Estimating the Size and Components of the U.S. Child Care Workforce and Caregiving Population

Key Findings from the Child Care Workforce Estimate

(Preliminary Report)

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Center for the Child Care Workforce,
Washington, D.C.

Alice Burton
Marcy Whitebook, Ph.D.
Marci Young
Dan Bellm
Claudia Wayne

Human Services Policy Center,
University of Washington,
Seattle, Washington

Richard N. Brandon, Ph.D.
Erin Maher, Ph.D.

Center for the Child Care Workforce
733 15th Street, N.W., Suite 1037
Washington, DC 20005
(202) 737-7700

Human Services Policy Center
Evans School of Public Affairs
Box 353060
University of Washington
Seattle, WA 98195
(206) 543-8483

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The Center for the Child Care Workforce
The Center for the Child Care Workforce, founded in 1978 as the Child Care Employee Project, is a nonprofit research and education organization whose mission is to improve the quality of child care services by improving child care jobs—upgrading the compensation, working conditions and training of child care teachers and family child care providers.

Human Services Policy Center
The mission of the Human Services Policy Center (HSPC) at the University of Washington's Daniel J. Evans School of Public Affairs is to improve the well-being of children and families by promoting collaborative and preventive approaches to service across the bounds of professions, disciplines, and service organizations. HSPC conducts quantitative research in a wide range of child and family issues, considering the relationships among child well-being, financing policy and workforce issues, and seeks to improve the understanding of policy leaders and the general public.

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Executive Summary

In response to the rising demand for data on the child care[1] workforce, the Center for the Child Care Workforce (CCW) and the Human Services Policy Center (HSPC) at the University of Washington have embarked on a two-year research project to develop a framework and methodology for quantifying the size and characteristics of the U.S. child care workforce much more completely than has been done before. Our focus is on the workforce serving children ages 0 through 5 (excluding children enrolled in kindergarten).

Policy makers and organizations are turning increased attention to solving child care staffing problems – not only ensuring adequate staffing to meet families' current and future needs for services, but developing appropriate training programs, as well as local, state and national initiatives to improve the compensation and retention of the child care workforce. As they do so, they need complete counts of the size and character of the present workforce, and longer-range estimates of the demand for child care of different types that will factor in not only growth in the profession but high rates of occupational turnover.

The estimation model developed for the project is a "demand-based" approach, drawing on national data sets in which child care consumers (parents) describe their current use of child care services and child:adult ratios for this age group. We then take into account the best available data on the supply of child care workers and on such industry characteristics as turnover. Our effort has been not only to provide more complete estimates of the size and characteristics of this workforce, but also to build a new vocabulary for describing the workforce, conceptualizing and categorizing it more clearly than has been done before.

For our estimates of the child care workforce, we have included:

- The teaching staff of center-based programs, including Head Start programs, pre-kindergarten programs, nursery schools, and community-based private and public child care centers;
- Family child care providers caring for unrelated children in their own homes;
- Paid non-relatives caring for children on a regular basis in the child's home, such as nannies and other paid in-home caregivers;
- Paid relatives caring for children on a regular basis.[2]

[1] The term "child care" is used in this report as a generic term to encompass the many types of early care and education programs serving children ages 0-5 – including such center-based programs as nursery schools, pre-kindergarten programs, Head Start, and public and private child care centers, and such home-based services as family child care and care by relatives or other non-parental caregivers.

[2] We have excluded office workers and other non-teaching staff at child care centers or family child care programs and volunteers and other unpaid providers, including relatives (other than parents) and non-relatives.

Key Findings

Paid caregivers for children ages 0 through 5 are the primary focus of the study. We estimate a total of 2.3 million such caregivers in the child care workforce at a single point in time, and 2.5 million over the course of the year because of occupational turnover.[3] These figures are substantially higher than the total of 1.7 million child care workers and preschool teachers *for all children ages birth through 12* that can be derived from Census Bureau and Bureau of Labor Statistics data.

- Of the 2.3 million individuals paid to care for children ages 0-5 in the U.S. in a given week, looked at by the setting in which the adult works, approximately:

550,000 (24%)
are working in center-based settings, including private and public child care centers, Head Start programs, and pre-kindergarten programs,

650,000 (28%)
provide family child care,

804,000 (35%)
are paid relatives other than family child care providers,

298,000 (13%)
are paid non-relatives other than those working in centers or family child care programs (e.g., nannies).

- Looked at by the age of child with whom the adult works, approximately:

667,000 (29%)
are caring for infants (0-18 months),

1,133,000 (49%)
are caring for toddlers (19-36 months),

501,000 (22%)
are caring for pre-schoolers (3-5 years).

In addition to the paid child care workforce, the total U.S. "caregiving population" serving children 0-5 also includes approximately 2.4 million individuals providing unpaid child care during a given week. Most (93%) are *unpaid* relatives, and the remainder are volunteers in center-based programs (primarily parent volunteers) and unpaid, non-relative caregivers.

[3] Occupational turnover data is available in the research literature only for center-based staff and family child care providers, at an estimated rate of 18% per year. Since such data is not available for other segments of the child care workforce, our figure of 2.5 million workers needed over the course of a year is a conservative estimate.

Implications of Findings

As we suspected at the outset of the study, U.S. workers who care for children ages 0-5 have been seriously undercounted in previous analyses, and, as a result, the economic and social contribution of child care workers and the projected future need for child care workers (as well as the resources to train and pay them) have been seriously underestimated. It appears from these findings that paid home-based providers, primarily relatives caring for young children, are most often missed in the currently available federal government counts. We also found a surprisingly high number of caregivers working with toddlers (age 19-36 months), suggesting that caregiving skills for this age group should be a major focus of training and professional development. The disproportionate share of toddler caregivers is due to three factors: the ratio of children to adults is much lower in toddler care than for older children; our population estimates indicate there are more toddlers than pre-schoolers; and more infants remain in parental care.

Our demand-based estimate reveals that more than one-third of the child care workforce is comprised of paid relatives, a finding that adds complexity to the conventional view of child care workers in our society. We have chosen to include this population in the workforce estimate because they are paid to do the work on a regular basis, often for a substantial number of hours per week. In recent years, largely in the wake of welfare reform, certain public child care subsidies have been made available for the first time to relatives and other unlicensed providers. The share of subsidized children receiving care by relatives ranges from about twenty to fifty percent, varying widely by state (Collins et al., 2000; U.S. Department of Health and Human Services, 1998). It remains to be seen what impact this policy will have across sectors of the child care workforce in terms of regulation, professionalism, compensation, and turnover or stability.

The second year of the project is now focused on adapting this methodology so that it can be applied to produce state- and community-level estimates. The project has been funded by the Child Care Bureau, Administration for Children, Youth and Families, U.S. Department of Health and Human Services.

Introduction

The demand for data on the child care[4] workforce is rising. Policy makers and organizations are turning increased attention to solving child care staffing problems – not only ensuring adequate staffing to meet families' current and future needs for services, but developing appropriate training programs, as well as local, state and national initiatives to reward and retain child care workers. As they do so, they need complete counts of the size and character of the present workforce, and longer-range estimates of the demand for child care of different types that will factor in not only growth in the profession but high rates of occupational turnover.

In response, the Center for the Child Care Workforce (CCW) and the Human Services Policy Center (HSPC) at the University of Washington have embarked on a two-year research project to develop a framework and methodology for:

1. Quantifying the size and character of the U.S. child care workforce much more completely than has been done before, and

2. Adapting our methodology so that it may be developed for state- and community-level estimates.

This working paper describes our findings and methodology related to the first of these two questions: estimating the size and characteristics of the current U.S. child care workforce serving children ages 0 through 5 (excluding children enrolled in kindergarten). The estimation model developed for the project is a "demand-based" approach, drawing on national data sets in which parents describe their current usage of child care services and child:adult ratios for this age group. We then take into account the best available data on the supply of child care workers and on such industry characteristics as turnover. The project has been funded by the Child Care Bureau, Administration for Children, Youth and Families, U.S. Department of Health and Human Services.

[4] The term "child care" is used in this report as a generic term to encompass the many types of early care and education programs serving children ages 0-5 – including such center-based programs as nursery schools, pre-kindergarten programs, Head Start, and public and private child care centers, and such home-based services as family child care and care by relatives or other non-parental caregivers. Where appropriate, the report distinguishes among program types such as Head Start and pre-kindergarten programs.

The Need for Better Information on the U.S. Child Care Workforce

The U.S. Bureau of Labor Statistics has named the category of "child care workers" as among the fastest-growing occupations for the decade 1998-2008, a distinction shared with computer programmers, elementary school teachers and registered nurses, and has estimated that this category will need to grow by 26% during that period.

Yet although there is every indication that we will need new caregivers of many types—given high turnover rates, growing demand for non-parental care, and the difficulty of recruiting and retaining teachers and other caregivers in this typically very low-paying field—available data sources have offered little information about the size and composition of this complex workforce, including educational qualifications and other demographic characteristics.

A number of policy efforts are now underway to ensure adequate child care staffing for meeting families' needs, to develop appropriate caregiver training programs, and to offer wage increases, stipends and other financial incentives to child care workers. Better compensation has been positively associated with improvements in observed child care quality and good developmental outcomes for young children, including heightened school readiness.[5] Yet policy makers have largely been forced to develop and monitor such initiatives without the benefit of reliable estimates of the numbers, demographic characteristics, and educational qualifications of center-based and home-based caregivers in target states and communities. Most counties in California, for example, using a new tobacco tax fund earmarked to services for young children, have begun developing initiatives to reward child care teachers and providers with stipends linked to their levels of training and education. But without accurate data or a systematic method for estimating the size of the workforce, policy makers and program administrators have been seriously hampered in budgeting for the initiatives, identifying

[5] While the findings presented here are for the nation as a whole, and thus not directly applicable to local communities crafting child care policies, the computational model we have developed should prove to be useful at the state and local level. We are currently conducting a second stage of the study to refine state and local applications of the model.

underserved populations of caregivers, monitoring progress, and projecting community demand for child care-related training.

Major questions about the child care workforce also persist for policy makers, researchers and others who are concerned about serving various populations of children and families with appropriate services. For example, given what we know about the demand for family child care[6] services for infants, and factoring in annual turnover in family child care, how many new providers and assistants will be needed each year in the United States? Similar questions persist for meeting the child care needs of other groups, including racial and ethnic minorities, children with limited English proficiency, and children with disabilities. Educational reform initiatives that seek to increase school readiness will also need better estimates of human resource capacity in the early care and education field.

Further, more accurate figures are needed for building greater public awareness of the dimensions of child care staffing problems. Now that the teacher shortage in elementary and secondary education has been widely publicized and recognized, it would be highly beneficial to have comparable data placing the supply of and demand for child care workers in such a perspective – especially because these occupations are so interdependent, with many teachers and caregivers moving from the child care field to jobs in elementary education. A more accurate estimate of the number of child care workers – placed in the context of high rates of turnover and growing demand for services – could heighten awareness of the crucial role they play in supporting the U.S. economy, and in promoting good outcomes for children such as improved school readiness. This could also heighten awareness of the need for public policy to support greater professionalism and better compensation in this field.

[6] For the purposes of this study, "family child care" is defined as paid, out-of-home, non-relative care.

Limitations of Existing Data Sources

The available data sources and estimates that we examined at the beginning of this study indicated a total of 1.7 million members of the U.S. child care workforce, including center-based and home-based providers, as of 2000. But this estimate is unreliable for several crucial reasons.

While teachers in grades K-12 are individually certified, and thus relatively easy to track and count, no such system exists in child care. Although the licensing of certain centers and home-based programs allows for rough tabulations of the numbers of child care workers in these sectors, the estimates are questionable, given the often incomplete data collection at the state level, and the differing methods among the states for categorizing home-based providers.

We also lack a current survey of the child care workforce on the scale of the 1990 Profile of Child Care Settings (Willer et al., 1991). Further, the child care data samples gathered in recent years as part of research studies have not focused on all segments of the workforce. Very little research has been devoted to the large "informal" sector of unregulated child care by family, friends and neighbors, even though it is increasingly receiving public child care dollars.

Data collection by the U.S. Department of Labor, which is the primary source of ongoing information about the size of the center-based child care workforce, is limited by its longstanding practice of classifying different members of the workforce, as "preschool teachers" or "child care workers" – categories that have little relation to actual job duties. The more typical job titles in most child care centers are "teacher" and "assistant teacher" for center-based care, and "provider" and "assistant" for family child care settings; these correspond more accurately to patterns of responsibility and lines of supervision. Although Department of Labor reports on the number of preschool teachers and child care workers would seemingly provide a reliable measure of the overall number of teaching staff employed in centers serving children 0-5, the job titles muddy our understanding of the distinct roles played by teaching staff, and omit other key staff such as center directors.

The currently available profile of home-based child care workers, both licensed and unregulated, is particularly limited. The Department

of Labor does not track self-employed workers, and therefore excludes the majority of family child care providers from its surveys. The U.S. Census Bureau's Current Population Survey (CPS), which includes people who care for children in their own homes, offers no information about whether respondents are licensed family child care providers, non-parental relatives of the children they care for, or providers of other kinds of services. It has long been suspected that home-based child care providers are undercounted by the CPS, due to the reluctance of many providers to declare their occupations – either out of concern about unreported or under-reported income, or a disinclination (particularly among relatives providing child care) to define their services as an occupation. Nor have reliable projections been made of the demand for family child care and other home-based forms of care on the parent/consumer side. In the absence of better information, it has remained difficult to grapple with how, and in what sectors, the child care workforce needs to grow, e.g. by type of care, and with caregivers of what levels of education and experience.

Our interests in improving on the estimates currently offered by child care workforce data sources are threefold:

1. To develop a clear set of concepts and definitions of who is to be included in the "child care workforce," recognizing that the broader "caregiving population" is comprised of a range of participants, from full time workers, to those who work part time or intermittently, to those for whom pay may be secondary to helping a family member. We believe it is important to estimate the number of unpaid caregivers as well, since they play a critical role in caring for young children.

2. To estimate more accurately and completely the number of individuals in the child care workforce at a single point in time and annually, including previously undercounted sectors (such as home-based care providers) and taking account of high turnover within the course of a year.

3. To produce estimates which are more consistent with the occupational categories normally used in the field.

Who is Included in the Child Care Workforce?

Our approach in this study has been to estimate the entire U.S. "caregiving population" – the non-parental population caring for children ages 0-5 in the U.S. at any given time, whether paid or unpaid – and, within that number, to estimate the subgroup of people who could be considered members of a bona fide, paid "child care workforce." The following discussion concerns our rationales for whether or not various segments of the caregiving population should be included in the workforce estimate.

Clearly included in the child care workforce are:

- The teaching staff of center-based programs, including Head Start programs, pre-kindergarten programs, nursery schools, and community-based private and public child care centers;
- Family child care providers who are licensed or regulated to care for a group of young children in their own homes;
- Nannies and other paid in-home caregivers.

Potentially included are:

- Paid relatives caring for children on a regular basis;
- Paid non-relatives (including friends, neighbors, unlicensed family child care providers, and nannies) caring for children on a regular basis;
- Office workers and other non-teaching staff at child care centers or family child care programs;
- Unpaid providers, including relatives (other than parents) and non-relatives.

Paid Relatives

A major issue is whether paid relatives, about two-thirds of whom are grandparents, should be included in the child care workforce estimate. In a minority of cases, payment comes in the form of a public subsidy, which could otherwise be paid to workers in formal settings. Paid relatives provide care for an average of approximately 35 hours per week; for many, therefore, it is the equivalent of a full-time job (Human Services Policy Center, 2002).

Conclusion: We have decided to include estimates of paid relatives in our final estimates of the paid child care workforce, but to present this group as a separate category as appropriate. We recognize that there are significant policy implications involved in considering paid relatives as part of the workforce, and that they generally have not been counted as such in previous studies. See further discussion in "Implications of Findings."

Paid Non-Relatives

Many friends, neighbors and other types of unlicensed caregivers are also paid to care for young children. For reasons similar to those offered above for paid relatives, we will include these in our final estimates of the child care workforce. Further, since one of our major data sources, the 1999 National Household Education Survey (NHES-99), a nationally representative survey conducted by the National Center for Education Statistics (NCES), does not differentiate among types of non-relative child care arrangements, we assume that some of the

paid, non-relative, out-of-home caregivers would actually meet the definition of "family child care provider." Those definitions, of course, vary considerably by state.

Conclusion: We include estimates of paid non-relatives in the final estimates of the paid child care workforce, and categorize paid, non-relative, out-of-home caregivers as family child care providers. Paid, non-relative, in-home providers, such as nannies, are also included as part of the child care workforce, but in a separate category from family child care providers.

Office Workers and Other Non-Teaching Staff

The question of including office workers and other non-teaching staff in the estimates of the child care workforce raises the issue of whether we are estimating the workforce of an occupation or of a sector. In the case of estimating the entire child care sector – i.e., the total workforce of all organizations and entities that offer child care as a service – non-teaching staff would be included.[7] If our interest, however, is in estimating how many individuals are regularly providing direct care to children on a paid basis, then office assistants and other administrative staff should not be included.

Conclusion: We have decided to focus on child care as an occupation, rather than as a sector, and therefore are excluding office workers and other non-teaching staff from our estimates.

Unpaid Caregivers

Finally, there is the category of unpaid and/or volunteer, non-parental caregivers. These are caregivers who should not be considered members of the paid workforce, but for whom it is useful to develop estimates in order to complete the picture of all individuals offering child care. These estimates help provide a sense of how much the paid workforce would have to expand if we were to move the care provided in these unpaid settings to more formal paid settings. They also provide a way to achieve an estimate of the cost of paying unpaid providers if payment policies were to change.

Conclusion: We have decided to exclude unpaid relatives and non-relatives who care for children on a regular basis, as well as child care center volunteers, from our estimates of the child care workforce, but to include them in our overall estimate of the larger U.S. caregiving population.

[7] Non-teaching staff in a child care center could include not only administrative office personnel, cooks, custodians, and drivers, but such direct-care-related positions as social workers, educational coordinators and family support specialists.

A Demand-Based Estimate of the Child Care Workforce

Our study has been prompted by the lack of reliable data that cover all child care workers and that correspond to occupational titles and responsibilities as generally recognized in the field. Due to the limitations of existing data from the U.S. Department of Labor's Bureau of Labor Statistics (BLS) and the U.S. Census Bureau, we have found it necessary to develop an alternative route for estimating the size and characteristics of the U.S. child care workforce, and of the larger "caregiving population" within which it operates.

Our approach follows a relatively simple logic. A recent, reliable, nationally representative household survey is available that asks parents about their child care usage: the 1999 National Household Education Survey (NHES-99), conducted by the National Center for Education Statistics. (This survey is described in more detail in Appendix A, "Data Sources and Methodology.") Parents were asked in the survey whether or not their children use a particular child care arrangement (including center-based care, and home-based care by relatives or non-relatives), and for how much time each week; how many children and adults are in the room for each type of care they use; and whether the care is paid or unpaid, and in-home or out-of-home. If we know how many children are in each type of care (paid and unpaid), the number of hours they use that care, and the ratio of children to adults, we can infer the number of paid and unpaid adults who must be caring for children at a given point in time. We can then make a variety of adjustments to move from an estimate of hours of care to the number of individuals providing care – a single-point-in-time "workforce estimate" – by factoring in our knowledge from other data sources of the average number of hours that caregivers work per week. We then move from an estimate of the number of caregivers in a single week to an annual workforce estimate by factoring in the occupational turnover rate.

Since we are working from a data base of individual households and children in care, and the survey includes demographic and other information about each child in care, we can also infer how many adults are caring for children with different characteristics. We do this by examining the patterns of care and reported child:adult ratios for subsets of children with each characteristic of interest. We illustrate this method for two ethnic groups (African American and Latino children), for children with disabilities, and for children with limited English language proficiency.

Our approach does carry certain limitations and potential controversies. In order to compute a single total, we have worked from the available categories of care, using several estimates, each with its own potential margin of error. There is also the possibility of parent misreporting of child care usage due to inaccurate recollection, and the possible inaccuracy of parent reports of the number of adults

per child working in a child care program.[8] Further, in order to adjust our estimates, we have relied on various secondary studies, each of which has its own set of limitations. Finally, our decision to include paid relatives and various categories of paid non-relatives in the child care workforce has significant policy implications, and in general, child care workforce studies and estimates have not included these groups.

Our approach, however, has the advantage of producing workforce estimates that are directly linked to the patterns of child care usage in the general population. Delineating these linkages will allow us to project potential workforce changes likely to result from changes in use of care. Thus, if there is a shift from parental care to family child care as a result of financing changes, we can readily estimate the number of additional family child care providers that would be required in order to accommodate that shift. Similarly, linking workforce estimates to children's characteristics yields important information. For example, parents were asked in the NHES-95 and 99 whether their child has a special physical or emotional need.[9] Hofferth's (1998) analysis of the NHES-95 demonstrated that children with special needs were more likely to be in center care, and to be in care with lower child:adult ratios, than other children. Our analysis of the NHES-99 shows similar results. We can thus use our estimation method to determine roughly how many adults are caring for special needs children on a paid or unpaid basis – information that is important for planning appropriate training and support for such caregivers in various settings. Knowledge of the settings in which caregivers work is important for designing delivery systems, since, for example, the types of training materials that would be developed for child care center staff are not likely to be as effective with grandparents who are paid to care for a child.

Our estimates are much less certain, however, when we are dealing with characteristics of children (e.g., ethnicity, disability status, and limited English proficiency), due to our inability to determine the extent to which children with these characteristics are concentrated in or dispersed among caregiving locations. For example, let us assume that there are five children with disabilities using center care, and that for these children, parents report an average child:adult ratio of 5:1. If all five of these children are in a single setting – that is, only with other children with disabilities – then only one provider per five children is caring for a child with a disability and would need to have special skills or training. But if the five children are in five separate settings – namely, each is cared for with four children without special needs – then there would be a total of five child care workers spending a portion of their time with a special needs child and requiring appropri-

[8] For center care, we offer an adjustment to the parent-reported child:adult ratios that is based on a single study documenting the extent of parent misreporting of child: adult ratios in center-based care (Willer et al., 1991).

[9] "Special needs" in the NHES-99 survey is defined as having at least one of the following conditions: learning disability, mental retardation, speech impairment, serious emotional disturbance, deafness or other hearing impairment, blindness or other visual impairment, an orthopedic impairment, or another health impairment lasting six months or more.

ate training and support. For these characteristics of children, we therefore report an estimated range of caregivers, with the mid-point suggesting a moderate level of concentration. These ranges are often quite large, as they reflect two very different scenarios: namely, high concentration or high integration of children from different populations in each type of child care.

We would also like to describe the characteristics of caregivers, including their age, educational background and income. While we cannot derive these characteristics from a reliable national data base, we do have other sources for such information. In reviewing the research literature (see Appendix C), we found a variety of studies that provide reasonably reliable information on the characteristics of caregivers in each component of the child care sector: centers, family child care homes, and the population of paid relatives, friends and neighbors. While the data in these studies are not amenable to a formal meta-analysis, we have been able to delineate converging estimates for key characteristics. We therefore report the distribution of characteristics for the workers in each type of care.

Single-Point-in-Time Estimates vs. Annual Estimates

An important issue is whether to estimate the number of child care workers at one point in time, or over the course of a year. Labor force statistics are usually estimates of the number of workers in a sector or occupation at a single point in time, usually one week. For purposes of comparing child care workers to other occupations, the weekly point-in-time estimate is the most appropriate. However, if we wish to use the child care workforce estimates for such purposes as estimating how many people must be recruited into the field, or the professional development resources that should be made available, we need to take into account the total number of individuals who provide child care over the course of a year. The critical factor relating the annual estimate to the single-point-in-time estimate is the occupational turnover rate – the number of individuals entering or leaving the occupation during the course of a year.

For center-based staff and family child care providers, we have reasonably reliable occupational turnover estimates from the literature review, and we use these to adjust the weekly point-in-time estimates up to annual estimates.[10] We do not, however, have turnover estimates for other types of paid caregivers, whether relatives or non-relatives, and therefore include the weekly point-in-time estimates for those workers in the annual total, knowing that we are thereby giving a minimum estimate of that portion of the workforce through the course of the year. One advantage of our methodology is that if turnover estimates for these "informal" paid caregivers become available, our estimates can easily be adjusted accordingly. Similarly, if policy initiatives such as efforts to raise child care workforce compensation succeed in reducing turnover, our annual estimates can be adjusted downward. Our methodology could thus be used to estimate the reduction in the number of caregivers that could be achieved if turnover were to be reduced.

[10] The study used to estimate occupational turnover for center-based providers in a given year is based on a sample of relatively high-quality centers in one state, but is the only available evidence separating occupational turnover from job turnover (Whitebook, Sakai, Gerber & Howes, 2001). It is therefore a lower-bound estimate of turnover and leads to a lower-bound estimate of the number of caregivers.

Defining Types of Care and Job Responsibilities

Since paid and unpaid caregivers of young children can potentially shift status in response to public policies, it is important to account for both groups. The provision in the federal Child Care and Development Fund (CCDF), requiring states to pay relatives who care for subsidy-eligible children,[11] has undoubtedly increased the number of relatives who are paid for the child care they provide. Estimates of the percentage of children receiving CCDF assistance who use relative care range from about 25 percent (Collins et al., 2000) to 50 percent (U.S. Dept. of Health & Human Services, 1998). Similarly, if expanded financial assistance policies led more parents to use non-parental care, allowing them to spend more hours in paid employment, this would also yield an increase in the paid child care workforce. But as indicated above, estimating the size of the child care workforce and categorizing its members are difficult tasks, and it is particularly challenging to compare varying estimates across different data sources.

Our demand-based approach, using the NHES-99 survey, overcomes many limitations of other surveys (such as the Current Population Survey and reports from the Bureau of Labor Statistics) by allowing us to count the number of unpaid providers, and to include home-based workers in the count of paid providers but to exclude kindergarten teachers. The classification of child care providers into categories that represent the occupation, however, is limited by the type of child care arrangements asked about in the survey. However, we rely on available secondary sources to break down the major categories of workers into positions. For the purposes of our estimates, we have used the following definitions:

Paid Providers

Center-Based Staff: Providers working in child care centers, including pre-kindergarten and Head Start programs. (Center directors, however, are not counted as part of classroom staff.)[12]

- Teachers
- Assistant teachers
- Directors

Family Child Care Providers: Non-relative paid providers offering child care in their own home.

- Providers
- Assistants

Paid Relatives. Relatives, typically grandparents, who are paid (sometimes through public subsidy) to offer child care in their own home or in the child's home.

Other Home-Based Caregivers: Paid, non-relative providers, such as nannies, offering care in the child's home.

Unpaid Providers

Center-Based Providers: Volunteers (often parents), who are not considered part of the regular classroom staff and are not counted for regulatory purposes in child:adult ratios.

Non-Relatives: Unpaid non-relatives providing care on a regular basis either in or away from the child's home.

Relatives: Unpaid relatives, other than parents, providing care on a regular basis either in or away from the child's home.

[11] This requirement is subject to state health and safety requirements, and other limitations that states may impose on in-home care.

[12] There is some potential for over-counting of directors here, to the extent that in small centers, parents may observe directors in the classroom and include them in the reported child:adult ratio.

Job Turnover and Occupational Turnover

Employee turnover is typically defined in one of two ways. "Job turnover" occurs, for example, when a teacher leaves a particular child care center but does not necessarily leave the child care field; such a person might obtain employment in a different center, or open a family child care business. Available data about child care worker turnover generally describe job turnover, and concern about the impact of high turnover typically centers around this type, because of the instability it causes for co-workers, parents and children. "Occupational turnover" refers to instances in which a worker departs not only from his or her particular workplace, but leaves the occupation altogether. Occupational turnover, unlike job turnover, has a direct impact on the overall supply of caregivers available to fill positions in programs serving young children, and thus is of direct relevance to our annual estimates of the number of child care workers.

The turnover of self-employed home-based providers, such as family child care providers or relative care providers, can also be characterized as job or occupational turnover, depending on whether they remain in the field by becoming teachers in a center or by other means, or move out of providing child care altogether.

Turnover is typically expressed as an annual rate, measured by dividing the number of staff of a workplace who left in the previous year or other interval, by the total number of staff employed at one moment in time (typically, at the time of observation or interview). In cases in which a single position turns over more than once in a year, each staff departure is counted as an instance of turnover. In the case of home-based providers, such as family child care providers or relative care providers, turnover rates express the percentage of providers who no longer care for children in exchange for payment.

Major Findings

We first present our estimates of the size of the overall U.S. caregiving population and of the child care workforce; then the numbers of child care workers caring for children of different characteristics; then the key characteristics of the child care workforce. We also show the number of children in care, by age and type, from which the workforce estimates were derived. We present point-in-time estimates for a typical week as well as annual estimates, each of which is useful for different purposes.

1. The Size of the U.S. Caregiving Population for Children Ages 0 Through 5

As detailed in Table 1 on the following pages, there are nearly 5 million individuals caring for someone else's child or children ages 0 through 5 in the United States, excluding those enrolled in kindergarten, in any given week. Slightly fewer than half of these are paid for the care they provide.

The Paid Child Care Workforce

A. Single Point-in-Time Estimate Approximately 2.3 million individuals are paid to care for children ages 0-5 in the U.S. in a given week. (See Table 1, and Figures 1 and 2.)

- Looked at by the setting in which the adult works, approximately:

550,000 (24%) are working in center-based settings, including private and public child care centers, Head Start programs, and pre-kindergarten programs,
650,000 (28%) provide family child care,
804,000 (35%) are paid relatives other than family child care providers,
298,000 (13%) are paid non-relatives other than those working in centers or family child care programs (such as nannies).

- Looked at by the age of child with whom the adult works, approximately:

667,000 (29%) are caring for infants (0-18 months),
1,133,000 (49%) are caring for toddlers (19-36 months),[13]
501,000 (22%) are caring for pre-schoolers (3-5 years).

B. Annual Estimate At least 2.5 million individuals are paid to care for young children in a given year – a higher number than the above point-in-time estimate due to occupational turnover. Note: Turnover estimates are available in the research literature for center-based staff and family child care providers, but not for other caregivers such as paid relatives and non-relatives. As a result, our figure of 2.5 million workers needed over the course of a year is a conservative estimate.

- Approximately 104,000 more individuals are needed to work in child care centers through the course of a year than during a single week.
- Approximately 107,000 more family child care providers are needed on an annual basis than during a single week.

Unpaid Caregivers

The total U.S. caregiving population also includes approximately 2.4 million individuals providing unpaid child care during a given week. (See Table 1, and Figures 3 and 4.)

- By provider setting, approximately:

42,000 (2%) are volunteers (primarily parent volunteers) in center-based programs,
2,232,000 (93%) are unpaid relatives,
121,000 (5%) are unpaid non-relative caregivers.

- By age of child in care, approximately:

756,000 (32%) are caring for infants,
1,128,000 (47%) are caring for toddlers,
511,000 (21%) are caring for pre-schoolers.

[13] It is notable that such a significantly larger number of providers are caring for toddlers. This may be because there is relatively little non-parental care for infants, and because child:adult ratios are higher in the care of pre-schoolers. A substantial number of providers caring for toddlers are likely to be friends, family members or neighbors, whether paid or unpaid.

Table 1: Demand-Based Estimates of the Size of the Overall U.S. Caregiving Population, Including the Paid Child Care Workforce and Unpaid Caregivers, per Week, by Age of Child (0 through 5) and Type of Provider

	Paid Child Care Workforce				
	Total Paid	Center-Based Staff	Family Child Care Providers	Paid Relatives	Paid Non-Relatives
Infants (0-18 mos.)	666,692	115,230	180,373	284,161	86,928
Toddlers (19-36 mos.)	1,133,353	242,354	355,232	387,012	148,755
Pre-schoolers (3-5 yrs.)	501,168	192,232	114,574	132,472	61,890
All Children 0-5	2,301,212	549,816	650,178	803,645	297,573

	Unpaid Caregivers				Caregiving Population
	Total Unpaid	Center-Based Volunteers	Unpaid Relatives	Unpaid Non-Relatives	Overall Total
Infants (0-18 mos.)	755,681	8,711	725,272	21,698	1,422,373
Toddlers (19-36 mos.)	1,127,921	18,322	1,034,735	74,864	2,261,273
Pre-schoolers (3-5 yrs.)	511,439	14,533	472,481	24,425	1,012,607
All Children 0-5	2,395,041	41,566	2,232,488	120,987	4,696,254

Figure 1:
Number of Child Care Providers at a Single Point in Time by Child Care Setting or Provider Type

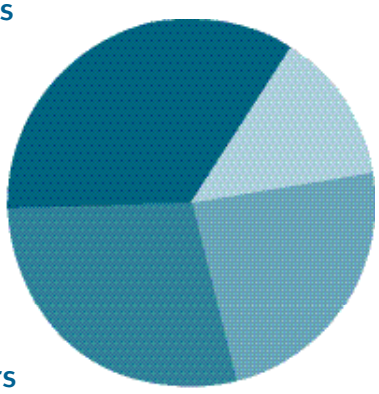


Figure 2:
Number of Child Care Providers at a Single Point in Time Providing Care for Each Child's Age Group

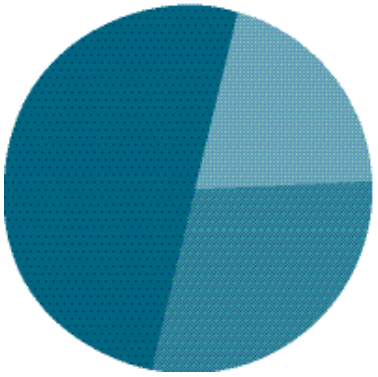


Figure 3:
Number of Unpaid Child Care Providers at a Single Point in Time by Child Care Setting or Provider Type

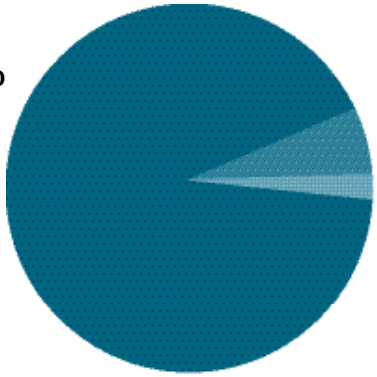
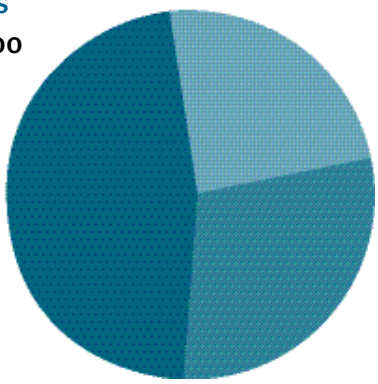


Figure 4:
Number of Unpaid Child Care Providers at a Single Point in Time Providing Care for Each Child's Age Group



2. Comparison of Demand-Based Estimates to Census Data

Our point-in-time, demand-based estimate of the number of child care workers serving children ages 0-5 in the United States indicates that there are approximately 600,000 more individuals being paid to care for children than are revealed by U.S. Census counts for all children ages 0-12 (U.S. Census Bureau, Current Population Survey, 2000). This difference would likely be even larger if our estimates also included child care providers caring for school-age children before and after school hours. The 804,000 paid relatives (largely grandparents) and non-relatives (other than family child care providers) are likely to form a major part of this difference.

Table 2: Summary of Child Care Workforce Estimates from U.S. Census Bureau's Current Population Survey (CPS) and from Demand-Based Approach

Child Care Workforce Categories	Number of Workers
U.S. Census, Current Population Survey (CPS), 2000	
Preschool Teachers (not including Kindergarten)[14]	470,000
Assistant Teachers	480,000
Family Child Care Providers	457,000
Child Care Workers, In-home	275,000
Total	**1,682,000**
Bureau of Labor Statistics, Occupational Employment Statistics, 2000	
Preschool teachers	357,000
Child care workers (including private households)	398,000
Total	**755,000**
Demand-Based Estimate	
Center-Based Staff	550,000
Family Child Care Providers	650,000
Paid Relatives	804,000
Paid Non-Relatives	298,000
Total	**2,301,000**

[14] Since the U.S. Census category of "preschool teachers" includes kindergarten teachers, we have subtracted the estimated number of kindergarten teachers reported in the U.S. Department of Labor's Occupational Employment Statistics 2000 from the CPS estimate reported above.

3. The Paid U.S. Child Care Workforce for Children Ages 0-5, by Job Responsibility

Note: We arrived at the following estimates of different job positions by taking the demand estimates for the total number of center-based staff and family child care providers, and then dividing them into categories, using ratios from the available research literature on the average numbers of each job position found in each setting. (See Appendix A, "Data Sources and Methodology.")

Of the 550,000 individuals working in centers in a given week,

- 57,000 are directors;
- 282,000 are teachers;
- 211,000 are assistant teachers.

Of the 653,000 individuals working in centers through the course of a year,

- 65,000 are directors;
- 324,000 are teachers;
- 264,000 are assistant teachers.

Of the 650,000 individuals working in family child care programs in a given week,

- 393,000 are primary providers;
- 257,000 are assistants.

Of the 757,000 individuals working in family child care programs during the course of a year,

- 457,000 are primary providers;
- 300,000 are assistants.

4. The Size of the Paid U.S. Child Care Workforce and Unpaid Caregiving Population Caring for Children with Selected Characteristics

To illustrate how our demand-based procedure can be applied to estimating the number of caregivers caring for children in certain populations, we use this method to estimate the number of workers caring for African American and Latino children, children with disabilities, and children with limited English proficiency.

As noted above, since we cannot determine the degree to which children of particular characteristics are concentrated in or dispersed among caregiving settings, we present our workforce estimates as ranges reflecting different levels of concentration. That is, if children from special populations are concentrated in one classroom or center, the number of caregivers in contact with these children will be lower than if we assume that the children are dispersed across settings. We therefore present a range of estimates. These ranges are often quite large, as they reflect two very different scenarios: namely, high concentration or high integration of children from different populations in each type of child care. The lower range assumes that children with a selected characteristic are highly concentrated, so that each caregiver is caring for several such children. The upper range assumes that such children are highly dispersed, with each caregiver interacting with only one such child among all the children in their care. The mid-points suggest a moderate level of concentration.

We are hopeful that the data provided on this topic could be of significant use to planners and policy makers who are considering the numbers and qualifications of staff necessary to provide appropriate services for certain

populations of children. Our findings certainly highlight the need for such services. But they also highlight the need for further research, particularly because it has been necessary to give such broad ranges in our estimates, and because we do not yet know how close or appropriate the current match is between caregivers and children in services for children from different subgroups where there is a specific policy concern.

We chose to select African American and Latino children as two examples of how data can be applied to various racial and ethnic groups, and not with the intention of being inclusive of all such groups in the U.S., among whom Asian American/Pacific Islander children are also prominent. Further research should be conducted on the size of other segments of the workforce, and of the skills needed to serve these other groups of children.

Table 3 presents as a range the number of caregivers caring for African American children ages 0-5, who are estimated to comprise 14% of the total U.S. population of children ages 0-5 who are not in school; for Latino children, estimated to comprise 17% of this population; for children with disabilities, estimated to comprise 8%; and for children with limited English proficiency, estimated to comprise 8%.

These estimates are based on the percentage of African American and Latino children in each type of care, the number of hours in which they use that care, where appropriate, and the reported child:adult ratio within that care. We estimate that there are anywhere between 503,000 and 1.9 million paid caregivers taking care of African American children, with a mid-point estimate of 1,208,000.

Given the rate of use, hours, and child:adult ratios reported by parents of Latino children, we estimate the number of paid caregivers providing care for Latino children to be between 376,000 and 1.1 million, with a mid-point of 749,000 – somewhat lower than the estimate for those caring for African American children. This lower estimate, despite slightly higher population numbers, is due to the smaller number of Latino children in paid child care, compared to other groups.

Using data on child care use and characteristics specific to children with disabilities and children with limited English proficiency, we estimate that anywhere between 309,000 and 1.1 million paid caregivers are caring for children with disabilities, with a mid-point of 725,000, and between 145,000 and 405,000 caregivers care for children with limited English proficiency, with a mid-point of 275,000.

If turnover is the same for center-based staff and family child care providers who care for children within these populations as for the general child care workforce, then for an annual estimate, we would expect each of these weekly estimates to increase by 15 to 25% for center-based staff (depending on position) and by 17% for family child care providers.

Table 3: Paid Workforce Caring for Selected Groups of Children 0-5, by Type of Provider, Per Week

	Center-Based Staff	Family Child Care Providers	Paid Relatives	Paid Non-Relatives	Total Workforce, All Types (Mid-Point Estimate)
African American Children	132,000-1,037,000	156,000-539,000	203,000-300,000	12,000-37,000	1,208,000
Latino Children	63,000-478,000	70,000-200,000	209,000-365,000	34,000-79,000	749,000
Children with Disabilities	84,000-629,000	78,000-262,000	115,000-177,000	32,000-73,000	725,000
Children with Limited English Proficiency	20,000-161,000	22,000-56,000	93,000-169,000	10,000-19,000	275,000

Characteristics of the U.S. Child Care Workforce

From our estimates of the number of providers, we then set out to estimate the number of providers in each of several demographic categories, including educational attainment, ethnicity, age and gender. This information could be valuable for a number of policy applications – for example, in determining whether the educational level of the child care workforce, which has been identified as an essential ingredient of program quality, has decreased, increased or remained stable in recent years. We approached this task through a detailed review of secondary data sources reported in the child care workforce literature, and our results are presented in Tables 4 through 11.

This approach, however, has had serious limitations. Not all segments of the child care workforce have been studied in the literature to date, and thus we present results only for those workers whose educational and demographic characteristics have been documented by recent research. In general, the center-based workforce has been studied in more detail, but even where workforce characteristics have been studied, the data were generally collected no more recently than the early to mid-1990s. In the absence of a new nationwide profile of child care settings, which has not been undertaken in over a decade, we have used the best data presently available. The sources and findings of the literature review are described in more detail in Appendix A, "Data Sources and Methodology."

Center-Based Child Care Workers

Table 4: Formal Education of Center-Based Staff

	Percentage of Workforce
Center Teachers	
Bachelor Degree or more	33%
Some College (including Associate Degree)	47%
High School or less	20%
Center Assistants	
Bachelor Degree or more	12%
Some College (including Associate Degree)	45%
High School or Less	43%
Center Directors	
Bachelor Degree or more	69%
Some College (including Associate Degree)	27%
High School or Less	4%

Source: Helburn, ed. (1995).

Table 5: Ethnicity of Center-Based Staff

	Percentage of Workforce
Center Teaching Staff (Teachers and Assistants)	
African American	16%
Asian American	3%
Caucasian	70%
Latino	11%

Source: Helburn, ed. (1995).

Table 6: Age of Center-Based Staff

	Percentage of Workforce
Center Teaching Staff (Teachers and Assistants)	
18 and younger	7%
19-25	34%
26-30	17%
31-50	34%
51 and older	7%

Source: Whitebook, Howes & Phillips (1990).

Table 7: Gender of Center-Based Staff

	Percentage of Workforce
Center Teaching Staff (Teachers and Assistants)	
Female	97%
Male	3%

Source: Helburn, ed. (1995).

Family Child Care Providers

Because these samples describe only licensed family child care providers, and our workforce estimates include both licensed and unlicensed providers, the following four estimates are approximate.

Table 8: Formal Education of Family Child Care Providers

	Percentage of Workforce
Bachelor Degree or more	17%
Some College (including Associate Degree)	38%
High school or less	44%

Source: Kontos, Howes, Shinn & Galinsky (1992).

Table 9: Ethnicity of Family Child Care Providers

	Percentage of Workforce
African American	17%
Asian American and Other	7%
Caucasian	71%
Latino	5%

Source: Kontos, Howes, Shinn & Galinsky (1992).

Table 10: Age of Family Child Care Providers

	Percentage of Workforce
20-29	8%
30-39	33%
40-54	44%
55+	15%

Source: Alameda Health Alliance (1997).

Table 11: Gender of Family Child Care Providers

	Percentage of Workforce
Female	99%
Male	1%

Source: Burton, Whitebook & Sakai (1994).

Implications of Findings

The findings of this study advance our understanding considerably about the U.S. child care workforce and the broader caregiver population of which it is a part. Our effort has been not only to provide more complete estimates of the size and characteristics of this workforce, but to build a new vocabulary for describing the workforce, conceptualizing and categorizing it more clearly than has been done before.

Beginning with paid caregivers for children ages 0 through 5, who are the primary focus of the study, we estimate a total of 2.3 million caregivers in the child care workforce at a single point in time, and 2.5 million over the course of the year because of occupational turnover.[15] It is particularly notable that these figures are substantially higher than the total of 1.7 million child care workers and preschool teachers *for all children ages birth through 12* that can be derived from Census Bureau and Bureau of Labor Statistics data. As we suspected at the outset of the study, U.S. workers who care for children ages 0-5 have been seriously undercounted in previous surveys, and as a result, the economic and social contribution of child care workers and the projected future need for child care workers have been seriously underestimated. It appears from these findings that paid home-based providers, primarily relatives caring for young children, are most often missed in the currently available federal government counts. We would also point out that, given the unexpectedly high proportion of the child care workforce serving the toddler age group, there may need to be a greater focus on toddler care in the design and implementation of caregiving training programs, particularly for those working in home-based care.

Paid Relatives

Our demand-based estimate reveals that more than one-third of the child care workforce is comprised of paid relatives, a finding that adds complexity to the conventional view of child care workers in our society. We have chosen to include this population in the workforce estimate because they are paid to do the work on a regular basis, often for a substantial number of hours per week.

Yet paid relatives have significantly different needs from workers in the more formal sectors of center-based care and licensed family child care. Relative care providers, like friends and neighbors, tend to charge lower fees, are less likely than those in the formal sector to self-identify as child care workers, typically receive little child care-related training, and are usually not formally affiliated with the early care and education profession. Typically caring for their own grandchildren, nieces or nephews, paid relatives are more likely to see themselves as helping out parents than as earning a living or pursuing a child care career. Studies have indicated, however, that these caregivers are concerned about the development of children in their care, engage in a range of learning activities with children, and desire opportunities for support that will improve the quality of their caregiving (Human Services Policy Center, 2002; Brown-Lyons et al., 2001; Porter, 1998).

A number of factors can lead parents to use relative care, including lower cost, lower numbers of children per adult, availability,

[15] Again, this may be a low annual estimate, since the estimate of occupational turnover is based partly on a sample of high-quality centers in one state (Whitebook et al., 2001).

familiarity of the caregiver to the child, the potential for flexible caregiving hours, and the desire to have a cultural and linguistic match between child care and home (HSPC, 2002, Pungello & Kurtz-Costes, 1999). In addition, federal law requires states to make child care subsidies available to relative caregivers (subject to state health and safety requirements and other limitations), although this stipulation currently affects a small portion of relatives paid to provide child care.

Recognition of paid relatives as part of the child care workforce raises several concerns and questions that should be addressed by additional research:

- To what extent does the widespread use of relative care reflect parent "choice," and to what extent does it reflect parent accommodation to a limited range (real or perceived) of available child care options?

- Will counting this group in the child care workforce inadvertently complicate efforts to promote early care and education as skilled work that requires specialized education and training? Or will it encourage paid relatives to take their responsibilities more professionally and obtain additional training?

- Should public child care subsidies continue to be made available to relative care providers? Is this an appropriate and desirable way to expand the U.S. child care delivery system, and to make it more diverse and accessible, albeit that this method may well be the quickest and least costly approach? This policy is a relatively new phenomenon; the current mix of paid and unpaid caregivers is partially a response to funding policies, and may change as those policies change.
- What impacts will the reimbursement of relatives and other unlicensed caregivers have across sectors of the child care workforce in terms of regulation, professionalism, compensation, and turnover or stability? For example, will differential standards or costs inadvertently encourage parents to shift their children from regulated child care to relative care?

- Should paid relatives be included in efforts to improve child care compensation and other public policy initiatives?

Center-Based Staff

While our demand-based estimate of the size of the center-based workforce (including nursery schools, pre-kindergarten programs, Head Start, and public and private child care centers) is less dramatically new than our results concerning relative care providers, our study makes a significant contribution to the field by introducing more accurate and appropriate vocabulary and categories in describing this sector. Instead of identifying these workers by the misleading categories of "preschool teacher" and "child care worker," we have used the job titles of "teacher," "assistant teacher" and "director," far more closely in line with those actually used in child care centers and in accepted research on the child care workforce. As a result, the estimates offer information about the workforce that will be more useful to researchers, policy makers and practitioners.

Occupational Turnover

By offering both single-point-in-time and annual estimates of the number of child care workers, the findings of this study contribute an important understanding of the role that occupational turnover plays in fueling the demand for child care workers. The minimum difference between the number of center-based staff and family child care providers offering care at one point in time, and those

present in the occupation during an entire calendar year, is 211,000 individuals (approximately 104,000 center-based staff and 107,000 family child care providers). This is based on an annual rate of movement of workers out of the child care field across all positions of about 19% for center-based staff and 17% for family child care providers, or an overall annual rate of movement out of the field of 18% for these two types of caregivers. Given that this rate of departure represents only center-based staff and family child care providers, and not other caregivers for whom we have no information, we must assume that applying this 18% turnover only to these groups of paid staff results in a very conservative estimate of the number of child care workers across all paid caregivers on an annual basis (Whitebook et al., 2001).

Additional research on occupational turnover among relative care providers and others would be of great benefit in extending this aspect of the analyses. Much attention has been focused on the disruptive effects of job turnover, particularly within child care centers, but until now, researchers and practitioners have lacked data with which to evaluate the collective effects of occupational turnover on the labor market. These findings highlight the significant challenges facing those who are charged with recruiting child care workers, such as center directors, school district pre-kindergarten program administrators, and child care resource and referral agencies. The drain of teachers and providers away from the field requires recruiters to constantly identify new child care teachers and family child care providers, occupations that are characterized by very low pay and benefits. The high incidence of occupational turnover also suggests the importance of reevaluating public investments in the early care and education training system, to assess how well training translates into job retention, and what kind of return we receive on our training system in general.

Unpaid Caregivers

The findings of this study also provide a window to the 2.4 million unpaid/volunteer caregivers who, together with paid teachers and providers, comprise the rest of the broader U.S. non-parental "caregiving population," a grouping typically ignored in child care and economic policy discussions and interventions. Although this report is chiefly concerned with paid members of the workforce, who comprise about half of all caregivers, we have sought also to view caregivers from the demand perspective, as those who care for children regardless of compensation. Although unpaid providers receive no monetary compensation for their work, they make a substantial contribution to the U.S. economy, indirectly providing support for the child care delivery system that goes unmeasured in most child care workforce research. Unpaid caregivers also incur opportunity costs for providing services at no charge – for example, the wages that they would otherwise earn if they operated within the market economy.

In addition to the economic contribution made by unpaid providers, we have included them in the total caregiving population so that we can measure the effects of various polices on the demand for paid and unpaid child care. If, for example, universal full-day pre-kindergarten programs were instituted, which hypothetically would cause a sharp decrease in demand for unpaid child care, we would be able to measure the total demand for pre-kindergarten providers, given the current supply of paid and unpaid caregivers for preschool-age children. It is also interesting to note that paid and unpaid providers care for roughly the same proportion of children by age, with a slightly higher number of unpaid providers caring for infants than paid

providers. Unpaid providers are much more likely to be relative care providers than center-based workers or family child care providers.

Next Steps: Second-Year Research Activities

Most policy measures related to child care and early education are enacted on a state, county or municipal level. Like their counterparts who work on the national level, state and local planners of compensation initiatives, training programs and financing models have operated without an accurate estimate of the current child care workforce or of the number of workers who will be needed to sustain the child care delivery system in the future. Lacking reliable workforce estimates, planners of state initiatives are seriously hampered in their advocacy, planning and budgetary efforts. County and municipal policy makers would also benefit from being able to disaggregate state findings to the local level. It is therefore vitally important for the work of state and local governments, training institutions and private sector stakeholders to have an adaptable standard for estimating the size of the child care workforce and projecting its size in the future.

The second phase of this study will include pursuing several analytic approaches to state-level child care workforce estimates. For example, we will be examining state-level differences in the number of providers, using multivariate techniques. Drawing on the National Survey of American Families (NSAF) 1999, which contains representative data on 13 states, we will estimate the effect of state demographic and policy variables (collected from other sources) on the demand and characteristics of child care in that state, as these are the key components of our demand-based method developed in year 1. In so doing, we can illustrate how our demand-based method needs to take these characteristics of states into account when applying our demand-based methodology at the state level in the absence of a representative state-level demand survey. If we find no state-by-state variation, when controlling for the appropriate individual-level differences, then the national estimates of the demand for and characteristics of child care providers can be applied to state populations. We are also exploring the feasibility of including school-age child care providers in our estimates.

APPENDIX A: DATA SOURCES AND METHODOLOGY

Description of Data Sources

The National Household Education Survey (NHES) is a nationally representative household survey conducted by the National Center for Education Statistics, whose legislative mission is the collection and publication of data on the condition of education in the United States. The NHES offers policy makers, researchers and educators a variety of statistical data and descriptive information on educational activities of the U.S. population. The NHES is a random digit dial survey that collected data throughout the 1990's on adult education, parent and family involvement in education, before- and after-school programs and activities, civic involvement, early childhood program participation, household library use, school readiness, and school safety and discipline.[16]

The 1999 survey (NHES-99), performed between January and April of 1999, consisted of a parent interview, a youth interview, and an adult education interview. Information used in this report is drawn from the Parent Survey, which collected data from 6,939 households regarding:

- participation in non-parental child care and early education programs such as relative care, non-relative care, Head Start programs, and child care centers;
- characteristics of programs and care arrangements;
- home learning activities;
- health and disability status;
- parent and family characteristics.

The NHES data are weighted so that estimates are representative of and generalizable to the U.S. population.

Overview of Methods

The starting point of our analyses is the demand-side NHES-99 estimate of the use of child care of various types for children ages 0 through 5, divided into the age groups of infants (0-18 months), toddlers (18 months to 3 years) and pre-schoolers (3-5 years). We have excluded five-year-old children enrolled in elementary school from our analyses.

These analyses are divided into two sets of calculations. The first set relies on the NHES estimates to convert child care demand data into a supply-side estimate of the number of providers. The second set converts our final point-in-time estimates of the number of providers offering various types of care to an estimate of the actual number of providers working in a given week or year, taking into account average hours worked per week and annual rates of occupational turnover, by position. These analyses are described in detail below.

CALCULATION OF SINGLE-POINT-IN-TIME ESTIMATES

The first step in this set of calculations is to estimate the percentage of children in each age group for each of the main categories of care previously described: center-based care, family child care (defined as paid, out-of-home, non-relative care), other forms of non-relative care, and relative care. For relative

[16] Another potential source of demand-based child care information is the U.S. Census Bureau's Survey of Income and Program Participation (SIPP). Given that its focus is on participation in publicly-funded programs, however, and that the most recent available SIPP data at the time this research began, were from 1997, we concluded that NHES was a more appropriate data source.

and non-relative care, we categorize each as paid or unpaid, and by location (in or outside the child's home). The second step is to estimate the mean number of hours spent in each type of care by age. Finally, we estimate the average number of children per adult, or child:adult ratio, in each type of care for each age group of children.[17]

Using these three basic estimates, and the population totals provided by the NHES-99 survey, which represent the total number of children in each age category, we performed the following calculations to generate demand-side estimates of the total number of full-time equivalent caregivers, when appropriate, or the total number of personnel, when full-time equivalency is not an appropriate measure. The calculations for various types of care are slightly different, depending on what we know about the caregiving context for each type. For center-based care and family child care, we:

1. **multiplied the percentage of children in each type of care by the population totals for each age group, in order to determine the number of children in each type of care for at least some time each week;**

2. **multiplied the total number of children in each type of care by the mean hours in that care, to derive an estimate of the total number of care hours;**

3. **divided the total number of care hours by child:adult ratios, resulting in an estimate of the total number of care hours per adult;**

4. **divided the total number of care hours per adult by 35 hours per week, to estimate the total number of full-time-equivalent adults providing each type of child care for each age of child.**[18]

For other types of care, including paid relative care, paid in-home non-relative care, and unpaid non-relative care, the calculations were slightly different. The primary reason for this difference is that for these more "informal" types of care, it does not make sense to estimate full-time equivalents. Many of these providers are not providing care in a sector where the concept of a full-time-equivalent worker is applicable. In addition, the care they provide is likely to be only for one or two children for a limited number of hours per week. It makes much more sense to represent these providers in terms of personnel per week serving the children in their care, rather than as a cohort of full-time personnel working formal child care hours. For this group of providers, we use the following reduced set of calculations to estimate a total number of personnel:

1. **We multiplied the percentage of children in each type of care by the population totals for their age group, to determine the number of children in each type of care for at least some time each week;**

2. **We divided the total number of children in that care by the mean number of children per adult, to estimate the number of providers in a given week providing care.**

[17] We have adjusted the center care and Head Start child:adult ratios in NHES-99 to account for parents' tendency to underreport the number of children per adult in this care (Willer et al., 1991).

[18] For the purpose of this analysis, we use a definition of full-time work as 35 hours per week (Whitebook, Sakai, Gerber & Howes, 2001).

These basic calculations for each type of care resulted in a demand-side estimate of either the total number of full-time-equivalent providers, or simply providers, in a given week offering care to the number of children using each type and amount of care.

Calculation of Weekly and Annual Provider Estimates from Supply-Side Adjustments

Next, we calculated the number of providers in a given week or year for each type of care. For the categories of "informal" providers, the estimation process went no further. Thus, we were able to calculate the number of informal providers each week for each age group of child, regardless of how many hours they provide that care. Insufficient information is available about this group of people to estimate the annual number of providers over the course of a year, taking turnover into account.

For center-based staff and family child care providers, however, we were able to draw upon our extensive literature review of these workers to estimate how the number of full-time-equivalent workers is distributed across positions within a child care setting, how many providers by position are working in a given week based on the average length of work week for each type of provider, and how many providers are needed in a given year based on estimates of job and occupational turnover. This summary describes our second set of calculations for center-based care and family child care.

For center-based care and family child care, we sought a breakdown of the actual number of providers per week (not simply full-time equivalents) and the annual number of providers per year, detailed by job position. The general procedure for calculating these estimates is provided below, with additional notes regarding specific calculations for each type of care.

1. Full-Time Equivalent Positions by Job Type

Taking the full-time-equivalent number of providers for centers and family child care from the first set of calculations, we relied on summary statistics from other studies indicating the ratio of teachers to assistants in centers and the ratio of primary providers to assistants in family child care programs. To estimate the number of teachers (or primary providers) and assistants, we divided the number of full-time-equivalent workers into teachers/providers vs. assistants, using the relative percentages from the best available studies.[19]

To determine the number of full-time-equivalent center directors, which we are assuming are not part of the classroom staff, and thus not included in reported child:adult ratios, we multiply the number of full-time-equivalent staff by the relative ratio of directors to classroom staff.[20] Thus, the full-time-equivalent number of directors is additional to the number of full-time-equivalent teaching staff in our demand estimates. For family child care, estimating a number of directors was not appropriate to that segment of the field.

[19] The estimate of the number of full-time-equivalent teaching staff in center-based care was divided into the following job types: teachers (62.5%) and assistants (37.5%) (Cost, Quality, and Child Outcome Study, 1993). The number of total full-time-equivalent positions for family child care was divided into the following job types: providers (80%) and assistants (20%) (Wilder, 2001; Burton, Sakai & Whitebook, 1999). These percentages represent an average across all these sources.

[20] We multiply the number of full-time-equivalent workers by 11% to obtain the number of full-time-equivalent directors (Wilder, 2001).

2. Actual Number of Personnel per Week

In our previous calculations, we calculated full-time-equivalent positions, assuming a 35-hour work week for center staff and family child care providers. We know from the literature review, however, that the actual average number of hours worked varies by position (e.g., directors do not work the same number of hours as teachers). Thus, while the number of full-time-equivalent workers is meaningful in the abstract, we are more interested in the actual number of workers who provide full-time care in a given week. We therefore multiplied the number of full-time-equivalent workers by the ratio of full-time work weeks to the actual hours worked within each job position. This results in an increase or decrease in the number of workers per week depending upon whether a worker in a given position works an average of less than or more than 35 hours per week. For caregivers in positions that work, on average, less than 35 hours per week, there is an increase in the estimate of the number of providers per week. For providers who work more than 35 hours per week, there is a decrease in the number of providers per week.[21]

In addition, for centers, we added volunteers to the total number of personnel per week. Since we know that volunteers work on an unpaid basis, typically for only a few hours per week, and cannot be relied on to fill classroom staff positions, we assumed volunteers to be in addition to the number of weekly personnel. We estimated the number of volunteers per week by multiplying the number of paid personnel per week by the ratio of volunteers to paid staff found in a study by Willer and others (1991).[22] There is no equivalent volunteer position in family child care; although some assistants are likely to be unpaid, we have no reliable information to distinguish between those who are paid and unpaid.

3. Annual Child Care Workforce

Finally, it is necessary to convert our estimates to the annual number of providers by position, taking into account job and occupational turnover to accurately reflect the number of child care workers beyond a single point-in-time estimate. The annual workforce is calculated by taking into account the annual rates of individuals leaving the field (occupational turnover) by position to adequately capture the additional number of personnel needed to replace departing workers.[23] We have no occupational turnover rates for paid relatives and paid in-home non-relatives.

[21] For centers, the full-time-equivalent positions are adjusted to actual number of staff, based on an average length of the work week of 40 hours for directors, 35 hours for teachers, and 28 hours for assistants (for directors and assistant teachers, Helburn, 1995; for teachers, Whitebook, Sakai, Gerber & Howes, 2001). The weekly number of positions of family child care providers and assistants is determined using the ratio identified in step (2), incorporating the following typical hours worked per week: 44.5 hours for providers and 17 hours for assistants (Kontos, Howes, Shinn & Galinsky, 1992; Wilder, 2001; Willer et al., 1991). The value for mean hours worked per week for providers is based on average of mean hours for providers presented in all sources listed. The value used for mean hours worked per week for assistants is based on the mean hours for assistants presented in Wilder (2001).

[22] In that study (Willer et al., 1991), only 28% of centers were found to have parent volunteers, and the average ratio of volunteers to paid staff was 3 to 8; i.e., 27% of total center staff were volunteers.

[23] For center teachers and directors, we estimate an annual occupational turnover rate of 16%; for assistant teachers, we estimate an annual occupational turnover at 25% (Whitebook, Sakai, Gerber & Howes, 2001). It is important to note that these are low estimates of occupational turnover, as they are based on a sample of high-quality centers in one geographic region. No other more representative estimates on occupational turnover are available, however. Thus, the number of center workers in a given year should be considered a conservative estimate. Annual occupational turnover for family child care providers is estimated at 16.5% for both providers and assistants (Kontos, Howes, Shinn & Galinsky, 1992).

Subgroup Analyses

Using the same procedure outlined in the previous section, we also calculated the minimum[24] number of child care providers serving children with disabilities, children with English as a second language, and Latino and African American children, using 1999 National Household Education Survey estimates specific to these groups.[25] However, since we do not have estimates on turnover or length of work week from other research studies specific to caregivers serving these populations, we assumed that the estimates used in our second set of calculations were constant across providers, regardless of the special populations they serve.

Literature Review

Two distinct literature reviews of research, related to the center-based and home-based child care workforces, were conducted as an integral part of the methodology of this study. Findings from these literature reviews played two primary roles in the study: first, as discussed above, to inform our calculations converting the parent-reported demand-side data from caregiver hours to actual numbers of caregivers by sector and job title. Secondly, key results from the literature review regarding child care workers' age, gender, ethnicity and education were used in combination with estimated numbers of U.S. child care workers to provide a profile of the characteristics of the child care workforce.

The literature review concerning the center-based child care workforce covered twenty-five research studies, including the major national research studies conducted over the last fifteen years. Research on the home-based child care workforce has been more limited; our literature review, including all major research conducted during this period, covered nine studies. (See "Bibliography and Works Cited," Appendix C.)

Our criteria for including particular research findings in the methodology had to do with study design, representativeness of the study sample, date of data collection, and whether the study used child care occupational titles congruent with those used in this workforce estimate project (i.e., teacher, assistant teacher, director, family child care provider, family child care assistant, and relative care provider). Of primary importance was the degree to which research designs included a nationally representative sample, since child care workforce research has revealed a high degree of geographical variation in educa-

[24] The estimate of the number of providers serving children from these subgroups is a minimum figure, because our estimates derived from the first set of calculations are based on the assumption that all the children in each child:adult ratio are from the same subgroup (i.e., a classroom is made up entirely of children with disabilities, for instance). In actuality, many of the children in care from each of these subgroups are in classrooms that are heterogeneous in terms of ethnicity, disability status, and primary language. Thus, when we report the total number of providers caring for children in each of these subgroups, we present a possible range of providers, which capture either extreme—whether children of a particular subgroup are in homogeneous classrooms with other similar children, or are entirely in mixed, heterogeneous classrooms.

[25] In some cases, the percentage of children using care, the mean hours in care, and the mean child:adult ratios are significantly different for children in these subgroups compared to the population as a whole.

tional attainment and other demographic characteristics. We also considered the date of data collection highly important, because of demographic shifts that are likely to have occurred over the past decade. In the case of some variables, we selected studies with more limited national samples, but that were conducted more recently, because there has not been a large-scale national random digit dial study of the child care workforce since the completion of the Profile of Child Care Settings in 1990 (Willer et al., 1991). A revisiting of such a large-scale survey research project would greatly benefit this research endeavor, as well as many others.

As an example of the selection process for child care teacher education, we identified the studies shown in Table 12, from our full review of the literature, to be those that met at least one of our criteria for inclusion. The Cost, Quality and Child Outcomes study results, which identified 33 percent of teachers as having a Bachelor Degree (B.A.) or more, best met this study's selection criteria, and the confirmation of this finding by other national and state-level research served as a validation for selecting it.

Table 12: Estimated Teacher Educational Qualifications—All Subjects

B.A.+	Some College*	High School or Less	Study
31%	44%	26%	**National Child Care Staffing Study** (Whitebook, Howes & Phillips, 1990)
33%	47%	20%	**Cost, Quality and Child Outcomes Study** (Helburn, 1995)
33%	----	----	**California Child Care and Development Compensation Study** (Whitebook et al., 1996)
47%	39%	13%	**A Profile of Child Care Settings** (Willer et al., 1991)
30%	72%	0%	**Who's Caring for the Kids? The Status of the Early Childhood Workforce in Illinois** (Krajec et al., 2001)

*Includes an Associate Degree, a Child Development Associate (CDA) certificate, or the completion of some college credits short of a degree.

APPENDIX B: Patterns of U.S. Child Care Usage From Which Workforce Estimates are Derived

To provide context for our estimates of the U.S. caregiving population and child care workforce, this Appendix presents a summary of the type of detailed estimates from the National Household Education Survey (NHES-99) used in the calculations described in Appendix A.[26] We present the summary estimates for percentage of children, average hours per week in care, and average child:adult ratios for each type of care.

A. Types of Care Used by Children of Different Ages

Since we are trying to estimate the total number of caregivers of all children, we focus on all types of care used by each child in the data base, rather than on the primary form of care, or on any care used for a certain minimum number of hours per week. The distribution of child care use is summarized in Table 13.

Table 13: Percentages of Children Using Any Amount of Care, by Age and Type of Care

	Centers	Head Start	Family Child Care	Paid Relatives	Paid Non-Relatives
Infants	9%	<1%	12%	8%	3%
Toddlers	27%	5%	13%	8%	3%
Pre-schoolers	58%	15%	11%	6%	2%

We apply these percentages to the relevant population figures for each age group to derive the number of children using each type of care. The NHES estimated that in 1999, 20.2 million children in the U.S. ages 0-5 were using child care. Of these, 5.9 million were infants, 9.6 million were toddlers, and 4.7 million were pre-schoolers.

[26] The actual estimates we used in the calculations are based on finer gradations within each type of care, including breakdowns by where the care took place. These estimates are presented for summary purposes only and do not necessarily reflect the actual estimates that went into each calculation.

B. Hours Per Week that Children Spend in Care

Table 14 summarizes the mean number of hours that children of each age spend in each type of care.

Table 14: Mean Hours Per Week, by Age Group, that Children Spend in Each Type of Child Care[27]

	Centers	Head Start	Family Child Care	Paid Relatives	Paid Non-Relatives
Infants	32	13	31	30	18
Toddlers	24	22	31	28	22
Pre-schoolers	21	21	26	28	21

This allows us to generate the total number of hours in each type of care for children in each age group, as summarized in Table 15.

Table 15: Total Hours of Child Care Per Week for All Children, by Age and Type of Care (in Millions of Hours)

	Centers	Head Start	Family Child Care	Paid Relatives	Paid Non-Relatives
Infants	16.6	.4	22.1	14.2	3.7
Toddlers	62.4	9.9	39.3	19.1	6.3
Pre-schoolers	56.7	14.7	13.9	7.1	2.2

[27] For paid relatives and non-relatives, there are large numbers of children who are only in care for a few hours per week, so that the median would be a better way of understanding what is the "typical" number of hours in care. For the logic of our methodology, however, it is necessary to use the mean.

C. Child:Adult Ratios

We then divide the total hours of care by the child:adult ratios to derive an estimate of the total number of hours provided by caregivers, recognizing that each adult often cares for more than one child. We have adjusted the center care and Head Start child:adult ratios in NHES-99 to account for parents' tendency to underreport the number of children per adult in this care (Willer et al., 1991). These ratios are summarized in Table 16.

Table 16: Average Number of Children Per Adult (Child:Adult Ratio) in Each Type of Care, by Age of Child

	Centers	Head Start	Family Child Care	Paid Relatives	Paid Non-Relatives
Infants	5.0	3.8	3.6	1.5	2.3
Toddlers	7.6	7.5	3.3	1.7	2.1
Pre-schoolers	9.6	8.6	3.6	2.2	2.3

Once we have the number of hours of care provided as a whole for each type of care and age of child, we can convert this figure to a number of full-time-equivalent providers, or an estimate of the number of providers in a given week, based on estimates of the actual hours worked each week from previous studies. The number of providers each week for each type of care is found in Table 1.

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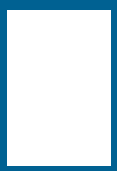

Center for the Child Care Workforce
733 15th Street, N.W., Suite 1037
Washington, DC 20005
(202) 737-7700