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CENTERS FOR DISEASE CONTROL AND THE EPIDEMIOLOGY OF VIOLENCE

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Abstract—Violence is a major cause of morbidity and mortality in the United States. The Center for Health Promotion and Education, the Centers for Disease Control (CDC) has begun to apply epidemiologic techniques to study the problems of child abuse, child homicide, homicide, and suicide. CDC's involvement in these areas has evolved in association with significant shifts in emphasis in public health policy and planning, from areas of acute and infectious diseases to areas of chronic diseases and premature mortality. We have recently addressed the problems of reporting biases and definitional variability in regard to child abuse and have characterized child homicide in the United States. We are currently epidemiologically investigating the underrecording of child homicide in this country. Our future work will include delineation and evaluation of programs to prevent violence toward children and examination of the relationship between intrafamilial violence and extrafamilial, noncrime related violence.

Résumé—Aux Etats-Unis, la violence est une cause importante de morbidité et de mortalité. Le Centre pour la Promotion de la Santé et de l'Education, et le Centre pour le Contrôle des Maladies (C.D.C.) ont commencé à appliquer les techniques épidémiologiques à l'étude du problème de maltraitance à l'égard d'enfants, de l'homicide de l'enfant, de l'homicide en général et du suicide. L'implication du C.D.C. dans ces domaines s'est développé parallèlement avec des changements importants de priorités et de planification d'activité. Ce changement de cap se fait aux dépens de l'étude des maladies infectieuses, et va dans la direction de l'épidémiologie des maladies chroniques et de la mortalité prématurée. Récemment le C.D.C. s'est intéressé aux facteurs qui faussent les statistiques dans le domaine des dénonciations d'enfants maltraités et les problèmes liés à la variabilité de la définition de la maltraitance d'enfant. Le C.D.C. s'est attaché à définir les limites du problème du meurtre d'enfants aux Etats-Unis. Il est en train d'étudier pourquoi, du point de vue épidémiologique, la statistique des meurtres d'enfants donne aux Etats-Unis des chiffres qui sont en-dessous de la réalité. Le Centre à l'avenir a l'intention d' évaluer les limites des programmes de prévention en ce qui concerne la violence à l'égard d'enfants: Le Centre veut voir également quelles sont les relations entre la violence intra-familiale, la violence extra-familiale, et la violence non-criminelle. Dans les études préliminaires déjà faites, le Centre a pu déterminer que les facteurs de risque cités classiquement dans la problématique de la maltraitance d'enfants s'appliquaient bien aux cas aboutissant à une issue fatale mais pas aux cas où les choses n'allaient pas jusqu'au meurtre. Le Centre a également trouvé qu'il y avait deux modèles d'homicide d'enfants. Lorsque la victime a moins de 3 ans, on trouve de la violence intra-familiale définie par l'abus de la force physique. Dans l'autre modèle, les victimes sont âgées de plus de 12 ans, la violence est surtout extra-familiale, et la mort survient au cours de rixes ou d'activité délinquante pendant lesquelles des armes à feu ou des conteaux sont utilisés. Entre 3 et 12 ans, il semble que les conditions correspondent à un mélange de ces deux modèles. Le premier modèle pourrait être appelé: Violence fatale à l'égard d'enfants et le deuxième: Négligence de la société ou des parents à l'égard d'enfants conduisant au meurtre. Les deux modèles représentent des problèmes de santé importants. L'auteur conclut que la prévention, pour être couronnée de succès, doit prendre une orientation beaucoup plus large, et s'efforcer de changer le comportement général des gens au lieu de se limiter à tâcher de contenir des épisodes sporadiques de violence qui constituent la définition actuelle des mauvais traitements.

INTRODUCTION

HEALTH PROBLEMS IN THE UNITED STATES have changed radically over this century. This is in large measure due to dramatic advances in the prevention, treatment, and

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management of infectious diseases, advances in general medical therapy, and improved sanitation and living conditions in this country. These successes have caused many of the most feared health problems to decline and even disappear as causes of disability and death. Unfortunately, other problems have risen to take their place, including chronic diseases such as cancer and heart disease and traumatic injuries caused by accidental or purposeful violence. This shift has led to a revolution in public health thinking that began about a decade ago.

Four ideas seem central to this revolution. First, it is more logical to prevent disability or death than to attempt cure or rehabilitation. Second, since death is inevitable, prevention should be directed toward reducing premature or unnecessary death or disability. Third, the extension of life expectancy is not a great achievement unless the quality of life is also improved. Fourth, health education and behavior changes, not medical advances, are the key to preventing most current major public health problems. Thus, because lifestyle and environment are the major causes of today's health challenges, the individual finally has the key to his or her own health.

This new approach to public health is reflected in two publications produced by experts within and outside the federal public health establishment: *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention* [1] and *Promoting Health and Preventing Disease, Objectives for the Nation* [2]. The second of these publications outlined a set of goals for the public and private health sectors to achieve by 1990. Included in these goals were reductions in child abuse, suicide, and homicide, especially for key target populations at high risk.

CENTERS FOR DISEASE CONTROL

One element of the public health sector is the Centers for Disease Control (CDC). CDC is a federal health agency that investigates acute and chronic public health problems, attempts to determine their causes through epidemiologic methods, and then suggests means of intervention and prevention on the basis of these studies. Not surprisingly, individuals at CDC played a major role in the "public health revolution" and, conversely, this "revolution" was reflected in the evolution of CDC itself. CDC was formed in 1942–1943, as the Office of Malaria Control in War Areas (MCWA), to address the problem of malaria in military recruits training in the South. In 1946 CDC's mission was expanded and the agency was renamed the Communicable Disease Center (CDC). During this era, CDC had impressive successes in the area of infectious diseases, including its role in the eradication of smallpox, tuberculosis and venereal diseases control, and the improvement in national immunization policy. In 1970, it was renamed the Center for Disease Control (CDC) to emphasize its changing mission, which now included involvement in chronic diseases, birth defects, family planning, and diabetes mellitus, as well as infectious diseases [3]. In response to the prevention directives first presented in *Healthy People* [1], CDC was reorganized in 1980 into five subcenters, one being the Center for Health Promotion and Education (CHPE). Among other responsibilities, this subcenter was given the task of investigating the problems of purposeful injury or violence, using epidemiologic techniques that have proven so successful with infectious diseases. CHPE is now actively investigating the problems of suicide, homicide, child abuse, and child homicide. The last two topics are being studied in depth and may be of interest to the readers of *Child Abuse & Neglect.* This work will, therefore, be outlined in some detail.

CHILD ABUSE RESEARCH

Initial child abuse analyses used data collected by the Georgia Department of Protective Services and computerized with the help of CDC. Our goal was to (1) address problems central to all child abuse research and (2) to address them in ways that could be easily and practically applied by other individuals to other data sets. Two of the problems we addressed were reporting (surveillance) bias and definition variability. One other project, not discussed here, is a review of the literature on the treatment of sexually transmitted diseases in sexually abused children [4]. Both the problems of reporting bias and definition variability can be approached in a number of ways and should be dealt with in some fashion by anyone working in this area.

Reporting Bias

We consider reporting bias an important and usually undiscussed source of confusion in child abuse studies. The problem can be stated as follows. If some characteristic makes a person, family, or group have more contact with sources of child abuse reports, it cannot be determined if that characteristic is associated with an increased risk of abuse, or just an increased risk of being suspected of abuse. For example, publicly funded community health clinics are a major source of child abuse reports. Suppose mothers who are the sole head of their household (single mothers) frequent these clinics more than mothers in two-parent households (married mothers). If these clinics report a high proportion of single mothers as possible child-abusers, this does not mean that single mothers are more likely to abuse their children. Even if single mothers and married mothers abused their children with equal frequency, you would expect to see more single mothers reported from this source. Yet, summarized data from confirmed child abuse records would suggest that single mothers are more likely to abuse their children than are married mothers.

We dealt with this problem by comparing confirmed child abuse cases with cases that were reported but, when investigated, determined not to be instances of child abuse [5]. Characteristics of both these groups were also compared with those of the Georgia population as a whole. Our analysis showed four factors to be associated with increased risk of child abuse: (1) The absence of the genetic mother from the household; (2) the absence of the genetic father from the household; (3) large family size; and (4) poverty. Three characteristics often cited as "risk factors" were found to be associated with reporting and not necessarily with actual child abuse. These were: (1) Urbanicity; (2) the period of infancy; and (3) teenage childbearing. Mothers were under more surveillance than fathers, but did not necessarily commit more abuse. We concluded that this method of analysis is a useful, inexpensive, and population-specific way to determine biases in child abuse reporting.

Definitions of Child Abuse

A second impediment to determining risk factors for child abuse is that definitions of child abuse vary widely, for at least two reasons. (An additional problem is created by researchers who do not even state the definitions they have used.) First, abuse is societally defined and, in practical situations, whether or not it occurred, is based on subjective criteria. Second, definitions of child abuse have been broadening over the last twenty years. Thus, "risk factors" for child abuse, as defined twenty years ago, may not be risk factors for all currently reportable child abuse.

We felt that these issues could best be addressed by defining as narrowly as possible the type of abuse being studied, by stating the definition used, and by comparing the epidemiol-

ogy of different types of abuse to one another. Using the Georgia data, we therefore compared sexual and physical child abuse and determined risk factors for each [6]. Similarly, we compared fatal child abuse, as representative of severe physical maltreatment, and nonfatal physical child abuse. Classic "risk factors" for child abuse were found to apply to fatal abuse, but not to nonfatal physical abuse [7].

CHILD HOMICIDE

As a natural extension of our concern about violence toward children and about fatal child abuse, CHPE has also been analyzing data on child homicide. This work is of special public health concern, since homicide is one of the 5 leading causes of death for persons 1 through 17 years of age in the United States. Our projects have dealt with two areas: (1) Quantifying the extent of the child homicide problem; and (2) characterizing child homicide cases. One of our studies suggests that vital statistics data underrecord homicide of infants because of coding changes instituted in 1967 [8]. A second study, now reaching completion, compares United States child homicide cases recorded by law enforcement agencies through the Federal Bureau of Investigations-Uniform Crime Reporting Program (FBI-UCR) with those recorded by vital statistics through the National Center for Health Statistics (NCHS) [9].

The FBI-UCR homicide data is derived from police records; NCHS homicide data is derived from death certificates. These data sets do not specify the deceased by name; therefore, the cases were matched by the state in which the death occurred and by the sex, race, and age (0± one year) of the victim. This matching suggests that each data set underrecords child homicide by at least 20% [10]. We emphasize that this 20% is a minimum estimate. Both systems tend to underrepresent victims with the following characteristics: Young females, infants, whites, nonblack minorities, those living in rural areas or small cities, and those killed by means of bodily force, e.g., hand or foot, or arson. We conclude that child homicide is highly underrecorded in the United States and that it is even more of a public health problem than recorded statistics indicate. We suggest that recording could be improved through (1) better cooperation between medical examiners/coroners and law enforcement personnel; (2) a higher index of suspicion in all deaths of young children; and (3) autopsy and consideration of police investigation for all traumatic deaths or deaths of unclear cause occurring in childhood.

Patterns of Child Homicide

We have also used FBI-UCR data to characterize child homicide cases. These analyses have been summarized [11] and discussed in detail [12]. The data suggest that there are two patterns of child homicide. The first predominates when victims are less than 3 years of age and is characterized by familial violence, ill-defined circumstances, and the use of bodily force. The second type predominates when victims are over 12 years of age and is characterized by extrafamilial violence, association with arguments or other criminal behavior by the offender, and the use of guns or knives. Homicides involving victims 3 through 12 years of age appear to be a mixture of these two patterns. The first pattern might be called fatal child abuse and the second, fatal parental/societal neglect. Both are important health problems. The public and private health sectors increasingly recognize the importance of the first because of society's growing concern about child abuse. Fatal parental/societal neglect has been largely ignored by the public health sectors. Research is needed to determine: (1) Whether means of preventing fatal child abuse, e.g., parent education, family planning, neighborhood networking, and stress reduction, also have an effect upon fatal parental/societal neglect; (2) whether the second pattern of child homicide represents extrafamilial replication of intrafa-

milial violence; and (3) whether school health education can be used to alter behavior patterns associated with increased risk of violence.

SUMMARY

In summary, violence is a major cause of morbidity and mortality in the United States. The incidence of child abuse has been estimated at between 200,000 to 4 million cases per year [2] and suicide and homicide accounted for an estimated 1,401,880 years of potential life lost in 1980 alone [13]. CHPE, CDC has begun to apply epidemiologic techniques to study this problem. We have shown the usefulness of epidemiology in the areas of child abuse and child homicide. Future directions will be to delineate and evaluate means of intervention and prevention.

Reviewing our work on violence more generally, we suggest that patterns of interaction which include intrafamilial violence are likely to include extrafamilial violence. Over the past twenty years, medical, social services, and health agencies have increasingly accepted responsibility in the intervention and prevention of familial violence. This responsibility has broadened with time from the area of child abuse to include spouse abuse and, recently, abuse of the elderly. It is time for this responsibility to be broadened still further to include extrafamilial, non-crime-related (primary) violence. An individual who is violent in the family setting is not likely to become peaceable when he or she steps outside the home. Successful prevention must be oriented toward changing patterns of behavior, not just toward inhibiting specific outbursts now defined as abuse.

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