CHAPTER 5 | INCIDENCE AND PREVALENCE

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INTRODUCTION

To develop optimal approaches to the treatment of epilepsy, to evaluate the effectiveness of treatment strategies, and more importantly, to identify interventions that may prevent the development of epilepsy, valid information regarding the frequency, cause, and natural history of the condition is necessary. Such information is provided by descriptive and hypothesis-testing epidemiologic studies. Early reports of the prevalence of epilepsy, which used information from selective service records, provided data similar to those of contemporary studies undertaken in industrialized countries, such as the United States, for the same age groups. Approaches to the study of the epidemiology of epilepsy have become increasingly sophisticated; current epidemiologic studies provide a much more comprehensive picture of the characteristics of persons with epilepsy, which has led to considerable improvement in understanding epidemiologic features of the seizure disorders in general and epilepsy in particular. These improved methods include the development of clear definitions of the condition being studied; use of data provided by incidence studies of the convulsive disorders; and use of these incidence cases and other inception cohorts to determine natural history and identify risk factors. Unfortunately, incidence studies are expensive and difficult to do. Therefore, there are relatively few reports dealing with total populations. Relying on less expensive and relatively less complex studies of prevalence to gain epidemiologic insights can be compared to an epileptologist performing epilepsy surgery based on clinical history alone. One may have some of the pieces, and a correct decision may be made, but in many cases, an inappropriate procedure will be undertaken.

The following discussion reviews data regarding the incidence of seizure disorders and epilepsy, and the risk factors for epilepsy as suggested by these studies. In addition, potential insights provided by prevalence studies are highlighted. Definitions are important in epidemiologic studies. In the present discussion, the term epilepsy represents a condition characterized by two or more unprovoked seizures. For other definitions, the reader is referred to the report of the Commission on Epidemiology and Prognosis of the International League Against Epilepsy (ILAE).46

INCIDENCE OF EPILEPSY

Total Population Studies

There are relatively few studies of incidence of epilepsy in total populations. In developed countries, the age-adjusted incidence of epilepsy (recurrent unprovoked seizures) ranges from 24 to 53 per 100,000 person-years.6,30,44,50,57–60,72,85,109 Total population studies reporting the incidence of a first diagnosis of unprovoked seizures (differing from incidence of epilepsy by the inclusion of persons with a single unprovoked seizure as well as those with recurrent unprovoked seizures) provides estimates of incidence ranging from 26 to 70 per 100,000 person-years37,31,37,68,72,90,112 (see Table 1). Given methodologic differences, the incidence in studies of predominantly Western, industrialized countries seems remarkably consistent across geographic areas. This seems particularly true of reports for the last two decades (1986 to 2005). Several recent studies provide incidence from developing countries. An incidence of epilepsy that is considerably higher than that reported in industrialized countries (114 per 100,000 person-years) has been reported from a rural area of Chile.66 A study in Tanzania106 reported the incidence of epilepsy to be 77 per 100,000. These are two to three times the incidence reported in industrialized countries in which similar definitions have been used. A study in Ethiopia reported an incidence of 64, but this fell to 46 after age adjustment, underscoring the importance of age adjustment if comparisons are to be made.

A large population-based survey in Ecuador97 identified all individuals with a history of seizures. Included were all persons with newly occurring nonfebrile seizures (including acute symptomatic seizures) and some children with multiple febrile seizures. Based on the number of people seen with seizures in the year preceding the survey, incidence was higher than that of most other reports (190 per 100,000), although incidence for neurologically confirmed cases was about 30% lower. In studies in France22 and Rochester, Minnesota,23 about half of newly occurring epileptic seizures do not fulfill criteria for epilepsy. Because of the broader case-inclusion criteria in the study from Ecuador and uncertainty regarding age-specific distribution and cause of acute symptomatic seizures, there is no way to compare these incidence studies. Nonetheless, the incidence of epilepsy may likely be higher in developing countries than in industrialized countries.

Studies in Selected Age Groups

A number of studies report the incidence of epilepsy in specific age groups. These include studies of children,111–115 adults,116–118 and the elderly.119 Evaluation of these studies again requires consideration of definitions used, but in general, information is complementary to and consistent with incidence in total-population studies when age-specific rates are evaluated. For example, the more comprehensive studies limited to children111–115 include children with neonatal seizures and children with a single unprovoked seizure as incidence cases of epilepsy. Taking this into account, incidence in the youngest...
### TABLE 1

INCIDENCE OF EPILEPSY IN SELECT POPULATION-BASED STUDIES OF ALL AGE GROUPS

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<th>Reference</th>
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* All unprovoked seizures.

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**Age-specific Incidence**

Contrary to popular belief, epilepsy is a disease with onset at the extremes of life (Fig. 1), at least in industrialized countries. Where provided, age-specific incidence is consistently high in the youngest age groups, with highest incidence occurring during the first few months of life. Incidence falls dramatically after the first year of life, seems relatively stable through the first decade of life, and falls again during adolescence.22,51,90 In virtually all studies conducted in industrialized countries, age-specific incidence is lowest during the adult years. Contemporary incidence studies, most of which are in Western countries, show an increasing incidence—at times dramatic—in the elderly.37,50,71,88 In Western countries, the incidence of epilepsy is higher after the age of 70 years than during the first 10 years of life. Only about 50% of cases of epilepsy start in childhood or adolescence.50,90 A British general practice survey reported that almost 25% of all newly identified seizures (not epilepsy) occurred in persons aged 60 years and older.108 The reported patterns of age-specific incidence are quite different in developing countries. In studies from Africa and South America, the peak incidence of epilepsy occurs in young adults, and the dramatic increase in incidence in the elderly has not been identified (Fig. 2).66,106,116 It is likely that patterns of incidence, and therefore risks for epilepsy, are different in these populations.

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**FIGURE 1.** Age-specific incidence of epilepsy in industrialized countries.
In most total population studies, incidence of epilepsy or of unprovoked seizures is higher in males than in females. This seems true even after the higher incidence in males of definite risk factors for epilepsy (i.e., head injury, stroke, central nervous system infection) is taken into account. One exception is the study from Ecuador, in which the male-to-female ratio is 0.8, although this study cannot be used for comparison as it included persons with acute symptomatic as well as unprovoked seizures. The other exception is the study of incidence in children in Sweden (male-to-female ratio of 0.7). For most but not all incidence studies, sex-specific differences in incidence are not statistically significant. The consistency of the male-to-female difference across studies suggests that males are at higher risk than females for unprovoked seizures and epilepsy.

Seizure Type

Seizure-specific incidence or proportions of cases with a specific seizure type based on the International Classification of Epileptic Seizures are provided in several contemporary incidence studies (Table 2). A detailed distribution from the Iceland study is provided in Figure 3. In studies in Rochester, Minnesota, the Faroe Islands, and Chile, slightly more than 50% of incidence cases were classified as partial seizures. Partial seizures are also the predominant seizure type in Sweden in adults after information from the separate studies of adults and children is combined.

Race

Most total population incidence studies have been performed in white populations of European extraction. Even in

<table>
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studies of incidence in Asian or African populations, study groups have been homogeneous. Racial differences have been examined only in incidence or cohort studies in children. In the National Collaborative Perinatal Project, 83 incidence of afebrile seizures did not differ across racial groups through the age of 7 years. In studies of Japanese children in Tokyo117 and Caucasian children in Rochester, Minnesota, 50 age-specific incidence and incidence by seizure type through the age of 14 years were virtually identical. Definitions of epilepsy were similar in these two studies, although methodology was different. A study of children in New Haven, Connecticut, 111 reported incidence of epilepsy through age 15 years to be 1.7 times greater in blacks than in whites, although the definition of epilepsy was quite different from those used in many of the studies mentioned above. This study also made an ecologic comparison based on mean neighborhood socioeconomic level. After controlling for race, incidence of epilepsy was significantly higher in lower socioeconomic classes.

### Time Trends

Information on time trends of incidence is provided in the studies from Copparo, Italy, 44 and Rochester, Minnesota. 50 In the Italian study, the incidence of epilepsy decreased over three time intervals from 1964 to 1978, although this may be related to methodologic issues (Fig. 4). The Minnesota study reports a more than 50% decrease in the incidence of epilepsy in those under the age of 10 years from 1935 to 1984. During these same years, there was an increase in incidence in those over age 60 years, causing the age-adjusted incidence in this community over the entire 50-year interval to show little change.
The fall in the middle decades of this century is largely unexplained, but the increase after 1975 may be related to increased sur_margin of very-low-birth-weight infants. The findings of this study turn the potential pitfalls in relying on total incidence of epilepsy in children.

In the studies of a British general practice that included all afebrile seizures, incidence under age 20 was 172 per 100,000 between 1964 and 1973, 152 per 100,000 between 1974 and 1984, and 141 per 100,000 (p = 0.001) from 1984 to 1993. This difference may be explained partially by inclusion in the earlier period of non epileptic episodes, but even cautious interpretation of these data suggest dramatic reductions in the incidence of childhood-onset epilepsy in industrialized countries. The reduction in incidence over time in children is not readily explained by current epidemiologic or clinical data and deserves further investigation.

It appears that the incidence of epilepsy in the elderly is increasing—at least in the United States. This may be related, at least in part, to an increase in the proportion of the population with a history of stroke. Although the incidence of stroke is decreasing, the prevalence is increasing as more people are surviving strokes.

### Epileptic Syndromes

There are few total population incidence studies that present the distribution of epilepsy syndromes such as the study conducted in Bordeaux,52, 53 studies from Rochester,54 and studies from Iceland. Isolated unprovoked seizures occurred in 18 per 100,000 population in the French study, which is similar to the incidence 6 per 100,000, and in Iceland, juvenile myoclonic epilepsy occurred in 1% of patients, providing an incidence of 0.7 per 100,000 person-years. Data from the Rochester cohort studies suggest that the incidence of juvenile myoclonic epilepsy is about 1 per 100,000 per year. These data seem to be reasonably consistent and suggest a lower frequency of juvenile myoclonic epilepsy than has been suggested in recent clinical studies. Lastly, childhood absence epilepsy occurred in seven patients in Iceland, 1% incidence of 0.3 per 100,000 person-years.90

The incidence of idiopathic localization-related epilepsy was 1.7 per 100,000 (7% of all cases). An additional 13.6 per 100,000 (56%) had symptomatic localization-related epilepsy. The data from the same criteria are used as in most other contemporary incidence studies, about 60% of cases can be classified as partial seizures. Each of the following syndromes accounted for about 1% of new cases: juvenile myoclonic epilepsy, awakening grand mal, and West syndrome. About 2% had pyknolepsy. These proportions are similar to those provided by the Rochester, Minnesota, studies. Crude incidence for all epilepsy (about 24.3 per 100,000) was about half that reported in studies in industrialized countries.55, 56

A few reports of incidence of specific epileptic syndromes in other total population studies provide data consistent with the above figures. In the incidence of nonfibrile situation-related epilepsy in the French study was about 30 per 100,000.74 Incidence for this class of seizure in Rochester, Minnesota, was about 40 per 100,000.75 Isolated unprovoked seizures occurred in 18 per 100,000 population in the French study, which is similar to that in Rochester76 and considerably less than that reported from Iceland.70

There are some reports of the incidence of specific syndromes. West syndrome has been studied in different geographic areas,66, 67, 68 with an incidence ranging from 2 to 7 per 10,000 live births. Benign rolandic epilepsy is thought to be among the more frequently occurring childhood epileptic syndromes; one Italian study69 reported this to account for 24% of incidence cases in children with epilepsy between the ages of 4 and 15 years. In Sweden, the incidence of benign rolandic epilepsy in children under 15 years of age was 10.7, accounting for about 14% of childhood epilepsies.12 In Iceland, benign rolandic epilepsy accounted for 5% all newly diagnosed cases.10 The incidence of juvenile myoclonic epilepsy in the Fairve Islands was 1.1 per 100,000 person-years, or about 2.5% of cases. In Sweden, five children under the age of 15 years had a diagnosis of juvenile myoclonic epilepsy, making the incidence 6 per 100,000,112 and in Iceland, juvenile myoclonic epilepsy occurred in 1% of patients, providing an incidence of 0.7 per 100,000 person-years. Data from the Rochester cohort studies suggest that the incidence of juvenile myoclonic epilepsy is about 1 per 100,000 per year. These data seem to be reasonably consistent and suggest a lower frequency of juvenile myoclonic epilepsy than has been suggested in recent clinical studies. Lastly, childhood absence epilepsy occurred in seven patients in Iceland, 1% incidence of 0.3 per 100,000 person-years.90

### ETIOLOGY OF EPILEPSY IN INCIDENCE COHORTS

#### Classic Risk Factors

Most physicians have preconceived notions about postnatal antecedents of epilepsy. Head (brain) trauma, stroke, central nervous system infection, and degenerative brain disease are frequently identified. Specific causes of epilepsy may differ across geographic areas, but whether incidence studies are undertaken in developing countries or in developed countries, a definitive etiology has been identified in only about one third of all newly diagnosed cases. In industrialized countries, cerebrovascular disease is the most frequently identified cause of epilepsy, accounting for about 12% of all new cases and about one third of cases with an identified cause (Fig. 5). In children, epilepsy associated with neurologic deficits from birth seems to be the most important single etiologic relationship, whereas cerebrovascular disease is the most commonly identified cause among adults.

#### Risk Factors Identified in Epidemiologic Studies

Epidemiologic studies have not only confirmed the importance of postnatal insults, but also qualified the risk. As shown in Figure 7, a risk ratio of 1 implies no increase in risk, a risk ratio of ≤1 suggests a protective effect, and a risk ratio of >1 suggests an increase in risk. The risk for epilepsy among persons with penetrating head injuries acquired during military service is more than 300 times that expected in the general population.123 In contrast, individuals who have had brain injury associated with loss of consciousness or amnesia of ≥30 minutes’ duration have no increase in risk.1 Studies have also identified other factors (drug and alcohol abuse, depressive illness, suicidality, migraine with aura, hypertension, and risk factors for stroke) that increase the risk for epilepsy—at times as much as or more than the classic risk factors.122, 124

There is a continued belief that adverse perinatal and perinatal events are associated with an increased risk for epilepsy (Fig. 8). Although at times these may be risk factors for cerebral palsy, they have not yet been demonstrated, at least in...
ETIOLOGY IN INCIDENT CASES OF EPILEPSY OR ALL UNPROVOKED SEIZURES

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In developed countries, to be risk factors for epilepsy in the absence of overt neurologic handicap. Separate or together, perinatal factors pose little increase in risk, and for most of these factors the differences are not significant. Epidemiologic evidence does not support a causal association between febrile convulsions and epilepsy.

Family History as Risk Factors

A small proportion of cases of epilepsy may be attributable to single-gene disorders. In two syndromes with mendelian inheritance patterns, a chromosomal localization has been achieved. Benign familial neonatal convulsions with a dominant inheritance pattern was initially localized to chromosome 20,27 but genetic heterogeneity has been demonstrated by a more recent localization to chromosome 8.35 A gene for progressive myoclonic epilepsy has been localized to chromosome 21.31 A gene for partial epilepsy with auditory features has been localized to chromosome 10, and several sodium and potassium channelopathies have been identified in association with Dravet syndrome and generalized epileptic seizures plus (GESE+) syndromes. Although the mode of inheritance is obscure, a localization for juvenile myoclonic epilepsy and other juvenile-onset disorders has been proposed.17,46 Others question this finding.45 Localizations for several other epilepsy syndromes have been identified. Even though a small proportion of cases follow mendelian inheritance patterns, epidemiologic terms family history may be considered an important risk factor for epilepsy. In the absence of other information, epilepsy in a first-degree relative increases the risk threefold.21 The absolute increase is modified by which first-degree relative is affected (sibling, mother, father), the seizure type and etiology of epilepsy in the affected relative, and the electroencephalographic pattern in the relative or individual in question.

![FIGURE 5. Age of onset attributable to various antecedents.](image)
Cumulative Incidence

Cumulative incidence is the summation of age incidence. Given the modest alteration mortality among people with epilepsy, cumulative incidence provides an estimate of the proportion of the total population that has been affected with epilepsy by a specific age. Estimates of cumulative incidence of epilepsy have been provided in four total population studies.\(^ \text{50}, \text{60}, \text{89}, \text{90} \)

In Denmark, the risk for having epilepsy by the age of 80 years was 1.3%,\(^ \text{60} \) a substantially lower number than the cumulative incidence of epilepsy for the same age in Rochester, Minnesota (4% for epilepsy and more than 5% for all unprovoked seizures)\(^ \text{50} \) or the rate of 5.4% for all unprovoked seizures to age 85 from the Iceland study.\(^ \text{90} \) This difference can be explained by the considerably higher incidence in the elderly in the Minnesota study. As would be expected from age-specific incidence rates, cumulative incidences of epilepsy through childhood are almost identical in Japan and Rochester.\(^ \text{50}, \text{10} \) In Rochester, the cumulative incidence for epilepsy and unprovoked seizures is significantly greater for males than females.

Incidence of All Afebrile Seizures

There are a few studies that include all afebrile seizures in their definitions of epilepsy, and this definition is consistent with some recent recommendations of the ILAE.\(^ \text{57}, \text{58}, \text{97} \) Table 4 includes studies from which incidence using this definition have been provided. The incidence is substantially increased in Ecuador,\(^ \text{97} \) although it is not clear if this is due to a methodologic approach or reflects differences in the burden of epilepsy between developed and developing countries.

PREVALENCE OF EPILEPSY

Because it is easier to obtain information about prevalence than about incidence, many prevalence studies of epilepsy from diverse populations have been reported.\(^ \text{10}, \text{11}, \text{13}, \text{16}, \text{18}, \text{19}, \text{25}, \text{31}, \text{32}, \text{34}, \text{39} - \text{43}, \text{47}, \text{53}, \text{61}, \text{62}, \text{69}, \text{73}, \text{79} - \text{81}, \text{87}, \text{92}, \text{101}, \text{103}, \text{104}, \text{110}, \text{113}, \text{114} \) Prevalence is a measure of the interaction of obvious factors such as incidence, death, and remission of illness, and except for

\[ \text{PREVALENCE} = \frac{\text{INCIDENCE} \times (1 - \text{MORTALITY})}{1 + \text{REMISION}} \]
geographic isolates such as Iceland, prevalence is also affected by factors such as migration or access to multiple sources of medical care. Prevalence is more a reflection of survival and severity or chronicity of illness than of frequency of illness. Little reliable information regarding etiology or prognosis can be derived from prevalence studies, although they can provide intriguing clues to guide hypotheses that can be tested in properly designed studies. Prevalence data are primarily of value in planning for health care.

There are some well-known difficulties in interpreting prevalence data, related to difficulties in interpreting mortality and remission. Other difficulties stem from inconsistencies in definitions or in the fact that only crude prevalence is reported. Age-specific prevalence in developed and developing countries is difficult to compare, given the dramatic differences in age structure of the populations and the wide variation in age-specific prevalence. Age standardization should be used if any comparisons are to be made, as wide variations in apparent prevalence are demonstrated even in studies of contiguous populations.

**Age-Adjusted Prevalence**

Age-adjusted prevalence per 1,000 population varies widely—from 2.7 to more than 40, although most studies show a range from four to eight. Even when the same investigators have used similar protocols, definitions of epilepsy, and methodologies, the prevalence of “active” epilepsy ranges from 3.6 to 41.3. Somewhat higher prevalence (ranging from 14 to 57 per 1,000) has been reported in pilot studies using a standardized World Health Organization (WHO) protocol in Panama, Ecuador, and Colombia. However, the same protocol used in large-scale population surveys yielded low prevalence in India and China. The high prevalence of epilepsy reported in Central and South America by those using the WHO protocol may be a reflection of methodology. One study using the International Community Based Epilepsy Research Group (ICBERG) protocol in rural Ecuador found the prevalence to be considerably lower (8 per 1,000) than that reported in a pilot study by investigators using the WHO protocol in the same region (18.5 per 1,000). The difference may be related to more stringent case verification in the ICBERG study, but this cannot account for all the differences. A recent population survey in a village in rural Mexico, which was age adjusted to the 1980 U.S. population, revealed a prevalence of active epilepsy of 5.9 per 1,000. The prevalence in Pakistan is about 10 per 1,000, and in rural Ethiopia about 5 per 1,000.

**Age-Specific Prevalence**

Although epilepsy is a disease acquired throughout life, the reported patterns of age-specific prevalence seldom reflect

### Table 4

<table>
<thead>
<tr>
<th>Reference</th>
<th>Publication date</th>
<th>Region</th>
<th>Population</th>
<th>Number of cases</th>
<th>Crude Incidence</th>
<th>Age-adjusted Incidence</th>
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<td>Placencia et al.</td>
<td>1992</td>
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<td>72,121</td>
<td>137</td>
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<td>174</td>
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<tr>
<td>Hauser</td>
<td>1993</td>
<td>Minnesota</td>
<td>573,152</td>
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<td>111</td>
<td>110</td>
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<td>Jallon et al.</td>
<td>1997</td>
<td>Switzerland</td>
<td>384,637</td>
<td>273</td>
<td>71</td>
<td>70</td>
</tr>
<tr>
<td>Jallon et al.</td>
<td>1999</td>
<td>Martinique</td>
<td>383,196</td>
<td>309</td>
<td>81</td>
<td>83</td>
</tr>
</tbody>
</table>
Chapter 5: Incidence and Prevalence

53

FIGURE 9. Prevalence of epilepsy in industrialized countries.

This is particularly striking, as many of the prevalence studies provide data for lifetime prevalence (which should approximate cumulative incidence) rather than for active prevalence (which measures current seizures or current use of antiepileptic drugs). In the studies of prevalence from Rochester, Minnesota, and from Iceland, there is a pattern of active prevalence increasing in each subsequent age group, with the highest prevalence occurring in the elderly (Fig. 9). Studies from other European countries and the Faroe Islands report a relatively constant prevalence in adults. In many cases, age-specific estimates are unstable because of small numbers within age groups. Most studies, particularly those from developing countries, report the highest prevalence in the second and third decades of life, with lower prevalence in the elderly (Fig. 10).

Gender

As is the case with incidence studies, most studies of prevalence report a higher prevalence in males than in females.

Etiology

For all total population studies providing information, the majority of cases, typically between 55% and 89% (Fig. 11), even in developing countries, have no identified cause.

Race

Race seems more of an issue in the United States than in most other countries, and most studies addressing race or ethnic issues are from this geographic area. There are few studies that provide data on the prevalence of epilepsy in underrepresented populations in the United States. Most studies provide data on prevalence in African-Americans. When comparable data were available, all report a higher prevalence than in the white population, although as usual, definitions cause difficulties in comparison. In Copalis County, Mississippi, the entire population was screened and follow-up evaluations were scheduled with symptoms of seizures or epilepsy to determine the

FIGURE 10. Prevalence of epilepsy in developing countries.
prevalence of epilepsy. Definitions used in this study would include some people now categorized as acute symptomatic epilepsy in other studies such as those in Rochester, Minnesota. The age-adjusted active prevalence in blacks defined as recent seizures or current medication use was 8 per 1,000. This was about 60% greater than the age-adjusted prevalence in the white population in the same county. A study in a rural Alabama county reported a lifetime prevalence of epilepsy of about 12 per 1,000 in the 2,200 black residents based upon clinic record review. This was almost double the prevalence in whites determined in a similar fashion.56 There are reports of prevalence of epilepsy limited to children that include information regarding the prevalence in minorities. The prevalence of epilepsy was determined in three counties in Oklahoma using multiple sources for case identification.68 The active prevalence in black children of 3.7 per 1,000 compared to 4.2 per 1,000 in white children. The overall prevalence in “others,” including Native American and Hispanic children, was 4.5 per 1,000. Prevalence was higher in males than in females for all ethnic groups. The excess in black children seemed attributable to a higher prevalence of generalized seizures and was present for all age groups. No further information is provided for the “other” group. In Atlanta, multiple sources were used to identify potential cases that were screened to identify children with epilepsy. The lifetime prevalence of epilepsy in black children at age 10 was 6.4 per 1,000, not significantly higher than the prevalence in white children (5.7 per 1,000). The prevalence of generalized seizures was significantly greater in black children than in white children.

Studies of prevalence in minority populations are inexorably related with community ranking by socioeconomic class.97 The prevalence of epilepsy in Pakistan has been reported to be 6.4 per 1,000, not significantly higher than the prevalence in white children. The overall prevalence in “others,” including Native American and Hispanic children, was 4.5 per 1,000. Prevalence was higher in males than in females for all ethnic groups. The excess in black children seemed attributable to a higher prevalence of generalized seizures and was present for all age groups. No further information is provided for the “other” group.

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Studies of prevalence in minority populations are inexorably confounded by socioeconomic status. Few studies attempt to address the relationship of socioeconomic status and the prevalence of epilepsy. In Ecuador, prevalence was inversely correlated with community ranking by socioeconomic class.97 The prevalence of epilepsy in Pakistan has been reported to be greater in rural than in urban areas.

SUMMARY AND CONCLUSIONS

As more insight is gained into the epidemiologic characteristics of the epilepsies, apparent discrepancies between epidemiologic and clinical studies will be resolved. In addition, more pointed questions will be asked, and the prime epidemiologic goal of preventing epilepsy and its consequences will be addressed.

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