Health Access Nurturing Development Services (HANDS)
Kentucky’s Home Visiting Program for First Time Parents

PROGRAM EVALUATION FINDINGS

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This document is a compilation of the evaluation research conducted for HANDS, Kentucky’s home visitation program for first-time parents. Findings from multiple studies, occurring since the program’s inception in 1999, are summarized. New information is highlighted with the following notation: NEW

Cumulative data continue to confirm that for those participants that fully engage, the program is effective in achieving goals related to infant health and well-being, subsequent child health and development, risk reduction and home safety, maternal well-being, child abuse prevention, and family functioning. Newly available evidence also appears to show that paraprofessional home visitors are equally effective compared to professionals (e.g., nurses). The manner in which the HANDS program has been piloted and implemented is a notable example of effective and thoughtful public policy carried out in a planned and stepwise fashion, with emphasis on program support, accountability, training and supervision, and the use of evaluative data to promote continuous improvement. In effect, the program has demonstrated that it can achieve the results it promised. However, these results are generalizable only to those families that remain engaged with the program; achieving a fuller impact remains dependent on engaging and retaining an increasing proportion of those in need.
HANDS is a voluntary home visiting program designed to assist overburdened first-time parents at critical development points. Pre- and post-natally, a trained para-professional or professional visits the home frequently to provide information, problem solve, facilitate parenting skill development, and assist in meeting basic needs such as housing, food, health care, and other required services. HANDS has been designed to replicate and expand on elements that have been shown through research to correlate with positive child and family outcomes. All of Kentucky's 120 counties now offer the HANDS program, and it has become one of the largest early childhood home visitation program in the nation. Each month, approximately 10,000 home visits are being made.

**Screening and Engagement.** Program screening and eligibility processes appear to be working quite well, in that the identified population has characteristics consistent with the program model and expectations. Similar to other home visitation programs, on-going engagement and retention is a challenge, although positive incremental change is seen over time in the proportion of parents that complete the full program.

**Program Fidelity.** Site visits conducted during the early years of the program (1999 and 2002) revealed that, in general, programs were operating smoothly and as intended. Adherence to protocols for selection and training of staff were confirmed. The studies found that staff have a clear understanding of the HANDS mission and philosophy, and there is a great deal of enthusiasm for the goals and activities of the program.

**Pregnancy Outcomes.** Participation in the HANDS program appears to be associated with positive pregnancy outcomes that exceed contrast groups, including those eligible but not served. This occurs despite the non-equivalence of the groups (the HANDS group in all probability is at much higher risk than the population sample, for example). Evaluation data also indicate that timing and dosage are important factors in enhancing the impact of the HANDS program. When the HANDS intervention begins during the first trimester, and when there is a greater number of prenatal visits, the program appears to have the greatest impact on pregnancy/birth outcomes, including length of gestation, birth weight, birth defects, and infant mortality.

**Prevention of Maltreatment.** It appears that participation in the HANDS program is associated with lower rates of child neglect, as compared to the general population. This finding is especially pronounced when higher levels of reporting due to the effects of greater surveillance (i.e., having a home visitor in the home) are factored out. These apparent outcomes are especially compelling in light of brain research showing the devastating long-term effects of child neglect.

**Infant Mortality.** Participation in the HANDS program appears to lead to fewer incidences of infant mortality. Using Vital Statistics data from 1999 through 2005, HANDS participants evidenced much lower rates of infant mortality than are seen in state and national data.
**Child and Family Functioning.** On a measure of perceived family functioning, several areas emerge as having changed over time, including understanding of child development, parenting skills, creating a positive learning environment, appropriate discipline, and family interaction. Notably, these coincide with the primary content of the HANDS intervention program, lending support to the hypothesis that the HANDS program is meeting its goal of improving family functioning and self-sufficiency, and thereby improving the likelihood of positive child outcomes.

**Emergency Room Usage.** Since the HANDS program works with families to identify a medical home, there was an interest in comparing the rates of ER utilization among Medicaid eligible HAND families to the rates among a comparison group of Medicaid eligible first time mothers. While a similar proportion of HANDS children use the ER at least once during the study period; the frequency of repeated ER use among HANDS children is much lower. Twenty percent (20%) of HANDS children had only one admission to the ER during the study period, compared to 6.9% of the children in the comparison group.

**Risk Reduction.** When intake and exit follow-up formal family assessments are compared, a significant reduction in perceived risks is evident, which may be attributable (at least in part) to the work of the home visitors. While there is some variation between mothers and fathers, reduced stress, improved supports and coping skills, disciplinary practices, and bonding with the infant show the greatest evidence of change, consistent with the program logic model.

**Developmental Milestones.** An analysis of the ratings on the Ages and Stages questionnaires revealed that HANDS participants exceed the norm group in every area. It appears that HANDS participants with twelve or more home visits are developing at or above levels consistent with their developmental peers.

**Maternal Education and Employment.** One year after entry into the program, mothers are more likely to have completed additional education and to be gainfully employed (especially full-time employment). The findings on maternal education and employment are no doubt partially a function of the passage of time (e.g., over time, mothers complete school that was already underway, or find gainful employment as they get older). However, they also reflect attainment of a significant set of program goals with respect to facilitation of self-sufficiency and risk reduction.

**Home Safety.** Pre-post analyses also show reductions in safety risks in the home.

**Staff Education and Pre-Service Training.** Recent cumulative analyses demonstrate that paraprofessionals are serving the same populations served by professional home visitors. Data describing both demographics and service delivery characteristics evidence no differences between the two groups. With respect to engagement, paraprofessionals appear to achieve the same “dosage” of home visits as do professionals, and the duration of their involvement is approximately the same. Reasons for exiting the program also appear to be relatively similar across the two groups. With respect to low birth weight, paraprofessionals appear to achieve results that equal or exceed those of professionals. On pre- and post-intervention measures of family functioning, paraprofessionals and professionals appear to achieve gains of a comparable magnitude. Taken together, these data seem to validate the program theory that high levels of training and supervision for paraprofessionals can produce results that are the same as those likely to be achieved by professional nurses.
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Kentucky's home visitation program for overburdened, first-time parents is entitled Health Access Nurturing Development Services (HANDS). It was developed as a core component of KIDS NOW, Kentucky’s early childhood initiative that focuses on fostering early childhood development.

The goals of the program are to:

- Prevent child maltreatment through parental skill development and monitoring of home environments
- Facilitate positive pregnancy and child health outcomes by insuring proper pre- and post-natal care
- Improve family functioning through parenting and problem solving skill development
- Optimize child growth and development by enhancing parental knowledge of child development and linking with relevant community resources

Modeled after Healthy Families America and Hawaii Healthy Start, HANDS has been designed to replicate and expand on elements that have been shown through research to correlate with positive child and family outcomes. These elements include:

- Focus on providing voluntary services to families at the greatest risk for a range of negative outcomes, such as low birth weight, pre-term infants, financial difficulties, poor parenting skills, child neglect, substance abuse, and domestic violence;
- Begin the family intervention prior to birth and continue services through the critical first two years of the child’s life, when brain development is occurring most rapidly;
- Conduct home visits intensely at first, and begin to taper as important milestones are reached, parenting skills improve, and self-sufficiency is established;
- Promote positive health-related behavior and infant care-giving, in addition to providing social support;
1. Program Description (continued)

- Focus on meeting broad-based family needs and reducing family stressors, rather than addressing isolated issues;

- Concentrate on the quality of parent-child interaction, parental sensitivity to the growing infant’s needs, and general knowledge about child development;

- Emphasize home safety and the quality of the social and psychological environment in the home;

- Use a mixture of well-trained nurses and social workers to assess family needs, and both paraprofessionals and professionals to conduct outreach and family engagement;

- Link families to community resources, with special emphasis on the provision of early and appropriate levels of medical care.

All of Kentucky’s 120 counties now offer the HANDS program, and it has become one of the largest early childhood home visitation program in the nation.

**Figure 2**

Developmental History of the Program Roll-out

The HANDS program was piloted in fifteen demonstration sites within county Health Departments across the Commonwealth of Kentucky in 1998 and 1999, and then expanded to 47 programs in FY00 and 103 by FY01. The program was available in every county in Kentucky by FY03.

*Circle symbols in Jefferson and Fayette Counties reflect pilot programs initiating prior to full county-wide implementation.*
1.1 Screening and Eligibility Determination

Within each community (through county health departments and regional collaboratives), all initial referrals are screened. Typically, this screening for risk factors occurs during pregnancy or at delivery, but eligibility can be determined up until the child is three months old. Those deemed to be at risk are offered participation in this intensive, two-year home visiting program. Risk factors utilized to trigger this initial referral are derived from the developmental literature and include unemployment, isolation, history of substance abuse, unstable housing, limited parental education, domestic violence, poor prenatal care, and maternal depression. Risk factors that lead to automatic inclusion include being single, separated, or divorced; non-compliance with pre-natal care; or abortion unsuccessfully sought or attempted. Any individual with two or more risk factors or any case with seven or more unknowns is also judged a positive screen. It is presumed that the amelioration of these family risk factors, coupled with the strengthening of parental skills and competencies, will provide some degree of protection for the child and family, reduce the likelihood of child abuse and neglect over the long term, and improve general health and well-being.

Once screened, potential participants are assessed by a professional (e.g. nurse, social worker, health educator, etc.) using the Parent Survey, an adaptation of the Family Stress Checklist (Kempe, 1976) used by the Hawaii Healthy Start program for eligibility determination. Based on clinical interviews with prospective participants, ratings (0, 5, 10, unknown) are given on ten dimensions such as perceptions of the new infant, parental substance use, poor mental health, current stressors, parental history of abuse as a child, coping skills and support system availability, anger management skills, plans for discipline, unrealistic expectations of the child, and the child being unwanted or at other risk for poor bonding. A score ≥25 results in one or both parents being designated “at risk” and therefore eligible.

Figure 3 portrays the cumulative patterns of families as they move through the process from referral to exit. From these data we can conclude that program screening and eligibility processes appear to be functioning quite well. The identified population has characteristics consistent with the program model and expectations. Similar to other home visitation programs, on-going engagement and retention is a challenge.
Figure 3
Cumulative Patterns of HANDS Service Delivery, 1999 through June 2007

Referral
52,890 mothers were referred to the HANDS program, mostly by Health Departments (86.7%).

Initial Screening
44,125 were screened positive (83.4% of the total), and therefore eligible for assessment.

Assessment Results
• 29,773 of the 32,562 assessed as positive (eligible), a rate of 91.4%.
• 2,789 (8.6%) were assessed as ineligible, and given referrals and information packets.

Assessed Eligible But Not Enrolled
(n=1,908)
• 770 persons refused services
• 7 were CPS involved
• 127 gave other reasons
• 71 were no response
• 917 were intake closed
• 3 were adopted out
• 13 were still birth/infant death

Exiting Reasons (n=29,354)
Full completion/goals met = 4,376 (14.9%)
Elected out before full completion = 5,204 (17.7%)\(^1\)
Moved = 2,509 (8.6%)\(^2\)
Lost contact = 4,304 (14.7%)\(^2\)
Never fully engaged = 2,995 (10.2%)\(^2\)
Fetal/infant death = 684 (2.3%)
Other = 8,488 (28.9%)
Transfer = 794 (2.7%)

\(^1\) Return to full time work or school is a typical reason for electing out before full completion.
\(^2\) These exits are associated with the voluntary nature of the program and the lack of full engagement.
1.2 Staff Training and Supervision

The HANDS program evidences a strong commitment to a comprehensive training program for home visitors, consistent with recommendations for best practice (Wasik, 1993) guidelines. Within the Kentucky system, training consists of five phased components:

1. 60 hours of pre-service core training for parent visitor and family support workers focusing on program philosophy, goals, roles, and strategies (supervisors complete this training, in addition to training on supervision processes)
2. 37.5 hours of pre-service certification training to implement the Growing Great Kids (GGK) curriculum Tier I.
3. 30 hours of wraparound training for all personnel within the first 12 months
4. 15 hours of follow-up training on the GGK curriculum (Tier II) plus 15 hours of additional topical training within 24 months of hire
5. 15 hours of GGK Tier III skill-building and 10 additional topical hours within 36 months of hire (and each subsequent year).

The above training regimen is the same for both professional and paraprofessional home visitors. Paraprofessionals are required to receive on-going supervision from a licensed professional. A regional support process was put in place to insure compliance with training and provide technical support and follow-up. These services are provided by seven regional technical assistance specialists who visit sites, check personnel files, problem solve, and coordinate communications. Regional staff also insure that caseloads are managed to insure an appropriate mix of case complexity, deal with administrative and policy issues, and promote creative outreach strategies.

1.3 Manualized Curriculum

“Growing Great Kids: An Interactive Parenting and Child Development Curriculum (GGK)” is a comprehensive instructional strategy designed to facilitate the development of nurturing and empathic parent-child interaction. It focuses on child development and health, provision of care, parenting concerns, and the dynamics of parent-child and family relationships. The curriculum is organized with modules that are addressed within each three months of development.

These modules are:
1. basic care
2. social and emotional development
3. cues and communication
4. physical and brain development
5. play and stimulation
6. parents’ corner (parenting issues)

Each lesson is activity-oriented and highly interactive in focus. The curriculum is designed to be used either during home visits or with parent groups. Each module within the GGK curriculum takes 1-3 visits to complete. In addition to the trainer manual, the program includes a master set of handouts with parent/child activities and information pertinent to the modules, certificates of completion for parents, and documentation records specific to each module.
2. Recipient Demographics and Service Delivery

2.1 Referral Sources

From the inception of the program in 1998 through June of 2007, 52,890 mothers were referred to HANDS, mostly through Health Departments (83.2%), but also from hospitals (6.0%), obstetricians/gynecologists and pediatricians (3.9%), self (3.7%), social services (1.7%), and other sources or unknown (1.5%). Identified risk factors at the time of referral included single/separated/divorced (83.5%), inadequate income (76.8%), low education levels (44.9%), unemployed partner (36.7%), unstable housing (20.3%), no phone (18.8%), history of or current maternal depression (28.8%), marital/family problems (22.5%), lack of adequate prenatal care (23.5%), and maternal psychiatric history (22.1%).

2.2 Demographics

- At initial referral, 51.7% are age 20 or younger, and 83.5% are 25 or younger. 81.3% of participant mothers are Anglo-American, 9.1% African-American, 4.4% Hispanic/Latino, and the remaining cases are divided among a number of racial/ethnic groups, or are unknown.
- About three-fourths of the first-time mothers are unemployed.
- Almost half of the mothers are not finished with high school, including about 5% with less than an 8th grade education.
- About a third complete high school or obtained a general equivalency diploma.
- Over two-thirds of the young mothers are not enrolled in any education program.
- More than 90% of participating mothers are eligible for Medicaid.
- About two-thirds of the young mothers are single, a fourth are married, and the remainder either live with a partner, are divorced, or are separated at the time of program entry.
- At the time of program entry, about 80% of known father/partners are not in school.
2.3 Service Delivery Patterns

Cumulative data from program inception through June of 2007 show that at initial screening, 80.7% of referrals are determined to be eligible for a more formal assessment based on risk factor criteria, and 75.1% of these choose to undergo a more formal needs assessment by a professional (e.g. nurse, social worker, health educator).

- Approximately one fourth of potentially eligible individuals choose not to participate at the outset.
- Of those that do undergo formal assessment, 90.5% are deemed eligible for the program, and of these 94.5% received at least one home visit.
- Once determined eligible, then, the rate of initial engagement for participants is quite high.

Since full statewide implementation, over 10,000 home visits are made each month. Approximately 55,000 live births occur in Kentucky on an annual basis, and about 10% of these participate (at least to some extent) in the HANDS program. Given that this is a voluntary program for the most at-risk first-time parents, this represents significant “market penetration”, but by no means full coverage.

![Figure 4](image-url)
2.4 Attrition and Engagement Rates

Attrition and engagement rates of entrants from 2000 through 2004 were studied using service data from those years and follow-up data through 2007.

- Using regression analysis (both linear and non-linear), about four dozen variables were tested to determine their predictive value relative to four criterion variables.

- Potential predictors included: (1) intake data (maternal age, education, employment, marriage status, and ethnicity/race); (2) child data (date of birth, age of child (in months) at entry); (3) the HANDS Child & Family Rating Scale items (22 items measuring environmental, caregiver, and family interaction patterns); (4) parent survey data (measures of 10 risk factors); and, (5) visit data (dates of first & last home visits, number of visits, number of calendar months with visits).

- Criterion variables included: (1) duration (number of months between the date of the child's birth and the last home visit); (2) continuity (number of calendar months with home visits divided by duration); (3) intensity (number of home visits divided by duration); and, (4) perceived success (unsuccessful, partially successful, or successful, based on exit designation).

- Using stepwise regression to find the best predictors of duration, continuity, and intensity, only one variable emerged (the child's age at entry), but the highest adjusted R square (using eleven demographic and risk variables simultaneously) was a modest .242.

- In contrast, adjusted R square values of over .550 were found for combinations of variables aimed at predicting success (as defined subjectively by the home visitor at exit).

- The best predictor of success was length of time in the program (in months). When used in combination with the child's age (in months) at entry, the adjusted R square was .580.

- The average successful case involved 63 home visits, and the average partially successful case involved 21 visits. The average unsuccessful case involved 20 visits, however, so success was not just a function of the number of visits.

Qualitative follow-up analyses sought to obtain the opinions of HANDS direct service and supervisory staff regarding factors that contribute to client retention, completion, attrition, and less positive outcomes. Four focus groups were conducted with HANDS home visitors and their supervisors. Themes derived from these discussions formed the basis for an online survey involving family support workers and their immediate supervisors throughout the state to enhance thematic analysis.
2.4 Attrition and Engagement (continued)

Qualitative analyses revealed that:

1. Mothers likely to remain in the program often were age 20 or over, unemployed, and enrolled in the program during their pregnancy.

2. Parents with stronger support systems perceived less need for the program, and were more likely to not engage or leave the program prematurely.

3. Families at both ends of the continuum of need (those with very high needs and low resources and those with low needs and high resources) tended to leave the program prematurely.

4. When families elected out of the program, it was often correlated with a return to work or school.

5. Low initial engagement rates were often associated with an inaccurate belief that the program was associated with child protective services.

6. The quality of the relationship between the parent and the family support worker was critical to retention.

7. Staff turnover contributed to families leaving the program prematurely.

8. Timeliness of the initial visit and consistency of subsequent visits contributed to retention.

9. Giving parents choices with respect to scheduling appointments made a significant difference with respect to retention.

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**Figure 5**

Families are most vulnerable to leaving the HANDS program prematurely during the six months following the child’s birth. This suggests that any extraordinary efforts directed at family engagement should be deployed during this period. Following the first six months, attrition rates drop to 18% during the 2nd six month period and 12% during the 3rd six months. Over half of the cases remained in the program one year after entry, reflecting a strong connection with the program and a significant period of service to the child and family.

**Duration of Engagement***

(percent leaving program after date of child’s birth; at six month intervals)

* Length of engagement is calculated by subtracting the date of the last home visit from the date of child’s birth. Only entrants from 2002-2004 were included in the analysis.
2.5 Program Process & Fidelity

Site visits to assess qualitative features of implementation in 1999 and 2002 revealed that, in general, programs were operating smoothly and as intended at all sites. Staff had been selected and trained, and home visiting had begun across the programs. Staff had a clear understanding of the HANDS mission and philosophy, and there seemed to be a great deal of enthusiasm for the goals and activities of the program.

As a complex program that relies on sophisticated clinical intervention, there have been (as expected) a variety of challenges in program implementation, in areas such as staffing patterns, caseload, policy development, intervention structure and content, extent of community involvement, resource availability, training, and support and supervision.

Based on evaluative and administrative feedback, the HANDS program has evidenced an on-going commitment to continuous quality improvement. In the process of “roll-out”, considerable effort went into addressing lessons learned from the pilot study experience. For example:

- The program adopted a comprehensive parent training curriculum to ensure the structure and content of family intervention (Growing Great Kids)

- The program adopted clear standards for supervision and pre-service training, and evidenced a strong commitment to in-service training, including the addition of an annual HANDS retreat that has been put in place to help sites meet all training requirements and the introduction of an online training component for wrap-around training is also being made available

- Regional technical assistance (TA) staff were employed throughout the state and there are now several layers of support available to local programs, these TAs conduct yearly on-site visits to each county and report to Central Office the strengths and opportunities for growth for each site according to HANDS polices and procedures

- Caseloads are managed more closely to insure an appropriate mix of service delivery, and to maximize reimbursement

- Administrative and policy issues have been dealt with in a systematic fashion through Health Departments

- There is high emphasis on creative outreach strategies and persistent attempts to engage hard-to-reach families

- In order to assure fidelity of implementation, there is now an overarching program handbook, standardized regional curriculum training for new staff, and promotional videos.

- Parent satisfaction surveys are conducted annually and compiled for statewide totals

- Sites enter program forms and data in a web-based data collection system which helps provide local management tools and statewide quantitative data

Emphasis has been placed on role-specific, on-going training and supervision processes for home visitors. Training is conducted with all staff at the same level without regard to prior training or degree.
In the fall of 2003, five demographically diverse HANDS families and their family support workers were interviewed about their experiences with the program. A convenience sample of families was chosen from three counties that participated in the HANDS evaluation. An attempt was made to obtain as wide a variety of “typical” cases as possible, in the hope of generating a diverse perspective of themes and issues. The purpose of this qualitative evaluation was to explore the similarities, differences, and “active ingredients” among five typical families who successfully completed (or nearly completed) the HANDS home visiting program. The case studies explored developing relationships between expectant mother and family support worker, and addressed themes of trust, self-disclosure, proper boundaries, adaptation, and adjustment. The results illuminated some of the processes that underlie change on a micro-level, and provide a more in-depth flavor for the process as it occurs in practice.
3.1 Pregnancy Outcomes

A primary goal of the HANDS program is to “facilitate positive pregnancy and child health outcomes by insuring proper pre- and post-natal care”. Several studies have been implemented to assess the impact of the HANDS program in achieving this goal. In particular, the studies have looked at length of gestation, prematurity, low and very low birth weights, and birth defects.

An initial study was completed in 2001 of pilot program participants from 1998 through 2000 (n=718), whose pregnancy outcomes were compared to unequal-size (random) groups of same-county non-HANDS participants and a statewide contrast group (both contrast groups were also 1st time parents). A subsequent wave of analyses was conducted in 2003 for HANDS participants who gave birth in 2001 and 2002 to gauge trends as the program expanded.

A third wave of comprehensive data analysis was conducted in the fall of 2004 (and updated in 2006).

- Earlier studies had clearly demonstrated that HANDS recipients: (1) received prenatal care in the first trimester of pregnancy at a slightly higher rate than a statewide comparison group; (2) had a higher average number of prenatal well-baby visits; (3) had longer average gestation periods; (4) exhibited higher average weight gains; (5) achieved higher APGAR scores at 5 minutes; and,(6) had lower rates of prematurity, low birthweight (LBW) and very low birthweight (VLBW).

- The purposes of the third wave of analysis were to estimate the effect of the program for a large cumulative sample (CY2000 through CY2003) from across the state and to obtain a more fine-grained understanding of the impact of timing (when services are initiated) and dosage (how many service episodes) on pregnancy outcomes.

- For this analysis, HANDS teen mothers who gave birth between 2002 through 2003 were compared to a stratified statewide comparison group (using the CDC-suggested LMP method). Contrast groups were derived from Vital Statistics data sets.

In 2007, a fourth study was conducted. In this most recent study, initiation of prenatal care, birthweight, length of gestation, and prematurity were again assessed. Unlike previous studies that focused on teen mothers, the 2007 study involved an examination of outcomes for first-time mothers of all ages.
3.2 Early Findings: Pregnancy Outcomes for Teen Mothers
First-time Births: Calendar Years 2002 and 2003

Figure 6

Rates of Preterm Births in Relation to Number of Prenatal HANDS Home Visits (Dosage),
Teen Mothers, 1st Child
Calendar Years 2002, 2003 combined)

Teen mothers who received 16 or more home visits from the HANDS program prior to the birth of their baby were much less likely to deliver their baby prematurely (8.0%) than the statewide comparison group of teen mothers (13.4%), despite the high-risk characteristics of this population (see Figure 6). In general, the number of HANDS home visits appears to correlate with improved prematurity outcomes, despite the high risk nature of the population.

Data sources: Kentucky Vital Statistics Data and HANDS-participant database

Figure 7

Rates of Preterm Births in Relation to Initiation of HANDS Home Visits
Teen Mothers, 1st Child
Calendar Years 2002, 2003 combined)

Teen mothers who participated in the HANDS program during their first trimester were about 3 times less likely to deliver their baby prematurely (4.6%) than the statewide comparison group of teen mothers (13.4%) (see Figure 8). In general, early initiation of HANDS home visits appears to correlate with improved preterm birth outcomes, despite the high risk nature of the population.

Data sources: Kentucky Vital Statistics Data and HANDS-participant database
Teen mothers who received between 11 and 15 home visits from the HANDS program prior to the birth of their baby were significantly less likely to give birth to a baby with low birth weight (5.5%) than the statewide comparison group of teen mothers (9.3%). Among those with 16 or more visits, the proportion of low birth weight babies was 6.4%. The contrast between HANDS and non-HANDS is most pronounced in the 11-15 visit range. HANDS participants with the highest number of pre-natal visits (16+) may also represent the highest risk pregnancies, resulting in a slight increase in the rate of LBW at that level (although the rate for this group remains below the rate for those with no or few HANDS home visits).

Figure 8

Low Birth Weight (< 2500 grams) by Number of Prenatal Home Visits
(based on 2000-2003 data for all teen mothers with no prior pregnancies, n = 19,369)

Teen mothers who participated in the HANDS program during their first trimester were significantly less likely to give birth to a baby with low birth weight (3.9%) than the statewide comparison group of teen mothers (9.3%). These results highlight the critical importance of early engagement as a means to maximize birthweight outcomes.

Figure 9

Low Birth Weight (< 2500 grams) by Initiation of Home Visits
(based on 2000-2003 data for all teen mothers with no prior pregnancies, n = 19,369)
3.2 Early Findings: Pregnancy Outcomes for Teen Mothers (continued)
First-time Births: Calendar Years 2000 - 2003

**Figure 10**

Very Low Birth Weight (< 1500 grams) by Prenatal HANDS Home Visits
(based on 2000-2003 data for all teen mothers with no prior pregnancies, n = 19,369)

The percentage of babies born with a very low birth weight (VLBW) decreases as the number of prenatal HANDS visits increases. The rate of very low birth weight (VLBW) of newborns to teen mothers was positively correlated with the number of pre-natal HANDS home visits received by the mother. These data provide further evidence that HANDS visits contribute to improved birthweight outcomes.

**Figure 11**

Very Low Birth Weight (< 1500 grams) by Service Initiation
(based on 2000-2003 data for all teen mothers with no prior pregnancies, n = 19,369)

No (0.0%) babies were born with very low birth weights to teen mothers who participated in the HANDS program during their first trimester. This compares to a statewide average among the comparison group of teen mothers of 1.61% of babies being born with very low birth weights. No babies were born with a very low birth weight to mothers who received prenatal HANDS visits during the first trimester of their pregnancy.
3.2 Early Findings: Pregnancy Outcomes for Teen Mothers (continued)

First-time Births: Calendar Years 2000 - 2003

**Figure 12**

Birth Defects by Number of Prenatal HANDS Home Visits
*(based on 2000-2003 data for all teen mothers with no prior pregnancies, n = 19,369)*

Babies were half as likely to be born with a birth defect if their mother received 16 or more prenatal HANDS visits (1.4%) than babies born to a statewide comparison group of teen mothers (2.8%). *In general, the number of prenatal home visits was inversely related to birth defects.*

Data sources: Kentucky Vital Statistics Data and HANDS-participant database

**Figure 13**

Birth Defects by Initiation of Prenatal HANDS Home Visits
*(based on 2000-2003 data for all teen mothers with no prior pregnancies, n = 19,369)*

Babies born to mothers who participated in the HANDS program during their first trimester were over three times less likely to be born with a birth defect (0.93%) than babies born to a statewide comparison group of teen mothers (2.84%). *Involvement in the HANDS program during pregnancy appears to be associated with a reduced risk of birth defects. The most significant impact appears to occur when the HANDS home visits are initiated during the first trimester.*

Data sources: Kentucky Vital Statistics Data and HANDS-participant database
The following figures portray the results of a follow-up analysis covering the period 2002 through 2005, the latest year for which Vital Statistics data are available. Outcome data was examined on 76,271 first-time mothers, 5002 of whom were HANDS participants. Vital Statistics birth data for HANDS mothers with prenatal home visits were compared to a statewide contrast group and to a subset of mothers referred to the program and deemed eligible but not served (i.e., declined to participate). Data is portrayed for teens (<20), young mothers (20-24), mothers 25 and older, and for all first time mothers. These data confirm that HANDS participants equal or exceed statewide averages (despite their high risk status) in several areas, and most notably for teen participants.

**Figure 14**

HANDS recipients with prenatal home visits evidenced longer gestation periods than all three comparison groups (non-HANDS, HANDS with post-natal home visits only, HANDS-eligible but not served) across all age ranges.

**Length of Gestation**

(2002 - 2005)

Statewide non-HANDS (n = 71,269) | HANDS participants with one or more prenatal home visits (n = 6,882) | HANDS participants with post-natal home visits only (n = 2,415) | Eligible for HANDS but not served (n = 4,751)

<table>
<thead>
<tr>
<th>AGE OF MOTHER</th>
<th>Less than 20</th>
<th>20 - 24</th>
<th>25+</th>
<th>All ages combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 20</td>
<td>38.37</td>
<td>38.41</td>
<td>38.59</td>
<td>38.59</td>
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<td>20 - 24</td>
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<td>38.48</td>
<td>38.55</td>
<td>38.55</td>
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<td>38.96</td>
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<tr>
<td>All ages combined</td>
<td>38.59</td>
<td>38.59</td>
<td>38.59</td>
<td>38.59</td>
</tr>
</tbody>
</table>
3.3 Latest Study: Pregnancy Outcomes for Mothers of All Ages (continued)
First-time Births: Calendar Years 2002 and 2005

**Figure 15**
HANDS teen recipients had higher birthweights than the three comparison groups, and although lower than the statewide average for the other two age ranges, birthweights were higher than the post-natal only and eligible but unserved groups.

**Figure 16**
With respect to prematurity, HANDS participants evidenced lower percentages than the three comparison groups in all but the 25+ range. And, with respect to both LBW and VLBW, HANDS recipients had lower rates than all three comparisons across all age ranges.
Figure 17
Mothers younger than 20, and mothers ages 20-24 that participated in HANDS had lower numbers of low birthweight babies than the non-HANDS mothers under age 20 and ages 20-24.

Figure 18
With respect to VLBW, HANDS recipients also had lower rates than all three comparisons across all age ranges.
3.4 Prevention of Maltreatment

An exploratory study in 2001 compared 1998-2000 HANDS participants (n = 3,746) to equal-size (random) groups of same-county, non-HANDS teen mothers and a statewide group on rates of maltreatment. Data from the state's child abuse and neglect registry were examined to assess the extent to which each group evidenced substantiations from the date of program entry forward.

- Equivalent contrast groups were derived from 1999 and 2000 Vital Statistics data on live births and compared to data from TWIST on the extent to which each group experienced abuse and neglect substantiations from 1998 forward.

- The unduplicated rate of physical abuse per 1000 mothers for HANDS participants was 5.1, as compared to 12.0 for non-HANDS same-county, and 7.1 for the statewide average.

- The contrast greater when neglect was considered. Here, the unduplicated rate per 1000 mothers for HANDS participants was 21.5, as compared to 55.5 for non-HANDS same-county, and 45.7 for the statewide average.

This analysis was replicated for teen HANDS participants and a statewide comparison group who gave birth in 2002, and these cases were followed for the two years following date of birth.

- The HANDS study sample involved 497 mothers who had participated in at least fifteen HANDS home visits since the birth of their baby in order to more precisely estimate dosage-related program effects. This cutoff for number of home visits was selected based upon an examination of the entire distribution of home visits, which revealed this to be at the approximate median.

- A contrast group of 2,930 non-HANDS teen mothers was selected stratifying for maternal age and education (the variable on the birth record deemed most likely to be a proxy for social class and socioeconomic status). Somewhat lower rates of substantiations for neglect were found for the HANDS group in comparison to the statewide sample (34.1 per 1,000 versus 42.0 per 1,000). Negligible differences were seen for substantiated physical, sexual, and emotional abuse, although it is notable that no such substantiations were found in the HANDS group (See Figure 19).

- A recent comprehensive meta-analysis of research by the Task Force on Community Preventive Services (Bilukha, et.al., 2005) demonstrated that families participating in home-visiting programs were more likely to be reported to child protective services (CPS), a systematic bias related to increased surveillance.

- Consistent with these findings, it was found that HANDS participants were more likely to undergo investigation (16.49% were investigated at least once, with 20.7% of the investigations resulting in a substantiation), whereas only 11.60% of the non-HANDS cohort were investigated (with a much higher substantiation rate of 36.18%).
3.4 Prevention of Maltreatment *(continued)*

- The meta-analysis identified a method to estimate the magnitude of the surveillance effect based on two controlled studies (Brayden et al, 1993; Dawson, VanDoornick, & Robinson, 1989) that contained data for CPS alone and home visitor reports. These studies concluded that the presence of a home visitor increased the rate of maltreatment reporting by 80% to 150%, respectively. The Task Force suggested that a more conservative approach (50%) be used to adjust for this effect.

- When this conservative rate was applied to the above Kentucky data, the adjusted rate of neglect for non-HANDS participants rose from 42.0 per 1000 to 63.0 per 1000, almost twice that of the HANDS group.

Although the effect cannot be measured directly, it appears that participation in the HANDS program is associated with lower rates of child neglect, as compared to the general population. These findings are especially compelling in light of brain research showing the devastating long-term effects of child neglect.

*Figure 19*

Rates of Substantiated Abuse or Neglect (Teen Mother as Perpetrator)  
Comparison of HANDS (n = 497) and Non-HANDS (n = 2,390) Cohorts from 2002 Live Birth Data
3.5 Infant Mortality

Based on year of entry into the HANDS program, the rate of infant mortality was calculated (using data from Vital Statistics) and compared to state and national rates. For HANDS program entries from 1999 through 2005, the rate of mortality in the first year of life was significantly lower for the HANDS sample than the contrast groups.

In general, rates of infant mortality across the nation and in Kentucky have been on the decline; however HANDS participants evidence much lower rates of infant mortality than are seen in state and national data. For each year beginning in 1999, the rate of mortality in the first year of life (per 1000 live births) was consistently lower for HANDS participants than the state and national rate.

- These findings were especially notable in the last three years of this analysis (2003, 2004, and 2005).

- In those years, HANDS rates were 4.0, 2.2, and 2.1 respectively, as compared to Kentucky (6.9, 6.8, 6.8) and national (6.8, 6.8, n/a) rates.

![Figure 20](image-url)

Figure 20
Comparative Infant Mortality for HANDS Participants, Kentucky, and the United States
(Rate per 1000 live births)

Data sources:
State and national data derived
KIDS Count and the KY Department of Public Health. HANDS data derived from Vital Statistics.
3.6 Child and Family Functioning

A 2001 preliminary study compared pre- and post-intervention ratings from the Child and Family Rating Scale on a sample of 756 program participants for whom complete data were available. In 2006, this analysis was repeated for the cumulative sample of program participants (n=3,364).

This 22-item scale, adapted from an instrument used by the social services agency of Los Angeles County, measures periodic judgments made by home visitors about aspects of the home environment, caregiver characteristics, family interactions, and child well-being. For this sample, the scale demonstrated more than adequate reliability, as evidenced by a Cronbach’s alpha reliability estimate of .95.

Exploratory factor analysis of this scale suggests further evidence of its validity for this purpose. The scale appears to measure four underlying constructs, accounting for 69.7% of the variance. They are:

- Caregiver (parenting) characteristics: parenting, emotional stability, child development knowledge, discipline, supervision, learning environment, communication, bond, cooperation
- Child well-being: health, hygiene, clothing, diet
- Stress and supports: financial stress, family support, other support, child care, transportation
- Home physical environment: cleanliness, safety

Paired samples t-tests were conducted to assess the magnitude of pre-post change for the 3,364 cases for which both types of data were available.

- All of the items on the scale showed significant positive change over time at the .000 level.
- Areas that evidenced the largest changes involved items that measure caregiver (parenting) and family interaction patterns.
- T-scores >20.0 (presumably, the strongest effects) included the following items:
  - Understands child development
  - Discipline
  - Provides enriching learning experiences
  - Quality/effectiveness of communication

- These items are highly consistent with the parenting skills the HANDS program seeks to promote and enhance.

There appears to be a high degree of relationship between the child, family, and environmental areas that are perceived as changing over time and the primary content of the HANDS intervention program (development, parenting, interaction, learning, discipline). This lends support to the hypothesis that the HANDS program is meeting its goal of improving child well-being, family functioning and environmental stability, thereby improving the likelihood of long-term, positive child outcomes.
3.7 Emergency Room Utilization

Using data from the Kentucky Department of Medicaid Services’ database, emergency room (ER) utilization of HANDS and non-HANDS Medicaid recipients in 104 counties were compared (for the HANDS group, Medicaid recipients comprised nearly 90% of the total population). Children in counties covered by a Medicaid managed care plan were omitted from the study because that program was specifically designed to limit ER utilization independent of the HANDS initiative.

The HANDS cohort (n = 8,324) included all children for whom at least one HANDS visit was billed to the Medicaid program between July 1, 2004 and June 30, 2006. The non-HANDS cohort was derived from the Vital Statistics data base that included all live births from 2001 through 2005 (taking into account the fact that a child who received a HANDS visit on July 1, 2004 could have been born almost two years prior to the visit). An initial random sample of 20,000 live births to first-time mothers was created, of which 53% (10,564) received Medicaid services (and therefore comprised the final comparison group).

- Medicaid-eligible HANDS children and non-HANDS Medicaid-eligible children were admitted to the emergency room (ER) at similar levels (67% of HANDS and 62% of non-HANDS had at least one admission).
- HANDS children were more likely to have fewer repeated admissions to the emergency room. Twenty percent (20%) of the HANDS children had only one admission to the ER during the study period, compared to 6.9 % of the children in the comparison group.
- The mean ER usage rate (number of visits/number of participants) for HANDS participating children was 2.29 (i.e., a typical baby involved in the HANDS program visited the ER 2.29 times during the two year period examined).
- In contrast, the mean ER usage rate for non-HANDS children was 4.57 (about double the HANDS rate).
- Locational access to hospitals did not appear to affect the rate of ER usage.

**Figure 21**
Comparison of HANDS and Non-HANDS ER Utilization Rates, 2004 -2006

<table>
<thead>
<tr>
<th>Non-HANDS ER rate/HANDS ER rate</th>
<th>HANDS ER rate higher (0.81 - 0.95)</th>
<th>Little to no difference (0.96 - 1.05)</th>
<th>Non-HANDS ER higher (1.06 - 4.55)</th>
<th>Non-HANDS ER much higher (4.56 - 11.20)</th>
<th>No data</th>
</tr>
</thead>
</table>

Of the 104 counties studied, HANDS recipients demonstrated lower rates of ER usage in all but two counties.

Data Source: Department for Medicaid Services
3.8 Risk Reduction

At the point of entry into HANDS, an assessment of risk factors (The Parent Survey) is completed by a program professional (community health nurse, social worker, or health educator) to assess child and family risk. This assessment results in rating the family 0, 5, or 10 for each of 10 dimensions. This assessment comprises the final determination with respect to program eligibility.

- Beginning in 2002, a follow-up Parent Survey was completed at approximately Year 1 of program participation (or at exit) for each family to assess whether there had been a reduction in risk (and in what areas). Six dimensions are assessed at follow-up, including: (1) lifestyle behaviors and mental health; (2) parenting experience; (3) coping skills and support system; (4) current stressors; (5) anger management skills; and, (6) plans for discipline. At the time of the study, there were 4,153 cases for which pre and post data are available for one or more items.

- Exploratory factor analysis of the scale lent support to general validity. Underlying factors appear to include a general conflict and mental illness dimension, a second factor that can be labeled coping, stress, and self-efficacy, a third that seems to be measuring problematic parenting skills, and a fourth that assesses knowledge of child development.

All of the six (6) risk dimensions evidenced improvement upon follow-up at the .000 level of statistical significance (i.e., they were highly significant), for both fathers and mothers.

- For mothers, the strongest gains were seen in improved coping and supports (probably a result, in part, of home visitor relationship), reduced stress, and improved disciplinary strategies.

- For fathers, the strongest effects were seen in coping skills, anger management, and plans for discipline.

- These patterns of change appear to be consistent with the program’s theory of change.

There appears to be a significant reduction in perceived risks when intake and one-year formal assessment scores are compared. While there is some variation between mothers and fathers, reduced stress, improved supports and coping skills, disciplinary practices, and bonding with the infant appear to show the greatest evidence of change, consistent with the program logic model.
3.9 Developmental Milestones

In 2008, the HANDS data set was examined to determine the extent to which participants were functioning at or above the expected developmental milestones at twelve months of age. This analysis provided a simple comparison of the program’s success, since a core goal of the program is to insure that participants are on developmentally appropriate levels (equal to or exceeding age peers).

- Since its inception, the HANDS program has used the Ages and Stages Questionnaire (Center on Human Development, University of Oregon). This is a brief screening measure with developmental age norms and referral cut-off scores at bi-monthly intervals, beginning at 4 months. For each age level, six items are rated across five domains: communication, gross motor, fine motor, problem solving, and personal-social.

- Criterion scores are based on responses of yes (10), sometimes (5), and not yet (0). Item scores are then summed within domains, and age-level cut-off scores for referral for further evaluation are computed.

- Essentially, for each age level sample, cut-offs are based on performance two (2) or more standard deviations below the mean for that group at each age level. Data are also provided for -1.5 SD and -1.0 SD, allowing for some flexibility with respect to usage.

- However, the authors recommend using -2.0 SD because at this level, the lowest number of false positives and false negatives are achieved. By definition, in a normal distribution of scores, -2.0 SD or less accounts for the bottom approximately 2.3%.

- Reliability and validity studies of the scale demonstrate that it has appropriate psychometric characteristics for the purposes of quick screening.

This study used records from participants who were referred to the program between 2002 and 2007. Cases for which fewer than 12 home visits had occurred were excluded from the analysis (based on the distribution of home visits and the desire to assess program effects for those that received adequate program dosage). Cases where the criterion score was incorrectly entered into the HANDS data system were also excluded from this study. A final program sample of 1,599 HANDS children was derived.

These data were then compared to the developmental age cut-off scores (-2.0 SD) of the Ages and Stages validation sample. Figure 1 provides a comparison of developmental age cut-off scores for referral at 12 months on the Ages and Stages Questionnaire, and the percent of HANDS participants that were at or below that score.

### Table: Ages and Stages Questionnaire Ratings

<table>
<thead>
<tr>
<th>Domain</th>
<th>Cut-off Score (normative)</th>
<th>% in norm group at or below cut-off (-2.0 SD)</th>
<th>% HANDS at or below cut-off (-2.0 SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>15.4</td>
<td>2.3%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Gross Motor</td>
<td>18.0</td>
<td>2.3%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Fine Motor</td>
<td>28.7</td>
<td>2.3%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>25.1</td>
<td>2.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Personal-Social</td>
<td>19.8</td>
<td>2.3%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

HANDS participants exceed the norm group in every area; in other words, a smaller percentage in the HANDS group evidence sub-par functioning at one year than is seen in the normative group. It appears that HANDS participants with twelve or more home visits are developing at or above levels consistent with their developmental peers.
3.10 Maternal Education and Employment

The demographic characteristics of HANDS moms are assessed at intake, including current level of education and employment. Upon exiting, the level of education and employment is also recorded, allowing for a comparison to be made between intake and exit.

The levels of education recorded include:

- Less than 8th grade
- Some high school
- High school grad/GED
- Some college
- Two year degree
- Four year degree
- Graduate school

2,325 cases with intake and exit data on maternal level of education were available.

- Of these, 78.7% exited at the same level, meaning 21.3% improved or increased their level of education while in the program. Most of these (17.4%, n=404) moved up one level, and a much smaller proportion moved up two (3.1%, n=71) or three (.9%, n=21) levels.
- The great majority of these improvements related to completing high school (n=218) and beginning some college courses (n=103).

1,919 cases had follow-up data on maternal employment. Significant increases in employment are associated with program participation (Figure 24). The findings on maternal education and employment are no doubt partially a function of the passage of time (e.g., over time, mothers complete school that was already underway, or find gainful employment as they get older. However, they also reflect attainment of a significant set of program goals with respect to facilitation of self-sufficiency and risk reduction.

**Figure 23**
Maternal Employment at Intake and One-Year Follow-up, 2001-2007

Over time, a substantial number of unemployed HANDS participants seek and find employment (especially full-time), thereby reducing a significant risk factor associated with poor outcomes. This may be partially attributable to program efforts and support. A small increase in unemployment due to caregiving responsibilities is also seen, presumably reflecting the presence of a new infant in the home.
3.11 Home Safety

A 2001 study compared pre- and post-intervention data from the Childproofing Checklist on a sample of 585 program participants for whom complete data were available.

This 52-item scale, adapted from the Healthy Kids program (American Academy of Pediatrics), measures home visitor assessments of home safety prenatally, and then at about 8 months postnatally. It covers safety considerations in the child’s bedroom, parent’s bedroom, bathroom, kitchen, and general safety.

It was found that:

- Many of the items showed significant positive change over time, although some would not be relevant in every situation (e.g., pets, smoking, firearms).
- The areas most likely to evidence positive change, in order of strength, are shown below:
  - Use of plug protectors
  - Use of ground fault plugs
  - Exposure to second-hand smoke
  - Fire evacuation plan
  - Bumper pads removed
  - Use of non-skid mat
  - Elevated corner posts removed from crib
  - Toy box lid removed
  - First aid kit available
  - No plastic near crib
  - Back burners used for cooking
  - No small “parts or pieces” in child bedroom
  - Smoke detector used
  - Firearm storage
  - Drugs inaccessible to child
  - Fire extinguisher available

In general, these findings lend support to the hypothesis that young children are likely to be more safe from accidents and injury due to the prevention efforts of home visitors. Direct comparative data on rates of accidents and injuries are unavailable at the present time.
Within the research literature, there is considerable debate as to whether effective home visiting is related to pre-service training. Some models of home visiting emphasize the exclusive use of home visitors with professional credentials (e.g., nurses) as a necessary prerequisite (despite the greater cost of this approach). Other models envision that paraprofessionals, carefully selected for their caregiving skills, can serve effectively as home visitors.

Aside from cost considerations, much of the rationale for the use of paraprofessionals rests in their status as community members, neighbors, and peers of service recipients. As non-professionalized “natural helpers” with special sensitivity to the unique issues and culture of their communities (i.e., less social distance), paraprofessionals may be in a better position to build relationships and engage at-risk populations.

Kentucky has opted to staff the HANDS program with both professionals and paraprofessionals, in part due to cost and availability. The emphasis in Kentucky has been on extensive, role-specific, and on-going training and supervision for home visitors regardless of one’s prior training and experience.

For calendar years 2002, 2003, and 2004, 8,803 cases could be identified where the preponderance of home visits were completed by either a paraprofessional or by a professional (some cases were mixed and were not included in this analysis). Of these, 6,333 (71.9%) mothers were served by paraprofessional home visitors.

The geographic distribution of these cases is shown in Figure 24, indicating by county the relative proportion of cases that are served by paraprofessionals. Not surprisingly, it appears that rural areas are far more likely to use paraprofessionals.

**Figure 24**
Proportion of Home Visiting Completed by Paraprofessionals, by County

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1. Within HANDS, professionals and paraprofessionals may serve as home visitors. By regulation, paraprofessionals must be 18, have complete extensive pre-service training, and be supervised by a licensed public health nurse or social worker. Professionals may be: (1) licensed public health nurses, (2) licensed social workers, (3) individuals with a bachelors or masters degree in social work from an accredited program, (4) bachelor-level trained in social or behavioral science with case management experience, or (5) trained at the associate level in early childhood education with home visitation training.
4.1 Demographics and Service Delivery Characteristics

Comparisons were made of the individuals served by the two home visiting groups (paraprofessionals, professionals) to assess whether any demographic or service delivery characteristics could be discerned (for the 8,803 cases).

It was assumed that there would be no differences between the groups, because cases are assigned to home visitors without regard to the pre-service education level of the home visitor. If differences were found, they would need to be examined as a potential factor influencing program outcomes.

Significantly, no meaningful differences were found with respect to: (1) maternal age at entry; (2) maternal income at entry; (3) maternal education level; (4) risk factors at referral as perceived by referral source; (5) average number of home visits; or, (6) average duration of service.

4.2 Outcomes

The question of whether there are systematic and meaningful differences between outcomes generated by the two groups is addressed in the figures that follow. Comparisons are made with respect to reason for exit, pregnancy outcomes, and family functioning.

Figure 25 shows a comparison between the two groups at the time of exit. There do not appear to be any appreciable differences in reason for exiting.

<table>
<thead>
<tr>
<th>Exit Reason</th>
<th>Paraprofessional Home Visitor</th>
<th>Professional Home Visitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed intervention (L1-3)</td>
<td>10.5</td>
<td>9.2</td>
</tr>
<tr>
<td>Family elected out</td>
<td>18.2</td>
<td>15.4</td>
</tr>
<tr>
<td>Family moved</td>
<td>4.1</td>
<td>4.5</td>
</tr>
<tr>
<td>Lost contact with family</td>
<td>18.3</td>
<td>17.2</td>
</tr>
<tr>
<td>Transfer to another county</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Other</td>
<td>3.1</td>
<td>2.5</td>
</tr>
<tr>
<td>Never fully engaged</td>
<td>13.1</td>
<td>10.6</td>
</tr>
<tr>
<td>Infant death</td>
<td>1.7</td>
<td>1.5</td>
</tr>
<tr>
<td>Goals met (L4)</td>
<td>29.6</td>
<td>37.8</td>
</tr>
</tbody>
</table>


4.2 Outcomes (continued)

Figure 26 shows a comparison between the two groups with respect to pregnancy-related outcomes for 2002 and 2003 combined, including non-duplicated counts of low birthweight (LBW) and very low birthweight (VLBW), as well as average birthweight. For this analysis, the paraprofessional subgroup was comprised of 2,573 cases, and the professional group had an n of 1,060. For all three dimensions, paraprofessionals appear to have achieved slightly better outcomes; however, these differences are too small to be interpreted as statistically significant.

![Figure 26](image)

Using pre- and post-intervention Family Rating Scale data (see earlier discussion of the content and technical adequacy of this measure), the paraprofessional (n=1,132) and professional (n=357) samples were subjected to separate paired samples t-tests. For all of the items on the scale except cleanliness and diet, positive change was seen at the .001 level. Consistent with the goals of the program, the greatest gains (for both groups) were in the domains of parenting, stress reduction, and family support.

In order to test whether any interpretable differences between the groups could be discerned, item- and domain-based gain scores were calculated, and then compared across the groups. At the item level, 5 of the 22 items showed minor differences between the groups. One of these favored paraprofessionals (sibling interaction) while four favored professionals (transportation availability, emotional stability, clothing, and hygiene).

Given that the differences between the groups at the item level were very small (possibly reflecting random variation), and since the pattern of these differences did not fit any clear theory, gain scores were aggregated to the level of the domains for the Family Rating Scale (as described earlier). Figure 27 shows the derived comparative scores for this calculation. It can be seen that there are no significant differences between the two groups on the domain-based gain scores.

![Figure 27](image)

### Independent samples t-tests of domain-based gain scores
(comparing paraprofessionals with professionals)

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment</td>
<td>-1.883</td>
<td>1487</td>
<td>.060</td>
</tr>
<tr>
<td>Caregiver</td>
<td>-.887</td>
<td>1487</td>
<td>.375</td>
</tr>
<tr>
<td>Family Interaction</td>
<td>-.293</td>
<td>1487</td>
<td>.769</td>
</tr>
<tr>
<td>Child Well-Being</td>
<td>-1.840</td>
<td>555.822</td>
<td>.066</td>
</tr>
</tbody>
</table>
4.2 Outcomes (continued)

The previous data show that, consistent with the intent of the program, paraprofessionals are serving the same populations served by professional home visitors. Data describing both demographics and service delivery characteristics evidence no differences between the two groups. With respect to engagement, paraprofessionals appear to achieve the same “dosage” of home visits as do professionals, and the duration of their involvement is approximately the same. Reasons for exiting the program also appear to be quite similar across the two groups. With respect to low birthweight (a risk factor for developmental problems), paraprofessionals appear to achieve results that equal or slightly exceed those of professionals. On pre- and post-intervention measures of family functioning, paraprofessionals and professionals appear to achieve gains of a comparable magnitude. Taken together, these findings are consistent with the program theory that high levels of training and supervision for paraprofessionals can produce results that are the same as those likely to be achieved by professional nurses (although there is no evidence of higher levels of engagement for paraprofessionals, as some literature might suggest).
5. Conclusion

Ongoing data analysis strongly supports the view that the HANDS program continues to be an effective intervention approach and a cost-efficient investment in the Commonwealth’s young children. There is compelling evidence that the program is meeting and/or exceeding its goals. Studies undertaken of the HANDS program and summarized in this report reflect positive outcomes in each of the following areas:

- Improved pregnancy outcomes, including fewer premature births, fewer low birth weight and very low birth weight babies, and fewer babies born with birth defects;
- Reduction in child maltreatment;
- Reduction in infant mortality;
- Improved child and family functioning;
- Reduction in repeated use of emergency rooms;
- Reduction in risks;
- Achieving developmental milestones;
- Increases in maternal education and employment; and
- Improved home safety

Assessments of the procedural aspects of the HANDS programs also have been positive, and reflect a program that is serving the intended population, with fidelity to the model, and with staff who are well-trained.

The implementation of the HANDS program is a notable example of effective and thoughtful public policy carried out in a planful and stepwise fashion, with emphasis on program support, accountability, training and supervision, and the use of evaluative data to promote continuous improvement. Achieving a fuller impact at the population level depends on engaging and retaining an increasing proportion of those in need.
References


