

**The Economic Burden of Child Maltreatment**  
**Alaska 2016 Case Study**

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## Executive Summary

According to the National Child Abuse and Neglect Data System (NCANDS), during 2016 in Alaska there were 8,246 child maltreatment investigations that involved a first-time victim and there was one fatality directly attributable to child maltreatment. The purpose of this paper is to estimate the lifetime societal costs to Alaskans attributable to child maltreatment experienced by Alaska children during 2016. We replicated the most up-to-date cost estimation methodology to apply nationally derived estimates to our Alaska specific incidence.

## Methods

- This study replicates two previous studies by Peterson, Florence, & Klevens (2018)<sup>1</sup> and Fang, Brown, Florence, & Mercy (2012)<sup>2</sup> using the same assumptions, estimates, and data sources to estimate the total Alaskan societal burden associated with new child maltreatment cases over the expected lifetime of the victims using short- and long-term health care, child welfare, criminal justice, and special education costs.
  - Two separate human valuation methods are utilized: the Human Capital method and the Monetized Quality Adjusted Life Years (QALY) method.

## Limitations

- Calculated costs used in the original studies are not necessarily representative of the Alaskan population, and in some cases possibly not representative of the child maltreatment population in general.
- Child maltreatment incidence and fatality estimates originated from NCANDS to be consistent with national studies, although state-level datasets contain more accurate data.
- Many of the individual cost estimates do not take into account that children at risk of experiencing maltreatment possibly have higher societal costs whether or not they are in fact victimized.

## Key Findings

- Human Capital method (captures potential loss of earnings)
  - \$228,634 in lifetime costs per new nonfatal victim. \$1,391,732 per fatal victim.
- Monetized QALY method (captures intangible costs such as pain, suffering, and grief experienced by victims and individuals in a community)
  - \$853,780 in lifetime costs per new nonfatal victim. \$17,067,258 per fatal victim.

## Conclusion

Based on the 2016 NCANDS data, there is an estimated lifetime burden of \$7.1 billion and \$1.9 billion using the Monetized QALY and Human Capital methods, respectively. Despite the limitations noted, child maltreatment has substantial costs to our Alaskan society and warrants increased effort, resources, and attention on prevention.

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<sup>1</sup> Fang, X., Brown, D. S., Florence, C. S., & Mercy, J. A. (2012). The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse & Neglect*, 36(2), 156–165. <https://doi.org/10.1016/j.chiabu.2011.10.006>

<sup>2</sup> Peterson, C., Florence, C., & Klevens, J. (2018). The economic burden of child maltreatment in the United States, 2015. *Child Abuse & Neglect*, 86, 178–183. <https://doi.org/10.1016/j.chiabu.2018.09.018>

## Abstract

In 2016, the National Child Abuse and Neglect Data System (NCANDS) documented that 1,750 children died nationwide due to child maltreatment and 676,000 suffered maltreatment that was substantiated by authorities (U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau, 2018). During the same period in Alaska, NCANDS reported 1 child maltreatment fatality and 3,142 children suffered maltreatment that was substantiated by authorities (USDHHS, 2018). By applying two cost estimate methodologies of child maltreatment calculated by Peterson, Florence, & Klevens (2018) and Fang, Brown, Florence, & Mercy (2012) we derived Alaska estimates and compare these to those of the United States. Calculating costs using investigated cases and the most up-to-date inclusive cost estimation methodology we find that child maltreatment in 2016 resulted in an annual Alaska lifetime economic burden of \$7.1 billion (2016 USD). This compares to an estimate of \$2.08 trillion nationwide. This estimation methodology quantifies direct costs and those perceived from the societal perspective which includes all costs regardless of payer or when they accrue. Although nationwide total costs are almost 300 times that of Alaska, when looking at costs on a per capita basis (using child population aged 0-18), Alaskans have a burden of \$37,700 per child compared to \$28,300 per US child. NCANDS reported that in 2016 Alaska had 3.38 children under 18 for every 10 adults compared to the US having 2.95 (USDHHS, 2018). These high costs associated with child maltreatment in Alaska, which are 1.33 times that of the per capita costs of the nation, emphasize the need for population based and targeted prevention investments.

## Background

Child maltreatment (CM) includes neglect, physical abuse, psychological maltreatment, and sexual abuse (Leeb, Paulozzi, Melanson, Simon, & Arias, 2007). In 2016, NCANDS documented that 1,750 children died nationwide due to child maltreatment and 676,000 suffered maltreatment that was substantiated by authorities (USDHHS, 2018). The estimated fiscal burden this created for the US population was \$431 billion (2016 USD) using a conservative measure based on substantiated cases<sup>3</sup>, and \$2.08 trillion (2016 USD) using a more liberal measure based on investigated cases<sup>4</sup> (Peterson et al., 2018).

This paper presents an estimate of average lifetime costs per CM victim and aggregate lifetime costs for all new Alaska CM cases incurred in 2016. We apply the national cost estimates derived by Peterson et al. (2018) and Fang et al. (2012) to Alaska-specific incidence estimates. Total lifetime economic burden is calculated using both the human capital approach and value per statistical life (VSL) mortality valuation in combination with monetized quality adjusted life years (QALY) morbidity valuation. The US Department of Health and Human Services (USDHHS) has provided guidance to use VSL and QALY methodologies for economic evaluation for regulatory impact analysis (Office of the

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<sup>3</sup> An investigation disposition that concludes that the allegation of maltreatment or risk of maltreatment was supported or founded by state law or policy (USDHHS, 2018).

<sup>4</sup> Type of CPS response that involves the gathering of objective information to determine whether a child was maltreated or is at-risk of maltreatment and establishes if an intervention is needed. Generally, includes face-to-face contact with the alleged victim and results in a disposition as to whether the alleged maltreatment occurred (USDHHS, 2018).

Assistant Secretary for Planning and Evaluation U.S. Department of Health and Human Services, 2016). VSL mortality and QALY morbidity valuations are estimated using an individual's self-reported willingness to pay for a defined change in mortality or morbidity risk, while the human capital method is based on the value of lost work and other productive activities due to mortality or morbidity. A major criticism of the human capital method is that intangible costs including pain, suffering, and grief experienced by individuals are not captured, which may underestimate the total cost society faces (Corso, Fang, & Mercy, 2011). Costs are estimated for CM-associated health care, child welfare, criminal justice, and special education as well. Under the lifetime economic burden it is important to note that having no new cases would not mean the costs would disappear, but rather there are still existing cases where victims will need services, potentially for the rest of their lives.

In 2016 there were 16,122 reported, 8,385 investigated, and 3,739 (2,158 being first-time victims) substantiated CM cases in Alaska (USDHHS, 2018). There was one fatality attributable to CM. Table 1 in the appendix reports the distribution of maltreatment types in Alaska and the US total. Although large variation exists between states in how maltreatment classification is operationalized, with the exception of psychological maltreatment, the distribution of maltreatment type is similar between Alaska and the US total. Based on both investigated and substantiated reports, we estimate the total lifetime economic burden resulting from new cases of fatal and nonfatal CM occurring during 2016 in Alaska using the human capital approach and monetized QALY approach. While multiple limitations must be considered when applying nationally derived cost estimates to state specific incidence estimates, this paper reports our best estimation given current knowledge and data on the lifetime costs of maltreatment in Alaska.

## **Methods**

### **Alaska Additions**

All costs from this point forward are estimated in US dollars adjusted to the reference year 2016 using the Consumer Price Index for All Urban Consumers (CPI-U) unless otherwise noted. Future costs are discounted at 3% to reflect the present value as recommended by the US Panel on Cost-Effectiveness in Health and Medicine (Gold, Siegel, Russell, & Weinstein, 1996). A sensitivity analysis evaluated at discount rates of 1%, 3% and 5% can be found in the appendix.

Incidence and fatality data for Alaska was obtained from the 2016 Child Maltreatment Report produced by the NCANDS (USDHHS, 2018). The USDHHS estimated that 70% of annual CM cases involve victims with no prior history of victimization and therefore we based our lifetime costs estimates on first-time victims using that rate (USDHHS, 2018). Research suggests that CPS data likely underestimates the total incidence of CM and that children involved in unsubstantiated cases have similar maltreatment experiences and development outcomes to children in substantiated cases (Drake, 1996; Haugaard & Emery, 1989; Hussey, Chang, & Kotch, 2006; Hussey et al., 2005; Kohl, Jonson-Reid, & Drake, 2009; Leiter, Myers, & Zingraff, 1994; Swahn et al., 2006).

### **Applied Methodology from Prior Studies**

We replicated the two prior studies by applying the same assumptions, estimates, and extracted data from the same sources shown in Table 2 in the appendix. Following Peterson et al.'s (2018) and Fang et al.'s, (2012) methodologies, we present annual population economic burden estimated on two incidence estimates: 1) investigated CM cases, and 2) substantiated CM cases.

Major costs associated with CM accounted for in this analysis include health care costs (short- and long-term), child welfare costs, criminal justice costs, special education costs, and either productivity losses or CM-specific monetized QALY and VSL. The median age for CM victims in 2008 was 6 years old, therefore that age was used to calculate the average lifetime cost per victim (USDHHS, 2010). All cost estimates originate from the Fang et al. (2012) national study.

Short-term health care costs include the incremental health care costs attributable to CM from age 6 to age 17. Florence, Brown, Fang, & Thompson (2013) formed a comparison group of Medicaid children based on propensity score matching to quantify the attributable difference in annual medical costs between the case and control groups. These short-term health care costs were estimated to be \$35,692 per victim of nonfatal CM and \$15,416 per fatal CM victim.

Long-term health care costs were estimated by looking at costs associated with physical, sexual, or both physical and sexual childhood abuse data from 3,333 women aged 18 to 64 enrolled in a large health care delivery system (Bonomi et al., 2008). Total annual costs were 21% higher in 2004 for women with a history of abuse compared to women without these abuse histories. Based on Bonomi et al.'s (2008) findings, the present value of these costs from age 18 to 64 is \$11,504 per case.

Child welfare costs were estimated using a national estimate of child welfare costs from 2006 following the methodology of Barnett, Birnbaum, Cremieux, Fendrick, & Slavin (2000) and Birnbaum, Leong, & Kabra (2003). The ideal method to estimate child welfare costs would be to track the CM victims and their child welfare costs over their entire childhood, but there are no longitudinal studies available. Since the number of children investigated for CM and the cross-section of the investigated sample with respect to age and services provided to the children remains relatively constant between years (USDHHS, 2018), steady-state methodology used by other researchers to estimate the lifetime costs of disease when longitudinal data are not available can be utilized (Barnett et al., 2000; Birnbaum et al., 2003). Following those steady-state assumptions, the total annual child welfare costs in 1 year served as a proxy for lifetime costs of victims investigated in a given year. This estimate yielded a cost of \$8,450 per investigated child.

Criminal justice costs associated with CM were estimated based on the effects of CM on juvenile and adult arrests. Data was analyzed from a longitudinal study that followed a group of 908 substantiated cases of CM and a comparison group of 667 children through adulthood and reported that 27.4% of maltreated children had a juvenile arrest compared to 17.2% of non-abused children (Widom & Maxfield, 2001). Expenditures to the criminal justice system for juveniles with court petitions were \$18,950 per participant in 1998 dollars (Reynolds, Temple, Robertson, & Mann, 2002). For adult criminal justice costs, it was found that CM increases the likelihood of having an adult criminal record by 9.1 percentage points with an estimated cost of \$69,038 in 1998 dollars (Reynolds et al., 2002). Based on mean juvenile arrest at 14 years old and adult arrest at 23 years old, the present value of future expenditures to the criminal justice system associated with CM is \$7,377 per CM victim.

24.2% of maltreated children received special education at a mean age of 8 years old, compared to 13.7% of children with no maltreatment record (Jonson-Reid, Drake, Kim, Porterfield, & Han, 2004). It was assumed that the incremental effect due to CM was simply the difference of 10.5% which resulted in an estimated present value of future costs of special education of \$8,746 per CM victim based on the average annual cost per child for special education services of \$7,791 in 1998 dollars (Reynolds et al., 2002).

### **Fang, Brown, Florence, & Mercy (2012) Human Capital**

Fang et al. (2012) estimated productivity losses associated with CM using the human capital method to measure the potential loss of earnings due to being maltreated during childhood. Individuals with documented histories of neglect and/or abuse earned about \$5,000 (2003 USD) less per year on average than others (Currie & Widom, 2010). This results in a present value of earnings lost from age 6 to be \$156,865 for a nonfatal case of CM and \$1.4 million for a fatal case.

### **Peterson, Florence, & Klevens (2018) Monetized QALY**

Peterson et al. (2018) utilized VSL and monetized QALY to replace the human capital valuation method in order to capture total societal costs. A VSL mortality value is usually applied as a single standard value in cost of illness studies to estimate the cost of one life (Office of the Assistant Secretary for Planning and Evaluation, 2016). QALY is a measure of the state of health of a person in which the benefits are adjusted to reflect the quality of life. One QALY is equal to one year of life in perfect health. QALYs are calculated by estimating the years of life remaining for a patient following a particular treatment or intervention and weighting each year with a quality-of-life score (National Institute for Health and Care Excellence, 2019). A child-specific VSL mortality value of \$17.1 million based on willingness-to-pay for reduced mortality risk to a child was used to calculate a monetized QALY morbidity value of \$782,011 (Peterson et al., 2018). The monetized QALY morbidity value was used as a cost in nonfatal CM cases, and the full VSL mortality value in fatal cases.

### **Results**

Nonfatal CM cases had a lifetime cost per victim of \$35,692 in short-term health care costs, \$11,504 in long-term health care costs, \$8,450 in child welfare costs, \$7,377 in criminal justice costs, and \$8,746 in special education costs. Using the QALY approach there is a reduction of \$782,011 in monetized QALY for a total cost of \$853,780 per nonfatal victim. Using the human capital approach there is an estimated \$156,865 loss in productivity for a total cost of \$228,634 per nonfatal victim. Fatal CM cases had a lifetime cost per victim of \$15,416 in short-term health care costs, and using the QALY approach \$17,051,842 from a loss of VSL for a total cost of \$17,067,258 per fatal victim. Using the human capital approach there is an estimated total cost of \$1,391,732 per fatal victim.

Based on the human capital approach, using 2016 Alaska CM incidence, the total lifetime economic burden on the Alaska population is estimated to be \$1,886,707,696 using investigated cases and \$494,783,904 using substantiated cases. Under the QALY approach the burden is estimated to be \$7,057,337,138 using investigated cases and \$1,859,524,498 using substantiated cases.

The QALY approach results in a much higher estimate due to it capturing and estimating intangible costs such as pain, suffering and grief experienced by victims and individuals in a community that are not captured using the human capital approach. Quantifying potential loss of earnings exclusively, as done in the human capital approach, may vastly underestimate the total cost society faces. Table 3 located in the appendix breaks down estimated economic burdens for the United States using both the human capital and QALY approaches side-by-side along with Alaska-specific estimates.

In 2016 the US had an estimated child population of 73,642,285 (USDHHS, 2018). With a nationwide societal burden from 2016 investigated CM cases estimated to be just over \$2 trillion, the burden comes out to \$28,290 per US child. Alaska had an estimated 2016 child population of 187,327 (USDHHS, 2018). Statewide societal burden from comparable 2016 investigated CM reports are

estimated to be over \$7.1 billion. The burden of CM, measured by investigated cases, in Alaska in 2016 comes out to \$37,674 per Alaskan child.

## Discussion

With estimated lifetime costs of Alaskan nonfatal CM ranging from a conservative \$495 million to a liberal \$7.1 billion depending on methods of calculation, we estimate that CM likely has substantial societal costs. These costs include emotional and QALY costs to survivors as well as the opportunity cost with regard to resources spent that could have otherwise been utilized by society in other beneficial ways. Considering these extensive lifetime costs, emphasis on reducing maltreatment early if not before a child is born is imperative. Recent data from the Alaska Child Abuse and Neglect Linkage project (ALCANLink) report that 37%, 30%, and 11% of children born in Alaska will be reported, investigated, and substantiated respectively, by child welfare before their ninth birthday. With the large life time costs of, and incidence of CM, extensive prevention and early intervention efforts are warranted from a fiscal perspective. Investments in families and communities using evidence based approaches are needed to avoid these societal costs in the future.

While this paper presents the most accurate estimates based on the methods and figures of prior studies, it is critical to interpret these findings in context of several limitations.

### Previous Study:

- 1) The VSL estimate used in the methods by Peterson et al. (2018) and applied in this paper is dependent on a willingness-to-pay survey conducted by the CDC in Georgia with a sample size of only 199 (Corso et al., 2011).
- 2) Long-term health care costs were estimated looking at a sample of strictly female patients (Bonomi et al., 2008), which is not representative of the entire CM population.
- 3) Costs of several other adverse outcomes associated with CM were not measured, such as neurobiological, cognitive, psychosocial, and behavioral outcomes (Petersen et al., 2014).
- 4) Long-term medical costs for adults over age 65 were not accounted for.
- 5) There is still much debate over which method, monetized QALY or human capital, is most accurate or appropriate.

### Our Study:

- 6) Costs are not necessarily representative of Alaska specifically, though many costs are in fact much higher in Alaska compared to the rest of the nation. For example, in 2014 health care spending in Alaska was more than \$11,000 per person compared to around \$8,000 per person nationally (Passini, Frazier, & Guettabi, 2018).
- 7) Costs were simply adjusted for inflation, and the increase in costs over time due to other factors was not captured.
- 8) The assumption that 70% of CM incidents were first time cases was made.
- 9) Net present values were evaluated based on 2008 national data indicating first-time CM occurring at age 8 rather than utilizing more current Alaskan data.

10) NCANDS data was utilized in order to offer comparability with the previous studies, but there may be more accurate data sources available from the State of Alaska.

Future research is needed to reduce the impact of these limitations on the Alaska-specific valuation of CM. In order to more accurately apply the VSL/QALY methodology in Alaska it would be beneficial to estimate VSL through a new study, perhaps utilizing survey questions on the Behavioral Risk Factor Surveillance System annual survey. Further research should be done to compare major costs associated with CM between Alaska and the rest of the country in order to more accurately apply those costs to the methodologies in this paper. This would include defining which specific costs do and do not apply in Alaska that may apply in the areas the previous works analyzed. The cost estimates would be most valid if they took into account that children at risk of maltreatment may have higher societal costs whether or not they are in fact victimized. It would be beneficial to use Alaska-specific Medicaid data to compare abused and non-abused children's medical costs similar to the work of Florence et al. (2013). CM incidence data obtained from the State of Alaska may provide more accurate estimates to calculate lifetime costs and may show that median age of first-time abuse is different than that of the US in general.

In consideration of these limitations this study uses the most up-to-date methodologies to estimate economic burden associated with CM and regardless of method used. Based on investigated reports, we estimate the total lifetime economic burden resulting from new cases of fatal and nonfatal CM occurring during 2006 in Alaska using the human capital approach to be \$1.9 billion (2016 USD), and with the monetized QALY approach to be \$7.1 billion (2016 USD). With such high estimated costs to society resulting from CM, focusing efforts on prevention programs, even if expensive may very well be a cost-effective approach in the long run.

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## Appendix

Table 1. Maltreatment Types of Victims<sup>5</sup>

| <b>Maltreatment Types of Victims n (%) *</b>  |                |                        |                    |                  |                    |                      |                  |                |                                   |
|---|----------------|------------------------|--------------------|------------------|--------------------|----------------------|------------------|----------------|-----------------------------------|
|   | <b>Victims</b> | <b>Medical Neglect</b> | <b>Neglect</b>     | <b>Other</b>     | <b>Physical</b>    | <b>Psychological</b> | <b>Sexual</b>    | <b>Unknown</b> | <b>Total Maltreatment Types**</b> |
| <b>Alaska</b>   | 3,142          | 73<br>(2.3%)           | 2,408<br>(76.6%)   | -                | 376<br>(12.0%)     | 992<br>(31.6%)       | 181<br>(5.8%)    | -              | 4,030<br>(128.3%)                 |
| <b>US</b>   | 671,622        | 14,028<br>(2.1%)       | 502,615<br>(74.8%) | 46,289<br>(6.9%) | 122,067<br>(18.2%) | 37,859<br>(5.6%)     | 57,329<br>(8.5%) | 105<br>(0.0%)  | 780,292<br>(116.2%)               |
| *A child is counted in each maltreatment category only once, regardless of the number of times the child is reported as a victim of the maltreatment types. |                |                        |                    |                  |                    |                      |                  |                |                                   |
| **A child may have been the victim of more than one type of maltreatment, therefore, the total maltreatment count is duplicative and may total over 100%.   |                |                        |                    |                  |                    |                      |                  |                |                                   |

Table 2. Cost Sources

| <b>Source of Costs</b>        |                              |   |
|-------------------------------|------------------------------|---|
| <b>Human Capital Approach</b> | <b>VSL/QALY Approach</b>     | <b>Reference</b>                                    |
| Short-term health care costs  | Short-term health care costs | Florence et al. (2012)                              |
| Long-term health care costs   | Long-term health care costs  | Bonomi et al. (2008)                                |
| Child welfare costs           | Child welfare costs          | DeVooght et al. (2008)                              |
| Criminal justice costs        | Criminal justice costs       | Widom and Maxfield (2001)<br>Reynolds et al. (2002) |
| Special education costs       | Special education costs      | Jonson-Reid et al. (2004)<br>Reynolds et al. (2002) |
| Productivity losses           | -                            | Currie and Widom (2010)                             |
| -                             | VSL/QALY Reduction           | Corso et al. (2008)<br>Corso et al. (2011)          |

<sup>5</sup> Within NCANDS, each state implements CAPTA within their own statutes, policies, and regulations. Therefore any comparisons between proportions should be used with caution.

Table 3. Results Evaluated at 3% Discount Rate

| <b>3% Discount Rate Results</b> |                    |                     |                      |                      |
|---------------------------------|--------------------|---------------------|----------------------|----------------------|
| Approach                        | Human Capital      |                     | VSL/QALY             |                      |
| CM Year                         | 2016               |                     |                      |                      |
| Cost Year USD                   | 2016               |                     |                      |                      |
| Discount Rate                   | 3%                 |                     |                      |                      |
| CM Outcome                      | Nonfatal           | Fatal               | Nonfatal             | Fatal                |
| <b>Lifetime cost per victim</b> |                    |                     |                      |                      |
| Short-term health care          | \$ 35,692          | \$ 15,416           | \$ 35,692            | \$ 15,416            |
| Long-term health care           | \$ 11,504          | -                   | \$ 11,504            | -                    |
| Child welfare                   | \$ 8,450           | -                   | \$ 8,450             | -                    |
| Criminal justice                | \$ 7,377           | -                   | \$ 7,377             | -                    |
| Special education               | \$ 8,746           | -                   | \$ 8,746             | -                    |
| Productivity losses             | \$ 156,865         | \$ 1,376,316        | -                    | -                    |
| Value per statistical life      | -                  | -                   | -                    | \$ 17,051,842        |
| QALY reduction                  | -                  | -                   | \$ 782,011           | -                    |
| <b>Total cost per victim</b>    | <b>\$ 228,634</b>  | <b>\$ 1,391,732</b> | <b>\$ 853,780</b>    | <b>\$ 17,067,258</b> |
| <b>Economic burden</b>          |                    |                     |                      |                      |
| <u>Incidence</u>                |                    |                     |                      |                      |
| National                        |                    |                     |                      |                      |
| Investigated                    | 2,405,138          | 1750                | 2,405,138            | 1750                 |
| Substantiated                   | 469,307            |                     | 469,307              |                      |
| AK                              |                    |                     |                      |                      |
| Investigated                    | 8,246              | 1                   | 8,246                | 1                    |
| Substantiated                   | 2,158              |                     | 2,158                |                      |
| <b>Total Cost</b>               |                    |                     |                      |                      |
| National                        |                    |                     |                      |                      |
| Investigated                    | \$ 552,331,852,492 |                     | \$ 2,083,326,423,140 |                      |
| Substantiated                   | \$ 109,735,067,638 |                     | \$ 430,552,631,960   |                      |
| AK                              |                    |                     |                      |                      |
| Investigated                    | \$ 1,886,707,696   |                     | \$ 7,057,337,138     |                      |
| Substantiated                   | \$ 494,783,904     |                     | \$ 1,859,524,498     |                      |

Table 4a. Human Capital Valuation Sensitivity Analysis (Substantiated Cases)

| <b>Economic Burden of Child Maltreatment Human Capital Valuation</b> |                              |                        |                        |                       |                    |                    |                    |
|--|------------------------------|------------------------|------------------------|-----------------------|--------------------|--------------------|--------------------|
| Human Capital Approach   |                              |                        |                        |                       |                    |                    |                    |
|  | Source of Cost               | Substantiated          |                        |                       |                    |                    |                    |
|  | Nonfatal                     | National               |                        |                       | AK                 |                    |                    |
|  | Incidence                    | 469,307                | 469,307                | 469,307               | 2,158              | 2,158              | 2,158              |
|  | Discount rate                | 1%                     | 3%                     | 5%                    | 1%                 | 3%                 | 5%                 |
| 2016<br>Dollars  | Short-term health care costs | 18,572,355,218         | 16,750,505,444         | 15,204,608,186        | 85,400,692         | 77,023,336         | 69,914,884         |
|  | Long-term health care costs  | 9,998,585,635          | 5,398,907,728          | 3,139,663,830         | 45,976,190         | 24,825,632         | 14,437,020         |
|  | Child welfare costs          | 3,965,644,150          | 3,965,644,150          | 3,965,644,150         | 18,235,100         | 18,235,100         | 18,235,100         |
|  | Criminal justice costs       | 4,671,012,571          | 3,462,077,739          | 2,600,899,394         | 21,478,574         | 15,919,566         | 11,959,636         |
|  | Special education costs      | 4,605,309,591          | 4,104,559,022          | 3,675,612,424         | 21,176,454         | 18,873,868         | 16,901,456         |
|  | Productivity losses          | 142,047,026,918        | 73,617,842,555         | 41,311,687,289        | 653,170,492        | 338,514,670        | 189,962,266        |
|  | Total                        | 183,859,934,083        | 107,299,536,638        | 69,898,115,273        | 845,437,502        | 493,392,172        | 321,410,362        |
|  | Fatal                        |                        |                        |                       |                    |                    |                    |
|  | Incidence                    | 1,750                  | 1,750                  | 1,750                 | 1                  | 1                  | 1                  |
| 2016<br>Dollars  | Medical costs                | 26,978,000             | 26,978,000             | 26,978,000            | 15,416             | 15,416             | 15,416             |
|  | Productivity losses*         | 2,408,553,000          | 2,408,553,000          | 622,356,000           | 1,376,316          | 1,376,316          | 355,632            |
|  | Total                        | 2,435,531,000          | 2,435,531,000          | 649,334,000           | 1,391,732          | 1,391,732          | 371,048            |
|  |                              |                        |                        |                       |                    |                    |                    |
| <b>Total (fatal+nonfatal)</b>  |                              | <b>186,295,465,083</b> | <b>109,735,067,638</b> | <b>70,547,449,273</b> | <b>846,829,234</b> | <b>494,783,904</b> | <b>321,781,410</b> |

\*Productivity losses evaluated at 3% and 7% discount rates as done in previous studies for simplicity

Table 4b. Human Capital Valuation Sensitivity Analysis (Investigated Cases)

| <b>Economic Burden of Child Maltreatment Human Capital Valuation</b> |                               |                        |                        |                        |                      |                      |                      |
|--|-------------------------------|------------------------|------------------------|------------------------|----------------------|----------------------|----------------------|
| Human Capital Approach   |                               |                        |                        |                        |                      |                      |                      |
|  | Source of Cost                | Investigated           |                        |                        |                      |                      |                      |
|  | Nonfatal                      | National               |                        |                        | AK                   |                      |                      |
|  | Incidence                     | 2,405,138              | 2,405,138              | 2,405,138              | 8,246                | 8,246                | 8,246                |
|  | Discount rate                 | 1%                     | 3%                     | 5%                     | 1%                   | 3%                   | 5%                   |
| 2016<br>Dollars  | Short-term health care costs  | 95,180,931,212         | 85,844,185,496         | 77,921,660,924         | 326,327,204          | 294,316,232          | 267,153,908          |
|  | Long-term health care costs   | 51,241,465,090         | 27,668,707,552         | 16,090,373,220         | 175,681,030          | 94,861,984           | 55,165,740           |
|  | Child welfare costs           | 20,323,416,100         | 20,323,416,100         | 20,323,416,100         | 69,678,700           | 69,678,700           | 69,678,700           |
|  | Criminal justice costs        | 23,938,338,514         | 17,742,703,026         | 13,329,274,796         | 82,072,438           | 60,830,742           | 45,699,332           |
|  | Special education costs       | 23,601,619,194         | 21,035,336,948         | 18,837,040,816         | 80,917,998           | 72,119,516           | 64,582,672           |
|  | Productivity losses           | 727,972,739,012        | 377,281,972,370        | 211,717,082,726        | 2,495,849,804        | 1,293,508,790        | 725,870,642          |
|  | Total                         | 942,258,509,122        | 549,896,321,492        | 358,218,848,582        | 3,230,527,174        | 1,885,315,964        | 1,228,150,994        |
|  | Fatal                         |                        |                        |                        |                      |                      |                      |
|  | Incidence                     | 1,750                  | 1,750                  | 1,750                  | 1                    | 1                    | 1                    |
| 2016<br>Dollars  | Medical costs                 | 1,750                  | 1,750                  | 1,750                  | 1                    | 1                    | 1                    |
|  | Productivity losses*          | 26,978,000             | 26,978,000             | 26,978,000             | 15,416               | 15,416               | 15,416               |
|  | Total                         | 2,408,553,000          | 2,408,553,000          | 622,356,000            | 1,376,316            | 1,376,316            | 355,632              |
|  |                               |                        |                        |                        |                      |                      |                      |
|  | <b>Total (fatal+nonfatal)</b> | <b>944,694,040,122</b> | <b>552,331,852,492</b> | <b>358,868,182,582</b> | <b>3,231,918,906</b> | <b>1,886,707,696</b> | <b>1,228,522,042</b> |

\*Productivity losses evaluated at 3% and 7% discount rates as done in previous studies for simplicity

Table 5a. VSL-QALY Valuation Sensitivity Analysis (Substantiated Cases)

| <b>Economic Burden of Child Maltreatment Human Capital Valuation</b> |                               |                        |                        |                        |                      |                      |                      |
|--|-------------------------------|------------------------|------------------------|------------------------|----------------------|----------------------|----------------------|
| VSL/QALY Approach  |                               |                        |                        |                        |                      |                      |                      |
|  | Source of Cost                | Substantiated          |                        |                        |                      |                      |                      |
|  | Nonfatal                      | National               |                        |                        | AK                   |                      |                      |
|  | Incidence                     | 469,307                | 469,307                | 469,307                | 2,158                | 2,158                | 2,158                |
|  | Discount rate                 | 1%                     | 3%                     | 5%                     | 1%                   | 3%                   | 5%                   |
| 2016<br>Dollars  | Short-term health care costs  | 18,572,355,218         | 16,750,505,444         | 15,204,608,186         | 85,400,692           | 77,023,336           | 69,914,884           |
|  | Long-term health care costs   | 9,998,585,635          | 5,398,907,728          | 3,139,663,830          | 45,976,190           | 24,825,632           | 14,437,020           |
|  | Child welfare costs           | 3,965,644,150          | 3,965,644,150          | 3,965,644,150          | 18,235,100           | 18,235,100           | 18,235,100           |
|  | Criminal justice costs        | 4,671,012,571          | 3,462,077,739          | 2,600,899,394          | 21,478,574           | 15,919,566           | 11,959,636           |
|  | Special education costs       | 4,605,309,591          | 4,104,559,022          | 3,675,612,424          | 21,176,454           | 18,873,868           | 16,901,456           |
|  | Productivity losses           | 495,319,748,396        | 367,003,236,377        | 291,976,064,901        | 2,277,613,624        | 1,687,579,738        | 1,342,584,594        |
|  | Total                         | 537,132,655,561        | 400,684,930,460        | 320,562,492,885        | 2,469,880,634        | 1,842,457,240        | 1,474,032,690        |
|  | Fatal                         |                        |                        |                        |                      |                      |                      |
|  | Incidence                     | 1,750                  | 1,750                  | 1,750                  | 1                    | 1                    | 1                    |
| 2016<br>Dollars  | Medical costs                 | 26,978,000             | 26,978,000             | 26,978,000             | 15,416               | 15,416               | 15,416               |
|  | Productivity losses           | 29,840,723,500         | 29,840,723,500         | 29,840,723,500         | 17,051,842           | 17,051,842           | 17,051,842           |
|  | Total                         | 29,867,701,500         | 29,867,701,500         | 29,867,701,500         | 17,067,258           | 17,067,258           | 17,067,258           |
|  |                               |                        |                        |                        |                      |                      |                      |
|  | <b>Total (fatal+nonfatal)</b> | <b>567,000,357,061</b> | <b>430,552,631,960</b> | <b>350,430,194,385</b> | <b>2,486,947,892</b> | <b>1,859,524,498</b> | <b>1,491,099,948</b> |

Table 5b. VSL-QALY Valuation Sensitivity Analysis (Investigated Cases)

| <b>Economic Burden of Child Maltreatment Human Capital Valuation</b> |                               |                          |                          |                          |                      |                      |                      |
|--|-------------------------------|--------------------------|--------------------------|--------------------------|----------------------|----------------------|----------------------|
| VSL/QALY Approach  |                               |                          |                          |                          |                      |                      |                      |
|  | Source of Cost                | Investigated             |                          |                          |                      |                      |                      |
|  | Nonfatal                      | National                 |                          |                          | AK                   |                      |                      |
|  | Incidence                     | 2,405,138                | 2,405,138                | 2,405,138                | 8,246                | 8,246                | 8,246                |
|  | Discount rate                 | 1%                       | 3%                       | 5%                       | 1%                   | 3%                   | 5%                   |
| 2016<br>Dollars  | Short-term health care costs  | 95,180,931,212           | 85,844,185,496           | 77,921,660,924           | 326,327,204          | 294,316,232          | 267,153,908          |
|  | Long-term health care costs   | 51,241,465,090           | 27,668,707,552           | 16,090,373,220           | 175,681,030          | 94,861,984           | 55,165,740           |
|  | Child welfare costs           | 20,323,416,100           | 20,323,416,100           | 20,323,416,100           | 69,678,700           | 69,678,700           | 69,678,700           |
|  | Criminal justice costs        | 23,938,338,514           | 17,742,703,026           | 13,329,274,796           | 82,072,438           | 60,830,742           | 45,699,332           |
|  | Special education costs       | 23,601,619,194           | 21,035,336,948           | 18,837,040,816           | 80,917,998           | 72,119,516           | 64,582,672           |
|  | Productivity losses           | 2,538,449,989,064        | 1,880,844,372,518        | 1,496,339,770,734        | 8,703,059,288        | 6,448,462,706        | 5,130,191,178        |
|  | Total                         | 2,752,735,759,174        | 2,053,458,721,640        | 1,642,841,536,590        | 9,437,736,658        | 7,040,269,880        | 5,632,471,530        |
|  | Fatal                         |                          |                          |                          |                      |                      |                      |
|  | Incidence                     | 1,750                    | 1,750                    | 1,750                    | 1                    | 1                    | 1                    |
| 2016<br>Dollars  | Medical costs                 | 26,978,000               | 26,978,000               | 26,978,000               | 15,416               | 15,416               | 15,416               |
|  | Productivity losses           | 29,840,723,500           | 29,840,723,500           | 29,840,723,500           | 17,051,842           | 17,051,842           | 17,051,842           |
|  | Total                         | 29,867,701,500           | 29,867,701,500           | 29,867,701,500           | 17,067,258           | 17,067,258           | 17,067,258           |
|  |                               |                          |                          |                          |                      |                      |                      |
|  | <b>Total (fatal+nonfatal)</b> | <b>2,782,603,460,674</b> | <b>2,083,326,423,140</b> | <b>1,672,709,238,090</b> | <b>9,454,803,916</b> | <b>7,057,337,138</b> | <b>5,649,538,788</b> |