

THE ECONOMICS OF CHILD ABUSE

A STUDY OF SELECT CALIFORNIA COUNTIES

TECHNICAL APPENDIX

This Technical Appendix provides detailed information on the methodologies, assumptions, and sources used to create the cost estimation calculator for the economic burden of child maltreatment for the Bay Area and its individual counties, as well as select other counties around California. The calculation formula and template were created in collaboration between Safe & Sound and the Haas School of Business, University of California, Berkeley. The original calculation (and associated report) was created for the City and County of San Francisco and has been adapted for the greater Bay Area and other select counties around the state.

The cost estimate derived from the calculation indicates the financial value of preventing a single child from being abused or maltreated.

THE ANALYSIS

To determine our final methodology, we performed a broad literature review of reports written on the economic cost of child maltreatment or similar social issues and closely analyzed their methodologies and data sources. Reports covered a wide range of topics — child maltreatment, incarceration, education, and substance abuse — and spanned multiple geographies. We compared the different approaches and underlying studies used to support each analysis and determined best practices for our analysis.

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TIMELINE OF METHODOLOGY CHANGES

Safe & Sound began publishing county-by-county analyses of the economic impact for children maltreated in 2016. Each year, we leverage new data on the number of children with reports of abuse and substantiated abuse obtained from the California Child Welfare Indicators Project. We also pull updated data on the relative cost of healthcare in each county, per capita income, average age of maltreatment onset, and inflation as measured by a GDP Deflator.

In addition, we have made the following changes to other elements of our methodology over the years we have been publishing these reports:

Year Reported	Methodology Changes
2017	<p>Deaths: We began relying on a Public Records Act request to the California Department of Social Services (CDSS) to obtain data on the number of deaths related to child maltreatment. CDSS becomes notified of deaths via the submission of SOC 827 forms from the child death review team in each county. Previously, we relied on liaisons from each county to share the number of deaths due to maltreatment with us. However, this method introduced a risk that different counties may report deaths using different definitions or standards. Additionally, following up with individual counties became time-consuming. Leveraging CDSS data is preferable as the data is more consistent and comparable across counties.</p>
2018	<p>Healthcare: Changed the approach to adjusting the cost of childhood healthcare associated with maltreatment to each county. Previously, we used a ratio of mean Medicaid claims comparing the western U.S. to national averages in 2010. As Medicaid no longer reports claim data in the same way, we have changed our approach to leverage the per-county cost of healthcare as reported on Bestplaces.net, which leverages data from the Bureau of Labor Statistics - Consumer Price Index, Consumer Expenditure Survey, Medicare, and other sources.</p> <p>Healthcare: Changed the annual inflation rate from 1 percent (an estimate based on generic cost modelling research) to 4.6 percent (an analysis of healthcare cost inflation in the US over a 30-year time period).[22]</p> <p>Surviving Victims: Changed all cost calculations so the number of confirmed fatalities is subtracted from the number of substantiated child victims prior to arriving at a total cost for a region. Previously, we based our economic analysis on both the total number of substantiated victims and the total number of confirmed fatalities. After</p>

	<p>discussions with experts in child maltreatment in 2018, we determined that it is possible that a fatal case may also be represented as a substantiation in the same year. Thus, we updated our approach to minimize the risk of double-counting children who have died as a result of maltreatment.</p> <p>Special Education: Updated the incremental cost of special education from \$12,700 to \$16,800 based on communications with the California Legislative Analyst’s Office.[24]</p> <p>Deaths:</p>

In addition, we considered an alternative approach to calculating the economic burden of child maltreatment. This was proposed by a Centers for Disease Control research team in an article published in the December 2018 volume of Child Abuse and Neglect. This approach leverages the Quality Adjusted Life Years and Value per Statistical Life methodologies in lieu of calculating wages lost over a victim’s lifetime.[23] However, we have decided not to use this approach, as it gives a significantly higher estimate cost and we have concerns that it results in a less conservative estimate.

OVERARCHING ASSUMPTIONS

We considered the following assumptions while performing this analysis:

METHOD

There are generally two methods used for economic burden estimates: a prevalence-based approach or an incidence-based approach.[1] A prevalence-based method provides an estimate of the direct and indirect costs incurred in a given period resulting from all current and prior victims of child abuse, regardless of the onset of child maltreatment. In contrast, an incidence-based method estimates the total lifetime costs resulting from new victims of child maltreatment that occur within a given time period.

While both methods are relevant, an incidence-based approach is more useful in our context because the economic burden resulting from a single child with substantiated maltreatment could be compared with the cost of preventing maltreatment for a single child. In addition, the incidence-based approach was the most commonly used approach applied in the other cost estimation reports we reviewed.

SUBSTANTIATED VICTIMS

Each state defines the types of child abuse and neglect in its statutes and policies. Child protective services (CPS) agencies determine the appropriate response for the alleged maltreatment based on those statutes and policies. In most states, the majority of reports receive an investigation, which results in a determination about the alleged child maltreatment. The two most prevalent determinations are:

Substantiated: An investigation determination that concludes the allegation of maltreatment or risk of maltreatment was supported or founded by state law or policy.

Unsubstantiated: An investigation determination that concludes there was not sufficient evidence under state law to conclude or suspect that the child was maltreated or at risk of being maltreated.

For our total cost estimate, we considered only substantiated victims, but performed a sensitivity analysis to demonstrate the total cost — considering reported, substantiated, and estimated total victims of maltreatment.

In addition, we recognize overlap may exist between fatalities (children who have died as a result of maltreatment) and substantiated victims (children that have had a substantiated report of maltreatment).

To eliminate the risk of double-counting, in all analysis beginning in 2018 we have subtracted the number of fatalities from the number of substantiated victims in the calculations for each cost category below. We use the term “survivors” to represent the number of substantiated victims less the number fatalities.

ONE YEAR SCOPE

We estimate the societal cost for all children in a county who were maltreated in the year of the analysis. The estimate is based off a unique count of children who were maltreated in one year. Our data source for substantiated and reported victims of child maltreatment is the California Child Welfare Indicators Project.[2]

This data source provides the total number of children in California counties with reports of maltreatment, and the total number of children with substantiated cases of maltreatment. It is important to note that we leverage unique counts of children for this analysis – not unique counts of cases, as it is possible that one child may have multiple CPS cases opened in a given year.

We acknowledge that many victims are maltreated multiple times throughout their childhood. Thus, a portion of victims in 2018 were also victimized in 2017.

For this reason, the scope of this analysis is limited to one year. If one were to estimate the economic impact of children maltreated over multiple years, the first step would be to arrive at an unduplicated count of victims over the time period examined.

DISCOUNT RATE

We employ the discount rate whenever future dollar figures are adjusted to present value, to account for the time value of money.

The choice of an appropriate social discount rate for cost–benefit analysis of public investment projects has been subject to debate in economics literature for many years and ranges from 3 to 7 percent for developed countries. We considered multiple approaches: marginal social rate of time preference, social opportunity cost of capital, weighted average or optimal growth model, and shadow price of capital. There is no one-size-fits-all approach to selecting the social discount rate. We have selected 3 percent, because this is the social discount rate applied in the Center for Disease Control and Prevention’s (CDC) cost estimation report and a best practice for the Social Return on Investment (SROI) analysis as cited by experts and published in recommended guidelines.

GEOGRAPHIC ADJUSTMENT

Where possible, we adjusted per-category cost estimates derived from national studies to reflect differences in each county’s income and cost of living. The adjusting value is specified in the Cost Estimation Detail section. The only cost category that could not be adjusted for geography is the Criminal

Justice category. Because this category includes costs across multiple systems (e.g., police, courts, the justice system, juvenile detention, and jails) we could not identify for an appropriate adjusting factor at the county level.

COST IDENTIFICATION

We considered both direct and indirect costs to ensure that our estimate appropriately captured the full economic burden. After significant research, we selected the following broad cost categories for our estimates: healthcare, education, productivity losses, criminal justice, and child welfare. We also identified that the economic impact of child fatalities is different than surviving victims, though its cost drivers (healthcare and productivity losses) are similar.

Our analysis is modeled after that used by Centers for Disease Control researchers Fang, Brown, Florence, and Mercy in their 2012 paper, “The economic burden of child abuse in the United States and implications for prevention.” This study employs an incidence-based approach which identified five categories — healthcare, education, productivity, criminal justice, child welfare, and child fatalities — where research quantifies the economic cost of maltreatment and, for each category, cost-per-victim estimates from secondary data for children maltreated in the U.S. in 2008. Then, our analysis aggregates the lifetime cost of child maltreatment by multiplying the per-victim lifetime cost estimates by the number of new victims in a single year.

Studies have shown that child maltreatment may be associated with reduced life expectancy, decreased quality of life, and negative intergenerational outcomes[3], but we were unable to find studies that quantify these costs and therefore were unable to include them in our analysis.

AVERAGE AGE OF ONSET

This analysis requires a fixed age from which to base costs. While abuse could potentially occur as early as pre-natally, this report conducts relevant calculations based on a fixed age of 7, which is the weighted average age of abuse for first-time victims in 2017, the most recent year for which data are available.[4] Therefore, we have assumed that all costs begin at age 7 and all future economic losses are discounted to this age.

COST ESTIMATION DETAIL

OVERVIEW

Each cost category uses different underlying data and studies, depending on what is available, so we have used different approaches for each category. The methodologies are all rooted in the frameworks laid out by the CDC’s study.

Costs attributable to maltreatment were determined on a category-by-category basis, using the highest quality peer-reviewed studies we could find. The costs for each category were added to create a county-wide annual cost estimate.

Note that, where applicable, we adjusted historical costs for inflation and discounted future costs back to the present value at the year of study, 2018. Costs were referenced to 2018 using the gross domestic product (GDP) deflator (available from <https://fred.stlouisfed.org/series/GDPDEF>). Future costs associated

with child maltreatment accumulating over time were discounted at 3 percent to reflect their present value, as recommended by the U.S. Panel on Cost-Effectiveness in Health and Medicine.[25]

CHILD WELFARE

Methodology

To estimate child welfare costs attributable to victims of child maltreatment, we used a study calculating the total expenditure on child welfare prevention, investigation, and intervention by local, state, and federal agencies.[5] California's total expenditure was divided by the number of children investigated[6] in relation to child maltreatment in the year of the underlying study to get an average cost per victim estimate. We then adjusted it to the present value of our year of study.

Considerations

Because child welfare costs often extend beyond the year of investigation, it would be ideal to track the government expenditures related to child maltreatment on a per-victim basis and determine an average. However, since this data does not exist, we chose to use a steady-state methodology. This means that since the number of investigated victims of maltreatment was relatively constant surrounding the year of the base study, dividing the annual budget by the number of investigated victims serves as a proxy for the lifetime costs attributable to child maltreatment.

In addition, our estimate does not differentiate between different substantiated maltreatment outcomes (i.e., substantiated and placed in foster care), so it is not sensitive to changes in the severity of cases year-over-year.

Based on discussions with peers in our field, we feel our current approach is under-estimating the true cost of maltreatment to the child welfare system. We are currently working with researchers from Chapin Hall at the University of Chicago to conduct a time study of child welfare expenses in multiple California counties, which we hope will allow us to provide a better estimate of child welfare expenses.

EDUCATION

Methodology

We used two studies to estimate the costs of education: one that tracks the incremental chance of a child receiving special education due to child maltreatment,[7] and a second estimating the average incremental cost per year associated with a child receiving special education in California.[8] This annual increased cost is first adjusted to present value and then multiplied by the average years a child receives special education, assuming special education begins at the median age of 8,[9] and lasts until the child departs primary education at 18. A portion of these increased costs equal to the incremental chance of receiving special education is allotted to each substantiated victim of child maltreatment.

Considerations

This methodology has a number of limitations that cause it to be a conservative estimate. Ideally, a longitudinal study would track all the incremental education costs attributable to child maltreatment across the student's educational career. However, in the absence of such a study, we can only track the increased costs of children who are delayed severely enough to require a transition to special education. This excludes any potential increased costs for students who remain in general education, as well as any increased private costs incurred such as tutoring or counseling. It also does not account for the possibility

that special education costs may be higher for maltreated children than non-maltreated children, given the severity of their needs.

This approach also assumes that special education for all survivors begins at 8 years old, the median starting age for special education. However, we know that younger children (ages 0-5) are most likely to be maltreated, so it is possible the median starting age for special education among maltreated children is earlier than that of the population as a whole.

HEALTHCARE

Methodology

To estimate childhood healthcare costs, we used a study that analyzed the mean Medicaid claims of child maltreatment victims as compared to a control group,[10] matched for demographic and socioeconomic factors. This national value was first adjusted to present value and then to the increased regional cost of healthcare,[11] using a ratio comparing the mean Medicaid claim in the region to the mean national Medicaid claim. We then multiplied it by the number of years in the victim's childhood life.

We assume childhood healthcare resulting from maltreatment begins at age 6 and lasts until the child is 17. These assumptions were based on those Fang et al. used in the CDC's cost study, which states "the median child maltreatment case is a child aged 6 years, short-term health care costs include the incremental health care costs attributable to child maltreatment from age 6 to age 17."

To estimate adult healthcare costs, we used a longitudinal study that tracked the incremental healthcare costs per year incurred by adult victims as a result of past child maltreatment[12] and a geographic inflation index calculating the increased cost of healthcare in the individual counties studied.[13] This national value was first adjusted to present value and then to the increased cost of healthcare in the individual counties studied.[14] We then multiplied it by the number of years in the victim's adult life.

Considerations

One limitation of this study is that the survey measures child maltreatment through self-reporting, which has a set of criteria lower than those of most child welfare jurisdictions. It also explores only physical and sexual abuse, not emotional abuse or neglect. This leads to a different rate of maltreatment than our rate of substantiated maltreatment. Additionally, the study only reports data for survivors aged 18 to 64. Thus, we chose to use age 64 as an endpoint for our healthcare cost calculations, even though the mean life expectancy for women in the U.S. is ~79 years.

A related limitation in our estimate for childhood healthcare is that the underlying study[15] only analyzes healthcare costs covered by Medicaid. However, the researchers in that study account for this in sensitivity analysis and find that since child maltreatment is strongly associated with low socioeconomic status, and thus Medicaid enrollment, this limitation would have a very low effect on the results.

The base studies used to estimate the incremental healthcare costs per year have a number of limitations. However, after a literature review, we decided these were the best available sources for estimating incremental healthcare costs associated with child maltreatment.

CRIMINAL JUSTICE

Methodology

To estimate criminal justice costs, we used two studies: one estimating the incremental chance of a juvenile or adult arrest attributable to child maltreatment,[17] and another estimating the mean cost for each type of arrest.[18] The mean cost of arrest is adjusted to present value, making the assumption that the arrest will occur at the median age of arrest for each type. A portion of these costs equal to the incremental chance of arrest for each type is then allotted to each substantiated victim of child maltreatment.

Considerations

The primary limitation in estimating the cost of criminal justice attributable to child maltreatment is that, because of the data available, we are making the implicit assumption that the increase in criminality for children who are mistreated makes them equally likely to commit any crime. The costs for felony arrests are substantially higher than those for misdemeanors, and if the increase in criminality attributable to child maltreatment skews toward one or the other, it could shift this cost in either direction.

In addition, we use the cost of one arrest as a proxy measure of the criminal justice costs. Some youth offenders are arrested multiple times, and the costs of subsequent arrests are not included here.

LIFETIME PRODUCTIVITY

Methodology

To estimate lifetime productivity losses, we used a longitudinal study that measured the average annual earnings of child maltreatment victims, as compared to a control group.[19] The incremental loss in mean salary per year attributable to child maltreatment was adjusted to present value and then to the increased average earnings in the counties studied, as measured by the county's per capita personal income.[20] We then multiplied it by the number of years in the workforce, assuming a 1 percent annual growth in productivity.

Considerations

The underlying study uses a human capital approach, which substitutes annual earnings for productivity. While this is not a perfect measure of an individual's productivity, it is one of the most commonly used proxies when true productivity data is unavailable. Because of this structure in the underlying study, we chose to use a ratio comparing national average earnings to average earnings in the individual counties to adjust the study's results to our geography.

CHILD FATALITIES

Methodology

To estimate the losses related with child fatalities, we began by identifying the number of child fatalities in the region of study. In California, the California Department of Social Services (CDSS) Child Fatality unit maintains records of fatalities related to maltreatment. Each county is required to report deaths resulting from child maltreatment using the SOC 826 form within 10 days of the death. The CDSS team reconciles results with each county between January and April of the following year, after which they make statewide child death numbers public.

We identified medical costs and productivity losses using a national study of productivity and medical economic losses due to fatal acts of violence.[26] The national value was first adjusted to present value and then to the increased cost of healthcare in the county studied. Finally, these estimates were multiplied by the number of fatal victims of maltreatment in the county in 2018.

Considerations

The study established costs based on a sample size of 16,000 fatal victims of assault; however only 708 of these were aged 0-4. It is possible that a larger sample would have resulted in different cost estimates.

Note that estimates were based on the 0-4 age bracket in the study, as the majority of child deaths due to maltreatment nationally are among this age bracket.[4] This study does not limit to one type of payer or medical institution. We regard this as a strength since it is representative of the full range of healthcare environments that the victims of maltreatment may be treated in.

In addition, the underlying study uses annual earnings to measure productivity. Although it doesn't account for the fact that some jobs are valued more highly than others for a similar level of output, it is one of the most commonly used measures for productivity.

ESTIMATED PERCENT OF CHILDREN WHO WILL EXPERIENCE MALTREATMENT

Methodology

Child maltreatment can be unreported for a number of reasons. Studies use different instruments to measure child maltreatment, each with its own advantages and disadvantages. Many studies have relied, at least in part, on data collected by Child Protective Services and otherwise reported by professional child caregivers.

One study we reviewed is an exception.[21] Using data from a national survey of families, this study estimates the proportions of children maltreated in the past year by age range. We use the maltreatment rate for 7-year-old children, because this age is the average age of the first substantiation of maltreatment in California.[4] This study estimates that 11.5 percent of children at this age experience maltreatment.

Considerations

While the sample consisted of over 4500 children and youth and is nationally representative, this is a relatively small sample compared to the hundreds of thousands of children who have substantiated cases of child abuse within a given year.[4] In this study, one child was selected randomly for each household. Children 10 and over were interviewed directly, while caregivers were interviewed for children under 10 to identify any instances of abuse as well as other aspects of victimization. Thus, the data collection method may result in underestimated reports of abuse and victimization for young children, as caregivers may be reluctant to report abuse they have caused. Based on this, we believe 11.5 percent is a conservative estimate of the true rate of child maltreatment.

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