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Short-term Cost Benefits of Intensive Home Visiting

By Preventing Child Maltreatment

David A. Rooney, MSW

Director, Dakota County Community Services

Community Services Division, Dakota County, MN

One Mendota Road, W., Suite 500, West St. Paul, MN 55118-4773

Joan M. Granger-Kopesky, MPA

Deputy Director, Dakota County Social Services Department

14955 Galaxie Avenue, Apple Valley, MN 55124

Gay A. Bakken, MSW

Principal Planner and Coordinator, Dakota Healthy Families

Dakota County Public Health Department

One Mendota Road, W., Suite 500, West St. Paul, MN 55118-4773

Kevin M. Monroe, MPP

Researcher, University of Minnesota Department of Applied Economics

231 Caloff Building, 1994 Buford Avenue, St. Paul, MN 55108

Abstract

County community services investigated whether a home visiting program serving parents at risk to perpetrate maltreatment prevents maltreatment, and at a rate sufficient to off-set program costs. Child maltreatment records for 220 home visited families were reviewed at 1 to 2.5 years of program participation. Incidence of maltreatment was compared to the rate found in a comparison group receiving no intervention but matched to participants on parent stress factor scores. Costs associated with maltreatment intervention were calculated to estimate costs saved. Seven percent of participant families had maltreatment determined; 53% was expected. Maltreatment intervention costs saved nearly equaled the program operating costs, as each avoided maltreatment intervention saved enough to serve four families through intensive home visiting. Child maltreatment was prevented with substantial cost savings.

Key words: prevention, cost-benefit, maltreatment

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The University of Minnesota conducted this study for Dakota County in Fall of 2004. The study compared rates of child maltreatment—child abuse and neglect—among families involved in the Dakota Healthy Families program from July 2002 through June 2004 with a comparison group of similar families not involved in Dakota Healthy Families. The study was undertaken to determine whether Dakota Healthy Families is effective in preventing child abuse among parents at risk to perpetrate maltreatment and at a rate sufficient to off-set program costs.

The following is a reporting of the study methodology and results.

Program Background

Dakota Healthy Families is an intensive home visiting program serving families at risk for parenting difficulties. The program engages families who, without a proven child maltreatment prevention effort, likely would surface only after evidence of harm or developmental delays when more costly interventions of child protection, law enforcement and/or special education are mobilized.

The long-term costs of child maltreatment are well documented. In the more than 30 academic papers generated out of the Adverse Childhood Experiences (ACE) Study conducted through the Centers for Disease Control and Prevention and Kaiser Permanente, strong support was shown for significant correlation between incidents of maltreatment in childhood and later, costly adverse outcomes in childhood, adolescence and adulthood. Some of the impacts found in that work include early on-set of smoking and sexual activity and increased incidence of suicide during childhood and adolescence. Adulthood adverse impacts found include alcohol abuse and dependency, illicit drug use, depression, suicide, unwanted pregnancy, violence in intimate

relationships, and poor health outcomes such as liver disease, sexually transmitted infections, and chronic obstructive pulmonary disease. The more adverse experiences a child endures, the more adverse outcomes tend to occur, with implications for public sector costs in special education services and social services, community corrections, and other public support.¹

Other studies show children subject to maltreatment have deficits in IQ scores, reduced school performance and limited language abilities that persist into adulthood.² These shortfalls clearly have impact on special education costs and lifetime earnings. Children who have been identified as victims in child maltreatment cases are 55% more likely to be arrested as juveniles and 96% more likely to be arrested for a violent crime.³ There is little debate that avoiding maltreatment promotes community health and saves public costs in the long term.

Dakota Healthy Families is built on six essential ingredients for successful child abuse prevention and early learning programs for infants, toddlers, and young children. These elements are the foundation for all DHF administrative, practice and evaluation efforts and include:

1. Target services to the families with the highest risk.
2. Start early, preferably during the prenatal period or shortly after birth.
3. Be sustained.
4. Be frequent and home-based.
5. Be purposeful, practical and therapeutic.
6. Be connected to neighborhoods and communities.^{4,5,6,7}

To implement these elements, Dakota Healthy Families (DHF) serves families who face the greatest challenges in their new parental role. A typical participant is a poor, single, young mother facing issues of domestic violence, mental illness, limited education, isolation and

substance abuse. Families are engaged early, as DHF is a voluntary program for families expecting their first child or before that child is three months old. Intensive, long-term home visiting is provided by home visitors via contracts with school district Early Childhood Family Education, Head Start, and a non-profit agency matched to each family's strengths, needs and communities. Home visit protocol is patterned after the Healthy Families America and uses Growing Great Kids, Inc. early intervention model to improve infant-parent attachment, reduce isolation, teach positive parenting and problem solving skills, and connect families with resources in their community.⁸

While home visiting is provided through a range of contracted agencies, home visitors are well qualified, receive extensive clinical supervision, and place a premium on relationship building. Several DHF contract and Public Health Department staff supervising or providing home visits have Master's Degrees in social work, nursing, child development, early childhood education or counseling, and three are bilingual. All staff receives more than 40 hours of annual training. Dakota Healthy Families trains home visitors to be unrelenting in dosage of visits, visiting frequently and persisting in contact with the families. Service intensity—the dosage or frequency of visits—has significant impact on relationship building, as does the length of time a family is retained in the program receiving visits. The two key performance measures of dosage and family retention are monitored in order to ensure that relationship building is maximized.

Structurally, Dakota Healthy Families is a grassroots initiative among 17 public and private agencies, with a nine-member Steering Team to set policy and oversee the budget. Community partners—primary care clinics, ob-gyn clinics, and area hospitals—identify and refer potential DHF families. The Dakota County Public Health Department receives community partner referrals, conducts the in-home *Parent Survey* assessments to determine parent risk levels

and program eligibility, and assigns families to contracted home visiting partner agencies. The Public Health Department also is the administrative agent for the project, providing program coordination, home visiting contract development and oversight, and supervision and case consultation.

Figure 1

Now in its seventh year of serving families, Dakota Healthy Families has firmly in place the essential components for ensuring implementation consistent with its research-based home visiting model. These components include: clearly written policies and procedures; well-trained, diverse staff; effective clinical supervision; quality assurance; an information system for tracking performance and outcomes; and experienced leadership and partners including early childhood educators, health care professionals, public health officials, university researchers and Dakota County Commissioners. With these well-established components in place, DHF hired the University of Minnesota's Center for Urban and Regional Affairs in Fall 2004 to investigate DHF's success in preventing child maltreatment.

Study Objective

The primary objective of the study was to determine whether a home visiting program serving parents at risk to perpetrate maltreatment prevents maltreatment, and at a rate sufficient to off-set program costs. Although DHF has a number of outcome measures focusing on success regarding maternal prenatal tobacco use, age appropriate health care, immunization rates, home safety, and infant/toddler social, emotional, physical and language development, the child maltreatment outcome was selected for this outcome study because it lent itself to cost/benefit analysis.

Key Findings

Using published research methodology, Dakota County expected 46 of the 87 most at-risk Dakota Healthy Families mothers to have confirmed cases of child maltreatment. In fact, only 6 of the 87 mothers had confirmed cases of child maltreatment. Put another way, only 7% of the most at-risk DHF families had confirmed cases of child maltreatment, compared with an expected 53%. The result: DHF nearly pays for itself by avoiding cases of confirmed child maltreatment—and every child maltreatment case that is avoided saves enough money to serve four families through DHF. The long-term cost-avoidance is much greater, as early intervention programs like DHF often head off long-term dependency on government programs such as welfare, special education and the criminal justice system.

Methods

Families served by the Dakota Healthy Families program from July 2002 through June 2004 were compared to a group of mothers in a study examining the ability of the *Parent Survey* measuring parental risk factors to predict future maltreatment of children by the parent. The DHF program participants and comparison group subjects were very similar in age, education and income. The average age for DHF participants was 22 years compared to 20.9 years for the comparison group, with an age range of 14-40 years and 14-39 years respectively. DHF participants had 11.6 years of education compared to 11 years for the comparison subjects; all of the comparison group were low-income compared to 90% for DHF participants. Additional descriptive measures were similar. Twenty-eight percent of DHF participants were of Latino heritage compared to one-third in the comparison group. Slightly more than half—54%—of DHF participants were Caucasian compared to almost two-thirds—64%—of the comparison

subjects. All subjects in the comparison group were assessed prenatally for child maltreatment risk, compared to 53% of DHF participants prenatally and the remaining 47% postpartum up to child age three months. The measure showing the greatest difference was marital status: 60% of the comparison group compared to 18% of the DHF group was married.

As noted in the program description, Dakota Healthy Families assesses risk levels associated with child maltreatment using the *Parent Survey*, an in-home standardized interview tool, at the time of enrollment in DHF.⁹ The comparison group was assessed using the *Parent Survey*, a family stress checklist, to measure risk levels among 587 pregnant women. No intervention services were provided to these subjects. One hundred subjects with the highest risk levels were compared 100 with no risk. All 200 were then followed at 1 to 2.5 years to determine incidents of child maltreatment based on clinical records.¹⁰ The 100 high-risk subjects in this earlier work established the expected maltreatment rate based on parent risk level, and formed the comparison group for predicting incidence of maltreatment to be expected among the DHF participants. Researchers matched DHF participants to comparison study participants based on subject's *Parent Survey* scores, and then compared the expected and actual number of confirmed cases of child maltreatment for the two groups to determine whether child maltreatment was avoided. Next, the costs associated with confirmed cases of child maltreatment were calculated so that the savings resulting from prevented cases of child maltreatment could be projected.

Maltreatment Determinations

The Dakota County Community Services Division contracted with University of Minnesota Center for Urban and Regional Affairs to assist in evaluating the effectiveness of its Dakota Healthy Families program. Minnesota has a statewide Social Services Information

System (SSIS) that tracks social services data from counties, including child maltreatment cases through county child protective services. Under the direction of the Dakota County Community Services Director, the contracted researcher conducted a search of the SSIS database for DHF participants served between 7/1/2002 and 6/30/2004 (n=220) for reports of maltreatment occurring anywhere in the Minnesota's 87 counties. The actual number of confirmed cases of child maltreatment among program participants was counted and then compared to the expected number for DHF families based on a comparison group from Murphy, Orkow, & Nicola.^{10, p. 231}

The *Parent Survey* screening tool is an accepted measure of parental risk factors, covering ten life domains of psychiatric history, criminal and substance abuse history, childhood history of care, emotional functioning, attitudes toward and perception of the child, discipline of child, chaotic lifestyle and level of stress in parent's life.¹¹ Each domain is scored at either a 0 for no risk, a 5 for risk, or a 10 for high risk, with the sum of these providing the participant's total risk score. In the original study of the comparison group, mothers with *Parent Survey* scores ranging from 25 to 40 had confirmed cases of child maltreatment and a significant number, although were not confirmed, were suspected of child maltreatment.^{10, p.231} For this reason, measurement error was considered when using *Parent Survey* as a psychometric test to predict the probability of maltreatment and attribute outcome savings. Two inferential statistics—the propensity interpretation (mean) and the long-run relative frequency interpretation (standard error)—were used to ensure the *Parent Survey* scores are accurate predictors of parenting ability and to attribute cost avoidance/savings due to DHF intervention. Because the measurement units for the *Parent Survey* are in increments of five, most measurement error would tend to be in the direction of underestimating a score, going from high-risk to risk, rather than risk to no risk. A standard 5% testing error was used for the *Parent Survey* assessment tool.

The Murphy, Orkow, & Nicola study establishing the comparison group indicated that mothers with a score over 40, and who had a confirmed incident of child maltreatment, accumulated points in the following domains: chaotic lifestyle based on the level of crisis in the family, victims of poor parenting such as severe beatings or no active parent figure, and social isolation or depression.^{10, p. 230} A factor analysis of the *Parent Survey* for DHF participants was not done. However, *Parent Survey* scoring patterns were matched with an ancillary index to determine the quality of survey implementation and whether or not participants in DHF could be matched to participants in the Murphy comparison study. This additional index confirmed the scoring on the *Parent Survey* by finding a consistent description of stress levels and higher measures for mothers who had child maltreatment findings. (This analysis follows in endnote.)¹²

Short-term Cost Savings

Several studies document the future long-term savings attributed to well-implemented, research-based home visiting programs by investing in infants and young children.^{4, 5, 13} The significance of this study is the calculation of current net county cost avoidance in the home jurisdiction—in this case Dakota County, Minnesota. If, in fact, there are avoided costs, this should be reflected in the Dakota County Child Protection Services budget. DHF researchers in conjunction with Dakota County Financial Services and Social Services Child Protection managers calculated the cost of a Dakota County child maltreatment case, including intake, assessment, and proportional costs of county expenses in case management, purchase of services, out of home placement, and court proceedings based on the percentage of cases to which those items apply. The resultant per case cost was multiplied by the difference in the expected and actual number of confirmed child maltreatment cases to arrive at a gross cost savings/avoidance. The net cost savings/avoidance was then calculated by subtracting the DHF per family cost from

the gross cost savings, and a standard margin of error applied. Finally, actual child protection expenditures for the years spanning the study were examined to determine if there were indeed actual budget savings.

Results

The SSIS database search conducted by the University of Minnesota researcher revealed 13 confirmed cases of child maltreatment (12 unique + 1 recurrence) among DHF participants during the two-year study period. Ninety-five percent (208 of 220) of the at-risk mothers served did not have confirmed cases of child maltreatment. Seventy-two percent (158 of 220) of DHF participants had no Child Protection Services allegations. In addition, 92 percent (12 of 13) of the highest at-risk mothers—those who had been victims of abuse as a child—had no CPS allegations.

Dakota Healthy Families identifies and intervenes with high-risk families, targeting that is critical to cost effectiveness. Because a group of these families (17% or 36 mothers total) enrolled in DHF prior to the *Parent Survey*'s use in DHF or otherwise were missing a score, *Parent Survey* scores were available for 184 of the 220 (83%) women in the study population. DHF participants who had a Child Protection Services incident report or allegation scored an average of 44.4 on their *Parent Survey* in-home family assessment, whereas participants who had no CPS allegations scored an average of 36.4, significantly less ($p = .0022$). Figures 2 and 3 show the relative frequency distribution for DHF mothers' *Parent Survey* scores by their Child Protection Services status.

Figure 2

Figure 2 shows that there were 184 mothers with *Parent Survey* scores ranging from five to 70. Of these mothers, 157 DHF had no Child Protection Services reports or allegations. Additionally, there were 17 mothers with CPS reports that did not result in confirmed CPS cases and 10 mothers with confirmed CPS cases where child protection concerns were investigated and determined to have occurred.

Figure 3

Figure 3 shows the distribution of *Parent Survey* scores of 40 and higher, the group the comparison study defined as high-risk mothers.^{10, p. 228} Eighty-seven DHF mothers had *Parent Survey* scores of 40 or higher. Of these, 68 had no Child Protection Services reports while 13 mothers had reports with no confirmed CPS cases and six had confirmed CPS cases where maltreatment was found to have occurred.

Using the comparison study estimate of 53% confirmed cases of maltreatment among high risk mothers,^{10, p. 231} 46 Dakota Healthy Families mothers were expected to have confirmed cases of child maltreatment, as compared to only six high-risk DHF mothers with confirmed cases. Put another way, only 7% of the most at-risk DHF families had confirmed cases of child maltreatment, compared with an expected 53%.

Econometric analysis was used to estimate the impact of the *Parent Survey* scores and control for demographic and socio-economic variables in order to assess whether factors other than parent stress as measured by the *Parent Survey* accounted for differences in child maltreatment. A Maximum Likelihood Estimator (MLE) was used to estimate the probability of the event occurring. This analysis showed that the *Parent Survey* score was the only significant

explanatory variable, while demographic and socio-economic variables were weak indicators of parenting ability. A similar result was reported in the Murphy, Orkow, & Nicola study.^{10, p.233}

Program Cost Recovery

The DHF program nearly pays for itself through avoided child protection costs to Dakota County Social Services. Child protection cases also generate costs to other county departments, as well as to city and state programs such as law enforcement and courts. When accounting for state, county and city child protection costs beyond Social Services, there is a net cost recovery of nearly 85%. Table 1 shows how the number of cases was determined to which the per case cost was applied in order to calculate current gross and net cost avoidance/savings.

Table 1

The average length of time in the program for Dakota Healthy Families participants is 1.6 years. The first 15 months is at Service Intensity Level 1 (weekly visits) and the remaining four months is at Service Intensity Level 2 (biweekly visits). The maximum reimbursement a partner agency receives per visit is \$77.50, and the estimated yearly per family current cost for DHF is \$4,600. The estimated average program duration current cost per family is \$6,150: \$5530 for the first 15 months of weekly visits and \$620 for four months of biweekly visits. Based on these amounts, the estimated total current cost of providing services to DHF participants is \$1.34 million (218 families x \$6,150).

The yearly per case county cost of a Dakota County Child Protection Services is \$23,258. At this amount, 44 CPS prevented cases equals an avoided cost of \$1.02 million. When adding in state and city expenses, the total avoided cost grows to \$1.13 million. The result is a 76.1% (\$1.02m/1.34m) and 84.3% (\$1.13m/\$1.34m) cost recovery, respectively, from providing services to high-risk mothers.

With these avoided child protection costs, it would be expected that operational savings might accrue in the child protection program budget. The timeframe for this study was July 1, 2002, to June 30, 2004. Reports from intake to child protection assessment and expenses for in-home services and out-of-home placements (foster care) for the three calendar years framing the study in fact show considerable decline.

Table 2

It bears noting for future consideration that during the last quarter of 2004 out-of-home placement costs began to increase. A closer look at cases showed this was due, at least in part, to the increased incidence of parent poly-drug use. Methamphetamine use emerged as a significant issue in the second half of 2004, and the majority of foster care re-entries during that time in Dakota County were secondary to parent drug use.

Discussion

The majority of DHF participants are low-income single mothers (90% low-income and 80% single mothers respectively). Research shows children of low-income single mothers are more than two times as likely of being endangered by some type of child abuse or neglect as children from other households.^{14,15} Furthermore, parents who were abused as children are prone to prenatal inconsistency, poor limit setting, excessive harsh disciplinary measures, parenting conflict, poor communication, parental absence or unavailability, and social isolation.¹⁶ This study found that parents at high risk for maltreating their children had a much lower than expected occurrence of child maltreatment as compared to a group with similar risk factors but no intervention. For the same time period that the absence of maltreatment determinations in

DHF families was noted, Dakota County had reduced costs in Child Protection Services. That Dakota Healthy Families was effective in preventing child maltreatment in 92% of these families is significant success in both short- and long-term for private families and public costs.

It is possible that the extent of the success is even greater than the numbers show. Today, the likelihood of being reported to child protective services is greater than in the early 1980's because new statutes expanded incident types, reporting was mandated for more professionals, and the general population's attention has been mobilized.¹⁷ Additionally, Dakota County and the state of Minnesota's threshold for determining child abuse and neglect goes beyond the medical fact-finding protocol applied to the comparison group. Minnesota determinations of maltreatment do not depend upon documentation or reports from health care providers: in fact, of 10,537 maltreatment determinations affecting children under the age of 10 years in Minnesota during 2001-2002, only 12% documented that the child sustained a physical injury.¹⁸ A wide range of determinations of child maltreatment under Minnesota Statutes Section 626 that likely would not have been counted as child maltreatment for the comparison group in the 1985 study, including conditions such as unsanitary living conditions, small children found unsupervised, drugs or weapons accessible to children, domestic violence in the presence of a child, and failure to get a child to school on a regular basis (educational neglect).

While not reported here, the home visiting jurisdiction took additional steps to "reality check" the results of the study. Maltreatment rates were disaggregated to examine the influence of differential response to maltreatment—Alternative Response Child Protection Assessment, later known as Family Assessment. Trends in the different rates of maltreatment determinations were compared to the other metropolitan counties. This analysis found that Dakota County's maltreatment determinations rates declined more significantly than could be accounted for by

Alternative Response, and more than was seen in other metropolitan counties during the same time period. The home jurisdiction also looked at maltreatment determination rates by age groups. In considering maltreatment determinations rates this way, the data showed the greatest decline in maltreatment determinations was in age 0-4 years during the time studied. The drop for this age group was such that it accounted for Dakota County's total decline in its maltreatment determination rate. Pinpointing the decline to the age group served by Dakota Healthy Families and finding that the decline was not evidenced in other metropolitan counties further supports that savings are derived from Dakota Healthy Families in avoided case of child maltreatment.

Limitations

Three areas of study limitations are briefly highlighted including the need for study replication, methodology limitations pertaining to the comparison population and caution for program model replication.

Study replication. An extensive review of the home visiting and child protection literature did not reveal similar studies documenting current net cost avoidance/savings to the local jurisdiction. Replication of this study in other sites would provide a needed opportunity to compare findings and verify results. It is expected that child maltreatment case costs will vary by jurisdictions because of difference in child protection practice. For example, in the Chicago Child-Parent Center Program—Chicago Longitudinal Study (CLS) the child protection costs per case were nearly double those reported for this study.¹⁹ All such comparisons require careful attention to differences in practice.

Population differences. The comparison population of mothers in Metro-Denver, an urban suburban area in the early 1980s, could differ from program participants residing in

Dakota County, Minnesota, an urban, suburban and rural area in 2002-2004 in ways not identified and controlled for by the researchers. For example, the process and standard for determining child maltreatment differed for the two populations. Murphy concluded child maltreatment existed based upon a review by medical staff of medical records using a standard of verified or strongly suspected inflicted injuries for physical abuse and more than one incident of failure to thrive or provide basic needs resulting in multiple clinic visits and/or hospitalization for child neglect. For the DHF population, the local jurisdiction's child protective services investigators made child maltreatment determinations based upon state statutes and local practice protocol both of which included but were not limited to medical fact finding. In other words, DHF was compared to a more rigorous child maltreatment determination standard. The higher number of maltreatment findings seen in the subjects of the Murphy study were more serious physical abuse or neglect than the lower threshold needed for a maltreatment determination under Minnesota statute.^{10, p. 231} DHF still showed a significant reduction in confirmed cases of maltreatment among mothers with *Parent Survey* risk scores of 40 or higher even with a broader less serious definition of maltreatment.

Child Protective Services can vary from state to state and agency to agency in how serious maltreatment allegations must be before the threshold to investigate is reached. There is the possibility that agencies using a very high investigation threshold may have less maltreatment substantiated due to some actual maltreatment being screened out prior to investigation. It bears noting, however, that the standard for finding maltreatment in the comparison group is much more restrictive than typical today among child protection agencies^{10, p. 231}, as CPS rarely requires documentation in medical records in order to substantiate maltreatment.

Training and procedures for administering the *Parent Survey* could differ for comparison and program staff. For example, the comparison group assessors received six hours of training compared to 32 hours for DHF program assessors although in both settings assessors had Bachelor's Degrees in Social Work. The *Parent Survey* was administered to the comparison subjects actively engaged in health care during intake procedure at health care clinics. In Dakota Healthy Families, the *Parent Survey* was administered in the participants' homes based upon referrals from community partners, not all of whom were health care providers. What if any difference this had on the resultant *Parent Survey* scores for the two groups is not known.

Model replication. Understanding the interaction among features that make or diminish a program's success is key to all replication efforts. Entities seeking to replicate Dakota Healthy Families with the expectation of achieving the same cost savings must resist the temptation to modify the model as it pertains to the population served, staff qualifications and training, service intensity and clinical supervision. The DHF service dosage/intensity and participant retention rates illustrate staff perseverance in engaging and relentlessness in retaining voluntary participant families. DHF staff intervened longer with participants that scored 40 or above as measured by median days in program (entire population = 425 days; 35+ population = 437 days; and 40+ population = 524 days). This occurred without home visitors' knowledge of their families' *Parent Survey* score. This intensity coupled with rigorous clinical supervision of home visitors at two hours a week per full-time home visitor is central to retaining well-trained staff as well as retaining voluntary participants.

Conclusion

This research demonstrates that a well-implemented intensive home visiting program—one that utilizes a research-based model for intervention and targets those families at risk for parenting difficulties—can have the effect of reducing child protection costs in current budget.

The goal of child maltreatment prevention is simple: to stop abuse from ever occurring, thus sparing children and families the emotional and physical trauma, while decreasing the need for costly intervention and treatment services. The findings of this study illustrate that this intervention can have a significant effect on reducing child protection involvement for the county. The result is a net cost savings in the short-term directly for the county, challenging widely held perceptions that prevention programs like DHF only save money in the long-term for a broad range of institutions like schools and juvenile justice. The long-term cost-savings will be much greater, because early intervention programs like DHF often head off long-term dependency on government programs such as welfare, special education and the criminal justice system. Based on Dakota County's experiences, policymakers should be encouraged that investment in a program like Dakota Healthy Families makes sense fiscally, now and for the future.

Author Note

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Correspondence regarding this study should be addressed to Gay Bakken, Dakota County Community Services, 1 Mendota Road, Suite 500, West St. Paul, MN 55118-4773. Electronic mail may be sent via Internet to gay.bakken@co.dakota.mn.us.

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¹⁰ Murphy S, Orkow B, Nicola R. Prenatal prediction of child abuse and neglect: a prospective study. *Child Abuse & Neglect*. 1986; 9:225-235.

¹¹ Korfmacher, J. The Kempe family stress inventory: A review. *Child Abuse & Neglect*. 1999; 24:129-140.

¹² *Parenting Stress Index* is a parent self-report, 101-item questionnaire, designed to identify potentially dysfunctional parent-child systems and interactions. The *Parenting Stress Index (PSI)* was used to assess the validity of measures from the *Parent Survey* for the DHF population. The *PSI* measures parental perception of stress and isolation in the parent-child relationship and predicts children's future psychosocial adjustment. There exists a substantial body of published research linking PSI scores to observed parent and child behaviors and to a child's attachment style and social skills (See Abidin R. *Parenting stress index, 3rd ed.* Odessa, FL: Psychological Assessment Resources, Inc; 1995.) The following is a brief summary of the mean parent profile for mothers at-risk for child abuse according to the PSI risk profile, and scoring patterns between the first and last summary score to gauge improvement in parental perspective on stress levels.

DHF is serving at-risk mothers according to the PSI mean parent profile for mothers at-risk for child abuse. The mean isolation score for the PSI high risk group is 14 (DHF = 15, plus or minus 5); the mean depression score for the PSI high risk group is 22 (DHF = 21, plus or minus 6); the mean total parent domain score for mothers in the PSI high risk group is 134 (DHF = 130, plus or minus 25); and the mean total stress score for the PSI high risk group is 254 (DHF = 229, plus or minus 39). In addition, the mean life stress scores for DHF mothers' ranks between the 85th and 90th percentile, high-risk as measured by the PSI. These high risk measures

of stress clearly match the high risk stress levels of the subjects in the Murphy comparison group.

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¹⁷ The threshold for determining child abuse and neglect in Murphy, Orkow, & Nicola comparison study was confirmed abuse—welts, bruises, burns, broken bones—verified or strongly suspected to be inflicted injuries *documented in medical record*, and confirmed neglect—failure to thrive, failure to provide basic needs or supervision as evidenced by more than one incident of poison ingestion, severe falls, hospitalization for any accident, abrasions or bruises *necessitating a clinic visit*.^{10, p. 231}

¹⁸ Minnesota Department of Health. *Violence data brief: Child maltreatment*. St. Paul, MN: Minnesota Department of Health; August 2005. Available at: <http://www.health.state.mn.us/injury/pub/cm.pdf>. Accessed October 21, 2005.

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Table 1

Calculated Number of Cases of Child Maltreatment Avoided

Number of cases	Calculation
87	The number of Dakota Healthy Families mothers with Parent Survey scores 40 and above
46	The expected number of confirmed cases of maltreatment for DHF participants based on comparison group
4	The expected number of recurrences of maltreatment during the study period based upon the Dakota County Child Protection Service's recurrence rate of 8.2% at that time ($46 \times 8.2\% = 4$)
50	The total expected confirmed cases of maltreatment (expected plus recurrence cases or $46+4$)
6	The actual number of confirmed reports of child maltreatment found for DHF families
44	The number of confirmed child maltreatment cases avoided due to DHF intervention ($50-6$)

Table 2

Child Protection Services Reports and Expenses (2002-2004)

Operations	2002	2003	2004
Number of CPS Reports	777	653	622
In-home service expenses	\$956,408	\$755,390	\$597,624
Placement expenses	\$4,874,751	\$3,563,078	\$3,080,507