Incidence of Depression and Anxiety: The Stirling County Study

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Abstract: Prevalence studies in psychiatric epidemiology outnumber incidence investigations by a wide margin. This report gives descriptive information about the incidence of depression and anxiety disorders in a general population. Using data gathered in a 16-year follow-up of an adult sample selected as part of the Stirling County Study (Canada), the incidence of these types of disorders was found to be approximately nine cases per 1,000 persons per year. The data suggest that for every man who became ill for the first time with one of these disorders, three women became ill. Incidence tended to be higher among relatively young persons.

These incidence rates are consistent with prevalence rates of approximately 10 per cent to 15 per cent for depression and anxiety disorders aggregated together, given an estimated average duration of illness of about 10 years. It is concluded that these incidence rates are fairly realistic in view of evidence that disorders of these types tend to be chronic. (*Am J Public Health* 1988; 78:534–540.)

Introduction

Twenty years ago, Rema Lapouse reviewed the field of psychiatric epidemiology and concluded that the chief task had not been addressed.[1] Because most studies had focused on *prevalence,* she found them of dubious worth. "To determine the *incidence* (emphasis added) of psychiatric disorder, to relate the incidence to environmental and biological characteristics, to use inferences from these relationships as clues to etiology, and thereby to lay the basis for the prevention and control of diseases—these are the tasks of epidemiologic research in mental disorder."[1]

In emphasizing the importance of incidence, Lapouse draws on the distinction between incidence as enumeration of the first occurrences of a disorder over a defined interval of time, and prevalence as a count of all disorders in existence at one time.[2,3] Because prevalence rates are influenced by chronic disorders, most of which will have had their origins under circumstances that are remote in time from the period when they are enumerated, she saw prevalence studies as having "no value in uncovering possible etiologic relationships."[1]

Furthermore, Lapouse and others found many of the prevalence studies inadequate because the rates reported were variable.[1,4] An exception she noted was the comparability in overall prevalence given by the Midtown Manhattan Study[5] and the Stirling County Study.[6] These studies had been among the first to use structured interviews for gathering information about psychiatric disorders in samples of the general population, and it is possible that greater methodologic similarity accounted for the comparability in results. Nevertheless, the general variability among studies led her to suggest that the first step for improving psychiatric epidemiologic research was "to develop uniform criteria for the definition of a case."[1]

In the years since then, the problem of criteria has received attention. The thrust has not been to develop criteria for psychiatric caseness in the general sense, as might have been forecast by the climate of interests 20 years ago.[7] Rather, the target has been to construct diagnostic standards by which psychiatric cases can be differentiated into discrete types. The third edition of the *Diagnostic and Statistical Manual* (DSM-III) of the American Psychiatric Association was a landmark regarding this latter endeavor.[8] The emphasis on diagnostic distinctions reflects the view that etiologies are probably different for different types of psychiatric disorders.

Despite progress on the issue of criteria, there remains a dearth of evidence about incidence. Well over 100 prevalence studies have been conducted in general populations.[9,10] The number reporting incidence can, at most, be counted on two hands.[11] One reason for the paucity of incidence studies is probably that a longitudinal follow-up design is desirable. If a prevalence study is carried out first and the whole sample or population is followed and assessed later, it is possible to calculate incidence using as a denominator only those persons at risk for a first disorder, since those who had earlier given evidence of already having had a disorder can be removed for purposes of analysis. Additionally, the antecedent prevalence investigation gives a baseline reading that increases confidence that the disorders enumerated for incidence came into existence during the follow-up period, that they are in fact "first disorders." This issue is important because many psychiatric disorders tend to have an insidious beginning and the exact onset is often difficult to pin down.

It seems clear that incidence research in the mental health field is still in its infancy. The purpose of this article is to contribute to the growth of this area of investigation by giving incidence findings from a study of a general population. Named the Stirling County Study, the investigation has taken place over a number of years in an area of Atlantic Canada.[12,15] Our focus in this report is on depression and anxiety disorders as discerned by analysis of responses given in structured interviews. In addition to giving incidence rates for these types of disorders, we will describe their relationships to age and sex.

Our aim here is mainly to assess the credibility of these incidence rates. One way we will approach this issue is by relating incidence to evidence about prevalence and duration. We will also compare our rates to those reported in other incidence studies. In subsequent reports we plan to investigate the relationships between incidence and psychosocial risk factors. While recognizing the importance of incidence for etiologically oriented research, we will conclude this paper with reasons for believing that Lapouse's view that incidence studies will lead to preventive capability may need to be tempered.

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Background

The Stirling County Study is a longitudinal investigation in psychiatric epidemiology that consists of both repeated cross-sectional surveys and cohort follow-up investigations carried out between 1952 and 1970.[16,17] To analyze information about depression and anxiety elicited in the interviews with subjects, we recently constructed a computer program named DPAX (the DP stands for depression and the AX for anxiety) which makes use of a diagnostic algorithm with four main steps that, in sequence, apply criteria for: 1) essential features; 2) associated symptomatology; 3) impairment; and 4) duration.[18]

For a diagnosis of depression, the program first requires positive evidence of dysphoric mood as the essential feature, followed by positive evidence of disturbances in each of three characteristically associated spheres (sleep, appetite, and energy), then by positive evidence of impairment in one's ordinary work role, and lastly by evidence that the impairment persisted over a minimum duration of one month. The algorithm for anxiety is similar except that the content consists of typical symptoms of autonomic hyperactivity and motor tension in conjunction with apprehension, especially apprehension about having a nervous breakdown. We have suggested that these definitions bear a reasonable degree of comparability to unipolar depression and generalized anxiety in DSM-III. In addition to giving these diagnoses, the DPAX program identifies a residual category which we call "mixed affective disorder." These latter cases differ in that their symptoms are scattered across both syndromes but do not meet the complete criteria for either depression or anxiety.

We have begun to report the results of our longitudinal study using this computerized methodology. Our first report was a comparison of point prevalence for a sample of 1,003 adults selected in 1952 and for another sample of 1,094 adults selected in 1970.[19] Prevalence in the two samples was similar not only for specific diagnoses but also when depression and anxiety were grouped together. The overall rate, standardized for age, sex, and sampling districts, was 12.5 per cent for the 1952 sample, and 12.7 per cent for the 1970 sample. In both samples, women had higher overall prevalence than men, due mainly to anxiety and mixed affective disorder. The rates for depression were comparable for men and women.

Beginning in 1968, we also gathered follow-up information about the 1952 sample. Table 1 shows the results of this follow-up effort. Through procedures explained elsewhere we are quite confident that the data about vital status at the end of the study are complete and accurate. We were able to locate and re-interview 81 per cent of the survivors. Our first use of this follow-up information concerned an analysis of clinical outcome as it pertained to the 64 re-interviewed survivors who had been enumerated in the point prevalence rate for 1952.[20] We found that 26 per cent gave evidence at follow-up of being long-term chronic cases in that they said they were rarely free of the symptomatology and impairment that make up our definitions of depression and anxiety. Another 30 per cent gave evidence of having had one or more recurrences of these types of disorders, with these recurrent episodes being of variable duration. Those who were depressed at the beginning of the study had significantly worse outcome in terms of chronicity and recurrence than those diagnosed as anxious.

Then turning to mortality, we found that the 120 subjects identified as cases in 1952 experienced 1.5 times the number of deaths expected on the basis of rates for a large reference

TABLE 1—Results of Follow-Up Effort*

Baseline Categories**	Decedents**	Survivors Not Re-Interviewed**	Survivors Re-Interviewed**
Cases before 1952 (40)	4	6	30
Cases in 1952 (120)	41	15	64
Never cases by 1952 (843)	197	122	524
Total sample (1003)	242	143	618

*In an earlier version of this table we used December 31, 1969 to show vital status because the re-interviewing of survivors had essentially been accomplished by that time.[20] For the analysis of mortality, however, we used as the common closing date, July 1, 1968 when interviewing began.[21] The reason for this was that some re-interviewed subjects may have died shortly after the interview, and our search of death certificates did not include those already re-interviewed. Because the majority of subjects were re-interviewed during the summer of 1968, we use the 16-year period between the summers of 1952 and 1968 as the interval of follow-up for this report.

**The numbers in the parentheses refer to the number of subjects in the baseline categories and those in the columns refer to the number of subjects in the follow-up categories. It may be noted that while the number of cases in 1952 (120) gives a crude point prevalence rate of 11.96 per cent, the standardized rate is 12.5 per cent.

population.[21] Depression was significantly associated with increased mortality risk but anxiety was not.

In this study, as in others, many subjects diagnosed as depressed also met the full criteria for a diagnosis of anxiety.[22] In both the study of morbidity and that of mortality it was the presence of depression, irrespective of whether anxiety was also in evidence, that was mainly associated with poor outcome. The difference between depression and the other categories was underscored when we combined the mortality and morbidity data. Among those depressed at baseline, 82 per cent had an overall poor outcome in contrast to 47 per cent with poor outcome from the categories of anxiety alone and mixed affective disorder.

Methods

The estimates of the incidence of depression and anxiety to be described here are based on the interviews carried out in 1968 with the surviving subjects of the 1952 sample. The interview data used in this report do not allow us to estimate how many of the decedents may have experienced a first disorder after the initial data were gathered and before death, nor do the data provide information about those subjects who survived but were not interviewed a second time. It is unknown whether such subjects would have reported evidence similar to that given by re-interviewed survivors or not. In view of the association we found between these types of disorders and mortality, however, we suggest that incidence rates derived from survivors may err on the side of being somewhat lower than true incidence.

In order to conduct the incidence analysis, we needed to restrict the sample to those persons at risk for experiencing a first disorder during the follow-up period. The structured interviews used in our study ask subjects to respond to questions about symptoms and impairment and to give dates of onset and duration. Because the interviews were designed in the early 1950s, they are less precise than several of the more recently constructed schedules.[23–25] Nevertheless, the DPAX program distinguishes between those with a disorder at the time of interview from those who had previously been ill in these terms but who had recovered by the time of interview. While 12.5 per cent of the original sample was enumerated for the standardized point prevalence rate in 1952, lifetime prevalence up to 1952 involved 160 subjects.

TABLE 2—Age and Sex Characteristics of a Population at Risk for a First Depression or Anxiety Disorder

Age in 1952	Men	Women	Total
Under 40 years	99	138	237
40–49 years	73	71	144
50 years and older	79	64	143
Total	251	273	524

Excluding these subjects who had given evidence of ever having had a disorder up to and including 1952 identified a population at risk for a first disorder consisting of the 524 re-interviewed survivors shown in Table 1. The age and sex characteristics of these subjects are given in Table 2. Approximately half of the subjects at risk were under 40 years of age when the study started and the youngest among them had been born in the early 1930s.

A life table computer program by Monson was used to derive incidence rates.[26] The rates were calculated by using the number of new disorders reported as having occurred after 1952 as the numerator and the person-years of observation relevant to the 524 subjects who constitute the population at risk as the denominator. Survival time was the number of years to the first disorder or to the common closing date in 1968 for those who did not become ill. The incidence rates were standardized for age and are presented as the number of first disorders per year per 1000 persons for men and women separately.

While the primary goal of this report is to give descriptive information about incidence, we also offer a statistical assessment of the significance of the relationships of age and sex to the diagnostic categories. For this we used a computer program named LOGLIN that implements survival regression techniques as described by Laird and Olivier.[27,28]

Results

The interview data gathered in 1968 indicated that 72 individuals who earlier had not given evidence of ever having had a depression or anxiety disorder reported that they experienced a first disorder during the years of follow-up. The onset dates described by these incident cases were scattered throughout the 16 years of follow-up and the durations of illness were variable over and above the minimum requirement for one month.

Pure depression was reported by only one person. In view of this, we used three diagnostic categories in the analysis: depression (with or without anxiety); anxiety (without depression); and the residual category of mixed affective disorder. Table 3 gives estimates of the average annual incidence by age of onset and sex for these diagnostic categories as well as for their aggregation. When men and women are grouped together, the estimate from this study is that approximately nine adults per 1,000 became incident cases in any one year during the period of follow-up.

Table 3 also shows the results of survival regressions. Being female increased the risk for anxiety, and the diagnosis of mixed affective disorder was almost exclusively pertinent to women. When all the disorders were taken together, it was somewhat less common for a person of 50 years or more to become an incident case than was true of younger people.

To show the relevance of age and sex for the incidence of the disorders aggregated together and to compare incidence and prevalence in this regard, the information is presented graphically in Figures 1 and 2. Women were dominant in both the incidence and prevalence rates, and the comparison emphasizes that while younger persons were more likely to experience a first disorder, older persons were more likely to be enumerated in the prevalence rate.

In a time-limited study such as this, it is impossible to calculate the average duration of incident disorders directly because those subjects who had an onset that was historically recent (i.e., close to 1968) had not experienced the same period of risk for recovery or chronicity that was true for those with an onset earlier in the follow-up period. Never-

TABLE 3—Incidence Rates per 1,000 per Year for Depression and Anxiety Disorders, by Sex and Age of Onset*

Age of Onset	Depression	Anxiety	Mixed Affective	Aggregated Disorders
Men				
<40 years	2.6 (2)	3.9 (3)	1.3 (1)	7.9 (6) (4.1–15.1)
40–49	2.9 (3)	1.9 (2)	(0)	4.9 (5) (2.5–9.3)
≥50 years	1.4 (3)	1.9 (4)	(0)	3.4 (7) (1.8–6.3)
Total	2.1 (8) (1.1–4.0)	2.3 (9) (1.4–3.8)	0.3 (1) (0.1–0.8)	4.9 (18) (3.3–6.7)
Women				
<40 years	0.9 (1)	9.0 (10)	3.6 (4)	13.5 (15) (7.0–25.7)
40–49	3.6 (4)	7.1 (8)	8.9 (10)	19.6 (22) (10.2–37.6)
≥50 years	2.9 (5)	4.0 (7)	2.9 (5)	9.8 (17) (5.2–18.4)
Total	2.5 (10) (1.3–4.9)	6.3 (25) (3.8–10.4)	4.8 (19) (1.6–14.2)	13.3 (54) (9.6–19.5)

*The number of individuals enumerated as incident cases is shown in parentheses to the right of each incidence rate. For the marginal rates, 95% confidence intervals are shown below the incidence rate. These intervals were derived from survival regressions. The regression coefficients or effects estimates, when multipled by 1,000, were essentially the same as the incidence rates.

FIGURE 1—Average Annual Incidence of Aggregated Depression and Anxiety Disorders 1952–68: Rates per 1,000 Men and Women

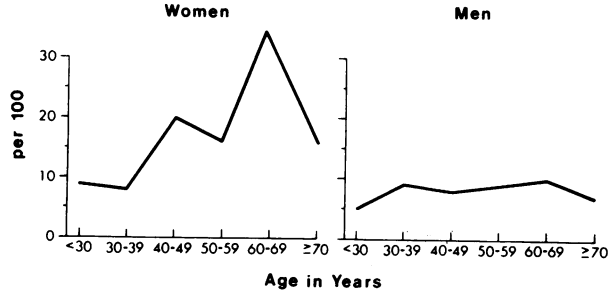

FIGURE 2—Point Prevalence of Aggregated Depression and Anxiety Disorders in 1952: Rates per 100 Men and Women

TABLE 4—Overview of Findings on Rates of DPAX Disorders

Types of Rates	Per 1000 Persons
Lifetime prevalence up to 1952	160
minus cases recovered by 1952	−40
gives point prevalence in 1952*	120
Adjusting for differential mortality (1952 to 1968) associated with cases	160 −50
gives an estimate of lifetime prevalence as of 1952 among those destined to survive**	110
Estimated lifetime prevalence as of 1952 among those destined to survive	110
plus 16-year incidence of DPAX disorders	+150
gives lifetime prevalence among survivors by 1968†	260
Lifetime prevalence among survivors by 1968	260
minus proportion of cases recovered by that time	−115
gives estimated point prevalence among survivors in 1968††	145

* As noted in the text, the application of the DPAX program to information in the 1952 interviews with 1,003 subjects identified 160 cases of depression and/or anxiety, among whom 40 had recovered by 1952.

**The differential mortality estimate is based on the fact that 45 of the 160 cases died by 1968 (.28) while 197 of the 843 non-cases died (.23). The difference of .05 is shown as 50 per 1,000. This estimate is somewhat lower than that given in our paper on mortality which dealt with the 120 unrecovered cases enumerated in the point prevalence rates among whom 41 died.[21]

†The estimate of total incidence is based on multiplying the 9.2 annual incidence (combining men and women) by the 16 years of follow-up; 147 has been rounded to 150 per 1,000.

††The proportion of recovered cases is based on the fact that among the 166 surviving re-interviewed persons who had ever reported a disorder identified by the DPAX program, 73 had recovered by 1968 (.44); 44% of the estimated lifetime prevalence of 260 per 1,000 equals 114 recovered cases, rounded to 115. The actual point prevalence in 1968 among 618 re-interviewed persons was 150 per 1,000 persons.

theless, average duration can be estimated by the well-known formula which states that prevalence is the product of incidence and average duration.[2,3] Dividing point-prevalence (120 per 1,000) by incidence (nine per 1,000) indicates that the duration of illness was, on the average, approximately 13 years.

Table 4 is an overview of findings in which the various rates are assessed sequentially in order to estimate the point prevalence of these disorders among all re-interviewed survivors at the time of final assessment. This information suggests that close to 75 per cent of a general population sample followed for 16 years remained free of the types of disorders identified by the DPAX program. Taking incidence, mortality, and recovery into account, the point prevalence among persons who survived over the 16 years can be projected roughly as 14.5 per cent. Actual point prevalence among the 618 re-interviewed survivors was 15 per cent at the time of interview in 1968.

Discussion

In overall terms, the results of this investigation are similar to general epidemiologic evidence about chronic diseases in that we found incidence to be low relative to prevalence. We have suggested that our estimates may be somewhat lower than true incidence due to absence of information about persons who died. While several of the incident cases indicated that they met the full criteria of our definition of a disorder for only a relatively short period of time, it is also possible that our rates underrepresent non-recurrent and quickly remitting disorders due to lack of recall.

Against this background of recognized limitations, our study suggests that during the 1950s and 1960s the overall annual incidence of depression and anxiety disorders was approximately nine persons per 1,000 in the general population of Stirling County. For every male incident case, there were about three female incident cases. In overall perspective, a first onset was more likely to occur among relatively young persons. With an estimated average duration of about 13 years, the expectation was supported that the magnitude of prevalence relative to incidence was due to chronicity. The fact that prevalence was higher among older persons also pointed to the role played by chronicity.

There is considerable consistency in the information available thus far in this study. For example, the diagnostic composition of the prevalence rates was comparable to the diagnostic composition of the incidence rates, and in both kinds of rates the diagnoses bore similar relationships to sex. The estimated average duration of slightly more than a decade is in line with the results of our clinical outcome study among the baseline cases that were excluded from the incidence analysis. The latter indicated that 56 per cent of those who were cases in 1952 reported continuous or recurrent episodes over the subsequent 16 years.[20]

Taking incidence, mortality, and recovery into account, the evidence suggested that 14 per cent to 15 per cent of the surviving members in the follow-up study were experiencing an episode of depression and/or anxiety at the time of the final interview. Bearing in mind that the follow-up group had aged by 16 years and could be expected to have somewhat higher prevalence than a probability sample representative of the population at any time, the 14 per cent to 15 per cent figures compare favorably with the 12.5 per cent overall prevalence when the sample was originally constituted in 1952 as well as with the 12.7 per cent overall prevalence for a similar sample selected in 1970. These prevalence rates suggest that during the period of investigation the population from which the samples were drawn was in a fairly steady state regarding the incidence and duration of depression and anxiety.

Since one of our main purposes in this article is to assess the degree to which these incidence rates are realistic, it is of value to compare our findings with those from other studies. Table 5 gives an overview of incidence studies that deal with diagnoses that are somewhat comparable to ours.[29–33] As context, Table 6 shows prevalence rates for somewhat comparable diagnoses from studies that used rather similar procedures for gathering and analyzing information.[23,24,34,35] While not minimizing the differences in the prevalence studies, we note that they tend to concur in suggesting that between 10 per cent and 15 per cent of a general population may suffer a depression or anxiety disorder at any one time. On the other hand, the range of incidence rates is broader. In fact the range of the rates shown in Table 5 is as wide as that which characterized prevalence studies when *they* were in *their* infancy.

It seems reasonable to suggest, however, that the methodologic differences among the incidence studies are greater than those pertinent to the prevalence studies. The incidence studies carried out in Australia and Florida gathered information by means of inventories of neurotic symptoms, mainly symptoms of depression and anxiety, and used cutting-points to identify cases.[30,32] In contrast, the diagnosis of depression in the Swedish study was derived through

TABLE 5—Comparative Overview of Incidence Studies of Depression, Anxiety, or Neurotic Disorders*

Studies	Time and Place of Study	Number of Persons at Risk	Case Identification Procedures	Diagnoses	Incidence per 1000 per Year
Henderson et al.[29]	1 Year 1977–78 Australia	169**	General Health Questionnaire administered 4 times.[30] Incident cases determined as any subsequent score above 4.	Neuroses	225
Schwab et al.[31]	3 Years 1970–73 Florida, USA	362†	Health Opinion Survey administered twice.[32] Incident cases determined as subsequent score above 30.	Neurotic Disorders	47
Hagnell et al.[33]	10 Years 1947–57 Sweden	2550††	Incident cases determined from clinical interviews by psychiatrists at beginning and end of interval.	Depression	1.8
	15 Years 1957–72 Sweden	2550††	Incident cases determined as above.	Depression	4.5
This Study	16 Years 1952–68 Canada	524	Incident cases determined by application of DPAX computer program to questionnaire interviews carried out at beginning and end of interval.	Depression Anxiety Mixed Affective Aggregated Disorders	2.3 4.3 2.5 9.2

*The studies selected for this review used longitudinal follow-up designs in which rates were or could be calculated for a population at risk for a first disorder excluding persons known to have had a disorder at or before the initial assessment.

**In the Australian study, 38 persons among 169 at risk met the criteria for being an incident case.[29] Information was not published indicating when during the year of investigation each new case appeared, and thus person-years of observation was considered to be 169 for the calculation of the incidence rate.

†In the Florida study, 51 persons among 362 at risk met the criteria for being an incident case.[31] The time when each case emerged during the three-year period was not published, and the person-years of observation was considered to be 1,086 for the calculation of the incidence rate.

††The population at risk in the Swedish study was not identified as such, but person-years of observation was used as the denominator after removal for death and a first depression among 2,550 persons.[33]

clinical interviews carried out by psychiatrists.[33] The diagnoses used in our study were based on the computer methods described earlier.

The annual incidence rate (22.5 per cent) from the Australian study is about twice as high as the prevalence estimates. If the year of investigation in this study were a typical year, it follows that almost every member of the population would have experienced a first episode by the end

TABLE 6—Comparative Overview of Prevalence Studies*

Studies	Time, Place of Study	Number of Persons	Case Identification Procedures	Diagnosis	Current Prevalence Rates per 100 Persons
Bebbington et al.[34]	1978 London**	310	Present State Examination and CATEGO Computer Diagnosis.[23]	Depression Anxiety	7.0 2.9
Myers et al.[35]	1980 New Haven†	3058	Diagnostic Interview Schedule and DIS Computer Diagnosis.[24]	Depression Anxiety	6.5 7.2
	1981 Baltimore†	3481	Diagnostic Interview Schedule as above	Depression Anxiety	4.6 14.9
	1981 St. Louis†	3004	Diagnostic Interview Schedule as above	Depression Anxiety	6.2 6.6
This Study	1952 Stirling County	1003	Questionnaire Interviews and DPAX Computer Diagnosis	Depression Anxiety	5.3 5.0
	1970 Stirling County	1094	DPAX Computer Diagnosis as above	Depression Anxiety	5.6 4.6

*The studies selected for this review reported the prevalence of various types of depression and anxiety disorders using structured or semistructured interview procedures for gathering information that was then analyzed by diagnostic computer programs.

**The study in London used a two-stage screening design. The original sample consisted of 1,012 person; 310 were selected for diagnostic interviews. Depression consisted mainly of neurotic depression; anxiety consisted of anxiety states, phobic states, and obsessive-compulsive disorders.

†The studies in New Haven, Baltimore, and St. Louis were carried out as part of the US National Institute of Mental Health's Epidemiologic Catchment Area Program. Diagnoses in these investigations were not mutually exclusive. Depression consisted of major depression, manic episodes, and dysthymia; anxiety consisted of phobia, panic, obsessive-compulsive, and somatoform disorders. The investigators in these studies have suggested that the higher prevalence of anxiety disorders in Baltimore was probably due to differences in the questions asked at that site in regard to phobic disorders.[35]

of about four years. This contrasts sharply with the evidence in our study that by the end of 16 years of follow-up, 75 per cent of the survivors reported that they had never had a depression or anxiety disorder. Perhaps the studies that used cutting-points on symptom inventories identified mild emotional ups and downs rather than the clinical types of depression and anxiety that figure in the findings from the other studies.

The investigation in Sweden, known as the Lundby Study, is more comparable to ours in design and results than the other incidence studies.[33] A difference is that the Lundby researchers gathered incidence information relevant to two intervals of time and have reported a significant increase in the incidence of depression with the passage of time. This leads us to emphasize that epidemiologic studies like the ones described here need to be viewed in the context of the different times and places of investigation as well as the differences in methods and definitions. The information from the Stirling County Study is limited to one historical period that ended about 1970 and to one geographical site that can be described broadly as a rural area which moved toward an urban way of life. If we were to repeat our study now, it is quite possible that changes in prevalence and incidence rates would be discerned. Even if the overall rates remained approximately the same, we might find that the influences of age and sex were different.

In this regard, it should be noted that the recent US studies which have reported overall prevalence rates for depression and anxiety disorders that are quite similar to ours, as shown in Table 6, have also pointed to the fact that prevalence now appears to be higher among younger persons than among older persons.[35] These and other studies suggest that persons born in the years since World War II are especially vulnerable to psychiatric disorders.[36–38] Such a trend is clearly of major importance. It concerns issues, however, that our study can address only by giving background evidence about an earlier historical era in which prevalence appeared to be higher among older persons.

We have interpreted this higher prevalence among older persons as partly influenced by the fact that the disorders registered by our methods tend, on the average, to have long durations. In this regard, our findings can be affiliated with those of recent patient studies that have shown that depression is often a fluctuating but chronic disorder.[39–41] A growing number of studies in primary care settings as well as other general population studies have also indicated that these types of disorders tend to run a chronic course.[42–44]

Although we suggest that the incidence and duration information from our study is credible and that it supports prevalence rates that are quite comparable to those in other studies, a point of difference regarding depression should not go unnoticed. In most epidemiologic studies, the prevalence of depression has been found to be higher among women than men.[11,37,45] In this study, men and women have been about equal regarding depression. This equality pertains not only to prevalence but also to incidence and to poor clinical outcome. It is in regard to mortality that we found a sex difference, in that depression among men was associated with twice the expected risk while the mortality risk among women was not appreciably above the expected. This led us to speculate that men may more often die of depression while women are more often disabled by it.[21]

Despite its unusual relationship to gender, the type of depression identified in this study appears to be the kind of life-threatening and unremitting disorder that it would be particularly helpful to know how to prevent. The fact that depression has been distinguished from anxiety and mixed affective disorder in all the various epidemiologic ways we have assessed it encourages the view that diagnostic differentiation is important for the etiologically oriented research that Lapouse saw as the pathway to control and prevention.

The rationale for emphasizing incidence as an aid to finding routes to prevention is the hope that research will indicate that the onset of a first disorder closely follows the experiencing of an etiologically important risk factor. In concluding this paper, it seems useful to comment on the implications of this rationale.

One implication is that incidence may serve best to identify etiologic factors relevant to those types of psychiatric disorders that take origin as a response to life experiences. Stressful life events have drawn considerable research attention as potentially important for the etiology of depression and anxiety.[46–48] Yet even within this framework, complex relationships seem to exist between events that occur in childhood and those which transpire closer to the time of a first depression in adulthood. Furthermore, there is increasing evidence that genetic factors play a role in depression and anxiety disorders.[49–51] This leads to the warning that an experience which occurs prior to the onset of a first episode may be a precipitating rather than a causal factor.

The advantage we see in using incidence for exploring the etiologic importance of psychosocial risk factors stems mainly from the fact that it may be possible to achieve confidence that a given risk occurred *before* the first onset of disorder. In contrast, if one looks at the relationships between prevalence and life experiences, it is likely that some correlations will reflect the consequences rather than the antecedents of disorder. At the same time, it would seem unwise to count on temporal proximity between a prior risk and the onset of a first disorder as giving a full picture of etiology. It may still be necessary to look at factors of genetic heritage and childhood that occurred earlier than when a disorder is enumerated for an incidence rate.

While studying the incidence of disorders is a major task for psychiatric epidemiologic research, it is important to remember that incidence may not be the primary key to etiologic knowledge that Lapouse suggested it might be.

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