

# THE ECONOMICS OF CHILD ABUSE

## A STUDY OF THE BAY AREA

### 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. The calculation formula and template were created in collaboration between the San Francisco Child Abuse Prevention Center 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 its nine other counties.

The cost estimate derived from the calculation indicates the financial value of preventing a single case of child abuse.

## 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.

## STUDIES REVIEWED

*A Cost-Savings Analysis of a Statewide Parenting Education Program in Child Welfare*  
Casey Family Programs 2012

*Economic burden of occupational injury and illness in the United States*  
Center for Healthcare Policy and Research and Department of Public Health Sciences 2010

*The economic burden of child maltreatment in the United States and implications for prevention*  
Centers for Disease Control and Prevention 2011

*Social Cost of Child Abuse in Japan*  
Child Abuse and Neglect: The International Journal 2014

*The Influence of Geographical and Economic Factors in Estimates of Childhood Abuse*  
Child Abuse and Neglect: The International Journal 2016

*Long-Term Consequences of Child Abuse and Neglect*  
Child Welfare Information Gateway 2013

*Child Maltreatment 2013*  
Children's Bureau 2013

*Cumulative Risk of Child Protective Service Involvement before Age 5: A Population-Based Examination*  
Children's Data Network 2013

*The nature of economic costs from child abuse and neglect in New Zealand*  
Every Child Counts 2010

*The economic costs of substance abuse treatment: Updated estimates and cost bands for program assessment and reimbursement*  
Journal of Substance Abuse Treatment 2008

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*Guidelines and challenges for estimating the economic costs and benefits of adolescent substance abuse treatments*

Journal of Substance Abuse Treatment 2008

*Economic and Fiscal Impacts of Child Sexual Abuse in Florida*

Lauren's Kids 2015

*The Cost of Child Abuse in Australia*

Monash University 2008

*The economic impact of child maltreatment in the United States: Are the estimates credible?*

Phaedra S. Corso, Angela R. Ferti 2010

*Estimated annual cost of child abuse and neglect*

Prevent Child Abuse America 2012

*Domestic Violence: An Economic Analysis*

Review of Social Economy, 55(3):337-58 1997

*Cost effectiveness of early intervention programs in Queensland*

Social Policy Research Centre, UNSW 2007

*Blueprint of a Cost Analysis Approach for Early Intervention*

St. Lawrence University 2007

*Child Abuse Prevention in the Greater Bay Area*

Stanford Student Group 2015

*Total Estimated Cost of Child Abuse and Neglect in the United States*

Suzette Fromm Reed, Ph. D., Purdue 2000

*An Assessment of the Economic Cost of Child Maltreatment*

The Perryman Group 2014

*Child Maltreatment in Colorado: The Value of Prevention and the Cost of Failure to Prevent*

University of Colorado 1995

## KEY ASSUMPTIONS

We considered the following assumptions while performing this analysis:

### APPROACH

There are generally two methods used for economic burden estimates: a prevalence-based approach or an incidence-based approach.<sup>11</sup> A prevalence-based method provides an estimate of the direct and indirect costs incurred in a given period resulting from all current and prior cases of child abuse, regardless of the onset of child maltreatment. In contrast, an incidence-based method estimates the total lifetime costs resulting from new cases of child maltreatment that occur within a given time period. While both methods are relevant, an incidence-based approach is more useful for the economic evaluation of prevention and intervention activities. For example, the economic burden resulting from a single case of child maltreatment could be compared with the cost of preventing a single case of child maltreatment in a benefit-cost analysis of prevention. In addition, the incidence-based approach was the most commonly used approach applied in the other cost estimation reports we reviewed.

### SUBSTANTIATED CASES

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

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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 cases, but performed a sensitivity analysis to demonstrate the total cost — considering both reported and substantiated cases.

## YEAR OF ANALYSIS

Our estimate is based in 2015, the most current year of available data for substantiated cases of child maltreatment found at the California Child Welfare Indicators Project.<sup>[2]</sup>

## DISCOUNT RATE

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, and therefore we have selected 3 percent. This is the social discount rate applied in the CDC's cost estimation report and a best practice for the SROI analysis as cited by experts and published recommended guidelines. We employ the discount rate whenever figures are adjusted to present value.

## 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. Studies have shown that child maltreatment may be associated with reduced life expectancy, decreased quality of life, and negative intergenerational outcomes,<sup>[3]</sup> but we were unable to find studies that quantify the 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 2014, the most recent year for which data are available.<sup>[4]</sup> 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.

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Ideally, we would be able to reference a longitudinal study tracking the incremental costs attributable to maltreatment for each cost category, but unfortunately this type of study is not available for all categories. Instead, costs attributable to maltreatment were determined on a category-by-category basis, using the best peer-reviewed study we could find. The costs for each category were added to create a national annual cost estimate.

We then adjusted this number to the year at which it would be incurred and then discounted back to the present value at the year of study, 2015. We then adjusted this national cost to the increased costs of the region studied, San Francisco, using a geographic inflation index appropriate for the underlying study.

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## 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.<sup>[5]</sup> California's total expenditure was divided by the number of children investigated<sup>[6]</sup> in relation to child maltreatment in the year of the underlying study to get an average cost per case 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-case 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 cases was relatively constant surrounding the year of the base study, dividing the annual budget by the number of investigated cases serves as a proxy for the lifetime costs attributable to child maltreatment.

## 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,<sup>[7]</sup> and a second estimating the average incremental cost per year associated with a child receiving special education in California.<sup>[8]</sup> 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 special education, 8,<sup>[9]</sup> and lasts till 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 case 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

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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.

## 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,<sup>[10]</sup> matched for demographic and socioeconomic factors. This national value was first adjusted to present value and then to the increased regional cost of healthcare,<sup>[11]</sup> 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. 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,<sup>[12]</sup> and a geographic inflation index calculating the increased cost of healthcare in the individual Bay Area counties.<sup>[13]</sup> This national value was first adjusted to present value and then to the increased cost of healthcare in the individual Bay Area counties.<sup>[14]</sup> We then multiplied it by the number of years in the victim's adult life.

### Considerations

The primary limitation in our estimate for childhood healthcare is that the underlying study<sup>[5]</sup> 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 study used to estimate the incremental adult healthcare costs per year has a number of limitations. However, after a literature review, we decided this was the most accurate estimate of adult healthcare costs as a result of child maltreatment. The first limitation is that the study only chose to survey women. In sensitivity testing, the original study found that the potential impact of this was negligible. Second, the survey identifies which participants were victims of child maltreatment through self-reporting. This leads to a much higher incidence rate than our incidence rate of only substantiated cases. While this would have a large effect on the total healthcare burden estimate, we are only using the per-case estimate for incremental health costs and applying this to our defined group of child maltreatment victims. Lastly, the study only reports data for victims aged 18 to 64. Thus, we chose to use age 64 as an endpoint for our calculations. This indicates that our estimate for adult healthcare costs is likely conservative, as the mean life expectancy for women in the U.S. is ~79 years.<sup>[15]</sup>

## 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,<sup>[17]</sup> and another estimating the mean cost for each type of arrest.<sup>[18]</sup> 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 case of substantiated 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

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attributable to child maltreatment skews toward one or the other, it could shift this cost in either direction.

## 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.<sup>[19]</sup> 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 individual Bay Area counties, as measured by the county's per capita personal income.<sup>[20]</sup> 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 Bay Area counties to adjust the study's results to our geography.

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