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ORIGINAL PAPER

# A Strategy for Assessing Costs of Implementing New Practices in the Child Welfare System: Adapting the English Cost Calculator in the United States

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**Abstract** In decisions to adopt and implement new practices or innovations in child welfare, costs are often a bottom-line consideration. The cost calculator, a method developed in England that can be used to calculate unit costs of core case work activities and associated administrative costs, is described as a potentially helpful tool for assisting child welfare administrators to evaluate the costs of current practices relative to their outcomes and could impact decisions about whether to implement new practices. The process by which the cost calculator is being adapted for use in US child welfare systems in two states is described and an illustration of using the method to compare two intervention approaches is provided.

**Keywords** Cost calculator in child welfare · Unit costs of children's services · Placement costs

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The comprehensive conceptual model of implementation, as described by Aarons et al. (2010), identifies factors that affect the application of evidence-based and innovative practices within public child welfare and mental health systems. The model defines stages of implementation that include factors within the outer-socio-political and inter-organizational contexts of child welfare systems (CWS).

The overall program costs of adopting a new practice is a critical factor at each stage of decision-making: whether to adopt, to implement, and how to sustain a new practice. Program administrators must consider all of the costs that are relevant when a new initiative is first contemplated. For example, start-up costs required for staff training, lost productivity costs during training, and costs associated with changes in management and staffing structure to support the new model. Likewise, the decision to adopt (Stage 2 of the Aarons et al. model), and the wide-scale implementation of an evidence-based program into the CWS (Stage 3), are highly dependent upon their economic value (Hoagwood et al. 2001).

Ultimately, estimates of how much it will cost for a program to implement a new practice, relative to the estimated improvement in outcomes, can be viewed as "bottom line" considerations. Such considerations influence the decision of whether or not to adopt. Yet, in the CWS, an intervention's costs are not readily obtained. In the mental health services system, for example, claims-based billing data are frequently used to approximate costs; however, CWS services are not delivered via specific claims-based systems.

Child and family outcomes accrue over long time-periods (often years) in a variety of contexts both within and outside of the CWS, and related costs from other public sector systems (e.g., education, mental health, and juvenile

justice) are not easily captured. Costs are heavily influenced by personnel costs, but the CWS does not typically track the time spent by case workers or supervisors on individual case management and required administrative, procedural and legal activities, all of which greatly affect cost. In general, there has been a lack of progress in strategies for unitizing and measuring CWS costs.

In this paper we describe a method for accurately estimating the costs of core activities routinely performed by child welfare case workers and supervisors and the associated administrative costs that accompany them—the Cost Calculator for Children's Services (hereafter referred to as the Cost Calculator; Ward et al. 2008). The Cost Calculator method was developed in England by researchers at The Centre for Child and Family Research, Loughborough University and is a strategy for calculating unit costs from the perspective of the child welfare program or systems. We are currently building on their extensive previous work to adapt the Cost Calculator for use in the United States CWS.

By providing detailed information on child welfare service delivery costs via the Cost Calculator, child welfare administrators could make more informed evaluations of when and how to implement evidence-based practices. The Cost Calculator formulates unit costs in a standard, rigorously-derived, administratively realistic format, and combines them with data on the frequency with which they are incurred, thus computing total costs for a particular time period. The cost information allows for more informed decisions to be made when weighing whether or not to adopt a new practice, as well as other administrative, policy, and practice-based departures from the status quo. Before describing the Cost Calculator in detail, we first briefly consider a wider perspective for thinking about innovation and costs.

## Making Decisions About Adopting Evidence-Based and Innovative Practices: The Role of Economic Evaluation

When contemplating whether or not to adopt evidence-based practices, child welfare administrators must examine several competing courses of possible action. At a minimum, they must consider any proposed evidence-based innovation relative to the possibility of continuing the status quo. The comparative costs of adopting or not adopting an evidence-based practice, or of pursuing some alternative possibility, will affect their opinion about which course of action is more attractive.

Formal tools for calculating how to weigh economic consequences of alternative courses of action are perhaps best known as part of "economic evaluation" (e.g. Drummond et al. 1987). One method of economic evaluation is cost-effectiveness analysis, which involves calculating how much an intervention costs to produce units of a given outcome. Another method of economic evaluation is cost–benefit analysis, which involves calculating when an intervention is successful and whether it costs more or less to mount than is saved by the relative improvement in people's lives. However, when reduced to its core, economic evaluation is "…the formalization of an approach used everyday: assess the advantages and disadvantages of alternative courses of action and choose the one which, on balance, is best" (Barnett 1993). Economic evaluation points to distinctions that help to organize our thinking and these distinctions underscore the fact that costs are not eternal or absolute.

Costs are relative to the time frame in which they are being considered. For example, high short-term costs (i.e., start-up costs) can eventually come down after routine implementation of an evidence-based innovation. Costs incurred in one arena can be balanced against savings realized in another area (e.g. costs associated with implementing an evidence-based intervention might be more than the overall savings from a reduction in very expensive disrupted placements). Costs are incurred and felt from someone's perspective (i.e., CWS supervisors). Unless special provision is made, savings that might result from implementing an evidence-based child welfare intervention in juvenile justice or education will not offset costs to child welfare budgets. For example, studies show that placing youth in residential treatment settings is likely to increase their risk for delinquency. More delinquency will, in turn, increase costs to juvenile justice systems and drive up victim costs of crime (e.g. Dishion et al. 1999). Implementing an evidence-based intervention within the CWS that prevented the initial residential placement might result in monetary savings by preventing costs of juvenile crime, but these costs would not be inherently obvious to the CWS. An ultimate goal for the researchers who developed the Cost Calculators is to separately compute the costs incurred in each system and then bring them together to show total costs to the public purse.

Cost analysis is an important step in economic evaluation. To conduct cost analysis is to "…Identify and estimate the value of all resources used…" (Barnett 1993). The measurement of "resources used" not only covers billed expenses, but also considers valuable commodities that often are not directly billed, such as administrative costs and employee time.

Developers of the Cost Calculator grappled with complexities in computing child welfare unit costs (i.e., how much it costs to deliver services to a case) and in doing so, have provided us with a standard method to calculate the costs of current services when considering the relative risks

of decisions to implement new evidence-based practices in the CWS.

## Implementing Evidence-Based Practices in the CWS

When CWS policy and decision makers contemplate the initiation of a new intervention, their first cost considerations are likely to be short term. The timing of these immediate economic implications are critical, particularly given scarce resources and politically sensitive trade-offs in prioritizing the delivery of service.

Understandably, cost-cutting strategies that provide immediate budgetary relief are preferred over more costly approaches that, despite having potential to improve long-term outcomes, are risky because their effects have only been tested in controlled research studies and not in real-world CWS. But a short-term perspective can hinder the translation of evidence-based into community services programs where long-term improvements may occur (Compton 2006). There is also a growing body of evidence in the UK to suggest that adherence to a short term perspective by, for instance, postponing admission to care, can increase costs in the longer term as children who have had extensive, long-term experience of abuse come to require more expensive, specialist placements (see Ward et al. 2008).

Along with thinking about the short-term costs, CWS policy makers are often likely to think only about costs associated with the intervention itself and disregard interventions that can reduce the costs of overall CWS services like improving parenting for foster, kinship, biological, and adoptive families. For example, cost savings from such interventions could result from fewer placement failures, quicker reunification after placement, and/or more stable permanency once reunification is achieved (Chamberlain et al. 2008; Fisher et al. 2009). However, implementing these interventions within the CWS involves expensive training and start-up costs, and the costs of supplanted caseworker time.

Recent mandates for the use of evidence-based practice in public sector systems and other forces (as reviewed in Aarons et al. (2010)) have contributed to increased support for focused economic evaluations of outcomes for CWS children (Barth and Reid-Johnson 2000; Courtney 1998; Foster and Holden 2002). Adopting a broader perspective could help CWS and other public service system administrators recognize that evidence-based preventive programs might trigger long-term savings across programs such as reduced subsequent costs in mental health services and less involvement in juvenile justice and special education (Rubin et al. 2004a, 2004b).

To begin to assess costs and savings over both the short- and long-term and across a full scope of child welfare activities, we need to develop methods to calculate how many resources are being consumed by activities that support child-welfare-based interventions. Currently there are no systematic methods available for assessing the cost of case work and administrative activities required for a family's participation in various interventions. Such data are essential to determine whether or not these costs are offset by outcomes such as improved child and family functioning, shorter and more stable episodes of care, or cost offsets in other public child service systems.

For example, imagine the potential CWS cost savings, both tangible and intangible, if there was a way to combine data on the costs associated with case work activities involved in setting up and maintaining child placements in various settings (e.g., foster, kinship, group homes, or residential treatment centers), with ongoing program costs and data on length of stay so that comparisons could be made of the costs and benefits of various service options. An example of such a comparison is provided later in this manuscript.

## Description of the Cost Calculator

The Cost Calculator is a system that was recently developed by Harriet Ward and researchers at Loughborough University that uses unit costs to assess the cost of providing services within the United Kingdom CWS. The Cost Calculator was originally commissioned by England's Department for Education and Skills (now Department for Education) .

Researchers developed the Cost Calculator using methods grounded in the principles for calculating unit costs (Beecham 2000). They used a "bottom-up" approach whereby core case work processes were identified and then broken down into discrete component activities. The time required for each activity was then estimated, and staffing and administrative costs were tied to each activity. Using this methodology, major sources of variation in costs within England and Wales were identified. These variations were associated with local factors (e.g., geography and salary levels), child factors (e.g., level of need, mental health, and disabilities) and placement types (e.g., foster, residential, or kinship care). Although this detailed approach is time consuming and complex to implement, it allows for a wide range of variables to be taken into account when calculating costs. The Cost Calculator is designed so that standard unit costs are developed for each activity within a set of core case work processes; variations in these costs relating to local differences, child factors and placement types are incorporated into the calculations. The

unit costs are combined with child level data on placements and reviews to calculate the total cost for each child over a specified time period. These costs can be aggregated in numerous ways, including the calculation of annual costs for a population of children in care, the costs for specific placement types, or the costs for specific groups of children (e.g., age, gender, early risk scores, or those with specific mental health or educational needs). The ability to reliably cost placements is a critical step toward linking costs to long-term child outcomes. It is also a backdrop from which to examine the introduction of alternative types of interventions, such as preventive programs designed to strengthen foster and biological family functioning. The Cost Calculator also provides a convenient means of comparing placement patterns and placement costs for different children with similar needs over a specified time period.

Researchers identified eight core case work processes based on UK Department of Health guidance (Department of Health 2003) when placing children into care in England and Wales. The processes included direct client-related activities as well as indirect activities and overhead costs (e.g., completion of paperwork, meetings with colleagues, and facility costs). The UK core processes are:

1. Deciding if the child needs to be placed and finding the first placement.
2. Care planning, including development of the permanency, educational, and health plan.
3. Maintaining the placement (placement costs and all ongoing activities to support the placement).
4. Ending the placement.
5. Finding a subsequent placement.
6. Case reviews.
7. Legal processes.
8. Transition to leaving care.

In England, the Cost Calculator is supported by a comprehensive research and development program with ongoing funding from the government to extend the research to other areas such as CWS-based family support services for children who are not placed, and costs of related services from other systems such as education and health. Two research centers in the USA, the Center for Drug Abuse Prevention in Oregon and the Child and Adolescent Services Research Center in San Diego, are collaborating with the Loughborough team to leverage this research to adapt and implement the Cost Calculator in pilot sites in the United States. A key question addressed in this collaboration is how well the eight UK core processes will map on to the typical work performed by CWS caseworkers in the United States, and what adaptations need to be made in order to use the Cost Calculator methodology in research on unit costs of child welfare services in US systems?

## Development of the Cost Calculator in the United Kingdom

To develop the Cost Calculator, researchers collected activity data by completing templates during the course of 17 focus groups held with 127 practitioners and 15 managers and team leaders in English and Welsh local authorities (equivalent to US counties). The information from these templates was collated and the average number of hours each activity took was calculated for each of the eight core processes (outlined above). Unit costs were then developed using salary scales to calculate the costs of the activity supporting each process. Next, an overhead cost (to cover administrative support, maintenance of buildings, holidays, training, etc.) was calculated using the formula developed by the Personal Social Services Research Unit (PSSRU) at the University of Kent, England (Curtis and Netten 2005). The calculation of the unit cost of maintaining the placement (Process #3) included both the process costs as described above, plus the foster parent payment or residential home fees.

Discussions held with practitioners during the focus groups reinforced the evidence from managers that there were extensive variations among the amount of activity required to support each process and that these variations accounted for differences in policies, practices, and procedures between the authorities. Children's characteristics, such as disabilities, emotional or behavioral difficulties, and delinquent behavior also resulted in different levels of cost-related activity across the range of processes. There were also extensive variations between authorities on the placement fees and allowances required to maintain children in different placement types. Templates completed during the focus group discussions included estimates of the different levels of activity and costs engendered by this range of factors. These data made it possible to calculate numerous variations to each unit cost.

Management information systems and case files of a sample of 478 children placed by the six participating authorities were then searched to collect data on occurrences and dates of each social work processes and placement experienced by each child, together with information concerning possible cost-related child and placement characteristics and also outcomes. Using the Cost Calculator, the research team was able to calculate the costs incurred by each child (and each local authority) over the 20-month period. From those data several key findings emerged. For instance, children with emotional or behavioural difficulties

were likely to incur 1.5 times the costs of children with no additional support needs, but only about half the costs of children who also committed delinquent offenses. There was also substantial variation among the different types of placements available, with 1 week in a residential unit costing about eight times that of a week in foster care and 9.5 times that of a kinship placement.

The Cost Calculator has also been applied to data for other local authorities in England. The software is not only designed to compare costs for children with different characteristics and needs, but it also organizes data longitudinally, rather than in a snapshot fashion, so that the cross-sectionally unfolding costs of different care paths over time can be examined. This makes the Cost Calculator an ideal tool for use in implementation research designed to understand how specific (and often costly) interventions impact a range of child and family outcomes over time.

## Steps to Translate the Cost Calculator to the US CWS

The first step in the collaboration between the UK and USA was taken by researchers who used the Cost Calculator to evaluate the cost benefits of Multidimensional Treatment Foster Care (MTFC; Chamberlain 2003) which is being implemented in numerous sites throughout the UK (see Holmes et al. 2008). This evaluation led to the conclusion that the structures of the CWS in both the UK and the USA are sufficiently similar that the Cost Calculator should (with adaptation) be highly applicable in the United States. Since 2008, Chamberlain and colleagues at the Oregon Social Learning Center and Landsverk and Rolls from the Child and Adolescent Services Research Center, have collaborated with British researchers to develop expertise in the content and methods of the Cost Calculator. We are working with US CWS leaders in Oregon and California to adapt and modify the Cost Calculator's eight core processes and the activities within these processes to accurately reflect services delivered within child welfare offices in the USA.

Thus far, the adaptation of the Cost Calculator for use in the USA has involved five steps: (1) Conducting an inventory of child welfare policies and practices in two states (California and Oregon). (2) Participating in a week-long intensive training at the University of Loughborough that focused on the underlying theory, functionality, and software characteristics of the Cost Calculator. This included visiting local authorities to observe how the calculator was being applied in real world settings. (3) Meeting with CWS leaders from California and Oregon to determine their views on the validity of the core processes. There was general agreement among leaders that the processes were quite similar and, with some modifications, could apply to case worker activities in the USA. Modifications include substantive and language adaptations and identifying variations that could be expected to affect costs (e.g., factors such as whether the child is being placed in a sibling group, has emotional/behavioral problems, or tribal affiliation). (4) Focus groups have been conducted with case work supervisors to refine US adaptations, and (5) a series of focus groups with case workers in both states are being conducted to estimate the time spent in each of the activities within each of the eight core processes. Focus groups will continue over the next 8 months in six counties (three counties in California and three counties in Oregon).

Once the focus group work is completed, caseworkers and supervisors will complete questionnaires that cover topics on activities similar to those discussed in the focus groups to triangulate data on time estimates. Case workers will also complete detailed time event logs that track all daily activities (and time spent) on individual cases over a 3-month period. Salary data and overhead costs will then be collected from each location. In addition, a database platform will be selected and build for the US version of the calculator using parallel calculations and logarithms from the Cost Calculator. Then the new instrument will be pilot tested on an existing dataset to examine costs and cost offsets of implementing an evidence-based practice within a US CWS.

## A Focus on Placement Disruptions

Placement disruptions have long been a concern for CWS and recently with the advent of the Federal Child and Family Services Reviews that audit permanency outcomes, strategies for preventing disruption have increasingly become a priority. We plan to use the US adaptation of the Cost Calculator to estimate the costs and cost off-sets on outcomes related to placement disruptions from foster care that have been found in previous preventative randomized trials. Studies indicate that during any 12-month period, one to two-thirds of children and adolescents who receive their first placement in foster care disrupt from their placements and have to be moved to another home or a more restrictive setting (Smith 2004). Such changes in placement are highly undesirable for many reasons. Disruptions are associated with an increased likelihood of failed permanent placements (i.e., reunifications and adoptions). For example, using administrative records for 6,831 children discharged from foster care in California, Courtney (1995) found that greater instability in placements was positively associated with risk for reentry. Similarly, Wells and Guo (1999) examined records from 2,616 children in foster care in Ohio and noted a positive association between number of transitions during the first period in foster care and likelihood of foster care reentry. Finally, Farmer (1996) reviewed records from 321 children

in foster care in the UK and reported that first attempts at reunification were significantly more successful than subsequent attempts. Significant emotional costs associated with placement changes have been documented in previous studies (Fanshel et al. 1990; van der Kolk 1987). For example, Newton et al. (2000) found that changes in foster placement were associated with increases in both externalizing and internalizing behavior problems. In their study of more than 400 children who had entered care at an average age of 6.6 (SD = 3.9 years), externalizing problems were the strongest predictor of placement disruption. Importantly, children who initially scored within the normal range on the CBCL were particularly vulnerable to the negative effects of placement disruptions. That is, placement changes for these children were followed by increases in both internalizing and externalizing scale scores on the CBCL 18 months later, strongly suggesting that placement disruptions contribute to the onset and development of child emotional and behavioral difficulties. Disruptions also translate to increased financial costs for the CWS. In a study conducted in San Diego County (Price et al. 2008), disruptions were estimated to require an average of more than 25 h of casework and support staff time (including time spent identifying and placing the child in a new setting, court reports, staff meetings related to placement decisions, and paperwork documenting need and processes).

Despite this well-established association, there are challenges in convincing policy makers to invest in research-based programs that reduce placement disruptions. Evidence about the economic advantages of placement stability could prove to be a tipping point in changing policy in this regard. Notably, the UK studies in which the Cost Calculator was employed (Ward and Holmes 2008; Ward et al. 2008) demonstrated that, as the number of foster placements increased, the costs of finding each new placement tended to increase *exponentially*. This is partly because, as children experienced more failed placements, they became increasingly difficult to place (it took more time and effort to find a suitable placement and the types of placement available were often limited to residential units). Finding fourth, fifth, or sixth placements took 3–4 times as long as finding first or second placements and cost six times as much. Moreover, disruptions often engendered subsequent "planned" moves, with concomitant costs. For example, youth who left one placement frequently went temporarily to shelter care until something more suitable became available (Jackson and Thomas 1999; Ward 2009). Furthermore, disruptions, runaways, and other crises often resulted in revisions to the permanency plan and extra reviews, thus adding to the costs of disruptions. There is currently no such parallel information available for the US CWS; therefore, the current adaptation potentially represents an innovative contribution to science and policy.

## An Illustration of Using the Cost Calculator: Excerpted From *Calculating and Comparing the Costs of Multidimensional Treatment Foster Care, England* (Holmes et al. 2008)

MTFC, an alternative to placement in group or residential care for youth who have severe mental health problems or delinquency has been tested in numerous clinical trials and implemented in numerous sites in the USA (www.mtfc.com). Beginning in 2002, MTFC was also implemented in 18 sites in the UK and Wales. The 2008 study using the Cost Calculator was conducted to calculate the costs of setting up and maintaining MTFC, and to examine how these costs compared with those of other types of programs for young people with similar needs. The aims were first to calculate the costs of setting up the program in local authorities, second to calculate the ongoing costs of supporting a young person in MTFC over time, and third to compare the costs incurred by the sample children during the period they were placed in MTFC with those incurred in the year prior to placement and in the placement they would have received had MTFC not been available.

The UK research team selected a sample of 24 young people placed in MTFC in five local authorities. To qualify for the study, MTFC programs in local authorities had to have had at least five young people aged between 10 and 16 who were, or who had been, in an MTFC placement for 6 months or more. Data were collected on the care costs (Ward et al. 2008) to cost the care pathway of each child in the sample during the period spent in MTFC, and during the 12 months before placement, and during a post placement time frame.

Table 1 shows a comparison of the costs for each of the eight core processes for youth placed in local "regular" foster care, agency foster care (analogous to treatment foster care), residential care and MTFC. As can be seen there, the average monthly cost for maintaining an MTFC placement (Process Three) is around £500 higher than that of maintaining a placement in regular foster care, but about 60% of the cost of maintaining a placement in residential care. The costs of arranging MTFC placements (Processes One and Five) are around £5,000 higher than those of arranging placements in regular foster or residential care, however Process One and Five costs are discrete (one-time for each placement) while Process Three costs are ongoing (monthly). Each month spent in MTFC costs less than a month in agency residential care, so that the extra costs of arranging the placement will have been recuperated after the first 5 weeks.

Overall, the study showed a reduction in social care costs when children were placed in MTFC. The social care costs incurred by the sample children in the first 6 months of MTFC were about 15% less than those they had incurred

**Table 1** Unit costs of MTFC-E compared with other types of care for children with similar needs in 2006–2007

| Process number | LA foster care in LA area (£) | Agency foster care in LA area (£) | Agency residential in LA area (£) | MTFC-E cost (£) |
|---|---|---|---|---|
| 1 | 1,069 | 1,391 | 1,346 | 6,157 |
| 2 | 120 | 120 | 120 | 120 |
| 3 | 2,729 | 5,020 | 9,818 | 5,645 |
| 4 | 263 | 263 | 263 | 263 |
| 5 | 635 | 956 | 1,036 | 5,868 |
| 6 | 572 | 572 | 572 | 402 |
| 7 | 2,765 | 2,765 | 2,765 | 2,765 |
| 8 | 1,164 | 1,164 | 1,164 | 1,164 |

in the 6 months prior to entry. The monthly costs of maintaining MTFC placements were also substantially less than those of the residential placements. They were also on a par with placements costs in independent fostering agencies and less costly if these proved to be less stable. When costs were considered over a longer timeframe, the annual cost to maintain a child in MTFC (including the reviewing and planning processes) was around £68,544. This compares with an annual cost of £61,384 to maintain a child with similar needs in agency foster care, £118,960 in agency residential care and £161,548 in local authority residential care. These costs would be increased substantially if the placement was made out of the area of the placing authority.

## Conclusion

The US adaptation of the Cost Calculator for estimating child welfare costs is a first step toward significant progress in an underdeveloped area of CWS research. Advancement in this challenging area of research is directly related to future practice improvements such as implementing evidence-based services within the resource-stressed CWS. The Cost Calculator does not yet include the capacity to assess costs in other public sector systems such as mental health or juvenile justice where potentially important cost offsets could be examined; however, progress in assessing such costs is occurring in England, where additional modules are being developed. The innovative modular structure of the Cost Calculator allows for incremental expansion so that new cost modules can be added to those previously developed using the same systematic methodology that was used to create the original Cost Calculator. The adaptation of the Cost Calculator and the initial focus on costing placement disruptions is seen as a building block from which, in collaboration with the UK, the capacity to estimate costs in future implementation studies and in preventive and intervention trials could be expanded. This increased capacity could have broad scientific and practical significance relevant to implementation research within the US CWS.

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