Child Care and Children’s Illness

Anne S. Johansen, Arleen Leibowitz, Linda J. Waite

November 1988
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ANNE S. JOHANSEN, MA, ARLEEN LEIBOWITZ, PHD, AND LINDA J. WAITE, PHD

Abstract: This paper uses nationally representative data from the Child Health Supplement of the 1981 National Health Interview Survey to test the hypothesis that the larger the groups in which children receive care, the more days per year they spend in bed due to illness. We estimate a model of annual bed days for children ages six months to two and one-half years old, and separately for children two and one-half to five years old. Our results show significantly higher numbers of bed days for children in day care centers than for children at home for both age groups, controlling for confounding factors. Children in family day care have significantly more bed days than those at home, but only among the younger sample. The negative effect of family day care is less than that of child care centers. Although the relative effect of group care is to increase annual bed days by 30 to 19 per cent, the absolute effect is modest with children in group care having 1.3 to .6 more bed days per year. (Am J Public Health 1988; 78:1175-1177)

Introduction

Currently more than half of all women with children under the age of six years are in the labor force. The majority of these children are cared for outside their homes, predominantly in family day care homes, or day care centers, and nursery schools. There is concern about possible negative health consequences of such care, because the daily interaction with other young children promotes the spread of infectious disease. Evidence suggests that children in group care are ill more than children cared for at home, and the medical literature provides evidence of the spread of particular diseases like Haemophilus influenzae b (HIB) and hepatitis A in day care centers. While these studies are important in documenting increased risk of certain rare diseases associated with day care centers, they convey little information about the impact of group child care in general on national illness rates, because they are confined to a small number of children and/or formal day care centers. Moreover, these studies have generally ignored the health consequences of family day care, in which small groups of children are cared for in a private home. In fact, most preschool children in care outside their own home are in family day care. This is a potentially important omission, because children in family day care are cared for in much smaller groups than children in day care centers. The mean number of children aged 0-4 years in child care centers is 15.8 children in a group; in family day care, 2.7 children per group; in their own home, 1.4 children per group. Because of the smaller group sizes, family day care may not have the same health consequences as care in formal day care centers and nursery schools.

The present study seeks to estimate the overall impact on children's illness due to group day care, family day care as well as formal day care centers, and nursery schools, based on a nationally representative sample of children.

Methods

Data and Sample

The data used for this study come from the Child Health Supplement (CHS) to the 1981 National Health Interview Survey (NHIS). In 1981, CHS obtained information on

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TABLE 1—National Estimates of the Average Number of Bed Days per Year by Type of Child Care*  

<table>
<thead>
<tr>
<th>Type of Child Care</th>
<th>Age 6 Mos–2–1/2 Years</th>
<th>Age 2–1/2–5 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day care center or nursery school</td>
<td>5.0</td>
<td>3.8</td>
</tr>
<tr>
<td>Family day care</td>
<td>5.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Own home</td>
<td>3.7</td>
<td>2.7</td>
</tr>
<tr>
<td>All types of care</td>
<td>4.2</td>
<td>3.0</td>
</tr>
</tbody>
</table>

*Estimates are based on weighted means of the annual number of bed days within each child care type.

Factors controlled for in the model are footnoted in Table 2. The results of the complete model, means and standard deviations of the independent variables are available upon request from the authors. Center care increases bed days for younger children by 30 per cent and family day care by 19 per cent (Table 2), representing an increase of 1.3 days and 0.8 days per year, respectively. Among the older preschoolers, only day care centers are associated with increased bed days, raising days in bed by 19 per cent per year or .6 bed days per year. Older children in family day care, however, have no more bed days than children cared for at home.

Our model included a test for whether children who spent relatively few hours in group care would experience fewer bed days than those who spent more hours in group care. For children six months to two and one-half years old, we found no significant effect of hours of care. But for children two and one-half to five years old in day care centers, limiting exposure reduces bed days significantly. The effect of day care on bed days due to illness is limited to children in day care centers for more than 10 hours per week.

The results described in this section were highly robust to various transformations of the dependent variable. The significance of all the coefficients remained in the various specifications, as did the relative effect size of factors influencing bed days (data available on request to authors).

Discussion

The results of our study clearly show that children in group care are ill more, as measured by the annual number of days they spend in bed, than children cared for at home, even controlling for other factors. A small amount of regular exposure to groups of child care increases days in bed due to illness for younger children, but only prolonged exposure to large groups (more than 10 hours per week in a day care center or nursery school) affects older preschoolers. This supports the hypothesis that young children in group care experience significantly more bed days due to greater contagion if they are cared for in a center/nursery school or a day care home rather than at home. This reflects the greater risk for children under age two and one-half who have less developed immune systems, whose lack of toilet training puts them at greater risk of transmission of intestinal disease, and whose habits of putting shared toys in their mouths lead to transmission of infection.

While the relative effect of day care centers is substantial, the absolute effect of child care arrangements is modest, because the overall level of illness is quite low among both younger and older children. Care in a day care center or nursery school increases bed days by 1.3 days per year for younger and 0.6 days for older preschoolers. The absolute effect of family day care homes is even smaller.

The estimated effects of group care may be small in absolute terms due to underestimation. First, data based on annual recall suffer from underreporting due to recall error.15,23 In our sample, children age six months to two and one half years, who reported having had between one and seven bed days in the previous year, had an average of eight bed days per year based on annualized two-week data. Second, parents whose children are cared for outside the home face higher costs for allowing a sick child a bed day. Consequently, our results are biased downward if children in group care are not allowed a bed day for the same degree of illness as children cared for at home. The extent to which day

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TABLE 2—Adjusted Percentage Increase in Annual Bed Days due to Child Care*  

<table>
<thead>
<tr>
<th>Type of Child Care</th>
<th>Age 6 Mos–2–1/2 Years (N = 1892)</th>
<th>Age 2–1/2–5 Years (N = 1999)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day care center or nursery school</td>
<td>30% (2% to 65%) (*)</td>
<td>19% (2% to 38%)</td>
</tr>
<tr>
<td>Less than 10 hrs/week in day care center</td>
<td>–3% (–59% to 51%)</td>
<td>–31% (–7% to –60%)</td>
</tr>
<tr>
<td>Family day care</td>
<td>19% (5% to 29%)</td>
<td>4% (–7% to 16%)</td>
</tr>
<tr>
<td>Less than 10 hrs/week in family day care</td>
<td>–5% (–16% to 36%)</td>
<td>–5% (–21% to 11%)</td>
</tr>
</tbody>
</table>

*Controlling for chronic conditions, the health status, age, and race of the child, the smoking status of the mother, the number of bed days of the mother and the father, the educational attainment of the mother and the father, the presence of a father figure, and family income. The number of adults and other children in the household, the employment status of the mother, the sex of the sample child, and the region of residence did not achieve statistical significance and did not affect the coefficients of the child care variables. Consequently, they were dropped from the model.

**The 95% confidence intervals are asymmetric because the logarithmic transformation is non-linear.
care centers and family day care homes have stringent exclusion policies for sick children limits this downward bias in our data.

If bed days were underestimated by a factor of four, the additional bed days attributable to child care arrangement would still amount to at most 5.2 days per year, which would be the increment due to child care for young children in day care centers. In our study, these children represent only 5 per cent of the children age six months to two and one-half years. The largest increment in bed days would therefore affect only a small portion of all children. Recent data, however, show day care centers and nursery schools to be the fastest growing type of child care. Currently about 17 per cent of all children (of working mothers) under age three years are cared for in day care centers and nursery schools. There may therefore be cause for concern if this trend continues.

In conclusion, our study has shown that children in group care are ill more than children cared for at home, and that children in day care centers are ill more than children in family day care homes, especially at younger ages. Furthermore, this study has shown the importance of distinguishing between family day care and day care centers when assessing the health consequences of group care, because family day care is associated with fewer additional bed days than are day care centers. Group child care does significantly increase children’s illness over the course of a year although quantitatively the effect is small. Our evidence supports the concern of parents, child care workers, and health professionals that group child care increases illness. But before parents and society question the value of group child care, we must counterbalance these small health effects against the economic, psychological, and developmental advantages of such care.

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REFERENCES
RAND'S POPULATION RESEARCH CENTER

The Population Research Center was established in 1979 to advance the basic research aims of its sponsoring agency, the National Institute of Child Health and Human Development. The Center strengthens and focuses academic population studies within RAND's broader problem-solving environment.