Child Abuse in Georgia: A Method to Evaluate Risk Factors and Reporting Bias

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Abstract: From July 1975 through December 1979, the Georgia Department of Protective Services Central Registry recorded population-based data on confirmed, non-confirmable, and ruled-out child abuse reports. We propose that reporting biases are reflected in the differential characteristics of confirmed and ruled-out reports of child abuse. Characteristics, households, or groups equally or more prevalent in the latter category cannot necessarily be considered associated with increased risk of child abuse, even if they are represented in the confirmed abuse population more than in the general public. Important examples of factors or categories for which an association was suggested in other studies but which are not supported by this analysis are: urban residence, teenage motherhood, infancy, and mothers and other female perpetrators. These are conditions or categories associated with greater surveillance; therefore, risk assessment is not possible using the data in this registry. Certain households do appear to be at increased risk for child abuse. These include large families, families without a biological mother or biological father, and families ever needing Aid to Families with Dependent Children (AFDC). This increased risk, however, is slight. Improved surveillance requires identification of reporting biases. A comparison of confirmed and ruled-out reports is an inexpensive and system-specific step toward achieving this aim. (*Am J Public Health* 1982; 72:1353–1358.)

Introduction

Recognition of child abuse as a significant public health problem[1–3] led to enactment of child abuse reporting legislation in every state by 1967. Widespread establishment of state surveillance systems followed,[4] but several investigators[3,5,6] suggested that individuals with certain demographic characteristics were more likely than others to be suspected of child abuse and reported to these systems. This biased reporting could cause researchers using data from these systems to conclude mistakenly that these characteristics are associated with risk of child abuse. We compared confirmed and ruled-out reports from the Georgia Child Abuse registry as one approach to separating risk factors from reporting bias.

Materials and Methods

Reporting System

In this paper, child abuse is defined as physical or sexual assault of an individual less than 18 years of age. It does not include instances of neglect alone. Physical and sexual abuse cases from the Child Abuse Registry in Georgia have been centrally computerized since July 1975. Details of the reporting system are described elsewhere.[7] Briefly, any individual, medical or health facility, or agency can report a case of suspected child abuse to the local Protective Services Department. Department staff attempt to gain further information on the incident, as well as about the child and the family. Once investigated, cases are classified into one of three categories: 1) "confirmed" if the investigation leads to substantiation of abuse; 2) "non-confirmable" if suspicion remains but cannot be documented, and 3) "ruled-out" if Protective Services personnel determine that injuries cannot be attributed to child abuse.

Analysis Technique

This analysis is based on the assumption that investigator classification of a case into confirmed or ruled-out categories is a more accurate assessment of whether abuse occurred than is the suspicion of someone reporting the case to the system. Thus, the reporting process represents a screening test and the results of investigation represent a determinant test. This assumption is not unreasonable, since the protective services worker can acquire more family, incident, and medical information during his/her investigation than can most reporting sources. However, final classification is dependent on investigator judgment, rather than absolute or defined criteria. Our analysis does not require that every case be correctly categorized. Quality of categorization is, however, probably improved by the presence of a "non-confirmable" category which permits investigators to

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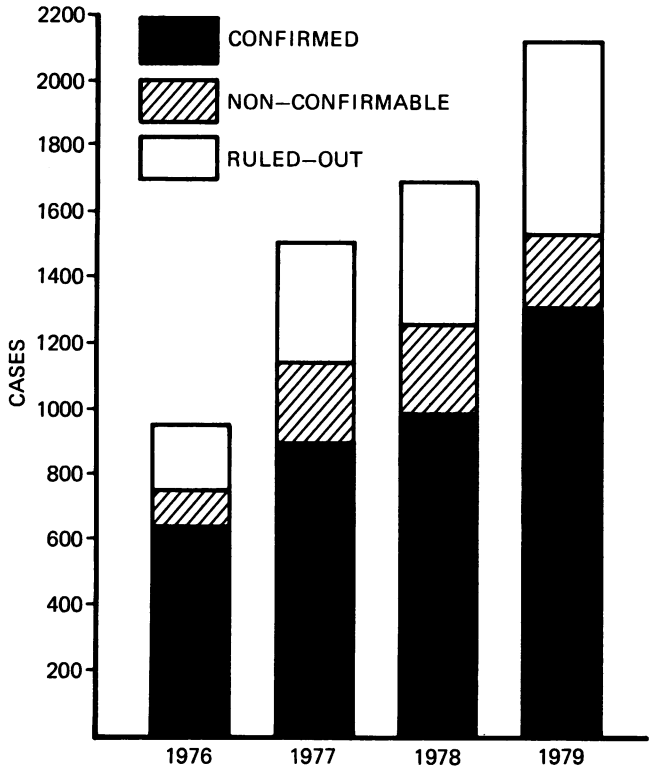

FIGURE 1—Cases of Reported Child Abuse in Georgia, January 1976 through December 1979

refrain from including questionable cases as "ruled-out" or "confirmed." This "non-confirmable" category was used in over 18 per cent of reported cases.

We use ruled-out cases as a comparison group for confirmed child abuse cases. When information is available, the general population will be used as a third comparison group. Since ruled-out cases are assumed to represent cases reported incorrectly to the surveillance system, any characteristic as prevalent in this group as in the confirmed group is therefore associated with being reported, not necessarily with being abused. Such a situation suggests the presence of either a surveillance artifact or a reporting bias.* In this case, it cannot be determined whether or not this characteristic is associated with increased risk of being abused or just increased risk of being reported. Increased risk is associated with a characteristic only when a characteristic is more prevalent in confirmed cases than in ruled-out cases. For optimal risk assessment, population data would also be available and the prevalence of a certain characteristic in ruled-out cases would approximate its prevalence in the general population.

*This includes both situations of personal bias and institutional catchment. For example, clinic personnel may not have a personal bias toward reporting their clients, but the population they see may not be representative of the population as a whole. Since clinics are a major reporting source, this surveillance artifact could cause the characteristics of clinic clients to falsely appear as risk factors for child abuse.

TABLE 1—Reported Child Abuse: Confirmation Status, Georgia Department of Protective Services, July 1975 through December 1979 (Percent Distribution)

Confirmation Status	Number	Per Cent
Confirmed	4,221	56.3
Non-confirmable	1,390	18.5
Ruled-out	1,891	25.2
TOTAL	7,502	100.0

Case/Population Data, and Significance Testing

The following data were not available for all cases: the identity of the perpetrator (missing in 3 per cent of confirmed and in 8 per cent of ruled-out cases); the presence or absence of the mother from the household (missing in 4 per cent and 4 per cent, respectively, of cases); the presence or absence of the father from the household (missing in 26 per cent and 30 per cent of cases); the mother's age at birth of her first child (missing in 15 per cent and 18 per cent of cases); and whether the family ever received Aid to Families with Dependent Children (missing in 4 per cent and 5 per cent of cases, respectively). Calculations in regard to these variables were done using only those cases where data were known.

Population data were obtained from the Georgia Office of Planning and Budget, Georgia Office of Family and Children Services, Georgia Department of Human Resources, and the US Bureau of the Census. Race adjustments or matching to abuse cases was done by taking race-specific population data and producing a weighted average based on the racial composition of reported abuse cases. This was done for population data concerning receipt of AFDC, the mother's age at the birth of her first child, and the percentage of families with only one child. Statistical analyses were done using Mantel-Haenszel chi square techniques[8] or an equation for the comparison of means of two large samples from normal populations.[9] Differences are referred to as significant at a $p < .05$ level.

Results

Between July 1975 through December 1979 there were 7,502 cases of suspected child abuse in Georgia. Reporting has increased over this period (Figure 1), but confirmation rates have declined. Overall confirmation of child abuse in Georgia over this time period were 56 per cent, compared with a national rate of 55 per cent in 1976.[4] Distribution of cases by confirmation status is shown in Table 1. Sources vary markedly in their reporting and in their confirmation rates. This is reflected in number of reports and confirmation rates for each source (Table 2).

Demographic characteristics of confirmed and ruled-out abuse cases differ significantly from each other and from the general population. These differences and the interpretations consistent with them are outlined in Table 3. Both abuse

TABLE 2—Reporting Sources by Number of Reports and Confirmation Rates, Georgia Department of Protective Services, July 1975 through December 1979

Sources	No. of Reports	No. Confirmed	Per Cent Confirmation Rates
Police	657	473	72.0
Public health offices	167	115	68.9
Juvenile courts	296	199	67.2
School	1195	796	66.6
Private MD	210	132	62.9
Parent	550	335	60.9
Other	511	282	55.2
Clinic	1080	593	54.9
Social Services	531	291	54.8
Relative	986	438	44.4
Concerned citizens	1274	527	41.4
Unspecified	45	40	—
TOTAL	7502	4221	56.3

categories have an urban predominance relative to Georgia, where 56 per cent of families with a child less than 18 years old live in an urban setting. This difference is significantly greater for ruled-out cases; therefore, urban living cannot be considered a risk factor. The incidence of confirmed physical abuse is highest in children less than three years of age (62 cases/100,000 children), but confirmation rate is lowest for this age group (46 per cent of reported cases confirmed). Risk assessment for infancy is not possible. The Black population comprises a relatively smaller percentage of the ruled-out category (28 per cent) than of the Georgia population (32 per cent) and larger percentage of the confirmed (35 per cent). This suggests that Blacks are not under heightened surveillance. The confirmed category had a history of family assistance significantly more often than the ruled-out, suggesting that chronic or intermittent poverty may be a risk factor for abuse. At the time of abuse, both confirmed and ruled-out categories utilized a family assistance program more than the Georgia population. These did not differ significantly from one another, suggesting that ongoing contact with a social service agency places a family at increased risk of being reported for abuse.

Family and perpetrator characteristics for households of physically abused children are shown in Table 4, as are our interpretations of the findings. These include:

- A natural mother and father are significantly more common in the ruled-out category than in the confirmed category, suggesting that the lack of a genetic parent in the household may increase a child's risk of abuse.
- There is no significant difference in the percentage of mothers in each group bearing their first child as a teenager, but teenage childbearing is significantly more common in

TABLE 3—Possible Risk Factors for Child Abuse, by Prevalence in Confirmed and Ruled-Out Cases and in the Georgia Population Reported Child Abuse, Georgia, July 1975 through December 1979

Possible Risk Factor	Per Cent Confirmed Cases	Per Cent Ruled-out Cases	p value[1]	Per Cent Georgia Population	Interpretation[2]
Urban residence	60.2	66.1	*	56.0[3,4]	A
Early childhood (<3 years)	18.5	27.2	*	16.6[3,4]	A
Black race	35.0	28.1	*	32.0[3,4]	B
Family known to AFDC agency	62.8	59.9	*	NO[5]	C
Family receiving AFDC at the time of abuse	25.6	24.3	NS	14.0[6]	A

1. *($p < .001$), NS (not significant). P value is for difference between confirmed and ruled-out cases.
2. Interpretations are coded as follows:
   A. Heightened surveillance present. Cannot be determined if this is or is not a risk factor.
   B. No apparent reporting bias. May be a true risk factor.
   C. Reporting bias may not be present, but factor may in addition be associated with increased risk. Insufficient data for full assessment.
3. Obtained from the Georgia Office of Planning and Budget, 1978 data.
4. Percentage of all persons in Georgia less than 18 years of age.
5. NO = Not obtainable.
6. Obtained from the Georgia Bureau of Family and Children Services, 1981.

TABLE 4—Possible Risk Factors for Physical Child Abuse, by Prevalence in Confirmed and Ruled-Out Cases and in the Georgia Population Reported Physical Child Abuse, Georgia, July 1975 through December 1979

Possible Risk Factor	Per cent Confirmed Cases	Per Cent Ruled-out Cases	p value[1]	Per Cent Georgia Population	Interpretation[2]
Natural mother absent from household	10.2	7.7	**	NO	C
Natural father absent from household	38.1	30.0	*	NO	C
Mother less than 20 years old at birth of her first child	47.6	46.8	NS	40.4[3]	A
Household with more than one child	71.9	64.4	*	62.0[4]	D
Abuse perpetrated by mother	34.0	42.3	*	NA	A
Abuse perpetrated by father	28.7	22.4	*	NA	B
Abuse perpetrated by a female	43.5	54.5	*	NA	A

1. *($p < .001$), **($p < .01$), NS (not significant). P value is for difference between confirmed and ruled-out cases.
2. Interpretations are coded as follows:
   A. Heightened surveillance present. Cannot be determined if this is or is not a risk factor.
   B. No apparent reporting bias. May be a true risk factor.
   C. Reporting bias may be present, but factor may in addition be associated with increased risk. Insufficient data for full assessment.
   D. Reporting bias present, but factor also associated with increased risk.
3. Obtained from a sampling of Georgia birth certificates indicating a first-born live child, 1974–1978.
4. National census data, Population Survey Series 20, 1979, for families with a child less than 18 years old.

NO = Not obtainable.
NA = Not applicable.

both groups than in a race-matched state population sample, suggesting reporting bias.

- Mothers are the most frequently cited perpetrators of confirmed physical abuse but are significantly more prominent in the ruled-out population. Fathers and male perpetrators are more frequent in the confirmed than in the ruled-out perpetrator population. This suggests that mothers, and females in general, are under heightened surveillance compared to fathers and males in general.
- Both confirmed and ruled-out cases have larger families and fewer one-child families than the Georgia population. This difference is significantly greater for confirmed than for ruled-out cases. This trend in number of children for confirmed, ruled-out, and state populations is seen for almost all parental, racial, and abuse-type combinations (Table 5); however, the difference between confirmed and ruled-out categories is significant only for physical abuse in White two-parent households and Black one-parent (mother) households. A conclusion of heightened risk is therefore strongest in these two groups.‡

The above evaluations were repeated twice, pooling non-confirmable cases with confirmable cases and then with ruled-out cases. The conclusions made did not differ from those above, and p values significant in the above analysis remained significant.

Discussion

It has been recommended that child abuse data analyses should attempt to discover the commonalities of cases originally classified as suspected, and later understood to be non-abuse, in order to reduce future diagnostic errors and false accusations of parents.[10] We agree that this is important. Child abuse registries must balance maximal case ascertainment with the maintenance of an individual's privacy and of the system's own financial solvency. They are burdened with vague and subjective case and confirmation definitions. An independent means of surveillance for child abuse would not resolve these issues, nor would it be practically feasible. These limitations make epidemiologic analysis possible only when surveillance (reporting) and assessment (investigator) biases are addressed and corrected. True risk factors for abuse cannot be determined until this is accomplished.‡‡

Our analysis addresses the issue of surveillance bias in an inexpensive and system-specific way by comparing ruled-out and confirmed reports. The presence of a non-confirmable category improves the clarity of the two other category definitions, although inclusion of these unconfirmed cases in our analyses would not alter our conclusions.

‡This analysis could not be repeated on a household basis, since it is impossible to identify sibling cases in this data set.

‡‡Sackett provides an excellent discussion of some of the many sources of bias in analytic research, subcategorized into sampling and measurement biases.[11]

TABLE 5—Mean Number of Children in Families of Abused Children and in US Families, by Race and Parental Composition of Household Reported Child Abuse, Georgia, July 1975 through December 1979

Type of Abuse	Race	Parental Composition	Mean No. of Children: Confirmed Cases	Mean No. of Children: Ruled-Out Cases	p value[1]	US[2]	Interpretation[3]
Sexual	White	2-parent present	2.8	2.7	NS	1.9	A
		Mother only	2.1	2.1	NS	1.7	A
	Black	2-parent present	3.2	3.0	NS	2.1	A
		Mother only	2.6	2.1	NS	2.2	B
Physical	White	2-parent present	2.4	2.2	*	1.9	C
		Mother only	2.0	1.9	NS	1.7	A
	Black	2-parent present	2.7	2.6	NS	2.1	A
		Mother only	2.5	2.3	**	2.2	C

1. *($p < .001$), **($p < .05$), NS (not significant). P value is for difference between means for confirmed and ruled-out cases.
2. Mean number of children for US families with children less than 18 years of age (US Census Bureau, 1978).
3. Interpretations are coded as follows:
   A. Heightened surveillance present. Cannot determine if large family size is a risk factor.
   B. No apparent reporting bias. Large family size may or may not be a risk factor.
   C. Reporting bias present, but large family size also appears associated with increased risk.

Previous studies have identified six demographic characteristics which may represent increased risk of child abuse: urban residence,[7] early childhood,[12] low socioeconomic status,[6,13] lack of natural parents,[4,7] early motherhood,[7,14] and large family size.[3] The literature frequently concentrates specifically upon risk of abuse by mothers.[15,16] Conversely, it has been proposed that socioeconomic status,[5,10] race,[10] and parental role[10] may place certain individuals and groups under increased scrutiny by this surveillance system.

We show that four of these presumed risk factors or high-risk groups (urban residence, early childhood, early motherhood, mothers) may, in fact, relate to heightened suspicion and not necessarily to true risk. The finding of urban residence predominance in abuse cases could be due to more intense surveillance in urban centers. Similarly, the predominance of infants may be due in part to a high index of suspicion on the part of reporting sources. Teenage motherhood is related equally to false reporting and actual child abuse; therefore, it cannot be assumed a risk factor. Our analysis suggests that mothers are held under suspicion more than are fathers. This could be because of their dominant role in child rearing, but it could also be due to widespread publicity about the risk of child abuse by mothers. Blacks are at slightly higher risk of confirmed abuse than Whites. This finding does not seem to be due to reporting bias; however, we cannot evaluate here what bias, if any, may be present on the part of abuse investigators.‡‡‡

For four other characteristics, we have evidence of true increased risk, despite ascertainment biases. These are represented significantly more frequently in the confirmed than in the ruled-out category and include large families* and households without a natural mother or without a natural father. The fourth characteristic associated with risk is low socioeconomic status, represented by need for AFDC. Families that had ever been in need of AFDC appear at heightened risk, although those currently receiving aid do not. It should be noted that the amount of risk associated with most of these characteristics is small when ruled-out cases are considered in the analysis; thus, even these remaining "risk factors" may not be useful in planning intervention screening programs.

This analysis suggests that the inclusion of ruled-out case data into a central registry is useful for assessing the spectrum and adequacy of the surveillance system. Continued gains in case ascertainment may require a redirection of surveillance procedures based on this assessment. Examples of practical applications are threefold. First, attention should be increased to relatively neglected populations, e.g., rural areas and older children. Second, when necessary, financial constraints could be addressed by concentrating investigative resources on cases from sources with high confirmation rates. Third, reporting sources with low input into the system and high confirmatory rates should be encouraged to participate more fully (Table 2), especially juvenile courts, public health services, and private physicians. We also

‡‡‡An analysis of assessment (investigator) bias could also be done using this technique. Protective services personnel could be randomly selected in regard to various characteristics, e.g., sex, race, urban/rural status. Their reports could be randomly sampled and the characteristics of their confirmed and ruled-out cases compared. Personal identifiers of personnel or cases would not be needed for this study.

*These results concerning family size could be due in part to multiple children in a given family being reported to the system. If a family is under heightened surveillance or at risk for a reason other than family size, more than one child in that family could be reported. Thus, larger families could appear multiple times in the system, weighting statistics toward larger family sizes. A comparison of ruled-out to confirmed cases partially resolves this problem; however, a family-based analysis would address it best. This is not possible with the current Georgia registry.

suggest the use of this technique to determine assessment, as well as reporting, biases within a surveillance system.

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