The Epidemiology of Anxiety Disorders: Prevalence and Societal Costs

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Anxiety disorders are the most prevalent of psychiatric disorders, yet less than 30% of individuals who suffer from anxiety disorders seek treatment. Prevalence of anxiety disorders is difficult to pinpoint since even small changes in diagnostic criteria, interview tools, or study methodology affect results. Analyses of the largest prevalence studies of psychiatric illnesses in the United States find that anxiety disorders afflict 15.7 million people in the United States each year, and 30 million people in the United States at some point in their lives. Currently, the European Study of Epidemiology of Mental Disorders and the World Health Organization World Mental Health 2000 studies are underway. These studies, which share a similar methodology, will facilitate future worldwide comparisons of the prevalence of anxiety disorders. Anxiety disorders impose high individual and social burden, tend to be chronic, and can be as disabling as somatic disorders. Compared with those who have other psychiatric disorders, people with anxiety disorders are high care utilizers who present to general practitioners more frequently than to psychiatric professionals, placing a strain upon the health care system. The economic costs of anxiety disorders include psychiatric, nonpsychiatric, and emergency care; hospitalization; prescription drugs; reduced productivity; absenteeism from work; and suicide.

(J Clin Psychiatry 2002;63[suppl 14]:4–8)

Approximately 1 in 4 individuals in the United States reports a lifetime history of at least 1 anxiety disorder.[1] According to 12-month prevalence data, anxiety disorders may be more chronic than either substance abuse or affective disorders.[1] They are generally concentrated among the young (showing peak prevalence between the ages of 25 and 44 years),[2] the poorly educated, the unmarried, the childless, and women.[3]

MAJOR STUDIES OF PREVALENCE

Identifying the prevalence of anxiety or other psychiatric disorders is fraught with challenges, and all data must be carefully viewed in the context of methodology. Even minor variations in diagnostic assessment or interview tools can considerably change the findings of prevalence studies. The National Institute of Mental Health (NIMH) Epidemiologic Catchment Area (ECA) study surveyed the prevalence of mental disorders among both community and institutionalized populations across 5 sites in the United States, using the NIMH Diagnostic Interview Schedule (DIS). Diagnoses were reached according to DSM-III criteria, according to which diagnostic hierarchy rules disallow a diagnosis of a comorbid disorder in the presence of a higher-ranking disorder that may cause the comorbid symptoms. In an analysis of ECA data, Leon et al.[4] estimated that 30 million individuals in the United States have at some point in their lives suffered from an anxiety disorder; in any 6-month period, 6% of men and 13% of women in the United States have an anxiety disorder.

The National Comorbidity Survey (NCS) likewise examined the prevalence of psychiatric disorders but differed from the ECA study in method, and thus in result (Table 1). (The NCS administered the Composite International Diagnostic Interview [CIDI], which differs from the DIS by more thoroughly probing phobia, to a national sample. Diagnoses were met according to DSM-III-R criteria, which discount diagnostic hierarchy rules and for generalized anxiety disorder require 6 months' duration of symptoms.) Working in part from NCS findings, Greenberg et al.[3] found that anxiety disorders afflict 15.7 million people in the United States each year and that 75% of these sufferers (11.7 million) also have at least 1 comorbid psychiatric condition.

A large prevalence study[5] in Edmonton, Alberta, Canada, measured the distribution of psychiatric disorders using the DIS and the DSM-III, as did the ECA study. The Edmonton study represented one arm of the Cross-National Collaborative Group,[6] which analyzed data also

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Presented, in part, at the satellite symposium "Anxiety: New Treatment Perspectives," which was held in conjunction with the 7th World Congress of Biological Psychiatry, July 1–6, 2001, in Berlin, Germany. The symposium was supported by an unrestricted educational grant from Pharmacia.

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Table 1. Lifetime Prevalence of Anxiety Disorders in the United States*

	Prevalence Study (Interview Tool/Diagnostic Criteria)	
Anxiety Disorder	ECA (DIS/DSM-III)[a]	NCS (CIDI/DSM-III-R)[b]
Panic disorder	1.5%	3.5%
Social phobia	2.4%	13.3%
Generalized anxiety disorder	4.1%–6.6%[c]	5.1%

[a]Data from Robins et al.[2]
[b]Data from Kessler et al.[1]
[c]Data from Wittchen and Hoyer.[16]
*Abbreviations: CIDI = Composite International Diagnostic Interview, DIS = Diagnostic Interview Schedule, DSM = *Diagnostic and Statistical Manual of Mental Disorders*, ECA = Epidemiologic Catchment Area, NCS = National Comorbidity Survey.

from the United States, Puerto Rico, West Germany, Taiwan, Korea, New Zealand, France, Italy, and Lebanon. The DIS and the DSM-III were applied to all samples. To control some of the variables between nations, the data collected in this study were standardized for the age and sex of the U.S. population. Despite differences in prevalence across the various countries, it is noteworthy that all the different anxiety disorders were identified in each country.

Investigations into the cross-cultural prevalence of psychiatric disorders including anxiety continue with the European Study of Epidemiology of Mental Disorders (ESEMeD), which is being conducted in 6 European countries (Belgium, France, Spain, Italy, Germany, and the Netherlands). Interviews of up to 25,000 noninstitutionalized adults use the CIDI, severity of mental disorders, the Short Form Health Survey (SF-36), the EuroQol 5D (EQ-5D), and sections of the World Health Organization (WHO) Disablement Assessment Schedule II. The utilization of services (treatment, duration, and intensity of care by type of provider and clinical setting), both currently and in the previous 12 months, will also be assessed. The methodology for ESEMeD is similar to that of the WHO World Mental Health 2000 studies, which comprise 100,000 interviews conducted in 23 countries around the world. These data will facilitate comparisons between the results for Europe and the rest of the world of prevalence, severity, and disability of a number of psychiatric disorders and the resultant use of services and medications. They will also compare the current proportions of treated and untreated cases.

The high prevalence of anxiety disorders worldwide suggests considerable burden, and prevalence-based human capital evaluations find their societal cost to be substantial. However, prevalence, help-seeking, and economic burden vary among anxiety disorders.

Panic Disorder

The NCS placed the lifetime prevalence of panic disorder in the United States at 3.5%.[5] Studies using the DIS and the DSM-III as opposed to the CIDI and the DSM-III-R found lower lifetime prevalence rates. The ECA study found the lifetime prevalence of panic disorder in the United States to be 1.5%. According to the Cross-National Collaborative Group, panic disorder lifetime rates vary across countries between 1.4% (Alberta, Canada) and 2.9% (Florence, Italy), with the exception of Taiwan, which had a much lower rate of 0.4%.[6]

Panic disorder is relatively rare in the elderly. Age at onset usually falls between adolescence and mid-30s. It is frequently comorbid with social and specific phobia, agoraphobia, obsessive-compulsive disorder, generalized anxiety disorder (GAD), major depressive disorder, and substance-related disorders.[7]

Like other anxiety disorders, panic disorder afflicts about twice as many women as it does men.[2] However, it inspires an unusually high rate of help-seeking among anxiety disorders. About one third of people with panic disorder seek psychiatric treatment, and almost as many seek medical help—perhaps due to somatic symptomatology such as tachycardia, which may mimic cardiac events.[4] As a result, health care costs are estimated to be higher among patients with panic disorder than among anxiety disorder patients generally,[3] who are in turn more likely than those with other psychiatric disorders to seek help from a mental health specialist, an emergency room, or a primary care practitioner.[4]

The World Health Organization studied the presentation of psychological illnesses in primary care, using a modified version of the ICD-10, and found a mean current prevalence of panic disorder in the general health care setting of 1.1%.[8] Though the prevalence rates of panic disorder in primary care patients seem near those observed in the general population, this is not the case for primary care patients referred to specialists. Sixteen percent of cardiac outpatients and up to 35% of general hospital patients with hyperventilation symptoms suffer from panic disorder.[9]

Despite increased treatment-seeking, individuals with panic disorder show high rates of social morbidity (unemployment, financial dependence, and substance abuse or dependence).[4] Quality-of-life measurements revealed that subjective quality of life among individuals with panic disorder is as poor as it is among individuals with major depressive disorder.[10] Infrequent panic attacks that fall short of a diagnosis of panic disorder also diminish quality of life, occupational functioning, and financial independence, leading to the observation that the difference between panic disorder and relatively infrequent panic attacks is more quantitative than qualitative.[10] The lifetime prevalence of panic attacks ranges from 1.8% in Italy to 9.3% in Germany, but clusters around 7% to 9% in most countries.[9]

Social Phobia

According to NCS data, social phobia (also called social anxiety disorder) has a lifetime prevalence of 13.3%.[1] Other estimates of prevalence are much lower; the

Table 2. Lifetime Prevalence of DSM-III Social Anxiety Disorder[a]

Study Center	Lifetime Prevalence (%)
Puerto Rico	1.6
Edmonton, Alberta, Canada	1.7
Paris, France	4.1
Zurich, Switzerland	3.8
Munich, Germany	2.5
Florence, Italy	1.0
Christchurch, New Zealand	3.5
Seoul, Korea	0.5
Taiwan	0.4–0.6

[a]Adapted with permission from Lépine.[13]
Abbreviation: DSM-III = *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition.

ECA study found a lifetime prevalence of 2.4%,[2] and the Edmonton study reported lifetime prevalence at 1.7%.[5] Magee et al.[11] pointed out that the high rate of social phobia indicated by NCS data when compared with previous studies is mostly related to methodological changes. DSM-III-R criteria for phobia—on which NCS questions were based—require avoidance of or distress on exposure to the feared object or situation, while DSM-III criteria—used in the ECA and the Cross-National studies—address only avoidance. Further, the CIDI asked about more high-prevalence social-phobic fears (such as having to use the toilet when away from home) than did the DIS. Thus, when DIS/DSM-III questions and algorithms were applied to NCS respondents, lifetime prevalence for social phobia dropped to 4.8%.[11]

Social anxiety disorder lifetime prevalence differs across countries as well, with Asian countries showing low rates of around 0.5%, and Paris and Zurich showing rates closer to 4% (Table 2).[12] This range may be explained in part by cross-cultural differences in social habits. Additionally, ongoing uncertainties regarding diagnostic thresholds may contribute to variation. Recently, though, very similar and rather high lifetime prevalence rates for DSM-IV social anxiety disorder were found in 4 large community studies carried out in Germany (7.3%), France (7.3%), Italy (6.6%), and the United States (7.2%).[13]

It is noteworthy that data from the United States suggest an increased prevalence of social phobia in recent cohorts, especially among white, educated, and married individuals,[14] since community samples historically showed elevated rates of social phobia among the never-married, the less-educated, and those of lower socioeconomic status.

There is less disparity between genders in the prevalence of social phobia than in the prevalence of panic disorder or GAD.[5,11] Social phobia also differs from other anxiety disorders by responding poorly or not at all to tricyclic antidepressants that have shown efficacy in treating panic disorder and GAD.[11]

According to ECA and NCS data, social phobia is comorbid in 69% to 81% of diagnoses,[11,15] most frequently with agoraphobia or specific phobia.[15] While the presence of social phobia alone is associated with increased suicidal ideation, the presence of a comorbid disorder with social phobia is associated with increased suicide attempts.[15]

Although 33.5%[11] of individuals with social phobia report considerable interference with their lives and activities, remarkably few seek help. In a study by Schneier et al.,[15] 5.4% of individuals with social phobia sought outpatient psychiatric treatment versus 8.0% of individuals with no psychiatric disorder at all. These low rates of help seeking may reflect a lack of insight in which social phobia is perceived as excessive shyness.

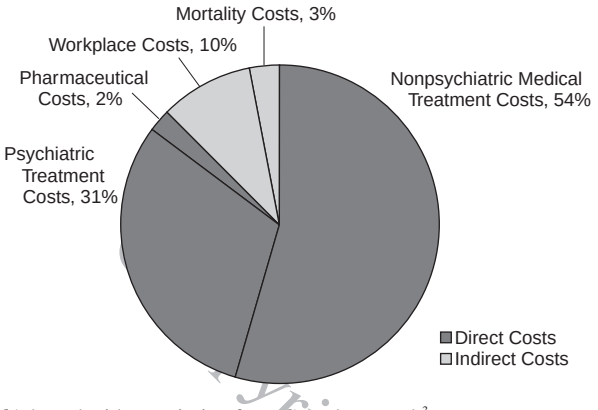
Generalized Anxiety Disorder

The NCS, which is the largest U.S. study to report epidemiologic findings for GAD to date, reported lifetime prevalence at 5.1%, 12-month prevalence at 3.1%, and current prevalence at 1.6%.[1] Lifetime prevalence of GAD in the United States according to the ECA study ranged by site from 4.1% to 6.6%.[16] Current prevalence of GAD was figured at 1.2%[16] by the ECA study and at 6.4% by a national epidemiologic study in Great Britain,[17] which was based on the ICD-10 diagnostic criteria commonly used in Europe. As with the epidemiology of other disorders, differing prevalence rates result largely from different conceptual foundations, different methods of measurement, and different diagnostic criteria. The use of diagnostic hierarchy rules, for example, greatly reduces prevalence rates of GAD. Still, it is possible to identify an approximate mean among the differing lifetime prevalence estimates. Despite diagnostic revisions, community epidemiologic studies found consistent current prevalence rates between 1.2% and 2.8% and lifetime prevalence rates between 4.0% and 6.6%.[9] Thus, the most accurate lifetime prevalence estimates for GAD are thought to be 5% according to DSM-IV criteria and 6.5% according to European ICD-10 criteria.[16] Current (i.e., 6-month), prevalence is likely to range from 2% to 3% in the general population.[16]

GAD is highly persistent, with only one third of sufferers experiencing spontaneous remission. Age is positively associated with prevalence and severity of illness, with women over 45 years of age most frequently affected.[18] Pure GAD is uncommon. Instead, GAD is strikingly comorbid, with comorbidity in community samples surprisingly similar to that in treatment samples.[19] Current comorbidity is estimated at 65.0% and lifetime comorbidity at 89.9%; the imposition of diagnostic hierarchy rules changes this little.[18] The extremely high rate of comorbidity has led to disagreements about whether GAD is a primary and independent disorder, a prodrome or a residual of other disorders, an exacerbating comorbidity, or a personality trait.[20]

High comorbidity may suggest that GAD is both a consequence of and a risk factor for other disorders.

Figure 1. 1990 U.S. Costs of Anxiety Disorders (total cost = $42.3 billion)[a]



[a]Adapted with permission from Greenberg et al.[3]

Table 3. Prevalence (%) of Current ICD-10 Diagnoses in Primary Care (WHO-PPGHC)[a]

Study Center	Panic Disorder[b]	GAD[b]
All centers	1.1	7.9
Ankara, Turkey	0.2	0.9
Athens, Greece	0.7	14.9
Bangalore, India	1.0	8.5
Berlin, Germany	0.9	9.0
Groningen, the Netherlands	1.5	6.4
Ibadan, Nigeria	0.7	2.9
Mainz, Germany	1.7	7.9
Manchester, England	3.5	7.1
Nagasaki, Japan	0.2	5.0
Paris, France	1.7	11.9
Rio de Janeiro, Brazil	0.0	22.6
Santiago, Chile	0.6	18.7
Seattle, Washington, United States	1.9	2.1
Shanghai, China	0.2	1.9
Verona, Italy	1.5	37.0

[a]Adapted with permission from Lépine.[13]
Abbreviations: GAD = generalized anxiety disorder, ICD-10 = *International Classification of Diseases*, Tenth Edition, WHO-PPGHC = World Health Organization Collaborative Study on Psychological Problems in General Health Care.
[b]Data from Üstün and Sartorius.[8]

Thirty-day GAD is comorbid with any diagnosis in 66.3% of cases.[18] It has a comorbidity rate of 38.6% with major depressive disorder, 24.5% with specific phobia, 22.6% with panic disorder, 11.2% with alcohol dependence, and 5.1% with drug dependence. Comorbidity, especially with major depressive disorder, inhibits successful diagnosis and treatment of GAD and may intensify disability. According to a recently published study,[21] approximately 48% of patients with comorbid GAD and major depressive disorder—versus approximately 34% with pure GAD—reported at least 6 days of impairment over the previous month. In another study,[18] 82% of respondents with lifetime GAD reported that the disorder had interfered considerably with their lives and activities, that they had sought professional help for the disorder, or that they had taken medication for the disorder; comorbidity increased the probability of these situations.

While comorbidity intensifies the seriousness of the illness, it also leads to increased help-seeking. About 68% of individuals with comorbid GAD seek help, frequently in the general medical sector, versus about 48% with pure GAD.[18] GAD is the second most frequently seen psychiatric disorder in primary care, following depression.[16] Data suggest[22] that the prevalence of GAD among primary care seekers is about 8%, a higher prevalence than in the general population. Unfortunately, the general medical sector is not well equipped to diagnose or treat GAD.

COSTS OF ANXIETY DISORDERS

Anxiety disorders impose both individual and social burden and can be as disabling as chronic somatic disorders.[13] The direct costs of anxiety disorders include psychiatric and nonpsychiatric counseling, hospitalization, emergency room care, and prescription drugs.[3] Indirect costs include reduced productivity, absenteeism from work, and suicide. All anxiety disorders except specific phobia are associated with lost productivity or absenteeism from work.[3] Workforce participation is 16.5% less among persons with anxiety disorders,[3] and as a result, receipt of welfare and disability payments is elevated among this population.[4] Anxiety may contribute to or be a consequence of unemployment.[3]

Having conducted a prevalence-based human capital evaluation derived in part from NCS data, Greenberg et al.[3] (Figure 1) published a breakdown of the costs of anxiety disorders, which totaled U.S. $42.3 billion in 1990 dollars. (The researchers estimated these combined costs at $63.1 billion in 1998 dollars.) They found that 54%, or $23 billion, of the economic burden of anxiety disorders stems from the cost of nonpsychiatric medical treatment.

At present, patients with anxiety disorders seldom receive appropriate treatment in primary care due to underrecognition, misdiagnosis, and the complicating character of comorbidity, which may help explain the high proportion of cost attributed to this area of care. Comorbidity with other psychiatric disorders or with chronic somatic disorders induces maximal rates of disability considerably greater than those of the pure condition alone. The course and frequency of psychiatric disorders in primary care patients worldwide were examined in the WHO Collaborative Study on Psychological Problems in General Health Care (Table 3) and found to be substantial.[8]

Psychiatric treatment accounts for 31%, or $13.3 billion, of the total cost of anxiety disorders. Ten percent of the total, or $4.1 billion, is attributable to indirect workplace costs such as reduced productivity and absenteeism. Three percent, or $1.2 billion, represents the economic cost of mortality, although the precise relationship between anxiety disorders and suicide is controversial. Phar-

maceutical costs account for only 2%, or $0.8 billion, of the total expense. Another estimate using the human capital approach, by DuPont and colleagues,[23] placed the cost of anxiety disorders at $46.6 billion in 1990 dollars, which represented more than one third of total expenditures for all psychiatric illnesses. In this estimate, indirect costs accounted for more of the economic burden than direct costs.

Beyond the direct and indirect costs are those of impaired social functioning. Anxiety may increase the likelihood of school dropout, teenage childbearing, marital instability, poor career choices, and the need for caretaking by family and friends.[3] Further, anxiety disorders except GAD are associated with elevated rates of substance and alcohol abuse or dependence, from which individual and societal costs may be inferred.[4] A more robust body of research is needed on disability resulting from anxiety disorders.

CONCLUSION

Prevalence of anxiety disorders is difficult to determine; differing diagnostic criteria, assessment tools, and methodologies yield differing results. Still, anxiety disorders are present in the populations of all countries studied, and some consistencies—regarding risk factors, comorbidity patterns, and help-seeking behaviors—emerge in cross-cultural comparisons. According to some data, anxiety disorders are the most prevalent of psychiatric disorders,[10] yet less than 30% of persons with anxiety disorders seek treatment.[4] Fewer, however, receive psychiatric treatment for their illnesses.[1]

Nonetheless, among those with psychiatric disorders, people with anxiety disorders are high care utilizers who present to general practitioners more frequently than to psychiatric professionals, placing a burden on the health care system. In fact, GAD is the second most frequently seen psychiatric disorder in primary care, following depression. The high rate of comorbidity among anxiety disorders makes it still more difficult for the general medical care sector to treat these psychiatric illnesses. In a study[3] of economic burden, researchers found that the costs of anxiety disorders totaled $63.1 billion in 1998 dollars. More than half of this economic burden arose from the cost of nonpsychiatric medical treatment.

Impairment associated with anxiety disorders is severe, but evidence shows that psychotherapeutic and pharmacologic treatments for anxiety are very effective. More widespread recognition of anxiety disorders and appropriate treatment in primary care would reduce the burden of these disorders while addressing a currently unmet need.

Disclosure of off-label usage: The author has determined that, to the best of his knowledge, no investigational information about pharmaceutical agents has been presented in this article that is outside U.S. Food and Drug Administration–approved labeling.

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