

# Considering the Child Welfare System Burden From Opioid Misuse: Research Priorities for Estimating Public Costs

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## Introduction

The opioid epidemic has taken the lives of thousands of individuals and devastated the lives of many more.<sup>1</sup> The highly addictive nature of opioids and increased access to both licit and illicit sources, high rates of environmental stress, and societal redefinitions of pain are among several factors that have created the perfect storm for a national epidemic.<sup>2-4</sup> Although much of the initial focus in addressing this crisis was on those who misuse, and on health and criminal justice implications, the negative impact in several areas is now being recognized as well.<sup>5-8</sup> Many individuals who misuse opioids are parents or child caregivers. The relationship between substance misuse and child maltreatment has been well established and has resulted in the expansion and creation of child welfare services aimed specifically at protecting the children of substance misusers.<sup>9-13</sup> The widespread use of opioids among parents and the resulting impact on parental capacity raise major concerns regarding the well-being and safety of children.<sup>14</sup>

Despite the importance of this issue, little research has been conducted that demonstrates the relationship between parental opioid misuse and child welfare involvement, and fewer studies have considered the costs to the child welfare system (CWS) associated with such misuse. The present analyses use publicly available data to provide an initial national estimate of these costs via the use of empirically based estimates of system involvement and CWS costs. These estimates illustrate the potential value of existing data sources while highlighting the potential limitations of existing data and informing data-related needs to provide more accurate estimates that can guide policy and practice in the child welfare field.<sup>15</sup> We begin by reviewing existing research on the relationship between opioid use and CWS involvement. We then present a conceptual model to guide estimates of CWS costs and use publicly available data to project the attributable cost to the CWS from parental opioid misuse. We conclude by discussing data-related needs to improve these estimates that are derived from public data.

## ABSTRACT

The negative impact of opioids on those who misuse them has been widely documented. Despite significant spillover effects in the form of elevated rates of child maltreatment and child welfare system (CWS) involvement for children affected by parental opioid misuse, the public costs of opioid misuse to the CWS remain largely undocumented. This work seeks to understand the value and limitations of public data in estimating the costs of the opioid epidemic on the CWS. National data from federal sources are combined with best estimates of the association between opioid misuse and child services system utilization. The limitations of this work are explored, and future research priorities are outlined. Ultimately, this work illustrates the need to (1) improve data quality related to parental opioid misuse and CWS linkages; (2) better estimate the number of children and families coming into contact with the CWS as a result of parental opioid misuse; (3) improve predictions of CWS trajectories, including investigation, service provision, and foster care entry among this population; and (4) better estimate the CWS costs associated with patterns of system involvement resulting from parental opioid misuse. This information is crucial to ensuring the production of high-quality system involvement and cost projections related to the opioid crisis.

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## Opioid Misuse and Child Welfare System Involvement

Each year, 7.5 million children are the focus of a child protective services (CPS) investigation for suspected maltreatment, resulting in some level of formal CWS involvement or contact.<sup>16</sup> Although federal data on the specific association between opioid misuse and CWS involvement are limited, ample evidence highlights the role of parental substance misuse as a significant contributing factor to the increased rates of child abuse and neglect, as well as the high rates of foster care entry and poor foster care outcomes.<sup>8,17,18</sup> National point-in-time estimates of youth in foster care show a decline of more than 20% from fiscal years 2006-2012; however, the subsequent 4-year period through 2016 began to reverse that trend, with a 10% upswing in foster care population numbers.<sup>16,19-21</sup> More than 70% of states reported increased numbers of youth entering foster placement from 2014 to 2015.<sup>20</sup> Although multiple factors may affect rates of CWS involvement (eg, efforts to improve that quality of data reporting), parental substance use is a significant contributing factor to this observed rise: From 2009 to 2016, the percentage of entries submitted to foster care, for which parental substance use was a contributing factor, rose from 26% to 34%, representing the largest percentage increase among reasons for home removal.<sup>21</sup> State child welfare directors in various localities attributed a significant portion of the rise in foster placement rates to parental substance use, particularly the rise in opioid and methamphetamine use.<sup>21</sup>

Information on referrals for child protection associated with parental substance use are less widely available, in part because these data are not required for federal reporting through the National Child Abuse and Neglect Data System (NCANDS), a federally sponsored national data collection. Between 2015 and 2017, the presence of caregiver drug misuse was a documented risk factor for 27.1% to 30.8% of substantiated or indicated child maltreatment victims; 34 to 35 states provided information.<sup>16</sup> In 2010, using data from the National Survey of Child and Adolescent Well-Being—a nationally representative study of children and youth involved in CPS reports with sample weights to replicate national estimates of system contact and outcomes—Berger and colleagues reported that caseworkers perceived substance use problems in a primary or secondary caregiver in 13% of investigated cases, with approximately 1% having experienced referrals for substance use treatment.<sup>22</sup> Caseworker reports of substance use were correlated with significantly higher probabilities of perceived severe risk for harm to children compared with parents with no such indication (24% vs 5%, respectively), receipt of services arranged for or provided to the family (74% vs 43%, respectively), and substantiation (ie, an affirmative maltreatment finding [61% vs 27%, respectively]).<sup>22</sup> Further, substance use within this sample was associated with more than twice the risk for out-of-home/foster care placement (38% vs 16%, respectively). These results support

the observation that children in households marked by caregiver substance use are at risk for a more involved system response at 2 phases of investigation—that is, service provision and removal.<sup>22</sup>

One factor contributing to the increase in opioid misuse rates has been the access to prescription opioids, particularly among pregnant women and new parents. Prescription opioid use and misuse have increased dramatically among reproductive-age and pregnant women in the United States in recent years.<sup>23,24</sup> In fact, between 2000 and 2007, overall, 21.6% of Medicaid-enrolled pregnant women filled a prescription for opioids, and 2.5% received opioid prescriptions for an extended period (ie, >30 days).<sup>25</sup> Further, between 1992 and 2012, the proportion of pregnant women entering federally funded, facility-based substance use treatment with a history of prescription opioid misuse increased from 2% to 28%.<sup>26</sup>

The link between opioid use among pregnant women and child welfare reporting is affected by state policy. According to the Guttmacher Institute, statutes in 24 states and the District of Columbia classify substance use during pregnancy as reportable child abuse. A total of 23 states and the District of Columbia require healthcare professionals to report suspected prenatal drug use to child welfare authorities, with 7 states requiring testing for prenatal drug exposure if substance use is suspected. Among 40 states, substance exposure data on risk factors for child maltreatment victims <1 year of age were indicated for 9.8%; for infants <1 month of age, data were indicated for 18.2%; for infants 1 month of age, data were indicated for 3.2%; and for infants between 2 and 11 months of age, data were indicated for 1.5% to 1.9%.<sup>27</sup>

Neonatal abstinence syndrome (NAS), a related consequence of opioid use among pregnant women, is associated with a negative impact on the developing child across many functional domains. In parallel, with the increased rates of opioid use disorder (OUD), rates of NAS or neonatal withdrawal symptoms from opioids or other drugs have also increased across the United States—from 1.2 cases per 1000 hospital births in 2000 to 5.8 cases per 1000 hospital births in 2012.<sup>28</sup> This increase poses a considerable burden on states where prenatal substance exposure must be reported to CPS agencies and can incur significant costs when infants must be placed in special care settings. A recent 10-state study of trends in NAS from 2004 to 2014 revealed a substantial increase in the percentage of reports to CPS for NAS—from 4.72% in 2004 to 9.19% in 2014.<sup>29</sup> An Australian study documented that NAS led to a 5.7 times greater likelihood of CPS reporting, an 8.0 times greater likelihood of substantiated child maltreatment, and a 10.5 times greater likelihood of out-of-home placement.<sup>30</sup> Finally, a Massachusetts study revealed that, on average, opioid-related NAS resulted in >10,000 hours of additional caseworker activity per month across the statewide system.<sup>31</sup>

Limited data are available that reflect individual- and family-level associations between opioid misuse and CWS involvement.

Several state- and community-level studies provide verification of this association. Wolf and coworkers used community-level hospital discharge data for the state of California to examine the association between prescription opioid overdose and rates of hospitalization for child maltreatment from 2001 to 2011.<sup>32</sup> Results demonstrated a significant positive association (relative rate, 1.089; 95% credible interval, 1.004-1.165), indicating that a 1.0% increase in hospital discharges for prescription opioid overdose was associated with an 8.9% increase in hospitalization discharges for child maltreatment.<sup>32</sup> Because such cases may represent the most high-risk situations (eg, hospitalization for overdose, hospitalization for maltreatment-related injury), more general population-level research on rates of opioid misuse and CPS referral or foster care placement is needed. In an effort to investigate this association, Quast and colleagues, in a Florida-based study, observed that community-level prescription opioid rates predicted higher rates of foster placements.<sup>33</sup>

Nationally, Ghertner and coworkers used county-level data from 2011 to 2016 to determine that rates of overdose-related deaths were related to those of CPS and child welfare involvement: A 10.0% increase in drug overdose deaths was associated with a 2.4% increase in reports of maltreatment to CPS, a 2.4% increase in substantiated reports, and a 4.4% increase in foster care entries.<sup>34</sup> Drug-related hospitalizations generated a similar pattern: A 10.0% increase was associated with a 1.7% increase in reports of maltreatment to CPS, a 1.9% increase in substantiated reports, and a 3.0% increase in the foster care entries.<sup>34</sup>

Substance misuse is a significant contributing factor to increased rates of child abuse and neglect. Over recent decades, greater access to such addictive substances as opioids has increased the probability of long-term substance use and addiction problems and has increased the likelihood of child maltreatment on the part of parents across the country. As child maltreatment rates are affected, so, too, is the probability of formal involvement with the CWS. Next, we consider a conceptual framework for projecting national costs from increased CWS needs attributable to opioids.

## Conceptual Framework

The evidence summarized above illustrates how rising rates of substance misuse among parents are linked to increases in problems related to child maltreatment, which require action from the CWS. To provide a conservative estimate of costs for child and family services, specifically those associated with opioid use, modeling the impact on system service utilization is required. Several pathways are followed once child maltreatment is suspected (ie, a referral is made because suspicions exist that a child is in danger). Different pathways are associated with different costs, which involve personnel time and other administrative resources. For the purpose of this initial work, we consider 3 service categories that are likely affected

by increased access due to any form of opioid misuse: prescription opioids, heroin, and fentanyl.

**Child Protective Services:** CPS can involve intake, screening, family assessment or alternative response, and investigation services, as well as all associated administrative supports. Of these services, the 2 most costly types of CPS are screening and investigation.<sup>35</sup> The screening process involves the receipt and processing of child maltreatment referrals, to determine whether a report meets the criteria for further investigation or assessment (“screened-in”) or is below this threshold (“screened-out”). Screened-in reports are then referred for an investigation or an alternative response (eg, family assessment). Investigation, which involves activities that are designed to determine the validity of the child maltreatment allegation, results in a case finding (ie, substantiated/indicated or unsubstantiated/unfounded), as well as the determination of a child’s safety or future risk for harm/maltreatment. Alternative response focuses less on investigating the occurrence of maltreatment but rather on assessing underlying factors that may affect child safety and family-level needs to reduce the likelihood of maltreatment.<sup>35</sup>

**In-Home Services:** In-home services are provided when a need is determined after an investigation or a family assessment. These can include the following services: support for parenting, including parental training, coaching, and/or skill building; individual and/or family therapy; referral for substance use treatment and skill building to enhance coping and/or replacement behaviors; referral for mental or behavioral health treatment; support for applying treatment gains to family management and child safety; information on and referral for job training; assistance with child care, transportation, budgeting, and other logistical planning; and concrete assistance, such as food, clothing, furniture, and/or housing.

**Out-of-Home Services:** The primary out-of-home service within the CWS involves placement. Children may be temporarily placed in state custody, which leads to placement in a traditional foster home (eg, nonrelative), with a relative (eg, kinship care or relative foster home), in a specialty foster home setting (eg, treatment foster care), or in congregate care settings (eg, shelter care, group home, or residential care facility).

## Modeling Child Welfare System Service Utilization

Here, we build on previous works that have simulated the costs of the CWS and the effects of environmental or policy changes.<sup>36</sup> We adopt an analogous conceptual framework to capture the major cost drivers, incorporating projections by the Washington State Institute for Public Policy and the RAND Corporation (**Figure 1**).<sup>34,36,37</sup> A simulation approach for modeling has been used to demonstrate how changes in child maltreatment affect service utilization and consequent costs to the CWS.<sup>37</sup>

To conduct our analysis, we first obtained annual data on child maltreatment and CWS utilization rates from the NCANDS and the

Adoption and Foster Care Analysis and Reporting System (AFCARS).<sup>16,20,21</sup> The NCANDS is a voluntary data collection system that gathers information from all 50 states, the District of Columbia, and Puerto Rico on reports of child maltreatment. NCANDS was established in response to the Child Abuse Prevention and Treatment Act of 1988. The NCANDS child file includes information for each child involved in a completed CPS investigation during the fiscal reporting period. Elements include demographics of children and their perpetrators, types of maltreatment, case disposition, child and family risk factors, and postinvestigation services provided to the child and/or his/her family. The data are used to examine trends in child maltreatment across the country, with key findings published in our Child Welfare Outcomes Reports to Congress and annual Child Maltreatment reports. This includes children who receive protective and in-home services.

AFCARS collects case-level information from state and tribal title IV-E agencies on all children in foster care and those who have been adopted with title IV-E agency involvement. Examples of data reported in AFCARS include demographic information on the foster child, as well as the foster and adoptive parents; the number of removal episodes a child has experienced; the number of placements in the current removal episode; and the current placement setting. Title IV-E agencies are required to submit the AFCARS data twice a year based on two 6-month reporting periods.<sup>16,20,21</sup>

Importantly, neither NCANDS nor AFCARS includes direct information about the role of opioids in the CPS report or foster care entry, although each has indicators related to parental drug use more generally. NCANDS includes information on whether drug use was an identified caregiver risk factor, which is not submitted by all states, and AFCARS includes parental drug use as a reason for foster care placement. Our purpose in using NCANDS and AFCARS

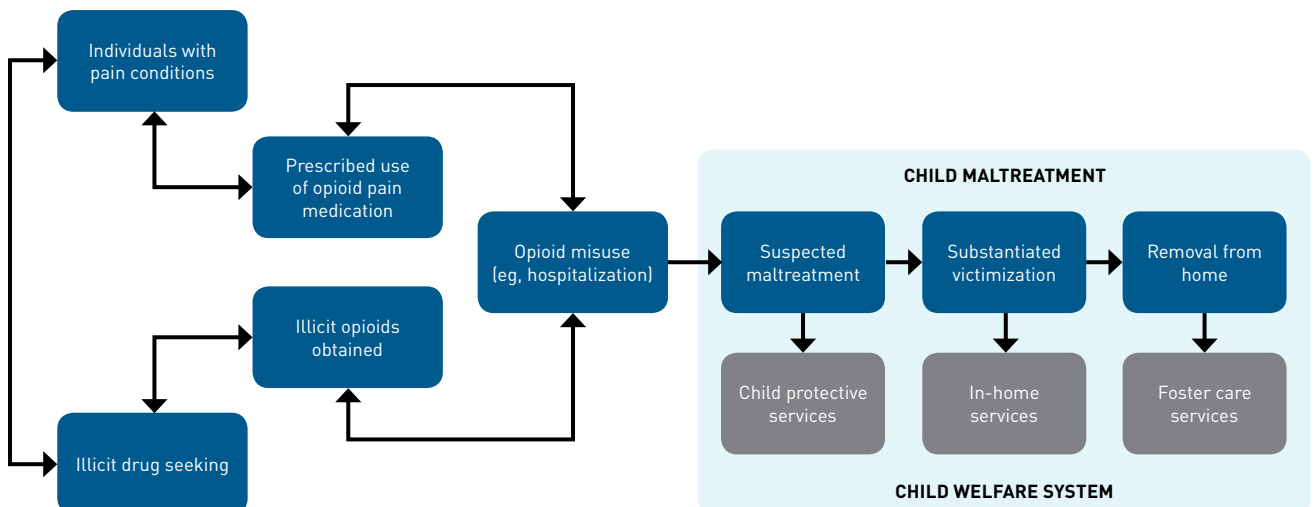
was to estimate national trends in CPS and CWS involvement that may be attributable to opioids based on prior research, as well as to estimate state child welfare costs.

### Projecting National Child Welfare Service Utilization

Before estimating the portion of CWS utilization attributable to opioids, we first used annual national data to calculate the total levels and rates of CPS, in-home services, and foster care services provided between 2011 and 2016 (Figure 2).<sup>21,38</sup> Both the total number of children with CPS involvement and those receiving in-home services were identified from NCANDS data.<sup>16,20,21</sup> AFCARS collects information on the total number of children entering foster care each year.<sup>16,20,21</sup> The costs associated with screening, investigation, and foster care were identified from published national estimates. For projections, we used a national per-case average cost in 2014—the most recent year available—of CPS utilization (\$2447), in-home service utilization (\$3680), and foster care (\$33,210).<sup>35</sup> All cost estimates were adjusted for inflation.<sup>21</sup>

With the goal of this work intended to highlight what publicly available data indicate the attributable CWS costs of the opioid epidemic to be, these estimates are expected to have key limitations that will serve to inform future research in this area. In particular, this work will be limited by the availability of data (eg, post 2016), as well as by limited information about the direct impact of opioids on rates of child maltreatment and formal CWS involvement. These factors limit precision of the range of the attributable impact of opioids. Additionally, given data limitations, our analysis does not value the downstream costs of child maltreatment attributable to opioids relative to the health and development of the maltreated child, although future work should seek to determine this additional

**FIGURE 1.** Conceptual Framework Linking Opioid Misuse to Child Maltreatment and Child Welfare System Service Utilization<sup>34,36,37</sup>



burden for addressing such needs. Greater downstream costs to child and family services are likely to also result from misuse of opioids among pregnant mothers. In this context, estimates derived from public data are likely to be conservative estimates of the total CWS costs from opioid misuse.

### Considering Attributable Impact of Opioid Misuse on the Child Welfare System

Limited information is available to determine the exact relationship between opioid availability and changes in child maltreatment, along with the consequent impact on CWS costs. To project the relationship between opioid misuse and CWS, we used the research from Ghertner and colleagues, which estimates the relationship between opioid-related hospitalizations and CWS utilization.<sup>34</sup> Specifically, from 2011 to 2016, a 10.0% increase in opioid-specific hospitalizations corresponded with a 1.1% increase in reports of maltreatment, a 1.1% increase in substantiated maltreatment reports, and a 1.2% increase in foster care entry. These numbers represent the only national, peer-reviewed estimates of the relationship between opioid-related hospitalizations and child welfare outcomes. In this context, they represent the best estimates available. Opportunities to improve these estimates are described below. Using data from the Healthcare Cost and Utilization Project, we calculated the projected increase

in child welfare reports, substantiations, and foster care entries attributable to opioid hospitalizations.<sup>39</sup> The formula is reflected in **Figure 3**.<sup>39</sup> From the projection of the attributable impact of opioid misuse on the CWS, utilization and costs can be estimated. Based on the standard errors for the association of opioid hospitalizations and child welfare utilization reported by Ghertner and colleagues, 95% confidence intervals were constructed to model uncertainty in these estimates.<sup>34</sup> These models seek to capture the upper and lower bounds of these estimates.

### Projected Child Welfare Resource Utilization and Costs Attributable to Opioid Misuse

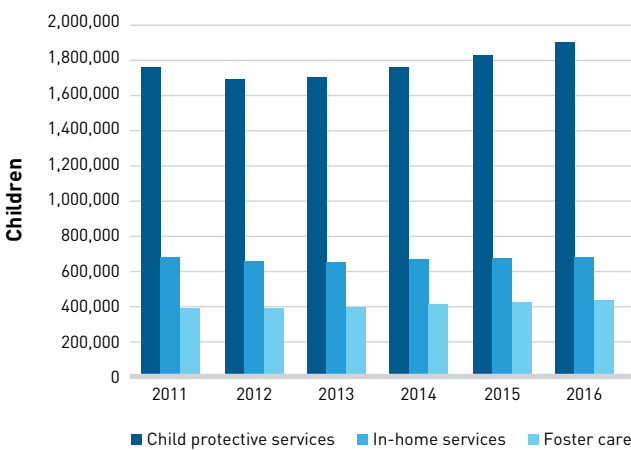
The costs presented here represent high and low estimates based on the previously described assumption each year for the 3 key CWS categories. Although these estimates represent rough calculations, they are the best estimates given the currently available public data. Specifically, between 2011 and 2016, the CWS experienced more than \$2.8 billion in costs attributable to opioid misuse, or about 2.1% of all child welfare costs during this time. This approach also demonstrated that in these 5 years, >200,000 reports of suspected child maltreatment, >80,000 victims of substantiated maltreatment, and >95,000 foster care entrants were attributable to opioid misuse.<sup>21,39</sup> The projected costs attributable to each form of service grew across time (regardless of inflation; **Figure 4**).<sup>21,39</sup> As expected, foster care services represent the largest driver of child welfare costs attributable to opioids.

Importantly, we sought to explore uncertainty in these estimates. Specifically, this included modeling the uncertainty of the association between opioid misuse (ie, hospitalization) and increases in CWS service needs. Bearing this in mind, we constructed 95% confidence intervals around these estimates. This represented a total attributable cost range between \$2.65 billion and \$3.0 billion. Costs attributable to CPS were between \$852 million and \$900 million, costs attributable to in-home services ranged between \$162 and \$174 million, and costs attributable to foster care were between \$1.6 and \$1.9 billion.

### Limitations and Priorities for Future Work

Through this work, we sought to highlight what is known about the attributable costs of opioid misuse to the CWS based on public data.

**FIGURE 2.** US Child Welfare System Involvement<sup>21,38</sup>



**FIGURE 3.** Formula for the Projected Increase in Child Welfare Reports, Substantiations, and Foster Care Entries Attributable to Opioid Hospitalizations<sup>39</sup>

$$\text{Attributable Child Welfare Costs From Opioids} = \sum \text{National Average Cost of Utilization}_A * \{ [\text{Total Service Utilization}_A] * [\text{Associated \% increase in services}_A * \{ \frac{1 - \text{Opioid Hospitalizations}_{2010}}{\text{Opioid Hospitalizations}_x} \}] \}$$

This effort was intended to generate estimates of the costs to the CWS that are attributable to opioids. All assumptions and estimates were intentionally designed to provide an initial estimate of the potential CWS costs that reflected the limitations of the data. This work was limited by the scarcity of data, as well as by the limited information available on the direct impact of opioids on child maltreatment. This, in turn, limited the precision of all estimates of the attributable impact from opioids. Further, they reflect the estimates based on the work of the Administration for Children and Families and the research by Ghertner and coworkers.<sup>19,34</sup> As described below, further efforts to develop convergent evidence from multiple studies will help to improve the precision and utility of these estimates. Child maltreatment is associated with substantial known costs to the healthcare system and the education system. Additionally, we do not include other potential cost drivers to the CWS that would increase projected cost estimates (eg, adoption services, federal overhead costs). Lacking the availability of better information on these linkages, we provide this initial estimate based on more direct costs.

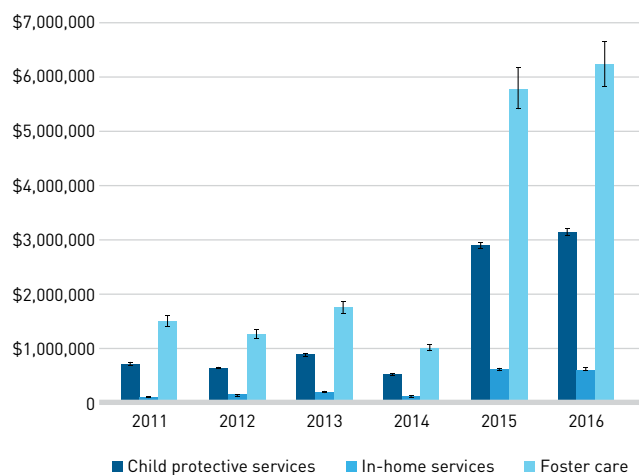
Ultimately, these estimates require several kinds of data to improve precision and capture the full range of costs. This includes individual-level child welfare data, preferably with information that would allow for linkage to perpetrators' medical records. For example, a linkage between Medicaid records and perpetrator records could allow a direct estimation of costs. Additionally, information on the availability of opioids within local geographic areas would allow for an improved understanding of how availability relates to changes in child maltreatment.

Understandably, most of the focus on family and child services affected by the opioid epidemic is related to the CWS. Service utilization for additional family needs, however, should be considered as well. Recent studies have noted trends for necessary treatment and programming to address personal and family dysfunction resulting from opioid addiction that is directly or indirectly related to opioid use.<sup>40</sup> For example, OUD is associated with a greater risk for intimate partner violence (IPV). Although it is challenging to sort through the reciprocal relationships between OUD and IPV, studies have documented an increased likelihood for IPV following substance use.<sup>41</sup> The family problems resulting from OUDs are likely to coincide with increased rates of IPV, thus requiring effective treatment that can serve collateral issues. Also occurring comorbidly with OUDs are mental health conditions that are exacerbated by long-term problems. Effective treatment for opioid misuse requires resources that address mental health needs concurrently, with some of the burden falling on state governments. The urgent need for adequate mental health support has led several states to seek joint support from the federal government. This is particularly true of children in foster care, whose healthcare costs are, on average, higher than those of children not in foster care.<sup>42</sup>

The opioid epidemic has led to efforts to implement and fund services that address family issues linked to substance misuse. These include services for treatment and prevention that may not have been required in the past. For example, the state of Wisconsin has developed Project Hope (Heroin, Opiate, Prevention, and Education) to serve families, including treatment and prevention programming, monitoring prescription drug patterns, and increasing the response time of public health officials to reported problems.<sup>43</sup> This initiated \$2 million per year to help support treatment and prevention efforts; \$250,000 in additional funds per year through the Child Psychiatry Consultation Partnership was provided for mental health services, and an additional \$5.4 million was allocated in the recent annual budget for the treatment of residential substance use.<sup>43</sup> Substantial state costs are linked to personnel and other administrative costs for funding and planning programs to address the problems that arise from opioid misuse. These costs are not captured by estimates provided in publicly available data.

Ultimately, these limitations illustrate what can be accomplished with currently available public data and can underscore the opportunities for future work. Of particular concern is the fact that these data are likely what many policy makers and practitioners rely on to guide their efforts to address the current opioid epidemic. To improve estimates of the full costs of the opioid epidemic for children and families, a clear need exists for more research and strong available data in this area.<sup>44</sup> From this effort, we identified 4 core priority domains and highlighted illustrative

**FIGURE 4.** Projected Marginal Child Welfare Expenditures From the Opioid Epidemic (2011-2016)<sup>21,39</sup>



AFCARS indicates Adoption and Foster Care Analysis and Reporting System; HCUP, Healthcare Cost and Utilization Project; NCANDS, National Child Abuse and Neglect Data System. Error bars provide 95% CI range of projection; projections based on HCUP, NCANDS, and AFCARS data (2011-2016).

examples of what is needed to move the field forward (Table). Specifically, there is a need to (1) improve data quality, (2) better identify the causal relationship between opioid misuse and child maltreatment, (3) increase model sensitivity to heterogeneity, and (4) develop improved price information.

**Data Quality:** Key to improving our understanding in this area includes improving the quality of data to better reflect a number of key issues. This includes enhanced documentation of the type of opioid misuse tracked in healthcare databases (eg, prescription opioid, heroin, fentanyl), along with the need to link electronic medical records and claims data with CWS records—in particular, perpetrator data. Further, there is a need to enhance the quality of healthcare data from pediatric care providers who capture injury and illness data related to child maltreatment.

**Mapping Opioid Misuse and Maltreatment Associations:** To strengthen the quality of projection estimates, there is a need for investigators to prioritize our understanding of the specific pathways of opioid misuse that lead to child maltreatment. Our estimates focus on associations between opioid-related hospitalization rates and CPS or CWS involvement, but research also must address the direct link between caregiver misuse and CWS contact. These paths may include prenatal exposure and NAS, as well as the relationships between opioid misuse and the occurrence of child abuse or neglect. Similarly, pathways to foster care placement may be associated with caseworker estimates of increased risk among

households affected by opioid misuse but may also include entry to foster care due to the death of a parent that is attributable to opioid misuse. Moreover, elucidating the differential relationships between opioid misuse and other forms of maltreatment (ie, neglect; physical, sexual, and psychological abuse) and placement trajectories (eg, length of stay, type of placement) is also important. Clearer indicators of the association between parental opioid misuse and the differential pathways of CWS involvement associated with misuse would reduce the uncertainty in estimates and provide more precise cost projections.

**Understanding Heterogeneity:** Increasing the utility of projection models requires improved understanding of the heterogeneity across geographic locales, as well as key demographic groups. This involves, in particular, more detailed estimates of variation in opioid misuse across gender and racial groups and whether there are subgroup differences in future engagement with the CWS. Further, understanding how contextual factors are related to misuse and maltreatment is also important. For example, regional variation in urbanicity and neighborhood socioeconomic variability are critical aspects to consider.

**Improving Price Information:** Ultimately, the success of cost projections requires accurate price estimates to minimize uncertainty.<sup>45</sup> These data should account for local price information, such that the cost of services will enhance our understanding of how market prices fluctuate over time (eg, inflation). Finally, accurate price information should provide not only average costs of service provision but also marginal price estimates that reflect the costs for local markets (eg, scarcity of child welfare workers, limited foster care sites).

**TABLE.** Research Priorities for Understanding the Impact of Opioid Use on the Child Welfare System

Research Priority Domain	Key Priorities
Data quality	<ul style="list-style-type: none"> <li>Improved documentation of type of opioid misused</li> <li>Linkages between healthcare electronic medical records and claims (public, private, managed care) and child welfare system perpetrator data</li> <li>Improved measurement and documentation in pediatric context of maltreatment-related injury or illness</li> <li>Markers of access to treatment and patient refusal when treatment is offered</li> </ul>
Mapping opioid misuse and maltreatment associations	<ul style="list-style-type: none"> <li>Pathways of opioid misuse that lead to child maltreatment (death, injury, financial loss)</li> <li>Relationships of opioid misuse with different forms of maltreatment (neglect; physical, sexual, and psychological abuse)</li> <li>Impact of opioid misuse on parental vs nonparental perpetration</li> <li>Reduced uncertainty in association estimates</li> </ul>
Understanding heterogeneity	<ul style="list-style-type: none"> <li>Understanding of geographic variability in misuse and service utilization</li> <li>Ethnic, racial, and gender variability in opioid misuse</li> <li>Rural vs suburban vs urban variability in misuse and service availability</li> <li>Socioeconomic variability in opioid misuse</li> </ul>
Improving price information	<ul style="list-style-type: none"> <li>Geographic variability in price information (state, county)</li> <li>Temporal variability in price information (year)</li> </ul>

## Conclusions

This work sought to understand how publicly available data can inform estimates of the attributable costs of CWS from opioid misuse. Preliminary estimates indicate a substantial burden of different child welfare services from opioid misuse but also illustrate a high degree of uncertainty in terms of magnitude. We identify a number of research priorities that provide a map for future research. In this context, we view these high costs to children and their families from this epidemic as key to motivating not only further inquiry but also strategic investment in evidence-based programs and policies. ■

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**Authorship information:** Concept and design (DMC, CMC, DJ, MWD); acquisition of data (DMC); analysis and interpretation of data (DMC, DJ, MWD); drafting of the manuscript (DMC, CMC, DJ, MWD); critical revision of the manuscript for important intellectual content (DMC, CMC, DJ); statistical analysis (DMC, DJ); administrative, technical, or logistic support (DMC, MWD).

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