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PSYCHIATRIC CLINICS
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Epidemiology of Personality Disorders

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The prevalence of personality disorder (PD) in the nonclinical (community) population was largely unknown through the early 1990s, although it was of considerable interest to the architects of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) system, the National Institute of Mental Health (NIMH), and the personality disorders research community. The prevalence estimates provided in the DSM manuals (DSM-III, DSM-III-R, DSM-IV) were essentially informed speculation, but they did not derive from properly designed population studies. Some specific disorders, such as borderline PD, were simply described as "common" [1–3]. At the NIMH-sponsored workshop on personality disorders held at Williamsburg, VA, in 1990, Weissman [4] conjectured that the population prevalence of "any PD" would be in the range of 10% to 13%. The "guess-timate" informed by early (1950s) community surveys and the rate of PDs observed in the biological relatives of psychopathology-affected subjects who were participating in other studies (eg, the nonpsychotic relatives of schizophrenia patients; or, healthy control subjects and their biological relatives). Clearly, this prior database was subject to a variety of methodological artifacts. For example, the early community studies did not use explicit diagnostic criteria for the definition of PD, nor could they have used structured interviews, as they did not exist in the 1950s. The study of the rate of PD in the relatives of psychiatric patients (eg, first-degree relatives of psychotic patients) resulted in data hampered by the fact that the samples were necessarily conditioned on the presence of major psychotic symptomatology in the study probands as well as the fact that biological relationships among the study subjects precluded independence of observation across the samples. In short, the sample selection and relatedness of the subjects shaped the samples in ways that would not be characteristic of samples drawn from the population at large. Thus, issues of diagnosis, sampling, and disorder definition loomed large in the consideration of data drawn from these early studies. Nonetheless, the

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"guess-timate" conjectured by Weissman [4] provided an initial starting value to consider when evaluating the results of subsequent community-based studies.

Clearly, community-based studies were needed to provide a proper estimate for PD prevalence in the general population. Prevalence rates simply could not be estimated from biased samples recruited for other studies. Nor could they be effectively estimated from the study of consecutive admissions to psychiatric hospitals and/or clinics. Simply put, it was not known whether PD patients presenting at clinics and hospital settings were representative of the population of PD-affected individuals. However, in light of what was known about *Berkson's Bias* [5] in the epidemiology literature, it seemed highly likely that clinic/hospital patients would not only be unrepresentative of the population of PD-affected cases (eg, showing more severe PD impairment, perhaps greater Axis II comorbidity), but they would also likely present with greater pathology of all sorts (eg, Axis I, medical disorders, and other impairment). Moreover, some PD patients might be less likely to present at clinics unless they were in a state of crisis, for example, schizotypal or paranoid PD patients.

It is well known from the clinical literature that PDs are highly comorbid with a wide range of Axis I disorders [6–11], that the impairment in role functioning due to PDs is substantial [12–14], and that people with PDs are heavy users of both primary care and mental health services [14–17]. Thus, accurate community-based prevalence estimates have long been sought after given their obvious utility for public health planning matters as well as basic scientific research.

THE LONGITUDINAL STUDY OF PERSONALITY DISORDERS: AN INITIAL ESTIMATE

A sea change in the epidemiology of the PDs began in the early 1990s with the inception of the *Longitudinal Study of Personality Disorders* (LSPD) [18], the first NIMH-sponsored longitudinal study of personality pathology. The LSPD was undertaken in a nonclinical population from which study samples were drawn for long-term prospective study of PD, personality, and temperament. The LSPD used a two-stage selection procedure for the selection of study subjects for the planned longitudinal investigation. In short, a nonclinical university population (n = 2000) was sampled in a representative fashion and screened with a psychometric screen for personality disorder known as the *International Personality Disorder Examination-Screen* (IPDE-S), developed in the context of developing the *International Personality Disorder Examination* [19,20]. The overall sample was parsed as a function of those who screened positive for a personality disorder versus those who did not. Subsamples of those who screened PD-positive or PD-negative were subsequently interviewed using the IPDE. This provided a novel opportunity to employ the powerful two-stage approach to case identification [21] for the generation of a prevalence estimate for personality pathology in a nonclinical population. Lenzenweger and colleagues [22] reported a point prevalence of 11.01% (95% CI 7.57%–14.52%) for "any PD." This figure accounted not only for specific PD diagnoses

(definite + probable cases), but also included the category PD Not Otherwise Specified (PD-NOS). The breakdown for prevalence rates for specific PDs and DSM-III-R cluster PD (Cluster A "odd, eccentric," Cluster B "erratic, impulsive," Cluster C "anxious, avoidant") in the LSPD can be seen in Table 1.

INTERNATIONAL STUDIES OF PERSONALITY DISORDER PREVALENCE

Torgersen and colleagues [23] conducted an epidemiologic study of PD in Oslo, Norway, in a representative sample of 2053 adults between the ages of 18 and 65. Using the Structured Interview for DSM-III-R Personality Disorders (SIDP-R) [24] administered by experienced psychiatric nurses, Torgersen and colleagues [23] found a prevalence for "any PD" of 13.4% (weighted %). In their sample, Cluster C disorders appeared to be more common (9.4%) than either Cluster A (4.1%) or Cluster B (3.1%). No sex differences were found at the level of any of the three PD clusters.

Coid and colleagues [25] conducted a national survey of PD in Great Britain among adults using a two-stage procedure for case identification. The first-stage Axis II screening was conducted within the British National Survey of Psychiatric Morbidity and included 8886 subjects (69.5% response rate). Subjects were selected for assessment at the second stage on the basis of their PD status as determined in the first-stage screening. The second-stage assessments (n = 638) were conducted on those agreeing to participate using the Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) [26] interview. Coid and colleagues [25] found an overall prevalence rate of 10.1% for "any PD" (including PD-NOS) and they also reported rates for specific PDs as well as the PD clusters (see Table 1). The rates of Cluster A, B, and C PDs were all broadly comparable; the most frequent diagnosis in the Coid and colleagues [25] study was PD-NOS (5.7%). Cluster B PDs, but not Cluster A or Cluster C PDs, were significantly more common in women than men.

COMMUNITY STUDIES IN THE UNITED STATES

Samuels and colleagues [27] reported PD prevalence rates for one of the original sites in the well-known Epidemiologic Catchment Area Study, specifically the Baltimore, MD, site. In a sample of 742 adults (ages 34 to 94), Samuels and colleagues [27] used the IPDE, administered by experienced clinical psychologists, and found an overall prevalence rate of 9.0% for "any personality disorder." Their sample was noteworthy for a high rate of antisocial personality disorder (4.1%), which led to a somewhat higher rate of Cluster B PDs relative to Cluster A and C PDs. Cluster A and B, but not Cluster C, disorders were found to be significantly more common in men than women.

Crawford and colleagues [28], reporting from the *Children in the Community Study* (directed by Patricia Cohen, PhD), found in a sample of 644 adults (average age = 33 years) that 15.7% of their sample had some form of PD. The Axis II diagnostic assessments were conducted by clinically experienced

Table 1
The prevalence (percentage) of personality disorders in six nonclinical population/community studies using validated structured interviews

	Study					
	Lenzenweger et al [22]	Torgersen et al [23]	Samuels et al [27]	Crawford et al [28][a]	Coid et al [25]	Lenzenweger et al [30]
Instrument	IPDE	SIDP-R	IPDE[b]	SCID-II	SCID-II	IPDE
Nomenclature	DSM-III-R	DSM-III-R	DSM-IV	DSM-IV	DSM-IV	DSM-IV
Location	Ithaca, NY, USA	Oslo, Norway	Baltimore, MD, USA	Upstate New York, USA	Great Britain [National]	United States [National]
Personality Disorder						
Paranoid	1.0	2.4	0.7	5.1	.7	—
Schizoid	1.0	1.7	0.9	1.7	.8	—
Schizotypal	1.6	0.6	0.6	1.1	.06	—
Cluster A	2.8	4.1	2.1	6.8	1.6	5.7
Antisocial	0.6	0.7	4.1	1.2	.6	.6
Borderline	1.3	0.7	0.5	3.9	.7	1.4
Histrionic	2.9	2.0	0.2	.9	—	—
Narcissistic	2.7	0.8	0.03	2.2	—	—
Cluster B	5.3	3.1	4.5	6.1	1.2	1.5

Avoidant	1.0	5.0	1.8	6.4	.8	—
Dependent	0.6	1.5	0.1	.8	.1	—
Obsessive-Compulsive	1.3	2.0	—	4.7	1.9	—
Passive-Aggressive	1.6	1.7	—	—	—	—
Cluster C	2.6	9.4	2.8	10.6	1.6	6.0
Any PD	11.01[c]	13.4[d]	9.0	15.7	10.1[e]	9.1[f]

Instruments indicate the structured clinical interview used: International Personality Disorder Examination (IPDE); Structured Interview for DSM-III-R Personality Disorders (SIDP-R); Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II). Dashes indicate not applicable. All prevalences reported are weighted prevalences.

Abbreviations: DSM, *Diagnostic and Statistical Manual of Mental Disorders*; PD, personality disorder.

[a]Prevalences for antisocial PD and histrionic PD were estimated using self-report data [28].

[b]IPDE (DSM-IV version) [19].

[c]Includes sadistic PD as well as PD–Not Otherwise Specified (PD-NOS) based on the IPDE (DSM-III-R version).

[d]Includes self-defeating, fearful, and sadistic PDs.

[e]Includes PD-NOS.

[f]Includes PD-NOS. All *National Comorbidity Survey Replication* (NCS-R) prevalence rates are based on multiply imputed values in nationally representative sample of subjects from the United States. See Lenzenweger and colleagues [30] for extensive technical detail.

staff using the SCID-II interview. These authors found Cluster A and Cluster B PD prevalence rates to be broadly comparable (6.8% and 6.1% respectively), whereas Cluster C PDs were somewhat more prevalent (10.6%). Sex differences were not reported in Crawford and colleagues [28].

A NATIONALLY REPRESENTATIVE STUDY IN THE UNITED STATES: NATIONAL COMORBIDITY SURVEY REPLICATION

Each of the prior studies done in the United States focused on samples drawn from populations possessing unique characteristics (eg, university students; inner city Baltimore, MD; rural Upstate New York) that potentially limited their results in terms of generalizability to the United States as a whole. Thus, it was decided to address this gap in the psychiatric epidemiology of the United States within the context of the *National Comorbidity Survey Replication* (NCS-R) [29]. It was deemed essential to have clinically experienced diagnosticians using a well-validated structured clinical interview conduct the assessments for the NCS-R. Clearly, all members of the representative national sample drawn for the NCS-R ($n > 5000$) could not be interviewed face-to-face for the Axis II assessments. Therefore, it was decided to employ the two-stage procedure for case identification and a screen would be used in the preliminary assessment phase of the NCS-R. Given that the IPDE-Screen had performed very well in the LSPD [29], it was selected for inclusion in the NCS-R. Specifically, there were no cases of "definite" PD associated with a positive IPDE-S screening value (ie, no false negatives) in the LSPD. The second-stage Axis II assessments conducted for the NCS-R were done using the IPDE. A complex multiple imputation procedure was then used to estimate population prevalences for PDs from the clinical reappraisal sample (second-stage assessment sample) for the sample as a whole (see Lenzenweger and colleagues [30] for extensive technical detail). As can be seen in Table 1, the overall prevalence rate for PD in the US population was found to be 9% [30]. A noteworthy feature of the NCS-R PD data was the estimation of prevalence rates for specific Cluster B PDs, namely borderline and antisocial PDs. Borderline PD was found to have a general population prevalence of 1.4%, whereas antisocial PD had a prevalence of 0.6%. The NCS-R PD prevalence rates were not associated with sex at the level of clusters or "any PD"; however, there was a nontrivial trend for antisocial PD to be less prevalent in women. Of particular note, borderline personality disorder was equally common in men and women. Finally, as found in many prior inpatient and outpatient samples, a wide range of Axis I disorders were frequently comorbid with the Axis II disorders diagnosed in the NCS-R subjects (across all three PD clusters) [30].

In this context, I note that a study by Grant and colleagues [31] also sought to estimate prevalence rates for a subset of Axis II disorders using a national population sample. However, the data from this study are not discussed here as that study did not use a validated Axis II diagnostic instrument and the Axis II assessments were done by census workers with minimal experience in the diagnosis of severe psychopathology.

SUMMARY

These modern epidemiological studies, each conducted in different populations, yield remarkably consistent estimates for "any PD" as defined by the DSM system and assessed using a validated structured clinical interview in the hands of experienced diagnosticians. The median prevalence rate for "any PD" across these studies is 10.56% and the mean prevalence rate is 11.39%. Despite variation in methods and instrumentation, these data indicate that approximately 1 in every 10 persons suffers from a diagnosable personality disorder. Personality pathology is clearly a frequently occurring phenomenon and a matter for concern from the standpoint of public health (ie, treatment use, impact on occupational functioning). Sex differences do not appear to have a consistent pattern for the PDs across the various studies. These studies also highlight the utility of the PD-NOS diagnosis, which was found to be relatively common in several studies (eg, see Lenzenweger and colleagues [22] and Coid and colleagues [25]). Finally, from the standpoint of research, the relatively high rate of PD serves as a powerful stimulus for efforts to understand the neurobiology of PD [32,33], resolve endophenotypes for the specific PDs [34,35], illuminate issues of stability and change in PDs across the lifespan [36,37], and determine which are the most effective treatments for PD [38].

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