

Fatalities and the Organization of Child Care in the United States, 1985–2003

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Nearly 8 million children of employed parents are in nonrelative child care, but little is known about safety risks. Drawing on the literature reporting mistakes in organizations and medical errors, the authors analyze fatalities in U.S. child care. Types of child care vary greatly in organizational features, from formally organized centers to informal care offered in providers' or children's homes. This allows analysis of how the social organization of care affects risks. A unique national dataset is used to provide a lower bound on fatalities and to analyze fatality rates across types of care. Data come from three sources: (1) a systematic national media search for 1985–2003, (2) legal records of civil and criminal court cases involving fatalities and serious injuries in child care, and (3) ethnographic data from state records in seven states. Overall child care is quite safe, but there are striking differences in fatality rates across types of care. Center care is significantly safer than care offered in private homes and offers particular protection against fatalities from violence. Detailed narratives of how fatalities occur suggest that the organization of work is a crucial factor in risk differences.

On April 24, 2001, the parents of 5-month-old Dylan Salmon dropped him off at the house of Maryann Constantino. Dylan's mother had located the provider, a 36-year-old mother, after an extensive search for child care. Her older daughter, Rachel, had been in Constantino's care for 2 years before starting school. "This isn't someone I just found in the phone book," Salmon said. "I was careful to find someone I trusted and came recommended" (Estes 2001:1).

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The mother got a call at work during lunch. "I don't like the way Dylan is breathing," Constantino told her. By the time she got to Constantino's home, the paramedics were working on her unconscious son. Dylan was rushed to the hospital, where he was diagnosed with brain damage from being shaken. He suffered seizures, bleeding behind his eyes, and massive cell death in his brain. Three months later, Dylan was released from the hospital but still had to be fed through a tube. Dylan's mother said, "Our whole life changed in a day." "In a moment," her husband added (Estes 2001:1).

Constantino first said that another child fell on Dylan, then that her own 3-year-old daughter dropped him on the carpeted basement floor. Finally, she admitted to police that she had shaken the baby at least three times (Richardson 2001:2). No complaints had been lodged against Constantino in the 9 years that she had provided licensed care in Rockland, Massachusetts. Other parents with children in Constantino's care were disbelieving. One mother told reporters, "In my heart I know Maryann would never hurt a child—her own or anyone else's. It's very sad. Her reputation is now ruined" (Estes 2001:1).

Little is known about the circumstances that could lead a woman such as Maryann Constantino, with an impeccable reputation and 9 years of experience with children (two of those years with Dylan's sister), to violently shake a child. In this article, we provide the first systematic national data on fatalities and serious injuries in child care. Although each individual fatality seems to stem from the most mundane of events, and to be almost inexplicable in its eruption, fatality rates differ significantly across different types of child care. This pattern, we suggest, arises from and illuminates fundamental differences in how organizations and individuals operate in the provision of care.

Nearly 8 million children of employed mothers are in some form of nonrelative care (Blau 2003:443), but no agency collects national data on fatalities or serious injuries in child care, and state data are limited. In this article, we analyze caregiving failures that compromise the physical safety of children. We exclude harms that do not arise from the caregiving arrangement, such as (rare) cases of children dying from natural causes.

This article makes two contributions: First, we rely on a unique data set to provide a lower bound on fatalities to children in child care for 1985–2003. This represents the first systematic national study of fatalities in child care. Second, we show that the social organization of care strongly affects patterns of fatalities and injuries in child care. This in turn can provide insight into how the organization of work can limit caregiving failures and safety risks in the human services. "Mistakes" and their control have been analyzed extensively in both high-risk industries and medicine, but organizational theorists have devoted little attention to the analysis of mistakes in care settings despite their importance for vulnerable populations, both old and young.

Before turning to the literature on mistakes and its potential application to human services, we outline the organization of child care. The U.S. child care market is divided into three major sectors. Although some U.S. social institutions, such as public schools, have become highly standardized in form, child care is not institutionalized to this extent. Excluding care by relatives, the three child care sectors are care in the child's home (by nannies, au pairs, or

those more generically termed "babysitters"),¹ care in the provider's home (family day care), or care offered in centers. In-home care, which usually is the most expensive mode, is favored by affluent parents. It can also be common among low-income families who rely on friends or informal networks for child care needs. Among children in nonrelative care, about 7 percent are looked after in their own homes. Family day care enrolls about 27 percent, and centers about 66 percent (National Household Education Survey 2001). We focus on analyzing caregiving failures across these three types.

Types of care differ in crucial ways. Most importantly, they differ in degree of formality, with centers being the most formal, family day care providers occupying an in-between status, and in-home caregivers operating in the least formal work environments. Centers are bureaucratic organizations with directors, multiple employees, and recognized procedures based at least partly on professional expertise (Fitz Gibbon 2002). In-home care and family day care are both offered by individuals working alone in private homes (Kontos et al. 1994; Nelson 1991; Uttal 2002; Wrigley 1995). Family day care providers operate small businesses and usually serve multiple families. A substantial proportion are licensed or otherwise regulated by the state. They are customarily required to have some training. In-home caregivers are hired by parents. Many arrangements are semi-underground, with work rules and hours individually negotiated and taxes not paid. The differences across sectors make it possible to examine the effect of organizational differences on safety outcomes. Our analysis of national data over a long time span shows that fatalities and serious injuries occur differently in bureaucratic care, as compared with both types of care offered by individuals in private homes.

ANALYZING MISTAKES

Organizational theorists and policymakers have closely analyzed industries with hazardous technologies in which accidents could be cata-

¹ Babysitters can include housemates who provide child care in exchange for housing, or others who provide care without having an identity as a caregiver.

strophic, including aviation, chemical and petroleum processing, and nuclear power. Some theorists argue that these “high-reliability” industries successfully control risks by creating cultures of safety, training personnel, rigorously analyzing “near misses,” and establishing redundant safety systems (Reason 2000; Weick 1987; Weick, Sutcliffe, and Obstfeld 1999). “Normal accident” theorists take a more pessimistic view, stressing the inherent safety risks in complex organizations with tightly coupled processes (Perrow 1984). Whether they stress the reliability or the risks of hazardous industries, however, both sets of theorists work from a systems perspective, in which operator error is downplayed in favor of analyzing underlying processes.

In medicine, a more individualistic perspective has predominated, with errors attributed to failures in the attention or skill of individual practitioners. The Institute of Medicine tried to change this in a 1999 report that called for a switch to a systems approach in which errors are seen as stemming from difficulties in communication across medical status hierarchies, lack of systematic reporting of mistakes (and thus, inability to learn from them), and lack of integration of patient care across units or doctors in hospitals (Kohn, Corrigan, and Donaldson 1999). The report was highly publicized, but has not led to widespread changes in dealing with errors (Leape and Berwick 2005). This may be attributable in part to a failure to take into account the work culture in medicine, a culture built on hierarchy and professional autonomy, in which mistakes are likely to be hidden or minimized (Bosk 2005; Hughes 1971).

Despite the incomplete application of a systems perspective to medicine, this approach has opened up lines of analysis that are relevant to understanding errors in other types of organizations. First, it has entailed a shift of attention from industries in which many lives can be lost in one incident to institutional settings in which fatalities from errors typically occur one by one, with much less social visibility than in high-risk industries (Pizzi, Goldfarb, and Nash 2001). In institutional environments where mistakes are more likely to yield single fatalities, even the definition of errors is subject to contestation and negotiation, and much dispute occurs over the number of fatalities that can be

attributed to errors (Leape 2000; McDonald, Weiner, and Hui 2000).

Second, a systems approach to medical errors has spurred research on how the limitations of individuals can be checked and compensated for in a variety of environments. Such checking is common in high-risk industries, in which individual fallibility is assumed. In such industries, the active promulgation of a culture of safety encourages lower-ranking personnel to speak up when they observe errors in the making, even when those errors are being committed by their superiors. In medicine, hierarchies of rank, occupation, and specialty remain powerful, with lower-ranking personnel reporting that they are reluctant to point out potential errors to those above them. This has led to the development of technical fixes to limit errors, including computerized prescription systems and the introduction of many types of auditory alarms in hospital settings. These can create their own risks of mistakes or of medical personnel bypassing or ignoring the new controls.

Researchers have found that in medicine, not only are individuals often insufficiently checked, but the segmentation of care across specialists and hospital units also can create risks from lack of communication (Sutcliffe, Lewton, and Rosenthal 2004). One partial solution has been the development of new specialties, including “hospitalists” who manage patient care (Kohn et al. 1999). This solution does not, however, require a broader institutional integration or a reshaping of medical work culture. To the extent that errors result from problems of checking individuals, or of working across existing lines of organizational or hierarchical segmentation, medicine has made few strides toward a “culture of safety.”

Human service enterprises such as child care are at the opposite end of the scale from high-tech enterprises. They are more similar to medicine, but even here, differences are apparent. Centers, the most structured form of child care, are simple organizations compared with hospitals. Caregivers deal mainly with healthy clients, as opposed to those who are ill, and do not routinely administer drugs. Medication errors are the biggest source of preventable mistakes in hospitals (Koppel et al. 2005). Despite these differences, child care and medicine have enough similarities that the literature on med-

ical mistakes may offer some insight into caregiving failures. The two realms are alike (and different from high-reliability organizations) in the absence of systematic reporting on mistakes and near misses. They are also alike in the low social visibility of fatalities that occur one by one.

Those promulgating a systems approach to medical mistakes have argued that the organization of work is critical in the generation and control of errors (Cook, Woods, and Miller 1998). In child care, caregiving work is organized very differently in centers and in private homes, suggesting that patterns of risk may differ in these sectors. The steep hierarchies of medicine and the reliance of doctors on indirect reports about colleagues' skills hinder the checking of individuals, but centers may benefit from workers' direct observation of each other. Findings have shown such direct observation to be critical even in a highly structured field such as aviation. Risks of errors are increased when copilots have their heads down performing tasks instead of keeping their eyes on pilots (Dismukes, Young, and Battelle 1998). In centers, the presence of multiple employees of roughly equal status engaged in similar tasks may enhance safety. Centers also may benefit from the relatively greater professionalism and training of employees, as compared with those working in private homes. Training can be critical in creating a "culture of safety" (Kohn et al. 1999).

Child care offered in private homes diverges markedly from the organizational arrangements of medicine. Caregivers in their own homes or the child's home work alone. There is no hierarchy, little training, and no clear organizational boundaries separating the care arrangement from the private world. Children, particularly those in family day care, are brought into the caregivers' family realm. In this caregiving model, safety rests almost entirely on the engagement and attentiveness of the caregiver herself, with none of the elaborate checks observed in high-reliability organizations, the more scattershot checks of medicine, or the simple ones of centers. On the positive side, there is no diffusion of responsibility. All rests on the caregiver, and there can be no failures of communication or confusion over roles. The intimate environment of home-based care also may enhance attachment, creating a spur to

safety, as opposed to the more bureaucratic environments of medicine or of child care centers.

The literature on the culture of work and medical mistakes suggests areas of both strength and vulnerability in different sectors of child care. Analysis of fatalities in child care addresses a social issue that has not been considered previously. In addition, the study of fatalities in child care can enrich the general literature on mistakes in organizations two ways. First, because child care includes radically different sectors, from the wholly informal to the bureaucratic, it affords an unusual opportunity to analyze adverse events in relation to the distinctive organizational features of child care arrangements. These arrangements have a common purpose and attract broadly similar clientele, but they operate differently in terms of work culture.

Second, in child care and other human service operations serving vulnerable populations, the line between intentional and unintentional acts, between abuse, neglect, and simple mistake often is blurry. The Institute of Medicine report on medical mistakes specifically excluded analysis of those caused intentionally (assumed to be a very small part of the total). If we start, however, with the outcome for children (in this case, fatalities), we can analyze how risks of all sorts, from the most deliberate to the most unintentional, arise in different child care settings. It is an empirical question whether children's vulnerability follows neat lines of intentionality.

The first section discusses the study's method and then presents fatality rates for children of different ages in different types of care. The next section assesses competing explanations for differences across types of care, followed by an analysis evaluating specific features of the organization of care that appear to contain or increase safety risks. Finally, the discussion concludes with a focus on the study's implications for the analysis of mistakes in human service organizations, and with recommendations for improved safety in child care.

METHOD

Our analysis of caregiving mistakes or failures in child care required first defining what constituted a failure. Childrearing values differ

among people of different backgrounds (Kohn 1989; Lareau 2003). We collected data on outcomes that would be considered negative from any childrearing perspective: fatalities, serious injuries, sexual abuse, and “near misses” (in which a child was exposed to harm but was not injured). In this article, we focus on the fatality data.

Data collection also required case selection rules. We excluded cases arising in relative care, including care by mothers’ boyfriends, foster care, or residential care, but included all other forms of child care. Motor vehicle fatalities were included if the child was in the care of a provider at the time. Fatalities from natural causes were excluded.² We gathered data on fatalities attributed to sudden infant death syndrome, but do not analyze them in this discussion because they are considered natural deaths.³

As discussed, child care differs from “high-reliability” organizations, in which data on failures and near misses are systematically collected and analyzed. No government or private agency collects data on injuries or fatalities in child care. Such basic sources as national homicide records or vital statistics records are inadequate because child care often is not identified as a child’s place of death. Even when child care is

indicated, it is seldom distinguished by type (Finkelhor and Ormrod 2001).

Research on child care fatalities and serious injuries has been limited. One national study found that requiring caregiver training beyond high school reduced accidents, but the study excluded infants and had little information on how injuries occurred (Currie and Hotz 2001). Other work, predominantly showing injuries in child care to be minor (usually on playgrounds) and less common than those at home, draws on samples too small to provide data on fatalities (Alkon et al. 1994; Briss et al. 1994; Consumer Product Safety Commission 1999; Kotch, Hussey, and Carter 2003; Thacker et al. 1992). A study of child care fatalities in four localities analyzed only nine cases (Good, Parrish, and Ing 1994). An analysis of crimes against children by babysitters, using the FBI’s National Incident-Based Reporting System, found that they made up only 4 percent of crimes against children younger than 6 years of age, but center staff were not defined as babysitters (whereas teen sitters were included), and the study had limited geographic coverage (Finkelhor and Ormrod 2001).

These limitations led us to create our own dataset. To obtain as complete a picture as possible of caregiving failures, we collected data from three sources: media reports, legal cases, and state records.

MEDIA SEARCH

We conducted a systematic national search of full-text newspaper databases from 1985 through 2003 for cases of caregiving failures in child care involving fatalities, serious injuries, sexual abuse, or “near misses” (cases in which children could have come to harm but did not, such as cases of toddlers found wandering on highways).⁴ The search was conducted using Nexis, Dialog, and the electronic archives of individual newspapers through 2000. In 2001, we contracted with a clipping service, Burrelle’s-Luce, to conduct the media search.

² Among the natural deaths in child care we found, 18 resulted from bacterial meningitis, 6 from *Escherichia coli*, and 3 from pneumonia. Children’s attendance at child care settings with more than 6 children has been found to increase the rates of communicable illnesses (gastrointestinal, respiratory, and ear infections) among them compared to children at home or in smaller child care groups. Research has been inconclusive on whether this early exposure will convey relative immunity as children get older (NICHD Early Child Care Research Network 2003).

³ Previous research has shown that sudden infant death syndrome (SIDS) deaths in child care occur at a higher rate than in children’s own families. Roughly 7 percent of SIDS deaths would be expected to occur in child care, based on enrollment and hours in care, but a study of 1,916 SIDS cases in 11 states found that 20.4 percent occurred in child care, with deaths occurring disproportionately in family day care as compared with center care (Moon, Patel, and Shaefer 2000). Some researchers believe that the higher SIDS rate in child care could be attributable to the placement of infants in unsafe sleep arrangements (Moon, Biliter, and Croskell 2001).

⁴ We found 524 near misses: 22 percent involving lost children, 16 percent involving fires on the premises, 9 percent involving children left alone in vehicles, 8 percent involving violence on the premises, and 8 percent involving access to poisons.

Burrelle's-Luce covers all 17,000 English-language and Spanish-language daily and weekly newspapers in the United States, and also the transcripts of local TV news broadcasts. To check the Burrelle's-Luce search process, for the first 2 months we compared findings with those using Nexis. Overall, the media search yielded 3,681 cases of caregiving failures. Of these, 43 percent occurred in family day care, 24 percent in child care centers, and 16 percent in in-home care.

LEGAL SEARCH

We used Lexis for Law Schools to search for civil and criminal legal cases involving caregiving failures from 1990 to 2003. The search produced 777 cases, found in records of jury verdicts, settlements in civil cases, and decisions of administrative law judges in licensing cases. Again, the majority of legal cases, 47 percent, occurred in family day care homes, whereas 28 percent occurred in center care and 10 percent in in-home care.

STATE RECORDS

Media and legal records provided data on adverse events that reached the public arena. We also sought more detailed narratives on a wider range of incidents known to state authorities. Such narrative data has been crucial to the analysis of errors in aviation, in which they form the core of the incident reporting system (Billings 1998). This led us to gather state records on harms to children in child care from seven states chosen for their geographic diversity as well as the quality and accessibility of their records: Colorado, Delaware, Georgia, Maryland, Michigan, Oklahoma, and Oregon. These records included files from state child care licensing agencies, data from child protective agencies, decisions by administrative law judges in licensing cases, and data from state child death review boards.⁵

Overall, we coded 826 state records. Of these, 54 percent involved family day care cases; 38 percent dealt with cases involving child care

centers; and 5 percent involved in-home care cases. Many contained detailed accounts of investigations and findings, including rich descriptions of each care environment's work culture. They constituted a source of ethnographic data providing insight into participants' thoughts and feelings as well as specifics on how each event occurred.

All cases were coded on a wide range of variables including the age and sex of the child and caregiver, the type of care, the manner of death (e.g., homicide, accident), the type of incident involved (e.g., drowning, suffocation), the location of the incident, and any record of prior abuse or neglect by the caregiver. Cases from media, legal, and state records yielded similar findings.

DATA STRENGTHS AND LIMITATIONS

Our dataset provides the most comprehensive information currently available on serious caregiving failures in child care. Its advantages include collection of data over a long period on a national basis, which is important in the study of rare events. The dataset covers all types of child care and fatalities from both violence and accidents. Finally, the data often include detailed narratives of how caregiving failures occurred, offering rich information on the circumstances that led to fatalities or other caregiving failures, the relationships between the parties, and the reactions of those involved.

The data also have limitations. Most importantly, although our search processes were systematic and thorough, not all cases of caregiving failures reach the media or become the subjects of civil or criminal cases. Fatalities are likely to be the best reported adverse events, however, and we concentrate on them in this analysis. We calculate fatality rates and draw upon the ethnographic data to illuminate how fatalities occur. There is no doubt that fatality cases have been missed. It is important to note that error can be in only one direction, that of fatality undercounting. Each case is specific and identifiable, with no projection to a sample. Our data are best understood as providing a lower bound on fatalities.

REPORTING BIAS

Given our analytical strategy of comparing fatalities across types of care, it is crucial to consider

⁵ Some records were obtained through Freedom of Information Act requests. State authorities made others available to us.

whether our sources are likely to be biased, reporting some types of fatalities in some types of care more than others. We note that child care centers are the most public kind of care facilities and the most likely to be licensed and inspected. They serve larger numbers of children at a site than do home-based arrangements, further increasing their social visibility, as compared with in-home care or family day care. Finally, they carry insurance, which makes them likely to be a more fruitful target for civil suits than more informal types of care in private homes. Given these circumstances, we believe that fatalities in centers are more likely to reach public view than those occurring in family day care or in-home care.

The next section discusses fatality rates in child care by age of child and type of care, followed by sections analyzing differences in fatality rates for different types of care.

FATALITY RATES

Media, legal, and state sources yielded reports of 1,362 fatalities in child care from 1985 through 2003. These included 110 in center care, 270 in in-home care, and 656 in family day care.⁶ In an additional 104 cases, the care was provided in a private home, but the source did not specify whether it was the child's or the provider's home. A category of "home-based care" can be created by combining child care in private homes, whether the child's or the caregiver's, with this combined category accounting for a total of 1,030 deaths.

We calculated fatality rates across types of care. This required estimates for the number of children enrolled in specific types of child care arrangements. Two major national data sources provide such estimates by age of child and type of care: the National Household Education Survey (NHES), which relies on a telephone survey conducted by the National Center for Education Statistics, and the Survey of Income Program and Participation (SIPP), a face-to-

face survey carried out by the Census Bureau. The two surveys differ in their estimates of how many children are in in-home care, and to a lesser extent, of how many are in family day care. Child care enrollment figures are sensitive to variations in survey type and question wording (Rindfuss, Raley, and Harris 2000).

Given the enrollment differences across surveys, we calculated overall fatality rates using enrollment data from each survey (Figure 1). Later analyses will rely on enrollment data from the NHES because it offers more recent data. The NHES contains age-specific child care enrollment data from surveys conducted in 1995 and 2001, and the SIPP data comes from surveys in 1995, 1997, and 1999. For the rate calculation, we selected the period from 1993 to 2003 because earlier data on the child's age by type of care are not available. Our denominator consisted of summed enrollment data for these 11 years. For the numerator we summed our fatality data for children ages 0 to 4 years during the same period.⁷

For 1993 through 2003, the overall fatality rate per 100,000 children in child care was 0.71 using the NHES and 0.83 using the SIPP. Child care is quite safe as compared with other settings in which children spend time, and deaths in child care make up only a small part of overall injury mortality in the age group. This is in line with the findings of Currie and Hotz (2001), who reported that child care provides a generally safe environment, partly because motor vehicle accidents are less likely in child care, although not one without significant risks. Analysis of the data on fatalities, however, shows that there are striking differences in the safety of different types of care and among children of different ages. Areas of high vulnerability are concealed in overall fatality rates.⁸

⁷ In calculating rates, we excluded fatalities we found in the years 1985 through 1992. These fatalities, however, are useful to analyze for insight into situations leading to risks, even though the actual rate calculation covers a later period.

⁸ We also calculated rates using hours of care and rates for each child's age group on an annual basis in each type of care over the 11-year period. Patterns were consistent. The results are available from the authors on request.

⁶ We found, but excluded from the analysis, 124 fatalities in relative care and 98 fatalities in "makeshift" care arrangements (in which parents were not relying on a regular caregiver). We also excluded (and did not count in the fatality total) 289 deaths attributed to sudden infant death syndrome.

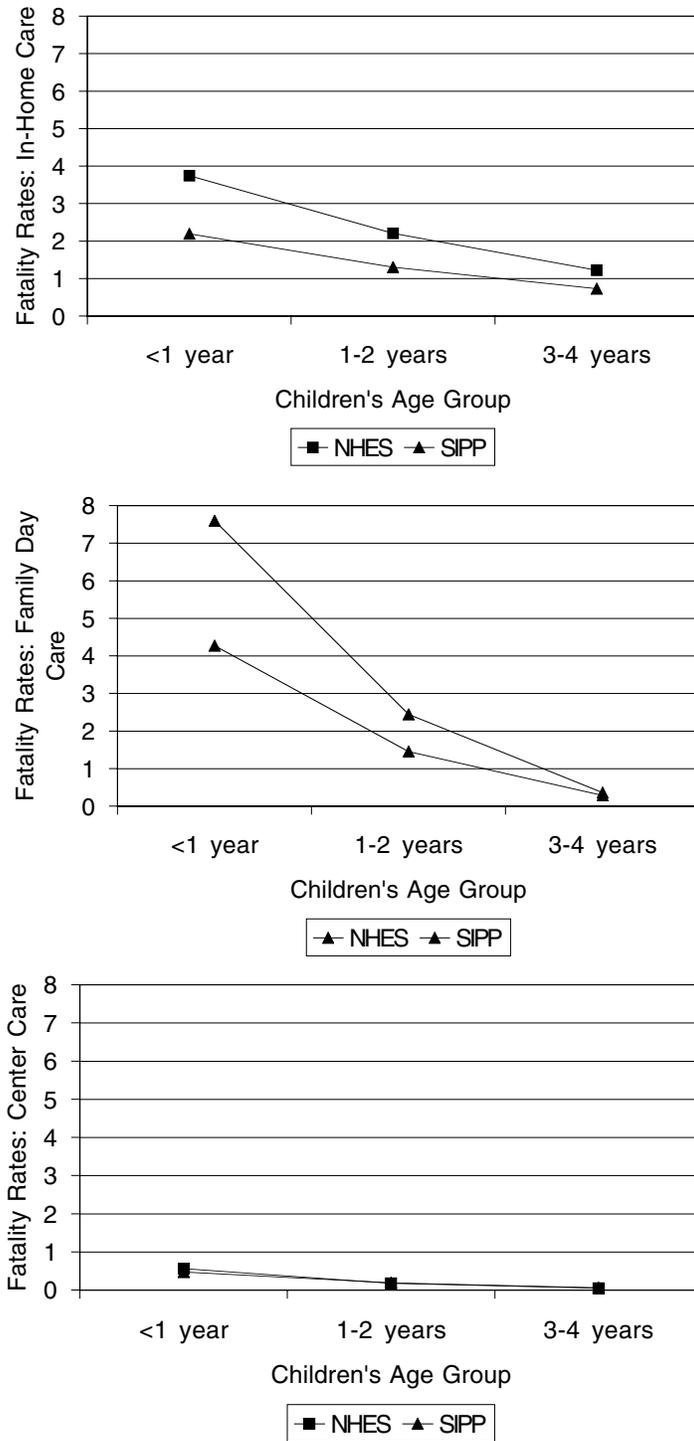


Figure 1. Fatality Rates per 100,000 Children in Three Types of Child Care by Child Age Using Two Sources of Enrollment Data in the United States, 1993–2003

Note: Two datasets were used, the National Household Education Survey (NHES) and the Survey of Income Program and Participation (SIPP), because of differences in enrollment figures between the surveys.

DIFFERENCES IN FATALITY RATES ACROSS TYPES OF CARE

We compared fatality rates by age group and type of care for 1993 through 2003. The fatality rate in centers for children 0 to 4 years of age is 0.11 per 100,000 children enrolled. Family day care, offered in the provider's home, is less safe, with a fatality rate of 1.58. Care in the child's own home is the least safe, with a fatality rate of 2.06.⁹

Infants (children younger than 1 year) are far more vulnerable than older children. The overall fatality rate rises to 3.06 per 100,000 children in the 0 to 1 year age group. Even more striking are the differences in fatality rates for infants across child care types. Infants in family day care have a fatality rate of 4.27, more than seven times the rate of 0.56 in child care centers. The safety advantage of centers diminishes for children beyond infancy, but remains substantial for children younger than 4 years of age. The most dramatic differences occur in rates of infant deaths from violence (Figure 2). Deaths from violence occurred for 130 infants in family day care (rate of 2.31) and for 24 infants receiving in-home care (rate of 2.00), whereas the findings showed no deaths of infants from violence in centers between 1993 and 2003.¹⁰ Deaths from accidents are more evenly distributed across types of care, although centers also have a safety advantage in this area among the youngest children. Again, this advantage diminishes with age, but is still notable by the time children reach 3 and 4 years of age. Only one type of fatality occurs at a higher rate in centers than in family day care or in-home care: child death from heat stroke attributable to children forgotten in vehicles.

Thus far, we have considered all three major types of nonrelative child care. In most of the discussion that follows, we combine the two forms of care that occur in private homes: care offered by family day care providers in the provider's home and care offered by nannies or

babysitters in the child's home. We refer to this combined category as "home-based care." We do this for simplicity of presentation and because the patterns in these modes of care are similar and distinctively different from those occurring in child care centers. For completeness, data for all three modes of care are presented in separate tables later in this article.¹¹

For home-based care, the rate of infant fatalities attributable to accidents is seven times that for centers (1.60 to 0.23). For children of all ages, centers are highly protective against acts of violence. Between 1985 and 2003, we found 39 serious injuries from violence in centers, as compared with 347 in home-based care. For fatalities from violence, the difference is more striking: We found 5 cases of fatal violence in centers, as compared with 507 in home-based care.

It is noteworthy that age-related patterns of fatalities attributable to neglect or abuse in home-based child care track quite closely with those found in families. An estimated 1,500 children died of abuse or neglect in 2003 (U.S. Department of Health and Human Services 2003:55). Nearly four-fifths of these fatalities were attributed to abuse or neglect by one or both of the child's parents. Of the estimated 1,500 fatality victims, 43.6 percent were infants younger than 1 year. In home-based child care (family day care and care in the child's home), 39.4 percent of fatalities in our dataset were experienced by children younger than 1 year. In centers, only 20 percent of fatalities were experienced by infants.

It is striking that with three types of care occurring in private homes (care provided by parents, family day care providers, and in-home caregivers), infants are the subjects by far the most vulnerable to death from abuse or neglect. If it were not for the pattern observed in centers, it might be thought that, across the board, infants simply are more vulnerable than other children because of their "dependence and fragility" (Banks 2003:3). This vulnerability appears to be socially conditioned, however, because it is much less evident in centers. The protectiveness of centers is shown most strikingly in the absolute numbers: We found only 1 infant fatal-

⁹ In doing these calculations, we excluded 104 fatalities for which we had insufficient information to know whether they occurred in the child's home or the provider's home.

¹⁰ We did find one infant death from violence in a center. It occurred in 1985, outside the years of the rate analysis.

¹¹ Figures comparing home-based care and center care are available from the authors.

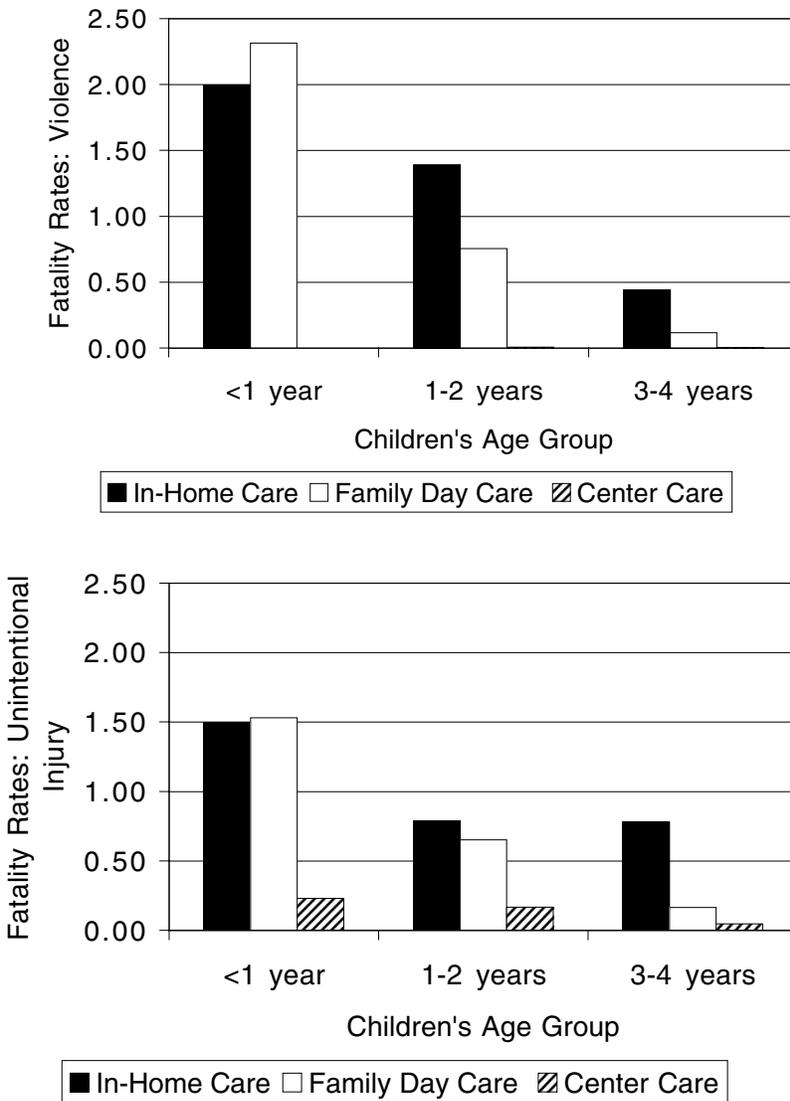


Figure 2. Fatality Rates per 100,000 Children in Child Care by Child Age, Type of Care, and Cause of Death in the United States, 1993–2003

ity from violence in centers and 10 from unintentional injuries.

Before turning to possible explanations for differences in fatality rates, we consider a possible difference between regulated and unregulated providers *within* family day care. Almost all centers are licensed, whereas in-home caregivers are not regulated by the state. Family day care is the only form of care with many providers in both categories, licensed and unlicensed. There are several reasons why licensed family day care providers may offer safer care

than unlicensed providers. First, overall, they offer higher-quality care (Helburn and Bergmann 2002). Second, licensing rules include many safety requirements. Licensed providers must lock up hazardous supplies, cover electrical outlets, and sometimes take basic safety courses. Finally, licensing could enhance caregivers' identities as professionals, which in turn could help them deal with the rigors of caregiving (Helburn and Howes 1996:69).

We are not able to compare fatality rates across the licensed and unlicensed sectors of family day care because the number of children in unregulated family day care is unknown. We can, however, determine that being licensed is not the crucial element in the safety of centers, as compared with that of family day care. This can be confirmed by calculating a fatality rate using those cases known to have occurred in licensed family day care. This rate will be a major underestimate because enrollment data from the NHES or the SIPP do not specify whether the child is in licensed or unlicensed family day care. Therefore, the total enrollment in family day care must be used as the denominator (whereas the figure for licensed family day care would be much smaller). Even with the use of this overly large denominator for lack of a more accurate one, the fatality rate for infants in licensed family day care is 2.4 times higher than in center care (1.34 to .56). In short, the fatality rate for the licensed family day care sector is significantly higher than for centers, even though these two modes of care are alike (and different from other modes of care) in being regulated.

WHY DO CAREGIVING FAILURES OCCUR?

The striking differences in fatality rates across types of care offer a starting point for analysis. Three possible explanations of the fatality patterns are considered: first, it is suggested that the differences arise from selection bias in the sorting of children into types of care; second, that the differences arise from variations in the quality of care offered across types; and third, that the different fatality patterns arise from differences in the social organization of caregiving work.

SELECTION BIAS

Different types of children, or perhaps different types of families, could be sorted into in-home child care, family day care, and center care. It is possible that more demanding children are more often in home-based environments than in centers or vice versa. It also is possible that there are socioeconomic differences in the parents choosing the various types of care. For example, if there were more children from poor

families in family day care than center care, this could affect the ability of parents to monitor care arrangements. Poor parents might lack the job flexibility, access to transportation, or social capital to monitor their children's care as effectively as more advantaged parents. Both dynamics could also operate at the same time, with poorer families having children with more difficult temperaments or behavior problems than their more privileged counterparts as well as parents with less ability to monitor their care.

Much research has been done on the child care choices of parents (Burchinal and Nelson 2000). Family day care typically is cheaper than center care, so it might be expected to draw poorer families. In-home care usually is the most costly, presumably making it most available to affluent parents. These patterns do hold, but only to a limited extent. Analysis of data from the NHES shows that each type of care (centers, family day care, and in-home care) enrolls children from families across the income range. Child care centers have substantial numbers of children from poor families, with many receiving subsidies. Head Start and state-supported preschool programs alone enroll roughly 1.5 million children (Fuller et al. 2004:507). Even in-home care, with the association of nannies with affluent families, actually covers a broader range than its public image suggests. Immigrants at the bottom of the socioeconomic ladder often hire people in their communities who are available for low wages and speak their language (Wrigley 1995).

Fuller et al. (2004) reported that child care choice does not occur along straightforward economic lines. These authors argued that researchers have focused too much on factors affecting parents' individual choices and have paid insufficient attention to geographic, social, and institutional factors that affect selection of care. Overall, there is a curvilinear relation between center quality and family income, with middle-income families experiencing "the most uniformly poor quality of care," as compared with upper-income families or low-income ones, whose children often benefit from subsidized programs (Phillips et al. 1994:489).

This is further reinforced by evidence that families often change child care arrangements as their immediate circumstances change. When parents change work hours, move to a new house, or have another child, they often switch

modes of care (NICHD Early Child Care Research Network 2004). All these factors militate against matching types of care with parents of different socioeconomic levels.

There remains the issue of whether children are sorted into types of care on the basis of their own temperaments or characteristics. Families with children who have physical or behavioral handicaps, for example, may prefer the attention offered by individual caregivers. There are indications, however, that centers enroll more children with disabilities than family day care homes (Whitebook et al. 2004). Furthermore, the highest fatality rates occur among infants, including those only a few months old. Although some infants are more difficult to care for than others (Stafford, Nagle, and Rice 2005), the characteristics of such very young children are not as fully developed or visible as those of older children, suggesting that selection among them is unlikely.

In summary, selection bias does not appear to explain the pronounced fatality patterns found across child care types. Selection among parents is complex, with socioeconomic variation in each type of care, and the literature provides no evidence for selection among very young children, among whom differences in fatality rates are greatest.

DIFFERENCES IN QUALITY OF CARE

It is possible that differences in quality of child care underlie the different fatality rates across types of care. Centers may offer higher-quality care overall, which could also translate into safer care. Here, too, the picture is complex. Researchers generally agree that quality differences within care types are wider than those across them, with each type running the quality gamut. Even within specialized sectors, such as child care centers serving low-income populations, there are wide quality differences (Phillips et al. 1994:488). To the extent that quality differences occur across types of care, research suggests that for the youngest children, quality is higher in family day care and in-home care than in centers. A study of 576 children found that caregivers in family day care and children's homes were warmer and more responsive to infants than those in centers (NICHD Early Child Care Research Network 1996). By the time children were 3 years old,

however, centers had improved their quality standing (NICHD 2000), leading NICHD researchers to conclude that "no one care type is uniformly 'better' than another" (NICHD 2004:226).

Quality of care does not appear adequate to explain differences in fatality rates between centers and home-based care. If anything, quality differences run in favor of home-based care and against centers, especially for infants. It is worth remembering that centers not only have lower fatality rates, they also have an almost complete absence of deaths from violence. Even the lowest-quality centers are almost completely protective against fatalities from violence. Similarly, even the centers serving the poorest families are almost completely free of such fatalities. They also have a strikingly different age pattern of fatalities. Whether from violence or accidents, infants are more protected in centers than in either type of home-based care or even care within families. This suggests that the explanation for differences in fatality rates should be sought in elements of care that distinguish centers from all three forms of care offered in private homes (care within families, by family day care providers, and by in-home caregivers).

THE SOCIAL ORGANIZATION OF CARE

Research investigating mistakes in different types of organizations has found that the work culture affects the incidence and nature of errors. Medicine offers the closest analogy to the organizational environment of human services. Often, mistakes arise through failures of communication that hamper the checking of individuals (Sutcliffe et al. 2004). These failures themselves typically arise from larger institutional problems, including steep authority gradients that can make subordinates afraid to question a superior. Finally, norms of professional autonomy and protectiveness can hamper the weeding out of the unskilled (Hughes 1971).

Centers clearly differ from home-based care in their work culture and organization (Kontos and Stremmel 1988; Phillips, Howes, and Whitebook 1991; Strober, Gerlach-Downie, and Yeager 1995). They are formal institutions, contrasting sharply with the informal organization of care in private homes. Their formality entails specific features that distinguish the organiza-

tion of work from that of care offered in private homes. Centers have multiple employees. Staff members operate on a professional model, with training and accountability to a director with professional authority. Finally, centers are single-purpose organizations that have clear boundaries. They are not living spaces, and thus have rules governing access.

Home-based care differs in all three of these elements, at least in degree, and generally in kind. Most caregivers in private homes work without supervision or coworkers. They typically operate not on a professional model, but on a quasi-maternal one and have little or no training. Finally, they work in private homes, without organizational boundaries surrounding the care arrangement (Fitz Gibbon 2002; Kontos et al. 1994; Nelson 1991).

The Institute of Medicine's report on medical errors noted that mistakes in organizations can be studied through analysis of "naturalistic decision making," an examination of how people make decisions and operate in their natural work settings (Kohn et al. 1999:63). Bosk (2005) went further and argued that the analysis of work culture has been neglected in the study of mistakes, although many types of errors spring from the organizational dynamics of particular work settings. Relying on detailed narratives of how fatal incidents in child care have occurred, we now turn to the question of how they may be affected by the structure and work culture of the different care arrangements in centers and private homes. We look first at ways in which faults and weaknesses of individuals may (or may not) be checked in different work settings, focusing particular attention on how the presence of coworkers may affect caregiver violence against infants.

VIOLENT FATALITIES AND THE ORGANIZATION OF CARE

THE CHECKING OF INDIVIDUALS

The largest differences in fatality rates between center care and home-based care arise from violence (Table 1), especially for infant deaths. The protection of infants from violent fatalities in centers is almost total. We found a report of only one infant death from violence in a child care center (Case 340), the death of a 2-month-old in 1985.¹² Home-based care lacks such a level of protection against violent deaths to infants. In cases of infant deaths from violence in home-based care, the caregiver is the perpetrator in the overwhelming majority of incidents (91.3 percent of cases). Fatal violence to infants arises overwhelmingly in the core of the caregiving relationship.

Most infant deaths from violence in home-based care are caused by shaking (61.1 percent). Because the head of an infant is large in proportion to its body size, and because the neck is weak, only 20 seconds of vigorous shaking can cause severe brain damage and retinal bleeding (sometimes causing blindness) from the whiplash motion (Feldman et al. 2001; Jenny

¹² The center was unusual, accepting children on a drop-in basis and operating in the evening. It resembled a babysitting service more than a typical center. The parents dropped off their baby for their first evening out since his birth. When they returned, workers reported that he was not breathing. They had not sought help for him. The death was first classified as attributable to sudden infant death syndrome (SIDS), but when the parents protested, it was reclassified.

Table 1. Fatalities and Serious Injuries from Violence by Type of Child Care in the United States, 1985–2003

Type of Incident	Fatalities, by Type of Care				Serious Injuries, by Type of Care ^a			
	FDC (%)	In-home (%)	Center (%)	Total (N)	FDC (%)	In-home (%)	Center (%)	Total (N)
Violent Assault	66	32	2	255	61	18	21	160
Shaking	84	16	0	187	85	12	3	168
Sexual Assault	25	75	0	16	47	47	5	19
Total, N	330	123	5	458	249	59	39	347
(%)	(72)	(27)	(1)	(100)	(72)	(17)	(11)	(100)

Note: FDC = family day care.

^a Requiring medical care.

et al. 1999; Listman and Bechtel 2003). Most shaken baby fatalities occur to infants, but toddlers can also die from shaking if the action is sufficiently violent.

Case records suggest that shaking incidents most commonly arise in response to caregiver anger and frustration over infant crying. Crying is highly aversive to many adults and can be a trigger of child abuse within families (Crowe and Zeskin 1992). A Danish study found that almost 6 percent of parents confessed that they sometimes took risky actions to stop their babies' crying, including smothering, slapping, and shaking them. The peak of infant crying, with its provocative effect on adults, coincides with the periods of greatest child abuse, including fatal abuse (Reijneveld et al. 2004:1342).

The narratives describing 203 cases of shaken baby fatalities and 187 shaking injuries in home-based care (including care in the provider's or child's home or with an undetermined home location) show the intensity of caregiver desire to get babies to stop crying. A 36-year-old licensed family day care provider in Nebraska, Teri Hicks, described in a handwritten confession how she came to shake a 4-month-old baby in her care. The baby "was crying while I was changing his diaper, and my son was playing with the phone. . . . I got frustrated and shook Peyton. After I shook Peyton, he went unconscious and did not wake up. Immediately after I shook him, I wanted to take it back. I just wanted him to stop crying." The provider had been in business only 3 weeks (Von Kampen 2002, Case 2283).

In another incident, a New York nanny, Melanie JeanBeaucejour, told detectives how she shook a baby to death. When he would not stop crying, she hit him on the top of his head with her fist several times. He continued crying. She told detectives that she then picked up the baby and started shaking him. "'I do not know how long I shook the baby, but I did not stop until he was unconscious'" (Seper 2001, Case 2136).

Caregivers who are depressed or ill can lose the emotional resilience necessary to deal with the stress of infant crying. A family day care provider, Tonia Johnston, with a "real bad" headache said she felt overwhelmed when she could not get a 6-month-old boy in her care to stop crying. "Fed up with the baby's uncontrollable sobbing, Johnston picked him up in his

bouncy chair and threw both on the floor. . . . 'Everything I tried to do, he just got louder,' she told police. Johnston started shaking [the baby] violently and realized something was wrong when he went silent and curled his fists to his chest." The baby died, and she was charged with murder (Monks 2004, Case 3999).

Some caregivers describe themselves as responding with rage to infant acts that they interpret as aggressive. Margolin (1990a) also found that caregiver abuse of children was sometimes fueled by anger over seeming infant aggression. In our database, a nanny threw a baby across the room, fracturing his skull, after he pulled her long hair (Case 101). Other caregivers shook or assaulted children when they spit up or urinated on them (Cases 1580 and 920). Some caregivers expressed not just impulsive anger toward children, but dislike for the particular infants in their care. A family day care provider said the baby she shook was "difficult to love" (Case 810). Another described a baby in her care, also shaken to death, as being ugly and retarded (Case 682), and a family day care provider said the baby who died at her hands cried all the time and "clung to people like Velcro" (Case 1431).

Collective and internal pressures on people can narrow cognitive options and impair decision making (Vaughan 1999). This seems to happen on a very intense level when caregivers shake or assault infants. People in the grip of intense emotion can forget the future as they give priority to relieving their immediate stress (Loewenstein 2004:691; Tice, Bratslavsky, and Baumeister 2001). When infants cannot be consoled or quieted, providers can feel incompetent, precipitating anger (Margolin 1990a). Caregivers can lose all perspective on the children's behavior. Crucially, "intense visceral factors tend to narrow one's focus inwardly—to undermine altruism" (Loewenstein 2004:693). Confrontations are particularly damaging when staged with the most physically vulnerable children, infants.

Some caregivers express astonishment at what they have done. A 28-year-old family day care provider in Illinois admitted that she had shaken Jake, the child in her care. She was charged with reckless homicide. She said:

Normally when I can't deal with Jake I walk out of the room to cool off. I don't know why I didn't walk out of the room. It was like something

snapped. It seemed like Jake was crying forever and wouldn't stop. I went over to Jake and I picked him up and I shook him. I didn't mean to do it that hard. I didn't even know I did it that hard (Case 2850).

Centers are remarkably protective against this form of violence to children. We found no shaken baby fatalities in centers and only five injuries, although shaking is an impulsive action that can occur within seconds. Case narratives of violent fatalities in home-based care indicate that they often arise quickly out of anger and stress. The generation of these emotions, or their expression in violence, may be limited in centers because of the presence of coworkers.

The controlling effect of multiple employees is hard to assess, but we reviewed cases of fatal violence in home-based care and found cases in which caregivers engaged in fatal violence against young children even in the presence of adults or children old enough to serve as witnesses. One example involved an Indian immigrant, Manjit Basuta, the mother of three children, who was a family day care provider in San Diego. When a 13-month-old boy was taken to the emergency room from her home with fatal head injuries, Basuta said that he had fallen while playing with other children on her brick patio. Basuta had an assistant, however, Cristina Carrillo, an undocumented immigrant from Guatemala, who first supported Basuta's story, but then told police that she had seen Basuta shake the boy. She said that Basuta became enraged when the child would not break off from watching TV to have his diaper changed. Carrillo described Basuta as grabbing the boy by his arms, shaking him violently, then putting him on the floor and continuing to shake him until he turned blue and lost consciousness. Basuta could not overcome this testimony and was convicted and sentenced to serve 25 years to life in prison.

In another case with witnesses, a family day care provider told investigators that a dog had knocked an 18-month-old boy off her porch, leading to fatal injuries. The providers' two teenage daughters eventually said, however, that they had seen their mother abuse and shake the boy when he would not stop crying. The provider was charged with first-degree murder (Case 2091). These were not the only children to testify against a parent (Case 880). Siblings of victims also sometimes have witnessed abuse

and were old enough to talk about it. A nanny told police that a baby had fallen out of a walker, but the victim's older brother said that his brother had been crying and the nanny had shaken him. The nanny was convicted of second-degree murder (Case 372). In another case, a victim's brother ran next door to tell a neighbor of the caregiver's assault.

These cases show that caregivers can shake and assault children in the presence of others, but most of the potential witnesses were dependents (an undocumented employee of the provider or children). Such dependents can later report what happened, but might not be "capable guardians" (Cohen and Felson 1979) in the sense of exerting a powerful restraining effect on others.

Experience in medicine has shown that residents and nurses can be reluctant to challenge powerful supervising doctors (Kohn et al. 1999). "High-reliability" organizations actively work to overcome such reluctance on the part of subordinates.

In centers, employees are peers, with their own professional standing. The authority gradient in child care is low. Most child care workers believe in the importance of their work (Curbow et al. 2000:528; Strober et al. 1995). This type of value commitment can enhance organizational functioning (Weick 1987:124). Center workers also have legal and professional obligations to report abusive actions by coworkers. They regularly do so, as shown in state records. They also inform police or parents of abusive behavior. Examples include staff members in a Florida center who told a mother that another employee had thrown her 2-year-old daughter against the wall (Case 1873), and employees who accused a staff member of abusing eight children her first day on the job (Case 3122). In another center, coworkers called police when an employee shook, hit, and threatened four children. The worker was arrested (Case 2425). In Oregon, a new worker called state authorities after witnessing teachers screaming at and demeaning children (Case R31). Workers' ability to observe each other directly gives them an information advantage over workers in many fields, including medicine, in which doctors usually rely on indirect reports for evaluating colleagues (Bosk 2005). Aside from monitoring each other, coworkers may help each other regulate behavior even when they are depressed.

Center employees are more likely to report clinical levels of depression than are family day care providers (Hamre and Pianta 2004; Whitebook et al. 2004:61). Observers found, however, that only among family day care providers did depression lead to more negative interactions with children, perhaps because the structured nature of the centers may have constrained those who were upset or depressed (Hamre and Pianta 2004:314). Some caregivers who shook babies said they were ill or depressed at the time. Home-based caregivers lack emotional support from other adults or the social control they can provide.

In addition, multiple employees might help limit stressful situations. Staff members value center directors who allow them to take breaks when they have reached their emotional limits (Strober et al. 1995:107). In centers, no one caregiver is likely to be saddled with an inconsolable infant. Multiple employees can both provide support and exert social control. Finally, because centers transcend individuals, they can make it possible for staff members who feel that they are emotionally disintegrating to remove themselves from the situation. In Delaware, a staff member reported a substitute employee at the center to the director for punching a toddler in the stomach. The director, in turn, reported the incident to the police and licensing authorities. Meanwhile, the perpetrator told a coworker, "I can't take this. I need to go home," and left the premises. The state investigator's report said:

Perp[etrator] said that she had to leave because she was feeling "unstable . . . a little on the edge . . . children were just crying." . . . (She) was the only one concerned with getting them quiet . . . thought the best thing to do was to come home . . . settle down and calm down (Case D9).

If this distraught staff member had been in sole charge of children, she might have reached a flash point at which she would have gone beyond punching a toddler. In private homes, caregivers may try to escape, but the organization of care makes a true escape impossible. In a family day care case, the provider went into the back yard to escape the children, later telling investigators that "adults need time-outs too." Not able to remove herself fully from the situation, she returned to the house, where she shook and severely injured a 2-month-old boy (Case 2190).

It makes intuitive sense that multiple employees would enhance safety. It is, however, unlikely to be the whole explanation for the almost complete absence of fatal violence against young children in centers. First, some acts of aggression against children do arise in centers, as discussed later. Centers protect extremely well against fatal violence, but not against all violence. Furthermore, some teachers in centers display anger and hostility toward children even in the presence of other adults, suggesting that professional norms are not fully enforced (Ahn 2005:59; Mill and Romano-White 1999).

Second, day care employees sometimes are alone with children. Staffing problems are frequent in centers (Krieger 2001; Strober et al. 1995) and can lead to teachers being on their own, especially at the beginning and end of each day or at nap time, when others are given breaks. State records contain many reports of licensing violations arising from individual workers being left with many children.¹³ Multiple employees are likely to enhance safety in terms of both surveillance and support, but centers are small institutions with much staffing flux, and their presence is not guaranteed.

TRAINING AND STRUCTURAL SUPPORTS

Another protective element of centers may derive from their professional orientation. Center staff members have an educational advantage over home-based caregivers (NICHD Early Childcare Research Network 2004:214; Burton et al 2002). Almost half of center teachers have college degrees, compared to only 11 percent of licensed family day care providers (Blau and Currie 2004:17). Training shows the same pattern. Less than 1 percent of center teachers have been found to have no training in early childhood development (Saluja, Early, and Clifford, 2002:11), as compared with roughly half of family day care providers (Marshall et

¹³ The National Household Education Survey (NHES) survey has a question for parents on how many adults are in the "room or group" with their child in child care. Surprisingly, 16.5 percent of parents of children in centers said that they were with one adult. This response could be attributable to the ambiguity in the question wording, but it does suggest that the "multiple adults" feature of centers is not absolute.

al. 2003). Teachers report that they find their jobs easier when they know more about child development (Strober et al. 1995:109). Centers also are run by directors, who have more professional training and education than teachers, and who provide supervision and administrative support (Burton et al. 2002:24). Directors screen out individuals who are unstable or unskilled (Krieger 2001:222).

Centers might also be more than the sum of their parts in terms of staff training. Multiple staff members can compensate for individuals who are poorly trained. In a comprehensive study of child care in a community, Whitebook et al. (2004:19) wrote: "In family child care homes, where the quality of care is highly dependent on a single, relatively isolated adult, the training of the individual provider is extremely important. In center-based arrangements, it is the training of the teaching staff considered as a unit . . . that most strongly influences the quality of children's experiences."

Although center staff members are, on the average, better educated and trained than home-based caregivers, Whitebook et al. (2004: 62) pointed out that the work forces have many of the same characteristics. There are "striking similarities" between center teachers and family day care providers, with caregivers in both sectors being "female, primarily between the ages of 30 and 50, and married with children." They are also alike in that many members of both groups earn little. Salaries often are insufficient to cover basic needs. There is considerable movement of workers back and forth between sectors. The organizational circumstances in which the two groups work, however, are very different. In-home caregivers lack most of the structural supports that can bolster even depressed, unstable, or unskilled workers in centers.

Studies of people's daily moods have shown that two features of the working environment are particularly likely to create negative moods: lack of opportunity to talk with coworkers and feeling time pressure (Kahneman et al. 2004:1779). Such features of the work situation "exert a powerful influence on affect" (p. 1779), with "time pressure a particularly important determinant of enjoyment at work" (p. 1778). In-home caregivers experience these two pressures to a high degree. Isolated caregivers must cope with children of different ages. They report

that this is one of the most demanding parts of their jobs (Curbow et al. 2000), and say that it is stressful to juggle conflicting tasks (Marshall et al. 2003). They also have little support (Whitebook et al. 2004).

Center employees, in contrast, fit into an ongoing enterprise instead of having the whole caregiving operation depend on their emotional well-being. Caregivers in centers do not report time pressures and stress from dealing with children of different ages (Curbow et al. 2000). Separation of infants is often a license requirement. The negative moods of family day care workers translate more directly into more strained interactions with children than do those of center employees (Hamre and Pianta 2004). Multiple demands on in-home caregivers, particularly family day care providers, may not only increase stress, but may also reduce their ability to provide individual attention to children. Group sizes and the child-adult ratio affect the quality of care (NICHD 2000). In infant fatality cases, 12 percent of the family day care providers were said to have been looking after too many children, but this was not a factor in such fatalities in centers.

BOUNDARIES

"High-reliability" organizations strongly enforce physical and institutional boundaries. Outsiders are not allowed on the premises of aircraft carriers, nuclear power plants, or chemical or materials processing facilities. They also are not allowed to intervene in the workings of such organizations. Home-based child care, with its informality and location in the private spaces of families, stands at the opposite end of the scale in terms of boundary creation and enforcement.

The fatality data show that this creates some distinctive risks. This is especially the case with family day care, in which the providers' family members and guests may be on the premises. These individuals are likely to have no training in child care. They may have no commitment to caring for the children although they are in close daily contact with them. Infants may interact primarily with caregivers. Family day care providers are responsible for 90 percent of the fatal violence against the infants in this mode of care, with family members of providers accounting for 8 percent. As

children grow older, they may increasingly encounter other members of the household. Among 3- and 4-year-olds, family day care providers are responsible for 75 percent of the fatal violence that occurs to their charges, whereas family members account for 12.5 percent.

With infants, some fatal injuries result from the anger of others in the house over their crying. These cases are analogous to those in which the caregivers are perpetrators, except that in these instances, the caregivers generally are not present. In one instance, a family day care provider went to take a shower, leaving her boyfriend with the 13-month-old boy in her care. When the baby would not stop crying, the boyfriend put his hand over the baby's mouth for 2 or 3 minutes, smothering him (Case 831).

Other cases are similar, with caregivers leaving their husband or boyfriend, or sometimes their children, in charge, only to have them erupt in anger and shake or assault the children (e.g., Cases 871, 1028, 726, 2890, 1496, 2961, and 1502). In one family day care case, the caregiver's husband became angry when a 13-month-old girl threw cereal at him. She began crying, so he put his hand over her nose and mouth and then threw her into a crib. When he and the caregiver later found her unresponsive, they called 911. The husband was charged with first-degree murder. He admitted that the child had enraged him by her crying and said that he had nicknamed her "The Screamer" (Case 3042).

Parents are sometimes unaware of who else is in the house when they drop off their children. One provider left her boyfriend in charge when she left the house. He became angered by a 2-year-old girl's crying and threw her against the wall, causing fatal injuries. The mother said she had not known the boyfriend existed until the incident. "I had no reason to believe that anything was wrong, that anybody but Julie was watching her" (Case 2864).

In home-based care, boundaries have a limited effect as a safety mechanism because the perpetrators of violence often are within care boundaries, whether the caregivers themselves or others associated with them.¹⁴ The presence

of physical boundaries around centers, however, and institutional boundaries governing access appear to operate effectively in containing risks from parties not connected to centers. We found a total of five fatalities from violence in centers, including the case of the infant previously described. In addition, an 8-year-old boy was abducted and murdered by a fired employee of an after-school program (Case 1376).¹⁵ Two children, ages 3 and 4 years, died when a deranged driver deliberately drove onto a center playground (Case 765). In the fifth case, the perpetrator was a staff member, a 19-year-old worker who pushed a 2-year-old girl, causing her to fall onto a table, which resulted in a fatal skull fracture (Case 794).

Two of the perpetrators in these cases, the driver and the fired employee, did not enter center buildings, but attacked their victims outside, with the driver literally crashing the boundaries of the center. They invaded premises instead of being invited within them. In centers, it is also clear that boundaries do not simply envelop perpetrators, because staff members were very rarely the perpetrators of fatal violence. The formality of centers offers a protective element in the clear lines drawn between those who are in and those who are out, with only those connected to the institution's purposes generally granted access (with some exceptions, as noted in the next section).

INJURIES FROM VIOLENCE IN CENTERS

Before turning to fatalities from unintentional injuries, we briefly discuss injuries from violence in centers. Although our discussion focuses on fatalities, it is important to note that centers do not control all injury-producing violence against children. This suggests that protections may be effective but not absolute. Injuries from violence in centers deserve analysis not only for their importance in themselves, but also because they offer insight into situations that can weaken protective mechanisms and their consequences. They are not "near misses" in the

¹⁴ Space precludes discussion of sex abuse cases in child care, but it is relevant to note that in family

day care, 68 percent of the perpetrators in sex abuse cases are family members of providers.

¹⁵ This case was not included in the rate analysis because the victim was past the age limit.

conventional sense of being events that could have caused harm but did not, because they did cause harm. But they are near misses in the sense of illuminating problems not revealed in the fatality analysis.

For the period 1985 to 2003, we found reports of 39 serious injuries to children from violence in centers: 33 assaults, 5 shakings, and 1 sex abuse case resulting in physical injury. If centers have multiple protective mechanisms, why did they not operate in these cases? Narratives of how fatalities occurred allow us to identify some ways protective mechanisms can be weakened.

The first way is a boundary issue. Center owners have access to centers, although they are not professionals as are directors. Case records suggest that their presence can sometimes be problematic. Cases include an owner biting a child to teach her a lesson (Case 3030), an owner charged with cruelty for locking a girl in a pantry and telling her that it was filled with bugs (Case 668), owners ordering staff members to give babies sedatives (1280 and 3165), and owners charged with hitting and abusing children (Cases 3165, 2120, 2135, 3165, and D33). Owners' family members also can behave unprofessionally, echoing some of the problems that can exist in family day care. In a 1997 Wisconsin case, the daughter of an owner bit, slapped, and force-fed pepper to children. She was charged with felony child abuse, and the center lost its license (Case 1096). In Tennessee, the son of an owner transported children in a center van while drunk (Case 446). In Oregon, a married couple owned a center and allowed their emotionally disturbed son free access. The director said she would take the job only if they controlled their son, which they promised to do. He continued to have free rein, however, and ultimately was committed to a psychiatric ward after sexually abusing several children.

Second, center staff members can handle children roughly when they lack the skills to establish routines and manage groups of children. Centers build the day around routines (Butterfield 2002; Kanter 1972), but it takes skill to implement them. A licensing inspector in Georgia reported visiting a center and finding 17 1-year-olds sitting on a mat being asked to identify rectangles and triangles. The teachers then tried to get the 1-year-olds to sit at tables for an art project. As soon as one child

was seated, the others got up. "For approximately 30 minutes, staff attempted to sit the children in chairs one at a time and leave them at the table with nothing to do. When the children got up and left the table, staff became impatient and frustrated. Staff members picked up each child by one arm to carry them back to the table" (Case G147). They knocked one child to the floor and pushed others roughly into their seats.

Third, when staff members are on their own in a situation, they can respond to frustration without the restraint imposed by others. At nap times, individual workers can be left with roomfuls of children. In nap situations, children have suffered injuries from being slammed onto mats, including a broken collar bone (Case 1247), a concussion (Case 1008), and a broken jaw (Case 1729). Staff members have duct-taped children to get them to lie or sit still (Cases G169 and 1017).

These cases, along with the overall injury data, make it clear that center protections do not always operate effectively in terms of ensuring that children receive sensitive and skilled care. They can experience abuse, including abuse that results in injuries, when protections are weakened through boundary failures, lack of professional management skills, or workers being on their own with many children. The protections seem robust, however, in guarding against a level of violence above the previously described pushing, hitting, or slamming. For the most part, this treatment was also directed at children past infancy. Very few infants in centers suffer injuries from violence, suggesting that few acts of violence are ever initiated against them. Even when centers are not of high quality, and some children suffer rough treatment, the most vulnerable children appear insulated within institutional protections.

DEATHS FROM UNINTENTIONAL INJURIES

Deaths from accidents conform more closely to the category of mistakes made by medical personnel than do deaths from violence. The deaths of most young children from unintentional injuries are considered to stem from some degree of inattention or neglect (Brenner et al. 1999). The types of problems that lead to accidental death vary across types of child care,

suggesting, as in medicine, that insight can be gained from going beyond the faults of individual practitioners to analyzing elements of the work culture. In particular, the pattern of fatalities across types of care reflects, in the case of home-based caregivers, failures of individual vigilance, whereas in the case of center care, it more often reflects problems arising from a diffusion of responsibility.

Rates for fatalities from unintentional injuries do not differ as strikingly across types of care as do rates for fatalities from violence (Figure 2). The vulnerability of infants as compared with that of older children is also less pronounced. There are, however, higher rates of accidental death in home-based care than in center care. Figure 3 presents fatality rates for six kinds of unintentional injuries. Notably, only one type of death, fatalities arising from heat stroke when children are left in vehicles, occurs at a higher rate in center care than in home-based care. Also notably, almost every type of accidental death is found in both home-based and center care. Neither personal nor institutional care is able to protect fully against deaths from drowning, suffocation, and strangulation (Table 2).

For center care, the most basic finding is that children who are physically within the boundaries of centers are well protected against deaths

from unintentional injuries. Boundaries not only control access, but also encompass the zone of greatest safety for children in center care. Infants, who are rarely outside centers, run a lower risk of death from accidents than they do in home-based care. As children get older, they are more often removed from centers on field trips. The multiple institutional protections inside center boundaries do not operate as well in other environments. This helps to account for the gradual reduction in centers' safety advantage over home-based care in terms of unintentional injuries as children get older.

As single-purpose institutions (Whitebook et al. 2004), centers are designed for children's care. They are staffed with caregivers who do not have competing duties in terms of household tasks, and with their multiple employees, centers are structured so that children have constant supervision. Most centers are built with clear sight lines so that children are visible at all times and workers can see each other. Centers also do not have equipment designed for adult use that can pose risks for children, such as guns.

As shown in Figure 3, fatality rates for home-based care diverge from those for centers. The greatest difference in rates occurs in fatalities from fires. As specialized institutions, inspected by the state for safety, centers are almost

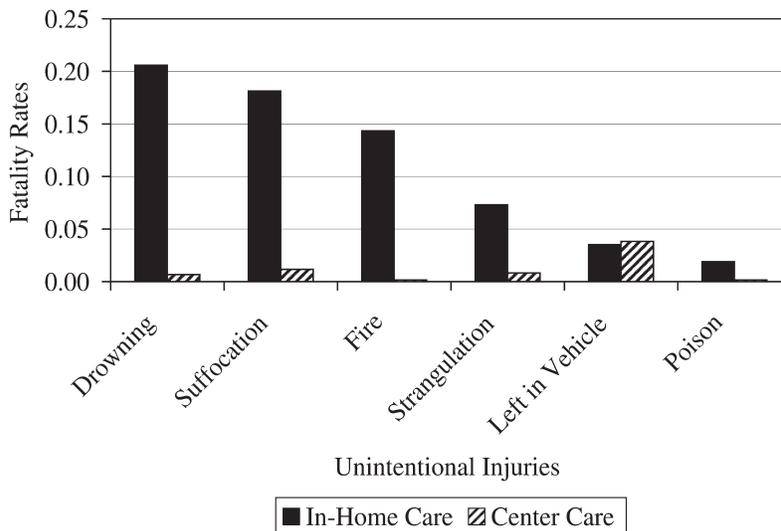


Figure 3. Fatality Rates per 100,000 Children in Child Care from Unintentional Injuries by Cause of Death in the United States, 1993–2003

Table 2. Fatalities and Serious Injuries from Unintentional Causes by Type of Child Care in the United States, 1985–2003

Type of Incident	Fatalities, by Type of Care				Serious Injuries, by Type of Care ^a			
	FDC (%)	In-home (%)	Center (%)	Total (N)	FDC (%)	In-home (%)	Center (%)	Total (N)
Suffocation	80	9	11	99	50	17	33	6
Strangulation	61	11	27	44	50	0	50	6
Poison	73	9	18	11	70	0	30	10
Drowning	62	24	14	127	58	21	21	38
Left in Vehicle	26	5	68	38	0	0	100	1
Motor Vehicle	43	18	39	44	8	4	88	51
Firearm	42	58	0	12	54	31	15	13
Animal Bite	71	29	0	7	87	10	3	30
Fall	53	35	12	17	29	10	61	49
Struck by/Against ^b	40	10	50	10	57	0	43	14
Fire	31	68	1	101	32	59	9	56
Scalding/Burn	100	0	0	3	45	15	40	40
Undetermined	70	11	18	61	50	10	40	8
Total, N	322	147	105	574	134	63	125	322
(%)	(56)	(26)	(18)	(100)	(42)	(20)	(39)	(100)

Note: FDC = family day care.

^a Requiring medical care.

^b Struck by/Against = cases where children fall into objects or objects fall onto them. Examples of “Struck by/Against” cases include a child killed by a falling television (Case 358), one killed by a folded cafeteria table that had been leaning against a wall and fell on him (Case 1333), and a sleeping child crushed by a heavy roll of paper accidentally dropped on her by a child care center employee (Case 3515).

completely free of fire risk. In home-based care, fires claimed 100 lives.

To illustrate the differences between home-based and center care, we look in detail at two types of accidental deaths of children that occur with all types of care: deaths from drowning and being left in vehicles. Although the modes of death are the same across organizations, narratives show incidents to be quite different, revealing the specific weaknesses in the organizational arrangements for each type of care.

The organization of home-based care involves reliance on one individual to monitor children. In family day care, caregivers usually supervise children of different ages. Providers are in their own homes and may clean and cook when they get spare moments. A study of family day care found that on the average, providers spent 37 percent of their time disengaged from the children in their charge (Divine-Hawkins 1981, cited in Helburn and Bergmann 2002:104). In private homes, the environment is not designed for visibility, but as a living space. Children may be in several rooms, and infants, in particular, may be put to nap away from other children because of their greater sleep needs. This means

that they may be out of caregivers' sight for considerable periods. Also, family day care homes may not have as much specialized equipment as centers. If cribs are lacking, infants may be put to sleep on adult beds or on couches, which can increase suffocation risks.

Researchers investigating organizational safety have found that risks can be created when systems rely too heavily on individual vigilance. People can become distracted; can face the pressure of multiple demands; can be depressed, anxious, or agitated; or may face the challenge of maintaining constant vigilance during long periods of relative inactivity (Kohn et al. 1999:172). The difficulty caregivers face in maintaining vigilance can be seen in a review of drowning cases in home-based care.

DROWNING

Drowning cases reflect the interplay between children's changing risk profiles as they get older and the distinctive features of the social organization of care in home-based and center settings. Infants in centers have little or no risk of drowning, sheltered as they are in specialized

environments. We did not find a single drowning case involving a child younger than 12 months. In home-based care, even very young children can face drowning risks inside if they are at all mobile. We found 22 cases of infants drowning in buckets, toilets, and bathtubs in home-based care. Children drowning in such tiny bodies of water could be saved if observed.

In home-based care, the pattern of children being out of caregivers' sight and falling into bodies of water continues for older children. Overall, roughly one-fourth of the children who drowned in home-based care did so inside, with bathtubs presenting the biggest inside drowning risk (21 deaths). In these cases, narratives show that young children were left alone in tubs when caregivers left them to attend to other children, open the front door, or answer the phone.

Most children, however, died in pools, falling into them unnoticed after wandering away. We found 78 cases of children in home-based care who drowned in pools, 7 cases of children who fell into wading or ornamental pools, and 2 cases of children who fell into hot tubs. An additional 20 children died in natural bodies of water (ponds, creeks, or rivers), some when they wandered from the caregiving property and some when taken to parks. A typical case occurred when a 22-month-old boy in a Michigan family day care home was found floating unconscious in a decorative pond. The provider said that she had been inside making lunch for him and the five other children in her care. Although the provider said he had been out of her sight for only about 5 minutes, medical tests later showed that he had been in the water for at least half an hour. The provider had asked an 8-year-old to watch the children, which the child told police she did on a regular basis. The provider was charged with neglect (Case 96), although in these situations, many caregivers are not prosecuted.

In centers, drowning cases differ in several important respects. No infant drownings were found in centers. Children are rarely taken out of centers, which are very safe physical environments. In most cases of older children drowning, they are not out of caregivers' sight. Usually, there are multiple adults watching them, but none notice the children's struggle to remain afloat while in a group. Few centers have pools, but drownings have occurred when children were taken on field trips to places with pools.

Such trips also can create a diffusion of responsibility, as center staff members may view lifeguards or swimming instructors as sharing supervisory duties with them.

A Georgia case illustrates some of these issues. A 6-year-old girl was one of 45 children taken from a center to a YWCA pool. Three staff members and two Y lifeguards watched the children in the water. A videotape viewed later showed that the 6-year-old struggled in the water for 4 minutes. She called for help, but no one noticed her effort to stay afloat. Only when another child saw her submerged was she pulled from the water, already dead (Case G13). Despite five adults watching the children, none observed her struggle. This is in keeping with research suggesting that high levels of staffing can reduce the vigilance of individual staff members through diffusion of responsibility (Bosk 2005:13) or, as Snook (2002:119) put it in his study of a friendly fire incident, "when everyone's responsible, no one is." Demanding work can enhance attentiveness, within limits (Weick 1987:118).

CHILDREN LEFT IN VEHICLES

Research on medical errors has shown that problems often result from a lack of coordination and communication as patients are shuttled between units (Sutcliffe et al. 2004). Centers also lose some of their safety protections when children are outside the boundaries of the center, not only through risks in their new locations, as with pools, but through errors in the transport itself. This reflects organizational problems in incorporating specialized personnel, in accommodating to changes in routines, and in checking individual errors. Drivers of center vans often are not professional employees, but specialized personnel, and if they forget a young child sleeping in a van, no system of error checking alerts center staff members that the child was sent to the center that morning. The child's absence often is discovered only when parents arrive at the end of the day.

Mistakes in organizations can arise when changed circumstances require changes in routines (Weick 1990). In center van cases, such changes can contribute to children being forgotten. In a Tampa, Florida case, understaffing led a director to drive the van unexpectedly. She usually checked the children off when they

arrived, but as both the driver and checker that day, she was distracted and did not notice a 15-month-old boy asleep in the back. Six hours later the director did a second run with the van, and a child told her there was a baby in the back. She found him dead from hyperthermia (Case 2127). The state closed the center, and the director was criminally charged. In a Georgia case, a 3-year-old girl whose mother usually picked her up was put in a van instead one afternoon. The van driver did not use a checklist as children got off and did not remember that this child was on board. The girl was found dead 5 hours later (Case 650).

In these situations, centers did not provide the varied protections that usually operate within their institutional boundaries. In particular, there was no compensating mechanism to adjust for the errors of individuals or to enhance communication between people when routines changed. Within center boundaries, workers can check each other easily because they usually can observe directly what others are doing. Drivers, however, often assume individual responsibility for children. They can be distracted by changes in routines or the demands of shepherding a group, which make them vulnerable to mistakes in tracking individuals. Individuals are prone to error “because of interruptions, fatigue, time pressure, anger, anxiety, fear, or boredom” (Kohn et al. 1999:163), requiring that organizations find ways to check potential mistakes.

Children also are left in vehicles in home-based care, but case records show that they usually are not forgotten. Instead, caregivers leave them to do other activities such as shopping, taking their own children to the dentist or doctor, or even doing cleaning jobs as adjuncts to their caregiving work. In 17 of the 20 cases of a child left in a vehicle in family day care, the provider left the children in the car while doing such errands. Home-based caregivers perform in a manner similar to that of an autonomous mother, but without the freedom of that mother, which can create tensions leading caregivers to try breaking away from the children in their charge. Without coworkers or an institutional framework to constrain behavior, caregivers can decide to pursue personal goals even while on the job. Children rarely suffer fatalities when left by individual caregivers, however, because the

caregivers usually do errands in public places, and the children are noticed by passersby.

Overall, the safety of children in child care depends on a complex interplay of the caregiver work process, children’s activities at different ages, and environmental features. Even when the manner of death is the same, as in drowning cases, the underlying dynamics of how children come to harm often differ in different types of care. Safety and risk are intimately bound to the specific features of the organization of child care.

CAN RELIABLE AND UNRELIABLE CAREGIVERS BE DISTINGUISHED?

Serious caregiving failures are rare, but occur at much higher rates in some child care settings than others. For families, this means that a child’s individual risk profile could be radically altered by the parents’ choice of a caregiver. Overall, all types of child care are safer than care within children’s own families (Finkelhor and Ormrod 2001). Centers are more socially controlled environments than home-based care arrangements, but even home-based arrangements are more visible and involve more daily accountability than the private realm of the family itself. For children from abusive or neglectful families, child care could provide a much higher level of safety than they experience in their own homes. Every child has an individual risk profile, however, and for some, child care can create new risks.

This raises the question of whether reliable caregivers can be differentiated from unreliable ones. Is a child’s death in care unpredictable and without warning, or are many fatalities the responsibility of “bad apples”? Many professions, including doctors, seek to protect the weak or negligent in their midst (Hughes 1971). On an aggregate level, quality as measured across types of care does not provide good guidance on reliability, and Mocan (2001) argued that parents often misread quality cues in assessing arrangements.

On the question of “bad apples,” the data show that at one extreme is a small group of caregivers who are responsible for multiple incidents of harm to children. These include 2 caregivers who each had three separate deaths occur and 29 caregivers who each had two deaths (with early deaths usually attributed to SIDS but

then reconsidered by the authorities after subsequent fatalities). In 13 cases, caregivers who had one fatality occur also had another child who experienced a serious injury. Less extreme are caregivers who have had a fatality in their care after compiling a record of abuse. For 109 fatalities in home-based care, or approximately 10 percent of the cases, providers had records of prior abuse. This compares with four fatalities in centers (two accidental deaths and two deaths from violence) at the hands of employees who had records of prior abuse. Because we found only five fatalities from violence in center care, these two represented 40 percent of the perpetrators, but the absolute number is very small, suggesting the effectiveness of screening.

Despite a certain proportion of bad apples, many providers who commit acts of fatal violence do not have histories of abuse. They may be highly regarded in their communities. In 71 cases of children who died or were seriously injured while in care, community members actively supported the caregivers. In the Constantino case described in the opening vignette of this article, a neighbor who lived across the street from Constantino had her own 6-year-old daughter in Constantino's care. After Dylan Salmon was put on advanced life support, the neighbor said, "I'm sorry, but I just don't believe she did this. I've seen her with the kids, and I've never had any problems" (Conkey and Walker 2001:1). Some caregivers retain support even when they confess, despite the difficulties of negotiating stigma reduction in the face of such profound norm violations (Margolin 1990b). Because fatal violence typically occurs in response to high levels of emotional arousal over small incidents, it can be almost impossible for others to imagine the person before them, once returned to "normal," to be capable of causing a death, especially in response to a minor provocation from a deeply vulnerable person.

CONCLUSIONS

A small but influential body of work in sociology analyzes failures and mistakes (Perrow 1984; Vaughan 1996). These are considered to be "systematically produced as a part of the social organization of work" (Vaughan 1999:284), but the relationship between work structure and mistake remains largely unchart-

ed (p. 285). Most research has focused on complex systems involving high technology, but systems approaches have been applied increasingly to the analysis of medical errors. In medicine, fatalities from errors usually occur one by one, and are less socially visible than those caused by plane accidents or other dramatic events. Their number remains contested, and data on them are not systematically collected or analyzed. "Near misses" also remain largely unreported, in contrast to the legally required reporting of such events in aviation and other high-risk industries.

We have analyzed caregiving failures in different forms of child care, with a focus on how the organization of care affects risks. This study does not deal with failures in complex bureaucracies or complicated technologies. Instead, it deals with small bureaucracies and compares their workings with those of care arrangements based on individuals. Child care offers an unusual opportunity to compare operations and risks across organizational types. Home-based care is not a vestigial relic of an earlier era. It is rather a large and important segment of the child care system. Centers and home-based care arrangements have common purposes and serve populations that do not divide neatly. Children often flow back and forth between them. The work forces they draw upon also have many similarities (Whitebook et al. 2004). The modes of care differ most strikingly in their social organization and work environments.

There are fatalities with each form of care, but the risks differ greatly, and they arise differently in each. We have suggested that features of the social organization of centers provide protection against fatalities, especially those caused by violence. Fatalities are extremely rare, but risks are much higher when the most vulnerable children are in the least socially controlled forms of care, those entirely dependent on the emotional control, stability, and commitment of an individual.

Bureaucratic organizations demand less of people. They are built with what Jane Jacobs (2004), in another context, called "redundancy of nurturing." They have multiple safeguards against personal failures. Professionalism helps establish care standards. The most volatile and aggressive people can be identified by colleagues and excluded, and center boundaries help to maintain safety within and potentially

harmful people without. Whereas researchers have stressed the dark side of organizations, child care presents the bright side. With little conscious intent, a mode of child care has been created that provides extremely high levels of safety, particularly for infants, the children most vulnerable in every form of care offered in private homes, including care provided by the child's own family, in-home caregivers, and family day care providers.

We believe that the differences in fatality rates across types of care that we report actually are conservative. First, as previously discussed, there is reason to believe that fatalities in centers are more likely to be reported than those occurring in private homes. Second, we use enrollment data from the NHES, which produces a lower estimate of fatality rates in home-based care than would be obtained if we used data from the SIPP. Third, the differences in fatality rates are so large (especially in the case of infant deaths from violence) as to be relatively impervious to variations in enrollment estimates.

We have suggested that features of the social organization of centers provide protection against fatalities, especially fatalities from violence. The data do not allow us to assess the relative importance of different possible protective elements. No organizational element of centers is absolute: directors are not always professional and do not always supervise well or exercise good judgment; center employees are not always in the company of others and do not always report fellow employees who engage in abusive or negligent behavior; and center boundaries are not always maintained, with parties unconnected to the organization's purposes excluded and those who could serve as "capable guardians" included. Furthermore, in the case of unintentional injuries, centers may not sufficiently compensate for increased risks when children are physically outside their institutional boundaries. Weaknesses in these protections can increase risks of harms to children. Nonetheless, redundancies of protection provide sufficient robustness that centers stand out for their high levels of safety, especially the safety of infants. This is perhaps a not fully appreciated element of institutions that have mainly been hailed for their possible educative value.

This topic has only begun to be explored, but some policy recommendations can be suggest-

ed based on the analysis. First, it should be recognized that infants are particularly vulnerable to neglect or abuse in child care. They are safer in centers than in home-based care, but quality infant care in centers is particularly expensive because of the low child-to-staff ratio required. This means that a major expansion of center care for the youngest children would require a social investment in terms of state or federal subsidy or provision. Voucher policies favoring informal care also should be reassessed given the safety advantage of centers (Whitebook et al. 2004).

Second, states could also try to improve the safety of family day care by bringing more family day care homes under licensing rules (Gormley 1999). In roughly half the states, small family day care homes are exempted from state regulation. Researchers have found that licensed care is generally of higher quality than that offered in unlicensed family day care homes, but the effects are small, perhaps because of lax enforcement of licensing rules (Blau 2002). From a safety standpoint, the consequences may be more significant. Licensing could be more consequential in identifying the highest-risk facilities than in assisting in overall quality upgrading. The failure to require licensing for many family day care homes makes it harder for licensing authorities to collect information on harms to children in these homes, restricting their ability to track abusive or neglectful providers. Many fatalities arise unexpectedly, but some are attributable to providers with long abuse records.

Third, efforts could be made to increase the training and professional support of home-based caregivers. Such caregivers work long hours and earn little, while facing demanding and stressful working conditions. Their jobs and earnings need to be upgraded and their professional skills enhanced to maximize their chances of maintaining safe and positive interactions with children in their care (Whitebook et al. 2004).

Finally, the United States could follow the path of most Western European countries and expand parental leave policies (Waldfogel 2001). Many parents may prefer working for economic or personal reasons, but a social investment in parental leave would offer parents a meaningful choice. If working parents are not satisfied with the child care available to them, they would have more ability to stay home with-

out jeopardizing their jobs or, with paid parental leaves, their incomes.

Fatalities in child care have not been “disasters” (i.e., large-scale dramatic events that have captured public attention) (Vaughan 1999), but have been dealt with as private tragedies. This low social visibility has hampered data gathering on fatalities. Key to any effort aimed at reducing risks is gathering consistent, reliable data on fatalities, serious injuries, and near misses in child care. This would require child fatality review teams, child protective agencies, criminal justice agencies, medical examiners, and hospitals not only to distinguish child care as a place of death or injury, but also to specify accurately the type of child care. Unlike fatalities or serious injuries in public schools, harms to children in child care have been largely invisible, with only a few gaining widespread media attention. This has hampered efforts to understand patterns and devise prevention strategies, and as a result, the safety advantages of centers have been unacknowledged.

Finally, care of the vulnerable, whether young or old, has increasingly moved out of the family and into the institutional sphere. The functioning of these institutions has not been subjected to the searching examination that has been applied to “high-risk” industries, although ideas about safety generated in these industries are being applied tentatively in medicine. We have extended these ideas to child care, where they shed new light on patterns of risk. Fatalities and injuries in the human services are not as dramatic as those in high-risk industries, but the same drive to reduce fatalities through understanding the limits of human psychological functioning and through building in checks and structural supports needs to occur in a realm that encompasses millions of the vulnerable. This requires close analysis of adverse events and not just overall quality levels, a core insight from the literature on high-risk industries.

We have analyzed the safety of children in an important sphere, and have contended that the most serious caregiving failures arise in arrangements that have few organizational protections to guard against individual volatility or inattention. Such failures are hard to predict or control. The striking success of centers at controlling fatal violence against children—indeed, almost eliminating it—and their relative safety in terms of protection against accidents

suggests the power of social organization in reducing risks. In a society with high dependence on strangers, this deserves recognition and further exploration.

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