possibilities. However, this is likely to be an area of considerable growth over the next decade.

Challenges for Psychiatric Epidemiology

Analytic Epidemiology

As the neurosciences continue to advance knowledge regarding human brain structure and function, the relevance of neurobiologic factors to psychiatric disorders at the population level is likely to increase. There is an urgent need for closer collaboration between epidemiology and clinical psychiatry, as there is a large gap between clinical and population samples with respect to many of the major risk factors now under investigation in biologic psychiatry. Gender and age differences provide important clues regarding underlying biologic mechanisms for emotional, cognitive, and behavioral regulation that could be far more intensively studied in the future. Likewise, epidemiologists need to expand their tools to include biologic measures as reliable and valid biologic correlates of psychiatric disorders emerge with advances in neuroscience.

An important task for the next half-century in psychiatric epidemiology will be to understand how multiple risk factors interact over time in producing multiple outcomes. This understanding will be achieved only if the study of risk factors is not narrowed by disciplinary orientation; and only if the study of outcomes is not narrowed by strict confines of diagnosis. Breaking loose from the confines of discipline and diagnosis will lead to progress in comprehending the web of causation for the complex combination of phenomena we call mental disorders (Eaton & Merikangas, in press).

Integration With Prevention Science and Social Policy Analysis

A challenge for psychiatric epidemiologists and prevention scientists alike is to bridge the gap that currently exists between analytic epidemiology and prevention research. Psychiatric epidemiologists also need to become involved in more large-scale social policy research interventions. For example, recent Federal welfare reform legislation in the United States led to a series of State-level natural experiments moving welfare mothers into the labor force. Early evaluations of these experiments by economists clearly show that the previously neglected high rates of mental disorders found among welfare recipients are major impediments to successful transitions into the labor force (Friedlander & Burtless, 1996). This observation has stimulated debate regarding the importance of providing mental health services as a central part of welfare-to-work transition programs. Unfortunately, this debate has been uninformed by empirical or conceptual input from psychiatric epidemiologists. It is critical that psychiatric epidemiology becomes more central to this and other emerging social welfare and entitlement program reform debates and interventions.

The Importance of Secondary Prevention

Most theorizing and research on mental health prevention continues to focus on primary prevention either with a universal focus or a high-risk focus. However, many universal preventive intervention trials yield discouraging
results (Mrazek & Haggerty, 1994). This is slowly leading to an interest in selective or targeted interventions, sometimes overlaid on universal interventions. Targeted secondary interventions (i.e., interventions aimed at preventing the progression of incipient disorders) are of particular interest. This is true for two reasons. First, as noted earlier in this paper, we increasingly realize that prodromes of many mental disorders start at such an early age that it is very difficult to envision a broad-based problem that could prevent their occurrence. Second, the complexities of interventions to prevent the progression of mental disorders from early manifestations to more serious and chronic cases are so great that it is necessary to focus delivery of these interventions in high-risk segments of the population. Analytic psychiatric epidemiologists need to reorient their research to facilitate the development and testing of hypotheses regarding focused secondary preventions of this sort. The importance of linking analytic epidemiologic research to preventive interventions becomes increasingly clear as this need is more commonly recognized.

One very important and currently neglected research paradigm for this purpose is the naturalistic longitudinal study of the determinants of illness course in cohorts of current patients. There have been several very influential large-scale longitudinal naturalistic studies studying illness course in representative adult patient samples (Coryell et al., 1994), but these have been clinical studies rather than epidemiologic studies. Analytic investigations of the predictors of these outcomes are needed to support the development of principled adult secondary preventive interventions.

Understanding the Determinants of Help-Seeking

The problem of unmet need for treatment is much more severe in the mental health arena than in most other areas of medicine. Standard conceptual models for studying the help-seeking process highlight the importance of health beliefs, including perceived need for treatment, perceived efficacy of treatment, barriers to seeking treatment, and facilitating factors (Janz & Becker, 1984). These models are useful in understanding and modifying the help-seeking process in many different areas of medicine. However, in the case of mental illness, it might be useful to extend these models in several ways. One way is to appreciate that the range of cultural categories that are available to make sense of signs and symptoms of mental disorder is much greater than for other illnesses, leading to greater complexity in the initial stage of defining oneself as in need of help (Skelton & Croyle, 1991).

Another potentially useful way of extending standard conceptual models begins with the realization that the range of culturally available and acceptable strategies for coping with emotional problems is much more diverse than for physical disorders. Alternative and complementary medicine, the use of informal social support networks, other problem-focused strategies aimed at resolving the presumed situational determinants of the emotional problems (e.g., lifestyle change), and cognitive strategies aimed at redefining the situational determinants of the distress so that they lose their sting (e.g., cognitive reappraisal, displacement) are all ways of coping with mental illness. Given the stigma associated with mental illness, it is reasonable to assume that most people will work their way through many, if not all, of these strategies before seeking help from a mental health professional. Insight into the help-seeking process might be increased if epidemiologic studies conceptualized professional treatment as the end result of a defensible process of sorting through a hierarchy of coping strategies in which treatment ranks rather low on the preference hierarchy of many people.

Conclusions

A number of encouraging advances occurred in psychiatric epidemiology over the past two decades. However, the problem of uncertainty regarding diagnostic categories and criteria and the problem of underreporting
because of respondent reluctance to admit symptoms continue to be major sources of difficulty in cumulating knowledge. Additional problems exist in studies of special populations, including youth and the elderly. Innovative methods of minimizing and evaluating the effects of measurement error and especially of systematic underreporting are needed to advance the aims of analytic epidemiology. Psychiatric epidemiologists need to move beyond the focus on description and analysis of broad-gauged risk markers to study modifiable intervention targets and to develop collaborations with the prevention scientists and social policy analysts who are currently at the forefront of developing, implementing, and evaluating interventions.

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