Jennifer Han, Ph.D.

Community Epidemiology and Evaluation

Community and Family Health Service

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Children First: Infant Health in Oklahoma

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Children First is a voluntary family support program in Oklahoma modeled on the Nurse-Family Partnership program. Children First offers home visitation services to mothers expecting their first child. A public health nurse works with the mother to help her improve her chances of having a healthy baby and to educate her about child safety and development. The nurse can also connect the mother to other services in her community, including child care, housing, and employment and educational programs. The mother must enroll in the program by 29 weeks of pregnancy, and can remain in the program until her child is 2 years of age.1

This report provides a snapshot of children born into the Children First program as single births between July 1, 2010 and June 30, 2012 (Oklahoma state fiscal years 2011 and 2012). Children born as multiples are not included in this analysis. The report will present birth outcomes and information regarding infant health within the first 12 months of life of these single-birth infants. Because infant health information are gathered at 6 months and 12 months of age, data for these outcomes will be presented for a subset of the original population of singleton births.

**A Look at Demographics**

There were 1,865 babies born as singletons to mothers enrolled in Children First within the 2011 and 2012 state fiscal year in Oklahoma. Almost 37% of mothers were younger than 20 years of age at the time they gave birth. Thirty-eight percent of infants were non-Hispanic White and 28% were Hispanic ethnicity (of any race) as reported by their mothers. At intake into the Children First program, 35% of the soon-to-be mothers had less than a high school education and 72% were unmarried.

**Table1. Characteristics of Children First Single-Birth Infants Born Between**

**July 1, 2010 and June 30, 2012 and Their Mothers.**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Frequency | Percent |
| Total | Total | 1,865 | 100 |
| Sex of Infant | Male | 962 | 52.3 |
|  | Female | 878 | 47.7 |
|  | Missing | 25 | - |
| Race/Ethnicity of  | White, non-Hispanic | 698 | 37.7 |
| Infant as Reported  | Black, non-Hispanic | 242 | 13.1 |
|  By Mother | American Indian, non-Hispanic | 76 | 4.1 |
|  | Hispanic, of any race | 517 | 28.0 |
|  | Other | 317 | 17.1 |
|  | Missing | 15 | - |
| Age of Mother at  | < 18 | 254 | 13.6 |
| Time of Birth (years) | 18 to 19 | 432 | 23.2 |
|  | 20 to 24 | 778 | 41.7 |
|  | 25 to 29 | 269 | 14.4 |
|  | 30 to 34 | 103 | 5.5 |
|  | ≥ 35 | 29 | 1.6 |
|  | Missing | 0 | - |
| Educational Status  | Less than high school | 630 | 34.9 |
| of Mother At Intake | High school graduate/GED | 395 | 21.9 |
|  | Some post-secondary school | 674 | 37.3 |
|  | College graduate | 108 | 6.0 |
|  | Missing | 58 | - |
| Marital Status of  | Married | 442 | 24.0 |
| Mother at Intake | Single, never married | 1,324 | 72.0 |
|  | Divorced/Widowed | 48 | 2.6 |
|  | Separated | 5 | 1.4 |
|  | Missing | 26 | - |

**Select Birth Outcomes**

Almost 8% of Children First infants were born pre-term, prior to 37 weeks of gestation, and 8.4% were born with low birth weight (weighing less than 2,500 grams or 5 lbs 8 oz or less). Although the populations are different, consider that approximately 10% of all Oklahoma first-born infants are born pre-term, and more than 8% are born with low birth weight.2 Children First has fewer pre-term births than the Oklahoma population, though rates of low birth weight are similar.

Birth weight is related to gestational age, as is demonstrated in Table 2. More than half of Children First infants who were born pre-term also had low birth weight, compared to only 3% of infants born at 37 weeks of gestation or later. Each additional week of gestation lowers the odds of having a low birth weight baby by 43%. Children First encourages mothers to obtain early and regular prenatal care. One important goal of prenatal care is to reduce pre-term births – infants born prior to 37 weeks of gestation are more likely to have health problems, and to have increased severity of health problems.3 Complications due to pre-term births and low birth weight are together considered the second leading cause of infant deaths.3

**Table 2. Gestational Age and Low Birth Weight Status of Children First Single-Birth Infants**

**Born between July 1, 2010 and June 30, 2012.**

|  |  |  |
| --- | --- | --- |
|  | Birth Weight† |  |
| Gestational Age | < 2500 grams | ≥ 2500 grams | p-value (α = .05) |
| < 37 weeks of gestation | 91 (58%) | 66 (42%) |  |
| ≥ 37 weeks of gestation | 51 (3%) | 1628 (97%) | < 0.0001 |

†Birth weight is missing for 29 infants.

Statistically significant racial/ethnic differences in mean birth weight and gestational age were evident (Table 3). Black, non-Hispanic infants had a lower mean birth weight by at least 0.5 pounds compared to the other racial/ethnic groups. Their mean gestational age was also lower than that of White non-Hispanic infants, Hispanic infants, and infants in the “other” category, with differences of approximately 3-5 days. In addition to racial/ethnic differences, the youngest mothers (aged 17 years and younger) gave birth to infants with a lower mean birth weight when compared to mothers aged 25-29 years (Table 3). However, there were no significant differences in gestational age according to age of mother.

**Table 3.Racial/Ethnic Differences in Mean Birth Weight and Gestational Age of**

**Children First Single-Birth Infants Born between July 1, 2010 and June 30, 2012.**

|  |  |  |
| --- | --- | --- |
|  | Birth WeightMean (95% CI) | Gestational AgeMean (95% CI) |
| Race/Ethnicity |  |  |
| White, non-Hispanic | 7.2 (7.1-7.3) | 38.9 (38.7-39.0) |
| Black, non-Hispanic | 6.6 (6.4-6.8) | 38.2 (37.8-38.6) |
| American Indian, non-Hispanic | 7.3 (7.0-7.5) | 38.9 (38.4-39.3) |
| Hispanic, of any race | 7.1 (7.0-7.2) | 38.8 (38.6-39.0) |
| Other, non-Hispanic | 7.2 (7.1-7.3) | 38.9 (38.7-39.1) |
| Age of Mother at Birth (years) |  |  |
| < 18 | 6.9 (6.8-7.1) | 38.8 (38.6-39.0) |
| 18 to 19 | 7.0 (6.9-7.2) | 38.7 (38.6-38.9) |
| 20 to 24 | 7.1 (7.0-7.2) | 38.8 (38.7-39.0) |
| 25 to 29 | 7.3 (7.2-7.4) | 38.8 (38.6-39.0) |
| ≥ 30 | 6.9 (6.7-7.2) | 38.4 (37.9-38.8) |

**Infant Health**

There were 986 infants from the original dataset who had a completed 6-month infant health form and 490 infants who had completed 6- and 12-month infant health forms. The analyses presented below utilize these data.

Routine Check-ups

At 6 and 12 months, primary caregivers were asked where they take their infant for routine checkups. At both time frames, most infants visited a private doctor’s office for a routine check-up, followed by a community/free clinic. Three percent of primary caregivers indicated their infant saw a health care provider only when sick. White infants more often visited a private doctor’s office (81.6% versus 66.0% of non-Whites at 6 months), while non-White infants more often visited a community/free clinic (18.9% versus 6.4% of Whites at 6 months) or hospital clinic (8.3% versus 4.8% of Whites at 6 months).

**Table 4. Locations for Infant’s Routine Check-Ups**

|  |  |  |
| --- | --- | --- |
|  | 6 months (n = 986) | 12 months (n = 490)\* |
| Private doctor’s office | 756 (76.7) | 367 (75.1) |
| Hospital clinic | 58 (5.9) | 38 (7.8) |
| Hospital ER | 1 (0.1) | - |
| Health department | 3 (0.3) | 2 (0.4) |
| Community/free clinic | 102 (10.3) | 49 (10.0) |
| IHS/tribal facility | 27 (2.7) | 13 (2.7) |
| Military facility | 1 (0.1) | - |
| Other facility | 6 (0.6) | 5 (1.0) |
| Sees provider only when sick | 32 (3.3) | 15 (3.1) |

\*Data missing for 1 infant at 12 months.

Usual Health Care Provider

Having a usual health care provider can be important for a variety of reasons.4,5 A usual provider is an advocate for patient health care, and by developing a respectful and trusting relationship with the patient and the patient’s family, can improve the quality of and satisfaction with care received. A usual provider knows the patient’s history; coordinates services, perhaps expanding access to appropriate services; and provides preventive health education and early detection of disease.

At 6 and 12 months, primary caregivers were asked to identify their infant’s usual health care provider (Table 5). At both time frames, a pediatrician was most often identified as the infant’s usual health care provider, followed by the family doctor. Pediatricians are physicians who specialize in the care of infants, children, and adolescents, while family doctors care for individuals of all ages. More non-White infants were cared for by a pediatrician (73.3% versus 63.7% of Whites), and a larger percentage of White infants visited a family doctor (26.4% versus 18.3% of non-Whites). Regardless of the type of health care provider seen, almost all infants had a usual health care provider.

**Table 5. Infant’s Usual Health Care Provider.**

|  |  |  |
| --- | --- | --- |
|  | 6 months (n = 986) | 12 months (n = 490) |
| Family doctor | 234 (23.9) | 120 (24.5) |
| Pediatrician | 655 (66.8) | 318 (64.9) |
| Physician’s assistant | 29 (3.0) | 9 (1.8) |
| Nurse practitioner | 59 (6.0) | 42 (8.6) |
| Other | 4 (0.4) | 1 (0.2) |
| Missing | 5 (-) | 1 (-) |

Childhood Illnesses

At 6 and 12 months, primary caregivers were asked to identify, from a specific list, any adverse health conditions a health care provider has ever said their infant had (Table 6). By 6 months of age, 61 infants (6.2%) had been affected by a single condition and 11 infants (1.1%) had experienced multiple conditions. By 12 months of age, 60 infants (12.3%) had experienced a single condition and 9 infants (1.8%) had experienced multiple conditions. Pneumonia was the most common condition on the list afflicting infants by 6 months of age, and anemia was the most common condition at 12 months.

**Table 6. Percentage of Infants with an Adverse Health Condition.**

|  |  |  |
| --- | --- | --- |
|  | 6 months (n = 986) | 12 months (n = 490) |
| Asthma | 10 (1.0) | 12 (2.5) |
| Croup, bronchitis, bronchiolitis | - | - |
| Pneumonia | 22 (2.2) | 19 (3.9) |
| Epilepsy, convulsions, seizures with no fever | 2 (0.2) | 3 (0.6) |
| Heart condition requiring surgery or medication | 8 (0.8) | 6 (1.2) |
| Developmental delay | 11 (1.1) | 8 (1.6) |
| Anemia | 14 (1.4) | 20 (4.1) |
| Poor eyesight | 5 (0.5) | 7 (1.4) |
| Poor hearing | 6 (0.6) | 5 (1.0) |
| Baby bottle or other tooth decay/cavities | - | 4 (0.8) |
| Lead poisoning | - | 4 (0.8) |
| Ongoing bone, joint, orthopedic condition | 11 (1.1) | 10 (2.1) |
| No conditions reported by a health care provider | 913 (92.7) | 420 (85.9) |
| Other health condition parent worries about | 125 (12.8) | 60 (12.4) |

Testing for Lead Poisoning

Lead poisoning is a concern for young children exposed to certain environments, such as living in an older home where lead-based paint may have been applied to the walls. An elevated level of lead in the body is toxic to many organs and interferes with nervous system development. Lead poisoning can cause such things as learning disabilities, lower IQ, attention deficit disorder, and other conditions.6 Blood testing to check for possible lead poisoning is recommended for infants who meet certain criteria.7

Few infants in the Children First program had been tested for lead poisoning by 6 months, though many more had been tested by 12 months (it is possible that those not tested did not meet criteria for recommended testing). By 6 months of age, 21 infants (2.2%) had been tested, and all results were negative except for one with results pending. Testing status for 54 infants was unknown. Of those who had not been previously tested (n = 447) or whose testing status was unknown (n = 25) at 6 months of age, 133 infants (28.2%) had been tested by 12 months of age. Results were pending for 40 of the infants, and 4 had tested positive for high levels of lead in the blood. It is unknown whether these 4 infants received treatment and what type of treatment was provided.

Emergency Room Visits and Hospitalizations

Primary caregivers were asked if their infant had been to the emergency room or if the infant had been hospitalized for any reason in the previous 6 months (i.e., from birth to 6 months, and again from 6 to 12 months). Within the first 6 months of life, 330 infants had visited the emergency room for any reason. Thirty-five infants (3.5%) had been to the emergency room because of an injury or ingestion of a harmful substance, with 4 of them having multiple visits. Two infants (0.2%) were admitted to the hospital due to an injury or ingestion. Many more infants visited the emergency room because of an illness, with 174 infants (17.7%) having a single visit and another 133 (13.5%) having multiple visits, some as many as 15 or 20 visits. Seventy-four infants (7.5%) had been hospitalized because of an illness, and 14 of them had been admitted more than once.

Between 6 and 12 months of age, 30 infants (6.1%) had been to the emergency room because of an injury or ingestion of a harmful substance. Four of these infants had been to the emergency room more than once, and 3 infants (0.6%) had to be hospitalized due to an injury or ingestion. One hundred thirty infants (26.5%) had been to the emergency room because of an illness, with 49 of them visiting the emergency room multiple times. Sixteen infants (3.3%) were hospitalized due to an illness, with 1 infant having been hospitalized more than once.

More infants who had visited an emergency room by the age of 6 months (52.9%) also visited the emergency room between 6 and 12 months compared to infants who had not been in an emergency room during their first 6 months of life (20.9%). In addition, mothers less than 20 years of age were 50% more likely than older mothers to have an infant visiting the emergency room by 6 months of age.

**Summary**

Children First has been striving to improve the health of first-time mothers and their infants since 1997. Previous analyses have demonstrated better behavior and health outcomes for Children First families8 and lower rates of infant mortality among Children First infants compared to the general Oklahoma population.9 This report touches on the importance of the gestational period and its positive relationship with birth weight, and demonstrates the disproportionate rates of gestation and birth weight among non-Hispanic Blacks, who generally have poorer outcomes than other racial/ethnic groups. This report also shows that the youngest mothers had lower birth weight infants than older mothers. While all expectant mothers benefit from pre-natal education, targeted efforts for Blacks and young mothers may be appropriate.

Children will always get sick, and minor injuries are common. There are steps caregivers can take to help reduce the frequency of illness and injury among children under their care. In addition, once children become ill or sustain an injury, caregivers should be able to assess the situation and take appropriate action. Children First nurses teach primary caregivers and their families how to help keep the children healthy and how to minimize risk of injury. This report shows that younger mothers were more likely to have infants visit the emergency room by 6 months of age compared to older mothers. Perhaps more prevention education targeted towards the younger mother would help to lower their rate of emergency room visits.

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