

**A COST-BENEFIT ANALYSIS OF MARYLAND'S MEDICAL CHILD CARE
CENTERS***

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Prepared for the Office for Genetics and Children with Special Health Care Needs

Maryland Department of Health and Mental Hygiene

November 2008

Revised December 2008

*The author is grateful to Sharon Holloway, Sherry Ruiz, Rick Trail, Meredith Pyle, and especially Jamie Perry. Without their help the study described in this report could not have been completed.

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INTRODUCTION

Maryland has two medical child care centers, the Family, Infant, and Child Care Center (FICCC), which is located in Montgomery County, and PACT's World of Care, which is located in Baltimore County. These two centers provide up to 11 hours of child care a day, from Monday through Friday, for children with serious medical conditions (e.g., chronic lung disease, spinal bifida, cerebral palsy, seizure and feeding disorders). Children can attend the centers from six weeks until they are five years of age, although most children do not remain at the centers for all five years, in part because their qualifying medical condition may improve.

In addition to child care, the centers provide family education and support, early intervention therapy for attending children, and professional nursing care. Registered nurses provide daily medical assessments and interventions. In addition to nurses, the staff of the centers includes therapists, special education teachers, social workers, and trained child care staff. Because of their health conditions, few of the children attending the centers could be cared for under typical child care arrangements. During the 2008 fiscal year (July 2007 through June 2008), the number of enrolled children ranged between 23 and 29 each month at FICCC and between 32 and 38 each month at PACT. The child/staff ratio at the centers is three to one for children under 2 years old and four to one for children between 2 and 4 years old.

As might be expected, medical child care is costly to provide. The objective of the study described in this report is to conduct a cost-benefit analysis to assess whether the benefits that result from the centers are larger than these costs or are exceeded by them. The following section of the report considers the different benefits that may result from the medical child care

centers. The third section of the report describes how the benefits and costs that are examined in the cost-benefit analysis were measured and mentions some problems with estimating these benefits and costs. This section also discusses potential benefits from the centers that could not be estimated and what the implications of this limitation are for drawing conclusions from the study. A fourth section presents the study's findings. The last section of the report briefly summarizes the conclusions that can be drawn from the cost-benefit study and explores possibilities for further work.

BENEFITS FROM THE CENTERS

There are several potential benefits that may result from children attending the centers. These are described next.

Reduced Use of Private Duty Nursing. Because of their health conditions, the children attending the medical child care centers need varying degrees of skilled nursing care. As mentioned in the introduction, the centers provide nursing care for up to 11 hours a day, five days a week. In the absence of the centers, some of the children would require private duty nursing care in their homes. Indeed, private duty nurses do often attend some of the children during the evenings and weekends when the centers are closed. The benefits from the reduced use of private duty nursing accrue to the organizations that would otherwise have to pay for this care. This varies among the children attending the centers as some have their health care paid for directly by Maryland Medicaid under a fee-for-service arrangement, some have their health care covered by Medicaid managed care organizations, and a few are covered by private insurance policies.

Increased Earning. In the absence of the medical child care centers, alternative child care arrangements would not be possible for most of the attending children. As a result, their parents would not be able to work as many hours and, hence, their earnings would be smaller. Thus, an important potential benefit of the centers is the increase in earnings that some of the parents of attending children receive as a result of the provided child care. These additional earnings will also increase the receipt of various fringe benefits (for example, health, retirement, and life insurance benefits), and this further benefits the parents of the children enrolled in the centers. On the other hand, the taxes that the parents must pay rise as their earnings increase.

*Reduced Hospitalization.*¹ Because of their health condition, most of the children attending the medical child care centers require hospitalization while they are enrolled. Without the centers, it is possible that they would spend even more time in hospitals. Even some of those children who are not hospitalized might be without the centers, but attendance at the centers prevent this from occurring. The reason the centers may reduce or avoid hospitalization is because the health of the children at the centers is regularly monitored by skilled registered nurses. This should result in the early detection of medical problems, permitting their earlier treatment and potentially avoiding hospitalization altogether or reducing the length of hospitalization. However, in the absence of the centers, more private duty nursing care would have been received by some of the children at the centers, although far from all of them. This would also have potentially helped avoid hospitalization in a similar fashion, thereby possibly partially neutralizing the effect of centers in reducing hospitalization. In addition, the children's parents may have detected some the same health problems as those identified by the nurses.

Perhaps more importantly, it is possible that days of hospitalization actually increased as a result

¹ Much of the discussion in this section is based on correspondence with Jamie Perry, Associate Medical Director of the Office for Genetics and Children with Special Health Care Needs of the Maryland Department of Health and Mental Hygiene, and Barbara Cookerly, the Nurse Program Manager at PACT.

of the centers because attendance at them results in increased exposure to infections from other children. Many of these children by nature of their chronic medical conditions are at much greater risk for becoming seriously ill and needing hospitalization related to common childhood infections, particularly respiratory infections that are easily transmitted in a child care setting, even with rigorous infection control measures. In addition, early identification of a problem may itself result in hospitalization if hospitalization appears needed as a treatment.

Increased Access to Various Parental and Family Support Services. The centers provide parents with information about how to care for their medical needy children and about community resources that they might use. Support is also provided parents in coping with what can be difficult situations. This information and support is likely to have value to the parents who receive it and thus is a potential benefit that parents receive from the centers.

ESTIMATING THE COSTS AND BENEFITS

Operating Costs of the Centers

Cost data were obtained from the accounting records maintained by the centers. These data pertain to the 2008 fiscal year (July 1, 2007 to June 30, 2008). Total expenditures during the 2008 fiscal year are allocated among the major sources of funding for the centers, which include fees paid by Maryland Medicaid, government grants from several state agencies including the Maryland Department of Health and Mental Hygiene and the Maryland State Department of Education, and fees paid by the parents of the children attending the centers. Small amounts of funds are also sometimes obtained from private donors. In the case of FICCC, which is administered by The Arc of Montgomery County, an organization that also runs other

programs in the county for adults and children with developmental disabilities, shortfalls between expected funding and actual expenses are made up by The Arc from surpluses existing in other programs it operates.

Maryland Medicaid pays a fee of \$80 a day for each Medicaid-enrolled child-attending the centers. This fee is intended to pay for certain medical costs, but not cover costs associated with child care. The Medicaid fee is only paid for days that a child is in attendance at a center. In addition, similarly to Maryland Medicaid, private insurance policies sometimes pay a daily fee of \$80, although this is fairly rare because insurance companies usually do not recognize the centers as medical programs. Parents also pay a fee to the centers on a sliding scale that depends on their income; this is paid for each day their child attends the center. However, if parents are eligible for Purchase of Care Daycare Vouchers funded by the Maryland State Department of Education, then that Department pays part or the entire fee for the parents. At PACT, the parent's fee is currently \$15 a day for families with annual incomes below \$50,000 and \$25 a day for families with annual incomes above this amount. At FICCC, the parent's fee is more complex, as the sliding scale takes both family size and family income into account and ranges between \$14 a day and \$80 a day. To illustrate, a single parent with one child and an annual income of \$15,000 would pay \$27 a day, while a single parent with one child and an annual income of \$75,000 would pay a daily rate of \$50. Two parents with three children and an annual income of \$15,000 would pay \$14 a day, while a similarly structured family with an annual income of \$75,000 would pay \$33 a day.

Reduced Use of Private Duty Nursing²

To estimate this benefit, it was necessary to first determine the number of days of private duty nursing care that would have been required in the absence of the centers—that is, the days of care avoided as a result of the centers—and then estimate the monetary value of these avoided days of care. To do this, reviews were conducted of the medical child care records of all the children enrolled in the centers during fiscal year 2007 (July 1, 2006 – June 30, 2007) to determine whether each would have likely qualified for private duty nursing during each of the calendar quarters they were at the centers. The need for private duty nursing was based on the medical criteria used by the Nursing Services Division of Maryland Medicaid. When questions arose, the staff at the center at which the child was enrolled was asked for clarification. A sample of records was cross-reviewed by a nurse in the Nursing Services Division of Medicaid to ensure that the medical criteria were applied appropriately.

There was considerable variation among the children in the number of days over which they would have qualified for private duty nursing in fiscal year 2007 while they were attending the centers. This is due both to changes in their health status during this period and because some children were not enrolled at the centers for the full fiscal year. To reflect this variation, private duty nursing qualifications are determined for each calendar quarter and range between zero for those children who did not qualify during the year and four for those children who attended the center during the entire fiscal year and would have qualified over the entire year.

The value of the benefit from the days of avoided private duty nursing care for each child was obtained by multiplying the cost of a calendar quarter of private duty nursing by the number of calendar quarters the child would have qualified for private duty nursing care. The cost of a

² The work necessary to estimate this benefit was performed at the Office for Genetics and Children with Special Health Care Needs by Meredith Pyle under the supervision of Jamie Perry.

quarter of private duty nursing was determined to equal $\$31.48 \times 10 \times (250/4)$ or a total of \$19,675, where \$31.48 was the hourly Medicaid Fee-for-Service reimbursement rate during the 2008 fiscal year, 10 is the average estimated number of hours an enrollee spends at the centers during a typical day, and 250 is the number of days the centers are open during a year (and, hence, $250/4 = 62.5$ is the average number of days they are open in a quarter). The hourly reimbursement rate paid by private insurers and medical care organizations does not necessarily correspond to the \$31.48 reimbursement rate paid by Medicaid. Indeed, an informal telephone survey of the seven Medicaid managed care organizations indicated that while two of six that responded did pay \$31.48 per hour, the hourly rate for the remaining four varied from \$19.20 to \$46.00. Unfortunately, while it was possible to determine whether each child was covered by fee-for-service Medicaid, a Medicaid managed care organization, or private insurance, it was not possible to determine the specific managed care organization or private insurer to which a child belonged.

In general, the estimate of the value of the benefit from avoided private duty nursing care should be relatively accurate. It is subject to only two important potential limitations and biases from these limitations should be relative small. The first limitation arises because the data on qualifying for private duty nursing are for the 2007 fiscal year, but it is assumed that with certain adjustments—specifically, the calculations used the Medicaid reimbursement rate for the 2008 fiscal year and were adjusted by multiplying them by the ratio of the number of children enrolled at each center in an average month during the 2008 fiscal year to the number of children enrolled in the center in an average month during the 2007 fiscal year—these data can be used to determine financial benefits from avoided private duty nursing care during the 2008 fiscal year. The validity of this assumption depends on the extent to which the medical needs of children at

the centers were similar in the two years. Because the two years are adjacent and there is no reason to think that the characteristics of the children served by the centers changed very much over this short period, the assumption seems reasonable.

A second limitation results because qualifying for private duty nursing care not only depends on having a medical need, but also on needing “an awake and alert caregiver.” The latter criterion is met if a parent or some other adult is unavailable or unable to care for a child. Under such circumstances—for example, if all the adults in the child’s household worked—the child would qualify for a private duty nurse if he or she also met the medical need criteria. Although accurate information about medical need was available from the records maintained on each enrolled child at the centers, information on the availability of an alert caregiver, while existing, was incomplete for some children. However, when sufficient information was available, it appeared that children who met the medical need criteria also met the criterion of needing “an awake and alert caregiver.” It was assumed that this was also the case when the information on the availability of an alert caregiver was insufficient. Thus, there may be a few instances in which it appeared that a child would have qualified for private duty nursing care in the absence of the centers, but the child actually would not have qualified. This would cause the estimated benefit from avoided private duty nursing care to slightly overstate the true benefit.

Increased Earning

To attempt to determine the increases in parental earnings that results from the child care provided by the centers, the parents of the children attending the centers were asked to complete a questionnaire when they dropped off or picked up their child. A copy of this questionnaire, which was fielded in August 2008, appears in the appendix of this report. The response rate for

the survey was high, with 36 out of 38 PACT families and 20 of 28 FICCC families completing the survey. However, as indicated below, a few respondents did not provide usable answers to some of the questions they were asked.

The key survey questions about earnings asked respondents how many weeks they worked last year and how many of these weeks they would have been able to work if their child did not attend the center. If there was a second adult in the household, the respondent was asked similar questions about him or her. In addition, the respondent was asked about the amount of their earnings and other deductions and those of the second adult before taxes.

The benefits from the earnings increases resulting from the centers was computed as the product of weekly earnings and the difference between the weeks actually worked and the weeks that would have been worked in the absence of the centers. This amount was then multiplied by 20 percent to compute the amount of fringe benefits that were received as a result of the earnings attributable to the centers.³ In addition, the increase in earnings amount was also multiplied by 26.2 percent to determine the federal, state, and local taxes that were paid on the earnings.⁴ Increases in fringe benefits are, of course, an additional benefit of the medical child care centers to the families who are able to work more weeks as a result of the centers. Increases in taxes, in contrast, are a cost to these families. However, they are a benefit that the government receives from the centers.

³ The 20 percent figure was computed from statistics published by the Employee Benefit Research Institute on total earnings and on the total amounts of various fringe benefits (“Employer Spending on Benefits,” www.ebri.org). Fringe benefits include employer-provided health insurance, pensions and group life insurance, and employer payments into the funds that support workmen’s compensation, unemployment compensation, and social security.

⁴ This 26.2 percent figure is an average tax rate that was computed as the sum of the percentage of income paid in state and local taxes in Maryland (e.g., state income taxes, property taxes, and sales taxes) and the percentage of family income paid to the federal government in taxes (i.e., income taxes and social insurance). The percentage of income paid in state and local taxes in Maryland was estimated by the Retirement Living Information Center of the Tax Foundation to be 10.8 percent in Maryland in 2008 (“State and Local Tax Burden: All Years, One State, 1977-2008,” www.retirementliving.com). The percentage of family income paid to the federal government in taxes was estimated by the Congressional Budgetary Office to be 15.4 percent in 2001 (“Effective Federal Tax Rates: 1979-2001,” www.cbo.gov.ftpdocs/53xx/doc5324/04-02-TaxRates.htm). The 15.4 figure is for families with children who were in the middle income quintile.

There are several limitations with relying on a survey to attempt to determine the additional earnings that result from children's attendance at the child care centers. The first is that the key questions on how many weeks respondents and other adults in the household would have worked if their children were not enrolled at one of the centers are hypothetical. The children of the respondents were, in fact, actually attending one of the centers. However, it seems plausible that parents would know whether this permitted them to work or whether, in the absence of the centers, alternative arrangements for the care of their children during the work day would have been available.

An additional problem with relying on the survey may result if survey respondents are favorably inclined towards the center their child is attending and believe that it will be assessed on the basis of their responses to the survey. Under such circumstances, they may tend to exaggerate the weeks that their center enabled them to work. Indeed, as discussed below, there is some indication that some survey respondents may have done this. Steps that were taken to minimize this problem are also described below.

A third problem may result because parents who would have received private duty nursing for their child in the absence of the centers would also have been able to work while the private duty nurse was in their home. The problem results if, as seems likely, when asked in the survey about how many weeks they would have worked had their child not attended the centers, some of these parents did not take the possible availability of private duty nursing care into account. Like the second problem, this would cause the estimated benefit attributable to increased earnings to be overstated. A rough calculation suggests that the overstatement should be no larger than 26 percent and is likely to be smaller.⁵ The implications of reducing the

⁵ As will be discussed further below, 31.5 percent of all the children enrolled at one of the medical child care centers in the 2007 fiscal year would have been eligible for private duty nursing care in the 2007 fiscal year based on record

estimated earnings benefit by 26 percent are explored when the cost-benefit findings are presented in the next section of the report.

To increase the accuracy of the estimated benefits from the earnings increases resulting from the centers, several adjustments were made to the data collected in the survey. First, the questions about weeks worked were intended to determine the additional weeks worked as a result of the centers during the year prior to the survey. However, some children had been attending the centers for less than a year at the time questionnaire was administered. Thus, the total increase in weeks by the respondent and the second adult in the family (if any) during the year prior to the survey was not allowed to exceed the smaller of the number of weeks their child had been enrolled at one of the medical child care centers or 52. This adjustment substantially reduced the size of the estimated benefit.

Second, as mentioned above, the survey was fielded in August 2008, and therefore data from it pertain only to families with children who were attending the centers at that time. Thus, children who had been enrolled in the centers during the year prior to the survey, but before it was fielded, were missed. The estimates of the operating costs of the centers and the benefits from the reduced use of private duty nurses, in contrast, pertain to *all* the families with children at the centers at any time during an entire 12 month period (specifically, 2007 fiscal year). To make all the estimates used in the cost-benefit analysis compatible with one another, the estimates of additional weeks worked by each family responding to the survey was multiplied by a value of one for those families with children who had been at a center for at least a year and by

review and 82.3 percent of the respondents to the survey claimed that their earnings increased as a result of having a child enrolled at a center. The 26 percent figure mentioned in the text was obtained as the product of these two percentages (i.e., $.315 \times .823$). It seems likely to be an upper bound because some families whose child would have qualified for private duty nursing care would have qualified during only part of the time they were enrolled in a center during the 2007 fiscal year. Moreover, some survey respondents may have taken the potential availability of private duty nurses into account in answering the questions about how many additional weeks the center enabled them to work.

a value computed by dividing 52 by the number of weeks enrolled in a center for those families with children who had been at the center for less than a year.

An illustration for a hypothetical family with a child who had been attending one of the centers for 39 weeks at the time of the survey might help make the rationale behind this adjustment clearer. If the number of children enrolled at the center remains fairly stable over time, another child (or perhaps several children) will have attended the center during the remaining 13 weeks of the year. The parents of this child or children were, of course, missed by the survey. Thus, by multiplying the estimate of the number of additional weeks worked by the family responding to the survey by 1.33 ($52/39$), we can account for the additional weeks worked by the family or families who had children at the center during the year prior to the survey, but who left the center before the survey was fielded.⁶

Once the two adjustments described above were finished, the resulting earnings estimates for individual families were summed to obtain an estimate of the total benefits from the additional weeks worked as a result of the centers. This calculation was made separately for each center.

Once this calculation was completed, a further adjustment was necessary because, as previously indicated, some families with children who were attending the centers in August 2008 did not complete the survey, while a few families that did complete the survey did not provide usable answers to the questions about the additional weeks they worked as a result of the centers. Thus, without an adjustment to account for these omitted families, the total benefits from the effect of the centers on weeks worked would be understated. To keep this from occurring, the

⁶ This procedure will result in too small an adjustment if the survey was conducted during a month when enrollment at the centers was atypically small and in too large an adjustment if enrollment at the centers was atypically large. Fortunately, enrollment in August 2008, the survey month, was similar to the monthly average over the 2008 fiscal year, although it was a bit larger.

estimate of the total earnings benefit was multiplied by the ratio of the total number of families with children enrolled in each of the centers in August 2008 to the number of families who provided usable answers about the additional weeks they worked as a result of the center. The ratio for FICCC is 28/18, while that for PACT is 38/34. Use of this ratio assumes that families who provided usable survey responses about additional weeks worked and those that did not are similar in terms of the additional earnings they received as a result of the centers.

Reduced Hospitalization

An attempt was made in the parent survey to collect information about how attendance at the centers affected the hospitalization of children. More specifically, the questionnaire respondents were asked if their child had been hospitalized last year. If they answered yes, then they were further asked if the child would have been in the hospital even longer if he or she were not at a center and, if so, for how many days. If they answered no, they were asked if their child would have been hospitalized if he or she were not at a center and, if so, for how many days.

Although findings from these questions are discussed in the following section of this report, they are not used to actually estimate the monetary benefits from reduced hospitalization because there are serious reasons to question their validity. The key reason is the hypothetical nature of the underlying survey questions. Unlike the questions about the weeks that would have been worked in the absence of the centers, which are also hypothetical, it seems likely that it would be very difficult for parents to know the number of days their child would have been hospitalized had they not attended one of the centers. They really only know with certainty the number of days their child was hospitalized while attending the center.

It does seem possible, however, that parents might have some general sense of whether their child would have spent more days in the hospital without the centers than with them, even if they do not know the exact number of days. Moreover, similar questions to those asked about hospitalization, and subject to much the same limitations, were also asked about private duty nurses. This is useful for purposes of validating the survey because, as described earlier, rather good independent data on the number of days of private duty nursing care that would have been needed in the absence of the child care centers were obtained from each child's medical child care records. The survey implied that the average annual need for private duty nursing would have been about five days per child in the absence of the child care centers (this includes both children who would have had zero need for this service and children who would have had needed daily private duty nursing), while the comparable figure implied by the medical child care records is an average of 4.7 days per child. While this in no way "proves" the accuracy of the survey information—it may merely be fortuitous—it is somewhat reassuring. It is important to recognize, however, that the potential need for a private duty nurse without the centers is dependent upon a limited number of variables that should be relatively evident to families, while the potential for an increase in hospitalization is more complex and dependent upon significantly more factors.

Increased Access to Various Parental and Family Support Services

As discussed earlier, the increased information and support that the centers provide parents may have considerable value to them. However, estimating this value is inherently exceedingly difficult and no attempt was made to do so in this study. To the extent this omission

is important, the total benefits of the centers, which are based on those benefit components that were estimated, will be understated relative to the costs of operating the centers.

FINDINGS

The key findings from the cost-benefit analysis of the two medical child care centers are summarized in Table 1. The table shows benefits and costs separately for each of the two child care centers and also for the two centers combined, where the latter were computed as the sum of benefits and costs for the two individual centers. Benefits (the positive numbers) and costs (the negative numbers) are reported from five points of view—those of the parents of the children attending the medical child care centers, Maryland Medicaid, Medicaid managed care organizations, private insurers, and the government (other than Medicaid). In the last column of Table 1, benefits and costs are summed over these five entities. These totals may be viewed as the societal costs and benefits of the child care centers, as the individuals and organizations listed in the table are all part of society. The last row for each center sums the measured benefits produced by the center and subtracts the center's costs to compute an estimate of the center's total *net* benefits.

In examining the table, it is important to keep in mind that some important potential effects of the child care centers (for example, effects on hospitalization) are not estimated and, thus, omitted from the table, while benefits that are listed (for example, increased earnings) may be measured with serious error. These limitations are considered later.

Table 1: The Costs and Benefits of the Medical Childcare Centers in Fiscal Year 2008

	<u>Parents of Attending Children</u>	<u>Medicaid Managed Care Organizations</u>	<u>Private Insurers</u>	<u>Medicaid</u>	<u>Government^a (other than Medicaid)</u>	<u>TOTAL</u>
<u>FICCC</u>						
Reduced private duty nursing	---	\$148,314	\$148,314	\$362,546	---	\$659,175
Increased earnings	\$644,110	---	---	---	---	\$644,110
Increased taxes	-\$168,757	---	---	---	\$168,757	\$0
Increased fringe benefits	\$128,822	---	---	---	---	\$128,822
Operating costs of centers	-\$190,093	---	\$0	-\$223,520	-\$833,470	-\$1,247,083
TOTAL NET BENEFITS	\$414,082	\$148,314	\$148,314	\$139,026	-\$664,713	\$185,024
<u>PACT</u>						
Reduced private duty nursing	---	\$762,834	\$0	\$334,903	---	\$1,097,737
Increased earnings	\$1,283,831	---	---	---	---	\$1,283,831
Increased taxes	-\$336,364	---	---	---	\$336,364	\$0
Increased fringe benefits	\$256,766	---	---	---	---	\$256,766
Operating costs of centers	-\$116,173	---	-\$6,397	-\$440,279	-\$737,150	-\$1,299,999
TOTAL NET BENEFITS	\$1,088,060	\$762,834	-\$6,397	-\$105,376	-\$400,786	\$1,338,335
<u>TWO CENTERS COMBINED</u>						
Reduced private duty nursing	---	\$911,148	\$148,314	\$697,449	---	\$1,756,912
Increased earnings	\$1,927,941	---	---	---	---	\$1,927,941
Increased taxes	-\$505,121	---	---	---	\$505,121	\$0
Increased fringe benefits	\$385,588	---	---	---	---	\$385,588
Operating costs of centers	-\$306,266	---	-\$6,397	-\$663,799	-\$1,570,620	-\$2,547,082
TOTAL NET BENEFITS	\$1,502,143	\$911,148	\$141,917	\$33,650	-\$1,065,499	\$1,523,359

^a Includes amounts from the Department of Health and Mental Hygiene and Maryland State Department of Education. The government figure for FICCC also includes a contribution of just under \$10,000 from United Way and the government figure for PACT also includes a contribution from the Baltimore Public Schools of just under \$5,000.

According to Table 1, the overall measured benefits from both child care centers exceed the costs of operating these centers. These total net benefits are especially large in PACT. Looking at Table 1 a little more closely, it can be seen that much of the measured benefits from the centers accrue to the parents of the children who attend the centers, while most of the costs are borne by the government.

The benefits to parents result from the increases in the earnings and fringe benefits they receive while their children are cared for at the centers. The large estimated increase in earnings is not surprising. Of all the families in which at least one adult worked (about 95 percent of all those responding to the survey), 87 percent indicated that they were able to work more weeks as a result of their child attending the center. However, parents do not keep all of the increase in earnings they reap as a result of the centers; part of it must be paid in taxes. Moreover, many parents paid a fee to the centers. From the perspective of the parents, these fees are costs.

The costs borne by the government mainly result from grants that the Maryland Department of Health and Mental Hygiene and the Maryland State Department of Education provide the centers to support their operation. In addition, the Maryland State Department of Education pays the fees of some parents through Purchase of Care Day Care Vouchers. A small part of these costs to the state government is offset by the increase in taxes paid by the parents of children who attend the centers, although an important share of these tax revenues go to the federal government.

Importantly, Medicaid, which is of course also part of the government, pays a daily rate of \$80 to the centers for each Medicaid-enrolled child. An important offset to these costs are the savings that result from the reduced need for private duty nursing by children attending the centers. Although a little less than a third of all the children who were enrolled in the centers

during the 2007 fiscal year would have otherwise qualified for private duty nursing care, the savings for these children are quite large—about \$58,000 per qualified child. However, the savings accrue to Maryland Medicaid only for those children who are not enrolled in Medicaid managed care organizations or covered by private insurance companies. As suggested by Table 1, a high proportion of children at PACT who would require private duty nurses in the absence of the center ~~are~~ were enrolled in Medicaid managed care organizations in FY07.

A notable finding in Table 1 is that the total net benefits are considerably larger for PACT than for FICCC. One reason for this is that the estimated benefit from increased earnings is about twice as large for PACT as for FICCC. This is partially due to the fact that, with about one-third more enrolled children on average during the 2008 fiscal year, PACT is larger than FICCC; but it might also be partially attributable to somewhat different types of families enrolling in the two centers. For example, it is possible that the parents of the children attending PACT would have more difficulty in working in the absence of PACT.

Much of the difference in the total net benefits produced by PACT and FICCC is attributable to the latter being more costly to operate than the former. Although PACT served about one-third more children than FICCC, the total operating costs of the centers are nearly the same. Based on average monthly enrollment in the 2008 fiscal year, the cost per attending child is about \$37,000 at PACT, but over \$47,000 at FICCC, about \$10,000 more. It is not evident why this occurs, but scale economies could play a role. If FICCC had the same cost per enrolled child as PACT, its total operating costs would be just under a million dollars and, as a consequence, its total net benefits would be well over twice as large as those reported in Table 1.

It is important to determine whether the key finding implied by Table 1—that the total benefits produced by the medical child care centers exceed the total costs of operating the centers—

is valid. As discussed earlier, there are reasons to believe that the estimate of the benefits from reduced private duty nursing is modestly overstated and that from increased earnings is substantially overstated. For example, it was suggested earlier that the benefit from increased earnings could be overstated by as much as 26 percent, if when asked in the survey about how much they could have worked without the centers, respondents did not take account of the possibility of receiving private duty nursing care if their children did not go to the centers. What are the implications of this possible overstatement? If the benefits from increased earnings and fringe benefits are reduced by 26 percent, total net benefits at PACT remain strongly positive at \$938,000, but those at FICCC become slightly negative at -\$16,000.

It is also useful to determine the amount by which the benefits that are reported in Table 1 would have to be overstated for the centers to breakeven (that is, for their total net benefits to approximate zero). As it turns out, PACT would approximately breakeven if the benefits from reduced private duty nursing are only three-quarters of what they were estimated to be and the benefits from increased earnings and fringes are only one-third of what they were estimated to be, but operating costs were accurately estimated. It seems implausible that these benefits were overstated by such large amounts. Thus, it seems highly likely that PACT's benefits actually do exceed its costs. FICCC, in contrast, would break even if the benefits from increased earnings and fringes are only three-quarters of what they were estimated to be, but the benefits from reduced private duty nursing *and* program operating costs were both accurately estimated. Overstatements of these magnitudes certainly do seem possible. It is important to recognize, however, that the total net benefits of the medical child care centers could well be larger than those reported in Table 1 because, as pointed out earlier, some potential effects of the child care centers are omitted from the table. One of these omitted effects, increased access to parental and

family support services, is almost surely of positive value to the parents of children enrolled in the centers, although its magnitude is unknown.

An omitted second effect, the influence of the centers on hospitalization, is more difficult to assess. As suggested earlier, it is possible that the centers actually increase the need for hospitalization because attending children are more exposed to infections from other children. This would obviously reduce the total net benefits shown in Table 1. However, the effect may instead be positive. The health of children at the centers is closely monitored by the centers' nursing staff and this would increase total net benefits if it reduces the need for hospitalization or at least results in shorter stays when hospitalization occurs. At least, according to their responses to the questionnaire they filled out, many of the parents of the children enrolled in the centers seemed to believe that the centers do indeed reduce hospitalization. For example, almost three-quarters (73.2 percent) of the parents completing the survey indicated that their children had been hospitalized during the previous year. Of these parents, nearly 60 percent believed that their children's days of hospitalization would have increased in the absence of the centers. In addition, about a quarter of the parents of the children who were *not* hospitalized believed their children would have been hospitalized had they not been enrolled in the centers. At best, these responses should be viewed as no more than suggestive; as discussed earlier, it is not clear that parents really know whether their child would have been hospitalized for more days without the centers than with the centers.⁷ In addition (and similar to the parent-reported earnings data),

⁷However, it seems likely that parents can better predict whether additional hospitalization would have occurred at all in the absence of the centers than predict the exact number of additional days of hospitalization that would have occurred. Nonetheless, they were asked to predict the number of additional days. Of the 52 usable answers to this question, 51.9 percent of the respondents indicated that no additional days of hospitalization would have been required, 39.1 percent indicated that between 2 and 15 additional days would have been required, 3.6 percent indicated that between 30 and 40 additional days would have been required, and 5.4 percent indicated that 100 or more additional days would have been required. The average over the 52 usable answers is 11.9 additional days. However, answers of 100 or more additional days seem implausibly high. If respondents who give these extremely large values are dropped from the computation, the average falls to 3.3 additional days.

many parents probably did not take into account the possible availability of private duty nursing for some of their children in the absence of the centers when answering the questions about hospitalization. Like care by the centers' nurses, care by a private duty nurse would also have potentially helped avoid hospitalization or decrease length of stay, thereby possibly partially neutralizing any effect of centers in reducing hospitalization.

CONCLUSIONS

This report describes a cost-benefit analysis of Maryland's two medical child care centers, FICCC and PACT. It is important to emphasize that strictly speaking the study results pertain only to the study year, fiscal year 2008. If there are important future changes in the way the centers operate—for example, if child-staff ratios alter, the number of children served by the centers substantially increase or decrease, or the medical conditions of the children attending the centers change—the benefits and costs of the centers could differ considerably from those reported here. Moreover, there is considerable uncertainty about the results for even **fiscal year 2008** because all of the potential benefits produced by the centers could not be estimated and there are reasons to expect that those that were estimated were measured inaccurately. Nonetheless, the findings do seem to suggest that at least for PACT, the center's total benefits, the benefits that accrual to society as a whole, exceeded the social costs incurred in operating the center. The major beneficiaries of both centers are the parents of the attending children and Medicaid managed care organizations. The major costs are borne by the government, including the Medicaid system.

The net benefits resulting from the centers could be increased somewhat by increasing the proportion of children enrolled in the centers who would require more days of private duty

nursing care without the centers or with parents who would be unable to work without the care provided by the centers. Most of the benefits from having more children who would need nursing care without the centers would accrue to Maryland Medicaid, Medicaid managed care organizations, and private insurers; while the benefits from having more children with parents who could not work without the centers would accrue mainly to the parents themselves.

Some of the uncertainty surrounding the findings from this study could be greatly reduced if the benefits from the centers could be estimated more accurately. This would be possible if earnings, days of hospitalization, and utilization of private duty nurses for families that participate in the centers could be compared to the same outcomes for similar families that do not participate.

In principle, this could best be accomplished if it were possible to randomly assign a subset of families who are interested in enrolling their child in the medical child care centers to a control group that is not allowed to participate. This would be feasible, however, only if more families wished to enroll their child in the centers than it is possible for the centers to accept, given their available resources. This does not appear to presently be the case, although the centers do sometimes have a waiting list. Another possibility would be to compare families that choose to enroll with similar families that do not choose to enroll. The problem here is finding truly similar families. One would expect that families who choose to enroll differ systematically from families who are located near the centers but choose not to enroll. Of course, it might be possible to find similar families who live in geographic locations where medical child care centers do not exist (such as the Eastern Shore or Western Maryland); but the labor markets in such places are likely to differ from the urban labor markets near FICCC and PACT, causing earnings to also differ. It may also be difficult to collect data on the earnings, days of

hospitalization, and utilization of private duty nurses from families that do not have children enrolled in the child care centers, especially if they are located some distance from the centers.

APPENDIX

THE QUESTIONNAIRE ADMINISTERED TO

PARENTS⁸

⁸ The survey instrument that appears in this appendix is the one the PACT parents were asked to complete. The instrument that FICCC parents were asked to complete is identical, except that the name of the center that appears in the survey differs.

SURVEY OF MEDICAL CHILD CARE CENTERS

We would greatly appreciate it if you would fill out this survey. It will take only a few minutes of your time. The survey will help us look at the benefits from your child going to the PACT. You do not have to put your name on this survey. It is not needed for the study and we want to make sure your privacy is protected. If more than one of your children go to PACT, a separate survey should be filled out for each child.

1. Did you work over the last year? (Please check one answer.)
Yes ___
No ___
(If you did not work last year, please go to question 7)
2. If yes, how many weeks did you work over the last year?
___ weeks
3. How many weeks would you have been able to work if your child did not go to PACT?
___ weeks
4. When you work, how many hours do you usually work during a week?
___ hours
5. How much do you usually make before taxes and other deductions (for example, health insurance and Social Security)?
\$ _____
6. Is the amount you put in question 5 for a day, week, two weeks, a month, a year, or other? (Please check the appropriate answer.)
Day ___
Week ___
Two weeks ___
Month ___
Year ___
Other ___ (please specify)
7. Besides yourself, are there any other adults in your household?
Yes ___
No ___
(If no, please go to question 14)
8. If yes, did the other adult work over the last year? (Please check the appropriate answer.)
Yes ___
No ___
(If the other adult did not work over the last year, please go to question 14)
9. If yes, how many weeks did the other adult work over the last year?
___ weeks
10. How many weeks would the other adult have been able to work if your child did not go to PACT?
___ weeks
11. When the other adult works, how many hours does he or she usually work during a week?
___ hours
12. How much does the other adult usually make before taxes and other deductions?
\$ _____
13. Is the amount you put in question 12 for a day, week, two weeks, a month, a year, or other? (Please check one answer.)
Day ___
Week ___
Two weeks ___
Month ___
Year ___
Other ___ (please specify)

14. Did you use a nurse in your house over the last month for the child that goes to PACT?
Yes ___
No ___
(If no, please go to question 17)
15. If yes, would you have needed a nurse in your house for even more days over the last month if your child did not go to PACT?
Yes ___
No ___
16. For how many more days during the last month? (This question may be hard to answer, but please give your best guess.)
___ days
17. If no, would you have needed a nurse in your house over the last month if your child did not go to PACT?
Yes ___
No ___
18. If yes, for how many days during the last month? (This question may be hard to answer, but please give your best guess.)
___ days
19. Was the child that goes to PACT in the hospital over the last year?
Yes ___
No ___
(If no, please go to question 22)
20. If yes, would the child have been in the hospital for even more days during the year if he or she did not go to PACT?
Yes ___
No ___
21. For how many more days during the last year? (This question may be difficult to answer, but please give your best guess.)
___ days
22. If no, would the child have been in the hospital over the last year if he or she did not go to PACT?
Yes ___
No ___
23. If yes, for how many days during the last year? (This question may be hard to answer, but please give your best guess.)
___ days
24. How old is your child?
___ years and ___ months
25. Has your child been going to PACT for over a year?
Yes ___
No ___
26. If yes, for how long?
___ years and ___ months
27. If no, for how many months?
___ months