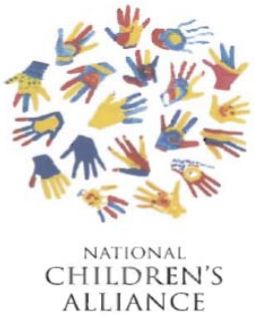
Cost-Benefit Analysis of Community Responses to Child Maltreatment:

A Comparison of Communities With and Without Child Advocacy Centers

A research project of the
National Children's Advocacy Center
funded by the National Children's Alliance.



The National Children's Advocacy Center

Cost-Benefit Analysis of Community Responses to Child Maltreatment: A Comparison of Communities with and without Child Advocacy Centers

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This publication was supported by Grant # Hunt-AL-SEG-A-04 from the National Children's Alliance. The contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Children's Alliance.

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ACKNOWLEDGEMENTS

Numerous individuals and agencies contributed their time, resources, expertise, ideas and feedback to the cost-benefit analysis project reported here. The authors wish to gratefully acknowledge the assistance of the following people in realizing this contribution to the field of child maltreatment: Ms. Renae Blades, Dr. Robert Caldwell, Ms. Connie Carnes, Ms. Nancy Chandler, Dr. Patrick Cotter, Dr. Phaedra Corso, Dr. Ted Cross, Ms. Cynthia Futral, Dr. David King, Mr. Jonathan Kingsford, Dr. Mary Laska, Ms. Marian Loftin, Ms. Cindy Miller, Dr. Ismail Noor, Mrs. JoAnn Plucker, Dr. Akram Temimi, Ms. Joy Wagoner, Dr. Brian Yates, The Centers for Disease Control National Center for Injury Control and Prevention, Decatur Police Department, Hartselle Police Department, Madison County Multidisciplinary Team, Madison County Personnel Office, Morgan County Department of Human Resources, and the Morgan County Sheriff's Department.

ABSTRACT

In the three decades since passage of the Child Abuse Prevention and Treatment Act (1974) a large body of literature has demonstrated that child maltreatment and abuse have long term negative impacts on victims' physical and mental health and may be associated with juvenile delinquency and adult criminality. As a result, the estimated costs of child maltreatment to society are enormous. This paper provides review of studies that have applied economic analysis to costs *or* benefits, or costs *and* benefits to programs that seek to prevent or intervene in child maltreatment. The paper also reports on a cost-benefit analysis undertaken in two counties that use different models of child abuse investigation: a Child Advocacy Center (CAC) model using a multidisciplinary team approach and a traditional child protection and law enforcement services model that typically uses a joint investigations approach. The cost-benefit study indicates that while CAC style investigations have somewhat higher operational costs, they also result in higher perceived public benefits. The CAC community studied here achieves a $3.33 to $1 benefit-cost ratio.

Introduction

Since the passage of the first Child Abuse Prevention and Treatment Act (CAPTA) in 1974, American society has recognized the need to battle child maltreatment. Child maltreatment is defined by federal law as "any recent act or failure to act on the part of a parent or caretaker, which results in death, serious physical or emotional harm, sexual abuse or exploitation, or an act or failure to act which presents an imminent risk of serious harm". [1] Child maltreatment can also include harm that a caregiver *allows* to happen (or does not *prevent* from happening) to a child. There are four major types of child maltreatment: physical abuse, sexual abuse, neglect, and emotional abuse. The term "child abuse and neglect" commonly seen in the literature generally refers to one or more of the above four types of child maltreatment.

According to *Child Maltreatment 2002*, a report based on data submitted by child protective services (CPS) agencies in each State and the District of Columbia, CPS agencies received 2.6 million reports of maltreatment involving 4.5 million children during calendar year 2002. More than 1.8 million reports (slightly above two-thirds) of these reports were accepted for investigation or assessment and 30 percent were substantiated, resulting in 896,000 cases of documented child victimization in 2002. More than 60 percent of the reports involved child neglect and 37 percent reported one or more types of abuse. Among

1. Keeping Children and Families Safe Act of 2003, Title I Child Abuse Prevention and Treatment Act (Public Law 108-36, Title 42, Chapter 67, Subchapter I, **§** 5106g). Each State also has its own laws that define abuse and neglect for purposes of stating the reporting obligations of individuals and describing required State and/or local child protective services agency interventions. For instance, Alabama statutes define abuse as "harm or threatened harm to a child's health or welfare" and neglect as "negligent treatment or maltreatment of a child, including the failure to provide adequate food, medical treatment, supervision, clothing, or shelter", where a child refers to a person under 18 years of age. However, abandonment is defined separately from abuse in Alabama child maltreatment laws. In regards to mandatory reporting, professionals in health care, mental health, social work, education\child care, and law enforcement must report any known or suspected cases of abuse and neglect (The Code of Alabama 1975: §26-14-1 and §26-14-3).

the latter cases more than half (54 percent) reported physical abuse, 27 percent reported sexual abuse, and 19 percent reported emotional abuse. Two key statistics of child maltreatment, the number of reported children per 1,000 children and the number of substantiated victims per 1,000 children in 2002 were 35.9 and 12.3, respectively. Both key statistics have trended downward since the mid-1990s (Finkelhor & Jones, 2004; U.S. Department of Health and Human Services, 2004).[2] Detailed data on the two incidence rates from 1991 to 2002 are shown in Table 1.

Table 1. Incidence Rates of Child Maltreatment, 1991-2002

Year	No. of Reports per 1000 children	No. of Substantiated Victims per 1000 children
1991	41	14.0
1992	43	15.1
1993	43	15.3
1994	43	15.2
1995	43	14.7
1996	44	14.7
1997	42	13.8
1998	40	12.9
1999	39	11.8
2000	39	12.2
2001	36	12.4
2002	35	12.3

Source: Waldfogel (2004); U.S. Department of Health and Human Services (2003, 2004).

While the incidence of child maltreatment seems to be slightly lower today than ten years ago, the suffering of the young victims as well as the huge costs to society each year to intervene in child maltreatment continues to be a serious concern. Numerous studies conducted by educators, medical professionals, and social scientists have documented strong associations between childhood victimization and a broad range of problems such as poor

[2] The incidence rate of substantiated victims was 11.8 per 1,000 children in 1999; however, this was considered an outlier unduly influenced by census estimates of child population base numbers (U.S. DHHS, 2003).

academic performance, depression, substance abuse, and violent behaviors (e.g., National Research Council, 1993; Franey et al., 2001). The direct cost of providing services required for maltreated children alone, including medical care, child welfare system, law enforcement, and judicial system is estimated as high as $24 billion annually (Fromm, 2001). Yet, societal commitment to combating child maltreatment is far from commensurate with the severity of the problem (Putnam, 2001). As a result, our understanding of the causes of child abuse and neglect continues to be limited and evaluation of the effectiveness of various intervention programs remain inconclusive (National Research Council, 1993).

We focus on a particular aspect of the literature on child maltreatment in this review -- the economic evaluation of programs and services for child maltreatment, including cost-benefit analysis and cost-effectiveness analysis. While these methods have not been widely used in assessing programs specific to preventing and treating child abuse and neglect, their potential value in helping achieve efficient allocation and use of the limited economic resources to such programs has been acknowledged by several studies (Daro, 1988; Dubowitz, 1990; Plotnick & Deppman, 1999). This report adds to the literature by 1) providing a comprehensive review of previous studies on the cost-benefit and cost-effectiveness of child maltreatment interventions and 2) reporting on a cost-benefit analysis comparing two model strategies for investigating child abuse at the community level. Within this report, the reader will find a literature review that summarizes the rather complicated child welfare system and federal legislation concerning child maltreatment. Findings from cost studies of child abuse and neglect are presented, which in many cases may be interpreted as either the costs of treatment programs or potential benefits (cost-savings) of successful prevention programs. Economic evaluations are reviewed along with methodological issues

and distributional concerns. Suggestions for future research are offered. A report on the cost-benefit analysis undertaken at the National Children's Advocacy Center is given. Finally, a guide for Child Advocacy Centers (CAC) wishing to replicate this cost-benefit study in their own states is included.

The Child Welfare System

There has been certain amount of confusion relating to the child welfare system in the United States. Waldfogel (2004) points out that it has been narrowly perceived by many people as a foster care system. In fact, the child welfare system offers a broad range of services such as investigation of child maltreatment reports, support and preservation of families, and provision of out-of-home care, including adoption (U. S. Congress H. R. Committee on Ways and Means, 2004). Moreover, many families involved with the child welfare system are eligible for a variety of means-tested government programs, including Medicaid, Temporary Assistance to Needy Families (TANF), Head Start, and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), among others (Courtney, 1998). For instance, Rovi et al. (2004) estimates that Medicaid is the primary payer for two thirds of hospital costs resulting from child abuse and neglect.

In introducing the problem of cost-benefit analyses of child abuse programs, we focus mainly on programs and services for child maltreatment as well as pertinent legislative background. Nonetheless, we must take into account the interaction between the child welfare system and other social services in order to more reliably gauge the benefits and costs of child maltreatment programs.

Legislative Background of Child Maltreatment

The first statute dealing with child abuse and neglect dates back to 1874 in New York State. By 1967, virtually all States and the District of Columbia had passed child maltreatment reporting laws although these statutes differed in the definition of maltreatment, reporting standards, and sanctions against convicted perpetrators (Daro, 1988). The wide variation in state child maltreatment laws and the "rediscovery" of child abuse during the 1960s prompted the passage of the Child Abuse Prevention and Treatment Act (CAPTA) in 1974 (Courtney, 1999). CAPTA mandated the reporting of child maltreatment by professionals who interact with children and required states to investigate these reports and take immediate measures to protect children who might be in danger. As a result, many states modified their statutes to conform to the standards set by CAPTA (U. S. Congress H. R. Committee on Ways and Means, 2004).

States can also request CAPTA monies to help support their child welfare systems. However, CAPTA grants are by no means major sources of funding for child welfare. The total amount of CAPTA funds granted in fiscal year 2003, including support of CPS agencies, family support services, and research was $109 million (U. S. Congress H. R. Committee on Ways and Means, 2004). Instead, the bulk of child welfare spending is financed through several federal programs established under the Social Security Act. A chronological list of these laws and programs provided in Table 2.

Together with some state and local initiatives for child abuse and neglect, these laws provide a safety net for maltreated children and children at risk of maltreatment.

Overview of Child Welfare System

The child welfare system is not a single entity. Many government and nongovernmental entities work together to protect children from abuse and neglect. The federal government determines basic guidelines for responding to child maltreatment and provides federal funds to support these activities. The provision of child welfare services, however, is primarily the responsibility of the states. Each state has its own legal and administrative structures and programs to serve the children and families involved with the

Table 2. Federal Legislations and Major Child Welfare Programs

Year	Federal Legislation	Programs Established/Amended
1935	Social Security Act	Child Welfare Services Program (under title V)
1961	Social Security Act	Foster Care Maintenance Payments (under title IV-A)
1967	Social Security Act	Child Welfare Services Program (transferred to title IV-B)
1974	Child Abuse Prevention and Treatment Act	
1980	Adoption Assistance and Child Welfare Act	Foster Care Program Adoption Assistance Program (both under title IV-E)
1985	Consolidated Omnibus Budget Reconciliation Act	Independent Living Program (under title IV-E)
1993	Omnibus Budget Reconciliation Act	Family Preservation and Support Program (part 2 under title IV-B)
1997	Adoption and Safe Families Act	Promoting Safe and Stable Families (renamed family program under title IV-B part 2)
1999	Foster Care Independence Act	Chafee Foster Care Independence Program (renamed Independent Living Program)
2001	Promoting Safe and Stable Families Amendments	Mentoring Children of Prisoners (part 2 under title IV-B)

Source: Courtney (1999); U. S. Congress, H. R. Committee on Ways and Means (1998, 2004).

child welfare system due to a report of child maltreatment.[3] In tribal areas of the United States, child protection efforts are the result of an intricate interplay between federal, state, and local child welfare statutes and the laws developed by each sovereign tribal authority. At the local level, child protection service (CPS) agencies work in tandem with medical professionals, law enforcement personnel, and the judicial system to investigate alleged child maltreatment, provide for medical and counseling services to victims, offer in-home services, and make permanency plans for children in foster care.

Major federal programs dedicated to child welfare services include the Title IV-B Child Welfare Services, Promoting Safe and Stable Families, and Mentoring Children of Prisoners programs; and the Title IV-E Foster Care, Adoption Assistance, and Foster Care Independence programs.[4] Almost all the funds under Title IV-E are entitlements and the federal government matches what states have spent on those programs according to predetermined rates, ranging from 50 to 80 percent depending on specific activities. Programs under Title IV-B, on the other hand, are funded by a combination of discretionary and entitlement amounts and funds are matched with total spending capped (U. S. Congress H. R. Committee on Ways and Means, 2004).

States may also use some federal funds from TANF and the Title XX Social Services Block Grant (SSBG) to provide child welfare services. In addition, Medicaid and the Supplemental Security Income (SSI) program have helped cover part of medical and disability-related costs for abused and neglected children. Using survey data from state child welfare directors, Bess et al. (2002) estimated that the overall cost of child welfare services

[3] The National Clearinghouse on Child Abuse and Neglect Information provides state-by-state information about State civil laws on reporting child maltreatment, case management, permanency planning, and adoption at http://nccanch.acf.hhs.gov/general/legal/state/index.cfm.

[4] For a detailed treatment of these programs, see Courtney, 1999 and U. S. Congress H. R. Committee on Ways and Means, 2004.

to taxpayers was at least $20 billion in 2000, of which federal funds accounted for 50%, state funds 40%, and local funds 10%. While states vary widely in designing specific child welfare programs to spend the federal funds authorized by law, most state spending on child welfare services is designed to match federal funds.

Bess et al. (2002) also report that a significant share of funds expended have been used to provide services after child maltreatment has occurred, mainly for out-of-home placements and adoption. At least $11 billion was spent on these services in 2000. In contrast, only $2.9 billion was spent on all the other services including prevention, investigation, family preservation and reunification, and in-home support.[5] This distribution of expenditures reflects an essentially passive response of the child welfare system and suggests an inability to effectively prevent child maltreatment. Part of the reason for this passivity is that expenditures on children in out-of-home care are mandated by law while prevention programs are not. When child welfare agencies have limited resources at their disposal and specifics mandates, then programs without a mandate, such as prevention services generally receive scant attention.

Welfare Reform and Child Maltreatment

The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 overhauled the nation's welfare system. A growing body of literature has focused on how this drastic reform would affect children, particularly those in low-income single mother families. Two distinct types of research questions relating welfare reform to child maltreatment have been discussed in the literature.

[5] These numbers were out of the $15.7 billion that States managed to categorize into different services. Total expenditures specific to child maltreatment prevention were unavailable.

One strand of research concerns the impact of welfare reform on child welfare financing (Geen & Waters, 1997; Bess et al., 2002; Scarcella, et al., 2004). While it did not change child welfare programs directly, PRWORA did change four funding sources for child welfare services. First, PRWORA eliminated the Emergency Assistance (EA) program whose funds were largely used by states for child maltreatment interventions. However, funds from the EA program are now rolled into the TANF block grant, and states may transfer some TANF money to child welfare-related activities. Second, PRWORA eliminated the Aid to Families with Dependent Children (AFDC) program but the request of federal match for expenditures on children in foster care is still linked to the eligibility criteria of AFDC as of July 16, 1996. These criteria have eroded in value over time, thus making it more difficult for states to reimburse foster care spending. Third, PRWORA reduced SSBG which supports child welfare services from $2.8 billion to $2.38 billion for fiscal years 1997 - 2002.[6] Finally, PRWORA eliminated the individual functional assessment as a mechanism for determining eligibility for the federal SSI program. Because many children in foster care were determined to be SSI-eligible through this mechanism, its elimination could result in less SSI funds.

A series of Urban Institute studies have tracked expenditures on child welfare services by state and local child welfare agencies in 1996, 1998, 2000, and 2002 (Scarcella, et al., 2004). Child welfare spending from federal, state, and local funds increased from $14.7 billion in 1996 to $22.2 billion in 2002. The discretion that states were given over the use of the TANF block grants largely compensated for the elimination of the EA program and the reduction in SSBG funding. As a result, at least $3.6 billion from TANF and SSBG

[6] Under the Transportation Equity Act (Public Law 105-178), SSBG entitlement ceiling was scheduled to be permanently reduced to $1.7 billion beginning in fiscal year 2001 (U. S. Congress H. R. Committee on Ways and Means, 2004).

were spent on child welfare services in 2002. Federal spending on foster care maintenance payments and SSI reimbursements, however, witnessed slight decreases in 2002 owing to PRWORA. The Urban Institute predicted that states would continue to rely on funds not primarily created for child welfare services such as TANF and Medicaid to offset funding reductions caused by PRWORA.

The other strand of research examines the impact that welfare reform has on child welfare involvement, as indicated by the incidence of child maltreatment or entry into foster care (U. S. Congress H. R. Committee on Ways and Means, 2004). This rationale is based on empirical findings that families on welfare are more likely to come into contact with the child welfare system for reports of child abuse and neglect.[7] The literature has recognized two channels through which welfare reform could affect child maltreatment, though the direction and magnitude of the impact remain inconclusive.

First, PRWORA fundamentally changed the purpose of welfare from entitlement to temporary assistance. Most recipients have to comply with stringent work requirements in exchange for financial aid. Failing to find or keep a job could lead to termination of welfare benefits, which in turn reduces family income or makes it more unstable. As a result, the incidence of child maltreatment may increase because of the strong connection between family income and child maltreatment (Berger, 2004; Waldfogel, 2004). For instance, Paxson and Waldfogel (2002) find that increases in the proportion of children living below 75% of the poverty line were associated with higher rates of child maltreatment while lower welfare benefits were associated with higher rates of foster care.

[7] See Waldfogel (2004) for a list of references on this issue.

Second, as more parents (mostly single mothers) become employed, the stress from work and less supervision of children may result in worse parenting, hence increasing child abuse and neglect. On the other hand, if job market participation enhances parents' self-esteem as well as increases family income, child maltreatment will likely be reduced. Empirical findings to date, suggest that neither of these hypotheses is dominant. Using survey data on 1998 welfare recipients in nine Illinois counties, Slack et al. (2003) find that parental employment combined with welfare receipt lowered the risk of child welfare involvement compared to welfare recipients without jobs. However, using state-level panel data, Paxson and Waldfogel (1999, 2002) conclude that the incidence of child maltreatment increases as the proportion of children living with working single mothers increases.

There are also many research studies dealing with the general well-being of children as a result of welfare reform (for reviews, see Chapter 10 of Grogger et al., 2002 and also Morris et al., 2001). One challenge posed by the reform is how to reconcile wide variations in state welfare systems resulting from the devolution of welfare reform to states. A hodgepodge of welfare policies makes it more difficult and problematic to compare aggregated outcomes across states. A better alternative might be comparing outcomes of each state over time.

Consequences and Costs of Child Maltreatment

Since the early 1960s, when the issue of child abuse gained increased attention, there have been numerous studies on child maltreatment (Daro, 1988; National Research Council, 1993). Topics include the etiology of child maltreatment, the consequences of maltreatment, national surveys of incidence, and evaluation of a variety of programs relating to child maltreatment. Of particular relevance to this review is the literature that attempts to quantify

the costs of child maltreatment in monetary terms (Bess et al., 2002; Forjuoh, 2000; Fromm, 2001; Irazuzta et al., 1997; Miller et al., 1996; Rovi et al., 2004; Scarcella et al., 2004). These studies, based on research that examines the relationship between maltreatment and a broad range of sequelae, assigned actual dollar amounts to the costs incurred from maltreatment. Before we review these studies in more detail, a brief summary of current understanding of the consequences of child maltreatment is in order.

Consequences of Child Maltreatment

The Research on Child Abuse and Neglect Panel of the National Research Council conducted a thorough review of the literature prior to 1993 relating to the consequences of maltreatment (specifically, Chapter 6 of National Research Council, 1993). This review detailed the short- and long-term effects of maltreatment on victims from childhood to adolescence and adulthood. Maltreatment experiences in early childhood have direct impact on the physical, psychological, cognitive, and behavioral development of children. Physical abuse (including vigorously shaking a baby) and neglect of a child's basic nutritional needs may result in brain dysfunction, growth retardation, or even death. Some studies have demonstrated that abused and neglected children tend to be intellectually delayed, particularly in the area of verbal intelligence, and these children consistently demonstrate poor school performance. Psychologically, children suffering from physical abuse and emotional neglect are at risk for diminished self-esteem, whereas sexually abused children are more likely to show high levels of dissociation. Aggressive and antisocial behaviors are consistently documented for physical abuse victims.

The Panel found that the intermediate and long-term impacts of child abuse and neglect were not as well understood as its direct impact on children. In part this is because of

the methodological challenges inherent in research on the longer term effects of maltreatment. These challenges include longitudinal and prospective data needs, lack of comparison groups, and difficulty controlling for confounding factors such as poverty, unemployment, and domestic violence. Nevertheless, the Panel presented evidence that suggested a relationship between child maltreatment and several problems that appear in adolescence, including delinquency, violence, running away, sexual promiscuity, teenage pregnancy, alcohol or drug abuse, and suicide attempts. Concerning the causal linkage between childhood victimization and adverse experiences in adulthood, the Panel pointed out that most research had focused on psychosocial outcomes whereas others such as intellectual and physiological outcomes were rarely explored.

Recent research has made several strides in studying the consequences of child maltreatment (for reviews, see Dallam, 2001, Hildyard & Wolfe, 2002, and Jonson-Reid, 1998). Methodologically, twin studies from Australia have been used to control for environmental factors when studying the effects of sexual abuse on lifetime prevalence of psychiatric disorders (Dinwiddie et al., 2000; Nelson et al., 2002). After controlling for family factors these authors find that child sexual abuse remains associated with increased risk for adverse outcomes such as major depression, conduct disorder, and alcoholism. Another Australian study examining the relationship between child maltreatment and juvenile offending finds that compared to sexual and emotional abuse, physical abuse and neglect are more predictive of offenses (Stewart et al., 2002). Hildyard and Wolfe (2002) focus on child neglect and conclude that relative to physically abused children, neglected children have more severe cognitive and academic deficits, social withdrawal, and internalization of problems.

More evidence on the negative impacts of childhood maltreatment on adult survivors has begun to emerge. For example, evidence now suggests a general association of maltreatment with leading causes of death in adults and specific risks for chronic diseases such as diabetes (Felitti et al., 1998; Kendall-Tackett, 2001). A more disturbing discovery is that adults with a history of maltreatment tend to have poorer responses to medication and poorer treatment outcomes (Kang et al., 2002; Simpson, 2002; Zlotnick et al., 1995). These findings highlight the urgency of effective prevention of maltreatment, an area which is currently compromised by limited resources available for child maltreatment.

Costs of Child Maltreatment

Both scholarly and popular literatures suggest how much child maltreatment may cost society. Yet, as emphasized by the National Clearinghouse on Child Abuse and Neglect Information (2003) "…few in-depth and rigorous financial analyses have been conducted to give us a solid understanding of the total costs of maltreatment." The main explanation for this gap in knowledge is that the causal link between childhood maltreatment and a variety of problems, in particular those that appear later in adolescence and adulthood, has not been firmly established in the existing research. The lack of sound quantitative estimates discourages the effort to evaluate the cost of child maltreatment comprehensively. As a result, cost studies on child maltreatment tend to adopt a more conservative approach, measuring only those costs of little controversy.[8]

One cost component that is relatively easy to track is government spending on child maltreatment interventions, such as child protective services and foster care. Courtney (1999) reports that the costs to the *federal* government of caring for only those children removed

[8] This section will focus exclusively on studies that only examine the costs of child maltreatment; those which examine both the costs and benefits will be reviewed in the next section.

from the home increased from $610 million in 1986 to $3.67 billion in 1996. Researchers from the Urban Institute have undertaken more comprehensive analyses of government expenditures on children and families served by the child welfare system. From surveys completed by state child welfare agencies, they estimate that governments at all levels spent $14.7 billion, $15.7 billion, $20 billion, and $22 billion on child welfare activities in 1996, 1998, 2000, and 2002, respectively (Bess et al., 2002; Scarcella et al., 2004). These numbers are certainly an underestimation of the total fiscal costs of child abuse and neglect because they do not include expenditures for the law enforcement investigations and the judicial system prosecutions of child maltreatment, nor do they consider many other government programs for which maltreated children are eligible, such as special education programs.

Another cost resulting from maltreatment are expenditures for children hospitalized because of abuse or neglect (Bopp et al., 1997; Forjuoh, 2000; Irazuzta et al., 1997; Rovi et al., 2004;). Findings consistent across all these studies indicate that children who have experienced abuse or neglect tend to have suffered from more urgent and severe injuries relative to non-maltreated children. In addition, they face a much higher risk of death and longer hospital stay, which in turn increases their medical costs. For instance, Rovi et al. (2004) found that the average length of hospital stay for a maltreated child is 8.2 days as compared to 4 days for an ordinary child, and the total charges for hospital care of an abused or neglected child are twice as much as those for a non-abused hospitalized child ($19,266 vs. $9,513). Of note, Medicaid paid the medical expenses for almost two-thirds of the maltreated patients.

There are a few studies that have explicitly calculated the indirect costs of child maltreatment, quantifying a wide range of expenses in such areas as special education,

chronic health care, substance abuse, juvenile delinquency, adult criminality, lost productivity, and reduced quality of life. A National Institute of Justice study assesses that on average, each case of child abuse incurs a cost of $60,000 to the victim alone, from immediate medical charges to the pain and suffering of the victim (Miller et al., 1996). This is equivalent to an annual cost of $56 billion that has to be borne by both victims and taxpayers.

Another recent study commissioned by Prevent Child Abuse America (PCAA) estimates that the comprehensive cost of child maltreatment to American society reaches $94 billion annually (Fromm, 2001). This PCAA cost report provides the most recently published estimates of direct and indirect costs associated with child abuse and neglect. The estimates are conservative and limited in that the monetary values estimated were for costs of abuse and neglect, not all indirect costs were considered, incommensurables and intangibles were outside the scope of the study, benefits derived from prevention and intervention were not directly addressed, and a stringent inclusion criterion for the analysis was set such that only cases meeting a standard of harm rather than a standard of endangerment were included.

The actual cost resulting from maltreatment is expected to be higher than either Fromm (2001) or Miller et al. (1996) suggest, since both rely on more stringent standards of what constitutes abuse or neglect. Nevertheless, these cost estimates imply that the potential savings from reducing the incidence of child abuse and neglect would without doubt be enormous. In the public policy arena, however, the justification for devoting more resources to tackling child maltreatment is that the cost of preventing or treating child maltreatment is outweighed by the costs avoided, or the benefits generated. This leads to the discussion in the

next section of cost-benefit and cost-effectiveness of child maltreatment intervention programs.

We conclude this section by noting that recent cost studies provide a degree of needed current statistical evidence relating to child maltreatment; we remain not far removed from Plotnick and Deppman's (1999) assessment that cost-benefit analysis should be applied to child maltreatment programs, and Courtney's (1999) charges that current estimates of the overall costs and benefits fail to withstand rigorous scrutiny. We discuss this in more detail in the next section.

Cost-Benefit Analysis of Child Maltreatment Programs

Cost-benefit analysis is now routinely required by funding agencies to assess the financial soundness of a proposed project. [9] It has been applied to evaluating a wide variety of social programs, including occupational health (Cropper & Oates, 1992), substance abuse (Berger, 2002), early education (Reynolds et al., 2002), and welfare programs (Foster & Holden, 2002). There is scant literature on the cost-benefit analysis of programs and services specific to child maltreatment--the majority of studies that examine the outcomes of child maltreatment programs do not include an economic evaluation (Dubowitz, 1990). Nonetheless, several studies provide valuable guidelines for conducting sound cost-benefit analyses of programs that intervene in child abuse and neglect (Barnett, 1993; Daro, 1988; Foster & Holden, 2002; Plotnick & Deppman, 1999). However, none of these studies provide actual cost-benefit analyses. Instead, they are limited to discussion/consideration about the utility and implementation of such analyses.

[9] Sometimes the term benefit-cost analysis instead of cost-benefit analysis is used in the literature. They are interchangeable.

This section introduces the general methodology of cost-benefit analysis as it applies to child maltreatment programs and reviews studies that have analyzed the cost-benefit or cost-effectiveness of these programs. The term “child maltreatment programs” is used rather loosely throughout the paper, but these studies may be classified into three broad categories: prevention, investigation, and treatment. Prevention programs refer to those aimed at preventing child abuse and neglect. A few notable examples are home visitation and school-based sexual abuse prevention programs. Investigation programs arise from different practice principles of child welfare agencies in response to alleged child maltreatment cases, including traditionally separate child protective services (CPS) and law enforcement (LE) investigations, joint CPS/LE investigations, and multidisciplinary team investigations offered by a Children's Advocacy Center (CAC) that involves CPS, LE, medical, mental health and other professionals. Treatment programs encompass a broad range of social services, such as counseling, family support, and parenting education. Unless otherwise specified, the analysis below applies to all these programs.

The Cost-Benefit Framework: An Overview

Cost-benefit analysis is viewed by economists as the applied side of modern welfare economics. The theoretical underpinnings of cost-benefit analysis are that overall social welfare would improve if the gains from an activity are proven to exceed the losses (Boardman et al., 1996). In some sense, the idea of comparing benefits and costs of social services in the public sector is analogous to investment decisions in the private sector (Plotnick & Deppman, 1999). For example, cost-benefit analyses of several alternative programs for reducing the incidence of child sexual abuse can illuminate which program produces the greatest net benefits, and hence provide a basis for public decision making. The

general framework of cost-benefit analysis outlined below is largely drawn upon findings reported by Barnett (1993) and by Plotnick and Deppman (1999).

Perspectives of Cost-Benefit Analysis

Before the cost-benefit analysis of a program is conducted, it is necessary to define the perspective of analysis, which can be from that of program participants, nonparticipants (or taxpayers), or society as a whole (Plotnick & Deppman, 1999). A clear definition of the analytic perspective is central to identifying the benefits and costs of a program appropriately, as a benefit to participants might well be a cost to nonparticipants, or vice versa. For instance, free counseling for children from low-income families benefits the children but incurs costs to those who pay extra taxes to fund this service.

Unless restricted to a specific perspective, any cost-benefit analysis should first determine costs and benefits separately for participants and nonparticipants, then sum them up to obtain society-wide costs and benefits (Plotnick & Deppman, 1999). Presenting cost-benefit results from all three perspectives may help policymakers ascertain the distinctive impacts a program has on different members of society as well as decide whether to approve a program or not.

Costs

The costs of providing a public program are relatively well-defined in monetary terms. In general, any resources involved as a result of the program constitute its costs, since they could have been put to other uses. Some costs, such as salaries of child protective services personnel and the depreciation of office buildings, can be easily quantified using accounting records. Others, however, are less straightforward. For example, if volunteers are recruited in a home visiting program and they visit families at risk of child maltreatment once

a week for two hours, the travel expenses and volunteers' time should be counted as costs of the program. Similarly, the time that parents spend on parenting education is also a cost (Barnett, 1993). Plotnick and Deppman (1999) also acknowledge other subtle cost components such as the loss of privacy due to home visits by a caseworker. Table 3 illustrates the costs of a home visiting program and a CAC investigation model.

Table 3. Costs of Home Visiting Programs and the CAC Investigational Model

Home Visiting Programs	**CAC Investigation Model**
Costs to Visited Families	*Costs to Victims and Non-offending Family Members*
-Parents' time spent on the program	-Time spent on forensic interview/evaluations and court appearances
-Lost privacy of families	-Emotional pain and suffering
	-Stigma and stress
	-Lifestyle changes (jobs, homes, etc)
Costs to Home Visitors	*Costs to Perpetrators*
-Time spent on commuting to the targeted families	-Time spent on interrogations and court appearances
-Foregone income if visitors are volunteers	-Court fines and victim compensation fees
	-Stigma and emotional distress
	-Attorney fees
	-Costs of mental health counseling if paid by perpetrators
Costs to Taxpayers	*Costs to Taxpayers*
-Facilities and Overhead	-Facilities and Overhead
-Salaries and fringe benefits of program administrators and home visitors	-Salaries and fringe benefits of CPS investigators, law enforcement investigators, and other multidisciplinary team members
	-Medical exams and mental health services
	-Victim services

Source: Barnett (1993).

Program Effects

Whenever a new program is proposed, it is crucial to study its outcomes using experimental designs (Barnett, 1993). The results of the outcome study may directly affect the potential benefits (or cost-savings) of the program. However, measuring all the outcomes is particularly problematic for some child maltreatment programs because of the complexity of human development. For instance, visiting families with a newborn child, in addition to

reducing parent stress, may have long-term positive impacts on the child's cognitive and social functioning, which may be observed only at an older age. Unless the impact study is conducted over a sufficient long prospective time horizon, it is impossible to assess these outcomes accurately.

Outcome studies in this area have long been criticized for their small sample sizes, lack of control groups, limited outcome measures, and failure to measure the process of the program (National Research Council, 1993). Therefore, when presenting the results of a cost-benefit study, it is important to spell out some expected future benefits which are not measured in the outcome analysis.

Benefits

Benefits in cost-benefit analyses are essentially monetary values of program outcomes. Unlike costs incurred in child maltreatment programs, benefits derived from these programs are much more difficult to quantify in monetary terms. Long term benefits may fall out of the scope of an outcome study, and there are ethical concerns over assigning a dollar value to the prolonging of a child's life or better quality of life as a result of successful child maltreatment interventions (Dubowitz, 1990; Barnett, 1993). Depending on different interventions relating to child maltreatment, benefits may vary from program to program. Table 4 illustrates the benefits of home visiting programs and those of a CAC investigation model.

Some benefits, such as avoided medical expenses and time saved in the investigation of a child abuse case, are readily valued in monetary terms. Others, such as better parent-child relationships, reduced trauma due to a child-friendly interview environment, and

Table 4. Benefits of Home Visiting Program and the CAC Investigational Model

Home Visiting Programs	**CAC Investigation Model**
Benefits to Visited Families	*Benefits to Victims and Their Families*
-Improved health of children	-Improved experience with investigation due to child-friendly environment
-Reduced developmental problems	-Fewer forensic interviews/evaluations
-Better parent-child relationship	-More timely referral to needed services
-Better parenting	-Better advised about legal procedures and alternatives
-Informed of accesses to various social services	
Benefits to Taxpayers	*Benefits to Taxpayers*
-Reduced government expenditures in areas such as health care, welfare, and criminal justice system	-Reduced costs of investigation because of better coordination among agencies
-Increased tax revenues	-Deterring the occurrence of maltreatment in the future
-Decreased social problems such as child abuse, poverty, delinquency, and teen pregnancy	

Source: Barnett (1993).

satisfaction knowing that other people's children will not be abused or neglected because of prevention efforts, require special estimation techniques. One such technique, contingent valuation (CV), which has been widely used in the economic literature to value goods without a market, may be used to measure these non-marketed values.[10]

The CV method designs survey questions to elicit people's willingness to pay (WTP) for a good described in a hypothetical market, since this good is not currently traded in a market or there is no market for this good at all (Mitchell & Carson, 1989). Willingness to pay simply means how much a person is willing to pay for a good or service. It is a fundamental concept in welfare economics, and a subjective measure of how people value a good or service based on their preferences and incomes. In a classic market it is necessary for people's willingness to pay to be no less than the market price in order to make a purchase.

[10] For a detailed treatment of contingent valuation and how it has been applied to value goods, such as air visibility and programs for reducing the risk of heart attack, see Haab & McConnell (2002) and Mitchell & Carson (1989).

Willingness to pay remains a conceptual measure of the benefits that people attach to a good or service if there is no market for this good or service (Plotnick & Deppman, 1999).

By asking questions like “how much would you be willing to pay for a program that reduces the incidence of child abuse by 50%”, the CV method infers the benefits of such a program assuming that people would act according to their answers if the program were offered by a market. Specifically, for participants of the program, their WTP amounts might suggest, among other things, how much they would pay to avoid the trauma caused by abuse or neglect, while the WTP amounts of nonparticipants might reflect how much they value the satisfaction derived from a safer environment for children.

An easier alternative to cost-benefit analysis is cost-effectiveness analysis, in which case the benefits of a program are not valued in monetary terms. Instead, only one or two outcome measures capturing the primary goal of the program are utilized to justify the costs. For instance, if a family support program reduces the rate of child abuse recidivism by 50%, funding decisions about this program can be made if the reduction is deemed worth the cost. If there are multiple competitive programs, resources can be allocated to the one that yields the highest reduction rate given a fixed amount of cost. However, the simplicity of cost-effectiveness analysis comes at the cost of an incomplete accounting of all the benefits that a program may generate. Therefore, unless the primary effect of a program is the only decision factor, cost-benefit analysis is preferred to cost-effectiveness analysis.

Time and Uncertainty

It is not uncommon for certain nontrivial program effects to appear at some point in the future. For child maltreatment programs in particular, benefits may be sustained long after the programs have ended. An outcome study with a longitudinal design may capture

part of the long-term effects, but extrapolations need to be made from existing data and related research findings for the period beyond the outcome study. Failure to include these benefits might exclude a potentially desirable program, but careless extrapolations might also mislead the result. Therefore, it is important to check the robustness of the benefit-cost comparison to different extrapolation schemes.

Once data on the costs and benefits of a program are obtained for the period under consideration, the present value of net benefits can be computed as the difference between the discounted values of benefits and costs. The choice of discount rates is largely at the discretion of researchers, but needs to account for the uncertainty around future costs and benefits. Note that costs and benefits do not have to be adjusted for inflation as long as they are discounted by a real discount rate (Plotnick & Deppman, 1999). However, it is still necessary to assess how robust the cost-benefit ratio is given different discount rates.

Distributional Effects

A well-conducted cost-benefit analysis would consider the distributional impact of a program as well as the whole spectrum of program costs and benefits. The distributional impact of a program concerns the equity of resource allocations among all members of society while the comparison of costs and benefits addresses only the efficiency issue. Often times both are of interest to policymakers. For instance, free mental health care for inner-city abused victims may not pass the benefit-cost test, but the favorable distributional impact on the low-income group may compensate for the efficiency loss.

Plotnick and Deppman (1999) explain two approaches to incorporating distributional effects into a cost-benefit analysis. One is to present the cost-benefit analysis and the distribution analysis separately, and leave the judgment of the equity and efficiency tradeoff

to the decision maker. The other is to adjust the cost-benefit results based on some predetermined weights over different groups. For the second approach, however, it is recommended that both the weighted and unweighted results be presented to allow for different weights from the perspective of the policymaker.

Review of Cost-Benefit Studies

Despite the relevance of cost-benefit analysis in understanding the economic efficiency of child maltreatment programs, few scholarly studies have actually examined the costs and benefits of these programs. Daro (1988) and Dubowitz (1990) located only six economic analyses of child maltreatment programs in the 1970s and 1980s, including two evaluation projects conducted by Berkeley Planning Associates that assessed the costs and effectiveness of 30 different child abuse programs, and four other evaluations concerning a family support center, medical-foster family care, lay therapy, and nurse home visitation. A later review of home visiting programs by Barnett adds six more studies that looked at the costs and benefits of child maltreatment prevention programs (Barnett, 1993). The following section focuses on economic evaluations of child maltreatment programs published after the previous three review studies. The criterion for inclusion of a study in this section is that it employs the framework of a cost-benefit analysis.

Michigan

Two studies funded by the Michigan Children's Trust Fund attempt to measure the costs of preventing child abuse against the costs of child abuse in Michigan between 1992 and 2002, and conclude that preventive programs are extremely cost effective in combating child abuse (Caldwell, 1992; Noor et al., 2004). Specifically, the total costs of child maltreatment, including an arguable item, low birth weight, as well as protective services,

medical treatment, special education, and foster care, were estimated to be $823 million in 1992 and $1795 million in 2002. In contrast, the costs of providing home visiting programs to every family in Michigan having a first baby were $57.59 million in 1992 and $65.26 million in 2002. Based on an average reduction rate of 40% of child abuse and neglect, the provision of home visiting programs would have saved Michigan $329 million (or 6 times of the program costs) and $718 million in 2002 (or 11 times of the program costs).

Colorado

The Colorado Children's Trust Fund conducted a similar analysis that compared the costs incurred in Colorado by failing to prevent child maltreatment with the costs of providing intensive home visitation to high risk families with children from birth to 3 years old (Gould & O' Brien, 1995). For Colorado, the annual direct costs of CPS investigations, child welfare services, and foster care are estimated at $190 million, and indirect costs associated with the long-term consequences to individuals maltreated as children are estimated at $212 million. The total costs of the state-wide home visiting program are projected at $24 million, which implies that if this program were able to reduce the total costs of child maltreatment by 6 percent, then the program would pass the cost-benefit test.

Allegheny County, Pennsylvania

Bruner (1996) estimates the potential savings of child maltreatment expenditures by contrasting maltreatment-related spending in high-risk, distressed neighborhoods with the level of spending in low-risk neighborhoods in Allegheny County, Pennsylvania. The spending under consideration encompasses direct costs of the child welfare system and indirect costs in such areas as special education, mental health, welfare dependency, substance abuse, criminality, and lost tax revenue. Discounted over 20 years, the difference

in spending across different neighborhoods could result in $416.3 million of savings if the high-risk neighborhoods were to be improved as compared to the low-risk ones. The savings are then compared to the costs of establishing family centers to serve families with very young children in high-risk neighborhoods, which is $18.5 million or only 5 percent of the potential savings.

However tempting the findings are, these studies suffer from serious methodological flaws. They approach the economic evaluation of child maltreatment preventions by demonstrating how huge the cost can be if no effort has been made to prevent child maltreatment, rather than rigorously analyzing the costs and benefits of a particular prevention program(s). Statistics from various sources are used to extrapolate the costs that can be linked to child maltreatment. Moreover, there is no outcome study that randomly assigns families to different prevention programs, such as home visiting and family centers, to gauge the effectiveness of a specific program. As a result, these studies are of limited use in guiding future cost-benefit analysis of child maltreatment programs.

Children's Advocacy Centers

Children’s Advocacy Centers (CAC) are community-level innovations that strive to streamline child maltreatment investigations and minimize the trauma of revictimization caused by multiple forensic interviews (Walsh et al., 2004). In contrast to the traditional investigation of child abuse cases by CPS agencies, the CACs bring together CPS investigators, police, prosecutors, physicians, and mental health professionals as a multidisciplinary team to investigate and prosecute child maltreatment allegations, and secure timely treatment to child victims and their families. Many CACs have specialized interviewers with education and training in child development and forensic interviewing.

Typically, information concerning the maltreatment is collected from an interview between the child victim and an interview specialist in a comfortable setting while investigators from multiple agencies watch through a one-way mirror or closed circuit television (Walsh et al., 2004).

The first CAC was developed in 1985 in Huntsville, Alabama by then District Attorney, Robert E. Cramer of Madison County as an effort to improve child sexual abuse investigations (Cramer, 1985). By 2003, there were 330 CACs nationwide accredited by the National Children's Alliance (National Children's Alliance, 2004). CACs may be established as independent centers, as units in hospitals, or as departments in other agencies such as district attorney's offices or mental health centers. The targeted population has been expanded from sexual abuse victims to serious physical abuse and homicide victims as well. Walsh et al. (2004) provides an excellent review of different innovative programs under the CAC model.

To our best knowledge, no cost-benefit analyses of CACs have been published in academic journals. One study conducted by the Children's Advocacy Center in Washington, DC (Crapo et al., 1996) has cost-benefit analysis in the title, but in actuality it is much closer to cost-effectiveness analysis than to cost-benefit analysis. Specifically, the study considers a hypothetical case of child sexual abuse and illustrates how the traditional investigation system and a CAC would respond to interview the victim and how all of the parties involved would communicate with each other prior to court hearings. Then, using the hypothetical abuse case, a detailed comparison between the CAC model and the traditional investigation system is made. Comparisons include hours of work needed for interviewing and interagency consultation for each case. These estimates are quantified in monetary terms for both

investigative models. In 1996, the hypothetical cost was $1626.35 to the District if there was no CAC, and $801.45 with a CAC. This suggests a 50 percent cost saving, i.e., the CAC investigation is more cost effective. If the District expects to have 500 victims of child sexual abuse in that year, total cost savings would exceed $400,000. This, of course, assumes that the hypothetical case represent an average of the 500 actual cases expected.

The primary source of cost savings is the time saved due to CAC's coordination of the agencies involved in this case, including Department of Human Services, the Police Department, Corporation Counsel, and the U.S. Attorney's office. In particular, the child is typically interviewed only once by a specialized interviewer under the CAC model. Under the traditional model the victim may be subject to multiple repetitive interviews. Multiple interviews may generate conflicting information from the child, and may cause unnecessary trauma.

The Crapo et al. (1996) study provides some insights about CACs and their advantages vis-à-vis the traditional investigatory approach. Nevertheless, it is an incomplete study of the costs and benefits of a CAC. The study does not make clear the analytical perspective, nor does it explicitly define the boundary of where the CAC's involvement with the case ends. Further, it does not take into account the costs of running a CAC itself. Hence the savings from using a CAC model cannot be compared to establish a meaningful estimate of the net cost savings. The difficult-to-measure benefits of a child and family friendly investigation system are ignored, as are the benefits accrued from a more effective system of prosecuting alleged child abusers.

Early Childhood Intervention

Early childhood intervention refers to a variety of services available to children during the first several years of life, and in some cases, their families as well. While most services do not have the reduction of the incidence of child maltreatment as an explicit goal, they tend to reduce the risk factors for child maltreatment if targeted towards the enhancement of parenting skills and improvement of dysfunctional home environments. For this reason we include a recent economic analysis of two early childhood intervention programs by Karoly and colleagues at the RAND Corporation (Karoly et al. 1998). Courtney (1999) remarks that this work represents a rigorous cost-benefit study of child maltreatment prevention.

The two programs selected for cost-benefit analysis in Karoly et al. (1998) are the Prenatal\Early Infancy Project (PEIP) in Elmira, New York, and the Perry Preschool Program (PPP) in Ypsilanti, Michigan. Both programs are particularly amenable to cost-benefit analysis for the following reasons: first, they had fairly large sample sizes with random assignment at program outset, and suffered little sample attrition. More specifically, both studies enrolled economically disadvantaged families and randomly assigned study participants to intervention or control groups. The Elmira PEIP enrolled 400 first-time mothers and their children. The Perry Preschool Program consisted of 123 African American children with below normal IQ scores and their parents.

Both programs followed the subjects long enough for benefits to accrue. The Elmira PEIP collected data on mothers during pregnancy and every four to six months for the first four years after the child's birth. A final follow-up was administered when the child was 15 years old. The Perry Preschool Program interviewed the children annually from age 3

through age 11, and again at ages 14, 15, 19, and 27. At the age 27 follow-up, 117 of the 121 living participants completed interviews.

Both programs measured a broad array of outcomes that could be quantified in monetary terms. For instance, the Elmira PEIP measured children's birth weight, emergency room visits, and hospital stays, while for mothers, information on their pregnancy behaviors, work activities, time on welfare, substance abuse, and criminal records (including child abuse and neglect) was collected. The Perry Preschool Program focused more on the participating children and reported their time in special education, academic attainment, teen pregnancy, employment, welfare participation, and criminal activity.

On the basis of measured program outcomes, the Karoly et al. (1998) study employs a more conservative approach than the cost-benefit analysis by taking account of only the costs and savings to the government generated by these programs. The quantified savings come from increased tax revenues and decreased welfare outlays resulting from better job market performance, reduced expenditures for education, health, and other services, and lower criminal justice system costs such as adjudication and incarceration expenses. After discounting costs and savings for the birth of the participating child, the cost per child of high-risk families in the Elmira PEIP is $6,083. This is one-fourth the savings resulting from the program ($24,694). For the Perry Preschool Program, the savings to the government ($25,437) are more than twice the program costs ($12,148). These results suggest that expenditures for both programs are justified because of future reductions in required government spending for treatment.

The Karoly et al. (1998) study also considers other monetary benefits to society in addition to the savings in government expenditures. They include the higher income enjoyed

by program participants when compared with non-participants, and the savings to persons who, in the absence of the program, would have been crime victims. This increases the benefits of the Elmira PEIP to $30,766 and those of the Perry Preschool Program to $49,972. Sensitivity checks also demonstrate that the positive savings of both programs are robust to different choices of the discount rates.

As the authors have acknowledged in the study, a major limitation of their study is that while they included the full costs of these programs, they failed to account for all potential benefits because of the constraints in measuring outcomes. In addition, intermediate measures of the process of the programs have typically been ignored in the evaluation studies. Therefore the result of cost-benefit analysis does not help address why successful programs work and other programs do not. Another limitation is that the above two programs were implemented on a small scale with highly trained staff; it is unknown whether the benefits and savings could be replicated if implemented on a larger scale.

Summary

The literature seems to have reached a consensus that the long-term consequences of child maltreatment cost society dearly. There is sufficient evidence to conclude that the costs are enormous. However, improvements in the measurement of all costs are needed. Our review of the social safety net for children indicates that efforts to combat abuse and neglect have fallen short of the scope of the problem. The majority of resources have been spent on caring for children who have already been maltreated. In part, this results from the difficulty of intervening in the privacy of family life, particularly regarding issues involving child rearing practices. Our insufficient understanding of the economic efficiency of child maltreatment programs contributes to the resource misallocation. We argue in this paper that

rigorous cost-benefit analysis can help determine which new programs are worth funding and identify the most efficient alternative programs already in place.

An important prerequisite for sound cost-benefit analysis is high-quality program evaluations. Yet we still have limited knowledge about the range or nature of treatment and preventive services for child maltreatment, and about what services appear to work for which individuals or groups and under what circumstances (National Research Council, 1993). Future evaluation studies should employ longitudinal designs, use appropriate control groups, and gather data on the characteristics of the process by which the service is provided as well as a broad range of outcomes that may help quantify benefits in monetary terms. The research community needs to develop common instruments for assessing the process and outcomes of child maltreatment programs in order to make more reliable comparisons across evaluations.

Methodology

The first child advocacy center was created in Huntsville Alabama in 1985 as a community-level response to the continuing problem of child abuse. It was designed to meet the needs of the local community stakeholders in responding to federal and state mandates requiring investigations of all reported instances of maltreatment and abuse of children. This center became the National Children's Advocacy Center (NCAC), which has served for twenty years as the model for the establishment of Child Advocacy Centers (CACs) across the U.S. Today, there are more than 350 fully accredited CAC members of the National Children's Alliance and almost 200 associate member CACs. Nevertheless, millions of families and children live in communities that continue to use a model of child abuse response that employs traditional, pre-1985 child abuse investigation and prosecution procedures. The traditional approach to investigating reports of child abuse involves separate and independent reviews of cases by either the state Child Protective Service (CPS), Law Enforcement (LE) or by both agencies. To distinguish these alternative methods of investigating abuse we refer to the former multidisciplinary team approach as the CAC model and latter individual agency approach as the traditional or CPS/LE type of investigation.

The CAC model simplifies the process of community responses to child maltreatment by creating a coordinated response to reports of abuse and focusing on providing a child and family friendly investigatory environment. The single most important difference between the CAC and the traditional investigative approaches is that CAC brings together a multidisciplinary team (Kolbo & Strong, 1997; Walsh et al., 2004). Law enforcement, child protective services, prosecution, mental health, medical and other agencies work together as

a team to provide a coordinated response to child abuse. The members that make up the team may be co-located under one roof or geographically dispersed across the local community, but the key is that they function as a team and work together to serve alleged child abuse victims in a child friendly environment. In contrast, the traditional CPS/LE investigative model may increase the likelihood that victims bounce between agencies, undergo repeated and duplicative interviews and make effective interagency communications more difficult (Sheppard & Zangrillo, 1996).

The resources available to communities to investigate reports of child maltreatment and prosecute alleged abusers are limited and there is wide recognition that efficient and effective investigatory procedures are in the public interest. The CAC model and the more traditional CPS/LE approach provide alternative methods that communities can choose in organizing and responding to the continuing problem of child abuse. Community leaders, elected and appointed officials and, ultimately, voters must choose between the alternative investigatory models. An important public policy question confronting local communities is which of these two alternative organizational forms of investigating abuse is best? Two related questions are:

- In the context of investigating reports of child abuse, how should "best" be defined?
- Given the definition of best, is it possible to quantitatively demonstrate the superiority of one investigatory model vis-à-vis the other?

There is a long history and tradition of research in economics that examines questions of this sort, but to date, none of these studies have systematically investigated issues related

to child abuse and maltreatment. The branch of economics that considers questions of the type posed above is referred as to *public sector applied welfare economics*.[11] One of the leading methods used in this area of economics is cost-benefit analysis (CBA). Choices, whether in the public or private sector, are invariably accompanied by costs as well as benefits. Comparing alternative choices using the cost and benefit analysis allows economists to rank alternative policies that could be chosen by public officials. Using this method, the best policy choice is the one that provides the greatest benefit to society or community compared to *all* costs that are incurred in creating those benefits. Thus, CBA provides a framework for defining what is best. Further, if costs and benefits are reliably measured, CBA can be used to quantitatively evaluate and rank social choices concerning alternative methods of organizing and carrying out public sector activities, such as investigating reports of child abuse.

In 2004 the National Children's Alliance, a consortium of children's advocacy centers, contracted with the NCAC to apply cost-benefit analysis to the investigation of child abuse allegations with the primary objective of identifying and measuring the benefits of using a CAC multidisciplinary team model versus the cost of conducting investigations through a traditional child protection system approach. This report provides information on a cost-benefit analysis completed in two northern Alabama counties that use differing investigatory methods and procedures. It also offers background information on how child abuse investigations fit into the framework of public economics and sets the stage for quantifying the difficult to measure social benefits accompanying the child and family

11. Public sector economics considers issues relating to the size and composition of government expenditures and taxes as well as government regulation and control of private markets. In addition, it considers alternative methods of organizing government activities within the economy. Applied welfare economics considers what is best when choices are made in both the private and public sectors of the economy.

friendly CAC investigations. Finally, it outlines procedures and methods used to estimate costs and benefits, it summarizes the technical results of the research, and it discusses the policy implications for communities with and without CAC's.

Public Goods, Child Abuse Investigations, and Cost-Benefit Analysis

Economists distinguish between two broad classes of goods. Most goods, such as ice cream and television sets are referred to as "private" because the market system works effectively to maximize social benefits while minimizing social costs associated with these goods. In contrast, "public goods" are a class of economic goods in which the private market system fails to provide a valuable good *at all* or consistently produces the wrong amount when evaluated using well-developed principles of applied welfare economics. "Pure public goods" will not be provided by private markets at all. Examples of such public goods include provision of justice and national defense. Goods that are provided by private markets but always in the wrong quantities are sometimes referred to as "quasi public goods." Education and police and fire protection are leading examples of goods that are under produced by private markets. In contrast, products that are produced with excessive amounts of pollution or toxic side effects provide examples of goods with excess production in private markets.

Child Abuse Investigations and Victim Services are Examples of Public Goods

Investigating reports of child abuse and prosecuting child maltreatment cases is a part of the provision of justice in the United States and, therefore, fits squarely into the class of pure public goods. Thus, private markets cannot be relied upon to systematically provide investigations and prosecutions of child abuse and maltreatment. Moreover, services provided to child victims of abuse and maltreatment and their families, while available in private markets, would be seriously under supplied in the absence of publicly provided

services. Therefore, from the perspective of *public sector applied welfare economics*, victim services to abused children and their families are quasi-public goods. The existence of public goods necessitates difficult social choices.[12] Society and individual communities must answer four fundamental questions when confronted with pure public goods such as providing fire protection and investigating child abuse and prosecuting offenders.

1. First should the public good and associated services be provided at all?
2. If provided, what quantities of the public good and associated services should be supplied?
3. If provided, what methods and procedures should be used in producing the goods and services and how should they be distributed within the community?
4. If provided, how should the community pay for the costs of resources required to provide the public good and associated services?

In a democracy these questions are decided by voters, elected officials and government employees who are charged with implementing policies relating to the provisions of public goods.[13] Decisions are normally made after much debate and are subject to periodic review and change. Every government must ultimately balance the costs of publicly provided programs against their benefits. Cost-benefit analysis (CBA) is a formal method of bringing economic thinking to bear on the first three questions listed above.[14] The

12. The problem is doubly difficult due to what economist call the "free-rider problem." People definitely receive benefits from public goods, but they almost always want someone else to pay for them. Seldom will they voluntarily agree to pay. Free riders are people who take advantage of the benefits of public goods but routinely refuse to pay in tax for them. They do this because they perceive that they can get the benefits without paying.

13. The questions are slightly different but similar for quasi-public goods such as education and victim services for abused children. The fundamental question for quasi-public goods is whether or not to intervene in private markets to modify the quantity of quasi-public goods. If intervention occurs then questions virtually identical to the remaining pure public goods questions must also be answered for quasi-public goods.

14. Economists also offer advice relating to the fourth question, but how to fund and finance public programs is generally not a part of CBA and is not discussed here.

first and most fundamental question is addressed first. If the total benefits to society exceed the monetary value of the resources required to provide the public good then the economic way of thinking concludes that it is in the best interest of the community to supply the good through a publicly funded program. Conversely, if the total costs of resources required exceed the total benefits, the community has a higher standard of living and is better off if than if the public good is not provided at all.

The remaining questions relating to public goods are contingent upon the answer to the first one. Answers to questions 2 and 3 involve the use of marginal analysis, which is an integral part of the economic way of thinking. In choosing the quantity of public goods to provide (question 2) and the methods and procedures for providing the public good (question 3) decision makers should weigh and evaluate the *marginal social benefits* (MSB) and *marginal social cost* (MSC) of the alternative choices. If the MSB of a public good exceed it's MSC then the well-being of the community is enhanced by providing *more* of the public good. Similarly, if switching from one approach to providing the public good to an alternative method of providing the good or service is associated with more MSB than MSC, then the community is unambiguously better-off if the change in methods is adopted.

Question No. 3 is directly related to the key research issue of interest in this study.

- Is a community that relies on the traditional (CPS/LE) method of investigating allegations of child abuse better-off if it switches to the CAC investigation model?

If the MSB of switching exceeds the MSC, the well-being of the community is improved by the change in the method and procedures employed in investigating allegations of child abuse. Therefore, for non-CAC communities the CAC investigative model is better than the

CPS/LE approach if switching generates more MSB than associated MSC.[15] As a practical matter, direct measures of MSB and MSC of alternative methods of implementing public sector programs are difficult to obtain. However, cost-benefit analysis provides an operational procedure for estimating approximations of the relevant social benefits and social costs that can be useful in making choices between alternative methods and procedures for conducting child abuse investigations. It deserves emphasis that reliably measuring the costs and benefits is neither easy nor cost free.

Cost-Benefit Analysis

Cost-benefit analysis (CBA) is a method of improving knowledge and informing discussion and debate relating to the provision of public goods. Costs reflect the values of the resources consumed when public goods and services are produced and distributed. Benefits are the value or utility created by programs that provide public goods. To the maximum extent possible costs and benefits are always expressed and valued using what economists refer to as the measuring rod of money. Thus, the costs of public goods are the monetary values of the resources that are consumed in the process of creating the dollar value of the benefits of public programs.

In practice two broad types of CBA can be distinguished. The first and most frequent application uses CBA to evaluate new regulations or proposed changes in an established program. CBA is to used to organize data relating to the new program, identify key uncertainties and highlight any trade-offs that should be considered in making public policy decisions. The purpose of this type of analysis is to improve knowledge and elevate the debate relating to the policy choices. The second type of CBA analysis in the literature seeks

15. A related proposition also holds. Communities with CAC's would be better-off switching to the traditional CPS/LE investigative model if the *MSB* of switching exceeds the *MSC*.

to provide a management tool that can be used to guide communities and government agencies with essentially fixed budgets so that they allocate their expenditures and resources in a manner that maximizes the value of the social benefits of their programs.[16] It is this second type of CBA that we employ in this report. However, the research results reported below can also be interpreted as providing a new way for communities to think about how they organize and use their limited resources to investigate reports of child maltreatment and abuse.

Measuring Costs and Benefits

CBA must reliably measure both costs and benefits if is to prove useful as a management tool in assisting decision makers in ranking alternative choices concerning how to best use limited resources. Errors in measurement can lead to incorrect rankings of alternative social choices. Among economists it is widely acknowledged that measuring the monetary value of the costs of government programs is conceptually less difficult than measuring the associated benefits. This is the case because government employee payrolls, fringe benefits, materials and facilities cost used in providing government programs have explicit dollar values that are established in market transactions. It is well-established in the CBA literature that *all* costs must be considered and double counting should always be avoided. Further, the concept of costs should be restricted to the value of the resources used in providing the public goods and services.

Measuring *all* benefits is much more difficult to quantify in monetary terms especially when dealing with public goods such as police protection and child protective

16. Beginning early in the 1980s the federal government began requiring agencies to routinely conduct CBA of major new regulatory initiatives. An Executive Order (no. 12291) mandating the use of cost-benefit analysis was first issued by President Reagan in 1981 [46 Federal Register 13193]. This was reaffirmed by a new Executive Order (no. 12866) issued by President Clinton in 1993 [58 Federal Register 51735].

service investigations. While some benefits may be readily identified and measured in terms of money others are not. These benefits have a difficult to measure social dimension that are not easily evaluated. In the study reported here, this dimension of the social benefits was referred to as “qualitative” and “non-monetized.” For example, how much value does a community place on future reductions in child deaths, sexual and physical abuse that accompany the expected outcomes from efficient investigations and prosecutions of homicides due to abuse and other child maltreatment?

It turns out that the difficult to measure social dimension of benefits associated with the CAC model of investigation can be reliably estimated in terms of money if the proper research procedures are employed. To explain this we note that in private markets benefits are measured by observing prices in voluntary trade and exchange. The prices reveal people’s *willingness to pay*, which is readily inferred from observing what is in fact paid in a market transaction. Individuals will not pay the price asked by a seller unless the subjective value of the benefit of the good is at least as large as the cost they incur in making the purchase. In the case of public goods, however, there are no market prices or voluntary exchanges. Some other method of establishing the value of benefits is required. Based upon methods that are widely used in environmental and resource economics we estimate the willingness to pay for public goods associated with child abuse investigation using the contingent valuation methodology.

Willingness to Pay and Contingent Valuation

How should we assess and evaluate the difficult to measure benefits of public goods? The most extensively applied and widely accepted method is to conduct a public opinion survey in which a random sample of adults in a community are asked about their *willingness*

to pay (WTP) for the public good. Estimates of the willingness to pay based on such surveys are called *contingent valuations* (CV) because they provide monetary values contingent upon the public goods being provided and the persons surveyed paying for the goods. Together, the WTP survey and the statistical and econometric analysis required to implement the estimates of willingness to pay are referred to as the *contingent valuation method* (CVM).

The logic of CVM is straightforward. Willingness to pay refers simply to how much a person is willing to pay for a good or service. It is a fundamental concept in welfare economics, and a subjective measure of how people value a good or service based on their preferences and incomes. As noted above, in a private market it is necessary for a person's willingness to pay to be no less than the market price of the good they are considering before they will buy the good, i.e., a person will never knowingly engage in voluntary trade if the cost (price) they must pay exceeds the value of the benefits received.[17] Willingness to pay remains an economically sound measure of the subjective benefits that people attach to a good or service even when there is no private market for the good or service. Thus, requiring that total benefits of public goods, as measured by WTP, exceed the total of cost of providing public goods is the public sector counterpart to WTP in private markets being greater than or equal to the price paid if voluntary exchange is to take place.

Other Research Methods Related to Cost-Benefit Analysis

In evaluating programs or alternative choices economists always prefer to express all resources used and outcomes of the programs and choices in terms of dollar values. As Alfred Marshall, a famous economist writing in the early 20th century articulated, economics

17. Once uncertainty is taken into account it is possible that mistakes can be made. Incomplete information concerning *all* costs or an over estimation of expected benefits may lead to choices that are recognized *ex post* as a mistake. However, *ex ante* buyers always expect or anticipate that the benefits will exceed the costs.

uses the measuring rod of money to make choices commensurate (Marshall, 1920). Thus to the maximum extent possible costs and benefits are expressed in terms of monetary ($) values. But in dealing with public goods many of the outcomes are notoriously difficult to reliably measure using money. Therefore, in some areas of research such as health economics and the evaluation of youth services and mentoring programs (Yates, 2005) research methods that are closely related to CBA have arisen. When the outcomes of a policy or program cannot be adequately quantified using the measuring rod of money researchers can apply what has come to be referred to as cost effectiveness analysis. This approach measures the outcomes of a program in terms of the natural units in which they occur. For example, the number of child abuse reports investigated and closed in a year is a measure of effectiveness, as is the number of child abusers convicted in trials by juries. Effectiveness thus refers to the specific outcomes that result from a program using its resources to effect particular changes. Cost effectiveness measures the outcomes relative to the associated resource costs.

Cost utility analysis is a related method evaluating outcomes not measured in terms of dollar values. It differs from cost effectiveness analysis in that it converts seemingly difficult to compare outcomes into units of measure (not money) that is sufficiently general so that a range of alternative policies and alternative choices can be compared and analyzed. This method is extensively used in health policy analysis and proceeds by converting outcomes into personal preferences (or utilities). Two alternative medical procedures appied to two distinct individuals that extend their lives by one year can be compared by assigning judgments relating to the “quality of life” that is extended. For example, a procedure with a 0.5 quality of life (QOL) outcome that costs $10,000 is equivalent in terms of cost-utility

analysis to an alternative procedure with a QOL result of 0.25, which costs $20,000. Thus, cost-utility analysis allows disparate procedures to be compared.

A final policy evaluation procedure that we take note of is a variation on cost-benefit analysis and has been described by Yates (1994, 1996, 1997) as Cost-Procedure-Process-Outcome Analysis (CPPOA). Some cost-benefit studies have been criticized because they lack sufficient information to allow policy makers and other interested individuals to adequately understand the sources of the benefits. CPPOA seeks to remedy this by insisting that the analysis go beyond quantifying and measuring with the objective of identifying and understanding the factors that give rise to benefits. Such analysis serves to better inform decision makers and contributes to making policies more effective. Some CBA studies have unquestionably been remiss in spelling out the sources of the benefits of public programs. One reason for this is that the benefits of interest are subjectively determined by individual choosers and it is often difficult to know exactly why some of these people value a public good while others do not. In this regard, Plotnick and Deppman (1999) observe:

> "A well-done cost-benefit analysis will take a comprehensive view of benefits and costs and not mechanically assign monetary values to as many aspects of a program's costs and impacts as possible while ignoring the rest (p. 385)."

In the research reported below we attempt in so far as possible to follow Plotnick and Deppman's dictum quoted above. In the process of carrying out the work we combine our cost-benefit analysis with elements of Yates' CPPOA framework.

Estimating Costs and Benefits of Child Abuse Investigations and Prosecutions

The two communities we consider are counties in northern Alabama. Madison County uses a CAC model of investigation of child abuse allegations and is served by the NCAC headquartered in Huntsville. Morgan County employs a traditional CPS model for

investigating child abuse allegations. The two counties are geographically adjacent, operate under the same state laws and court procedures, and share similar demographic characteristics. In Madison County child abuse investigations are handled though a Multidisciplinary Team, which is comprised of specially trained CPS, LE, medical, legal and mental health professionals, co-located at the NCAC. In Morgan County, child abuse investigations may be handled as independent investigations through either CPS or LE offices. These offices may also cooperate in joint investigations when the allegations appear to be criminal in nature.

Background – Community Demographics and Child Abuse

Madison County is more densely populated with an estimated 2001 population of 281,931 persons. Morgan County has an estimated 2001 population of 111,429 persons. Census 2000 data show the population of Madison County is 51.2% female, 72.1% white, and 25.6% under the age of eighteen. Morgan County's census data show its population is 51% female, 85.1% white, and 25.3% under the age of eighteen. Madison County's median income in Census 2000 was $44,704, with a poverty rate of 10.5% and 85.4% of the population having at least a high school diploma. In contrast, Morgan County's median income was lower, $37,803, its poverty rate was higher, 12.3%, and 76.3% of its population had at least a high school diploma.

Tables 5 and 6 summarize information on the average annual number of reported and indicated cases of child maltreatment and abuse, average annual number of children in the state and in each county and average annual incidence rates of abuse in Madison and Morgan counties. As a point of reference, these tables also provide comparable information for the state of Alabama as a whole. The relatively small number of abuse cases in Morgan County

shown in Table 5 reflects a much smaller child population base. The incidence rates in Table 6 correct for this by expressing reported and indicated abuse by the number of children less than 18 years of age. Compared to both Morgan County and Alabama, Madison County has uniformly lower incidence rates of child abuse for reported cases and indicated cases, as well as for each type of abuse. For example, sexual abuse and physical abuse cases are almost 30% lower than in Morgan County and more than 40% lower compared to Alabama as whole. Child deaths due to abuse are, 22% and 24% lower than in Morgan County and the state as a whole, respectively. In contrast, compared to Alabama, Morgan County has incidence rates that are larger in some cases and smaller in others. Generally, the incidence of child abuse in Morgan County is more similar to the state of Alabama as a whole than is the comparable rate in Madison County.

Table 5. Average Annual Frequency of Child Maltreatment and Deaths Due to Abuse in Madison County, Morgan County, and the State of Alabama, 1999-2003

Number of Reports and Indicated[1] Findings by Type of Abuse

	State of Alabama	Counties	
		Madison	Morgan
Reported Number of Abused Children	31,256	1,750	762
Indicated Number of Abused Children[2]	11,238	519	257
Indicated Sexually Abused Children	2,388.8	85.8	47
Indicated Physically Abused Children	4,215.4	155.5	86
Other Indicated Abuses of Children	4,633.6	277.8	123.5
Child Deaths Due to Abuse	21	1	0.5

1. An alleged child abuse is indicated when a Child Protective Service investigation reveals that abuse has in fact occurred. The perpetrator may or may not be identified in indicated cases and the evidence may not rise to the level that results in a prosecution of the crime.
2. The indicated number of abuses is the sum of sexually, physically and emotionally abused and neglected children. County level abuse data are unavailable for 2001. In the early years of the five year period this aggregation by type of abuse does not yield a total that exactly matches a separately reported number of indicated abuses in copies of records supplied by the Alabama Department of Human Resources.

Source: Summary data prepared by the Alabama Department of Human Resources in conjunction with annual reports to the National Child Abuse and Neglect Data System (NCANDS).

Table 6. Number of Children Under Age 18 and Incidence Rates of Child Abuse in Madison County, Morgan County, and the State of Alabama, 1999-2003

	State of Alabama	Counties	
		Madison	Morgan
Number of Children Under Age 18	1,123,422	70,787	28,144
Incidence Rates[2] of Child Abuse and Maltreatment			
# of Reported Cases per 1,000 Children	27.8	24.7	27.1
# of Indicated Abuses per 1,000 Children	10	7.3	11.4
# of Indicated Sexually Abused Children per 1,000 Children	2.1	1.2	1.7
# of Indicated Physically Abused Children per 1,000 Children	3.8	2.2	3.1
# of Other Indicated Abuses of Children per 1,000 children	4.1	3.9	4.4
# of Child Deaths Due to Abuse per 100,000 Children	1.9	1.4	1.8

1. An incidence rate is generally the number of reported or substantiated cases per 1,000 children. However, for child deaths the incidence rate is expressed per 100,000 children.
2. The incidence rates are obtained by multiplying the mean values reported by the Alabama Department of Human Resources for 1999, 2000, 2002 and 2003 by 1000 and dividing by the number of children under 18 years of age. County level abuse data are unavailable for 2001.

Source: Calculated from Table 1 and information on the number of children less than 18 years of age reported in the 2000 U.S. Decennial Census of Population.

The Research Plan

To apply CBA to evaluate the CAC and traditional (CPS/LE) approaches to investigating reports of child abuse we proceed by estimating the cost and benefits separately. As discussed above, our principal interest is in measuring the *marginal social benefits* of switching from the traditional CPS/LE approach to investigations relative to the associated *marginal social costs*. To accomplish this we first measure the comparative costs of the two distinct approaches to organizing and carrying out child abuse investigations. We then use the contingent valuation methodology to measure the *subjective marginal benefits* that citizens of Madison and Morgan Counties place on having a child and family friendly investigation system that is combined with an efficient and effective system for prosecuting child abusers compared to the traditional investigation and prosecution procedure. The details of the willingness to pay survey used in CVM of measuring the benefits are explained below.

The Costs of Investigating Child Abuse Allegations

Investigating reports of child abuse and prosecuting alleged offenders requires substantial resources that have alternative uses. Therefore, communities incur an opportunity cost irrespective of how they organize their systems of investigation and prosecution. The CAC method and traditional (CPS/LE) approaches to investigating reports of abuse require the use of similar resources, especially personnel, facilities and supporting material. For example, both require LE officers, CPS investigators, social workers, medical examiners (pediatricians, nurses and nurse practitioners) and legal personnel (attorneys, investigators and paralegals) in the District Attorney's office to prosecute the most serious cases of child abuse. An administrative, supervisory and support staff is also required. Office space to house the personnel is also required as are copying machines, police cruisers, gasoline, and office supplies.

The types of resources employed in Madison and Morgan Counties to scrutinize reported child abuse are similar as are most of the procedural steps used in investigations. Appendix B provides detailed procedural steps used in both counties. However, despite similarities in resources used and procedural steps the utilization of the resources in the distinct investigation and prosecution systems differs considerably. As noted previously, the coordination of the process through the Multidisciplinary Team is the key difference. In the CAC investigatory model members of the team spend much more time in joint meetings and in exchanging information. As a rule, the entire Madison County Multidisciplinary Team meets weekly for approximately 2 hours. Thus, on average, slightly more than five percent of a normal work week is spent in team meetings. Further, the NCAC is co-located, which promotes even more personal contact. Thus, in Madison County the members of the

Multidisciplinary Team spend substantially more time interacting and communicating with one another than in Morgan County. In contrast, the LE and CPS personnel in Morgan County meet jointly approximately five or six times per year and may spend more time traveling to and conducting potentially duplicative interviews.

To estimate the cost of child abuse investigations under alternative organizational regimes the research proceeded on two fronts. We first sought guidance by checking the scientific literature. In one of the only studies remotely close to the current research, Plotnick and Deppman (1999) recommend using CBA analysis to evaluate child abuse prevention and intervention programs. It should be noted here that Plotnick and Deppman (1999) do not actually conduct CBA of child abuse programs. Instead, they discuss the methodology in general terms and suggest how it could be applied to evaluate prevention and treatment programs. In particular, Plotnick and Deppman (1999) suggest considering "average" or "typical" cases in investigating costs and benefits and in highlighting the results of the cost-benefit analysis.

The first path we explore in measuring costs follows Plotnick and Deppman's suggestion that "average" or "typical" cases are a useful starting point. The second path implements direct annual measures of the total costs of investigating and prosecuting child abuse cases in each county. We briefly discuss each of these approaches to measuring costs in turn.

"Average" or "Typical" Child Abuse Cases

In an effort to identify "average" or "typical" child abuse cases in Madison and Morgan County a large number of detailed cases that are a part of the database of the University of New Hampshire's National Evaluation of Child Advocacy Centers (2005) were

reviewed. The database contains over 400 cases of child sexual abuse and child physical abuse investigated within Madison County and Morgan County (more than 200 from each county).[18] Descriptive statistical summaries were completed for sexual abuse and physical abuse cases separately by county to generate a list of actual cases from which typical composite cases could be derived. An extensive procedure involving independent reviews and rating by five members of the Multidisciplinary Team was employed to rate agreement on the typicality of four composite abuse cases out of the more than 400 actual Madison and Morgan County cases detailed in the National CAC Evaluation (New Hampshire) database.[19] Two of the typical composite cases involved sexual abuse, one from each county, and two were physical abuse cases, again, one from each county. The cases were judged by the reviewers and the research staff of NCAC to be representative in terms of victim demographics, perpetrator demographics and incident characteristics of the hundreds of cases investigated at the NCAC each year. A description of the typical composite cases is provided in Appendix C.

It turns out that using "typical" or "average" cases to study the costs associated with investigating reports and allegations of abuse is more helpful in understanding the types of cases for which the CBA data applies in a jurisdiction than it is in actually implementing CBA of alternative abuse investigation models. The reason for this is fourfold. First, there is enormous diversity in cases and using the concept of an average oversimplifies by suggesting a measure of central tendency that may in fact not exist. We know little about the distribution of child abuse cases across the full range of case characteristics and if there is an average

18. Madison and Morgan County were two of the eight sites studied in detail with assistance of the NCAC and three other CAC's. For more details on the National Evaluation of Children's Advocacy Centers see Walsh et al., (2004).
19. Those participating included one person from each of five professional groups that comprise the bulk of the Multidisciplinary Team -- LE, Prosecutors, CPS, Counseling and Medical personnel.

abuse case, it is also true that there is a huge standard deviation around that average. Second, even if we identify an "average" or "typical" abuse case, it is still necessary that we estimate the *total investigation costs* in Madison and Morgan counties in order to calculate the average cost. Third, as discussed previously, it is the marginal cost of switching from one system of investigating allegations of abuse to another that is relevant in applying cost-benefit analysis to evaluate the advantages of the CAC investigative model vis-à-vis the traditional approach. Finally, it is a well established principle of economics that comparing total costs of alternative choices is far more useful in inferring marginal costs than is any comparison of average costs. Nevertheless, the identification of "typical" abuse cases serves to provide a general descriptive outline of the types of cases seen by child abuse investigators in Madison and Morgan Counties in Alabama, and therefore the types of cases to which the cost data collected here can be generalized. That said, it should be noted that descriptive data on CACs reported by Walsh et al. (2004) underscores the diversity of populations seen and organizational structures used in communities throughout the U.S. Therefore, we caution that our "typical" description of abuse cases may not be generalizable to the types of cases seen in other communities. Our typical cases simply represent scenarios for the most likely cases in Madison and Morgan Counties for which investigative resources are expended. The most common scenarios for cases in which investigative resources are used are expected to differ in other communities.

Annual Costs of Child Abuse Investigations and Prosecutions

To estimate the annual cost of investigating child abuse cases we began by interviewing members of the Madison County Multidisciplinary Team and administrative staff of NCAC. The NCAC has evolved into a multipurpose organization with significant

training, research and fund raising activities that are not typical of most other CACs. Therefore, we focused on the core costs associated with the primary mission, which is responding to reports of abuse, investigating cases and prosecuting alleged offenders. These costs are most closely associated with the Multidisciplinary Team. The single most important cost component is wages, salaries and fringe benefits, but we also measured the rental cost of facilities required to co-locate the Multidisciplinary Team and essential support staff.

Based upon interviews the research staff of NCAC first determined the number of full time equivalent (FTE) persons normally employed to work on child abuse investigations and prosecutions at the Madison County NCAC. Many members of the Multidisciplinary Team work full time on child abuse investigations and prosecutions, while others divide their time with some portion devoted to other work. In particular, the supervisory personnel usually devote only a small portion of their time to child abuse cases and Multidisciplinary Team activities. For these less than full time personnel we used the best judgments of the professionals involved to determine the FTE work on child abuse investigations and prosecutions.

As shown in Table 7 there are 29.03 FTE employees normally involved in child abuse investigations and prosecutions in the Madison County. All are co-located at the NCAC, but their salaries are paid by different agencies. Some are paid by the NCAC, others by the District Attorney's office and still others by Alabama Department of Human Resources and various LE jurisdictions within Madison County. However, all are public employees in positions with established minimum (entry level) and maximum wage and salary scales. We determined the minimum and maximum salaries for each type of position and used the midpoint to estimate the direct cost of wages and salaries. Next, we determined the cost of

fringe benefits and applicable payroll taxes paid for each FTE. These costs are shown separately in Table 7 as Insurance, FICA, and employer contributions to retirement. Finally, we estimated the annual rental and utilities cost of co-locating the 29.03 FTE in facilities provided at the NCAC.[20]

Table 7 shows annual total personnel costs of investigating and prosecuting allegations of child abuse to be $1,420,045 in Madison County. Facilities and utilities cost add $86,446 to yield a total of $1,506,491. We point out that this does not include the cost of police cruisers, staff automobiles, gasoline, or office supplies. However, it is a useful estimate of annual costs of investigating and prosecuting child maltreatment and abuse in Madison County that can readily be compared to other local communities.

Table 7 was produced by a Microsoft Excel® spreadsheet that can be easily adapted and applied to other communities. Relying on contacts with Morgan County officials established during the data gathering phase of National Evaluation of Child Advocacy Centers the research staff of NCAC used the spreadsheet format to estimate the annual costs of investigating and prosecuting child abuse allegation in a community that employs the traditional LE/CPA investigation method. The results for Morgan County are shown in Table 8. The personnel employed in investigating and prosecuting child abuse and maltreatment in Morgan County is estimated to be 20.66 FTE with direct wages and salaries of $730,560. Adding the costs of fringe benefits and payroll taxes brings the annual personnel cost to $973,033. The estimated cost of facilities and utilities adds another $41,837 for a total cost of $1,014,869.

20. In 2003 the NCAC moved into four buildings in a campus-like setting near downtown Huntsville. These state-of-the-art facilities were acquired through community support and NCAC fund raising activities. However, in 2002 the NCAC and the Multidisciplinary Team were co-located in rented office space more representative of CACs around the country. We use the 2002 rental and utility costs as point estimates of facilities costs in Table 7.

We point out that there is an important difference in the estimated facilities and utilities costs in Tables 7 and 8. In Table 7 we used actual rental prices and utility costs incurred in 2002 to estimate Madison County costs. We were unable to obtain direct Morgan County cost for facilities and utilities for personnel used in investigating and prosecuting allegations of abuse and maltreatment for the year 2002. Morgan County personnel are not co-located and are employed by a several different agencies with offices and facilities in different parts of the county. Therefore, we assumed that, on average, the rental and utility cost per FTE employee in Morgan County is the same as in Madison County.

Table 7. Annual Investigation and Prosecution Costs, Madison County

Madison County

Agency	Department	Personnel	Salary Midpoint	FTE	Total Salary	Ins 19.50%	FICA 7.65%	Retire 6.04%	Total Personnel	CAC Facilities	Total Costs
CAC	Administration	Executive Director	$73,000	1	$73,000	$14,235.00	$5,584.50	$4,409.20	**$97,228.70**	**$3,216.00**	**$100,444.70**
		Administrative Assistant	$23,500	1	$23,500	$4,582.50	$1,797.75	$1,419.40	**$31,299.65**	**$3,216.00**	**$34,515.65**
		Finance Director/Accountant	$59,500	0.5	$29,750	$5,801.25	$2,275.88	$1,796.90	**$39,624.03**	**$1,608.00**	**$41,232.03**
	Counseling	Clinical Director	$54,000	1	$54,000	$10,530.00	$4,131.00	$3,261.60	**$71,922.60**	**$3,216.00**	**$75,138.60**
		Therapist	$35,000	3	$105,000	$20,475.00	$8,032.50	$6,342.00	**$139,849.50**	**$9,648.00**	**$149,497.50**
		Family Advocate	$25,000	1	$25,000	$4,875.00	$1,912.50	$1,510.00	**$33,297.50**	**$3,216.00**	**$36,513.50**
		Family Advocate Assistant	$21,500	1	$21,500	$4,192.50	$1,644.75	$1,298.60	**$28,635.85**	**$3,216.00**	**$31,851.85**
		Clinical Assistant	$21,500	1	$21,500	$4,192.50	$1,644.75	$1,298.60	**$28,635.85**	**$3,216.00**	**$31,851.85**
	Medical	Pediatrician	$108,000	0.1	$10,800	$2,106.00	$826.20	$652.32	**$14,384.52**	**$0.00**	**$14,384.52**
		Nurse Practitioner	$61,000	0.33	$20,130	$3,925.35	$1,539.95	$1,215.85	**$26,811.15**	**$1,061.28**	**$27,872.43**
		Nurse Assistant	$22,500	1	$22,500	$4,387.50	$1,721.25	$1,359.00	**$29,967.75**	**$3,216.00**	**$33,183.75**
DHR	CPS	CSA Supervisor	$35,000	1.5	$52,500	$10,237.50	$4,016.25	$3,171.00	**$69,924.75**	**$4,824.00**	**$74,748.75**
		CSA Investigator	$30,500	3.5	$106,750	$20,816.25	$8,166.38	$6,447.70	**$142,180.33**	**$11,256.00**	**$153,436.33**
		CPA Supervisor	$35,000	2	$70,000	$13,650.00	$5,355.00	$4,228.00	**$93,233.00**	**$6,432.00**	**$99,665.00**
		CPA Investigator	$30,500	1	$30,500	$5,947.50	$2,333.25	$1,842.20	**$40,622.95**	**$3,216.00**	**$43,838.95**
	Ongoing Services	Social Worker	$29,500	1	$29,500	$5,752.50	$2,256.75	$1,781.80	**$39,291.05**	**$0.00**	**$39,291.05**
LE	HPD	Supervisor	$46,500	0.5	$23,250	$4,533.75	$1,778.63	$1,404.30	**$30,966.68**	**$0.00**	**$30,966.68**
	HPD	CSA Investigator	$42,000	1	$42,000	$8,190.00	$3,213.00	$2,536.80	**$55,939.80**	**$3,216.00**	**$59,155.80**
	MPD	Supervisor	$70,500	0.25	$17,625	$3,436.88	$1,348.31	$1,064.55	**$23,474.74**	**$0.00**	**$23,474.74**
	MPD	CSA Investigator	$45,000	1	$45,000	$8,775.00	$3,442.50	$2,718.00	**$59,935.50**	**$3,216.00**	**$63,151.50**
	MSD	Supervisor	$38,500	0.25	$9,625	$1,876.88	$736.31	$581.35	**$12,819.54**	**$0.00**	**$12,819.54**
	MSD	CSA Investigator	$29,500	1	$29,500	$5,752.50	$2,256.75	$1,781.80	**$39,291.05**	**$3,216.00**	**$42,507.05**
DA	Prosecution	DA	$156,500	0.05	$7,825	$1,525.88	$598.61	$472.63	**$10,422.12**	**$0.00**	**$10,422.12**
		Assistant DA	$78,500	1.2	$94,200	$18,369.00	$7,206.30	$5,689.68	**$125,464.98**	**$3,859.20**	**$129,324.18**
		Victim Advocate	$29,500	0.75	$22,125	$4,314.38	$1,692.56	$1,336.35	**$29,468.29**	**$2,412.00**	**$31,880.29**
		Team Coordinator	$26,000	1	$26,000	$5,070.00	$1,989.00	$1,570.40	**$34,629.40**	**$3,216.00**	**$37,845.40**
		Clerical Assistant	$22,500	1	$22,500	$4,387.50	$1,721.25	$1,359.00	**$29,967.75**	**$3,216.00**	**$33,183.75**
		Paralegal	$26,000	1	$26,000	$5,070.00	$1,989.00	$1,570.40	**$34,629.40**	**$3,216.00**	**$37,845.40**
		DA Investigator	$46,000	0.1	$4,600	$897.00	$351.90	$277.84	**$6,126.74**	**$321.60**	**$6,448.34**
TOTAL				**29.03**	**$1,066,180.00**	**$207,905.10**	**$81,562.77**	**$64,397.27**	**$1,420,045.14**	**$86,446.08**	**$1,506,491.22**

Table 8. Annual Investigation and Prosecution Costs, Morgan County

Morgan County

Agency	Dept	Personnel	Salary Midpoint	FTE	Cost	Ins 19.50%	FICA 7.65%	Retire 6.04%	Total Personnel	Facilities Rental 150sf/p @13.50/sf	Total Cost
CAC	Administration	Executive Director									
		Administrative Assistant									
		Finance Director/Accountant									
	Counseling	Clinical Director									
		Therapist	$35,000	4	$140,000.00	$27,300.00	$10,710.00	$8,456.00	**$186,466.00**	**$8,100.00**	**$194,566.00**
		Family Advocate									
		Clinical Assistant									
	Medical	Pediatrician	$108,000	0.1	$10,800.00	$2,106.00	$826.20	$652.32	**$14,384.52**	**$202.50**	**$14,587.02**
		Nurse Practitioner	$61,000	0.17	$10,370.00	$2,022.15	$793.31	$626.35	**$13,811.80**	**$344.25**	**$14,156.05**
		Nurse Assistant	$22,500	1	$22,500.00	$4,387.50	$1,721.25	$1,359.00	**$29,967.75**	**$2,025.00**	**$31,992.75**
DHR	CPS	Intake	$33,700	1	$33,700.00	$6,571.50	$2,578.05	$2,035.48	**$44,885.03**	**$2,025.00**	**$46,910.03**
		CSA Supervisor	$37,600	1	$37,600.00	$7,332.00	$2,876.40	$2,271.04	**$50,079.44**	**$2,025.00**	**$52,104.44**
		CSA Investigator	$32,600	3	$97,800.00	$19,071.00	$7,481.70	$5,907.12	**$130,259.82**	**$6,075.00**	**$136,334.82**
		CPA Supervisor	$37,600	1	$37,600.00	$7,332.00	$2,876.40	$2,271.04	**$50,079.44**	**$2,025.00**	**$52,104.44**
		CPA Investigator	$32,600	3	$97,800.00	$19,071.00	$7,481.70	$5,907.12	**$130,259.82**	**$6,075.00**	**$136,334.82**
	Ongoing Services	Social Worker	$33,700	1	$33,700.00	$6,571.50	$2,578.05	$2,035.48	**$44,885.03**	**$2,025.00**	**$46,910.03**
LE	HPD	Supervisor	$38,500	0.33	$12,705.00	$2,477.48	$971.93	$767.38	**$16,921.79**	**$668.25**	**$17,590.04**
	HPD	CSA Investigator	$34,950	1	$34,950.00	$6,815.25	$2,673.68	$2,110.98	**$46,549.91**	**$2,025.00**	**$48,574.91**
	DPD	Supervisor	$38,500	0.33	$12,705.00	$2,477.48	$971.93	$767.38	**$16,921.79**	**$668.25**	**$17,590.04**
	DPD	CSA Investigator	$29,500	1	$29,500.00	$5,752.50	$2,256.75	$1,781.80	**$39,291.05**	**$2,025.00**	**$41,316.05**
	MSD	Supervisor	$38,500	0.33	$12,705.00	$2,477.48	$971.93	$767.38	**$16,921.79**	**$668.25**	**$17,590.04**
	MSD	CSA Investigator	$34,950	1	$34,950.00	$6,815.25	$2,673.68	$2,110.98	**$46,549.91**	**$2,025.00**	**$48,574.91**
DA	Prosecution	DA	$156,500	0.05	$7,825.00	$1,525.88	$598.61	$472.63	**$10,422.12**	**$101.25**	**$10,523.37**
		Assistant DA	$78,500	0.5	$39,250.00	$7,653.75	$3,002.63	$2,370.70	**$52,277.08**	**$1,012.50**	**$53,289.58**
		Victim Advocate	$29,500	0.25	$7,375.00	$1,438.13	$564.19	$445.45	**$9,822.76**	**$506.25**	**$10,329.01**
		Team Coordinator									
		Clerical Assistant	$22,500	0.25	$5,625.00	$1,096.88	$430.31	$339.75	**$7,491.94**	**$506.25**	**$7,998.19**
		Paralegal	$26,000	0.25	$6,500.00	$1,267.50	$497.25	$392.60	**$8,657.35**	**$506.25**	**$9,163.60**
		DA Investigator	$46,000	0.1	$4,600.00	$897.00	$351.90	$277.84	**$6,126.74**	**$202.50**	**$6,329.24**
TOTAL				**20.66**	**$730,560.00**	**$142,459.20**	**$55,887.84**	**$44,125.82**	**$973,032.86**	**$41,836.50**	**$1,014,869.36**

Comparing Costs Across Counties

Madison County's total cost in Table 7 is 48 percent greater than the comparable Morgan County cost reported in Table 8. However, as noted above, Madison County is more densely populated with an estimated 2001 population of 281,931 compared to Morgan County's 111,429. Thus, Madison County's population is 2.6 times larger than Morgan County's. Further, information in Tables 5 and 6 show that Madison County has 2.5 times as many children as Morgan County and during the period 1999-2003 received reports of child abuse that were more than three times greater than comparable reports in Morgan County. To make the total cost more comparable across counties an adjustment for differences in population size is required. The investigation and prosecution costs adjusted for number of children between 0 age and 18 years are shown in Table 9. Once the size of the child population is taken into account we see that investigation and prosecution costs are 41% lower per 1000 children in Madison County than in Morgan County.[21]

Table 9. Annual Investigation and Prosecution Costs, Madison and Morgan Counties

	Madison County	Morgan County
Costs Per 1,000 Children	$21,282	$36,060

The size of the differential leads to the obvious question of why costs are so much lower per 1,000 children in Madison as compared to Morgan County. There are several possible explanations. First, the cost differential may reflect greater cost effectiveness that occurs as a result of more efficient use of the resources employed in investigating reports and prosecuting alleged offenders. This explanation is consistent with one of the few comparative studies of the cost effectiveness of the CAC investigation method vis-à-vis the more

21. Essentially the same result is obtained if we adjust the cost by using the total county populations rather than child populations. Adjusting costs per 1,000 persons (children and adults) results in Madison County costs that are 43.5% lower.

traditional approach. In a study of the Washington DC CAC, Crapo et al. (1996) found that efficiencies inherent in the CAC investigation reduced cost by 57 percent compared to the more traditional procedures. Second, there may be important economies of scale in the investigations and prosecutions of child abuse cases. If there are such economies, then costs are lower per 1,000 children in more densely populated communities because of economic efficiencies associated with the size and intensity of the service utilization of the investigation/prosecution staff relative to the community population.[22]

To assist in determining whether disparities in population size, and thus simple economies of scale, help in explaining Madison's lower costs per 1,000 children we suggest that investigation costs should be compared across counties with similar size populations of children under 18, both using the CAC model to investigate child abuse cases.

The Benefits of a CAC-type Investigation and Prosecution Model

As discussed above, the benefits of a child and family friendly system of investigating reports of child abuse and maltreatment are estimated using the contingent valuation methodology (CVM) developed in environmental and resource economics. The methodology has begun to be applied in other areas. For example, CVM has been used to assess people's willingness to pay for health care programs (Diener et al., 1998) and has been recently applied to investigate programs that reduce the risk of assaults and murders (Cohen et al., 2004). However, CVM has not been used in the literature relating to the prevention and investigation of child abuse. Therefore, the research described here is the first to apply CVM and the key economic idea of "willingness to pay" (WTP) to study the difficult to measure

22. Economies of scale have long been recognized in economics and play a crucial role in explaining the observed structure and size of sellers in many private markets. In many industries larger business firms are more efficient than smaller firms. As size goes up, average costs go down, at least up to a point.

benefits of public programs relating to child abuse. For communities interested in learning more about the application of national WTP estimates to the issue of child maltreatment, it should be noted that the Centers for Disease Control (CDC) conducts a national study of injury prevention that makes use of CVM. Given the importance of prevention in the area of child maltreatment, our study followed the path of the CDC and also explored issues relating to the willingness to pay for child abuse prevention programs in Madison and Morgan County in addition to paying for child abuse intervention programs. [23]

A Note on Concerns About CVM

Before describing the survey used to elicit responses concerning WTP for child friendly investigations and efficient prosecutions of alleged offenders a potential shortcoming of CVM warrants brief discussion. A major debate took place in economics concerning the reliability of CVM method in the late 1980s and early 1990s. Some economists were concerned that CVM may yield unreliable estimates of the true benefits associated with public goods. This outcome is viewed as possible because people do not actually have to pay for what they *say* they are willing to pay in surveys. Some economists continue to be skeptical about CVM (Diamond & Hausman, 1995) since what people say they will do and what they actually do are often very different. However, a distinguished panel headed by Nobel Laureates Kenneth Arrow and Robert Solow concluded in a report commissioned by the National Oceanic and Atmospheric Administration (NOAA), that CVM can provide

23. We thank the CDC and Phaedra Corso in particular for sharing a preliminary version of their prevention survey instrument. Our survey questions are modeled after theirs with the ultimate objective of comparing WTP in two Alabama counties to their national estimates. Therefore, we used essentially the same WTP questions and dollar amounts as planned for the forthcoming CDC study. We considered three of the four types of abuse (child deaths, sexual abuse and physical abuse) that the CDC is planning to study (they will also consider neglect). We asked about WTP for abuse intervention and abuse prevention. The results of the prevention questions are not reported here. However, including the prevention questions in the same survey instrument as the intervention WTP questions creates some potential bias (order effects) in responses. These are discussed in econometric analysis section below.

reliable measures of the benefits when certain guidelines are followed in the design and implementation of the survey (Arrow et al., 1993). Most of the guidelines established by the NOAA panel are followed in our survey to elicit willingness to pay for a CAC program.

The CAC Willingness to Pay Survey

We selected a sample of 600 households in Madison and Morgan Counties by random digit dialing. The survey is designed to quantify the *ex ante* value of the CAC program, as measured by how much people are willing to pay for it. To ensure that respondents from Madison County are not influenced by the existence of the National Children's Advocacy Center, we did not explicitly mention the phrase "Children's Advocacy Center" in the questionnaire. Instead, typical features of such a center, drawn from NCA standards for child advocacy centers are described. The exact language used in the survey follows:

> "Imagine that a well designed, coordinated and child friendly system is available that minimizes the stress and anxiety experienced by abused children and their families, while effectively prosecuting child abusers. This program is staffed by professionals and is a proven success in streamlining investigations and minimizing intrusions into the lives of children and their families. The system is in addition to or a replacement for the standard method of investigating child abuse."

Respondents were then asked whether they would be willing to pay a particular dollar amount of additional taxes each year to help sponsor the described program. Two WTP questions were asked. In the initial question respondents were offered a dichotomous choice – "yes" or "no" – with willingness to pay (bid offer) amounts randomly selected from among $20, $40, and $60. One third of the sample was asked the $20 question, one-third responded to the $40 questions and the remaining one-third was asked if they were willing to pay $60. A different follow-up question was asked depending on whether respondents answered "yes" or "no" to the initial WTP question. If the respondent said "yes" the follow-up question asked

whether or not they would be willing to pay 50% more than the initial offer amount. If the respondent said "no" to the initial WTP question, the follow-up question cut the offer amount in half. For example, 200 respondents were asked the $20 question and just fewer than 30 percent said "no". The follow-up question asked this set of respondents whether or not they were willing to pay $10. In the CVM literature follow-up questions of the sort we asked are referred to as "double bounded" WTP questions.

Like the initial WTP question the follow-up question required respondents to make a dichotomous choice – Will you pay $*t* or not. Asking the key question in this manner is widely accepted in the CVM literature and is recommended by the NOAA panel of distinguished social scientists. The dichotomous response question eliminates, to the largest extent possible, strategic behavior of respondents (Carson, 2000; Arrow et al., 1993). In order to mitigate the hypothetical bias of the survey, respondents were repeatedly reminded to take account of their budget constraints. They were also asked how confident they were in the answers they provided when responding to the willingness to pay question. Reminding respondents of the budget constraints they face is also widely used practice in the CV research and is recommended by the NOAA panel. The text of the survey follows:

> "In answering keep in mind, any contributions you make will reduce the amount of money you have to spend on other things."
>
> "Now thinking about your household income, monthly bills and other expenses, how confident are you in your previous answers about whether you would pay for the effective child abuse investigation program?"

Telephone interviews of the sample in Madison County and Morgan County were conducted in late January, 2005. The specific individual interviewed within a contacted household was determined by using the "last birthday" technique. Specifically, the interviewer asked to speak to the person 21 years of age or older whose birthday occurred

most recently. If this person was not available a callback was arranged. The procedure used resulted in a random sample of adults aged 21 or over who reside in the two counties. The final partition of the sample was 424 in Madison and 176 in Morgan, where the stratification reflected the relative population sizes of the two counties.

Willingness To Pay Estimates

In addition to WTP, questions were asked about respondents' household income, family structure including the number of children, and demographic characteristics. The survey also asked two abuse related questions. The specific language used in the abuse questions follows:

> "Relative to the nation as a whole, how would you judge a child's chance of being abused in your county?"
>
> "Looking back on your childhood, did you or someone close to you ever experience a form of child maltreatment such as physical or sexual abuse or neglect of basic needs by a parent, caregiver or known adult?"

A comparison of our sample to the 2000 U.S. Census indicates that middle-aged white females are slightly overrepresented in the sample. The mean age of respondents is just over 50 and the average household size is around 2.6. More than 85% of the respondents perceived the risk of a child being abused in their community as no higher than the national average, which was estimated by the National Clearinghouse on Child Abuse and Neglect to be approximately 12.4 per 1,000 children victimized in 2003. In addition, 30 percent of the respondents reported that they or someone close to them were once abused as a child. Table 10 summarizes the demographic composition of respondents.

Table 10. Demographic Characteristics of Survey Respondents

	Madison Co.		Morgan Co.		Full Sample	
	Count	Percent	Count	Percent	Count	Percent
Total	424	70.7%	176	29.3%	600	100%
Gender						
Female	256	60.4%	122	69.3%	378	63.0%
Male	168	39.6%	54	30.7%	222	37.0%
Race						
White	357	84.2%	156	88.6%	513	85.5%
Nonwhite[1]	56	13.2%	13	7.4%	69	11.5%
no response	11	2.6%	7	4.0%	18	3.0%
Family Income						
< $13K	20	4.7%	12	6.8%	32	5.3%
$13-26K	56	13.2%	29	16.5%	85	14.2%
$26-43K	112	26.4%	49	27.8%	161	26.8%
$43-73K	89	21.0%	47	26.7%	136	22.7%
> $73K	116	27.4%	24	13.6%	140	23.3%
no response	31	7.3%	15	8.5%	46	7.7%
Marital Status						
Married	269	63.4%	112	63.6%	381	63.5%
Unmarried[2]	150	35.4%	63	35.8%	213	35.5%
no response	5	1.2%	1	0.6%	6	1.0%
Abuse Experience						
No	290	68.4%	116	65.9%	406	67.7%
Yes	124	29.2%	56	31.8%	180	30.0%
no response	10	2.4%	4	2.3%	14	2.3%

1. This includes 11 respondents in Madison and 4 in Morgan who identified themselves as from some other group.
2. This includes people who are currently separated, divorced, widowed or never married.

Responses to the key WTP question "..., would you be willing to pay $*t* [with *t* being 20, 40, or 60] in extra taxes per year to help sponsor this program [the CAC program]?" are presented for the entire sample and for selected subgroups in Table 11.

Table 11. Estimates of Willingness to Pay for CAC by Demographic Characteristics

	% of Yes to $20	% of Yes to $40	% of Yes to $60	WTP Amount ($)	Std. Error
Total	70.8%	69.4%	61.3%	40.3	1.19
Gender*					
Female	77.0%	72.1%	62.8%	42.39	1.46
Male	62.8%	63.9%	58.6%	36.09	2.49
Race*					
White	76.3%	69.9%	65.0%	42.26	1.25
Nonwhite	48.0%	66.7%	44.0%	28.6	4.27
Income					
< $26K[1]	71.9%	51.4%	57.1%	25.28	1.95
$26-43K	72.5%	82.1%	63.6%	40.79	2.74
$43-73K	70.3%	78.8%	62.5%	40.06	3.20
> $73K	70.2%	69.0%	73.2%	14.15	0.80
Abuse Exper.*					
Yes	83.0%	83.9%	71.9%	45.47	0.80
No	65.0%	62.9%	58.3%	37.24	1.96
County					
Madison	73.3%	72.8%	61.2%	41.49	1.40
Morgan	62.8%	63.8%	61.5%	37.29	2.85

* The WTP estimates for the subgroups are significantly different from one another based on a two-sample t-test.

1. We combined respondents from the two lowest income groups as the number of respondents with income less than $13K was too small to allow for meaningful estimates.

To be consistent with the referendum format in which only people who actually cast their votes count, we restrict our sample to only those respondents who answered either 'yes' or 'no' to the CV question.[24] While it would be nice to probe specific reasons for nonresponses, the time constraint of the telephone interview did not permit us to pursue this issue. However, previous research using CVM suggests that indifference between a yes and a no vote, insufficient time and information to make a decision, and disinterest in the program and the survey usually account for most of the nonresponses (Arrow et al., 1993).

24. The results are only marginally different if we treat those who answered "don't know" and those who did not respond to the question as if they had said "no".

In general, the percentage of individuals willing to pay for the CAC program declined as the offered tax amount increased, although the reduction was relatively small due to moderate increases in the prices (i.e. the WTP amounts of $20, $40 and $60). For instance, 70% of the respondents who were asked the $20 question were willing to pay that amount whereas the percentage of yes responses decreased to 61% for those asked the $60 question. This decrease in WTP as the price increases is the predicted result from basic economic principles. If we split the sample by different demographic characteristics, it is evident that people who are female, white, and have a personal experience with abuse during childhood are more willing to support the CAC program compared to their counterparts, regardless of the tax amounts. What this means is that, compared to other respondents, these individuals place a higher subjective value on the benefits of child friendly investigations and efficient prosecutions of alleged offenders.

Relying on methods developed in environmental and resource economics allows us to apply statistical inference and econometric estimation procedures that test explicit hypotheses. In applying statistical and econometric methods to analyze WTP responses we consider only the initial WTP questions. The reason for this is that the scientific literature that employs CVM regards the double bounded questions as less reliable and when follow-up questions are used they are invariably analyzed separately and placed in a secondary role. More confidence can be attached to the estimates of benefits based on the initial WTP questions.[25] However, we do make use of the follow-up question in reporting the overall estimate.

25. Double bounding WTP questions may create uncertainty in respondents' minds and could taint the responses to the follow-up question. When one tax amount is offered and then in the follow-up question another tax amount is offered, respondents may perceive that the quality of the public good/program has changed, or

We apply two distinct procedures that are widely used in the scientific literature that employs the CVM methodology. First, we report results based on a conservative nonparametric approach, the Turnbull lower bound estimator (henceforth the Turnbull). This approach is more likely to be understood by readers with an understanding of basic statistics. The second approach involves parametric estimates and requires an understanding of advanced statistics or basic econometrics to fully grasp the resulting findings. The purpose of the econometric analysis is to explore the factors that lead respondents to say "yes" to the key WTP question relating to the support of the CAC investigation model, while holding constant the influence of other variables that affect respondents' answers.

Turnbull Estimates of Willingness To Pay

The first approach makes use of "Turnbull" statistics, which are non-parametric estimates of mean responses to the willingness to pay questions. The Turnbull was originally applied to binary choice data from CVM surveys in Carson et al. (1994) and now has become a standard scientific method of inquiry in willingness to pay studies of public goods. Haab and McConnell (1997) prove the Turnbull is "… a lower bound approximation to the expected willingness to pay". The Turnbull does not make any distributional assumptions about willingness to pay. The only information it utilizes is that respondents are randomly assigned to one of the tax amounts ($20, $40 or $60) and thus, a respondent's willingness to pay is higher than the offered amount if the respondent answers "yes" to the choice question, and lower than the offered amount if the respondent answers "no." Therefore, the Turnbull is distribution free.

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that they have some bargaining power in the funding/provision decision. Thus, less confidence is generally attached to responses to the double question.

A maximum likelihood estimate of the probability of a "no" response to an offered tax amount can be calculated as the proportion of respondents who responded "no" to the amount compared to all the respondents offered that amount (Turnbull, 1976; Cosslett, 1982; Haab & McConnell, 1997, 2002). Since the three tax amounts in our survey effectively defines four intervals (1) $0 to $20, (2) $20 to $40, (3) $40 to $60, and (4) above $60, the probability that willingness to pay falls between two prices is the difference in the "no" proportions between those prices, provided these proportions are monotonically increasing.[26] The Turnbull lower bound mean is calculated by first forcing every WTP that falls in a particular interval to be exactly equal to the lower end of the interval and then estimating the ordinary sample mean (see Table 12 for an illustration of calculating the Turnbull estimate of the lower bound mean for the full sample).[27]

For the two counties combined, the average Turnbull willingness to pay is estimated to be $40.30. The standard error of the estimated mean is fairly small, $1.19, indicating reasonable precision in this estimate (see Table 11). Covariate effects can be incorporated by computing separate Turnbull estimates for well-defined sub-samples (Carson et al., 1994; Haab & McConnell, 2002). Table 11 shows the Turnbull estimates for distinct subgroups by gender, race, family income, previous experience of abuse, and county of residence. Hypothesis tests concerning equality of the sub-sample estimates of lower bound means are possible because of the asymptotic normality of the Turnbull estimator (Haab & McConnell, 2002).

26. It is not guaranteed in real data that the proportion of "no" responses increases as the offered price increases. A smoothing procedure proposed is to combine the responses of the adjacent amounts offered that violate the monotonicity constraints and drop the higher amount. Please see Haab and McConnell (1997) or Haab and McConnell (2002) for more details.

27. For instance, if 20% of the sample is estimated to be in the interval $20 to $40, the lower bound mean is calculated by assuming that this 20% of the sample is willing to pay exactly $20.

Female, white, and abused respondents have significantly higher willingness to pay for the CAC investigation/prosecution program. For instance, females are willing to pay $6.30 more than males ($42.39 versus $36.09). This is consistent with some evidence from the criminal justice system that women on juries of child abuse trials are more likely to find perpetrators guilty.[28] Those who admitted being abused or knew someone close to them who was abused as a child, on average are willing to pay $45.47 compared to $37.24 for those who reported no personal experience with abuse. While respondents from Madison County are willing to pay slightly more than those from Morgan County ($41.49 versus $37.29), this difference is not statistically significant.

Table 12. Illustration of the Turnbull Estimate of WTP Distribution and Lower Bound Mean for the Full Sample

Lower Bound of Interval	Upper Bound of Interval	Probability of Answering *Yes* at Upper Bound	Probability of Answering *No* at Upper Bound	Probability of WTP in each interval
$0	$20	0.708	0.292	0.292
$20	$40	0.694	0.306	0.014
$40	$60	0.613	0.387	0.081
$60	∞	0	1	0.613

Estimate of Lower Bound Mean: $0 * 0.292 + $20 * 0.014 + $40 * 0.081 + $60 * 0.613 = $40.3

The Turnbull estimates for different income groups reveal several findings worth noting. Compared to respondents with family income between $26,000 and $73,000, both poorer and richer groups are willing to pay less. This suggests that the CAC program can be thought of as a “normal good” when income is less than $73,000 but an “inferior good” when income exceeds $73,000. It makes intuitive sense that families in the bottom of the income distribution report lower willingness to pay because they simply cannot afford to volunteer

28. We thank a participant in a panel discussion at the 21st National Symposium on Child Abuse for pointing this out.

more tax payments due to the necessity of paying for their basic needs (food, clothing, shelter, and transportation).

In contrast to the results of the bottom of the income distribution, the result for the high-income respondents is surprising and puzzling. Based on the Turnbull estimates, they are willing to pay the least, only $14. There are at least several explanations for this unexpected result. First, respondents from high income families might perceive the risk of their children being abused as being very low and hence do not value a program that investigates child abuse. This is consistent with the finding in the literature on child abuse that economically disadvantaged families have much greater risk factors for child abuse (National Research Council, 1993; Weinberg, 2001; Berger, 2004). On the other hand, it may well be that higher income respondents are less altruistic (stingier) toward fellow citizens. Finally, it is possible that our offered tax amounts ($20, $40 and $60) are simply too small for this group. As shown in Table 11, the percentage of "yes" responses across the three amounts is essentially identical for this group, but appears to be the highest at $60. It should be noted that the smoothing procedure inherent in the Turnbull estimator drops both $40 and $60 amounts, which drives down the WTP estimate.

Econometric Analysis of WTP Responses

In this section we analyze responses to the WTP question using logistic regression analysis. It is not the purpose of this analysis to derive measures of central tendency from these parametric estimates because they are sensitive to how the willingness to pay function is specified (Haab and McConnell, 2002). The Turnbull lower bound estimate is a better alternative in measuring the central tendency of WTP responses. Instead, there are three purposes of the multivariate analysis in this section. First, as noted above, we explore the

effects of different variables on "yes" responses to the WTP question, while holding the influence of other control variables affecting responses constant. Second, this method allows us to examine interaction effects among variables. For example, we know that being female is associated with a higher WTP. We also know that having personal experience with abuse significantly affects WTP. The Female by Previous Abuse Experience interaction effect considers whether the combination of being female and having personal experience with abuse has a significant influence on WTP while holding constant the separate and distinct variables for female and abuse experience. Finally, the multivariate analysis allows us to demonstrate that the relationships between different variables obtained from the survey are mostly consistent with those predicted by relevant economic theory, which provides more confidence in the reliability of our reported results.

To implement the econometric estimates we employ a widely applied specification in the scientific literature dealing with the *CV* method. In particular, we make use of the exponential willingness to pay function (Haab & McConnell, 2002). The willingness to pay of individual *j* is specified as:

$$WTP_j = e^{\gamma Z_j + \eta_j}$$

where Z_j is a vector of attributes and η_j is a stochastic term with mean zero and unknown variance, denoted as σ^2. Information on the latent willingness to pay can be inferred from responses to the WTP question. Specifically, the probability of individual *j* answering "yes" to an offered tax amount t_j is equivalent to the probability of the random willingness to pay function being greater than t_j:

$$\Pr(yes_j) = \Pr(WTP_j > t_j)$$

$$= \Pr(\exp(\gamma Z_j + \eta_j) > t_j)$$

$$= \Pr(\eta_j > \ln(t_j) - \gamma Z_j)$$

Assuming η_j is logistically distributed; we estimate how the responses vary with the offered tax amounts as well as respondents' characteristics.[29] Table 13 summarizes the variables used in the logistic regression and Table 14 reports the regression results.

Table 13. Summary Statistics of Variables Used in Regression

Variable	Mean	Std. Dev.	Min.	Max.	N
Yes to WTP Question	0.71	0.45	0	1	440
Log of Tax Amounts	3.61	0.46	3	4.09	440
Previous Abuse Experience	0.33	0.47	0	1	440
Risk of Child Abuse	3.21	0.86	1	5	440
Age	49.03	14.48	21	87	440
Female	0.61	0.49	0	1	440
Female with Abuse Exper.	0.23	0.42	0	1	440
White	0.88	0.33	0	1	440
High School Graduate	0.49	0.50	0	1	440
College and Above	0.44	0.50	0	1	440
Income Less than 26K	0.19	0.40	0	1	440
Income between 43K-73K	0.26	0.44	0	1	440
Income More than 73K	0.27	0.44	0	1	440
Kids(under 18) at Home	0.40	0.49	0	1	440
Married	0.65	0.48	0	1	440
Madison County Residents	0.73	0.45	0	1	440
Version 1 Survey	0.51	0.50	0	1	440

29. While not reported here, we also estimate probit models using the same set of explanatory variables and find that the coefficient estimates are not sensitive to the distributional assumptions about η_j.

Table 14. Logistic Regression Estimates of the Probability of Willingness to Pay for CAC Services

	Specification (1)	Specification (2)	Specification (3)
Log of Tax Amounts	-.411	-.415*	-.416*
	(.251)	(.25)	(.242)
Previous Abuse Experience	.636**	.631	.607**
	(.282)	(.439)	(.276)
Risk of Child Abuse	-.244*	-.235	-.277**
	(.147)	(.148)	(.136)
Age	-.028***	-.028***	-.03***
	(.01)	(.01)	(.009)
Female	.57**	.558**	.6***
	(.236)	(.263)	(.228)
Female with Abuse Exper.		-.033	
		(.558)	
White	1.473***	1.417***	1.408***
	(.358)	(.354)	(.342)
High School Graduate	.707		.729*
	(.431)		(.402)
College and Above	.834*		.891**
	(.468)		(.417)
Income Less than 26K	-.387	-.511	
	(.335)	(.329)	
Income between 43K-73K	-.319	-.251	
	(.341)	(.323)	
Income More than 73K	-.216	-.134	
	(.35)	(.334)	
Kids(under 18) at Home	-.087	-.088	-.082
	(.289)	(.287)	(.277)
Married	-.267	-.277	-.13
	(.277)	(.272)	(.242)
Madison County Residents	.063		
	(.272)		
Version 1 Survey	-.009		
	(.228)		
Sample Size	440	440	458
Pseudo R^2	.103	.097	.104

Note: The sample was unweighted and the dependent variable included only those who answered either 'yes' or 'no' to the primary willingness to pay question. Standard errors are in the parentheses.
* significant at 10%, ** significant at 5%, *** significant at 1%.

Controlling for income and other factors, the probability of a "yes" response decreases as the offered tax amount increases (the coefficient of "Log of Tax Amount" is negative), although it is estimated without much precision. On the other hand, income does not seem to affect a respondent's choice of "yes" or "no" (the three dummy variables on income are jointly as well as individually insignificant). The absence of an income effect might be attributed to the small magnitude of the tax payments provided (capped at $60) relative to income.

Being white, female, and having personal experience with abuse significantly increase the probability of a "yes" response to the initial WTP question. Thus, the regression analysis is consistent with the previously discussed Turnbull results that indicate individuals with these characteristics have higher estimated mean willingness to pay. The regression findings are robust across different econometric specifications. We know that abuse statistics show that more females are victims of child abuse than males and it may be that this translates into willingness to pay for CAC programs. Therefore, we test whether the females in our sample who also have personal experience with abuse are the individuals most willing to support the CAC program with "yes" answers to the WTP questions. It can be seen from the second specification that there is no interaction effect between females and abusive experiences.

A respondent's age has significant negative effects on the decision about whether or not to help fund a CAC investigation program. One explanation of this finding is that the number of children under 18, and hence the chance of children being abused are negatively correlated with respondents' age. This implies a lower (use) value that older people would attach to the CAC program, i.e., the CAC has lower expected personal benefits as the age of

the respondent rises. More importantly, this effect dominates that of any nonuse value of the child-friendly investigation program that aged people may derive from the altruistic concern that abused children should be appropriately treated.

How respondents assess the risk of a child being abused in their county appreciably influences their responses to the designated tax amount. In particular, the higher the perceived risk, the greater the estimated likelihood that respondents will support a CAC-type investigation program.[30] Compared to high school dropouts, people with at least a high school diploma are more willing to sponsor the CAC program. In all cases, a person's marital status and the presence of children younger than 18 in the household do not affect how people would respond to the WTP question. Consistent with results reported for the Turnbull estimates reported in Table 11 we find that the county of residence does not make a difference in the amounts respondents are willing to pay.[31]

Applying CBA to Evaluate a CAC-type Investigation and Prosecution Model

To apply the cost and benefit estimates for an evaluation of switching from a traditional LE/CPS method to investigating and prosecuting child abuse cases to a CAC-type model requires that the costs and benefits be calculated for particular counties. The total costs reported in Tables 7 and 8 are already estimated at the county level. What remains is to convert the sample WTP survey results into county wide estimates. This is accomplished by

30. Note that risk of child abuse is evaluated on a scale from 1 to 5, with 1 corresponding to much greater than average, 3 being about average, and 5 much less than average.

31. In our survey, a respondent was asked about whether he or she would be willing to pay for a prevention program that reduces a type of child abuse in addition to the child-friendly investigation program. Previous research on CV surveys used to elicit willingness to pay for a sequence of goods indicates that, the first good asked is typically valued higher than the same good if asked later in the sequence (Carson & Mitchell, 1995; Stewart et al., 2002). To test for response bias from order effects that potentially influence respondents' valuation for the CAC program when surveyed about WTP for investigation versus WTP for prevention, we developed two survey versions with questions in counterbalanced order and randomly assigned roughly half of the sample to version 1 of the survey and the other half to version 2 of the survey. Results indicated that responses are not impacted by question order effects.

using the sample Turnbull mean WTP amounts as point estimates of the average benefits households in each county receive from a CAC–type investigation and prosecution model. Thus the benefits are:

Total Benefits = Turnbull Mean Value *x* No. of Households in the County

Using the lower bound Turnbull mean of $41.49 for Madison County and $37.29 for Morgan County results in conservative lower bound estimates of the benefits of a CAC–type model of nearly $5 million in Madison County and over $1.75 million in Morgan County. The lower bound benefit estimates make use of only the initial willingness to pay question and ignore the follow-up question. If we use the follow-up questions and calculate an upper bound Turnbull mean, then larger estimates of benefits emerge. The upper bound Turnbull means for Madison and Morgan County are $67.58 and $63.83, respectively. Applying these values to all households in each county yields the upper bound estimates of benefits of more than $8 million in Madison County and over $3 million in Morgan County, as shown in Table 15 below:

Table 15. Lower and Upper Bound Estimates of Total Benefits by County

	Madison County	Morgan County
Lower Bound Value of Total Benefits	$4.99 million	$1.77 million
Upper Bound Value of Total Benefits	$8.13 million	$3.02 million

The differences in the dollar magnitudes of the estimated benefits reported above reflect the underlying differences in the size of populations in the two counties. They also reflect slightly smaller Turnbull means in Morgan County. However, as discussed previously, we cannot reject the null hypothesis that there are no differences in Turnbull means across the two counties.

A key aspect of the CVM survey design discussed above warrants renewed emphasis. In answering the willingness to pay questions respondents were asked to:

> "Imagine that a well designed, coordinated and child friendly system is available that minimizes the stress and anxiety experienced by abused children and their families, while effectively prosecuting child abusers. This program is staffed by professionals and is a proven success in streamlining investigations and minimizing intrusions into the lives of children and their families. *The system is in addition to or a replacement for the standard method of investigating child abuse*" (emphasis added).

The wording used in the survey was purposeful; the intent was to interpret responses of Morgan County residents as an indicator and measure of the marginal benefits they perceive from having a CAC-type investigation and prosecution system in their community. The WTP survey suggests these county-wide marginal benefits are between $1.77 million and $3.02 million.

A key question is how do the marginal social benefits in Morgan County compare to the marginal costs of switching from a traditional CPS/LE method of investigating and prosecuting child abuse cases to a CAC-type organization? We do not know the exact costs of switching, but Table 8 shows the total costs of the traditional system in Morgan to be slightly above $1 million annually. In contrast, the core activities of the co-located and much larger Madison county CAC are estimated to cost slightly more than $1.5 million annually. However, once these costs are placed on the same footing as the benefits by adjusting them for differences in population size the CAC costs in Madison's county' are found to be more than 41 percent lower per 1,000 children than comparable costs of the traditional investigation method used in Morgan County. These cost differentials are in line with comparison of CAC and traditional costs of investigation in Washington DC (Crapo et al., 1996). Therefore, the evidence suggests that in the long-run CAC costs may well be below the traditional (CPS/LE) costs.

Even if the long-run costs of CAC investigations and prosecutions are lower than the comparable costs of traditional (CPS/LE) investigation methods, communities seeking to switch to the CAC model face important start-up costs. In the long-run these start-up costs are unimportant, but in the short-run they are very real and can create a significant barrier to switching. The experience of Morgan County provides a good example of how start-up costs can deter and delay the switch to the CAC model for investigating and prosecuting child abuse allegations. In 2003 community leaders including the elected District Attorney decided to switch to the CAC model and began fund raising efforts to assist in meeting the start-up costs. The fund raising was not very successful and expected assistance from the State of Alabama did not materialize due to a state budget crisis. In February 2005 it was announced that two federal grants totaling $98,500 had been awarded (Huggins, 2005). These grants combined with $15,000 raised locally have led to optimism among community leaders that a Morgan County CAC may be able to begin operation in late 2005. The exact start-up costs are not known with certainty, but it is apparent that they are much smaller than the marginal benefits associated with a CAC that is revealed by CV study of the willingness to pay in Morgan County.

Conclusions

There is wide agreement that successfully combating child abuse and maltreatment yields important benefits to children, their families and society as a whole. Yet, in many cases, the benefits of child abuse intervention programs are immeasurable using traditional tools of analysis. This study applies the contingent valuation method which is especially amenable to the valuation of non-marketed goods, and demonstrates how it can be used to value a child-focused investigative and prosecution model. In a representative sample of 600

residents in Madison County and Morgan County, Alabama, we find that a typical household would be willing to pay $40 per year for the CAC-type investigation and prosecution program. For the two counties combined, a conservative estimate of total willingness to pay is $6.8 million. In Morgan County, where the traditional method of investigating and prosecuting child abuse cases is in use, residents place a willingness to pay value on the marginal benefits of a CAC-type program equal to at least $1.77 million. The marginal cost of switching from the traditional investigation model in Morgan County is not directly measured. However, comparisons of total investigation and prosecution costs in Madison and Etowah Counties, which have CAC's, to Morgan County strongly suggest that the marginal benefits far exceed any reasonable expectation of incremental costs. The most important obstacles that communities face in switching to the CAC model involves convincing community leaders and key elected officials of the benefits associated with the CAC approach and then finding the resources to overcome the barrier created by start-up costs associated with switching.

The unique feature of the research reported here is that it is the first to make use of the contingent valuation methodology to study issues relating to child abuse intervention programs. The design of the survey used to elicit individuals' willingness to pay in this study follows the guidelines recommended by a distinguished panel of social scientists (Arrow et al., 1993). Multivariate analysis of the survey responses supports the construct validity of the willingness to pay survey. The choice of answering "yes" or "no" to the offered willingness to pay tax amount varies by demographic characteristics and the attitudes toward child abuse in a way that is consistent with prior expectations. In particular, average willingness to pay is

estimated to be significantly higher among those who are female, white, and have personal experience with child abuse.

An important question yet to be addressed is why do significant numbers of adults say "yes" to the willingness to pay questions? We know they say "yes" and we know a lot about the types of individuals who say "yes," but why do they say "yes"? Clearly, it is in the nature of the contingent valuation methodology that those responding affirmatively perceive subjective benefits from having a CAC in their community. The issue with which we are now concerned is as follows:

- What is it about a CAC that leads people to expect benefits to the community from switching from a traditional investigation and prosecution model to a CAC?

The willingness to pay survey does not answer this question, but it is suggestive. Two attributes of the CAC seem to stand out in trying to answer this question and both are touched upon in our survey. First, many individuals place a significant value on having a child and family friendly investigation process in their community. In some cases this reflects the respondent's personal situation. For example, they may have been abused as a child, know someone who was abused or have children or grandchildren at risk of being abused. In other cases, however, it almost certainly reflects altruism. Even when they do not personally know the children or families, some people receive subjective benefits from knowing that abused children in their community are treated with care and understanding. Second, respondents perceive that that the CAC approach is more effective in prosecuting, convicting and punishing child abusers. Thus, in the same way that people believe prosecutions, convictions and punishment deters ordinary criminal behavior; people also perceive the CAC

model as having a greater deterrent effect in controlling future child abuse in their community.

In conclusion, we point out that the research reported here has important policy implications. The estimates of the monetary value of the CAC program are readily applicable to a cost-benefit analysis of this program in the two Alabama counties, and hence facilitate local decision making concerning the CAC program. For instance, the total cost of running the investigation component of the National Children's Advocacy Center in Madison County was roughly $1.5 million in 2004. The lower bound estimate of the economic benefit of this program, however, is $4.99 million for Madison County, indicating a justifiable investment resulting in $3.33 of program benefit realized for every $1 of program costs spent. Morgan County officials may find the results useful in fund raising and pushing ahead to establish the CAC that they have been planning for two years. Local communities across the country can make use of the estimates of the value of a CAC program provided in this cost-benefit study to help convince key community leaders, local elected officials, state legislators and policy makers that a CAC program generates important net benefits that are valued by the individual members of the community. They may also find the results helpful in their private as well as public fund raising activities. Alternatively, a community can adopt the methodology and survey instruments developed in this study to perform their own cost-benefit study yielding locally relevant cost and benefit figures.

References

Abuse - Cost of investigating. (1989). *Juvenile and Family Law Digest, 21*(11), 374.

Arrow, K., Robert, S., Leamer, E., Portney, P., Randner, R., & Schuman, H. (1993). Report of the NOAA panel on contingent valuation. *Federal Register, 58*, 4601-4614.

Barnett, S. W. (1993). Economic evaluation of home visiting programs. *The Future of Children, 3*(3), 93-112.

Berger, L. M. (2002). Estimating the benefits and costs of a universal substance abuse screening and treatment referral policy for pregnant woman. *Journal of Social Service Research, 29*(1), 57-84.

Berger, L. M. (2004). Income, family structure and child maltreatment. *Children and Youth Services Review, 26*(8), 725-748.

Bess, R., Andrews, C., Jantz, A., Russell, V., & Geen, R. (2002). *The cost of protecting vulnerable children III: What factors affect states' fiscal decisions?* Washington, DC: The Urban Institute.

Blumenthal, B., et. al. (1988). *A step towards a business plan for children in Dallas County*. Dallas, TX: Dallas Commission on Children and Youth.

Boardman, A. E., Greenberg, D. H., Vining, A. R., & Weimer, D. L. (1996). *Cost-benefit analysis: Concepts and practice.* Upper Saddle River, NJ: Prentice Hall.

Bopp, K., Fraiser, L., & Fitch, D. (1997). *The economic costs of Shaken Baby Syndrome survivors in Missouri. Technical Report.* Jefferson City, MO: Missouri Children's Trust Fund.

Bruner, C. (1996). *Potential returns on investment from a comprehensive family center approach in high-risk neighborhoods: Allegheny County study. Technical report.* Des Moines, IA: Child and Family Policy Center.

Byford, S., McCrone, P., & Barrett, B. (2003). Developments in the quantity and quality of economic evaluations in mental health. *Current Opinion in Psychiatry, 16*(6), 703-707.

Caldwell, R. A. (1992). *The costs of child abuse vs child abuse prevention: Michigan's experience. Technical Report.* Lansing, MI: Michigan Children's Trust Fund.

Carlsson, F., & Martinsson, P. (2001). Do hypothetical and actual marginal willingness to pay differ in choice experiments?: application to the valuation of the environment. *Journal of Environmental Economics and Management, 41*(2), 179-192.

Carson, R. T. (2000). Contingent valuation: A user's guide. *Environmental Science & Technology, 34*, 1413-1418.

Carson, R. T., Hanemann, W. M., Kopp, R. J., Krosnick, J. A., Mitchell, R. C., Presser, S., et al. (1994). *Prospective interim lost use value due to DDT and PCB contamination in the Southern California bight. Technical report.* Washington, DC: National Oceanic and Atmospheric Administration.

Carson, R. T., & Mitchell, R. C. (1995). Sequencing and nesting in contingent valuation surveys. *Journal of Environmental Economics and Management, 28*, 155-173.

Centers for Disease Control and Prevention. (2005). *Preventing child maltreatment: Program activities guide.* Atlanta, GA: Centers for Disease Control and Prevention.

Cobley, C. (1998). Financial compensation for victims of child abuse. *The Journal of Social Welfare & Family Law, 20*(3), 221-235.

Cohen, M. A., Rust, R. T., Steen, S., & Tidd, S. T. (2004). Willingness-to-pay for crime control programs. *Criminology, 42*(1), 89-109.

Cosslett, S. R. (1982). Distribution-free maximum likelihood estimator of the binary choice model. *Econometrica, 51*, 765-782.

Coulton, C. J., Korbin, J. E., Su, M., & Chow, J. (1995). Community level factors and child maltreatment rates. *Child Development, 66*(5), 1262-1276.

Courtney, M. E. (1998). The costs of child protection in the context of welfare reform. *The Future of Children, 8*(1), 88-103.

Courtney, M. E. (1999). The economics. *Child Abuse & Neglect, 23*(10), 975-986.

Cramer, R. E. (1985). The district attorney as a mobilizer in a community approach to child sexual abuse. *University of Miami Law Review, 40*, 209-216.

Crapo, J. R., Cooper, E., & Shellman, K. A. (1996). *Cost benefit analysis of the D.C. Children's Advocacy Center and the multi-disciplinary team agencies principally charged with responding to child abuse victims. Presented to District of Columbia Financial Responsibility and Management Assistance Authority, September 1996.*Unpublished manuscript.

Cropper, M. L., & Oates, W. E. (1992). Environmental economics: A survey. *Journal of Economic Literature, 30*(2), 675-740.

Cullingford, C., & Morrison, J. (1998). The relationship between criminality and home background. *Children & Society, 11*(3), 157-172.

Dallam, S. J. (2001). The hidden effects of childhood maltreatment on adult health. In K. Franey, R. Geffner & R. Falconer (Eds.), *The cost of child maltreatment: Who pays? We all do.* (pp. 1-14). San Diego, CA: Family Violence & Sexual Assault Institute.

Daro, D. (1988). *Confronting child abuse: Research for effective program design.* New York: Free Press.

Diamond, P. A., & Hausman, J. A. (1994). Contingent valuation: Is some number better than no number? *Journal of Economic Perspectives, 8*(4), 45-64.

Diener, A., O'Brian, B., & Gafni, A. (1998). Health care contingent valuation studies: A review and classification of the literature. *Health Economics, 7*, 313-326.

Dinwiddie, S., Heath, A. C., Dunne, M. P., Bucholz, K. K., Madden, P. A., Slutske, W. S., et al. (2000). Early sexual abuse and lifetime psychopathology: a co-twin-control study. *Psychological Medicine, 30*, 41-52.

Dismuke, C. E., French, M. T., Salome, H. J., Foss, M. A., Scott, C. K., & Dennis, M. L. (2004). Out of touch or on the money: Do the clinical objectives of addiction treatment coincide with economic evaluation results? *Journal of Substance Abuse Treatment, 27*(3), 253-263.

Dubowitz, H. (1990). Costs and effectiveness of interventions in child maltreatment. *Child Abuse & Neglect, 14*(2), 177-186.

Fals-Stewart, W., Yates, B. T., & Klostermann, K. (2005). Assessing the costs, benefits, cost-benefit ratio, and cost-effectiveness of marital and family treatments: Why we should and how we can. *Journal of Family Psychology, 19*(1), 28-39.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*(4), 245-258.

Finkelhor, D., & Jones, L. M. (Jan 2004). Explanations for the decline in child sexual abuse cases. *Juvenile Justice Bulletin.* (NCJ 199298).

Finkelhor, D., Paschall, M. J., & Hashima, P. Y. (2001). Juvenile crime victims in the justice system. In S. O. White, ed. (Ed.), *Handbook of Youth and Justice.* (pp. 11-28). Dordrecht, Netherlands: Kluwer Academic Publisher.

Forjuoh, S. N. (2000). Child maltreatment related injuries: incidence, hospital charges, and correlates of hospitalization. *Child Abuse & Neglect, 24*(8), 1019-1025.

Foster, E. M., & Holden, E. W. (2002). Benefit-cost analyses of the child welfare demonstration projects: Understanding the resource implications of the IV-E waivers.

Children and Youth Services Review, 24(6-7), 431-453.

Franey, K., Geffner, R., & Falconer, R. (Eds.). (2001). *The cost of child maltreatment: Who pays? We all do.* San Diego, CA.: Family Violence & Sexual Assault Institute.

French, M. T., Roebuck, M. C., & McLellan, A. T. (2004). Cost estimation when time and resources are limited: The Brief DATCAP. *Journal of Substance Abuse Treatment, 27*(3), 187-193.

Fromm, S. (2001). *Total estimated cost of child abuse and neglect in the United States: Statistical Evidence.* Chicago: Prevent Child Abuse America.

Galano, J., Credle, W., Perry, D., Berg, S. W., Huntington, L., & Stief, E. (2001). Developing and sustaining a successful community prevention initiative: The Hampton Healthy Families Partnership. *Journal of Primary Prevention, 21*(4), 495-509.

Garland, A. F., Landsverk, J. L., Hough, R. L., & Ellis-MacLeod, E. (1996). Type of maltreatment as a predictor of mental health service use for children in foster care. *Child Abuse & Neglect, 20*(8), 675-688.

Geen, R., & Waters, S. (1997). *The impact of welfare reform on child welfare financing.* Washington, DC: The Urban Institute.

Giardino, A. P., Montoya, L. A., & Leventhal, J. M. (2004). Financing medically-oriented child protection teams in the age of managed health care: a national survey. *Child Abuse & Neglect, 28*(1), 25-44.

Giardino, A. P., Montoya, L. A., Richardson, A. C., & Leventhal, J. M. (1999). Funding realities: child abuse diagnostic evaluations in the health care setting. *Child Abuse & Neglect, 23*(6), 531-538.

Gothard, S., Ryan, B., & Heinrich, T. (2000). Treatment outcome for a maltreated population: benefits, procedural decisions, and challenges. *Child Abuse & Neglect, 24*(8), 1037-1045.

Gould, M. S., & O'Brien, T. (1995). *Child maltreatment in Colorado: The value of prevention and the cost of failure to prevent. Technical report.* Denver, CO: Center for Human Investment Policy, University of Colorado at Denver.

Grogger, J., Karoly, L. A., & Klerman, J. A. (2002). *Consequences of welfare reform: A research synthesis. Prepared for the Administration for Children and Families, U.S. Department of Health and Human Services.* (No. DRU-2676-DHHS). Santa Monica, CA: RAND.

Haab, T. C., & McConnell, K. E. (1997). Referendum models and negative willingness to pay: Alternative solutions. *Journal of Environmental and Management, 32,* 251-270.

Haab, T. C., & McConnell, K. E. (2002). *Valuing environmental and natural resources: The econometrics of non-market valuation.* Northhampton, MA: Edward Elgar Publ.

Hammerle, N. (1992). *Private choices, social costs, and public policy. An economic analysis of public health issues.* Westport, CN: Praeger.

Hanemann, W. M. (1994). Valuing the environment through contingent valuation. *Journal of Economic Perspectives, 8*(4), 19-43.

Hildyard, K. L., & Wolfe, D. A. (2002). Child neglect: developmental issues and outcomes. *Child Abuse & Neglect, 26*(6/7), 679-695.

Horton, C. B., & Cruise, T. K. (2001). *Child abuse and neglect: The school's response*. New York, NY, US: Guilford Press.

Huggins, P. (2005, February 12). Morgan gets funds for child advocacy center. *Decatur Daily News*.

Hyman, B. (2000). The economic consequences of child sexual abuse for adult lesbian women. *Journal of Marriage & the Family, 62*(1), 199-211.

Irazuzta, J. E., McJunkin, J. E., Danadian, K., Arnold, F., & Zhang, J. (1997). Outcome and cost of child abuse. *Child Abuse & Neglect, 21*(8), 751-757.

Jonson-Reid, M. (1998). Youth violence and exposure to violence in childhood: An ecological review. *Aggression and Violent Behavior, 3*(2), 159-179.

Kacapyr, E. (1998). What's wrong with this picture? *American Demographics, 20*(9), 18.

Kang, S., Deren, S., & Goldstein, M. F. (2002). Relationships between childhood abuse and neglect experience and HIV risk behaviors among methadone treatment drop-outs. *Child Abuse & Neglect, 26*(12), 1275-1289.

Karoly, L. A., Greenwood, P. W., Everingham, S. S., Hoube, J., Kilburn, M. R., Rydell, C. P., et al. (1998). *Investing in our children: What we know and don't know about the costs and benefits of early childhood interventions.* Santa Monica, CA: RAND.

Kendall-Tackett, K. A. (2001). Victimization and diabetes: An exploratory study. In K. Franey, R. Geffner & R. Falconer (Eds.), *The cost of child maltreatment: Who pays? We all do.* (pp. 71-74). San Diego, CA: Family Violence & Sexual Assault Institute.

Kolbo, J. R., & Strong, E. (1997). Multidisciplinary team approaches to the investigation and resolution of child abuse and neglect: A national survey. *Child Maltreatment, 2*, 61-72.

Kupfer, G. M., & Giardino, A. P. (1995). Reimbursement and insurance coverage in cases of suspected sexual abuse in the emergency department. *Child Abuse & Neglect, 19*(3), 291-295.

Levin, H. M. (1983). *Cost-effectiveness: A primer*. Beverly Hills, CA: Sage Publications.

Logan, T. K., Hoyt, W. H., McCollister, K. E., French, M. T., Leukefeld, C., & Minton, L. (2004). Economic evaluation of drug court: Methodology, results, and policy implications. *Evaluation & Program Planning, 27*(4), 381-396.

Marshall, A. (1920). Principles of Economics. London: MacMillan and Co. Ltd.

Massat, C. R., & Lundy, M. (1998). "Reporting costs" to nonoffending parents in cases of intrafamilial child sexual abuse. *Child Welfare, 77*(4), 371-388.

McCrone, P., Weeramanthri, T., Knapp, M., Rushton, A., Trowell, J., Miles, G., et al. (2005). Cost-effectiveness of Individual versus group psychotherapy for sexually abused girls. *Child & Adolescent Mental Health, 10*(1), 26-31.

McGuigan, W. M., & Pratt, C. C. (2001). The predictive impact of domestic violence on three types of child maltreatment. *Child Abuse & Neglect, 25*(7), 869-883.

Miller, T., Cohen, M., & Wiersama, B. (1996). *Victims' costs and consequences: A new look.* Washington, DC: National Institute of Justice, U.S. Department of Justice.

Mitchell, R. C., & Carson, R. T. (1989). *Using surveys to value public goods: The contingent valuation method.* Washington, DC: Resources for the Future.

Morris, P., Huston, A., Duncan, G., Crosby, D., & Bos, J. (2001). *How welfare and work policies affect children: A synthesis of research. Technical report.* New York: Manpower Demonstration Research Corporation.

National Children's Alliance. (2004). *2003 Annual Report.* Washington, DC: National Children's Alliance.

National Clearinghouse on Child Abuse and Neglect Information. (2003). *Prevention pays: The costs of not preventing child abuse and neglect.* Washington, DC: U.S. Department of Health & Human Services, Administration for Children & Families.

National Research Council. (1993). *Understanding child abuse and neglect.* Washington, DC: National Academy Press.

Nelson, E. C., Heath, A. C., Madden, P. A., Cooper, M. L., Dinwiddie, S., Bucholz, K. K., et al. (2002). Association between self-reported childhood sexual abuse and adverse psychosocial outcomes: results from a twin study. *Archives of General Psychiatry, 59*(2), 139-145.

Noor, I., Caldwell, R., & Strong, D. (2004). *The costs of child abuse vs. child. abuse prevention: A decade of Michigan's experience. Technical report.* Lansing, MI: Michigan Children's Trust Fund.

Paxson, C., & Waldfogel, J. (1999). Parental resources and child abuse and neglect. *The American Economic Review, 89*(2), 239-244.

Paxson, C., & Waldfogel, J. (2002). Work, welfare, and child maltreatment. *Journal of Labor Economics, 20*(3), 435-474.

Plotnick, R. D., & Deppman, L. (1999). Using benefit-cost analysis to assess child abuse prevention and intervention programs. *Child Welfare, 78*(3), 381-407.

Portney, P. R. (1994). The contingent valuation debate: Why economists should care. *Journal of Economic Perspectives, 8*(4), 3-18.

Putnam, F. W. (2001). Why is it so difficult for the epidemic of child abuse to be taken seriously? In K. Franey, R. Geffner & R. Falconer (Eds.), *The cost of child maltreatment: Who pays? We all do.* San Diego, CA: Family Violence & Sexual Assault Institute.

Reynolds, A. J., Temple, J. A., Robertson, D. L., & Mann, E. A. (2002). Age 21 cost-benefit analysis of the Title I Chicago child-parent centers. *Educational Evaluation and Policy Analysis, 24*(4), 267-303.

Robertson, A. A., Grimes, P. W., & Rogers, K. E. (2001). A short-run cost-benefit analysis of community-based interventions for juvenile offenders. *Crime & Delinquency, 47*(2), 265-284.

Roebuck, M. C., French, M. T., & McLellan, A. T. (2003). DATStats: Results from 85 studies using the Drug Abuse Treatment Cost Analysis Program (DATCAP). *Journal of Substance Abuse Treatment, 25*(1), 51-57.

Rovi, S., Chen, P.-H., & Johnson, M. S. (2004). The economic burden of hospitalizations associated with child abuse and neglect. *American Journal of Public Health, 94*(4), 586-590.

Sassone, P. G., & Schaffer, W. A. (1978). *Cost-benefit analysis: A handbook.* New York: Academic Press.

Scarcella, C. A., Bess, R., Zielewski, E. H., Warner, L., & Geen, R. (2002). *The cost of protecting vulnerable children IV: How child welfare funding fared during the recession?* Washington, DC: The Urban Institute.

Shanahan, M., & Donato, R. (2001). Counting the cost: Estimating the economic benefit of pedophile treatment programs. *Child Abuse & Neglect, 25*(4), 541-555.

Sheppard, D. I., & Zangrillo, P. A. (1996). Coordinating investigations of child abuse. *Public Welfare, 54*, 21-31.

Simpson, T. L. (2002). Women's treatment utilization and its relationship to childhood sexual abuse history and lifetime PTSD. *Substance Abuse, 23*(1), 17-30.

Slack, K. S., Holl, J. L., Lee, B. J., McDaniel, M., & al, e. (2003). Child protective intervention in the context of welfare reform: The effects of work and welfare on maltreatment reports. *Journal of Policy Analysis and Management, 22*(4), 517.

Stewart, A., Dennison, S., & Waterson, E. (2002). Pathways from child maltreatment to juvenile offending. In *Trends and Issues in Crimes and Criminal Justice, #241*. Canberra: Australian Institute of Criminology.

Stewart, J. M., O'Shea, E., Donaldson, C., & Shackley, P. (2002). Do ordering effects matter in willingness-to-pay studies of health care? *Journal of Health Economics, 21*, 585-599.

Swisher, J. D., Scherer, J., & Yin, R. K. (2004). Cost-benefit estimates in prevention research. *Journal of Primary Prevention, 25*(2), 137-145.

Turnbull, B. W. (1976). The empirical distribution function with arbitrarily grouped, censored, and truncated data. *Journal of the Royal Statistical Society, 38*, 290-295.

U.S. Department of Health and Human Services. Administration on Children Youth and Families. (2003). *Child maltreatment 2001*. Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services. Administration on Children Youth and Families. (2004). *Child maltreatment 2002*. Washington, DC: U.S. Government Printing Office.

U.S. Department of Health and Human Services. Administration on Children Youth and Families. (2005). *Child maltreatment 2003*. Washington, DC: U.S. Government Printing Office.

U.S. Congress, House of Representatives, Committee on Ways and Means. (1998). *1998 Green Book: Background Material and Data on Programs Within the Jurisdiction of the Committee on Ways and Means.* (105th Congress). Washington, DC: U.S. Government Printing Office.

U.S. Congress, House of Representatives,Committee on Ways and Means. (2004). *2004 Green Book: Background Material and Data on Programs Within the Jurisdiction of the Committee on Ways and Means.* (108th Congress). Washington, DC: U.S. Government Printing Office.

Waldfogel, J. (2004). Welfare reform and the child welfare system. *Children and Youth*

Services Review, 26(10), 919-939.

Walsh, W., Jones, L., & Cross, T. (2004). *Children's advocacy centers: One model, many programs.* Durham, NH: Crimes Against Children Research Center, University of New Hampshire.

Weinberg, B. A. (2001). An incentive model of the effect of parental income on children. *Journal of Political Economy, 109,* 266-280.

Widom, C. S. (1989). The cycle of violence. *Science, 244*(4901), 160-166.

Woodward, A. (1998). Overview of methods: cost-effectiveness, cost-benefits, and cost-offsets of prevention. In W. J. Bukowski & R. I. Evans, eds. (Eds.), *Cost-benefit/cost-effectiveness research of drug abuse prevention: Implications for programming and policy* (pp. 130-140). Washington, DC: U.S. Government Printing Office.

Yates, B. T. (1994). Toward the incorporation of costs, cost-effectiveness analysis, and cost-benefit analysis into clinical research. *Journal of Consulting & Clinical Psychology, 62*(4), 729-736.

Yates, B. T. (1996). *Analyzing costs, procedures, processes, and outcomes in human services.* Thousand Oaks, CA: Sage Publ.

Yates, B. T. (1997). From psychotherapy research to cost-outcome research: What resources are necessary to implement which therapy procedures that change what processes to yield which outcomes? *Psychotherapy Research, 7*(4), 345-364.

Yates, B. T., & Taub, J. (2003). Assessing the costs, benefits, cost-effectiveness, and cost-benefit of psychological assessment: we should, we can, and here's how. *Psychological Assessment, 15*(4), 478-495.

Yates, B. T. (2005). Cost-effectiveness analysis and cost-benefit analysis. In D. DuBois & M. Karcher (Eds.), *Handbook for youth mentoring*. Thousand Oaks, CA: Sage Publications.

Zlotnick, C., Ryan, C. E., Miller, I. W., & Keitner, G. I. (1995). Childhood abuse and recovery from major depression. *Child Abuse & Neglect, 19*(12), 1513-1516.

APPENDICES

Appendix A: Glossary of Economic Terms

altruistic behavior -- Occurs when individuals place value on the benefits and costs to others in making their own economic choices and decisions.

causal relationship -- Two economic variables are causally related if the movement of one causes movement of the other.

consumer price index (CPI) -- An index that captures the change over time in the cost of purchasing a "typical" bundle of goods.

contingent valuation -- Uses survey methods and asks individuals to place a value on their willingness to pay for public projects or programs.

control variables -- Variables that are included in cross-sectional regression models to account for differences between treatment and control groups that can lead to bias.

correlation -- Two economic variables are correlated if they move together.

costs -- The value of economic resources (labor, raw materials, human and physical capital) used to produce public and private goods.

cost-benefit analysis -- The comparison of costs and benefits of public goods projects to decide if they should be undertaken or more of a public good should be produced. This method can also be used to evaluate alternative ways of providing public goods.

cost effectiveness analysis -- For projects that have immeasurable benefits, or are viewed as desirable regardless of the level of benefits, we can compute the costs of alternatives and choose the most cost effective project**.**

cross sectional regression analysis -- Statistical analysis of the relationship between two or more variables exhibited by many individuals at one point in time.

direct effects -- The effects of government interventions that would be predicted if individuals did not change their behavior in response to the interventions.

economies of scale -- Economies of scale exist when the cost per unit of production declines as the number of units produced increases. The term usually applies only to certain range of a firm's output quantity, but in exceptional circumstances they can be virtually inexhaustible. Economies of scale are most often discussed in the context of a business firm's production, but there can be analogous economies of scale in marketing or distribution of a product or service and in public sector firms as well.

ex ante -- A Latin term often used in economics, which means "beforehand." In economic models where there is uncertainty that is resolved during the course of analysis, the ex antes

values (e.g. the expected outcomes) are those that are calculated in advance of the resolution of uncertainty.

externality -- Externalities arise whenever the actions of one party make another party worse or better off, yet the first party neither bears the costs nor receives the benefits of doing so.

free rider problem -- When an investment has a personal cost but a common benefit, individuals will underinvest.

indicated child abuse -- A term used in Alabama law to indicate that a child maltreatment investigation has substantiated that an allegation of child abuse or neglect has in fact occurred.

indirect effects -- The effects of government interventions that arise only because individuals change their behavior in response to the interventions.

long-run -- An analytical concept time used extensively in economics to refer to a period of calendar time that is long enough for producers of a good or service to make all of the necessary adjustments to take advantage of economic efficiencies in the use of resources required to produce the good or service.

marginal analysis -- The comparison of marginal costs and marginal benefits in making choices. Basic economic principles establish that marginal analysis is the key to rational decision making.

marginal benefit -- The incremental benefit an individual receives from consuming or using one more unit of a public or private good.

marginal cost -- The incremental cost incurred when resources are used to produce one more unit of a public or private good .

marginal social benefit -- The incremental (private) benefit received by an individual when he/she consumes one more units of a public or private good plus all additional benefits received by other members of the community when that unit is consumed.

marginal social cost -- The incremental (private) cost incurred when resources are used to produce one more units of a public or private good plus all additional costs imposed on other members of the community when the resources are used to produce that unit.

marginal willingness to pay -- The amount that individuals are willing to pay for the next unit of a good.

market failure -- A problem that causes the market economy to deliver an outcome that does not maximize inefficiency.

maximum likelihood estimator -- is a value of the parameter α such that the likelihood function is a maximum. A likelihood function $L(\alpha)$ is the probability or probability density for the occurrence of a sample configuration $x_1, ..., x_n$ given that the probability density $f(x; \alpha)$ with parameter α is known, $L(\alpha) = f(x_1; \alpha) \cdots f(x_n; \alpha)$

net present value (NPV) -- The value of each period's dollar amount of benefits minus dollar amount of costs (valued in today's prices), discounted into the future. Costs and benefits accrue across time and one dollar next year is worth 1 + r times less than a dollar now because the dollar could earn r% interest if invested. Discounting into the future requires choices of a particular time horizon for making decisions and an appropriate rate of discount.

observational data -- Data generated by individual behavior observed in the real world, not in the context of deliberately designed and controlled experiments.

opportunity cost -- The cost of any decision is the value of the next best alternative that could have been chosen, or the forgone opportunity. Also, the social marginal cost of any resource is the value of that resource in its next best use.

present discounted value (PDV) -- The value of each period's dollar amount in today's terms. A dollar next year is worth 1 + r times less than a dollar now because the dollar could earn r% interest if invested.

public goods -- Goods for which private markets fail either completely or partially. Private markets either fail to provide the good at all or fail be providing too much or too little.

pure public goods -- A subset of public goods for which private markets fail completely, i.e., the good is not provided at all. Such goods are perfectly nonrivalrous in consumption and nonexcludable.

public sector applied welfare economics -- The branch of economics that seeks to identify and provide advice concerning the best choices for society that can be made when providing public goods and placing taxes on individuals and business firms.

quasi public goods -- A subset of public goods for which private markets fail to supply the correct quantity of the socially desired output. For these types of goods private markets will supply some of the good, either too much or too little is provided. Government may be able to improve on private markets by controlling the quantity of the good supplied.

regression line -- The line that measures the best linear approximation to the relationship between any two variables.

short run -- An analytical concept of time extensively used in economics to refer to a period of calendar time that is too short for producers of a good or service to make all necessary adjustments to take advantage of economic efficiencies in the use of resources required to

produce the good or service. Some costs that are essentially unimportant in the long run, such as start-up costs, can be highly significant in making short run decisions.

social discount rate -- The appropriate value of r to use in computing PDV for social investments.

willingness to pay -- The amount that individuals are willing to pay for a product, which is the subjective value or benefit of the good.

Appendix B: An outline of child maltreatment investigation procedural steps in Madison County and Morgan County Alabama

Note: the procedures apply to both counties unless it is clearly indicated the step being described applies to a specific county.

1. Reports of suspected child maltreatment are received via phone, fax and sometimes in person at the DHR office.
2. Reports can come from anonymous callers, school personnel, parents, medical personnel, neighbors, etc. An intake worker at DHR processes and prioritizes these calls and must gather sufficient information from the reporter and agency records to be able to:

   - Identify and locate the children and the parents or primary caregiver;
   - Determine if the report meets the statutory and agency guidelines for child maltreatment;
   - Document the alleged maltreatment, including type, nature, severity, chronicity, and where it occurred;
   - Assess whether the child is safe;
   - Evaluate the motives of the reporter;

   The intake worker then checks agency records and the State's central registry (if appropriate) to determine if the family or child is known or has been reported to the agency previously.
3. The calls are given to the supervisors of the CAN unit to assess the emergent need of the case and assign the case to an investigative social worker.
4. That investigative worker has 12 hours to respond in cases where the child is thought to be in immediate danger and 5 days when there is no immediate danger.
5. The DHR investigator must have visual contact with the child and make an initial assessment. Visual contact usually takes place at the CAC, at home, at school or at a medical facility. Critical decisions that must be made at this stage of the DHR process include the following:

   - Is child maltreatment substantiated as defined by State statute or agency policy?
   - Is the child at risk of maltreatment, and what is the level of risk?

- Is the child safe and, if not, what type of agency or community response will ensure the child's safety in the least intrusive manner?
- If the child's safety cannot be assured within the family, what type and level of care does the child need?
- Does the family have emergency needs that must be met?

6. If the case appears to be at all criminal in nature, law enforcement is called to meet for the initial contact, and the investigators from DHR and LE may conduct the interviews in pairs.
7. At times when the law enforcement officer is the first upon a scene, they take the incident report and DHR is called, usually by the uniform officer's supervisor. The supervisor (such as the sergeant) will then pass the incident report along to the supervisor of the family violence unit, who will then assign the case to a law enforcement investigator who specializes in child maltreatment crimes. This is true in Morgan and Madison counties. The investigators in Morgan County however, are assigned to family violence crimes, or sex crimes, but not necessarily trained specifically for those investigations.
8. In Madison County, for a sex crime or a criminal physical abuse or neglect case, a forensic interview is scheduled at the NCAC if possible. If the child is in immediate danger the interview will be conducted at the home, or at school. If it is a physical abuse or neglect case where LE is not involved, then interviews are conducted at DHR Madison County or out in the field, instead of the NCAC. In Morgan County the interview would be conducted at DHR offices instead of the NCAC.
9. A forensic interview is conducted with the child, the caregiver and the alleged perpetrator, if known. This can take place at home, at school at DHR, but ideally at the NCAC. The interviews could last up to 2 hours, but are usually half that time. Interviews are videotaped at the NCAC, but not in other settings. Both Law Enforcement and DHR must write up synopses of their interviews.
10. In Madison County only, Forensic Interviews are conducted by a therapist from the NCAC if the child is under the age of 4, or if the child is developmentally delayed. DHR and LE can watch the interview on closed circuit television, or view the videotape at a later date.

11. Upon completion of the initial assessment and interviews, the investigator must determine the disposition of the report based on State laws, agency guidelines, and the information gathered.

    - The investigative caseworkers analyze the information collected to determine a risk assessment, determine if there is sufficient and believable information to confirm the risk factors, strengths and resources, and their interaction; and use the risk model to assign significance to each of the risk factors and strengths. The investigator groups this information into an overall picture of the family and its dynamics and analyzes it to assess the current level of risk of maltreatment.

12. There are two key decision points during the initial assessment or investigation in which the child's safety is evaluated. During the first contact with the child and family, the investigator must decide whether the child will be safe during the initial assessment or investigation. The second critical time for evaluating safety is at the conclusion of the initial assessment. This safety assessment follows the determination of the validity of the report and the level of risk. Investigators must determine:

    - Whether the child will be safe in his or her home with or without continuing DHR services;
    - Under what circumstances a case can be diverted to community partners;
    - Under what circumstances intensive, home-based services are necessary to protect a child;
    - Whether the child needs to be placed in out-of-home care.
    - To determine safety at this point, the investigator uses the findings of the risk assessment. The investigator identifies the risk factors that directly affect the safety to the child; the risk factors that are operating at a more intense, explosive, immediate, or dangerous level; or those risk factors that in combination present a more dangerous mix. The investigator weighs the risk factors directly affecting the child's safety against the family protective factors (i.e., strengths, resiliencies, resources) to determine if the child is safe.

13. The interventions in the safety plan are designed to control the risk factors posing a safety threat to the child. In identifying safety interventions and developing a safety plan, DHR investigative caseworkers are required to make reasonable efforts to preserve or reunify families. Child safety is the most important consideration in these efforts. When certain factors are present (e.g., abandonment, torture, chronic abuse, some forms of sexual abuse, killing of another person or the child's sibling, or termination of parental rights for another child), they constitute enough threat to a

child's safety that reasonable efforts are not required to prevent placement or to reunify the family. The sequence of least intrusive to most intrusive safety interventions include:

- In-home services, perhaps combined with partial out-of-home services (e.g., daycare services);
- Removal of abusive caregiver;
- Relative or kinship care;
- Out-of-home-placement.
- When possible, the safety assessment should be conducted jointly with the family; it may not, however, be safe to include the perpetrator. The safety plan also should be negotiated with the family.

14. In order to assure protection, DHR may have to remove the child or reach agreement with family members that the alleged offender will leave the family and have no unsupervised contact with the alleged victim.
15. Child maltreatment is often not an isolated problem; many families referred to DHR experience multiple and complex problems, often at crisis levels. The DHR investigative caseworker is often in the position of determining whether a family has emergency needs and of arranging for emergency services for the child and family. Examples of emergency services can include:

- Medical attention
- Food, clothing, and shelter
- Mental health care
- Crisis counseling

16. The decision that an investigator makes at the end of the initial assessment or investigation is whether a family should be offered ongoing child protective services or other agency services. In some cases, the decision is made based on whether a report is substantiated. In other instances, the decision to offer services is based on the level of perceived risk of maltreatment in the future since substantiation alone is not the best predictor of future maltreatment.
17. In Madison County, when a new case arises for any of the investigators at the NCAC, they can bring the case up at the weekly Multidisciplinary Team (MDT) meeting. If the case is uncomplicated the investigator may decide not to present it to the full MDT

meeting for discussion. They fill-in a form with the basic outlines of the case and give it to the Team coordinator. She then types an agenda that lists all the new cases as well as old cases still under investigation and faxes this agenda to all the parties that comprise the MDT.

18. In Madison County, if the case is a physical abuse case, and LE is involved, it will be discussed at the weekly MDT meeting. If LE is not yet involved and the case has been handled primarily at DHR by the CAN unit, they may choose to bring the case up for discussion at the MDT by faxing the case outline to the Team coordinator, and appearing at the MDT meeting to present the case.
19. In Morgan County, the DHR CAN unit holds monthly meetings amongst themselves to discuss cases and other administrative issues. If the DHR investigator is working with LE, she may have discussion by phone or in person about the case. Cases that appear criminal in nature are faxed to the District Attorney's office. The District Attorney may choose to put a case on the MDT agenda. Very few MDT meetings are held in Morgan County per year, perhaps half a dozen times in all, and very few cases are put on the MDT agenda.
20. In Madison County, the facts are presented at the Friday MDT meeting by either the DHR investigator or Law enforcement or both. The MDT is chaired by the Assistant District Attorney in charge of Family Violence crimes. In addition to the attorneys, LE and social workers, other disciplines often have a role in the initial assessment or investigation process:

    - **Medical personnel** may be involved in assessing and responding to medical needs of a child and perhaps in documenting the nature and extent of maltreatment.
    - **Mental health personnel** may be involved in assessing the effects of any alleged maltreatment and in helping to determine the validity of specific allegations. They may also be involved in evaluating the parent's or caregiver's mental health status and its effect on the safety to the child.
    - **Partner abuse experts** may be asked to assist in examining the safety of the child in cases where partner abuse and child maltreatment co-exist. These professionals may also be involved in the safety planning process.
    - **Other community service providers** who have had past experience with the child or family may be a resource in helping to address any emergency needs that the child or family may have.
    - **Other community partners** such as intensive, home-based service workers; parent aides; daycare providers; afterschool care providers; foster parents; volunteers; or

relatives may be used to help the agency implement a plan to keep the child safe within his or her own home.

- **Juvenile court** may be involved in helping to assure the safety of the child and to provide continuing protective services to the child and family when the child's safety cannot be protected, and the parents or caregivers have refused agency intervention.

21. The case is discussed among the MDT and next steps are decided. If the Team decides there is no case based on the facts presented, the case will be closed to further discussion.
22. Next steps can be interviews with witnesses, other possible victims, other family members, etc.
23. Next steps often can include a polygraph for the alleged offender. This consists of scheduling a trained polygraph examiner, scheduling the alleged offender, scheduling a room and carrying out the exam. After which the polygraph examiner must write up a report of the results.
24. Subsequent discussions at the Friday MDT meetings of this case will continue each week until the case is closed to the MDT. At this point it is either accepted for prosecution or the case is closed.
25. Case documentation provides accountability for both the activities and the results of the agency's work. DHR case records and information systems must carefully document: (1) contact information; (2) the findings of the assessments; (3) decisions at each stage of the case process; (4) interventions provided to the family both directly and indirectly; (5) the progress toward goal achievement, including risk reduction.
26. A Child Abuse & Neglect report must be filed by DHR within 90 days of the start of the investigation. This is a mandatory step. The report is what feeds into the Central Registry of DHR on all investigated cases of child maltreatment.
27. The DHR investigative social worker must also file a Child Abuse & Neglect Analysis, which is an internal report to DHR.
28. If the alleged abuser is indicated by DHR, they must be notified by certified letter within 10 days of the findings. The abuser has the right to an administrative hearing or appeal.
29. Law Enforcement must file an official incident report to their respective agencies (Sheriff’s Dept., Police Dept., etc.) if they have been involved in the investigation. If

further interviews are done, or other evidence is collected, then LE must file supplemental reports to the original incident report. The police report and incident report are not reported to NCIC. The only things reported in NCIC are warrants, arrests and sometimes a disposition.

30. If a Forensic Evaluation (FE) was performed by a clinician then documentation from the FE needs to be included and added to the team file. FE is an extended version of a forensic interview with either 6 to 8 sessions allotted to investigate further any allegations that may be unclear during the initial forensic interview or the investigator feels that there may be more to the child's story and therefore more sessions are needed.
31. Once the case has been accepted for prosecution the DA opens a file then sends the case on to Grand Jury. The case can go straight to a preliminary hearing only if the alleged offender was arrested and skip Grand Jury.

Appendix C: Typical Child Abuse Cases

Typical Child Sexual Abuse Case

Madison County Sexual Abuse Case

A 12 year old white female was allegedly sexually abused by her step-father. The child was living in the same household at the time of abuse. The child disclosed to her mother that the stepfather had fondled her under her clothes more than 20 times in the last 18 months. She was not injured and force was not used during the abusive incidents. The mother, who had no knowledge of the incidents while they were occurring, reported the incident to CPS. The alleged offender and child had no history of problems with CPS, and alcohol and/or drugs were not thought to have played a part in the incident. Law Enforcement was called to investigate the case regarding possible abuse. LE and CPS spoke with the child, mother, step-siblings, and the alleged perpetrator. The alleged perpetrator denied all inappropriate behavior. The case was reviewed at the Multidisciplinary Team (MDT) meeting. The alleged offender agreed to a polygraph and failed. The case was reviewed again by the MDT. A warrant was issued for the step-father and the MDT reviewed the case a third time, opening it to prosecution and closing it to further review with the arrest of the step-father.

Morgan County Sexual Abuse Case

A 10 year old white female was allegedly sexually abused by a male adult known to the child. She was not injured and force was not used in what is alleged to be a single incident. The non-offending caregiver (the father) had no knowledge of the incident while it was happening. The father contacted law enforcement after the child disclosed the incident to

him. The child alleges the known male adult fondled her under the clothes, exposed his genitals to her and penetrated her with his fingers or another object. The alleged offender does not reside in the same household as the victim. The alleged offender had no history of problems with CPS and alcohol and/or drugs were not thought to have played a part in the incident. CPS and LE conducted the investigation together. The child, non-offending caregiver, a witness, a family friend and the alleged perpetrator were interviewed. One medical exam was performed for the child. The exam was not consistent with penetration. The alleged offender denied all allegations. The witness denied the victim's story. The victim recanted. CPS coded the incident as unfounded. No charges were filed by LE.

Typical Child Physical Abuse Case

Madison County Physical Abuse Case

A 9 year old white female was allegedly physically abused by her father. The child was living in the same household at the time of abuse. The child disclosed to her maternal grandmother that her father had whipped her with a belt. There was only one incident, one time that was disclosed. The non-offending caregiver (the maternal grandmother) had no knowledge of the incident as it occurred. After child disclosure the grandmother took the child to the Emergency Room (ER). The child was mildly hurt, with bruises on the buttocks, thigh and ankle. The alleged offender and child had 2 prior reports to CPS .Alcohol and/or drugs were not mentioned as a factor in this incident. The ER called CPS, who came to interview the child and grandmother at the hospital. The CPS investigator called the Sheriff's dept. which also sent an investigator to the hospital. The investigator from the Sheriff's dept. photographed the child's injuries. The CPS and Sheriff's investigator spoke with the ER doctor, the grandmother, the child and the alleged perpetrator, as well as siblings and

stepmother of the child victim. The case was reviewed by the MDT once and the case was closed to prosecution. The bruises were from a disciplinary spanking were limited to the buttocks and were not severe. The bruise on the ankle was where the child had attempted to kick the father and connected with a corner of the dresser. The CPS investigator labeled the incident as Not Indicated for child physical abuse and closed the case to any further services. The perpetrator agreed to and enrolled in anger management classes at a local counseling center.

Morgan County Physical Abuse Case

A 9 year old white female was allegedly physically abused by her mother. The mother struck the child with an amount of force that could reasonably be expected to cause a minor bruise or small scratches. The non-offending caregiver of the child, the father, reported the incident to the local police department. According to the report this incident happened only once, and the child sustained only mild injuries. The mother lives in the same household as the child and neither victim nor offender was relocated. The child was able to disclose what had happened to her and first told her father of the incident. The alleged offender and child had no history of problems with CPS and alcohol and/or drugs were not thought to have played a part in the incident. CPS investigated, speaking with child, teacher, alleged offender and the father, the non-offending caregiver. The mother was indicated by CPS for child physical abuse, and sent to anger management classes.

Appendix D: Willingness to Pay Survey

WILLINGNESS TO PAY TO PREVENT AND INVESTIGATE CHILD ABUSE SURVEY

Respondent ID _____ County of Residence _____

_____

INTERVIEWER NOTES: Randomly assign respondents to VERSION = 1 or 2. Within each VERSION respondents must be further assigned to PATH = A, B, or C, ANCHOR = 1, 2, or 3 and RISK TYPE = 1 or 2. Each of these variables is to be included in the data set.

Questions vary slightly depending upon VERSION, PATH, RISK TYPE, and ANCHOR. VERSION refers to the sequence of key questions. PATH refers to types of abuse. RISK TYPE refers to degrees of effectiveness in preventing child abuse, and ANCHOR refers to the base amount of people's willingness to pay.

Version 1 Path _____ Risk Type_____ Anchor _____

Read: Hello. This is (your name), with the (polling agency name) Research Poll. We are doing a brief survey of randomly selected households in several Alabama counties to determine how people assess the costs and benefits associated with programs that combat child abuse. The survey will take approximately (5-10) minutes to complete and your answers are entirely confidential.

Read: Child maltreatment is the physical or sexual abuse of a child or the neglect of a child's basic needs by their parents, caretakers or a known adult. Child abuse can cause major physical or emotional harm, or death. Victims of abuse are more likely to have long-term health and social problems including suicide, trouble in school, juvenile delinquency and drug abuse.

National data reveal that 10 of every 1,000 or 1 out of 100 children experience some type of abuse by parents, caretakers or known adults each year. Based on these numbers about 10,000 Alabama children are abused each year.

	Code
1. Relative to the nation as a whole, how would you judge a child's chance of being abused in your county?	Much greater than average.....1 Somewhat greater than average .....2 About average .....3 Somewhat less than average.....4 Much less than average……...5

I will now ask a few questions about funding child friendly investigations of abuse. This will be followed by a second set of questions about funding of programs to prevent one type of abuse.

VERSION 1

READ: Under Alabama law all reported instances of child abuse must be investigated. This means children, families and those accused of abuse must be asked potentially embarrassing and possibly intimidating questions. Investigations lead to some alleged perpetrators being tried, convicted and sentenced to prison, while others are cleared of wrongdoing.

Imagine that a well designed, coordinated and child friendly system is available that minimizes the stress and anxiety experienced by abused children and their families, while effectively prosecuting child abusers. This program is staffed by professionals and is a proven success in streamlining investigations and minimizing intrusions into the lives of children and their families. The system is in addition to or a replacement for the normal or standard method of investigating that is common in most Alabama counties, which is not child friendly and results in relatively few prosecutions of child abusers.

2 If this program were available to your county, would you be willing to pay (**anchor 1:** $20/ **anchor 2:** $40/**anchor 3:** $60) in extra taxes per year to help sponsor this program? In answering, keep in mind that any contributions you make will reduce the amount of money you have to spend on other things you buy.	YES …….(SKIP TO 3.A)…….…1 NO (SKIP TO 3.B) …..2 DK (SKIP TO 3.B) 8 NR……(SKIP TO 3.B).…….9

3.A Would you be willing to pay (**$ANCHOR*1.5)**?	YES .....(SKIP TO 4).....1 NO .....(SKIP TO 4).....2 DK .....(SKIP TO 4).....8 NR .....(SKIP TO 4).....9 N/A (SKIP)…… 7

3.B Would you be willing to pay (**$ANCHOR*.5)**?	YES .....1 NO .....2 N/A (SKIP) ……7

4. Now thinking about your household income, monthly bills and other expenses, how confident are you in your previous answers about whether you would pay for the effective child abuse investigation program? Are you **(READ ANSWERS)**?	Very confident.....1 Somewhat confident.....2 Not too confident .....3 Not at all confident…….4

Read: The second set of questions deal with preventing one type of child abuse and I ask that you to completely ignore the first set of questions about investigating abuse and dollars amounts that I asked about.

Now Assign Respondents to PATH A, B or C. READ ONLY THE INTRODUCTION RELEVANT TO THE PATH TO WHICH THE RESPONDENT IS ASSIGNED.

Path A: Based on national data, 2 out of every 100,000 children are killed each year as a result of child abuse by parents, caretakers or known adults. Based on these numbers approximately 20 children in Alabama can be expected to die as a result of abuse each year.

Path B: One type of child maltreatment is physical abuse. Physical abuse is defined as an injury to a child resulting from having been hit with a hand or object or having been beat, kicked, bitten, choked, stabbed, burned, shaken or otherwise physically harmed. Based on national data, **2** out of every 1,000 children are victims of physical abuse by their parents or caretakers each year. Based on these numbers approximately 2000 Alabama children are physically abused each year.

Path C: One type of child maltreatment is sexual abuse. Sexual abuse involves any sexual activity with a child where consent is not or cannot be given. This includes all sexual contacts between an adult and a child. Based on national data, **1** out of every 1,000 children annually, are victims of sexual abuse by their parents, caretakers or known adults each year. Based on these numbers approximately 1000 Alabama children are sexually abused each year.

Now imagine that a well designed and effective prevention program is available and that this program is proven to reduce the risk of a child being…

Path A: …killed due to child abuse (**risk type 1:** by 50%/ **risk type 2:** by 25%). If all Alabama counties were to adopt this program then, on average, the number of children killed by child abuse in our state would be reduced from (**risk type 1:** 20 each year to 10./ **risk type 2: 20** each year to 15).

Path B: …physically abused due to child maltreatment (**version 1:** by 50%/**version 2:** by 25%). If all Alabama counties were to adopt this program then, on average, the number of physically abused children in our state would be reduced from (**risk type 1:** 2000 each year to 1000./ **risk type 2: 2000** each year to 1500).

Path C: … sexually abused due to child maltreatment (**version 1:** by 50%/**version 2:** by 25%). If all Alabama counties were to adopt this program then, on average, the number of sexually abused children in our state would be reduced from (**risk type 1:** 1000 each year to 500./ **risk type 2: 1000** each year to 750).

For the child abuse prevention program to be available in your County requires that people in your community contribute toward its cost.

	Code
5. To help make the program available in your county, would you be willing to pay (**anchor 1:** $50/ **anchor 2:** $150/**anchor 3:** $200) in extra taxes per year to sponsor the program? In answering, keep in mind any contributions to this program will reduce the amount of money you have to spend on other things you buy.	YES .....….1 NO.....(SKIP TO 6.B).....2 DK.....(SKIP TO 6.B).....8 NR……(SKIP TO 6.B).……9

6.A Would you be willing to pay (**$ANCHOR*1.5)**?	YES .....(SKIP TO 7).....1 NO .....(SKIP TO 7).....2 DK .....(SKIP TO 7).....8 NR .....(SKIP TO 7).....9 N/A (SKIP)…… 7

6.B Would you be willing to pay (**$ANCHOR*.5)**?	YES .....1 NO .....2 N/A (SKIP) ……7

7. Now thinking about your household income, monthly bills and other expenses, how confident are you in your previous answers about whether you would pay for this effective child abuse prevention program? Are you **(READ ANSWERS)**?	Very confident.....1 Somewhat confident.....2 Not too confident .....3 Not at all confident…….4

READ: To better understand and interpret the hundreds of responses to our questions about preventing and investigating child abuse we need to ask a few additional questions. The first involves information about you and the number of people in your family.

8. A. What is your age? .....**INSERT 2 DIGITS FOR AGE**
..... ____
B. How many people are there in your household?.....**INSERT 1 or 2 DIGITS**
..... ____
C. How many children age 16 & under are there in your household?.....**INSERT 1 DIGIT**
..... ____
D. How many children (age 6 & under) are there in your household?.....**INSERT 1 DIGIT**
..... ____
E. How many years of schooling did you complete?.....**INSERT 2 DIGITS**
..... ____
F. **If Speaking to a Female**
Are you the female head of the Household?....**INSERT 1 or 2**…**1=YES and 2=NO**
..... ____
If Speaking to a Male
Are you the male head of the Household?.....**INSERT 3 or 4**…**3=YES and 4=NO**
..... ____

9. What is your marital status? **(READ ANSWERS)**	MARRIED ……1 SINGLE …….. 2 DIVORCED ……. … .. 3 WIDOWED OR WIDOWER …. …. ….4 DK…… …8 NR..... …… ……9

10. Which of the following best describes your race and ethnicity. **(READ ANSWERS)**	WHITE .....(CAUCASIAN).....1 AFRICAN AMERICAN…..…….....2 HISPANIC……..3 ASIAN……4 OTHER…… 5 DK……... 8 NR..... 9

READ: The average family income in Alabama was $35,000 in 2003.

11. Compared to other Alabama families, which of the following best describes your families' income **(READ ANSWERS)**	AVERAGE, which means between $26K - $43K …… ……. 1 LESS THAN AVERAGE, which means between $13K & 26K ..2 MUCH LESS THAN AVERAGE, which means below $13K …..3 MORE THAN AVERAGE, which means between $43K & 73K .4 MUCH MORE THAN AVERAGE, which means above $73K ...5 DK ……..…… . 8 NR……..……..… 9

12. Looking back on your childhood, did you or someone close to you ever experience a form of child maltreatment such as physical or sexual abuse or neglect of basic needs by a parent, caregiver or known adult?	YES .....(SKIP TO END)……1 NO.....(SKIP TO END)……2 DK……...…8 NR...…….9

END OF SURVEY

Appendix E: Technical guide to adapting Cost-Benefit Analysis for replication in other local communities

Introduction and Overview

This technical guide summarizes the research plan applied to Madison and Morgan Counties in Alabama. Copies of data collection instruments are provided along with descriptions of data sources and comments on data extraction processes. This guide offers suggestions and advice concerning how to replicate and adapt the methodology for studying the costs and benefits of CACs in other local communities. A **Glossary of Economic Terms** is provided in Appendix A to assist in understanding and defining technical terms used in this report, submitted to the National Children's Alliance.

The guide is organized as follows: Part I summarizes the research plan, Part II contains pro forma copies of tables used to report key data. Each table is accompanied by brief instructions on data sources and comments on how information was collected. Part III contains a discussion of the WTP survey instrument and methodology used to measure benefits for the contingent valuation analysis. Brief comments are presented on how to analyze the willingness to pay data derived for the contingent valuation analysis.

Part I: The Research Plan

Cost-benefits analysis proceeds by separately estimating the costs related to the subject of interest and the benefits related to the same subject of interest. The principal objective of the research project was to measure the marginal social benefits relative to the associated marginal social costs of switching from the traditional CPS/LE approach to a CAC-style approach to child abuse investigations. To accomplish this we first measured the comparative costs of the two distinct approaches to organizing and carrying out child abuse investigations. We then used the contingent valuation methodology to measure the subjective marginal benefits that citizens of Madison and Morgan Counties place on having a child and family friendly investigation system that is combined with an efficient and effective system for prosecuting child abusers compared to the traditional investigation and prosecution procedure. Data from the measures of costs and the measures of benefits under each of the two investigation approaches were derived. Finally, differences in usual investigation procedures under each investigation model were identified and typical cases for each county were developed. The cost-benefit data we report may be appropriately generalized to cases that bear similarity to our typical cases and to investigations using procedures that are similar to our procedures.

It is advised that other communities wishing to use the figures from this study on the two Alabama communities should do so cautiously and with recognition that these figures may not be generalizable to other jurisdictions. A more accurate estimate of cost-benefit in any particular community will be obtained by engaging the services of a trained economist

and modifying the procedures outlined here to fit the unique circumstances and available data for that community.

Part II: Determining Incidence and Assessing Costs

Users wishing to replicate our methods for assessing costs and benefits will find the following sample data collection tables and instructions helpful in constructing cost estimates for their own operations. Three types of data need to be collected and tabulated: incidence, cost, and benefit information. Examples of each type of table that will need to be constructed are shown. Instructions are organized in an interactive question format below the table example.

I. Determining Incidence from Tables A and B

Table A. Average Annual Frequency of Child Maltreatment and Deaths Due to Abuse in Madison County, Morgan County and the State of Alabama, 1999-2003

Number of Reports and Indicated[1] Findings by Type of Abuse

	State of Alabama	Counties	
		Madison	Morgan
Reported Number of Abused Children	31,256	1,750	762
Indicated Number of Abused Children[2]	11,238	519	257
Indicated Sexually Abused Children	2,388.8	85.8	47
Indicated Physically Abused Children	4,215.4	155.5	86
Other Indicated Abuses of Children	4,633.6	277.8	123.5
Child Deaths Due to Abuse	21	1	0.5

Sources: Alabama Department of Human Resources and annual reports to the National Child Abuse and Neglect Data System (NCANDS).

1. An alleged child abuse is indicated when a Child Protective Service investigation reveals that abuse has in fact occurred. The perpetrator may or may not be identified in indicated cases and the evidence may not rise to the level that results in a prosecution of the crime.
2. The indicated number of abuses is the sum of sexually, physically and emotionally abused and neglected children. County level abuse data are unavailable for 2001. In the early years of the five year period this aggregation by type of abuse does not yield a total that exactly matches a separately reported number of indicated abuses in copies of records supplied by the Alabama Department of Human Resources.

Where does the information in Table A come from? Under provisions of the Child Abuse Prevention and Treatment Act (CAPTA) each state must collect and submit child abuse data to the National Child Abuse and Neglect Data System (*NCANDS*). In Alabama the Department of Human Resources (DHR) is the agency responsible for implementing child

protective service provisions of the law and, therefore, data used in this report was supplied by Alabama DHR.

Alabama, like many other states, collects data at the county level and aggregates to obtain state totals. A few states do not collect county level data. We obtained Alabama DHR data for four years (1999, 2000, 2002 and 2003). Due to changes in reporting systems county level data in Alabama were unavailable for 2001. Information on the state contact persons responsible for providing data to the *NCANDS* reports is given in the Appendices section of each Child Maltreatment, available online at the U. S. Department of Health and Human Services, Administration for Children and Families, Children's Bureau website. (http://www.acf.hhs.gov/programs/cb/publications/cmreports.htm)

What does Table A data mean? Table A provides background data on reports of and findings concerning child abuse in the two communities of interest and the State of Alabama as a whole.

Why is Table A data needed? Table A data is used in the calculation of incidence rates shown in Table 2.

Comments: There are quirks in the *NCANDS* data, and the accounting and reporting process in Alabama are periodically revised, leading to seemingly odd year-to-year differences in the reported data. For this reason, we felt that reporting averaged frequency results from data drawn over an extended time was superior to reporting frequency results for a single year. Thus, Table A reports averaged data.

For some states a breakdown of local *NCANDS* data may not be available or may be available for only a limited time frame. Some states are now reporting the county level data they collect to *NCANDS* and, some of this local area data may soon appear in the online

NCANDS database. However, due to delays in posting data to the *NCANDS* file, the most recent local data available will be obtained from the state Child Protective Service agencies in the various states.

Table B. Number of Children Under Age 18 and Incidence Rates[1] of Child Abuse in Madison County, Morgan County and the State of Alabama, 1999-2003

	State of Alabama	Counties	
		Madison	Morgan
Number of Children Under Age 18	1,123,422	70,787	28,144
Incidence Rates[2] of Child Abuse and Maltreatment			
# of Reported Cases per 1,000 Children	27.8	24.7	27.1
# of Indicated Abuses per 1,000 Children	10	7.3	11.4
# of Indicated Sexually Abused Children per 1,000 Children	2.1	1.2	1.7
# of Indicated Physically Abused Children per 1,000 Children	3.8	2.2	3.1
# of Other Indicated Abuses of Children per 1,000 children	4.1	3.9	4.4
# of Child Deaths Due to Abuse per 100,000 Children	1.9	1.4	1.8

Sources: Table A and the 2000 U.S. Decennial Census of Population.

1. An incidence rate is generally the number of reported or substantiated cases per 1,000 children. However, for child deaths the incidence rate is expressed per 100,000 children.
2. The incidence rates are obtained by multiplying the mean values reported by the Alabama Department of Human Resources for 1999, 2000, 2002 and 2003 by 1000 and dividing by the number of children under 18 years of age. County level abuse data are unavailable for 2001.

Where does the information in Table B come from? Table B combines the DHR and NCANDS reported frequency information from Table A with information found in the *number of children less than 18 years of age* variable as reported in the 2000 U.S. Decennial Census of Population. Data from the 2000 Census data is available online at http://www.census.gov/main/www/cen2000.html. The arithmetic for calculating incidence rates is straightforward and is explained in notes 1 and 2 to the Table. A calculation example is provided in the comments section.

What does Table B data mean? Table B combines data from Table A with Census information to provide estimates of incidence rates, reports of maltreatment, and indicated cases of abuse.

Why is Table B data needed? Incidence rate information is used to calculate the total dollars spent on investigating a child abuse case in a given catchment area.

Comments: To calculate an incident rate, please see the example provided below.

$$\text{Incidence rate} = \frac{\text{Reported Number (from Table A)} \times 1000}{\text{Number of Children Under 18}}$$

Example: Incidence rate of # of Reported Cases for State of AL

$$\frac{\text{(Reported Number of Abused Children) } 31{,}256 \times 1000}{\text{(Number of Children Under Age 18) } 1{,}123{,}422} = \frac{31{,}256{,}000}{1{,}123{,}422} = 27.8$$

II. Determining Costs from Table 3

Table C appears on page 118. It was produced using a Microsoft Excel spreadsheet.

Where does the information in Table C come from? Data to construct Table C is gathered from multiple sources including interviews, administrative databases, wage and salary scale information, and review of accounting records.

What does Table C data mean? Table C provides key data on the costs of organizing and supervising limited community resources to investigate and prosecute child abuse cases in a single county using a CAC model. The spreadsheet itemizes and summarizes annual costs related to personnel and facilities. Personnel costs are divided into annual salary costs and fringe costs. Fringe costs include benefits and payroll taxes. Facilities expenses are costed out as annualized rental or purchase dollars per square foot of office space per FTE.

Why is Table C data needed? Table C provides numerical and dollar figure answers to the following questions:

- How many personnel are involved in the investigation process?
- Who (which MDT agency) pays this person's salary?
- How much additional personnel expense is incurred beyond salary?
- What facilities expenses are incurred for key personnel?

It also summarizes the answers into a total annual amount of dollars invested in the personnel and facilities required to conduct child abuse investigations. These annual dollar amounts are used, along with the information in Tables A and B to derive estimates for the child abuse investigation cost per case or per 1,000 cases within the geographical catchment area served by the CAC.

Comments. It took substantial time for the National Children's Advocacy Center (NCAC) research staff and the consulting economist to agree upon the procedures for measuring the annual costs reported in Table C. We began with extended discussions of child abuse and neglect case investigation procedures used in Madison and Morgan County. These procedures are outlined in Appendix B. Once the case investigation procedures were detailed, the research staff held numerous interviews with key personnel involved in the investigation and prosecution process. In Madison County these interviews were simple and low-cost because of the ease of communications in a co-housed facility. The interviews involved answering and clarifying information related to the following questions:

1) How many personnel are involved in the investigation process? A important component in gathering the data in Table C is determining the full time equivalent (FTE) number of employees involved in responding to, investigating, following up on cases, closing cases and prosecuting alleged child abusers. In some cases the individuals work full-time on abuse cases and figuring out the FTE for that person is straightforward. For those who work

only part-time on abuse cases and divide their time between two or more activities, judgments about how that persons' time is allocated between tasks is required. In these instances the research staff relied on the judgments of the professionals involved.

2) Which agency pays this person's salary? In Alabama, the salaries are paid by a number of distinct public employers. From each of these agencies we obtained information on the established minimum (entry level) and maximum wage and salary scales. We could have used the actual salaries, but since we wished to make comparisons across counties we decided to use the midpoint of the range of salaries that could be paid to workers in these professional positions. Thus we used administrative records to determine the minimum and maximum salaries for each type of position and then used the average of the minimum and maximum to estimate the direct cost of wages and salaries per FTE.

3) How much additional personnel expense is incurred beyond salary? We determined the cost of fringe benefits and applicable payroll taxes paid for each FTE. These costs are shown separately in Table C as employer paid salary percentages contributed for insurance, FICA, and retirement. Due to variations in benefit costs and tax structures across catchment areas, the percentages associated with these employer paid contributions will change over time, organizational structures and jurisdictions.

4) What facilities expenses are incurred for key personnel? The final step in measuring the costs reported in Table C involved estimating the cost of facilities used to house the workers and supervisory personnel. For Madison County we used the rental cost per square foot per FTE to calculate this value. We were able to obtain actual rental cost and square footage for co-located members of the Multidisciplinary Team from accounting records and the assistance of accounting personnel. We then assumed that supervisory, non

co-located personnel would incur similar costs. If actual office square footage and rental costs are not available, these facilities cost figures can be derived using an alternative procedure that involves measuring square footage of space used and consulting with commercial real estate professionals on what the prevailing local costs are to rent the space required to house the total FTE personnel. For Morgan County, which is geographically adjacent to Madison County, we assumed the same dollar cost of facilities per FTE based on the fact that commercial real estate costs are similar in both areas.

Table C. Annual Investigation and Prosecution Costs, Madison County

Madison County

Agency	Department	Personnel	Salary Midpoint	FTE	Total Salary	Ins 19.50%	FICA 7.65%	Retire 6.04%	Total Personnel	CAC Facilities	Total Costs
CAC	Administration	Executive Director	$73,000	1	$73,000	$14,235.00	$5,584.50	$4,409.20	**$97,228.70**	**$3,216.00**	**$100,444.70**
		Administrative Assistant	$23,500	1	$23,500	$4,582.50	$1,797.75	$1,419.40	**$31,299.65**	**$3,216.00**	**$34,515.65**
		Finance Director/Accountant	$59,500	0.5	$29,750	$5,801.25	$2,275.88	$1,796.90	**$39,624.03**	**$1,608.00**	**$41,232.03**
	Counseling	Clinical Director	$54,000	1	$54,000	$10,530.00	$4,131.00	$3,261.60	**$71,922.60**	**$3,216.00**	**$75,138.60**
		Therapist	$35,000	3	$105,000	$20,475.00	$8,032.50	$6,342.00	**$139,849.50**	**$9,648.00**	**$149,497.50**
		Family Advocate	$25,000	1	$25,000	$4,875.00	$1,912.50	$1,510.00	**$33,297.50**	**$3,216.00**	**$36,513.50**
		Family Advocate Assistant	$21,500	1	$21,500	$4,192.50	$1,644.75	$1,298.60	**$28,635.85**	**$3,216.00**	**$31,851.85**
		Clinical Assistant	$21,500	1	$21,500	$4,192.50	$1,644.75	$1,298.60	**$28,635.85**	**$3,216.00**	**$31,851.85**
	Medical	Pediatrician	$108,000	0.1	$10,800	$2,106.00	$826.20	$652.32	**$14,384.52**	**$0.00**	**$14,384.52**
		Nurse Practitioner	$61,000	0.33	$20,130	$3,925.35	$1,539.95	$1,215.85	**$26,811.15**	**$1,061.28**	**$27,872.43**
		Nurse Assistant	$22,500	1	$22,500	$4,387.50	$1,721.25	$1,359.00	**$29,967.75**	**$3,216.00**	**$33,183.75**
DHR	CPS	CSA Supervisor	$35,000	1.5	$52,500	$10,237.50	$4,016.25	$3,171.00	**$69,924.75**	**$4,824.00**	**$74,748.75**
		CSA Investigator	$30,500	3.5	$106,750	$20,816.25	$8,166.38	$6,447.70	**$142,180.33**	**$11,256.00**	**$153,436.33**
		CPA Supervisor	$35,000	2	$70,000	$13,650.00	$5,355.00	$4,228.00	**$93,233.00**	**$6,432.00**	**$99,665.00**
		CPA Investigator	$30,500	1	$30,500	$5,947.50	$2,333.25	$1,842.20	**$40,622.95**	**$3,216.00**	**$43,838.95**
	Ongoing Services	Social Worker	$29,500	1	$29,500	$5,752.50	$2,256.75	$1,781.80	**$39,291.05**	**$0.00**	**$39,291.05**
LE	HPD	Supervisor	$46,500	0.5	$23,250	$4,533.75	$1,778.63	$1,404.30	**$30,966.68**	**$0.00**	**$30,966.68**
	HPD	CSA Investigator	$42,000	1	$42,000	$8,190.00	$3,213.00	$2,536.80	**$55,939.80**	**$3,216.00**	**$59,155.80**
	MPD	Supervisor	$70,500	0.25	$17,625	$3,436.88	$1,348.31	$1,064.55	**$23,474.74**	**$0.00**	**$23,474.74**
	MPD	CSA Investigator	$45,000	1	$45,000	$8,775.00	$3,442.50	$2,718.00	**$59,935.50**	**$3,216.00**	**$63,151.50**
	MSD	Supervisor	$38,500	0.25	$9,625	$1,876.88	$736.31	$581.35	**$12,819.54**	**$0.00**	**$12,819.54**
	MSD	CSA Investigator	$29,500	1	$29,500	$5,752.50	$2,256.75	$1,781.80	**$39,291.05**	**$3,216.00**	**$42,507.05**
DA	Prosecution	DA	$156,500	0.05	$7,825	$1,525.88	$598.61	$472.63	**$10,422.12**	**$0.00**	**$10,422.12**
		Assistant DA	$78,500	1.2	$94,200	$18,369.00	$7,206.30	$5,689.68	**$125,464.98**	**$3,859.20**	**$129,324.18**
		Victim Advocate	$29,500	0.75	$22,125	$4,314.38	$1,692.56	$1,336.35	**$29,468.29**	**$2,412.00**	**$31,880.29**
		Team Coordinator	$26,000	1	$26,000	$5,070.00	$1,989.00	$1,570.40	**$34,629.40**	**$3,216.00**	**$37,845.40**
		Clerical Assistant	$22,500	1	$22,500	$4,387.50	$1,721.25	$1,359.00	**$29,967.75**	**$3,216.00**	**$33,183.75**
		Paralegal	$26,000	1	$26,000	$5,070.00	$1,989.00	$1,570.40	**$34,629.40**	**$3,216.00**	**$37,845.40**
		DA Investigator	$46,000	0.1	$4,600	$897.00	$351.90	$277.84	**$6,126.74**	**$321.60**	**$6,448.34**
TOTAL				**29.03**	**$1,066,180.00**	**$207,905.10**	**$81,562.77**	**$64,397.27**	**$1,420,045.14**	**$86,446.08**	**$1,506,491.22**

Part III: Assessing Benefits using a Contingent Valuation Methodology

The Willingness to Pay Survey

Where does the information in Table D and E come from? Data to construct Tables D and E is gathered from administering the WTP Survey to a random selection of households in the catchment areas of interest, computing summary statistics for survey items 2, 3A and 3B from Version 1 of the WTP Survey, and applying the appropriate census-based population weights for the catchment areas of interest. The WTP Survey instrument can be found in Appendix D.

Table D. Estimates of Willingness to Pay for CAC by Demographic Characteristics

	% of Yes to $20	% of Yes to $40	% of Yes to $60	WTP Amount ($)	Std. Error
Total	70.8%	69.4%	61.3%	40.3	1.19
Gender*					
Female	77.0%	72.1%	62.8%	42.39	1.46
Male	62.8%	63.9%	58.6%	36.09	2.49
Race*					
White	76.3%	69.9%	65.0%	42.26	1.25
Nonwhite	48.0%	66.7%	44.0%	28.6	4.27
Income					
< $26K[1]	71.9%	51.4%	57.1%	25.28	1.95
$26-43K	72.5%	82.1%	63.6%	40.79	2.74
$43-73K	70.3%	78.8%	62.5%	40.06	3.20
> $73K	70.2%	69.0%	73.2%	14.15	0.80
Abuse Exper.*					
Yes	83.0%	83.9%	71.9%	45.47	0.80
No	65.0%	62.9%	58.3%	37.24	1.96
County					
Madison	73.3%	72.8%	61.2%	41.49	1.40
Morgan	62.8%	63.8%	61.5%	37.29	2.85

Table E. Upper and Lower Bound Estimates of Willingness to Pay by County

	Madison County	Morgan County
Lower Bound Value of Total Benefits	$4.99 million	$1.77 million
Upper Bound Value of Total Benefits	$8.13 million	$3.02 million

What does Table D and E data mean? Tables D and E provide key data on the willingness of respondents to pay for the CAC model of organizing and supervising limited community resources to investigate and prosecute child abuse cases. Table D summarizes WTP data by demographic characteristics of the respondents. Table E provides the upper and lower bound Turnbull estimates of WTP when the total sample WTP amount in Table D is weighted by the census population estimates for the geographical areas surveyed.

Why are Table D and Table E data needed? Comments: The cost-benefit analysis undertaken here required that we estimate the benefits of investigating reports of child abuse and prosecuting alleged offenders using the CAC Multidisciplinary Team approach. One method of determining the benefits of a service is to assess what taxpayers are willing to pay to have a service available within their community. It is not known whether taxpayers value child abuse intervention services for investigation and prosecution differently from child abuse prevention services, therefore we asked about both types of services and counterbalanced the order in which questions were administered. Version 1 of the Survey Instrument is reproduced in its entirety in Appendix D. It asks the intervention willingness to pay (WTP) questions for investigation and prosecution services before asking the prevention WTP questions. Version 2 of the Survey Instrument reverses the order of the questions and asks the prevention WTP questions first. Version 1 and Version 2 were each used in

interviewing 300 households. Thus, the sample of 600 was partitioned with half being asked the investigation questions first and the other half being asked the prevention questions first.

The Survey Instrument was designed so that telephone interviews lasted no more than 15 minutes. The instrument was pretested, which resulted in revisions that dropped some questions and shortened others. A professional public opinion survey firm with computer-assisted telephone interviewing (CATI) capabilities was engaged to help select the sample of 600 adult taxpayers and conduct the interviews. We used the services of this firm because selecting a random sample in two counties requires the knowledge, equipment and software to implement efficient random digit dialing in the target communities. The sample size of 600 was determined by balancing the need for sufficient statistical power with the limited resources available to pay for the services of a professional survey firm.

Once the WTP data and related information have been collected they can be analyzed using the contingent valuation methodology (*CVM*), which is well developed and widely applied in environmental and resource economics. The data analysis requires the services of a skilled statistician or econometrician. For purposes of conducting cost-benefit analysis the key statistic to be calculated from the survey data is the lower bound Turnbull mean, which is discussed extensively earlier in this report. When weighted by the appropriate population estimate, this statistic provides a conservative estimate of the perceived public benefit for the CAC service. The population weighted lower bound Turnbull estimate can then be compared with the total cost estimate derived from the spreadsheet shown in Table C in order to achieve a benefit-cost ratio for a given community.

To cite this publication, the following form is suggested:

Formby, J., Shadoin, A. L., Shao, L, Magnuson, S. N., & Overman, L. B. (2006). Cost-benefit Analysis of community responses to child maltreatment: A comparison of communities with and without Child Advocacy Centers. (Research Report No. 06-3). Huntsville, AL: National Children's Advocacy Center.

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