Assessing the Quality of Child Care Using Longitudinal, Administrative Data: What Can It Tell Us and How Can It Be Used?

Part I: The Report

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Abstract

In this paper, we use a wide array of administrative data that covers the welfare reform period (1996-2001) to assess how the quality of child care changed as a result of welfare reform and concurrent social, political and economic changes. We compare the group care of children receiving child care subsidies, children living in poverty neighborhoods and children that neither received subsidies nor lived in poverty neighborhoods. Our study area is Miami-Dade County, Florida.

We find many differences between providers that participate in the CCDF child care subsidy program (CCDF providers) and those that do not participate. CCDF providers more frequently violate minimum-standards regulations than other providers. Further, their minimum-standards violations tend to be more serious (including numerous instances of child-staff ratios in excess of minimum-standards requirements) than the violations of other providers. CCDF providers also have substantially more complaints filed against them than other providers, including other providers in poverty neighborhoods. CCDF providers have a larger proportion of unfilled (vacant) child care slots than other providers. However, CCDF providers report a smaller proportion of their staff with low levels of education (high school or less) than other providers, and CCDF providers are more likely to report use of a curriculum than other providers. CCDF providers are both more likely to be accredited and more likely to be profit-seeking firms than other providers. During the course of our study, we find a large increase in the proportion of faith-based providers. This trend is particularly strong for CCDF providers. We believe that this reflects Florida Governor Bush's faith-base initiatives.

A composite measure of quality helps to address many policy, administrative and research questions. We develop such a composite measure using principal components analysis (PCA) and multiple quality variables. The results of the PCA analysis are reasonable (e.g., they identify quality factors that are associated with various important aspects of child care quality). Specifically, the single composite indicator of quality that we develop using PCA reflects 80% of the total variation in our array of quality measures. This composite indicator could be used to develop a quality rating system that is based on multiple quality measures rather than on a single quality measure, such as accreditation, as is commonly done. The composite quality indicator also could be used to identify a group of very low-quality providers that administrators might want to target for quality-enhancing interventions. Finally, both the cross-sectional and time series variation in the composite indicator could be used to evaluate the impact of quality interventions. For example, using our composite indicator, we find an increase in the median overall quality of CCDF providers relative to providers that do not participate in the CCDF program after responsibility for the CCDF program was shifted to a local

not-for-profit agency with strong leadership, quality-enhancement initiatives and a school-readiness focus. This finding provides evidence that CCDF providers are responsive to quality initiatives.

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Assessing the Quality of Child Care Using Longitudinal, Administrative Data: What Can It Tell Us and How Can It Be Used?

Providing young children with quality child care makes good economic sense. Quality child care and early education foster the intellectual, social, and emotional development of children, gets them ready for school, and puts them on the right path toward healthy and productive citizenship. There is evidence that quality early interventions reduce later public expenditures for special education, grade repetitions, public assistance, delinquency and crime. Further, recent research indicates that early interventions are more cost effective than interventions later in life (e.g. in elementary and secondary school) (Carneiro and Heckman, 2003) .

While there is considerable research on the quality of child care, many studies are based on single sources of information--typically observations of process quality--and on one-time rather than repeated measures. Very few studies have tracked the quality of publicly subsidized child care available in low-income communities for a number of years following welfare reform and how it has changed. Most lacking of all are large-scale longitudinal assessments of the quality of child care based on multiple sources of information.

In this paper, we examine the quality of child care providers in a large metropolitan area, including providers caring for children receiving public child care subsidies and providers located in low-income neighborhoods. We assess quality longitudinally over a period of several years rather than on a one-time basis, and we use multiple sources of data. We use common sources of data (e.g., accreditation lists) as well as data sources rarely utilized to study child care quality. Some of the under-

utilized sources we employ include: (a) minimum-standards inspection records; (b) records of complaints filed against providers; (c) child care Resource & Referral (R&R) agency records; and (d) observational assessments of providers participating in the Child Care and Development Fund (CCDF) subsidized child care program.

Our study takes place in Miami-Dade County, FL, a large and highly diverse area with one of the largest concentrations of poor and low-income families in the U.S. The study spans the period from the first quarter of 1996 to the third quarter of 2001, thus covering the time immediately before and after welfare reform in Florida, which started in October 1996.

We find many differences between providers that participate in the CCDF child care subsidy program (CCDF providers) and those that do not participate.[1] CCDF providers more frequently violate minimum-standards regulations than other providers. Further, their minimum-standards violations tend to be more serious (including numerous instances of child-staff ratios in excess of minimum-standards requirements) than the violations of other providers. CCDF providers also have substantially more complaints filed against them than other providers, including other providers in poverty neighborhoods. CCDF providers have a larger proportion of unfilled (vacant) child care slots than other providers. However, CCDF providers report a smaller proportion of their staff with low levels of education (a high school education or less) than other providers, and CCDF providers are more likely to report use of a curriculum than other providers. CCDF providers are both more likely to be accredited and more likely to be profit-seeking firms than other providers. During the course of our study, we find a large increase in the proportion of faith-based providers. This trend is particularly strong for

[1] A provider was classified as participating in the CCDF-subsidized program during any period for which the provider received assessment scores by the program.

CCDF providers. We believe that this reflects Florida Governor Bush's faith-base initiatives.

In this study we demonstrate how, by using multiple sources of data on child care quality, it is possible to develop a composite measure that allows providers to be rated on the quality of care they provide and how it changes across time. Such a quality indicator tool could be of use to policy makers, administrators interested in measuring and improving the quality of child care for low-income children.

To develop such a composite measure we submit our array of quality variables to a principal components analysis (PCA). The results of the PCA are reasonable (i.e., they identify quality factors that are associated with various important aspects of child care quality). Specifically, the single composite indicator of quality that we develop using PCA reflects 80% of the total variation in our array of quality measures. This composite indicator could be used to rate providers on a continuum of quality for a tiered reimbursement program or other incentive program aimed at improving the quality of child care. Generally, rating quality on the basis of multiple measures is more valid and reliable than rating quality based on a single measure, such as whether or not the provider is accredited, as is commonly done.

Our composite quality indicator also could be used to identify a group of very low-quality providers that administrators might want to target for quality-enhancing interventions. Finally, both the cross-sectional and time series variation in the composite indicator could be used to evaluate the impact of quality interventions. For example, using our composite indicator, we find an increase in the median overall quality of CCDF providers relative to providers that do not participate in the CCDF program after responsibility for the CCDF program was shifted to a local not-for-profit agency with

strong leadership, quality-enhancement initiatives and a school-readiness focus. This provides evidence that CCDF providers respond to quality initiatives.

The outline of this paper is as follows. In the next section we briefly summarize some of the highlights of the literature on child care quality. We then describe our study area, our data sources and the quality measures we constructed from our data. Following this we present our descriptive findings and our analytic findings, followed by our conclusions.

The Literature on Child Care Quality: Some Highlights

Three important dimensions of child care quality are generally discussed in the literature--structural quality, process quality, and outcome quality. The Early Childhood Education community refers to structural quality as the quality of the resources or inputs used in the production of child care services. These are generally observable, measurable quantitatively and relatively easy to regulate by licensing bodies. They include such things as caregiver-to-child ratios, group sizes, and education and training of the staff. Process quality generally refers to the quality of the social environment and social relations between teachers or caregivers and children, the emotional tone of the classroom, the level of stimulation children receive, and the quality of the activities in which children engage while in care. These things are usually measured by direct observation. Outcome quality refers to the effects of the care received by children in terms of developmental outcomes, such as the children's ability to understand and use language, their pre-academic skills such as ability to count and recognize letters, their later academic performance, and the presence or absence of problem behaviors such as aggression, dependency, sad or angry feelings, and so on. To measure outcome quality it is necessary to follow up children over a period of time.

In this report we do not provide a comprehensive review of the literature on child care quality. Such reviews are readily available elsewhere (see, for example, Vandell and Wolfe, 2000).

To briefly summarize the child care quality literature, many studies have found high positive correlations between process quality and structural quality (including caregiver characteristics and health and safety practices). That is to say, when child-care programs get high marks on process quality measures, they also tend to get high scores on measures of structural quality, caregiver characteristics, and health and safety practices.

Much of the available research on child care quality also has reported significant and positive associations between process measures of quality and measures of outcome such as concurrent child functioning--cognitive, emotional, behavioral, and social. In addition, there is some evidence, although somewhat less strong and consistent, of a positive association between process and structural measures of quality, caregiver characteristics and outcome measures such as children's development (e.g., academic, cognitive, behavioral, and social) over a somewhat longer time period. A few classic studies of intensive and high-quality early-childhood interventions such as the Carolina Abecedarian Project and the Perry Preschool Project have followed children into adulthood and have found some evidence of long-term benefits of quality care and early education in terms of such things as level of involvement in criminal activities, earnings, and use of public cash assistance.

While there is a considerable body of research on the quality of child care and early education, many studies are of limited usefulness. For example, some are based on a small sample of providers. When a small sample is used, the group of providers

included in the study may be unrepresentative of the providers in a given area, such as a metropolitan area, particularly if the sample was not drawn scientifically. Even if a small sample were drawn scientifically, it might not be representative if a significant number of the providers originally selected later dropped out of the study for one reason or another. Another drawback of some studies is that they utilize a single source of information, for example, observations of process quality. Studies that are based exclusively on observation may lack validity if they are based on assessments made at officially announced visits for which providers were able to prepare in advance. Still another shortcoming of some studies is that they are based on point-in-time rather than repeated measures. Without repeated observations, the reliability of such studies might be low.

A limited number of studies have examined the quality of child care in low-income areas. Some have found that children from low-income families do not get good-quality care. Other studies have reported a curvilinear relationship between family income and quality of childcare, with children in the middle (i.e., working-class and lower-middle class) receiving the lowest quality of care.

At present there is little systematic knowledge about the quality of publicly subsidized child care available in low-income communities in the years since welfare reform. Particularly, there is a dearth of longitudinal assessments of the quality of subsidized versus unsubsidized child care in poverty and non-poverty areas utilizing multiple sources of information and based on large samples.

This study aims to address the limitations noted above. We assess the quality of child care providers, including those receiving child care subsidies and those not receiving subsidies as well as those located in poverty areas and those located in non-

poverty areas. We follow providers longitudinally over a period of several years utilizing a large database that includes repeated measures for each provider from multiple sources of data.

Our Study Area

We use data collected in Miami-Dade County (MDC), Florida (FL)--a metropolitan area with a population of 2,289,683. MDC is the largest and most racially and ethnically diverse county in FL. It includes the state's largest concentration of low-income families and approximately 28% of FL's welfare (i.e., cash assistance) population (Florida Department of Children and Families, October 2003). The city of Miami, which is the largest in the county, had a higher percentage of people in poverty than any other American city of 250,000 or more, according to Census 2000 figures. MDC also includes areas of concentrated wealth, such as Fisher Island, which is the wealthiest census place in the U.S. The county has a density of 1,158 persons per square mile. Compared to the state of FL as a whole, which has a population density of 296 persons per square mile, the area is very densely populated (US Bureau of the Census, 2003).

The population in MDC is predominantly (51%) composed of foreign-born persons. Sixty-eight percent of the population speaks a language other than English at home. The racial/ethnic breakdown of the population is 57% Hispanic, 21% non-Hispanic white, 20% black, and less than 2% Asian. Hispanics in MDC, although predominantly of Cuban origin, come from all over the Spanish-speaking world, particularly Latin America and the Caribbean. Most numerous among non-Cuban Hispanics in Miami-Dade are Puerto Ricans, Colombians, and Nicaraguans (US Bureau of the Census, 2003). The non-Hispanic white population in the county has been decreasing steadily, particularly after Hurricane Andrew, in large part due to the

continuous arrival of waves of immigrants from Latin America and the Caribbean. The black population is split between Afro-Americans and Caribbean blacks. Haitians are the poorest and largest segment of the county's Caribbean black population.

The median household income for MDC in 1999, according to the 2000 Census, was $35,966, compared to $38,819 for the state of FL. This summary figure for income masks vast differences in a metro area where the super rich and the dirt poor live in relatively close proximity.[2]

According to the 2000 Census, the average poverty rate in MDC is 18%, compared to the state's poverty rate of 12.5%. Several cities and census places within MDC have poverty rates exceeding 30%.[3] For related children under the age of 18, the average poverty rate in the county is 23%, but quite a few areas have child poverty rates exceeding 30%.[4]

Sixty-eight percent of those in MDC age 25 and over have a high school degree, compared to 80% for the state of FL. Same as for the state, 22% of those in MDC age 25 and over have a bachelor's degree. The county population is fairly stable geographically, relative to the state's population; specifically, 50% were living in the same house in 1995 and 2000, compared to 49% for FL.

Our Data Sources

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[2] For example, some areas in MDC, such as Coral Gables, Cutler, Key Biscayne, Fisher Island, Golden Beach, and Pinecrest, have median household incomes well above $80,000; yet, some other areas, such as Brownsville, Florida City, Gladeview, Goulds and Naranja, have median household incomes below $20,000.

[3] Cities and census places in MDC with population poverty rates exceeding 30% include Gladeview (53%), Naranja (50%), Goulds (44%), Florida City (43%), Brownsville (43%), Opa-Locka City (35%), West Perrine (34%), Pinewood (33%), Homestead (32%-65%) and the City of Miami (31%).

[4] Cities and census places in MDC with child poverty rates exceeding 30% include Gladeview (65%), Naranja (63%), Goulds (57%), Florida City (57%), Brownsville (55%), West Perrine (52%), Pinewood (46%), Opa-Locka City (42%), Homestead (39%-54%), Leisure City (32%-42%), West Little River (39%), Bunche Park (38%), the City of Miami (38%) and Princeton (33%).

We assess longitudinally over several years the quality of child care providers in MDC, including those receiving child care subsidies as well as those not receiving child care subsidies and including those located in poverty areas as well as those located in non-poverty areas. For the purposes of this study we classify areas with child poverty rates exceeding 30% as poverty areas.

We use multiple sources of data. Several of our data sources have been under-utilized in previous child care quality studies. These data sources are described in the following paragraph and include the following: (1) minimum-standards inspection reports of licensed child care centers and after-school providers; (2) data on complaints filed against providers; (3) provider records maintained by the two Resource and Referral (R&R) agencies serving MDC; (4) observational assessment scores of providers participating in the CCDF-subsidized child care program, (5) Gold Seal accreditation records, and (6) state licensing lists.

Data sources (1) and (2). The provider inspection and complaint data sources that we use are from the FL Department of Children and Families (DCF), Licensing Enforcement Division, District XI (Miami-Dade and Monroe counties). The data we use cover all licensed child care centers, Head Start providers, and after-school providers in MDC for the period January 1996 through August 2001.[5]

During the period of our study, FL required all licensed providers (i.e., child care centers, public and private before- and after-school programs, Head Start programs, and family child-care homes) to undergo inspections three or four times per year. The required inspections, designed to verify child-care provider compliance with state and

[5] Because our study includes only licensed providers, all the faith-based providers included are licensed. However, the reader should know that faith-based providers are not required to be licensed in Florida and that they can participate in the CCDF child care subsidy program regardless of whether they are licensed or not.

locally mandated minimum standards, are rarely used sources of information on provider quality. Yet, these inspection records have important advantages. For example, inspectors must observe and assess all licensed providers, not just a sample of them, and they must conduct their observations on an unannounced basis. Inspectors observe all aspects of the physical environment, health, food and nutrition, child discipline and supervision, and record keeping. Their reports contain data that can be used to develop multiple measures of quality, for example, compliance with minimum standards for staff-to-child ratios and compliance with minimum standards as to the maximum allowable number of children in care at the facility. The complaint records maintained by the Licensing Enforcement Division are also useful sources of information on provider quality observed by different sets of eyes, such as parents.

Data source (3). Since January 1996 we have been collecting monthly snapshots of the R&R provider databases maintained by Child Development Services (CDS), as well as yearly snapshots of the R&R provider databases maintained by Family Central, Inc. These are the two community child care coordinating (4C) agencies serving MDC. The main function of R&R databases maintained by the 4C agencies is to regularly collect and disseminate information on all child-care providers in the district, including detailed information about many aspects of the care that is offered and about staff credentials.

The R&R provider data we use includes information on all licensed non-family providers, including centers, non-exempt schools/preschools, Head Start programs and public and private after-school programs in the county. We do not analyze data on licensed family child care homes or license-exempt programs.[6] Our data covers the

[6] We decided to exclude license-exempt programs (e.g., private schools) and family child care homes (a very small group of providers in Miami-Dade) because our data on some of the measures of

period from the first quarter of 1996 to the third quarter of 2001, and it includes information on provider capacities, vacancies, hours, days and months of operation, ages of children served, and characteristics of care, including such things as prices charged, caregiver education and training and accreditation status.

Data source (4). For MDC providers participating in the CCDF-subsidized child-care program, we also use annual or bi-annual observational scores on the DCF Child Care Assessment Tool for the period 1997 through 2001. All FL providers receiving child-care subsidies from the CCDF are observationally assessed at least once annually[7] by the 4C agency in their area. These agencies-- CDS and Family Central -- administer the CCDF-subsidized child care program. Six different assessment tools were used during the period of our study, one for each age group (i.e., infants, two-year-olds, toddlers, preschoolers and school-age children) plus a "generic" tool covering areas such as program management and staff development. (Sample assessment tool forms are included in the Appendix of Queralt, Witte & Griesinger, 2000a). These tools observationally assess the quality of care received by children and cover things such as physical environment (indoor and outdoor space), learning environment, caregiver-child interactions, developmental program, parent involvement, and health and nutrition. Such assessments of providers receiving child-care subsidies provide an excellent source of data on process quality.

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quality for these providers was not as complete as for licensed group providers. For this same reason, of the faith-based providers we included only those that were licensed.

[7] During the period of our study, providers that scored less than 95% on the CCPA were visited and assessed twice per year.

Data source (5). We also use annual provider accreditation lists, for the period 1996-2001, from the National Association for the Education of Young Children (NAEYC) and from the FL Gold Seal Quality Care Program.[8]

Data source (6). In addition, we use, for the period ranging from 1996 to 2001, annual licensing lists from the FL DCF. These lists provide basic information on all licensed/registered/certified group child-care providers.

Quality Measures

In order to construct a composite index of provider quality, we started with the diverse and rich measures of quality to be described in this section. We derived these quality measures from minimum-standards inspections and complaint reports, from R&R data, from CCDF-subsidized provider assessments and from accreditation records.

Some indicators reflect observational measures of the quality of care received by children. Such measures are often called process measures, for example, accreditation status of the provider, DCF Child Care Assessment scores received by facilities participating in the CCDF-subsidized child care program, and complaints filed against providers. Other indicators reflect structural measures, for example, staff credentials. We provide a major addition to structural measures because we have measures of actual compliance with all prescribed minimum standards, for example, compliance with required staff-to-child ratios, and we also have information on various sanctions applied to providers for non-compliance with prescribed minimum standards.

By using a composite quality index, one can arrange providers in a given geographic area (including those receiving and not receiving CCDF subsidies and those

[8] The FL Gold Seal Quality Care program, which was established in 1998, qualifies providers accredited by nationally recognized accrediting associations whose standards substantially meet or exceed the National Association for the Education of Young Children (NAEYC), the National Association for Family Child Care, or the National Early Childhood Program Accreditation Commission to receive up to 20% higher reimbursement rates when they participate in the subsidized child care program.

located and not located in poverty areas) on a quality spectrum ranging from the highest quality settings (highest quartile of quality) to the lowest quality settings (lowest quartile of quality). Such a quality indicator tool would allow policy makers and administrators to identify high quality and low quality providers and to estimate the number and proportion of children, particularly low-income children, receiving care in the highest and lowest quality settings as child-care policies and administrative practices change. In addition, a quality index would be useful to rate providers in a tiered reimbursement program, or to rate providers on a continuum of quality as part of an incentive program aimed at improving the quality of child care. This approach would also make it possible to examine how process measures of quality relate to (correlate with) structural measures.

The following are the quality measures we developed:

Accreditation:

Using data from NAEYC and from the FL Gold Seal Quality program reports, we use a binary variable to classify providers on the basis of whether or not they are accredited by nationally recognized organizations.

Staff Credentials:

Using R&R data, we classify providers on the basis of the credentials of their staff, as reported by the providers in response to routine telephone inquiries made by the R&R agencies. For descriptive purposes, we use the following categories: a) staff have a high school diploma or less education; b) some staff have a CDA (Child Development Associate credential); c) some staff have an associate degree (AA); d) all

staff have the CDA; e) some staff have a bachelor's degree (BA); f) all staff have an AA degree; g) all staff have a BA degree.[9]

For analytic purposes, we develop a 3-point scale: 0) staff have high school or less education; 1) at least some staff have the CDA; 2) at least some staff have a higher educational credential (i.e., the AA or BA degree).[10]

Curriculum:

Using R&R data, we classify providers on the basis of the curriculum they offer, as reported by providers to the R&R agency.

For descriptive purposes, we classify providers on the basis of their curricular offerings, as follows: a) no evidence of any type of curriculum; b) child development curriculum; c) academic curriculum[11]; d) both child development and academic curricula.

For analytic purposes, we develop a binary variable to classify providers according to whether or not they report any type of curriculum (academic, child development or both).

Scores on DCF Child Care Assessment Tool

(only available for providers receiving CCDF-child-care subsidies)

For this quality indicator we use provider observational assessments made by the two 4C agencies (CDS and Family Central) in the Miami-Dade area during the period of our study. As described in the section on data sources, the 4C agencies use five assessment tools to rate each provider participating in the CCDF subsidy program in

[9]When questions are asked only about terminal degrees (e.g., high school, CDA, AA, BA), one misses training and personal and professional development some staff may have that did not culminate in a degree. Such additional information is generally not collected and was not available in Miami-Dade.

[10] We use as many categories as necessary to richly describe our data on the quality measures. However, for the analysis, we were forced to collapse a number of these descriptive categories into fewer categories in order to avoid the statistical problems associated with having too many small cells. When it became necessary, we tried to collapse categories as meaningfully as possible.

[11] Includes providers that describe their curriculum as either academic or Montessori.

terms of its age-group programs and an additional generic tool to rate program management and staff development.

As a quality indicator, we average for each CCDF-subsidized provider the "overall" scores they received during each year. The overall score, which is computed and recorded by the 4C agencies, is simply the average of the individual scores received by the providers across the five assessment tools.

Number of Inspection Visits:

From inspection reports by the Licensing Enforcement Division of DCF, we classify providers on the basis of the yearly total number of inspection visits they have had. Our reasoning for including this measure among our quality measures is that inspectors more frequently re-visit providers needing follow-up after various non-compliances have been noted during regular inspections.

Non-compliances:

To rate each provider's level of compliance with child care minimum standards, we create three separate measures. These are derived from data recorded in inspection reports issued by the Licensing Enforcement Division of DCF. Inspection reports cover many different aspects of quality, such as compliance with required caregiver-to-child ratios and measures of health and safety (e.g., level of sanitation and cleanliness, proper hand washing before meals and after diapering, staff tested for infectious diseases, outdoor environment properly fenced and so on). (Samples of recent inspection reports filed by inspectors in MDC may be viewed online by visiting the FL DCF website dedicated to child care provider searches. This site includes, for each provider, several recent inspection reports. The site is located at

http://199.250.30.131/childcare/provider/). The three quality measures we create from these data are:

(1) Total number of provider non-compliances per year.

(2) Number of provider non-compliances per year specifically for violations of caregiver-to-child ratio requirements.

(3) Severity of provider non-compliances:

For descriptive purposes, we classify each provider non-compliance, as recorded in each inspection report, on a yearly basis, as follows: a) no non-compliance reported; b) the reported non-compliance is not of a serious nature; c) the reported non-compliance is serious; d) the reported non-compliance is very serious. We use a panel of judges (two licensing enforcement directors from two districts in FL and two academic researchers) to classify all non-compliances in the standard inspection report in terms of their severity. A copy of the judges' combined ratings on the severity of non-compliance scale is included in the Appendix (Part II of this report).

For analytic purposes we develop a 3-point scale to classify the results of provider inspections, on a yearly basis, as follows: 0) no non-compliance found; 1) the non-compliance is less serious; 2) the non-compliance is more serious.

Complaints:

To rate providers in terms of complaints against them, we create two separate measures from the data compiled by the Licensing Enforcement Division of DCF:

(1) Total number of complaints filed against the provider per year.

(2) Seriousness of complaint:

For descriptive purposes we classify providers yearly on the basis of the seriousness of each complaint filed against them, as follows: a) no complaints on

record; b) complaint is not of a serious nature; c) complaint is serious; d) complaint is very serious. We use a panel of judges (two academic researchers and two research assistants) to classify all the complaints filed against providers during the period of our study into the categories delineated above.

For analytic purposes we create a yearly binary that flags providers against whom serious and very serious complaints have been filed.

Sanctions:

For descriptive purposes, from information gathered from the Licensing Enforcement Division of DCF, we classify providers yearly on the basis of the level of sanctions applied against them due to various violations, as follows: a) no sanction was applied; b) provider received a warning or citation or was fined less than $500; c) provider was fined $500 or more, was told that the facility would be closed unless problem was resolved or that no children would be allowed at the premises until the problem was resolved.

For analytic purposes, we develop a binary variable to flag sanctioned providers on a yearly basis.

Vacancy Rates:

Using R&R data we classify providers in terms of their capacity, that is, the number of children they are licensed to care for. Then we compute the vacancies they report to the R&R agency as a percent of their total capacity. (Provider capacities and vacancies are collected by the R&R agencies on a monthly or bi-monthly basis.) While vacancy rates have not traditionally been used as measures of provider quality, they do provide an indication as to whether or not a provider's services are attractive to parents. By placing their children with certain providers, parents reveal their preferences for the

services of these providers and such providers will have low vacancy rates. Economists say that such providers have met the "market test." By way of contrast, providers with high vacancy rates have failed to meet the market test.

Descriptive Findings

In this section we start by describing and briefly summarizing the characteristics of the providers in our database and then we focus our descriptions more specifically on the quality measures we developed.

We studied a total of 1,276 licensed child care providers in MDC over a six year period (1996 to 2001). The providers we studied include ALL the centers, Head Start programs and public and non-public after-school programs located in MDC that were both in the records of the local R&R agency and in the records of the Licensing Enforcement Division. Forty-seven percent of the providers (n=528) had participated at least for one of the years of our study in the CCDF-subsidized child care program. The remaining providers (53%) did not receive CCDF subsidies during the period of our study. Forty percent of the providers (n=510) were located in a poverty area,[12] and 60% were not located in a poverty area.

Types of Providers

Figures 1 and 14 describe the types of providers we studied in terms of their CCDF-subsidized status and whether or not they were located in a poverty area. [13] As can be seen in Figure 1, the majority (69% to 83%) of the providers, across the years and regardless of subsidy status, were centers. The figure also shows that the proportion of centers (vis-à-vis the other types of licensed non-family providers in our

[12] For the purposes of our study we classified a zip code area as a poverty area if at least 30% of the children under the age of 18 in the area were living in poverty, according to the 2000 U.S. Census.

[13] The year 1996 is not included in Figure 1 because we did not receive provider assessment scores from the CCDF subsidy program for this year.

database) among the CCDF-subsidized providers grew from 73% to 83% during the years of our study, while the proportion of centers among the providers not receiving CCDF subsidies slightly decreased during the same period. The second largest group of providers we studied was public-school after-school programs. Figure 1 shows a substantial decrease in the proportion of public after-school programs receiving CCDF subsidies during the years of our study. A small proportion of the licensed providers in our database, ranging from 3% to 10%, were Head Start programs. Most of the Head Start programs were not receiving CCDF subsidies. There were only a few private after-school programs in our database.

Figure 14 describes the providers in terms of their location in poverty and non-poverty areas. It is interesting to note the increase, over the years, in the proportion of centers in both poverty and non-poverty areas, as well as the decline in the proportion of Head Start programs (particularly in poverty areas). Also worth mentioning is the decline in the proportion of public after-schools, both in poverty and non-poverty areas. This decline in after-school care may be related to the state of FL's increasing emphasis on preschool care, particularly in recent years.

Religious Status

Figures 2 and 15 describe the licensed providers we studied in terms of their religious status (faith-based versus not faith-based), as reported by the providers to the R&R agencies. Both figures show a dramatic increase in the proportion of faith-based providers over the years. This major increase in the proportion of faith-based providers was more pronounced among those receiving CCDF subsidies (from 5% in 1997 to 49% in 2001) than among those not receiving subsidies (from 19% in 1997 to 44% in 2001). Figure 15 shows that the substantial increase in the proportion of faith-based providers

over the years extended to both poverty and non-poverty areas, although the increase was more dramatic in poverty areas (from 13% in 1966 to 47% in 2001) than in non-poverty areas (from 17% in 1996 to 45% in 2001). We believe that the remarkable increase in the representation of this category of child care providers is related to Florida's emphasis in recent years on faith-based providers.[14]

Profit Status

Figures 3 and 16 summarize the profit status of the providers and show that non-profit providers still dominate the MDC market, but they are losing momentum as the for-profits gain market share. As can be seen in Figure 3, the proportion of non-profit providers is higher among providers not receiving CCDF subsidies than among those receiving subsidies, and it has been increasing over the years (from 67% in 1997 to 70% in 2001). In contrast, the proportion of for-profit providers is higher among those receiving CCDF subsidies, and this proportion has been increasing through the years (from 39% in 1997 to 47% in 2001). Figure 16 shows, as would be expected, that the proportion of non-profit providers is greater in poverty areas than in non-poverty areas. However, it also shows that the proportion of non-profit providers (as compared to those for profit) has been decreasing somewhat in poverty and non-poverty areas.

Subsidy Status and Location

Figure 4 describes how the providers vary in terms of whether they receive or do not receive CCDF subsidies, depending on whether or not they are located in poverty

[14] For example, under Governor Bush faith-based providers have had a special seat on the state's Early Learning Council and on the State Partnership Board. Also, Governor Bush has opened a separate program office for faith-based providers.

areas.[15] As would be expected, the proportion of providers receiving CCDF subsidies is greater in poverty areas than in non-poverty areas, but it is not as large a proportion as one might have expected. In fact, the data shows that roughly half of providers in poverty areas do not participate in the subsidized child care program. In non-poverty areas roughly two-thirds to three-fourths of providers do not participate in the subsidized child care program.[16] Figure 4 also shows that the proportion of providers taking CCDF subsidies has been growing, in non-poverty areas from 24% in 1997 to 31% in 2001 and in poverty areas from 46% in 1997 to 52% in 2001.

Accreditation

The national accreditation status of the providers is summarized in Figures 5 and 17. Although the vast majority of the providers were unaccredited during the period of our study, Figure 5 shows a substantial increase in the proportion accredited through the years, particularly among CCDF-subsidized providers (from 2.6% in 1997 to 7.1% in 2001). The increase in accreditation was less substantial among providers who were not participating in the program (from 2.8% in 1997 to 4.2% in 2001).[17] The difference in the increase in accreditation among CCDF-subsidized providers is not surprising, given the substantially higher reimbursement rates received by providers participating in the

[15] We classified providers for each year of our study as receiving CCDF subsidies if, for that year, they had been assessed by either of the two 4C agencies. Those providers that had not been assessed by either of the two 4C agencies during a particular year were classified as not receiving CCDF subsidies.

[16] Requirements for participation, while not very onerous are not negligible. To participate in the subsidized child care program in MDC providers must sign a rate agreement, agree to be audited in accordance with Federal guidelines, and be willing to offer paid holidays for the staff. Also subsidized providers must agree to be observationally assessed at least once yearly by the 4C agency in their area. These providers must also be willing to keep attendance records on the children with child care subsidies they are caring for, to regularly submit these records to the 4C agency for reimbursement and to regularly collect co-payments from parents. We are not aware of any additional requirements. To be sure, subsidized providers do not have to maintain more stringent ratios or group sizes than unsubsidized providers and they do not have to participate in the USDA food program.

[17] Providers accredited by nationally recognized accrediting associations receive up to 20% higher reimbursement rates through the Gold Seal program when they participate in the subsidized child care program.

CCDF subsidy program and accredited by the FL Gold Seal Program. Interestingly, Figure 17 shows more substantial increases in the proportion of Gold Seal accredited providers in non-poverty areas (from 2.3% in 1996 to 6.1% in 2001) than in poverty areas (from 1.7% in 1996 to 4.3% in 2001).

Staff Credentials

Figures 6 and 18 describe the situation with respect to staff credentials, as reported by providers to the R&R agency. Both figures show that the largest proportion of staff members at child care facilities in MDC have a high school education or less. Figure 6 shows that, across the years of our study, the proportion of staff with high school or less was somewhat higher at facilities not receiving CCDF subsidies, as compared to facilities receiving subsidies. Figure 18 shows that the proportion of staff with high school or less increased substantially in poverty areas (from 28% in 1996 to 39% in 2001), while in non-poverty areas, the proportion of staff with high school or less decreased slightly over the years we studied (from 34% in 1996 to 33% in 2001). Figure 6 shows that facilities not receiving CCDF subsidies had a somewhat higher proportion of staff with BA degrees and a somewhat lower proportion of staff with the CDA credential, as compared to facilities receiving CCDF subsidies. Figure 18 shows that while facilities in poverty areas experienced a decrease in the proportion of staff with BA degrees in the years from 1996 to 2001, facilities in non-poverty areas experienced an increase in the proportion of staff with BA degrees. This figure also shows, through the years of our study, a decreasing proportion of staff with CDAs, both in poverty and non-poverty areas.

Curriculum

Figures 7 and 19 describe the curriculum situation, according to R&R records. As can be seen in these figures, a substantial proportion of providers report that they do not offer any curriculum for the children. Figure 7 shows that the proportion of providers not receiving CCDF subsidies reporting that they do not have any curriculum increased from 29% in 1997 to 37% in 2001. In contrast, for providers receiving CCDF subsidies, the proportion reporting no curriculum has decreased from 27% in 1997 to 18% in 2001. In terms of geographic areas, the proportion of providers reporting no curriculum has remained stable in non-poverty areas (28% in 1996 and 29% in 2001), but it has increased in poverty areas (from 26% in 1996 to 30% in 2001).

It is encouraging to note, however, that the proportion of both subsidized and unsubsidized providers in poverty and non-poverty areas offering an academic curriculum increased during our study period. Specifically, as shown in Figure 7, the proportion offering an academic curriculum increased among unsubsidized providers from 19% in 1997 to 21% in 2001, while it increased more substantially among CCDF-subsidized providers, from 13% in 1997 to 21% in 2001. As per Figure 19, the proportion of providers offering an academic curriculum increased in non-poverty areas from 18% in 1996 to 22% in 2001, and it increased in poverty areas from 15% in 1996 to 20% in 2001.

Number of Inspection Visits

Figures 8 and 20 provide information about the yearly number of CDF inspection visits to provider facilities to enforce compliance with child care standards. Both figures show a decline in the number of provider inspection visits per year, from a median of 4 visits in 1997 down to a median of 3 visits in 1999 and 2000. The decline affected all providers, subsidized and unsubsidized in poverty and non-poverty areas. It is our

understanding that this change reflects a reduction in the number of required provider inspection visits per year.

Non-compliances

Figures 9 and 21 summarize our findings with respect to provider non-compliances with child care minimum standards. (Please refer to the section on Quality Measures for a discussion of how our measures were created.) Figure 9 shows, across the years of our study, that providers not receiving CCDF subsidies were substantially more likely to be found to be in compliance with child care standards (i.e., to have no non-compliances), compared to providers participating in the subsidy program.[18] Figure 9 also shows a small increase through the years in the proportion of providers in compliance (i.e., with no non-compliances for a given year), with the increase being slightly greater for providers who were not participating in the CCDF subsidy program (34% in 1997 to 36% in 2000) than for subsidized providers (26% in 1997 to 27% in 2000). Figure 21 shows, through the years 1996 to 2000, a substantially larger and growing proportion of providers found to be in compliance with standards in poverty areas (from 30% in 1996 to 38% in 2000), compared to non-poverty areas, but no change in the proportion of providers in compliance in non-poverty areas (29% both in 1996 and in 2000).

Figures 9 and 21 show that a large proportion of providers (36% to 58%) committed what our panel of judges deemed to be very serious violations of the child care standards. Very serious violations of the standards include, among others, things such as lacking adequate supervision of children, presence in the facility of toxic or

[18] It should be noted that subsidized providers are observationally assessed by the 4C agencies at least once yearly and that, if the assessors observe any licensing violation or some other infraction while they are observing the program, they are required to alert licensing or the abuse line depending on the nature of the problem observed. This may result in higher numbers of licensing non-compliances noted for subsidized providers than for unsubsidized providers.

hazardous materials, exits not clearly marked, lack of an operable phone, medicines not properly labeled or stored, or children released to unauthorized individuals.[19] It appears that serious non-compliances are becoming less common than they used to be. Specifically, Figure 9 shows a reduction in the proportion of providers who had committed one or more very serious violations. This may be due to the decrease in the number of inspections per year or may indicate that compliance with minimum standards has improved through time. For unsubsidized providers the reduction was from 47% in 1997 to 39% in 2000, and for CCDF subsidized providers the reduction was from 58% in 1997 to 47% in 2000. Figure 21 shows the most dramatic decrease in the incidence of serious non-compliances taking place in poverty areas; specifically, in poverty areas serious violations went down from 50% in 1996 to 36% in 1997). Unexpectedly, however, the proportion of serious violations remained static in non-poverty areas (47% in both 1996 and 2000).

Figures 10 and 22 use box plots to provide information about the yearly number of provider non-compliances. The line in the middle of the box is the median number of non-compliances. The top of the box is the 75th percentile of the number of non-compliances and the bottom of the box is the 25th percentile of the number of non-compliances. The length of the box is the inter-quartile range (75th percentile-25th percentile), and it is a measure of how much providers vary in number of non-compliances. Fifty percent of providers will have a number of non-compliances that fall within the box. The lines extending out from the top and the bottom of one of the boxes are often called the whiskers. The whiskers extend 1.5 times the inter-quartile range.

[19] To view the judges' combined ratings on the severity of non-compliance scale, please refer to the Appendix in Part II of this report.

Providers with scores falling in the upper whiskers have large numbers of failures to comply with minimum standards.

Figure 10 shows that CCDF-subsidized providers had a substantially wider range of yearly non-compliances (i.e., from 0 to 17), compared to providers not receiving subsidies (from 0 to 12). CCDF-subsidized providers also had a higher median number of yearly non-compliances than unsubsidized providers in 1997 and 1998 (3 non-compliances in 1997 and 4 in 1998 for subsidized providers versus 2 non-compliances both in 1997 and 1998 for unsubsidized providers).[20] However, the median number of non-compliances for subsidized and unsubsidized providers became equal in 1999 and 2000 (2 non-compliances per year in 1999 and 2000 for both subsidized and unsubsidized providers). Figure 22 shows that the decline in the median yearly number of provider non-compliances after 1998 was more pronounced in poverty areas (from 3 non-compliances per year to 1) than in non-poverty areas (from 3 non-compliances per year to 2).

Compliance with required staff-to-child ratios is also an important indicator of quality, and minimum-standards inspections provide unique information on failures to meet required ratios. According to the FL child care standards, providers are required to stay within certain prescribed limits in terms of how many staff members must be present at the facility to care for children of different ages.[21] When inspectors visit the providers, they observe the actual ratios and are supposed to issue non-compliances when providers exceed the prescribed ratios. Figures 23 and 24 summarize our findings

[20] It is possible that the difference between subsidized and unsubsidized providers is at least partly attributable to the fact that, on average, subsidized providers are observationally assessed more frequently than unsubsidized providers and that assessors from the 4C agencies are required to report to the licensing office or to the abuse line any violations observed during their visits.

[21] During the years of study one staff member was required for every 4 0-12 month infants, for every 6 one-year-olds, for every 11 two-year-olds, for every 15 three-year-olds, for every 20 four-year-olds, and for every 25 children ages 5 and older.

with respect to the mean number of provider non-compliances due to staff-to-child ratio violations per year.

Figure 23 shows that, through the years of our study, CCDF-subsidized providers had a higher yearly mean number of staff-to-child ratio violations than unsubsidized providers, but the gap between the two categories of providers was becoming smaller. Specifically, in 1997, approximately 6% of unsubsidized providers were found to be in violation of ratio requirements, while 22% of CCDF-subsidized were found to be in violation. By the year 2000, approximately 10% of unsubsidized providers had staff-to-child ratio violations, while approximately 17% of subsidized providers had ratio violations. While subsidized and unsubsidized providers were coming closer together in terms of staff-to-child ratio violations, Figure 24 shows a growing gap between providers in poverty and non-poverty areas, with providers in poverty areas having an inspection record of fewer staff-to-child ratio violations than those in non-poverty areas. Specifically, in 1998 approximately 13% of providers in poverty areas had ratio violations, while it was approximately 17% in non-poverty areas. By 2000, the proportion of providers in poverty areas with ratio violations had fallen to approximately 7%, but it had increased to 18% in non-poverty areas.

Complaints

Figures 11 and 25 summarize our findings with respect to complaints filed against providers. As can be seen in these figures, while the vast majority of providers had no record of complaints, between 10% and 25% did have complaints filed against them during the years of our study. Figure 11 shows that complaints were less frequently filed against providers not receiving CCDF subsidies (90-93% had no complaints), than against CCDF-subsidized providers (75-84% had no complaints).

However, the proportion of unsubsidized providers with no record of complaints has been decreasing somewhat (from 93% in 1997 to 91% in 2000), while the proportion of CCDF-subsidized providers with no record of complaints has been increasing somewhat (from 82% in 1997 to 84% in 2000). For all geographic areas, Figure 25 shows a slight increase in the proportion of providers with no record of complaints (in poverty areas from 89% in 1996 to 91% in 2000 and in non-poverty areas from 85% in 1996 to 86% in 2000).

Very serious complaints are very rarely filed against providers. However, Figure 11 shows that the proportion of very serious complaints has been increasing. Among providers not receiving CCDF subsidies, the incidence of very serious complaints increased from .39% in 1997 to 1.17% in 2000, and among providers receiving subsidies it increased from 1.07% in 1997 to 1.41% in 2000). In terms of geographic areas, Figure 25 shows that the proportion of very serious complaints against providers has been decreasing in non-poverty areas (from 1.84% in 1996 to 1.3% in 2000), while it has been increasing in poverty areas (from .35% in 1996 to 1.22% in 2000).

Sanctions

During the years of our study providers were rarely sanctioned or fined for their non-compliances or misbehaviors. In fact, Figures 12 and 26 show that the vast majority of providers had a record free of any sanctions imposed by minimum-standards inspectors. This is true for all categories of providers, subsidized and unsubsidized as well as for providers in poverty and non-poverty areas. However, sanctions or fines are becoming more common. As can be seen in Figure 12, the proportion of subsidized providers who were sanction-free went down from 96% in 1997 to 84% in 2000, and for unsubsidized providers, the proportion sanction-free decreased from 97% in 1997 to

87% in 2000. Figure 26 shows that in poverty areas the proportion sanction-free decreased from 93% in 1996 to 85% in 2000, and in non-poverty areas the proportion sanction-free decreased from 93% in 1996 to 87% in 2000.

Major sanctions (i.e., fines of $500 or more, facility closings, or barring children from the premises until the problem is resolved), in particular, have increased substantially through the years. As can be seen in Figure 12, the proportion of providers, both subsidized and unsubsidized, receiving major sanctions has increased dramatically; specifically the proportion of providers not on CCDF subsidies receiving major sanctions increased from less than 1% (.2%) in 1997 to 10% in 2000, and the proportion of CCDF-subsidized providers receiving major sanctions increased from 0% in 1997 to 8.47% in 2000. Figure 26 shows the greatest increase in the proportion of providers receiving major sanctions in poverty areas (from .69% in 1996 to 12.47% in 2000), while the increase in major sanctions applied to providers in non-poverty areas, while very substantial, has been the lowest (from 1.15% in 1996 to 7.3% in 2000).

Vacancy Rates

Figures 13 and 27 provide box plots for provider vacancy rates (i.e., their acancies as a percent of their capacities or number of licensed slots). While vacancy rates have not traditionally been used to be a measure of provider quality, they do provide an indication as to whether or not a provider's services are attractive to parents. By placing their children with certain providers, parents reveal their preferences for the services of these providers, and such providers will have lower vacancy rates than other providers not chosen as frequently. Economists say that such providers have met the "market test." By way of contrast, providers with high vacancy rates have failed to meet the "market test."

Figure 13 shows that, across the years of our data, CCDF-subsidized providers had higher median vacancy rates than unsubsidized providers (medians are indicated in the graph by the line in the middle of the boxes). However, the differences in vacancy rates between subsidized and unsubsidized providers appear to be getting proportionally somewhat smaller than they used to be. Specifically, in 1997 unsubsidized providers had a median vacancy rate of 16%, while CCDF-subsidized providers had a median vacancy rate of 27%. By 2001 median vacancy rates were much lower--the median vacancy rate of unsubsidized providers was 9%, and it was 13% for subsidized providers. Figure 27 shows the same trend toward lower vacancy rates in the years we studied in both poverty and non-poverty areas. This figure also shows that median vacancy rates in 1997 and 1998 were higher in poverty areas (23% in 1997 and 22% in 1998) than in non-poverty areas (18% in 1997 and 19% in 1998). But the situation became reversed in 1999, 2000, and 2001, with higher median vacancy rates in non-poverty areas (17% in 1999, 10% in 2000, and 12% in 2001) than in poverty areas (14% in 1999, 8% in 2000, and 10% in 2001). The lower vacancy rates in poverty areas may well reflect the effects of welfare reform.

Analytic Findings

For both analytic and administrative purposes it is desirable to have a composite index of quality that incorporates many quality measures and reflects the multi-faceted nature of child care quality. To develop a composite index of quality, we used principal components analysis (PCA) (see Rencher, 1998). PCA allows one to develop a smaller set of factors that capture most of the information from a larger number of quality indicators. PCA also allows one to identify the pattern of association among the multiple

measures of quality, that is, it allows us to discern which measures of quality are highly correlated.

The PCA indicated that six factors explained approximately 80% of the variance in all of the quality variables available for all providers (all the variables except scores on the Child Care Assessment observations, which were only available for the CCDF-subsidized providers). These six factors successfully isolate major indicators for different aspects of quality.

Factor 1—Minimum-Standards Compliance

The first factor, which explained 28% of the overall variance in the quality indicators, loaded highly on factors related to minimum-standards compliance. It specifically reflects the providers' level of adherence to minimum-standards regulations. It is interesting that this factor explains such a large proportion of the overall variance in the data. The finding suggests that there may be substantial benefits gained from incorporating data from minimum-standards inspections when measuring provider quality.

Factor 2—Staff Credentials and Curriculum

The second factor, which explains 14% of the overall variance in the quality indicators, loaded highly on staff credentials and the use of a curriculum. These factors have traditionally been found to be associated with higher levels of provider quality.

Factor 3—Number and Seriousness of Complaints

The third factor, which explains 11% of the overall variance in the quality indicators, loaded highly on the absence of complaints about the provider. Complaints generally come from parents and sometimes from others (e.g., neighbors, police, firemen, advocates) who observe providers in the course of their own activities. More

complaints and complaints that are more serious provide an additional perspective on provider quality.

Factor 4—Percent Vacancies

The fourth factor, which explains 9% of the overall variance in the quality indicators, loaded highly on the percent of slots at the provider that were filled (i.e., it loaded negatively on the vacancy rate). As we had surmised, a provider's ability to attract parents is an important and unique aspect of quality. However, note that this factor is much less important than other commonly used measured of quality such as the credentials of staff and the use of a curriculum.

Factor 5--Sanctions

The fifth factor, which explains 8% of the overall variance in the quality indicators, loaded highly on the absence of sanctions (i.e., it was inversely related the number of sanctions that a provider received). It appears that the sanctioning process provides yet another look at provider quality.

Factor 6--Accreditation

The final factor, which also explains 8% of the overall variance in the quality indicators, loaded highly on accreditation. Accreditation, which is used by many quality rating systems, does appear to be a unique dimension of quality. Typically, to be accredited, providers need to undergo a self study and observation by a trained observer every three years or so. Receiving accreditation certifies, by an independent body, that they provider has achieved a threshold level of quality.

Observational Assessment of Classrooms and of Management

We also carried out a PCA analysis for CCDF-subsidized providers that included, in addition to the quality variables used in the previous analysis, the overall scores this set of providers obtained on the observational assessments using the Child Care

Assessment Tool. The PCA indicated that five factors explained approximately 70% of the variance in all of the quality variables available. The factors were approximately the same as for the PCA analysis that did not contain the observational assessment. Interestingly, the observational assessment scores loaded heavily on factor 2. This means that staff credentials and the use of curriculum are highly correlated with observational assessment of classrooms and of facility management.

The Composite Index of Quality

Using scoring coefficients (i.e., eigenvectors) from the PCA, we next calculated values for each of the factors for every provider and ranked each of the providers on each factor. Using the scores on each factor, we can compare how different providers rank in terms of minimum-standards compliance, curriculum and credentials of staff, the absence of complaints, the ability to attract clients, sanctions and accreditation.

Finally, weighting each of the factor values by the proportion of variance explained by the factor, we obtained two composite indexes of quality for providers that participate in the CCDF child care subsidy program and one composite index of quality for providers who do not participate in the child care subsidy program. One index used all variables including the observational assessments and the other used all variables except the observational assessments. As previously noted, the observational assessments were only available for CCDF-subsidized providers.

To see the impact of omitting observational assessments, we correlated the two composite indexes of quality for providers that participated in the child care subsidy program. The correlation of the two composite indices was .98 (significant at the .0001 level). We concluded that observational assessments add information; however, they, do

not add a great deal of information, if a wide array of other quality measures are available from administrative records.

Figure 28 provides box plots for the composite quality index by year and by whether or not providers participated in the child care subsidy program. The line in the middle of the box is the median score on the composite index. Providers that do not participate in the child care subsidy program have higher median quality ratings than providers that participate in the program. However, the difference in median quality rating is lowest in the final year.

The tops of the boxes in Figure 28 are the 75th percentiles for the composite quality ratings and the bottoms of the boxes are the 25th percentile of quality ratings. The height of the boxes is the inter-quartile range (75th percentile-25th percentile). Fifty percent of providers will have quality ratings that fall within the box. The height of the boxes tells us how variable quality is for the middle 50% of providers. As can be seen by the height of the boxes, providers caring for children with CCDF subsidies have more variable quality then providers who do no care for CCDF children.

The lines extending out from the top and the bottom of the boxes are often called the whiskers. Recall that the whiskers extend 1.5 times the inter-quartile range above and below the boxes. Providers with scores falling in the upper whiskers are high quality providers. Providers with scores falling in the lower whiskers are low quality providers. The whiskers for providers that care for children with CCDF subsidies are far longer then the whiskers for providers that do not care for CCDF children. This indicates that the greater quality variation for providers participating in the CCDF program relative to those that do not participate, extends to the high and low quality sectors of the subsidized provider community.

The dots that extend above the upper whiskers and below the lower whiskers are outliers. The providers associated with the dots above the upper whiskers have the highest quality ratings, and the providers associated with the dots below the lower whiskers have the lowest quality ratings. Note that in 1997 through 1999, there were a number of extremely low quality providers participating in the CCDF program. However, by 2000, the providers with exceedingly low quality scores had been eliminated for CCDF providers but not for providers that did not participate in the CCDF program.

Possible Administrative Uses of the Composite Quality Index

The box and whiskers categorization of providers on the composite quality index could be used in a number of ways. First, such categorization provides a firm foundation for a quality rating system. Providers represented by the dots at the top of the upper whisker could receive the highest quality rating and reimbursement rate. Those receiving scores in the upper whisker could receive the next highest rating. Those receiving scores that fell in the box could receive an average quality rating. Those receiving scores falling in the lower whisker could receive below average rating and those below the lower whisker could receive the lowest available rating.

Second, the box and whiskers categorization of providers allows administrators and advocates to quickly identify the providers with the lowest quality scores. These providers could be targeted for interventions. Finally, quality rating scores could be followed across time to see if quality improves as various quality-related interventions are put in place.

Significant Differences in Composite Quality Scores?

To discern if the quality scores of providers differed significantly, we compared, by means of t-tests, the pool of CCDF-subsidized providers versus the pool of

unsubsidized providers in terms of their quality scores for each of the years of our study. We found that for the years 1997, 1998, and 1999, CCDF-subsidized providers had quality scores that were significantly lower than unsubsidized providers ($p<0.0000$). In 2000, CCDF-subsidized providers had lower quality index scores than unsubsidized providers, but the difference was of borderline statistical significance ($p<0.054$).

We also compared, by means of t-tests, all the providers in non-poverty areas versus all the providers in poverty areas (both subsidized and unsubsidized). Because the largest group of providers in poverty areas receives CCDF subsidies, we thought it was possible that location in a poverty area, rather than subsidized status, might be an important reason behind the lower quality index scores of subsidized providers. However, we found that for the years 1997, 1998, and 1999, there was no statistically significant difference between the quality index scores of providers in poverty and non-poverty areas. For 2000, we found that providers in poverty areas had very significantly higher quality index scores than providers in non-poverty areas ($p<-.0003$). We, therefore, discarded the notion that providers receiving CCDF-subsidies might have lower quality index scores as a function of their more frequent location in poverty areas.

Finally, we consider how quality scores vary for providers over time. This is important. If there is relatively little variation in the quality scores of providers over time, then quality scores can be recalculated infrequently. If there is a great deal of variation in provider scores across time, then scores will need to be calculated more frequently. Somewhat surprisingly, we find a great deal of variation in provider scores across time. Specifically, for providers that participate in the child care subsidy program, the overall variation in quality score (the standard deviation) is .64. Given that the mean quality score is -.07, this represents very substantial variation (coefficient of variation=9). The

standard deviation of quality scores across these subsidized providers (i.e., between variation) is .48, and the variation in provider scores across years (i.e., within variation) is .40. For providers that do not participate in the child care subsidy program, the overall variation in quality score (the standard deviation) is .47. Given that the mean quality score is .06, this also represents substantial variation (coefficient of variation=8), but much less variation than for providers that participate in the subsidy program. The standard deviation of quality scores across subsidized providers (i.e., between variation) is .42, and the variation in provider scores across years (i.e., within variation) is .30. The substantial variation in quality scores for provides across time suggests that quality scores need to be recalculated rather frequently.

Summary and Conclusions

In this paper, we demonstrate some of the advantages of compiling a comprehensive set of quality indicators and following the scores of providers on these indicators over time. We show how such indicators can be used to track changes in the child care market and to examine impacts of changes in policies and administration. We compare and contrast providers operating in poverty and non-poverty neighborhoods and providers participating and not participating in the CCDF child care subsidy program. In many cases, trends for child care providers operating in poverty neighborhoods are quite different from trends for providers that participate in the CCDF subsidy program. This reflects the fact that many providers that participate in the CCDF subsidy program operate outside poverty neighborhoods and the fact that not-for-profit providers unaffiliated with the CCDF program provide much of the care in poverty neighborhoods. Further, while for-profit firms account for almost half of CCDF-subsidized programs in

recent years, for-profit firms account for only about 30% of the providers in poverty neighborhoods.

Over the period of our study, we find a marked increase in the number of child care centers and a decline in both Head Start programs and after-school programs in public schools. We are not aware of any demographic or income changes in the child and adolescent populations that might help to explain these programmatic changes. The decrease in after-school programs may reflect a shift of priorities in Florida (the state of our study area, Miami-Dade County). The increase in child care centers and decline in Head Start programs may be the result of the emphasis on work under Welfare Reform in Florida. For working parents, full-time child care centers would likely be more convenient than Head Start, if the Head Start program near them is not full-day. In our study area, we find a marked increase in the proportion of licensed providers with religious affiliations beginning in 2000 (see Figure 2 and Figure 15). Specifically, in 1996, the first year of our study and the year before welfare reform began, 13% of providers in more economically advantaged neighborhoods and 17% of providers in poverty neighborhoods had religious affiliation. By the year 2000, 51% of providers in both poverty neighborhoods and more economically advantaged areas had religious affiliation. Similarly, in 1997, only 5% of providers caring for children with CCDF subsidies had religious affiliation, but by the year 2000 55% of CCDF-providers had religious affiliation. This increase probably reflects Governor Jeb Bush's faith-based initiative, which was well underway by 2000 after his election as Governor in 1998.

During the period of our study, we also find a large increase in the proportion of providers caring for CCDF-subsidized children that report that they operate for profit (see Figure 3). Specifically, in 1997, 39% of providers caring for children receiving

CCDF subsidies reported that they were operating for profit. By 2001, 47% reported for-profit status. This contrasts with the trend for providers that did not take care of children with CCDF subsidies. Among these providers, those claiming for-profit status declined from 33% in 1997 to 30% in 2001.

We find that accreditation increased particularly for providers caring for children receiving CCDF subsidies (see Figure 5). However, during the period of our study, accreditation in Miami-Dade County remained rare. In 1997, 3% of both providers caring for CCDF subsidized children and those not doing so were accredited. By 2001, 7% of providers caring for CCDF subsidized children were accredited, while the proportion of providers without CCDF children who were accredited remained virtually unchanged since 1997. This reflects the increased reimbursements rates available to accredited CCDF providers.

We find a worrying increase in the proportion of staff with low levels of education (i.e., high school or less) at providers located in poverty neighborhoods (see Figure 18). In 1996, providers in poverty areas reported that 28% of their staff had a high school education or less, while by 2001 they reported that 39% of their staff had a high school education or less. In contrast, there was only a slight increase in the proportion of staff with a high school education or less among providers that cared for children with CCDF subsidies (see Figure 6).

As can be seen in Figure 7 and Figure 19, providers participating in the CCDF program were far more likely to report using a curriculum at the end of our study period than at the beginning. In 1997, 73% of CCDF providers reported using a curriculum, while in 2001 82% reported using a curriculum. By way of contrast, a smaller proportion of providers that did not participate in the CCDF program reported using a curriculum

(71% in 1997), and the proportion using a curriculum declined over the study period (63% reported using a curriculum in 2001). We believe that the increased use of a curriculum by CCDF providers reflects the increased emphasis on school readiness in the Florida CCDF program over the course of our study period.

One of our work innovations is to use both the results of minimum-standards inspections and records of complaints about providers as measures of quality. Our work indicates that these sources of information provide unique and very important measures of some aspects of quality. We find that providers outside the CCDF subsidy program are more compliant with minimum-standards regulations than providers that participate in the program (see Figure 9). For example, in 2001 36% of providers that did not participate in the CCDF program were found to be fully compliant with minimum standards, while only 27% of providers participating in the CCDF program were found fully compliant. As noted earlier, part of the difference may be attributable to the fact that subsidized providers are observationally assessed at least one extra time per year (compared to unsubsidized providers) and that assessors from the 4C agencies are required to alert licensing or the abuse line if they observe any violations.

Another of our work innovations is the development of a method for evaluating the seriousness of violations of minimum standards and of complaints about providers. To develop the measures of seriousness, we used an expert panel that included managers of inspection and compliance offices and researchers. As can be seen in Figure 9 and Figure 21, the proportion of providers in poverty neighborhoods and the proportion of providers participating in the CCDF program that had minimum-standards violations that were judged by the panel of experts to be very serious declined during the period of our study. For example in 1997, 58% of providers participating in the

CCDF program had violations of minimum standards that were judged to be very serious by our panel of experts. By 2001, only 47% of providers participating in the CCDF program had very serious violations. However, it is still worrying that a substantially larger proportion of providers participating in the CCDF program had very serious violations than either providers who did not participate in the CCDF program or providers operating in poverty neighborhoods. Again, the difference between subsidized and unsubsidized providers may be partly attributable to the fact that, on average, subsidized providers are observationally assessed more frequently than unsubsidized providers and that assessors from the 4C agencies are required to report violations observed.

One of the unique strengths of minimum-standards inspections is that they represent the only on-going observations of the degree to which providers abide by child-staff ratio requirements. Unlike most other observational assessments, minimum-standards inspections are unannounced and occur multiple times each year (four times a year at the beginning of our study and three times a year at the end). This means that minimum-standards inspectors are more likely to observe child-staff ratio violations than most other observers. As can be seen in Figure 23, minimum-standards inspectors report that providers participating in the CCDF program are much more likely to violate child-staff ratio requirements than providers that do not participate in the program. For example in 2000, minimum-standards inspectors reported that approximately 17% of providers participating in the CCDF program violated child-staff ratio requirements, while only approximately 10% of providers not participating in the program were found in violation of child-staff ratio requirements. It is possible that, due to eligibility re-determinations every six months, CCDF-subsidized providers do not get sufficient

advance notice about the number of subsidized children that will continue or will not continue in the program to make the necessary adjustments in staffing and that this leads in some cases to temporary ratio violations. The prevalence of for-profit providers in the CCDF program may also help to explain the large difference in child-staff ratio violations between subsidized and unsubsidized providers. For-profit firms have strong pressures to reduce costs to stay in business, and staff costs, which generally are between 70% and 75% of total provider costs, are by far the largest expense for child care providers. This issue merits further investigation.

While minimum-standards inspectors provide very important observational measures of such things as provider health, safety and compliance with standards, complaints from other individuals observing providers offer a different and also valuable source of information. Figure 11 and Figure 25 provide information on the frequency and seriousness of complaints about providers. Providers participating in the CCDF child care subsidy program received far more complaints, many of which were judged to be serious, than either providers that did not participate in the child care subsidy program or providers operating in poverty neighborhoods.

As can be seen in Figure 12 and Figure 26, during the period of our study, providers were not sanctioned for most violations of minimum standards. Only some of the more serious violations resulted in sanctions. However, for all provider groups studied, the proportion of providers receiving sanctions for minimum-standards violations increased during our study period, and providers in poverty neighborhoods as well as providers participating in the CCDF program were more likely to be sanctioned than other providers. The increase in the most serious sanctions (i.e., a fine of more than $500 or not allowing the provider to care for children) is particularly noteworthy.

The quality measures described to this point come either from telephone surveys of providers carried out by the R&Rs in Miami-Dade or from observations of minimum-standards inspectors or others interacting with providers. Complaints often come from parents, particularly very dissatisfied parents.

When parents are choosing a provider to care for their children, they assess the characteristics and services of various possible providers on whatever criteria they feel relevant. Research suggests that convenience, in terms of location and hours of operation, is an important consideration for parents, but that such things as the warmth of the provider and the way the provider interacts with their children are also important. Providers that have characteristics and services that parents want will have many parents willing to place their children in care. Such providers will have a large proportion of their licensed capacity utilized. By way of contrast, providers with characteristics and services that are less desired by parents will wind up with a large proportion of their licensed capacity unutilized. Providers with high capacity utilization "have met the market test," (i.e., in the language of economists, they have provided services that parents want to buy). As can be seen in Figure 13 and Figure 27, over the course of our study, all provider groups (i.e., those participating and not participating in the child care subsidy program and those located and not located in poverty areas) experienced an increase in capacity utilization. This reflects the buoyant US economy during the late 1990s. However, providers participating in the child care subsidy program had the lowest rate of capacity utilization of any of the provider groups we studied, although capacity utilization increased much more rapidly for CCDF providers (as well as for providers in poverty neighborhoods) than for other providers. Extra demand for CCDF

providers and for providers in poverty neighborhoods came from the playing out of welfare reform over the course of our study period.

One can learn a great deal from examining multiple indicators of quality and how these indicators change over time. To effectively address many policy, administrative and research questions, one must be able to combine these indicators into a single composite measure of quality that can be compared across providers and across time. Using all of our indicators and principal components analysis (PCA), we develop such a composite indicator. PCA identifies a set of independent factors that reflect as much of the variation in the quality indicators as possible. Quality indicators that are highly correlated will load heavily on the same factor. PCA will indicate how much of the total variation in the quality indicators is explained by each factor.

Our PCA analysis produced very reasonable results. Six factors explained 80% of the variance in all of our child care indicators. More importantly, these six factors seem to have successfully isolated major indicators for different aspects of quality. The factor that explained the largest proportion (28%) of the variance in the quality indicators loaded highly on indicators related to compliance with minimum standards. The next most important factor, which explained 14% of the variance, loaded highly on staff credentials and curriculum. Factor 3, which explained 11% of the variance, loaded heavily on the number and seriousness of complaints against providers. Factor 4, which explained 9% of the variance, loaded heavily on capacity utilization. Factor 5 and factor 6, each of which explained 8% of the variation, loaded heavily on sanctions and accreditation respectively.

We next used the scoring coefficients (i.e., eigenvectors) and the proportions of variance explained by each factor to calculate a composite index of quality for each

provider in each year. Figure 28 contains box plots showing the distribution of these composite quality scores. The distribution of composite quality scores offers policy, administrative and research insights. From a policy perspective, composite scores could be used to classify providers into quality categories (highest quality, high quality, average quality, low quality and the worst quality) for a quality rating system. From an administrative perspective, the composite scores allow identification of very low quality providers that might be improved by concentrated quality interventions. From a research perspective, composite scores allow us to discern how quality varies both across providers and across time. Surprisingly, variation in individual provider quality across time is almost as large as variation of quality across providers. This indicates that quality evaluation should occur relatively frequently.

Both the time series and cross sectional variation in the composite quality scores can be used to evaluate the impact of quality interventions. For example, as can be seen in Figure 28, the median quality score for CCDF providers increased during our study period, and the number of CCDF providers with exceedingly low quality scores declined. Such trends were not apparent for providers that did not participate in the child care subsidy program during our study period. We believe that these time series and cross sectional differences reflect the transfer of administration of the subsidy program to a local group and that group's strong commitment to quality care and to preparing subsidized children for school.

One commonly used measure of quality missing from the indicators that we used to create the above composite index is an observational measure of the nature of interaction between teachers and children in the classroom. Fortunately, such a measure was available to us for subsidized providers. The instruments used for the prescribed

twice yearly classroom observations by the child care subsidy program were developed on the basis of the most commonly used observational measures, such as the Infant/Toddler Environment Rating Scale (ITERS), the Early Childhood Environment Rating Scale (ECERS) and the School-Age Care Environment Rating Scale (SACERS). We added this measure to our quality indicators, carried out a PCA analysis like the one described above and developed a composite index of quality for subsidized providers that incorporated classroom observations. The factors for this PCA were like the factors for the PCA described above. Ratings on classroom interaction loaded heavily on Factor 2. This indicates that the observational measure of classroom interactions is highly correlated with staff credentials and with the use of a curriculum. The correlation between the composite quality measure for subsidized providers that contained observations of classroom quality and the composite quality measure for these subsidized providers that did not include classroom observations was .98, which is significant at the .0001 level of statistical significance. This high correlation suggests that it may not be necessary for the child care subsidy program to frequently conduct separate classroom observations, in addition to the frequent minimum-standards observations by inspectors, if minimum-standards reports are routinely reviewed by the child care subsidy program and if good information is available on the curriculum and staff credentials of subsidized providers.

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