

# Child Murder by Mothers: A Critical Analysis of the Current State of Knowledge and a Research Agenda

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**Objective:** Maternal filicide, or child murder by mothers, occurs more frequently in the United States than in other developed nations. However, little is known about factors that confer risk to children. The authors review the literature to identify predictors of maternal filicide and identify gaps in knowledge about maternal filicide.

**Method:** Databases were systematically searched for studies of maternal filicide and neonaticide (murder in the first day of life) that were conducted in industrialized countries and were published in

peer-reviewed, English-language publications after 1980.

**Results:** Women who committed filicide varied greatly by the type of sample studied. Neonaticide was often committed by young, poor, unmarried women with little or no prenatal care.

**Conclusions:** The results of the review suggest that little is known about the predictors of maternal filicide and that a systematic, focused program of research on reliable markers for maternal filicide is needed to better prevent these events.

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Among children under age 5 years in the United States who were murdered in the last quarter of the 20th century, 61% were killed by their own parents: 30% were killed by their mothers, and 31% by their fathers (1). Estimates by the Centers for Disease Control and Prevention for 1994 indicated that homicide was the fourth leading cause of death for preschool children and the third leading cause of death among children from ages 5–14 years (2). In the United States, the incidence of homicide of children less than 1 year old has increased over the past quarter-century (1). Compared to other developed nations, the United States has the highest rate of child homicide: 8.0/100,000 for infants, 2.5/100,000 for preschool-age children (age 1–4 years), and 1.5/100,000 for school-age children (age 5–14 years) (3). In contrast, Canada's reported rate for homicide of infants was less than half that of the United States: 2.9/100,000 (3). Furthermore, multiple authors have suggested that rates of child murder by parents are underestimated in epidemiological studies of child death (4–6).

Maternal filicide, defined as child homicide by mothers, is a problem that transcends national boundaries. However, little is known about the circumstances and factors associated with its commission, and this lack of knowledge makes prevention difficult. Two early seminal works, by Resnick in the United States and d'Orban in the United Kingdom, are often cited. In 1969, Resnick (7) reviewed the world psychiatric literature on filicide and found a high frequency of depression, psychosis, prior use of psychiatric services, and suicidality (suicidal behavior or suicidal thoughts, intent, or plan) among mothers who commit filicide. Resnick (8) later coined the term "neonaticide" to describe murder of a neonate within the first 24 hours of

life. Mothers committing neonaticide were typically younger and unmarried. They had unwanted pregnancies and no prenatal care. In 1979, d'Orban (9) studied filicide by mothers admitted for psychiatric observation to the hospital ward of a prison. The findings suggested an association between maternal filicide and the presence of certain stressors in the mother's life, such as being a survivor of domestic violence, early parental separation, and suicidality. In the case of neonaticide, d'Orban confirmed an association with unmarried status and younger mean maternal age and found a lack of association with depression or psychosis. Although women who kill their children are often labeled as "mad" (mentally ill) or "bad" (chronically abusive) (10), no consistent approach exists for defining the population of offenders. Data have rarely been collected on the basis of a priori theories. Nevertheless, theories regarding the psychological bases for filicide are abundant (7, 11, 12).

To advance the knowledge base about the predictors of maternal filicide and neonaticide, we addressed three questions through a critical analysis of the extant research literature: 1) What are the predictors or risk factors for maternal neonaticide and filicide? 2) How do these risk factors vary by the type of population studied? and 3) Which mentally ill mothers are at risk for committing neonaticide or filicide?

## Method

The analyses were based on extensive database searches, including searches through PubMed (Medline), PsychINFO, the Psychology and Behavioral Sciences Collection, and Sociological

Abstracts. Search terms included "filicide," "infanticide," "neonaticide," and "fatal child maltreatment."

### **Study Inclusion Criteria**

The studies that were selected for review had the following characteristics:

1. They dealt with maternal filicide only or separated maternal filicide offenders for some portion of analysis. This distinction was made in the selection because of the likelihood that different risk factors exist for paternal and maternal filicide.
2. They were conducted in industrialized countries. We focused on these settings because of the likelihood that different risk factors for infant homicide exist in underdeveloped countries (13). In underdeveloped countries, varying cultural, legal, and/or economic factors could constitute an external incentive for filicide unrelated to the mothers' psychological state. For example, a preference for male rather than female offspring in certain societies could influence filicide.
3. They were published in English-language, peer-reviewed journals or books after 1980, and they included contemporary samples.

### **Study Organization**

The selected studies were grouped according to population type, age of child victims, and geographic location.

**Population type.** General population studies may yield different results than studies of specialized populations, such as prison or psychiatric populations. Administrative record samples were defined as being more generalized, often including both psychiatric and correctional populations, as well as cases of maternal filicide-suicide, and were not weighted toward subjects who were adjudicated guilty or those with psychiatric dispositions. These studies cited coroners' records, newspaper reports, home office reports, or national statistics as data sources. Populations classified as corrections samples were diverse, ranging from women who were incarcerated (14, 15) to those described in judicial papers (16). Psychiatric populations were defined as mothers who were psychiatrically hospitalized or who were sampled from a setting that was likely to include subjects with psychiatric disorders, such as mothers referred for psychiatric evaluations subsequent to neonaticide or filicide.

**Age of child victims.** We distinguished between children killed when they were neonates and those killed when they were infants (within the first year of life), because neonaticide and infanticide may be influenced by different factors, compared to other filicides (8).

**Geographic location.** Geographic locations were classified as those inside or outside the United States. Rates of homicide and of filicide vary by country (17) and by culture. Furthermore, more than 20 countries have legislation that makes special provisions for maternal infanticide (18).

### **Search Results**

The database search yielded more than 250 references in the extant literature. The majority consisted of case reports, reports on series of filicide cases, and conceptual theoretical papers, and these publications were excluded. Eighty-three studies of child homicide were identified (4, 5, 10, 14–99 [some studies were described in more than one publication]). Forty-two of these 83 studies reported on child homicide but did not distinguish maternal filicide from paternal filicide or murder by a stepparent or a non-parent (4, 57–81, 83–89, 91–99). Those studies were not included in our analysis because they did not yield specific information

about maternal perpetrators. Two studies of maternal filicide were excluded because they presented data that were primarily historical (dating to 1850 or the early 1900s) and did not separately consider more recent data (82, 90). After exclusions, there remained 39 studies that were appropriate for use in our analysis. The characteristics of those 39 studies (5, 10, 14–56 [some studies were described in more than one publication]) are listed in Table 1.

## **Results**

All 39 studies we reviewed were retrospective in design. Ten included retrospective interviewing of mothers. Twenty-six included a comparison group. Many of the studies included intragroup comparisons.

Of the 39 studies specifically reporting on maternal child homicide, 13 were conducted in the United States and 26 were conducted in other countries. Thirteen other nations were represented: Canada (five studies), nations within the United Kingdom (five studies), Australia (four studies), Finland (three studies), Japan (three studies), with one study each conducted in Austria, Brazil, Hong Kong, New Zealand, Sweden, and Turkey. Four U.S. studies addressed neonaticide; three analyzed data from samples of administrative records, and one analyzed data from a psychiatric population (Table 1). Of the studies conducted outside of the United States, 11 addressed neonaticide; seven of those studies were based on administrative records, three examined data from psychiatric populations (either hospitalized or psychiatrically evaluated women), and one analyzed data from a correctional population. With regard to maternal infanticide (maternal filicide within the first 12 months of life, often defined by statute in countries outside the United States), one study of an administrative records sample was conducted in the United States and five were done in other countries. Studies of maternal filicide had various inclusion criteria for the child's age. Many studies combined analysis of neonaticide with that of other filicides. Ten such studies of maternal filicide were conducted within the United States: two with administrative records, five in psychiatric populations, and three in correctional populations. Nineteen such studies were conducted outside the United States: 10 with administrative records, seven in psychiatric populations, and two in correctional populations.

### **Neonaticide**

The three administrative record sample studies of neonaticide in the United States revealed that maternal perpetrators were likely to be unmarried, to have a mean and modal age in the late teenage years, to have low socioeconomic status, and to reside with parents or other relatives. The perpetrators had high rates of denied or concealed pregnancy and a relative lack of prenatal care. In the single U.S. study of a psychiatric population of women who committed neonaticide (49), the mothers had an older mean age (24 years) and middle to low socioeconomic status. The subjects in this study exhibited denial of preg-

TABLE 1. Characteristics of Studies of Maternal Filicide

Study	Year	Number of Subjects	Category of Child Murder <sup>a</sup>	Age of Child Killed (years <sup>b</sup> )	Comparison Group
Alder and Polk (17)	2001	22	Neonaticide, filicide	0–18	Intragroup comparisons <sup>c</sup>
Alder and Baker (19)	1997	32	Neonaticide, filicide	0–18	Intragroup comparisons <sup>c</sup>
Bourget and Bradford (20)	1990	9	Filicide	0–12	Nonparental homicides
Bourget and Gagne (21)	2002	27	Filicide	1 month to 13 years	
Cheung (22)	1986	35	Neonaticide, filicide	0–11	Intragroup comparisons <sup>c</sup>
Daly and Wilson (23)	1988	183	Infanticide, filicide	0→1	Regional/national rates
Gauthier et al. (24)	2003	442	Infanticide	0–1	Intragroup comparisons <sup>c</sup>
Haapasalo and Petaja (25)	1999	48	Neonaticide, filicide	0–12	Intragroup comparisons <sup>c</sup>
Herman-Giddens et al. (26)	2003	29	Neonaticide	Neonate	
Holden et al. (27)	1996	28	Filicide	0–14	Intragroup comparisons <sup>c</sup>
Husain and Daniel (28)	1984	8	Filicide	— <sup>e</sup>	Abusive mothers
Karakus et al. (29)	2003	44	Filicide	0–18	Intragroup comparisons <sup>c</sup>
Korbin (14, 15, 30, 31)	1987, 1986, 1989, 1998	9	Filicide	5 months to 6 years	
LaPorte et al. (16)	2003	32	Filicide	0–12	Intragroup comparisons <sup>c</sup>
Lewis et al. (32)	1998	60	Filicide	0–26	Intragroup comparisons <sup>c</sup>
Lewis and Bunce (33)	2003	55	Filicide	0–17	Intragroup comparisons <sup>c</sup>
McKee et al. (34)	2001	30	Filicide	— <sup>e</sup>	Other homicidal women
McGrath (35)	1992	115	Filicide	0–29	
Marks and Kumar (36)	1996	18	Neonaticide, infanticide	0–1	Intragroup comparisons <sup>c</sup>
Marks and Kumar (37)	1993	113	Neonaticide, infanticide	0–1	Intragroup comparisons <sup>c</sup>
Mendlowicz et al. (38, 39)	1998, 1999	53	Neonaticide	Neonate	Births
Meszaros and Fisher-Danzinger (40)	2000	9	Filicide	0–20	
Meyer and Oberman (41)	2001	219	Neonaticide, filicide	0–13	Intragroup comparisons <sup>c</sup>
Oberman (18)	1996	96	Neonaticide, filicide	0–8	Intragroup comparisons <sup>c</sup>
Pritchard and Bagley (42)	2001	14	Filicide	0–16	
Putkonen et al. (43)	1998	7	Neonaticide	Neonate	Other homicidal women
Sakuta and Saito (44)	1981	71	Neonaticide, infanticide	Neonate to 1 year	Intragroup comparisons <sup>c</sup>
Silverman and Kennedy (45)	1988	275	Infanticide, filicide	0–17	Other homicidal women
Smithey (46, 47)	1997, 2001	15	Filicide	0–3	
Somander and Rammer (48)	1991	23	Filicide	0–15	Intragroup comparisons <sup>c</sup>
Spinelli (49)	2001	16	Neonaticide	Neonate	
Stanton et al. (50)	2000	6	Filicide	Weeks to 7 years	
Vanamo et al. (51)	2001	121	Filicide	0–14	
Wallace (52)	1986	63	Filicide	0–5	
Weisheit (53)	1986	39	Filicide	— <sup>e</sup>	Other homicidal women
Wilczynski (5, 10)	1997	28	Filicide	0–18	Intragroup comparisons <sup>c</sup>
Wilkey et al. (54)	1982	9	Neonaticide	Neonate	
Xie and Yamagami (55)	1995	37	Filicide	0–23	
Zhu et al. (56)	2000	6	Neonaticide	Neonate	Nonparental homicides

<sup>a</sup> Neonaticide=killing within the first day of life or up to 4 days of life; infanticide=killing within the first year of life; filicide=killing of a child of any age (overall category that could include neonaticide and infanticide).

<sup>b</sup> Unless noted otherwise.

<sup>c</sup> Comparison groups included maternal/paternal filicides and filicides involving children of various ages.

nancy and frequently reported depersonalization, dissociative hallucinations, and intermittent amnesia.

Multiple studies of neonaticide from outside the Untied States were based on administrative records samples. They revealed that the maternal perpetrators were largely unmarried young mothers who lived with their parents, lacked prenatal care, concealed or denied their pregnancies, and showed no evidence of premorbid axis I psychiatric disorders.

In non-U.S. studies of psychiatric populations of mothers who committed neonaticide, the samples consisted primarily of unmarried women with an older mean age (20–26 years) and infrequent prenatal care. Some studies of non-U.S. psychiatric populations of mothers who committed neonaticide reported a relative lack of mental illness after psychiatric evaluation in the mothers (9, 22, 25),

while another reported a high rate of personality disorders or psychosis in the mothers (43).

The non-U.S. correctional studies (including historical data correlated with current data) revealed that neonaticidal mothers generally were single, illiterate, nulliparous, younger (mean age=22 years), and without prior mental illness. In a study in Japan, neonaticide was further classified into cases of “anomie,” in which the mothers had the general characteristics just described, and “mabiki” (“thinning out”), in which impoverished married women or couples killed neonates because of poverty (44). The mothers in cases of mabiki did not deny their pregnancies.

**Infanticide**

The single U.S. study that presented separate data concerning infanticide (filicide in first 12 months of life) was a macro-level study that revealed a relationship of maternal

Population Type			
General Population (Administrative Records)	Psychiatric Population	Correctional Population	Location
Yes			Australia <sup>d</sup>
Yes			Australia <sup>d</sup>
	Yes		Canada <sup>d</sup>
Yes			Canada <sup>d</sup>
	Yes		Hong Kong <sup>d</sup>
Yes			Canada <sup>d</sup>
Yes			United States
	Yes		Finland <sup>d</sup>
Yes			United States
	Yes		United States
	Yes		United States
Yes			Turkey <sup>d</sup>
		Yes	United States
		Yes	Canada <sup>d</sup>
	Yes		United States
	Yes		United States
	Yes		United States
	Yes		England <sup>d</sup>
Yes			Scotland
Yes			England <sup>d</sup>
		Yes	Brazil <sup>d</sup>
	Yes		Austria <sup>d</sup>
Yes			United States
Yes			United States
Yes			England <sup>d</sup>
	Yes		Finland <sup>d</sup>
Yes			Japan
Yes			Canada <sup>d</sup>
		Yes	United States
Yes			Sweden <sup>d</sup>
	Yes		United States
	Yes		New Zealand <sup>f</sup>
Yes			Finland <sup>d</sup>
Yes			Australia <sup>d</sup>
		Yes	United States
		Yes	England <sup>d</sup>
Yes			Australia <sup>d</sup>
	Yes		Japan
Yes			Japan

<sup>d</sup> Country whose laws have specific provisions for infanticide (generally for homicide of infants age ≤1 year).

<sup>e</sup> Not reported.

<sup>f</sup> Country whose laws have specific provisions for filicide of children age ≤10 years (18).

infanticide to economic stress (25). The non-U.S. administrative records sample studies of infanticide revealed that the mothers had a mean age in the early 20s and low rates of employment. Many mothers had psychiatric disorders. For example, 72% of the mothers in the study conducted in Japan had psychiatric disorders (44). There was a high frequency of physical anomalies among the child victims in the study conducted in Japan (44).

**Filicide**

Studies based on administrative records samples of maternal filicide occasionally included cases of filicide-suicide, and these mothers, for obvious reasons, would not be part of psychiatric or prison samples. The two U.S. administrative records sample studies of filicide (reported separately from neonaticide) found that the mothers were often poor, full-time caregivers who were socially isolated

and may themselves have been victims of domestic abuse. Neglectful and abusive mothers often had problems with substance abuse as well.

Certain studies divided mothers into groups on the basis of a proposed typology. This strategy found groups of mothers with variable rates of both mental illness and previous abuse of the child. Groups of mothers who committed “purposeful homicide” often killed their children in the context of mental illness, failed relationships, and “devotion” to the child (41).

Studies of maternal filicide offenders drawn from psychiatric populations in the United States noted high rates of psychosis, depression, suicidality, prior use of psychiatric services, and, in some studies, decreased intelligence. Mothers who committed filicide were more frequently married, compared with neonaticidal mothers, and had a high frequency of unemployment, alcohol use, and personal history of abuse.

Maternal filicide offenders in the studies of U.S. correctional populations were frequently victims of abuse themselves. Many had limited education, poor social support, and a history of substance abuse. In addition, they were often unmarried and unemployed, and some viewed the child they killed as abnormal.

Administrative records sample studies of maternal filicide conducted outside the United States found mental illness (psychosis, depression with suicidality) in approximately one-half of the mothers. Some of these studies noted histories of child abuse and domestic violence, and some noted child-related factors, such as persistent crying, as precipitants of the mothers’ violence. Mothers who committed filicide were frequently socioeconomically disadvantaged and had primary responsibility for their children. Studies of psychiatric samples conducted outside the United States noted high rates of psychiatric symptoms, particularly depression and psychosis, as well as prior use of psychiatric services, prior psychiatric admissions, and suicidality. The mothers often experienced considerable life stress, including being abused themselves. Filicidal mothers in non-U.S. correctional populations were also likely to have a history of previous use of psychiatric services and high rates of mental illness (depression and psychosis). The mothers in these cases of filicide were likely to have social and economic stresses, a history of abuse, unsupportive partners, primary caregiver status, and difficulties caring for the child.

In this critical analysis, we used these studies to identify factors that distinguish mentally ill mothers who are more likely to kill their children. We reconsidered the 14 studies of filicide in samples from psychiatric populations to identify studies that used control groups that were appropriate for the determination of possible risk factors. Although many of these studies included comparison groups, such as other female homicide offenders, there were no studies that compared mentally ill filicidal mothers with mentally ill mothers of similar socioeconomic sta-

tus who did not kill their children. In the study with the most suitable design, which compared abusive mothers with mothers who committed filicide, data for only eight maternal filicides were analyzed (28). Because of the limitations of the available studies, we were unable to identify the situational or personal factors that put mentally ill mothers at risk for filicide.

## Discussion

We found that the research on child murder by mothers, especially within the United States, was sparse. Studies of neonaticide that used administrative records samples and correctional populations both inside and outside the United States had fairly consistent findings. They frequently showed a pattern of powerlessness, poverty, and alienation in the lives of the women studied. However, the common factors, such as being young, poor, and undereducated and living with one's parents, describe a huge segment of the female population. There were virtually no distinguishing features to suggest which young, poor, and undereducated women with poor prenatal care were at risk for neonaticide. It is not surprising that the samples of neonaticide offenders from psychiatric populations differed from those in administrative records samples regarding the presence of mental illness, but data on this characteristic were sparse, and the results differed across countries.

Some of these studies noted that women who committed neonaticide had a high probability of denying or concealing their pregnancy. Denial or concealment of pregnancy may indeed be a predictor of neonaticide, but such behavior would be difficult to identify prospectively. The lack of prenatal care may also be a valid predictor of neonaticide. Additional, careful study is needed to elucidate factors related to denial of pregnancy in women who receive no prenatal care.

Knowledge about maternal filicide after the first day of life is even more meager. Offenders in psychiatric populations in the United States and other nations had high rates of previous mental health services use, depression, suicidality, and psychosis, as expected of psychiatric patients. Studies of maternal filicide in corrections populations noted social disadvantage in offenders. Studies conducted outside of the United States documented more mental illness in offenders.

England's Infanticide Act, the modern version of which became law in 1938, was based on the concepts of puerperal and lactational insanity (18). The Act reduced the charge from murder to manslaughter for a woman who killed her infant under age 1 year if "the balance of her mind was disturbed by reason of her not having fully recovered from the effect of giving birth to a child or by reason of the effect of lactation" (100). More than 20 countries currently have such legislation, including Canada and much of Australia, but not the United States (18). In these

countries, infanticide laws often result in the woman's receiving probation or referral to mental health treatment rather than incarceration (18). It is noteworthy that such legislation does not require that the mother have a formally diagnosable mental illness. Therefore, a nondepressed and nonpsychotic mother who commits neonaticide may be shown greater lenience than a psychotic and depressed mother who kills her 13-month-old child. Many severely mentally ill mothers may not be considered under legislation that applies only to death of children under age 1 year; a recent study found that the mean age of child victims of mothers found not guilty by reason of insanity in two states was older than 3 years (101). We would expect findings to be somewhat skewed when considering study results from various countries. However, samples in these studies often included mothers who killed children older than age 1 year. Specifically, one might expect that women in the United States who successfully plead insanity and procure a psychiatric disposition would be more psychiatrically ill than those with a psychiatric disposition in countries with infanticide laws. Likewise, women who had criminal dispositions in countries with infanticide laws might be less likely to be mentally ill. However, other things being equal, results from the more general administrative records samples may be similar.

Maternal filicide studies based on samples of the general population within the United States are sorely needed to develop strategies for prevention. Several studies of maternal filicide separated results on the basis of proposed typologies of motivations among mothers who commit filicide. In some studies, the age of the child that was killed was reported, but there was no discussion of the child's age in relation to the common factors in the lives of their mothers. The inclusion criteria for the age of the child victims varied drastically across studies, making the development of conclusions difficult. Because of the differing legal definition of infanticide among countries, comparison to U.S. incidence rates of filicide may be difficult. Based on our understanding of childhood abuse, we hypothesize that after the first day of life, risk factors for filicide are related to the age of the child. The literature supports the supposition that fatal abuse may be more likely to occur in younger children and that older children are more at risk from purposeful homicides. However, the existing research on filicide cannot be used to affirm this supposition.

The nature of filicide varies within the population of women studied. Consideration must be given to the appropriateness of the questions asked about the population and the selection of comparison groups. For example, within a mentally ill population, data should be sought to help inform clinicians why one mother with psychotic depression is more likely to kill her child than another mother with psychotic depression.

What we know about maternal filicide is specific to the population studied. Few factors are consistent across pop-

ulations; thus overall, we know very little about which children are at risk for death at the hands of their mothers. All of the studies reviewed here were retrospective, and most were descriptive. None of the studies included calculation of relative risks for filicide in women with specific disorders or maternal characteristics strongly associated with filicide. However, they did provide general descriptions of mothers who had committed filicide, and from these descriptions we can extrapolate some potential risk factors. Women at risk for neonaticide are often young and unmarried, deny or conceal the pregnancy, and lack prenatal care. The factors associated with maternal filicide appear to be nonspecific but seem likely to include past use of psychiatric services and a history of suicidality and depression or psychosis. However, the factors associated with maternal filicide are likely to be different for women who are psychiatrically ill, compared to those who are not psychiatrically ill.

Investigators who conducted research in psychiatric populations often had access to detailed psychological information about the maternal perpetrators of filicide, but their conclusions are limited in generalizability. Maternal mental illness appears to play a varying role in filicide. Descriptions of filicidal mothers were highly dependent on the source of the sample. Imprisoned U.S. perpetrators of maternal filicide were understandably less likely to be mentally ill than mothers who were psychiatrically hospitalized. These differences in study populations make it difficult to draw general conclusions about which mothers are at risk. Furthermore, although there were few studies, some were difficult to categorize because they were based on very specific populations that may have had some overlap. For example, a study of women referred for psychiatric evaluation after commission of neonaticide (49) was classified as a psychiatric population study because it would have included a preselected group of women who were more likely to have psychiatric disorders than would a general correctional population, although it could be argued that such a population should be considered a correctional population because the women were pretrial detainees at the time.

This critical analysis suggests that clearer parameters are needed for research in this area. There is a lack of standardization in filicide research regarding the age of children who constitute filicide victims. The children in the studies we reviewed ranged from neonates to young adults as old as age 29 years. We propose that future filicide research consider including only children under age 18 years, because they are minors and still of school age. The existing studies did not examine the possibility that contextual factors may vary according to the age of the child victim. No study reported on characteristics of the mothers based on the age of the child who was killed, other than in cases of neonaticide or infanticide. It is interesting to note that when study population samples were separated by country, different factors appeared to emerge. Less

variability occurred in the findings of neonaticide studies among nations than among population sample types.

Very few American general population studies were conducted. The epidemiological studies that do exist do not differentiate maternal filicide from other child homicides (69, 93). American infants at risk of homicide are known to be born to young, undereducated mothers with low socioeconomic status who do not obtain timely prenatal care. However, this research is limited by lack of classification of the homicide perpetrator as the mother, the father, or a nonparent. Psychiatric diagnoses are frequently made after the homicide, when women may develop depression or posttraumatic stress disorder in reaction to commission of the filicide. These diagnoses may not necessarily reflect the women's psychiatric status before the filicide. Furthermore, it is often unclear how rigorously the psychiatric diagnostic criteria were applied.

In a closely related area of research, two studies found a high incidence of filicidal thoughts in mentally ill women (102, 103). The study by Chandra et al. (103) of postpartum severely mentally ill women in India found that 43% had infanticidal ideation and 36% exhibited infanticidal behavior. Infanticidal behavior was associated with female gender of the infant, adverse maternal reaction to separation from the infant, and psychotic ideas relating to the infant. These findings are a step toward developing a profile of mentally ill mothers who may be at risk for filicidal deeds. Further descriptive research is needed to explore the character and quality of parenting by mentally ill women (104). This area of research is important because approximately one-quarter of the women referred to psychiatric services have a child under age 5 years (104). Similar studies of women who are not mentally ill—particularly women who are young, poor, and undereducated and who fail to obtain prenatal care—are also critical. For example, a study in a nonpsychiatric population found that 70% of mothers of colicky infants had explicit aggressive thoughts toward their infants, and 26% of these mothers had infanticidal thoughts during the infant's episodes of colic (105). Development of intervention strategies depends on a better understanding of the prevalence of these thoughts and the characteristics of mothers who are likely to act on these thoughts.

### ***Research Agenda for Maternal Filicide Studies***

Given that the reported incidence of filicide is increasing and given the limitations of the research literature, what are the most important research needs in this area? Although prospective studies are considered stronger than retrospective studies for establishing risk relationships, the rarity of filicide makes such studies impractical. However, well-conceptualized cross-sectional studies, with contemporaneous investigation of the circumstances surrounding all child deaths in a given catchment area, are feasible. These investigations could examine factors associated with different types of filicide (e.g., filicide resulting

from negligence, recklessness, or intentional acts). In addition, case-control studies examining features of filicide victims whose mothers were reported to child protective services for abuse could be compared to those of abused children who are not killed. The findings could point to characteristics that may identify women who are at high risk for killing their children.

Future studies of filicide in the United States should build on the knowledge gained from studies in other nations and should strive to meet the following criteria. First, the studies should contain comparison groups, such as mentally ill mothers or abusive mothers who do not kill their children. We need well-controlled studies comparing mothers in the general population who did and did not commit filicide, as well as mentally ill mothers who did and did not commit filicide.

Second, future studies should examine specific perpetrator subpopulations that would include mothers with and without key risk factors. An optimal strategy would be to examine such factors across the children's life span. Groups that should be targeted for study include women with no prenatal care, abusive mothers, and mentally ill mothers. These focused studies might allow the construction of risk profiles for filicide.

Third, future studies should investigate a large number of possible risk factors. Some factors, such as depression and social problems, have a widespread presence in the general population. Therefore, for mothers who commit filicide, a constellation of risk factors is likely to be more important than the presence of a single factor. Clusters of significant risk factors for filicide may include demographic factors, social milieu, psychiatric history, victim characteristics, specific situational factors, prior family conflict and violence, and a history of contact with social service agencies. All of these factors have all been suggested as candidates needing further study in the context of filicide risk (5). In future studies, researchers should seek to delineate which abusive mothers are most at risk for committing filicide.

Fourth, studies in the national U.S. population would be optimal to gain a sufficient sample size for this relatively infrequent crime. Although some potentially informative trends have been noted from international studies, different homicide and filicide rates across nations make inferences about risk factors somewhat problematic.

Finally, an important area of research concerns mothers who kill their children and themselves (filicide-suicide), because these mothers are not included in either correctional or psychiatric samples. Historically, they represent a significant proportion (16%–29%) of filicidal mothers (23, 48, 106). To facilitate such studies, death records of filicide victims should be augmented with information about perpetrators. This goal would be accomplished by examining the records of all filicide deaths reported to coroners.

### *Future Data Sources*

Standard reporting systems often do not provide specific data regarding filicide. Although current state and national databases link infant birth and death records, information about the identity of the homicide perpetrator is not similarly linked. Also, there is no current linkage of birth and death records for children over the age of 12 months. This limitation effectively eliminates critical information from the database in the case of older filicide victims. The Centers for Disease Control and Prevention is developing the National Violent Death Reporting System, which is funded in some states (107). When this system is in operation, it will link coroner, judicial, and law enforcement records, which will facilitate study in this area of homicide. Also, the U.S. Federal Bureau of Investigation has begun examining data for a large sample of mothers who have killed their children; this project makes use of information from the investigating law enforcement agencies and prosecutors' offices (K. Beyer, personal communication, 2004).

To facilitate understanding and to potentially intervene in this public health issue, certain states are also taking an active role. All 50 states have Child Fatality Review teams (108). In Ohio, for example, an interdisciplinary team evaluates the deaths of children age  $\leq 18$  years and examines factors that may relate to prevention. However, the teams do not necessarily investigate the child's death until after prosecution of the perpetrator, which could delay review of many maternal filicide cases. For optimal data collection, every filicide case that is evaluated by coroners should be contemporaneously investigated by coroners' inquests. Also, a survey given to new mothers, PRAMS (the Pregnancy Risk Assessment Monitoring System) (109), does not routinely include questions about mental health concerns, although states may opt to add such questions.

The office of the U.S. Surgeon General is planning prevention strategies for child maltreatment (110, 111). Psychiatry, public health, and the social sciences should collaborate across the traditional disciplinary boundaries to share approaches and resources that would improve our knowledge of the determinants of filicide. Without adequate data about who is at risk, preventive interventions cannot be developed. With the exception of data for neonaticide, public health data supporting targets for intervention to prevent filicide are lacking. Researchers in public health should be guided to modify data collection and organization to include specific data about perpetrators of child homicide. Their efforts should also include follow-up of cohorts of mentally ill mothers, with inquiry about filicidal intentions as an indicator. More data must be gathered before more appropriate prevention efforts can be targeted to avert these family tragedies.

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