

Right from the Start (RFTS) Program Evaluation

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Right from the Start (RFTS) Program Evaluation

Executive Summary

The West Virginia Right from the Start program (RFTS) has demonstrated effectiveness in meeting the challenges in high-risk situations created for expectant mothers, their infants and the family environments. RFTS has a positive return on the money invested and merits both continuation and expansion. This conclusion is supported by the research contained in this report.

RFTS is a comprehensive in-home care coordination system for women and their children who are at risk. RFTS is federal sponsored under various programs as well as receiving financial support from the State general fund. For 2008 (the year covered in this report) State General Fund expenditures were \$750,000 with an additional \$2,005,000 coming from federal programs. Every State dollar draws down \$2.67 from these federal sources.

This report was commissioned by the West Virginia Department of Health and Human Resources, Bureau for Public Health, Office and Maternal, Child and Family Health. The Center for Business and Economic Research (CBER) at Marshall University was commissioned to perform; an “outcomes” based program evaluation to determine the effectiveness of the RFTS program. In doing so CBER:

- Performed a comprehensive review of previous research on the problems associated with pregnancy, infant development and family environment in high risk situations.
- Derived from the research the costs of these problems which are addressed by home visitation programs
- Determined the characteristics of exemplary home visitation programs in reducing those costs
- Used statistical and economic analysis to ascertain the benefits of the RFTS program in West Virginia
- Provided conclusions regarding the effectiveness of the RFTS program with recommendations regarding program continuation and expansion

Research on the need for intervention in high-risk situations indicates that in-home visitation programs have the following results:

- Limited but positive effectiveness in reducing the incidence of LBW, preterm birth and infant mortality
- More positive effects on improving:
 - Mother/child relationships,
 - Overall family environment,
 - Better nutrition
 - Reduced smoking and alcohol/drug abuse
 - Better birth spacing
 - Less abuse, maltreatment and neglect

In summarizing the research on what constitutes an effect in-home visitation program, results from the research and the case studies of quality programs elsewhere provide these standards.

- Target at-risk families

- Frequent visits
- Use of high skilled and trained home visitors
- Visits should begin early in the pregnancy
- Integrate the in-home visits with other community support programs particularly high quality child-care.
- Well designed and individualized curriculum

The West Virginia RFTS meets or exceeds all of these standards.

The results of the CBER inquiry into the benefits of the RFTS are as follows:

- The research indicates that a minimum reduction in costs from lower incidents of LBW, premature delivery is between two (2) and five (5) percent of the hospital expenses experienced from these conditions
- The same minimal levels of reduction from incidents of child abuse, neglect and maltreatment are also to be expected. In practice these reductions may be much higher.
- These cost savings for the reduction in hospital costs for mothers and their infants due to LBW infants and preterm delivery was between \$715,825 if a two (2) percent reduction in incidence was assumed and \$1,789,971 if the reduction was five percent due to RFTS. This estimate is highly conservative as it does not include expenses for doctors or anesthesia.
- The cost savings for the reduction in costs to the State from problems associated with child abuse, neglect and maltreatment ranged between \$1,132,780 if a two (2) percent reduction was assumed and \$2,821,652 if a five (5) percent reduction was the result. Again this estimate is conservative as it only includes the direct or immediate costs and does not incorporate the lifetime costs of crime, unemployment, family abuse and illness which are the result of these maladies.
- The benefit/cost ratio to the State from state expenditures only is 2.46:1 the two (2) percent reduction level and 6.15:1 at the five (5) percent reduction level.
- Adding in the federal expenditures still provides for a positive benefit to cost ratio for the five (5) percent reduction scenario at 1.67:1.

Among the other conclusions in the study are:

- The effectiveness of RFTS would be enhanced if enrollment of those eligible was increased from the current 30 percent of those eligible. While not inconsistent with other programs, the reasons for this level of enrollment and how to increase it are worthy of investigation
- The program is underfunded. The level of support is only 62 percent of the national average for each low income child.
- RFTS should develop a more robust system for data collection and analysis. The current effort makes evaluation and the verification of results difficult.

For West Virginians the RFTS program is a wise investment of State dollars. It produces benefits which exceed costs using the most conservative methodology. It brings federal funds into the State to match the General Fund allocation which would be missing if the program ceased to exist. More importantly, the intangible benefits associated with the improved outcomes of the program (such as healthier communities which cannot be easily quantified) increase the desirability of RFTS.

Right from the Start (RFTS) Program Evaluation

Introduction and Study Background

The West Virginia Department of Health and Human Resources, Bureau for Public Health, Office of Maternal Child and Family Health contracted with the Marshall University Center for Business and Economic Research (CBER) to conduct an evaluation of the Right from the Start (RFTS) program in the State. RFTS is a program offering comprehensive in-home care coordination services to pregnant women and infants. That investigation was to include:

- A review of the literature:
 - On the problems faced by mothers, children and families the home visitation programs are to cover.
 - How home visitation programs addresses these issues
 - Guidelines as to the composition of successful home visitation programs
- Case studies of other home visitation programs which are cited as model programs
- Description of the RFTS program in West Virginia
- Determination of the cost savings to West Virginia from the RFTS program
- Conclusions concerning the RFTS program including a final evaluation with recommendations

Literature Review of Home Visitation Programs

The best and most recent studies have demonstrated that investment in human capital must begin early, preferably during pregnancy. Nobel Prize-winning economist James Heckman's work has established that perinatal investment has much higher returns than investments later in life. His conclusions can be summarized as follows:

Recent research highlights the urgent need for education and support for expectant and new parents... Early experience has long term effects according to... the Centers for Disease Control and Prevention ... Adverse childhood experiences are disturbingly common and have a critical impact on later adult health... Problems in the home greatly multiply one's chances of later illness, injuries, work problems and premature death. These consequences generate tremendous costs for individuals, families and society (Partners in Community Outreach 2007).

The most recent studies in child development find that different stages of the life cycle are important in the development of intelligence and abilities (Shonkoff and Phillips 2000). Most of these develop prior to the child's entry into school. When the opportunity to provide for the formation of these capacities is not realized, remediation in later life must transpire. That remediation is more costly than preventive action and less effective. Put in economic terms, the returns to investment in providing services to mothers and young children are significantly higher than waiting. Yet most policy discussions regarding children and mothers focuses on what should happen right before or after the child enters school. By then the best opportunity is lost.

The report from Harvard's Center on the Developing Child is the most complete and science-based evaluation of the returns for investment in early childhood policies (Center on the Developing Child at Harvard University 2007). It begins with this observation:

It is widely recognized that the path to our nation's future prosperity and security begins with the well-being of all our children. To this end, one of the most important tasks facing policymakers is to choose wisely among strategies that address the needs of our youngest children and their families. ... As scientists we believe that advances in science of early childhood and early brain development, combined with the finding of four decades of rigorous program evaluation, can now provide a strong foundation upon which policymakers and civic leaders with diverse political values can design a common, effective and viable agenda (Center on the Developing Child at Harvard University 2007).

The Harvard Center's report concludes a number of factors which enhance positive development (effectiveness factors) in the first five years of life and may be affected by home visitation. The factors are (Center on the Developing Child at Harvard University 2007):

- Access to basic medical care for pregnant women and children can help prevent threats to healthy development as well as provide early diagnosis and appropriate management when problems arise.
- For vulnerable families who are expecting a first child, early and intensive support by skilled home visitors can produce significant benefits for both the child and parents.
- For young children from low-income families, participation in very high-quality center-based early education programs has been demonstrated to enhance child cognitive and social development.
- For young children experiencing toxic stress from recurrent child abuse or neglect, severe maternal depression, parental substance abuse or family violence, interventions that provide intensive services matched to the problems they are designed to address can prevent the disruption of brain architecture and promote better developmental outcomes.
- For families living under the poverty level, work-based income supplements for working parents have been demonstrated to boost the achievement of some young children.
- Environmental policies that reduce the level of neurotoxins in the environment will protect fetuses and young children from exposure to substances that are known to damage their developing brains.

Research strongly indicates that the period between birth and three years is the time of the most rapid cognitive, linguistic, social, emotional and motor development (Center on the Developing Child at Harvard University 2007, Regalado and Halfon 2002). The science behind these conclusions is not reviewed in this report, because it is adequately substantiated by the work of the National Scientific Council on the Developing Child, National Research Council and Institute of Medicine (Cunha 2005, Shonkoff and Phillips 2000).

Research supports that home visitation programs are an effective method to reach children and families during the crucial time period between birth and three years. With an effective program

and well-trained home visitors, families, children and even government agencies can see the benefits of home visitation programs. The following sections outline the research surrounding home visitation programs.

This review of the literature is divided into four sections:

- Summation of research into the problems encountered during the perinatal period by mothers, children and their families
- Discussion of the research of home visitation programs including effectiveness and criticisms, cost benefit analysis, qualities of successful programs and implementation issues
- Guidance from the research on elements of home visitation effectiveness
- Results of previous West Virginia home visitation research.

Problems of Mothers, Children and Families

Prenatal Care

The effectiveness of prenatal care as a way of both improving outcomes for children and mothers and significantly reducing health care costs has a long history in the research. These inquiries show that the high rates of morbidity and mortality which arise from pre-term and low birth weight (LBW) babies impose an immense burden on the health, education and social services provided by government (O'Neill 2004, Petrou, Sach and Davidson 2001). Huntington and Connell have suggested that cost savings are not the only criteria by which the value of perinatal care should be evaluated (Huntington and Connell 1984). They cite happier, healthier pregnancies, better relationships with providers, better parenting, complete immunizations and reduced family stress as unmeasured but definite benefits.

LBW has been determined to be the principal cause of infant mortality and a leading cause of childhood illness. Women who receive prenatal care in the first trimester were four times more likely to have positive infant health outcomes as those who did not (Lowry 2000). This result was confirmed in a study of undocumented immigrants which found women without prenatal care were four times more likely to deliver a LBW baby and seven times more likely to deliver a premature infant (Lu 2000).

One study found that if all US women had adequate prenatal care, the additional \$15,000 cost incurred for each LBW baby would result in a savings of \$14,775 (Messonnier 1999). One extensive review of five cost benefit studies on the effectiveness of prenatal care showed savings for each dollar spent of \$1.49, \$2.57, \$3.38, \$4.70 and \$7.00 depending on the extent of intervention (Division of Science 1998). An older study in Texas found a \$2 return on each dollar spent by reducing the number of admissions to a NICU (Wilson, et al. 1992). A return of \$2.57 for each dollar spent was reached in Gorsky and Colby's study (Gorsky and Colby 1989).

The incidence of LBW is significantly higher for those who do not receive early prenatal care. Mothers who received no prenatal care are three times more likely to give birth to a low birth weight infant; this increases the risk of death of the infant by five times (Maternal and Child

Health Bureau 2008). The death rate for a Hispanic woman who did not receive prenatal care was 10.3 per 100,000 compared to 6.0 for those who did receive the care (Centers for Disease Control and Prevention 1999). Ural studied inner-city patients with a history of pre-term delivery (PTD) and found a significantly lower incident of PTD among women who received prenatal care. Lower incidents of PTD as a result of care received are also correlated to lower total health care costs for both mother and child (Ural 1998).

A series of studies were conducted during the 1980's and 1990's on the relationship between having insurance (Medicaid, state programs and private insurance) and receiving prenatal care. In a study in which undocumented women from three states received care under a state program in two states, it was found that the utilization rate was 10 times greater for women in a state where no prenatal care was covered (Minkoff 2001). Lu determined that if California eliminates prenatal coverage it could expect an increase in the costs of post natal care between \$3.33 and \$4.68 for each dollar of reduced spending (Lu 2000).

Two studies for Washington found that after passage of the Maternity Care Access Act in 1989, which provided prenatal care for low income women, the rate of indigent women not receiving prenatal care decreased by 54 percent with a reduction in LBW babies of 33 percent (Cawthon and Salazar 1999, Baldwin 1999). The President's Council of Economic Advisors found that expansions in Medicaid have reduced the incidence of LBW babies, decreased infant mortality and increased the number of infants seeing a doctor (President's Council of Economic Advisors 1997). A study completed 20 years ago strongly suggested that prenatal care for indigent women would result in a net reduction in perinatal morbidity and health care expenditures for infant morbidity by one half and advocated universal perinatal care (Moore, et al. 1986).

The results summarized from the studies above have been critiqued as overestimating the benefits of perinatal care. McCormick and Siegel found that more attention should be paid to women's health than is now the case as the main success of prenatal care has been the preservation of women's health (McCormick and Siegel 2001). Frick found "selection bias" in the studies (Frick and Lantz 1999). Women with better educations are more health conscious, abstain from alcohol, smoking and drugs, and are more likely to self-select prenatal care thus skewing the results when compared to women who do not possess the aforementioned attributes; two other studies make the same argument (Huntington and Connell 1984, Fiscella 1995).

On the other hand Liu, found the benefits of prenatal care to be underestimated substantially. Using an econometric model, he concluded that that the overall estimated effectiveness of prenatal care is over five times higher after controlling for the selection effects as women with poorer health are likely to receive more prenatal care (Liu 1998).

Smoking, Alcohol and Substance Abuse

The National Governors Association, citing data from the March of Dimes, Center for Disease Control and Prevention (CDC) and the US Public Health Service, found "quitting smoking is the most important action a pregnant woman can take to prevent serious illness and complications for herself and her child" (National Governors Association 2001, 1). Their report cites the following statistics in support. Smoking is responsible for (National Governors Association 2001):

- 20 to 30 percent of all LBW babies
- 8 to 14 percent of preterm deliveries
- 5 to 10 percent of all perinatal deaths.

The costs associated with birth complications to pregnant smokers were nearly \$2 billion annually and if all pregnant women who smoke were to stop, there would be a 10 percent decline in the infant death rate. Wojciak estimated a return of \$2 to \$3 for every dollar spent on smoking cessation programs (Wojciak 1999).

Alcohol and substance abuse follow closely behind smoking as a cause of unfortunate birth outcomes (Lester and Twomey 2008). In the words of the American College of Obstetrics and Gynecology, this is the single largest preventable cause of developmental compromise of infants in the US. In a recent review of the impact of substance abuse during pregnancy, Lester and Twomey related that almost 4 percent of pregnant women used illicit drugs during pregnancy and over 30 percent consumed alcohol and smoked. They provide data from a variety of sources which found:

- 800,000 to 1 million unborn children are exposed to illegal drugs each year
- 40 percent of all cases of abuse and neglect are related to illegal drug use
- Use of illicit drugs by one or more parents increases the risk of maltreatment by threefold
- 11 percent of all children live with at least one parent who is an alcoholic or addicted to drugs. (Lester and Twomey 2008)

The conclusion Lester and Twomey reach is that these are conservative estimates, because they were based on self-reports and “gestational exposure to licit drugs such as alcohol and cigarettes and illicit drugs (marijuana, cocaine, methamphetamine and opiates) is the single largest preventable cause of *in utero* developmental compromise of infants in the USA today” (Lester and Twomey 2008 67).

Health Care

The National Academy for State Health Policy has reviewed the literature on early child health (Kaye, May and Abrams 2006). They found that 15 to 18 percent of all children in the US had a developmental disability with the rate for Medicaid children being almost 40 percent. Most of these disabilities can be diagnosed prior to kindergarten entry, yet only 20 to 30 percent are diagnosed before they start school. At the same time 95 percent of all children see a doctor prior to school entry (Kaye, May and Abrams 2006).

The research identifies lack of assessment for developmental disabilities and coordination of the many programs designed to promote infant and toddler health as the major issues. Acute care does appear to be available, but preventive care does not always happen (Halfon, et al. 2005). The Halfon study lists the components of “preventive pediatric services” focused on child development:

- Ongoing assessment to identify developmental risks and problems (developmental screening)

- Education for parents on child development and ways of promoting learning and growth (anticipatory guidance)
- Intervention for developmental concerns either at the pediatric practice, specialist or community program
- Coordination of intervention and treatment services.

Child Abuse and Neglect

Child abuse and neglect is another area which has not received the attention merited by the high benefits-to-costs ratio these prevention programs provide. Maltreatment of children leads to a myriad of other problems like poor physical health, poor emotional health, social difficulties, cognitive dysfunction, high-risk behaviors and behavioral problems both as children and adults. For very young children, neglect is the biggest single cause of maltreatment with abuse increasing as the child ages.

Physical and sexual childhood abuse is associated with poor health across the lifespan. However, the association between these types of abuse and actual health care use and costs over the long run has not been well documented. To examine long-term health care utilization and costs associated with physical, sexual, or both physical and sexual childhood abuse Ohio State University conducted a study of 3,333 women with a mean age of 47 (Bonomi, Anderson, et al., Health Care Utilization and Costs Associated with Childhood Abuse 2008)

Data of abuse was collected by retrospective in telephone surveys. The study results demonstrated significantly higher annual health care use and costs for women with a child abuse history compared to women without comparable abuse histories. The most pronounced use and costs were observed for women with a history of both physical and sexual child abuse.

Study results indicated that women with both abuse types had higher:

- annual mental health
- emergency department
- hospital outpatient
- pharmacy
- primary care
- specialty care use

Total adjusted annual health care costs were 36 percent higher for women having both abuse types, 22 percent higher for women with physical abuse only, and 16 percent higher for women with sexual abuse only. The study revealed a high correlation between child abuse and elevated long-term health care use and costs, especially for women who suffer both physical and sexual abuse.

In West Virginia, a study found that the results of bad parenting cost the state \$38 million in 2009 and that this amount will almost double by 2010 (Hesley 2007). Screening for child neglect and home visitation show the greatest returns for reducing the incidence of child maltreatment.

An extensive body of additional evidenced based research provides promising “best practices” to improve child safety and reduce abuse and neglect (Wang and Holton 2007). The problems created in this area were categorized by Prevent Child Abuse America:

- Poor physical health
- Poor emotional health
- Social difficulties
- Cognitive dysfunction
- High-risk health behaviors
- Behavioral problems.

Many of these problems become evident in children even before their first birthday. The effects of abuse and neglect have long lasting effects creating costs which extend throughout the lifetime of the victim (Noll 2010). After a comprehensive literature review, Wang and Holton developed estimates for two types of costs: direct costs dealing with the immediate needs of children and indirect costs associated with the long term implications. Their conclusion was that child abuse and neglect cost \$103.8 billion in 2007. As noted in their report, this is a conservative estimate as it only includes the costs to the victim and did not include any costs associated with the perpetrators or the victim’s family (Wang and Holton 2007).

Heasley, for the Partners in Community Outreach, looked at the cost factors in West Virginia associated with child abuse and neglect using a “cost of failure approach.” For child maltreatment and bad parenting, state appropriations for child protective services, incarceration and construction of detention and correctional facilities were reviewed (Heasley 2007). There has been a steady increase in these expenses since 2003, reaching \$38 million in 2007 and projected to rise to \$68 million in 2010. Only a small fraction of these costs are directly associated with very young children, but early abuse results in these behaviors in later years (Thomas et al. 2007).

A recent study found that depressed fathers were more likely to abuse their children than those who were not depressed (Davis, et al. 2011). Health care providers were urged to include fathers in any evaluation of the home or parental environment. Usually attention is paid only to the mental health of mothers during office or home visits, yet 77 percent of the depressed fathers accompanied their children to well-baby visits where such intervention could have taken place.

For children under age five neglect is the most prevalent form of maltreatment, accounting for almost two thirds of the cases (Thomas et al. 2007). That neglect usually takes the form of malnutrition, failure to obtain medical care or lack of parenting including presence and emotional support. A somewhat dated study found that being neglected as a young child increased the likelihood of being arrested as a juvenile by over 50 percent and as an adult by almost 40 percent (Windom 1992). Child abuse’s long term effects on health care costs were born out by a detailed statistical analysis of the health care costs for women who had been abused either physically or sexually as a child (Bonomi, et al. 2008). On average these costs ran \$790 more per year.

Oral Health

Oral health is a much neglected issue in the discussions of early childhood medical care. Yet the research links it with the prevention of dental caries which have been identified as the number one health problem for children entering school. All dental associations have advocated that young children should have a “dental home” to provide comprehensive and consistent care (American Academy of Pediatric Dentistry 2004). Poor dental health in children has been positively correlated with a variety of adult diseases, including health problems and premature death.

Oral health is important for toddlers and young children even if their “baby teeth” have not fully developed. It was estimated that 40 percent of all children have dental caries (tooth decay) prior to kindergarten (Services 2003). In addition to pain, tooth decay leads to infections as well as problems with eating, speaking and learning (Hagan, Shaw and Duncan 2008). Dental caries were identified as the number one health problem for students entering kindergarten (Gift, Reisine and Larach 1992).

Tooth decay is preventable, but there are other issues involved in oral health care, such as teething, and thumb or finger sucking as a pacifier habit. Dietary habits, particularly sugar consumption, are the primary cause of dental problems. They can be addressed early before serious damage is done.

Obesity

Considering the epidemic in the US of overweight children, nutrition programs, along with efforts to increase physical activity, provide significant returns (Center for Disease Control and Prevention 2008, Institute of Medicine of the National Academies 2004, Office of the Surgeon General 2007). The Surgeon General found the obesity rate among children aged two to five had more than doubled in the past 25 years (Office of the Surgeon General 2007). Early age obesity almost ensures that obesity will continue through the elementary and secondary school years. The Institute of Medicine has documented the link between a variety of physical health (Type 2 diabetes, hypertension, hepatic steatosis, sleep apnea, certain cancers, heart disease and osteoarthritis), emotional health (low self-esteem, negative body image and depression) and social health problems (stigma, negative stereotyping, discrimination, teasing and bullying) (Institute of Medicine of the National Academies 2004).

The report goes on to relate that obesity reduces overall adult life expectancy and increases the prevalence of chronic disease conditions among adults. This not only increases medical costs but leads to greater work absenteeism and decreased worker productivity. While many of the problems associated with obesity are not present in childhood, the foundation for these are laid in those years and increase the risk of their developing in adulthood (Daniels 2006).

As the research shows, fighting childhood obesity will require multi-level and multi-faceted interventions. But nutrition programs, such as the Special Supplement Nutrition Program for Women, WIC and Food Stamps have been found effective in improving young children’s diets (Rose, Baicht and Devaney 1998, Gordon and Nelson 1995). As was documented in the section on prenatal and perinatal care, the success of nutrition programs both pre-birth and post-birth has

been conclusively established. WIC programs are especially effective for children in low income families (Bitler and Currie 2004, Ludwig and Miller 2005).

Nutrition is a major concern at this age as children born to obese weight parents have an 80 percent chance of being obese themselves. The dietary habits of individuals are usually established early in life and difficult to alter in later years. Obesity has been linked to a variety of problems both in childhood and adulthood such as diabetes, heart disease, stroke, cancer and osteoarthritis. Further, children who are severely overweight do not perform as well in school and are often the brunt of discrimination and teasing. State programs which emphasize nutrition and monitor compliance with dietary standards through home visitation and education are the most effective.

Home Visitation

Effectiveness of Home Visitation

The research on the results from home visitation programs is not clear. Some studies would agree that home visitation programs are an effective way of dealing with some of the problems discussed in this report. That conclusion has been reached in selected research which is reviewed in one study from 2005. The study found that high quality in-home visitation can reduce the incidence of most of these maladies up to 40 to 70 percent (Bilukha, et al. 2005).

The National Governors Association's Center for Best Practices (National Governors Association, 2001) found home visitation allows for early identification of mothers at risk of delivering a premature or LBW baby, along with treatment to reduce those risks. Early investments in home visitation programs have been shown to reduce costs associated with foster care placements, hospitalizations, emergency room visits and unintended pregnancies. Physical violence is inflicted on 2.5 to 6.6 percent of all pregnant women and results in fetal death and LBW babies.

Only four states have fully implemented the American College of Obstetricians and Gynecologists¹ recommendation that all patients be screened for violence throughout pregnancy. All states conduct public and provider education campaigns to alert pregnant women that they should not smoke, drink alcohol or take illicit drugs while they are pregnant. However, these programs have varying levels of success and are most successful when part of a home visitation project.

After reviewing the research, the Zero to Three Policy Center found:

High quality home visiting programs are an effective service delivery method to support healthy development in these early years, ensuring that children succeed in school and beyond. ... Infants and toddlers who participated in high quality home visiting programs were shown to have increased cognitive development, greater likelihood to enroll in preschool programs, increased school readiness at kindergarten entry, higher IQs and languages scores at age six, higher grade point

¹ <http://www.acog.org/>

averages and math and reading achievement test scores at age nine and higher graduation rates from high school (Zero to Three Policy Center 2008, 3).

An extensive research based evaluation was completed by the CDC's Task Force on Community Prevention Services which determined "early childhood home visitation has been used to address a wide range of public health goals for both visited children and their parents, including not only violence reduction, but also other health outcomes such as educational achievement, problem-solving skills and greater access to resources" (Bilukha, et al. 2005, 11).

An analysis of 28 studies on the effectiveness of home visitation summarized the literature as providing evidence that home visitation is effective in improving child development and health outcomes (Issel, et al. 2011). However, the review did not find significant differences in infant birth weight, gestational age or preterm birth but still reported, "Nonetheless, prenatal home visiting was associated with increased prenatal care utilization in more than one-third of the studies. An increased use of prenatal care can be clinically important even when not statistically significant, thus making prenatal home visiting potentially valuable" (162).

While there is substantial research supporting home visitation programs, other reviews of the research have not reached the same conclusions. A comprehensive research study on home visitation included review of 12 meta-analyses which was completed by Gomby (2005). "Given all the differences across programs, do home visiting programs produce benefits for parents and children? ... They can but they do not always do so" (Gomby 2005, 9). Gomby notes the benefits of home visitation are based primarily on the work completed for the Nurse Family Partnership program in three communities and cannot be generalized to different programs at different sites.

...the most rigorous studies show that programs may be somewhat more likely to produce benefits in outcomes related to families (i.e.in aspects of parenting) than in outcomes related to children (i.e., children's health and development). ... [H]ome visiting programs will rarely produce large, easily-observed changes across most of the families they serve (Gomby 2005, 9, 12).

Daro agrees with that assessment.

Several reviews have concluded that home visiting can be an effective strategy to improve the health and developmental outcomes of children from socially disadvantaged families. However, effects have not been found consistently and some studies have reported no impact. When effects have been found, they are generally not as large as originally predicted. In addition, effects have not been consistently identified in the same outcome areas (Daro 2006, 2).

One of earliest studies on the effectiveness of home visitation was performed by Olds and his colleagues (Olds, et al. 1986). Comparing women who received comprehensive prenatal and postpartum nurse home visitation and those who did not, the conclusion was that women visited by nurses:

- Attended childbirth classes more regularly and frequently

- Were more aware of community services
- Made greater use of nutritional supplements
- Had dietary improvements
- Included fathers more often in pregnancies
- Were more likely to have someone with them during labor
- Had fewer kidney infections
- Had heavier birth weight babies as adolescent mothers
- Had a 75 percent reduction in pre-term deliveries among mothers who smoked.

A later study of the same population covering 20 years of results from the Nurse Home Visitation Program in two cities determined the program provided benefits to low-income, unmarried women but had little impact on others. The positive findings for this group of mothers included (Olds, Henderson and Kitzman 1994):

- Reduced rates of childhood injuries and ingestion associated with child abuse
- Deferred future pregnancies
- Mothers who were more likely:
 - To find work or continue/resume education
 - Be economically self-sufficient
 - Eventually avoid substance abuse
 - Not to demonstrate criminal behavior
- Children, who by age 15 were:
 - Less likely to be arrested
 - Reported to smoke and drink less
 - Reported to have fewer sexual partners.

A study conducted by nurses of 1,139 primarily African women found no reduction in rates of childhood injuries and ingestions; these may be associated with child abuse and neglect in the children of mothers who received visits. Additionally, there was no difference in preterm delivery, low birth weight, immunization rates, mental development, behavioral problems or mother's employment and education in those children whose mothers were not visited. Significant positive differences were noted for pregnancy induced hypertension, fewer health care encounters for injury or ingestion and reduced second pregnancies (Olds, Henderson and Kitzman, et al. 1999).

In a recent study of the Healthy Families New York (HFNY) program, Lee discerned the following results for 500 women. "Home visitation is a service-delivery strategy that holds promise for improving birth outcomes for pregnant women and adolescents who may lack strong social support networks and be reluctant or unable to seek assistance outside the home" (Lee, et al. 2009, 157). His work indicated that HFNY mothers were half as likely to deliver pre-term babies as those who did not receive home visits under the HFNY program.

Cost-Benefit Analysis of Home Visitation

Despite the problems in the methods used to conduct studies of the returns to home visitation, several reports have provided estimates of the return on investment. For example, Santos concluded, "The relative costs and benefits of home visiting studies under optimal research

conditions (i.e. cost-efficacy studies) suggest that, in general, the benefit of home visiting outweighs the costs” (Santos 2005, 10). The National Governors Association’s Center for Best Practices (National Governors Association, 2001) found early home visitation programs were effective in reducing the costs to state governments due to better foster care placements, reduced use of hospitalization and emergency room visits and unintended pregnancies.

Olds concluded, “An economic evaluation of the program from the standpoint of savings to government showed that for low-income women (and especially those who were low-income and unmarried) the discounted cost saving to government exceeded the cost of the program before the children were four years of age by a factor of four over the lifetime of the children” (Olds, Henderson and Kitzman, et al. 1999, 57). More recently, the Schuyler Center reported that “national data estimates the cost of home visiting programs at \$5,000 to \$9,000 per child. On average programs return \$2.24 for each dollar invested. However, investments and returns can fluctuate depending on the range of services offered and the geographic location of the program” (Schuyler Center 2007, 4).

Cawthorne and Arons agree with a positive cost benefit outcome from home visitation.

Few cost-benefit analyses of home visiting programs exist, but some interesting findings have emerged. A 2005 analysis from the RAND Corporation found a net benefit to society of \$34,148 per high-risk family served, equating to a \$5.70 return per dollar invested in the Nurse Family Partnership. These savings were found primarily in four areas: increased tax revenues associated with maternal employment, lower use of public welfare assistance, reduced spending for health and other services and decreased criminal justice system involvement (Cawthorne and Arons 2010, 10).

While the studies are consistent in showing positive cost-benefit ratios, they are far from conclusive. Most of the research has been completed on results from only one program, the Nurse-Family Partnership (NFP). The other programs of nurse visitation are not similar to the NFP in composition of clients, methods of delivery, frequency of visits, services offered or quality of the visitor. Studies of small scale programs cannot be used to confidently estimate returns to larger scale programs (Gomby 2005, Center on the Developing Child at Harvard University 2007).

Olds, considered the father of home visitation studies, provided a similar insight as to why some programs may not be as successful as the NFP. “During the past five years, new studies have been reported that have cast doubt upon the effectiveness of home visitation programs that do not adhere to the elements of the model studies in these trials, including especially the hiring of nurses and the use of carefully constructed program protocols designed to promote adaptive behavior” (Olds, Henderson and Kitzman, et al. 1999, 62).

Qualities of Successful Home Visitation Programs

Several researchers and organizations have offered their list of elements in a home visitation program which is best designed to serve the goals of the intervention. Those suggestions are provided below.

A study completed in 1995 sought to determine what prenatal interventions were most effective (Alexander and Korenbrot 1995). The collective evidence they reviewed indicated the most efficacious prenatal care to be:

- Psychosocial (aimed at smoking, drinking and drug use)
- Nutritional (aimed at inadequate weight gain by mothers)
- Medical (aimed at general morbidity).

In the most exhaustive review of the literature on home visits to date Gomby noted the following characteristics of a successful program (Gomby 2005):

- Family engagement including all those living in the home, not just mother and child
- A curriculum which was well designed with specific outcomes based on the objectives of the program
- The home visitor who was well trained
- Consonance between the program and its clientele to maximize communication and acceptance of the program
- Delivery of services to high-risk families.

The CDC Task Force concluded that a successful home visitation program consists of a “two generational approach” of addressing problems and introducing interventions of mutual benefit to both parents and children consisting of (Center for Disease Control and Prevention 2008):

- Training of parent(s) on prenatal and infant care
- Training on parenting skills
- Developmental interaction with infants and toddlers
- Family planning assistance
- Development of problem-solving and life skills
- Education and work opportunities
- Linkage with community services.

Home visitation is most effective when it is “multi-component” including (Center for Disease Control and Prevention 2008):

- Provision of quality day care
- Parent group meeting for support and instruction
- Advocacy for children
- Transportation assistance.

The Schuyler Center provided a list of evidence based program characteristics which were deemed successful (Schuyler Center 2007):

- A specific model, curriculum or protocol in implementation
- Specific written materials that set out components and goals for practice protocols

- A description of intensity and frequency of services, including program outcomes
- A description of educational requirements of home visiting, ongoing training, support and supervision
- Data documenting a statistically significant impact on the stated goals and desired outcomes.

The Schuyler Center also established the characteristics of an ideal home visiting system as (Schuyler Center 2007):

- Universal, but targeted for high-needs
- Model-neutral (not based on one particular model)
- Voluntary
- Dependent of community choice
- Sufficient in terms of the infrastructure necessary to support it
- Flexible enough to accommodate needs that might seem outside the range of typical home visiting services
- Focused on the family and the child and the primary caregiver
- Culturally and linguistically sensitive
- Able to provide a comfortable, safe environment for the family
- For the families in need of the most intensive services, accountable for outcomes that are demonstrated through the research.

Implementation Issues of Home Visitation Programs

Zercher and Spiker discovered:

Research into the implementation of home visiting programs has documented a common set of difficulties across programs in delivering services as intended. First, target families may not accept initial enrolment into the program. Two studies...found one-tenth to one-quarter declined invitations to participate. In another study, 20 percent of families that agreed to participate did not begin the program by receiving an initial visit.. ... [Another study] found that 42 percent and 38-56 percent of scheduled visits were actually conducted. of families that agreed to participate did not begin the program by receiving an initial visit. [An additional study] found that between 20 and 67 percent of enrolled families left home visitation programs before the scheduled termination date (Zercher and Spiker 2004, 3).

The CDC Task Force also identified the barriers to the effectiveness of home visitation found in the literature as being (Center for Disease Control and Prevention 2008):

- Difficulties in retention of participants resulting from moving and lack of incentives to remain in the visitation program
- Turnover of program staff due to low salaries, travel, burnout and physical danger
- Use of under-qualified staff.

The research indicates that the necessary trusting relationship between visitor and recipient is developed over a long time period. Retaining staff so that a continuity of care can be provided must be a long range objective. As Kitzman (2004) says, "The quality of the relationship is a predictor of program outcomes" (3). As this can be achieved only with a long term relationship between visitor and recipient, this will require sufficient salaries, benefits and other support to reduce turnover and place more trained workers in the field, so that the heavy case burdens now experienced can be reduced (Kent et al. 2005).

Guidance from the Research

The disagreements among researchers on the results from home visitation programs arise due to the different research methods used, differences in the program content, population served and qualifications of the home visitor. Kitzman comments, "Home visiting programs vary dramatically. Differences exist in their underlying theoretical models, characteristics of target families, number and intensity of visits, duration, curriculum, approaches to services, degree of manualization, fidelity of implementation and background and training of the visitors" (Kitzman 2004, 1).

Still the better research does allow for some definite conclusions to be reached. Zercher and Spiker summarized their analysis of the literature:

Research on home visitation programs has not been able to show that these programs have a strong and consistent effect on participating children and families, but modest effects have been repeatedly reported. Programs that are designed and implemented with greater rigor seem to provide better results. These results may include changes in parental health and safety behavior, parenting and discipline and parental life course. Home visitation programs also appear to offer greater benefits to certain subgroups of families, such as low-income, single teen mothers. On the whole, home visitation programs have not been shown to result in large changes in important child outcomes such as birth weight cognitive development or behavior problems (Zercher and Spiker 2004, 5).

Kitzman summarized her research as follows:

Some programs that have included mother and family development strategies have demonstrated reductions in closely spaced pregnancies and reduction in total number of pregnancies. Prenatal health behaviors, including reductions in tobacco and other substance abuse, have been reported but have not been consistently associated with improved pregnancy outcomes. More positive parenting attitudes and mother-child interactions have been found. Mothers who were home visited have reported less impairment from substances than those not visited. One long-term follow-up study demonstrated fewer arrests and convictions in the home-visited group 15 years after the birth of a child. Home visited mothers also have been found more likely to be involved in stable relationships (Kitzman 2004, 2).

Target “At Risk” Families

There is near universal agreement that home visitation programs should be targeted, if not provided only for high risk families. Zercher and Spiker state the following about targeting high risk families:

One of the clearest messages that has emerged from this program of research is that the functional and economic benefits of the nurse home visitation program are greatest for the families at greatest risk. This pattern of results challenges the position that these kinds of programs ought to be made available on a universal basis. Not only is the universal approach likely to be wasteful from an economic standpoint but it may lead to a dilution of services for those families that need them the most because of insufficient resources to serve everyone well (Zercher and Spiker 2004, 5).

The strongest advocate of universal provision, citing the success of universal programs in other countries, indicates three levels of care which can be provided by home visitors (Schuyler Center 2007):

- *Universal*. For all expectant and new mothers/families
- *Targeted*. For children and families with identified needs such as mental illness, substance abuse, speech and language issues or physical disability
- *Intensive*. For families and children at high-risk for issues such as abuse and neglect, homelessness, poverty and teen mothers.

The Schuyler Center concluded that the greatest effort and expenditures should be on those in the targeted and intensive groups.

Reduce Abuse and Neglect

While the research is unclear, unconvincing and contradictory as to what leads to abuse and/or neglect, there is one strategy for reduction which is supported by all studies: home visitation (Bilukha, et al. 2005, Hagan, Shaw and Duncan 2008, Partners in Community Outreach 2007, Partners in Community Outreach 2008, Thomas et al 2007, VanLandeghem 2002, Zero to Three Policy Center 2008). A study of 400 disadvantaged pregnant women found that home visitation resulted in a statistically significant reduction in child maltreatment, although the effects diminished over time or with an increase in home violence (Eckenrode 2000).

Zercher and Spiker (2004) reported that “...program participation was associated with a reduction in the number of child abuse cases” (4). “Children in the nurse visitation program were in homes with less hazards, experienced 40 percent fewer injuries and ingestions, plus 45 percent fewer behavior and parental coping problems” reported Olds in an earlier analysis (Olds, Henderson and Kitzman 1994, 61).

These reviews of the scientifically based research find that effective home visitation is not only a preferred strategy for child maltreatment (reducing the incidence of abuse and neglect by 40 percent) but is also effective for perinatal care, health care and nutrition programs.

Increase Frequency of Visits

A much broader and unified conception of prenatal care than what exists currently was advocated. This finding was backed in Donovan's study which found that special and more extensive interventions resulted in a further 19 percent reduction in premature births over those who received less intensive care. These enhanced interventions included more frequent visits, classes in prevention education and instruction on what to expect in the hospital (Donovan 2007).

The most recent study completed by Deblec and colleagues utilized a random sample of 30,000 teenage first-time mothers. The research concluded that the frequency of the care was the most important factor in producing the desired results. The study concluded, "Women without prenatal care had more than seven fold higher risk of preterm birth compared with those attending 75-100 percent of the recommended visits. Women with less than 25 percent, 25 to 49 percent or 50 to 74 percent of expected prenatal visits were at significantly increased risk of preterm birth" (Deblec 2010). These results paralleled a Finish study which found that non- or under attendance at prenatal care substantially increased the incidence of adverse pregnancy outcomes (Raatikainen, Heiskanen and Heinonen 2007).

While most programs involve only 20 to 30 home visits, one researcher has determined that at least 100 visits need to occur for beneficial results to be noticed (Gomby 2005). Gomby also stated, "Too often, families receive a watered down version of home visiting services" (Gomby 2005, 39). One of the reasons was the high non-enrollment and dropout rates. As many as 40 percent of the families who are invited do not enroll in the program. Of those who do enroll, between 20 to 80 percent leave the program before the services are completed with an average rate of 50 percent (Gomby 2005).

Use of Trained Visitors

Virtually every study or list of recommendations includes using nurses or other highly trained personnel to complete the home visits (Olds, Henderson and Kitzman 1994, Bilukha, et al. 2005, Gomby 2005, Lee, et al. 2009, O'Neill 2004). Barnet concluded in a randomized trial that extremely well-trained home visitors are needed to serve families who are facing multiple, complex issues, work in programs with multiple, broad goals or work in programs with a curriculum that allows a great deal of flexibility (Barnet, Duggan and Devoe 2002). Gomby comments:

The success of a home visiting program rides on the shoulders of its home visitors. From the point of view of families, home visitors are the program. ... Home visitors must have the personal skills to establish rapport with families, the organizational skills to deliver the home visiting curriculum while still responding to family crises that may arise, the problem-solving skills to be able to address issues that families present in the moment when they are presented, and the cognitive skills to do the paperwork that is required. These are not minimal skills... (Gomby 2005, 40).

Based on their review of existing studies, Zercher and Spiker concluded that "available research indicates that home visiting programs produce better outcomes when they employ more highly

trained visitors such as nurses... (Zercher and Spiker 2004, 4). This is a point underscored by the National Conference of State Legislators (NCSL) which found that programs delivered by professionals (nurses and social workers) were much more effective than those delivered by paraprofessionals or volunteers (William-Mbengue 2004).

The evidence based research reviewed in this report shows that this is one of the most cost effective ways to provide the services needed by pregnant mothers, young children and their families. These programs must be delivered by trained nurses and social workers. These care givers must have the capacity to screen mothers and children, provide immunizations, give counseling, supply information and guide referrals.

Begin Visits Early

There is little doubt the research indicates better results when the home interventions begin early preferably in the first trimester of a pregnancy (Bilukha, et al. 2005, Center on the Developing Child at Harvard University 2007, Lee, et al. 2009, William-Mbengue 2004). The CDC Task Force viewed it as essential that these visits must begin at least within the child's first two years of life but preferably prior to birth (Center for Disease Control and Prevention 2008). Deblec also found that early, quality prenatal care improves the birth experience (Deblec 2010).

The reasons for this finding are obvious. The health of the mother is one of, if not the most important factor in the birth outcome. To the extent that reduction of smoking, alcohol use and illicit drug consumption can be accomplished by home visitation early in the pregnancy, the likelihood of a healthy baby are increased. Further, changes in the home environment, such as reduction in abusive activity, sanitation and housing conditions, should be addressed as soon as possible in the pregnancy (Kent et al. 2005).

Integrate with Other Child and Family Support Programs

It is difficult to find any research which supports home visitation as a "stand alone" program. Home visitation's strongest advocates call for an integrated program with other social services designed to deal with problems of children and their families. Gomby relates, "Over the past 30 years, programs that produced the most substantial long-term outcomes for children combined center-based early education services for children with significant parent involvement through home visiting, join parent-child activities, parent groups or other means" (Gomby 2005, 32).

"The cornerstone of the ideal system is its integration with other systems," wrote the Schuyler Center in its analysis for New York's proposed home visitation program (Schuyler Center 2007, 4). No single program approach or mode of service delivery has been shown to be a "magic bullet," but a comprehensive, multifaceted approach will produce the greatest and most long lasting effects (Center on the Developing Child at Harvard University 2007). Kitzman supports this conclusion, stating "...home visiting services are expected to augment, rather than replace, center-based health and human services" (Kitzman 2004, 1).

The key is enrolling the child in center-based early childhood programs (Cornell 2002). The report stressed the importance of integrating home visiting with other early childhood programs and the need to improve the quality of the programs. Both of these suggestions were supported by Zero to Three (Zero to Three Policy Center 2008).

Results of Previous West Virginia Research

Attention has focused on home visitation in West Virginia (Heasley 2007). In 2005, the West Virginia Legislature passed a resolution to study the need to expand In-Home Family Education. Partners in Community Outreach, a coalition of home visitation programs in the State (Healthy Families, American Maternal Infant Health Outreach workers and Parents As Teachers) was formed to promote the establishment of a statewide system of In-Home Family Education to provide high quality and voluntary home visiting services. According to the group's latest report, there were 17 counties with programs serving 737 families. Due to inadequate funding, 12 counties had lost programs between 2004 and 2007 (Partners in Community Outreach 2007).

The West Virginia DHHS produced a comprehensive report on their perinatal care provided under a variety of federal/state programs (Williams and Clark 2006). The report provided the following statistics:

- Family planning is a success story, saving \$3 in costs for newborns (primarily unwanted pregnancies) for every dollar spent. For this service the state ranked sixth in availability among the 50 states and DC.
- Early preventive prenatal care and education are offered by the West Virginia Perinatal Program and the Right from the Start Project (RFTS). These programs work through 76 community agencies which contract to provide care coordination and enhanced education. This is delivered by 165 Designated Care Coordinators (licensed social workers and registered nurses) who provide these services in-home. Transportation services are provided for those who have no means of transportation. Approximately 15,000 participants were served in 2006.

The report also listed challenges to prenatal care in West Virginia (Williams and Clark 2006):

- *Access to care.* There is a need to establish a “continuum of care” for patients, which would require consistent access to quality health providers and services. The report notes that first trimester care has improved from 60 to 86 percent in the past quarter century. But there are still gaps which need to be addressed.
- *Provider availability.* Gaps in the distribution of providers create geographic barriers to prenatal care. Most West Virginia counties are classified as “medically underserved,” which means there is a shortage of obstetricians, nurse practitioners, nurse midwives and family practice physicians.
- *Financial constraints.* West Virginia has experienced numerous funding cuts in reimbursement rates for service provision. The RFTS provider network has not increased reimbursement rates for Medicaid patients since 2003. Since the costs of providing prenatal care have dramatically increased, many providers have opted to discontinue prenatal services.
- *Smoking during pregnancy.* With the highest rate of pregnant women smoking in the nation, most efforts at public education have not produced results. While nationwide the number of smoking pregnant women has dropped almost 40 percent, the decline in the last 10 years in West Virginia is only 6 percent. In-home visitation has proven to be somewhat more successful.

- *Utilization of prenatal care.* From the data in the state's Pregnancy Risk Assessment Monitoring System (PRAMS) the following reasons were found as to why women did not seek prenatal care, listed in order of importance:
 - Inability to travel to an appointment
 - Lack of money or insurance
 - Not knowing they were pregnant
 - Lack of transportation
 - Lack of child care
 - Too much going on

While there has been a large amount of data collected, a cost-benefit analysis of these programs has not yet been performed to establish their comparative effectiveness or to determine the return on dollars spent.

In a report completed for Partners in Community Outreach, it was found that the In-Home Education program in West Virginia was conducted at an average cost of \$2,000 per family served. The program had increased protective factors known to prevent child maltreatment, built parenting knowledge and skills, reduced the incidence of LBW babies and increased the number of children who are fully immunized (Heasley 2007). The estimated cost for the problems identified to the State was estimated at \$250 million. It was hypothesized that the home visitation programs could reduce these costs by several times the expenses of extending the program to all at-risk West Virginia families.

Partners in Community Outreach has provided an outline of recommendations for a statewide home visitation system in West Virginia (Heasley 2007). The recommended program would work through existing programs which qualify. Those qualifications would in part include:

- Requiring home visitation (at least monthly), parent education and information referral as primary components
- Use of a research based model with evidence based curriculum
- Being credentialed by a national or multi-state organization
- Offering programs preferably starting prenatally until the child's third birthday
- Working as partners with other early childhood programs in the community
- Fulfilling the training requirements of the credentialing organization for all staff
- Developing programs in unserved areas based on need, capacity and community input
- Supporting statewide training, technical assistance, certification, contract management and quality initiatives.

West Virginia Right from the Start

Over the two decades since its formation, the West Virginia Right from the Start (RFTS) Program has been delivering services, providing health care for low-income mothers and infants at-risk of adverse health outcomes (West Virginia Right from the Start 2011). Formed in 1989, RFTS began delivering comprehensive in home care coordination to pregnant women. The program expanded in 2000 to include services to at-risk infants as well.

RFTS is a cooperative program between the West Virginia Department of Health and Human Resources (DHHR), Bureau of Public Health, Bureaus of Medical Services and the Office of Maternal, Child and Family Health (OMCFH). RFTS is authorized under West Virginia State Code §9-5-12 and receives funding from Medicaid Title XIX and Federal Maternal and Health Block Grants (Title V).

RFTS is a carefully crafted and highly interdependent partnership with tertiary care centers, primary care centers, local health departments, private practitioners and community agencies working with the West Virginia OMCFH for the past three decades (Brooks 2010). Its focus is the continuum of care model. Quality care provided during pregnancy and continued through birth and the first year of life is the most effective way to prevent problems, provide care and pay for the services (Williams and Clark 2006).

RFTS coordinates services provided to high risk, low income pregnant women through the second postpartum month and to Medicaid eligible high risk infants through age one. RFTS also helps women obtain medical coverage for both themselves and their infants and provides access to other enhanced services, such as parenting classes, transportation to medical appointments, smoking cessation programs and health and nutrition programs. RFTS operates under the *Right from the Start Project, Policy and Procedures Manual* (West Virginia Department of Health and Human Resources 2010). This partnership has:

- Expanded West Virginia's capacity to finance health care for targeted populations
- Strengthened the delivery of health care by:
 - Establishing protocols for care
 - Recruiting medical providers
 - Developing services like case management and nutrition counseling.

RFTS sees its successes as (West Virginia Department of Health and Human Resources 2010):

- Broadening medical coverage for target populations
- Streamlined medical eligibility for those seeking care
- Shared government funding for the targeted mothers and children
- Development of comprehensive programs.

A lead agency is contracted by RFTS to be the Regional Lead Agency. In each area, the Regional Care Coordinator (RCC), a Registered Nurse employed by the Regional Lead Agency, has the job of managing the Registered Nurses (RN), Licensed Social Workers (LSW) and Designated Care Coordinators (DCC). It is also the RCC's responsibility to recruit the care providers and agencies as well as to provide staff with training. The RCC refers the expectant mother or infant to the DCC who in turn prepares an individualized care plan.

As of 2010, RFTS works with 58 community agencies throughout the State (West Virginia Right from the Start 2011). For an agency to participate it must be either a:

- Local health department
- US Public Health Service health center
- Federally qualifying health or community service facility.

The locations of service providers in West Virginia, as well as the eight RFTS regions, are provided in Appendix A.

There are 188 Designated Care Coordinators (DCCs) in the State that provide access to early and adequate care for mothers and children both before and after birth (West Virginia Right from the Start 2011). The DCC must be certified in West Virginia either as a Registered Nurse or a Licensed Social Worker. There are also obstetricians, nurse practitioners, midwives and family practice physicians throughout West Virginia and surrounding states who have contractual agreements with RFTS to provide prenatal care services to eligible women and their children.

The core of the program is the execution of the plan developed during in-home visits. RFTS provides this description.

The purpose of the home visits is to assess education, social, nutritional and medical needs and to facilitate access to appropriate service providers. Coordination components include a personalized in-home assessment to identify barriers to health care, an individually designed care plan to meet client's needs, community referrals as necessary, follow up and monitoring (West Virginia Department of Health and Human Resources 2010).

The components of the individualized care plan may include:

- Assessment of health and safety barriers in the home which could cause injury to the infant
- Education and counseling programs for the mother including nutrition, substance abuse, smoking cessation, identification of problems during pregnancy, child birth, child care and parenting education
- Identification of and links to community resources for referrals for both mother and infant
- Obtaining health insurance
- Securing eligibility for private and public support programs
- Arranging transportation for the pregnant woman or child to access health care providers through the Access to Rural Transportation Project (ART).

Expectant mothers enter the program through referrals from a variety of sources including health care professionals, the WIC Program, Community Outreach Workers, social service agencies, friends, family and self-referral. In addition to these referral sources, infant referrals are received based on the results of scores from the Birth Score Office at West Virginia University. Birth Score uses the Birth Score Developmental Risk/Newborn Hearing Screen to identify at risk newborns.

Among the other instruments used in screening are the:

- Prenatal Risk Screening Instrument (PRSI)
- Alternate Entry Form
- Infant Birth Score Card
- Tobacco Screening Tests and Forms
- Infant Tracking Form
- Outcome Measures Form.

Under RFTS, prenatal care is divided into three levels based on the total minimum number of contacts received: intensive (eight), moderate (six) and minimal (five). After discharge from the hospital, the Manual requires a face-to-face meeting with the mother and child within two weeks of leaving the hospital (West Virginia Department of Health and Human Resources 2010).

Infants are to receive an in-home, face-to-face contact for initial assessment and development of the care plan by the DCC. During the next 11 months, six face-to-face visits are to occur. One final at home contact is to be made 30 days prior to the child's first birthday. At that time, the DCC is to refer the infant to the West Virginia Birth to Three Program if there is hearing loss, developmental delay or any condition known to lead to developmental delay (West Virginia Department of Health and Human Resources 2010).

In 2009 there were 3,382 prenatal women who met the criteria for RFTS who enrolled (West Virginia Right from the Start 2010). They received 8,587 home visits and 12,540 other contacts at doctors' offices, clinics and by phone for a total of 21,127 contacts for an average of 6.25 client contacts. A total of 3,499 infants met the criteria and were enrolled. In-home visits totaled 14,674 with 15,548 other contacts for a total of 30,222 contacts. Total contacts for both infants and mothers totaled 30,222 for an average of 8.64 client contacts. If including the 320 enhanced services, the total number of contacts made in 2009 were 51,349.

Program Case Studies

Nurse-Family Partnership

The Nurse-Family Partnership (NFP) is an evidence-based home visitation program that provides ongoing home visits from registered nurses to low-income, first-time mothers. These relationship-based visits provide eligible mothers with support until the child is age two. The NFP partners first-time mothers with registered nurses to achieve the following goals (Nurse-Family Partnership 2010):

- Improve pregnancy outcomes by encouraging preventive health practices, including participating in prenatal care, improving their diet and reducing the use of alcohol, cigarettes and illegal substances
- Improve child health and development by assisting parents in providing responsible and competent care

- Improve the economic self-sufficiency of the family by planning future pregnancies, continuing their education, finding employment and making a plan for their future.

The NFP was created on the work and research of Olds, who realized the benefits of early intervention for low-income children while working in an inner-city daycare. Olds conducted extensive research of a nurse home visitation program with three different populations in Elmira, NY, in 1977, in Memphis, TN, in 1988 and in Denver, CO, in 1994. His research illustrated favorable results including improved pregnancy outcomes, improvements in the health and development of the children and increased economic self-sufficiency (Nurse-Family Partnership 2010).

In 1996, Olds implemented his program in two locations: Dayton, OH, and various counties throughout Wyoming. Later in 1996, the US Department of Justice and the Office of Juvenile Justice and Delinquency Prevention funded six additional locations for the programs including Los Angeles, Fresno, and Oakland, CA, Clearwater, FL, St. Louis, MO, and Oklahoma City, OK (Nurse-Family Partnership 2010).

Since 1996, 118,454 families have been served by the NFP program, and currently 21,494 families are enrolled in the NFP. The NFP is serving clients in 32 states and 385 counties with 1,207 nurse home visitors on staff (Nurse-Family Partnership 2010). Typically, the NFP costs \$4,500 per family per year with a range throughout the country of \$2,914 to \$6,463 per family per year (Nurse-Family Partnership 2010). The NFP is funded by a range of both public and private funding sources. The funding sources of NFP include Medicaid, Maternal and Child Health Services Block Grant (Title V), juvenile justice funds, Child Care Development, Social Services Block Grants, Temporary Assistance for Needy Families and the Federal Maternal, Infant and Early Childhood Home Visiting Program in addition to state and local funds (Nurse-Family Partnership 2010).

As mentioned previously, the NFP focuses on first-time mothers in an effort to teach and promote positive development and health behaviors between baby and mother. Early intervention, typically during the first trimester of pregnancy, allows the registered nurses to address any critical behavior changes to improve the health of both mother and child. Nurse home visitors are provided with intensive education which allows them to provide families with clinical consultation and intervention resources that can be adapted to each family's needs. NFP also utilizes a web-based performance management system to collect and report NFP family characteristics, needs, services provided and progress towards accomplishing program goals (Nurse-Family Partnership 2011).

NFP has conducted more than 30 years of randomized, controlled trials. The research and trials were designed to study the effects of the NFP model on child development and maternal and child health. The trials compared the short-term and long-term outcomes of mothers and children enrolled in the NFP to those of a control group of mother and children who were not enrolled in the program. In the first trial study in 1977, 400 low-income white participants in semi-rural areas were studied in Elmira, NY. In 1988, 1,139 low-income blacks in urban areas of Memphis, TN, were studied, and in 1994, 735 Hispanics in Denver, CO, were studied. Fourteen follow-up studies have been conducted since 1979 to track the participants' outcomes

across the three trials. The longitudinal studies allow NFP to measure and evaluate both short-term and long-term goals (Nurse-Family Partnership 2010).

The trials and research have collected a variety of outcomes include improved pregnancy outcomes, improved child health and development, and increased economic self-sufficiency. Some of the specific outcomes collected from the research include (Nurse-Family Partnership 2011, Nurse-Family Partnership 2010):

- 79 percent reduction in preterm delivery for women who smoke and reductions in high-risk pregnancies as a result of greater spacing between first and subsequent births
- 48 percent reduction in child abuse and neglect
- 50 percent reduction in language delays of child age 21 months
- 59 percent reduction in arrests in child at age 15
- 32 percent fewer subsequent unintended subsequent pregnancies
- 20 percent reduction in months on welfare
- 83 percent increase in labor force participation by the mother by the child's fourth birthday
- 67 percent reduction in behavioral and intellectual problems at child age six
- 56 percent reduction in emergency rooms visits for accidents and poisonings
- 72 fewer convictions of mothers at child age 15.

Healthy Families America

Healthy Families America (HFA) is an evidence-base home visitation program which provides services for families who are at-risk for child abuse and neglect and other negative childhood experiences. The services of HFA are provided to families who have past experiences with trauma, partner violence, mental health or substance abuse. Local HFA programs select the population they plan to target, which could include families who are affected by low income, substance abuse or domestic violence (PCA America 2011).

Weekly home visits are provided beginning while the mother is pregnant and continue through the first five years after the child is born. HFA provides screenings and assessments for the enrolled participants, and HFA also may include other services such as parent support groups, father involvement programs, and job training (US Department of Health and Human Services 2011). The goals of the HFA program include (PCA America 2011):

- Systematically reaching out to parents to offer resources and support
- Cultivating the growth of nurturing, responsive parent-child relationships
- Promoting healthy childhood growth and development
- Building the foundations for strong family functioning.

HFA programs are located in 35 states in over 430 communities and serve more than 47,500 families. Families who are enrolled in HFA are served by highly qualified staff that has direct service experience and strong communication skills. The staff of HFA programs consists of

Family Assessment Workers (FAWs) and Family Support Workers (FSWs). FAWs may conduct initial screenings of potential participants and conduct assessments. FSWs provide the actual home visiting services. Based on a survey from 2003, HFA programs employed nearly 2,000 FSWs with 76 percent of the FSWs being college graduates or having attended some college (PCA America 2011). The staff of HFA provides specific services to enrolled families including (PCA America 2011):

- Ensuring that families have a medical provider
- Assisting families in identifying the child's needs and obtaining needed resources
- Supporting families and their children in their own home
- Sharing ideas for caring for babies, toddlers and young children
- Providing families with resources in the community including job placement assistance, day care providers and other needed resources
- Assisting families with recommended immunization schedules
- Providing information pertaining to the child's developmental process.

HFA was launched in 1982 by Prevent Child Abuse America in partnership with the Ronald McDonald House Charities. The program is funded by a variety of federal, state, local, and private funding sources. At both the state and local level, Title IVB Family Preservation and Temporary Assistance to Needy Families comprised 70 percent of federal dollars being spent to fund and support HFA. Other federal funding sources include Title V, Early Head Start, Child Abuse Prevention and Treatment Act, Part C-Early Intervention, Medicaid and the Office of Juvenile Justice and Delinquency Prevention (PCA America 2002). State funding sources include general revenue funds, TANF Maintenance of Effort, Department of Human Services, Department of Education and other state sources (PCA America 2002). The average cost per family to receive HFA services is \$3,348 with a range of \$1,950 to \$5,768 per family per year (US Department of Health and Human Services 2011).

By partnering with other organizations, HFA is able to more effectively utilize resources, provide a comprehensive spectrum of services to families, and avoid duplication of services. HFA partners with organizations such as Prevent Child Abuse America, the American Academy of Pediatrics, the National Association of Children's Hospitals and Related Institutions, the National Head Start Association and the Cooperative Extension Service of the US Department of Agriculture.

HFA focuses on three critical elements, including service initiation, service content and staff characteristics, to implement successful home visitation programs. These basic elements are used for HFA because they allow flexibility for implementation and opportunities for innovation. The descriptions of the three critical elements are below (Prevent Child Abuse America n.d.):

- Service initiation:
 - Initiate services prenatally or at birth
 - Use a standardized assessment tool to systematically identify families who are in the greatest need of services
 - Use positive outreach efforts to build family trust and offer services voluntarily.

- Service content:
 - Offer services to families for long term time periods (three to five years)
 - Materials should reflect the diversity of the population served
 - Services should be comprehensive to focus on both supporting the parents as well as the parent-child interaction and child development
 - Families should be linked to a medical provider and/or additional services
 - Staff members should have limited caseloads.
- Staff characteristics:
 - Service providers are selected on their ability to establish a trusting relationship
 - Service providers must receive training in such areas as cultural competency, substance abuse, reporting child abuse, domestic violence, drug-exposed infants and services in the community
 - Service providers should receive training specific to their role to better understand the components of family assessment and home visitation.

By focusing on the three critical elements for successful home visitation, providing an experienced staff and meeting with families, early HFA has been recognized as a successful home visitation program. HFA has been successful in creating positive outcomes in the areas of reducing child maltreatment, ensuring healthy child development, encouraging school readiness, promoting family self-sufficiency and demonstrating positive parenting (PCA America 2011).

HFA has also created specific program successes for children and families. In 1997, the statewide immunization rate for two-year-olds in Oregon was 73 percent while the immunization rate for children in the HFA program was 97 percent. Those participating in the program in Florida during the same year also experienced the benefits of HFA program. One hundred percent of the two-year-olds and 70 percent of the 16 to 23 month-olds were fully immunized and current with well-baby checkups. Ninety-four percent of mothers who were a part of the HFA program in Oregon received early and comprehensive prenatal care for their second pregnancies compared with 61 percent during their first pregnancies. In Virginia, 95 percent of participating parents noted that HFA improved their parenting (Ericson 2001).

Early Head Start

Early Head Start (EHS) is a federally-funded, community-based program for low-income pregnant women and families with infants and toddlers. EHS aims to promote healthy prenatal outcomes for pregnant women, enhance the development of very young children, and promote healthy family functioning (Zero to Three n.d.). EHS program model focuses on providing “high quality, flexible and culturally competent child development and parent support services with an emphasis on the role of the parent as the child’s first, and most important, relationship” (US Department of Health and Human Services 2011). EHS services include weekly 90-minute home visits and two group socialization activities per month for parents and their children (US Department of Health and Human Services 2011). EHS programs are based on a foundation of nine principles (Zero to Three n.d.):

- *High quality.* Programs will develop policies and practices that are based on the knowledge, professional ethics, and skills utilized by the fields of child development, community building and family development.
- *Prevention and promotion.* Programs will promote healthy child development before conceptions and promote that it continues upon birth and through the early years of the child's life.
- *Positive relationship and continuity.* Develop strong relationships that include the child, family and staff and develop a strong parent-child bond.
- *Parent involvement.* EHS programs encourage a high level of parent involvement.
- *Inclusion.* EHS programs will include children with disabilities and evaluate the individual needs of the child.
- *Culture.* The programs will also support the culture and language of each participating family, especially in relation to child and family development and community values and attitudes.
- *Comprehensiveness, flexibility, responsiveness and intensity.* Programs must also be aware that families can set their own goals, identify needs, and are capable of growth, therefore, the programs must be flexible to adapt to each family.
- *Transitions.* EHS programs must also facilitate a transition from EHS to Head Start programs or other programs.
- *Collaboration.* By collaborating with community agencies and resources, service providers will maximize the resources available to families with young children in a comprehensive manner.

EHS was established in 1994 when the Head Start Authorization Act of 1994 mandated new Head Start services. EHS services for families include early education both in and out of the home, parenting education, comprehensive health and mental health services, nutrition education and family support services.

EHS programs are provided to low-income families and each EHS program determines its own eligibility criteria. As of 2006, there were 708 community-based EHS programs serving 61,500 children (Administration for Children and Families 2006). Educational, health, nutritional and social services are provided to children and families by knowledgeable and experienced home visitors. Home visitors must have experience and knowledge of child development and early childhood education, principles of child health, safety and nutrition, adult learning principles and family dynamics (US Department of Health and Human Services 2011). Home visitors must also possess effective communication skills and knowledge of community resources (US Department of Health and Human Services 2004).

EHS does provide favorable outcomes for both the families and children enrolled. EHS participants are more likely to breastfeed than those mothers not enrolled in EHS. Forty-four percent of EHS participating mothers chose to breastfeed their children compared to just 33 percent of mothers who did not participate. Other significant benefits of EHS include better vocabulary, improved cognitive and social-emotional development for children and improved

parenting. Children who participate in EHS were studied and compared to children in a control group. The EHS children were found to exhibit lower levels of aggressive behavior, higher levels of sustained attention with objects in a play situation, a greater degree of engagement with their parents and less negativity toward their parents (Child Trends 2010).

Research has also illustrated that there are lasting positive effects from participation in the EHS programs. It was found that preschool-aged children who had participated in EHS had lower levels of aggressive behavior and high attention levels two years after leaving the EHS program than those who did not participate in the program. Those EHS participating parents also displayed multiple positive parenting techniques including (Child Trends 2010):

- Providing greater warmth and supportiveness toward their child
- Spending more time playing with their child
- Providing more educationally stimulating home environments
- Providing more support for language and learning
- Being more likely to read daily to their child
- Being less likely to spank their child.

Parents as Teachers

Parents as Teachers (PAT) assists organizations and professionals to work with parents during the early stages of children's lives, from pregnancy to kindergarten. The goals of PAT include increasing parent knowledge of early childhood development and improving parenting practices, providing early detection of development delays and health issues, preventing child abuse and neglect and increasing children's school readiness and school success (Parents as Teachers National Center, Inc. 2009). PAT is a program where parent educators (PAT home visitors) provide parents with support, encouragement and information to enhance their child's development during the early years. All PAT programs must provide the following (US Department of Health and Human Services 2011):

- One-on-one home visits
- Group meetings
- Development screenings for children
- Resource network for families.

PAT was developed in the 1970s when Missouri educators noted that those children beginning kindergarten exhibited different levels of school readiness. Professionals in the area of early childhood education suggested a program to provide detection of developmental delays and parent education to improve school readiness. PAT began 1981 in Missouri with funding from the Missouri Department of Elementary and Secondary Education and the Danforth Foundation. PAT began as a pilot project for first-time parents of newborns, and the Missouri legislature provided state funding in 1985 to implement PAT programs in all Missouri school districts. PAT has now expanded to all 50 states and seven other countries (Parents as Teachers National Center, Inc 2010).

According to the 2008-2009 PAT annual report, PAT serves over 267,000 families and 342,000 children. Over 227,000 children received health and developmental screenings and 15 percent of those screened (34,851) were identified with possible health/developmental problems. Sixty-four percent of those were then referred to receive follow up services. Also during this program year, 130,849 families were connected to at least one community resource. The services of PAT are highly sought after. Thirty-four percent of PAT programs have a waiting list with 21,666 families waiting to enroll for PAT services (Parents as Teachers National Center, Inc. 2009).

PAT is funded by individual contributions, contracts and federal grants. The average cost of a PAT family per year is between \$1,400 and \$1,500 (US Department of Health and Human Services 2011). PAT has two primary staff positions to implement its program. PAT hires parent educators who provide home visiting services and supervisors who supervise the parent educators. While the parent educators are not required to have specific education or background, specific training provides the necessary knowledge for the position (US Department of Health and Human Services 2011).

PAT is an evidence-based home visitation program with 45 percent of PAT programs reporting that they have participated in a formal evaluation or research study on child and family outcomes (Parents as Teachers National Center, Inc. 2009). Research has been conducted over the years to demonstrate the outcomes of PAT programs. Results of a multi-state randomized trial illustrated that families with very low income who participated in PAT were more likely to read aloud to their child, tell stories, say nursery rhymes, and sing with their child (Wagner and Spiker 2001). Sixty-three percent of parents of PAT children requested parent-teacher conferences in comparison to 37 percent of parents not in the program (Pfannenstiel 1999). At age three, PAT children were much more likely to be fully immunized compared to their peers and were less likely to be treated for injury in the previous year (Wagner, Iida and Spiker 2001).

PAT also has documented cases of reduced child abuse and neglect from those participating in the program. One study conducted in 1991 determined the impact of PAT on 400 randomly selected families in 37 diverse school districts across Missouri. Among those 400 diverse families, there were only two document cases of abuse and neglect which was significantly lower than the state average (Pfannenstiel, Lambson and Yarnell 1991).

Every Child Succeeds

Every Child Succeeds (ECS) implement two national home visitation models: Healthy Families America with 13 provider sites and the Nurse-Family Partnership with one provider site throughout Southwest Ohio and Northern Kentucky. In 2010, ECS served 3,169 families by providing families with parenting skills, education, safety, and medical and nutritional information (Every Child Succeeds 2010). From those families served by ECS, 94 percent of parents are unmarried, and 95 percent of ECS parents are within the low income bracket. A portion of these parents, 34 percent, also have inadequate prenatal care, and 24 percent of the parents are younger than 18 (Every Child Succeeds 2010).

ECS has provided more than 345,000 home visits and served more than 17,000 families since its beginning. At any one time, ECS is providing home visits to more than 2,000 families. Each month approximately 160 referrals are made to ECS, and 2,900 home visits are provided. Home

visits are provided two to four times a month by a professional home visitor who provides a number of services including (Every Child Succeeds 2010):

- Information pertaining to prenatal care
- Parenting support and guidance
- Stimulating activities for baby
- Tracking baby's development
- Health and nutrition education
- Assessment of the home environment to ensure its safety
- Goal setting for parents to achieve self sufficiency
- Referrals to needed resources
- Providing a parent-aid bag, which supplies books for the child, developmental toys and safety items.

ECS was founded by three organizations including Cincinnati Children's Hospital Medical Center, United Way of Greater Cincinnati and Cincinnati-Hamilton County Community Action Agency/Head Start. ECS is funded through a variety of sources. Ohio Help Me Grow and Kentucky HANDS provide approximately 60 percent of the funding for ECS. In Ohio, other funding sources include Temporary Assistance to Needy Families, Part C and General Revenue Funds. In Kentucky, funding sources include Medicaid and Tobacco Settlement dollars (Cincinnati Children's Hospital Medical Center 2011).

ECS also provides four additional enhancements to the home visitation program. The first additional resource is the Maternal Depression Treatment Program which provides in-home cognitive behavior therapy to clinically depressed mothers who are enrolled in ECS. ECS also provides the Medical Home Initiative which improves access to health care for ECS families by improving communication among home visitors, families and pediatric practices. Also provided by ECS is the Literacy Program which over the next three years will provide children from birth to three-years-old with literacy materials. The final enhancement to the program is the Avondale Community Partnership which is in place to increase enrollment in the high-risk community of Avondale in Cincinnati, Ohio (Every Child Succeeds 2010).

As with the other mentioned programs, ECS has also created favorable outcomes for families and children. More than 90 percent of children in ECS are on-track developmentally. Sixty-seven percent of two-year-olds enrolled in ECS are up-to-date with immunizations, and 66 percent of mothers initiated breastfeeding. ECS mothers also have reduced or quit smoking (18 percent), and 57 percent of mothers with depression have improved (Every Child Succeeds 2010). Other outcomes measured in 2009 include (Every Child Succeeds 2009):

- 100 percent of children have a medical home
- 94 percent have a safe play environment
- 96 percent of parents are responsive to their child's learning and emotional needs
- 97 percent of homes are structured to stimulate learning
- 95 percent of parents are actively involved in their child's learning

- 99 percent of mothers enrolled prenatally in ECS reported receiving at least 4 prenatal doctor visits
- 63 percent of mothers complete their postpartum visits.

Programs Summary

The five programs highlighted in this study are the Nurse-Family Partnership (NFP), Healthy Families America (HFA), Early Head Start (EHS), Parents as Teachers (PAT) and Every Child Succeeds (ECS). While the programs vary in method, each-evidence based program focuses on early intervention to create the most favorable outcomes for both parent and child.

The NFP provides continuing home visits from registered nurses to low-income, first-time mothers until the child is age two. This evidence based program has illustrated favorable results including improved pregnancy outcomes, improved child health and development and increased economic self-sufficiency of the parents. HFA provides home visiting services for families who are at risk of child abuse and neglect. Local HFA organizations perform weekly home visits which begin while the mother is pregnant and continue until the child is age five. HFA has created results for families, such as increased immunizations, increased well-baby checkups and increased prenatal care.

EHS performs a similar service as the other programs by providing home visitation services for low-income, pregnant women. The services of EHS include weekly 90-minute home visits and two group socialization activities per month for parents and children. Positive outcomes of the EHS program include increased breastfeeding rates, improved vocabulary and cognitive development in children, and lower levels of aggressive behavior in children. PAT not only provides home visiting services, but also group meetings and development screenings for children. Evidence based outcomes of PAT include increased immunization rates and reduced child abuse and neglect. Parents participating in the PAT program are more likely to read aloud to their children, tell stories and sing with their child. ECS implements two home visitation models, HFA and NFP. Evidence based research has also found that ECS has been successful in improving the lives of families with increased immunizations, increased breastfeeding rates and increased prenatal visits.

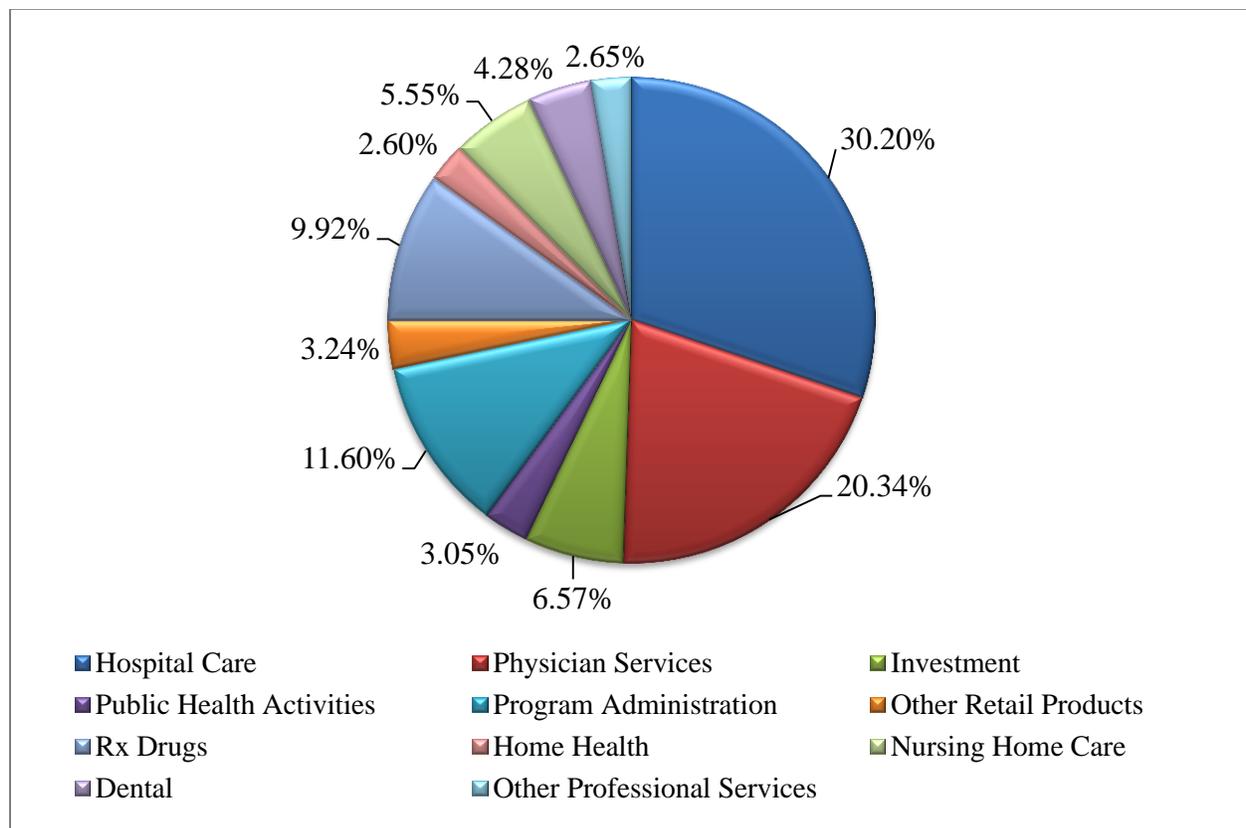
Cost Savings Associated with RFTS

Previous analyses provide several methods of determining the cost savings of RFTS. This section provides an application of those methods to the WV RFTS program. Insufficient data exists to make an absolute determination for the program in this State, but the applications from other studies are not unreasonable. The results indicate that no matter what method is used the RFTS program results in economic benefits to the State.

National Data

In 2008, the national hospital bill totaled nearly \$1.2 trillion for 39.9 million hospital stays. Five conditions accounted for 20 percent of that total: mother's pregnancy and delivery, blood infection, coronary artery disease, newborn infants and osteoarthritis. Sixty percent of the national bill for hospital care was billed to two government payers, Medicare (\$534 billion) and Medicaid (\$159 billion), while slightly less than one-third (\$373 billion) was billed to private insurance and about 4 percent (\$48 billion) was billed to the uninsured. (Weir and Andrews 2011) Hospital care comprised 31 percent of total health care spending in the United States in 2008. (Kimbuende, et al. 2010) Of hospital stays billed to Medicaid, the most expensive conditions were related to mother's pregnancy and delivery (\$22 billion) and care of newborn infants (\$19 billion). Figure 1 shows a breakdown of national health expenditures by category.

Figure 1 National Healthcare Expenditures by Category, 2008



Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group.

The growth rate of health care spending decelerated in 2009, increasing 4.0 percent compared to 4.7 percent in 2008. However, total health expenditures exceeded \$2.5 trillion, which converts to \$8,086 per person or 17.6 percent of the nation's Gross Domestic Product, up from 16.6 percent in 2008. (Center for Medicare and Medicaid Services)

Cost Savings Related to Right From The Start

Cost savings attributable to the Right From the Start (RFTS) program are not easily defined due to the nature of services provided and other potential impacts on birth outcomes. To determine potential cost savings CBER examined many areas in which RFTS services are targeted. The first of these is direct hospital costs for high risk outcomes compared to a “normal” delivery for mother and child. These costs are mean values only for hospital costs by payer for West Virginia births in 2008. These should be considered conservative as they do *not* include physician charges or anesthesia.

Using data from the U.S. Department of Health & Human Services Agency for Healthcare Research and Quality (AHRQ) Healthcare Cost and Utilization Project (HCUP) for birth outcomes in West Virginia in 2008 significant differences in hospital costs occur for “high-risk” deliveries. Both mother and infant hospital costs are significantly higher when complications arise.

Data was retrieved from the AHRQ HCUP database for specific outcomes by patient and hospital characteristics for childbirth and newborn related treatment. Comparisons were conducted between related Diagnoses Related Groups (DRGs)² for mothers and newborns including:

- Vaginal deliveries without complicating diagnoses
- Vaginal deliveries with complicating diagnoses
- Cesarean section deliveries without complicating diagnoses and comorbidities
- Cesarean section deliveries with complicating diagnoses and comorbidities
- Other antepartum diagnoses without medical complications
- Other antepartum diagnoses with medical complications
- Normal newborn
- Neonate with other significant problems
- Full term neonate with major problems
- Prematurity without major problems
- Prematurity with major problems

² Diagnosis Related Groups (DRGs) comprise a patient classification system that categorizes patients into groups that are clinically coherent and homogeneous with respect to resource use. DRGs group patients according to diagnosis, type of treatment (procedures), age, and other relevant criteria. Each hospital stay has one DRG and one Major Diagnoses Category (MDC) assigned to it. www.hcupnet.ahrq.gov

- Extreme immaturity or respiratory distress syndrome of neonate
- Neonates, Died or Transferred to Another Acute Care Facility

The following tables show hospital charges³ and related costs⁴ by payer for individual DRGs for WV births in 2008. The numbers in HCUPnet are based on the hospital discharge (i.e., the hospital stay), not a person or patient. This means that a person who is discharged from the hospital multiple times in one year will be counted each time as a separate "discharge" from the hospital.

Table 1 indicates the mean hospital cost for a vaginal delivery without complicating diagnoses was \$2,636 with a mean length of stay of 2.4 days compared to that of a vaginal delivery with complicating diagnoses which had a mean hospital cost of \$3,455 and an increased length of stay of 3.1 days. Complicating diagnoses, shown in Table 2, resulted in an average 29.17 percent increased length of stay and 33.91 percent increase in hospital costs.

Table 1 Vaginal Deliveries Without Complicating Diagnoses

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	73	0.66%	2.3	5,723	2,620
	Medicaid	5,175	46.67%	2.4	5,465	2,636
	Private insurance	4,815	43.42%	2.2	5,178	2,537
	Uninsured	171	1.54%	2.1	5,023	2,564
	Other	809	7.30%	2.2	4,978	2,049
	Missing	46	0.41%	2.1	5,009	2,508
All Discharges		11,089	100%	2.3	5,298	2,549

Table 2 Vaginal Deliveries With Complicating Diagnoses

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	11	0.70%	4.3	10,914	4,985
	Medicaid	751	47.71%	3.1	7,263	3,455
	Private insurance	654	41.55%	2.9	7,336	3,508
	Uninsured	26	1.65%	2.2	5,982	3,249
	Other	125	7.94%	2.8	6,356	2,615
	Missing	*	*	*	*	*
All Discharges		1,574	100%	3.0	7,215	3,413

³Total charges. The amount the hospital charged for the entire hospital stay. It does not include fees that individual physicians charge. The number is the mean, or average, charge for the stay. For the calculation of charges, if length of stay was over 365 days or total charges were over \$5 million, the record was dropped from the NIS and if length of stay was missing, total charges were set to missing. www.hcupnet.ahrq.gov

⁴Total charges were converted to costs using cost-to-charge ratios based on hospital accounting reports from the Centers for Medicare and Medicaid Services (CMS).

Table 3 indicates the mean hospital cost for a cesarean delivery without complicating diagnoses was \$3,816 with a mean length of stay of 2.8 days for Medicaid patients compared to that of a cesarean delivery with complicating diagnoses (Table 4) which had a mean hospital cost of \$5,053 and an increased length of stay of 4.8 days. Complicating diagnoses for cesarean deliveries resulted in an average 71.42 percent increased length of stay and 32.41 percent increase in hospital costs.

Table 3 Cesarean Section Deliveries without Complicating Diagnoses

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	42	0.87%	2.9	8,702	4,140
	Medicaid	2,100	43.32%	2.8	7,872	3,816
	Private insurance	2,306	47.57%	2.8	7,922	3,835
	Uninsured	59	1.22%	2.6	7,206	3,756
	Other	322	6.64%	2.8	9,476	3,616
	Missing	19	0.39%	2.4	7,466	3,735
All Discharges		4,848	100%	2.8	8,000	3,813

Table 4 Cesarean Section Deliveries with Complicating Diagnoses

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	34	1.36%	5.7	15,432	7,025
	Medicaid	1,197	47.82%	4.1	10,730	5,053
	Private insurance	1,088	43.47%	3.9	10,853	5,126
	Uninsured	27	1.08%	4.4	11,056	5,401
	Other	144	5.75%	3.2	10,803	4,576
	Missing	13	0.52%	2.8	8,515	4,175
All Discharges		2,503	100.00%	4.0	10,843	5,083

Table 5 shows the mean hospital cost for an antepartum diagnoses without complications of \$2,232 with a mean length of stay of 2.5 days for Medicaid patients compared to that of an antepartum diagnoses with complications (Table 6) which had a mean hospital cost of \$3,273 and an increased length of stay of 3.4 days. These complications resulted in an average 36 percent increased length of stay and 46.63 percent increase in hospital costs.

Table 5 Other Antepartum Diagnoses without Medical Complications

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	n/a	n/a	n/a	n/a	n/a
	Medicaid	159	50.80%	2.5	4,821	2,232
	Private insurance	134	42.81%	2.4	4,707	2,154
	Uninsured	*	*	*	*	*
	Other	12	3.83%	1.3	3,228	1,379
	Missing	*	*	*	*	*
All Discharges		313	100.00%	2.4	4,704	2,163

For consistency purposes Medicare has been left in the payer category and values designated as n/a when no patient records were relevant to this DRG. Values based on 10 or fewer discharges or fewer than 2 hospitals in the State statistics (SID) are suppressed to protect confidentiality of patients and are designated with an asterisk (*).

Table 6 Other Antepartum Diagnoses with Medical Complications

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	36	2.35%	3.5	7,406	3,420
	Medicaid	869	56.76%	3.4	7,101	3,273
	Private insurance	495	32.33%	2.4	5,104	2,411
	Uninsured	40	2.61%	2.3	5,599	3,029
	Other	79	5.16%	2.7	5,849	2,320
	Missing	12	0.78%	3.8	12,031	5,651
All Discharges		1,531	100.00%	3.0	6,397	2,961

Complications during the delivery of a child can be life threatening for the mother and newborn and extremely expensive. Hospital charges alone from the six maternal DRGs examined show significant increases as seen in Figure 2. Research shows that many of these can be prevented with proper prenatal care, adjustments in risky behaviors of the mothers and improvements in the mother's environment. All of these are goals of the RFTS program.

Figure 2 Average Cost Comparisons by Procedure for Mothers, 2008

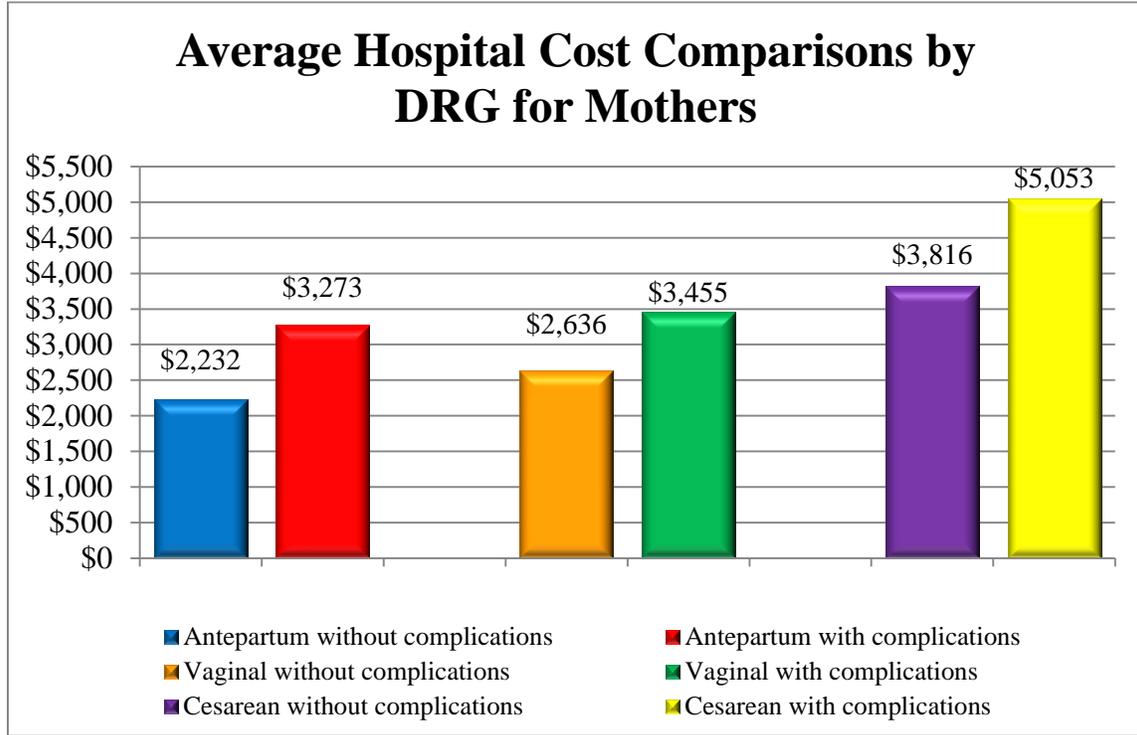
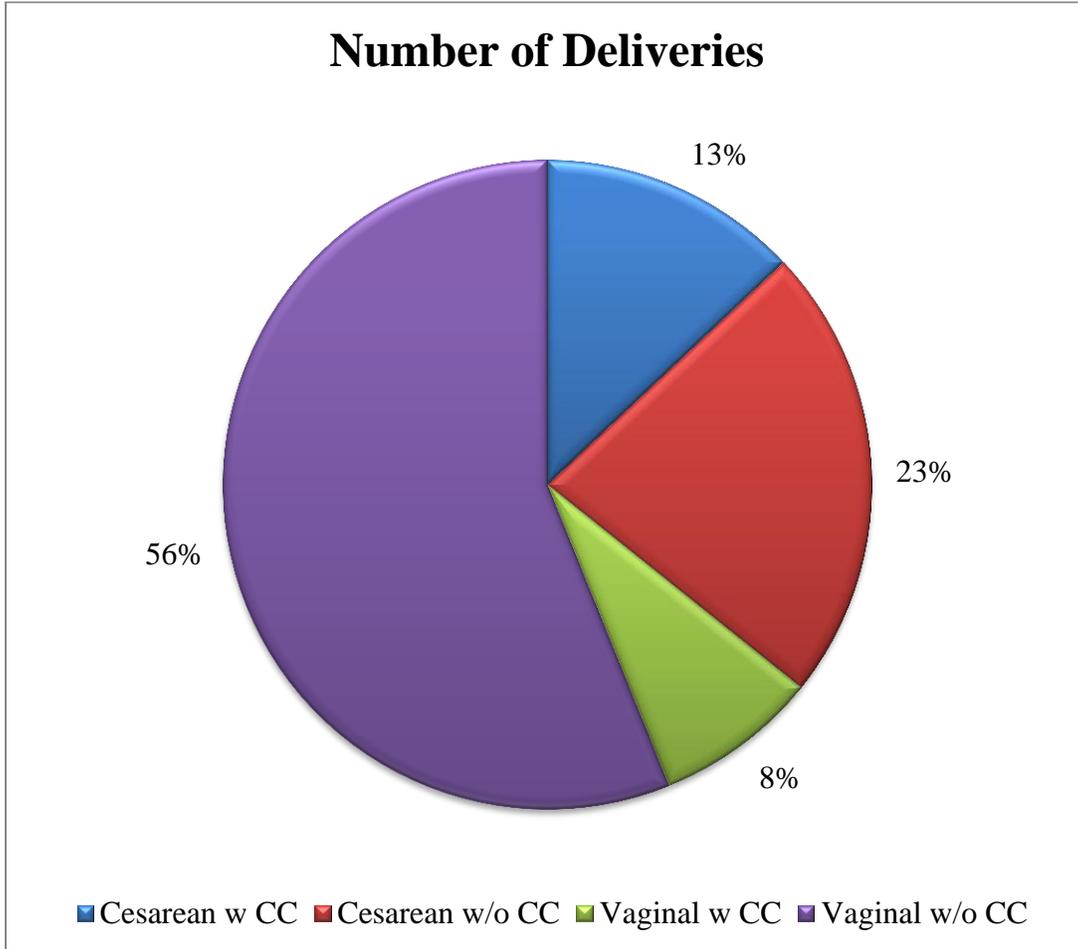


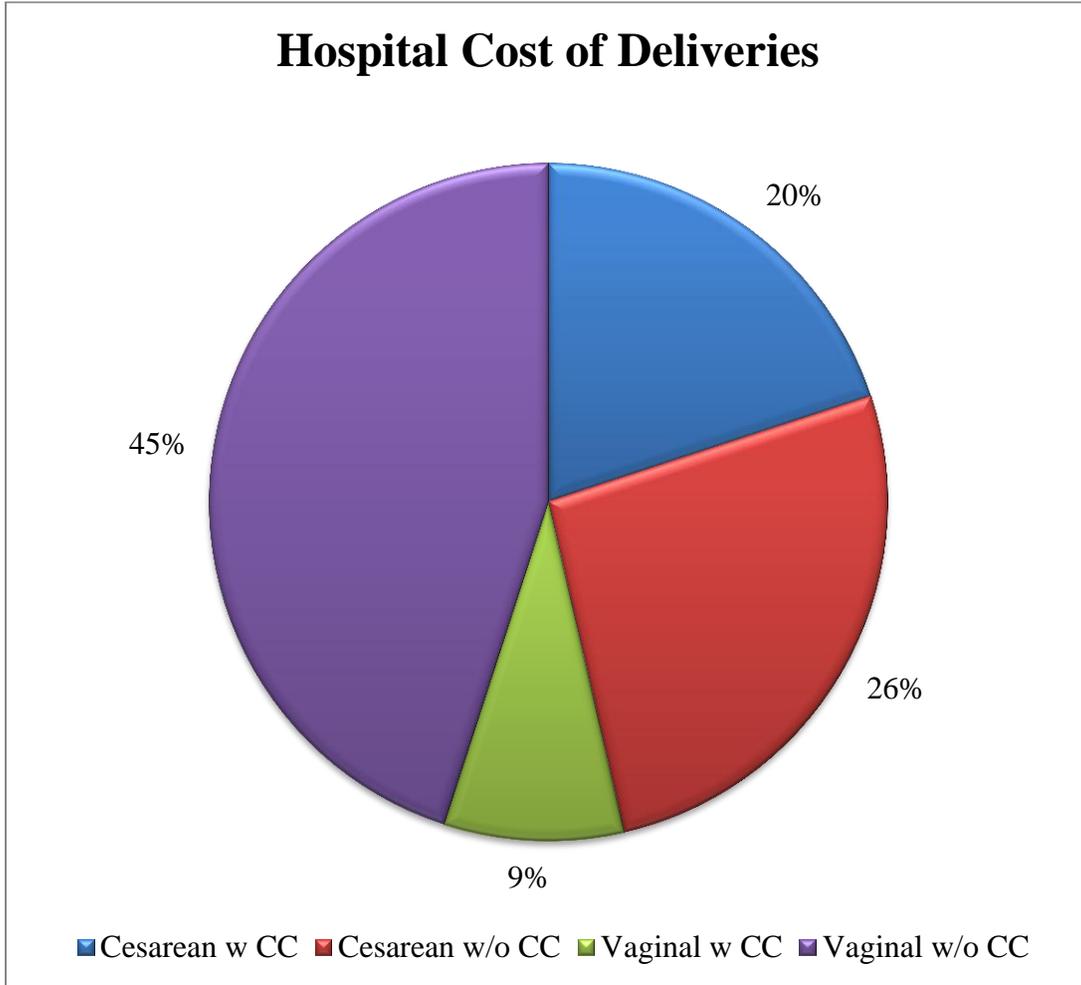
Figure 2 represented the average hospital cost by DRG code per discharge in 2008. While distinct differences are shown in the individual cost comparisons, the effect on total hospital costs for the state is better represented in Figures 3 and 4. Figure 3 relates the number of each type of delivery to the overall number of Medicaid deliveries in the state in 2008. Of the four major DRGs, a “normal” vaginal delivery without complications comprises the highest number of deliveries in the state at 56 percent. Cesarean deliveries without complications or comorbidities, Cesarean deliveries with complications or comorbidities, and vaginal deliveries with complications follow at 23 percent, 13 percent and 8 percent respectively.

Figure 3 Percentage of Deliveries by Major DRG, 2008



Perhaps the most expressive aspect of the costs of any delivery with complications is shown in Figure 4. Figure 4 represents the portion of total hospital costs attributable to each of the four major DRGs. The relationship between the percentage of each delivery type to the total hospital costs for the four major DRGs is indicative of the phenomenal expense incurred with complicated deliveries. For example, a vaginal delivery without complications comprises 56 percent of the number of Medicaid deliveries in 2008 while representing only 45 percent of total hospital costs. Whereas the remaining, and most expensive procedures, account for 44 percent of the number of deliveries but account for 55 percent of total hospital costs in this category.

Figure 4 Percentage of Hospital Cost by Major DRG, 2008



Newborn Hospital Costs

Hospital costs for a “normal” newborn covered under Medicaid in 2008 averaged \$1,556 with an average hospital stay of 2.1 days. Varying degrees of complications result in extended hospital stays and total costs. Table 7 shows the distribution of births of normal newborn by payer in West Virginia in 2008. The majority of these births (47.07 percent) are covered by Medicaid, the target group for the Right From the Start program.

Varying degrees of complications associated with newborn hospital stays are shown in Tables 7 through 12. Delivery of a normal healthy newborn resulted in average hospital costs of only \$756 per child. These costs increase drastically as the degree of complications rise to a staggering average of \$40,718 for a newborn with either extreme prematurity or respiratory problems.

Table 7 Normal Newborn

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	*	*	*	*	*
	Medicaid	6,698	47.07%	2.1	1,556	756
	Private insurance	5,982	42.04%	2.1	1,421	699
	Uninsured	500	3.51%	2.0	1,422	738
	Other	984	6.92%	2.1	1,334	546
	Missing	59	0.41%	1.8	1,322	687
All Discharges		14,229	100.00%	2.1	1,479	717

Values based on 10 or fewer discharges or fewer than 2 hospitals in the State statistics (SID) are suppressed to protect confidentiality of patients and are designated with an asterisk (*).

“Significant Problems” for Diagnosis Related Group (DRG) Codes 794 (Neonate with Other Significant Problems) include principal or secondary diagnoses of newborns or neonates with medical problems not assigned to DRG Codes 789-793, 795 or 998 which relate to conditions originating in the perinatal period.⁵

Table 8 Neonate with Other Significant Problems

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	*	*	*	*	*
	Medicaid	1,508	46.86%	2.6	2,901	1,397
	Private insurance	1,277	39.68%	2.4	2,304	1,111
	Uninsured	142	4.41%	2.4	2,059	1,050
	Other	264	8.20%	2.2	1,613	622
	Missing	23	0.71%	2.3	2,507	1,228
All Discharges		3,218	100.00%	2.5	2,524	1,206

Values based on 10 or fewer discharges or fewer than 2 hospitals in the State statistics (SID) are suppressed to protect confidentiality of patients and are designated with an asterisk (*).

“Major problems” for (DRG) Codes 791 (Prematurity with Major Problems) and 793 (Full Term Neonates with Major Problems) include diagnoses such as fetal malnutrition, complications related to aspiration, hemorrhages, drug reactions, various bacterial or histoplasmic infections and organ damage either in the principal or secondary diagnoses.⁶

⁵ Medicare Severity Diagnosis Related Groups (MS-DRGs) Definitions Manual Version 25.0. Document number PBL-012.

⁶ Ibid. For a detailed discussion of “Major Problems” related to newborns and other neonates, please refer to MDC 15.

Table 9 Full Term Neonate with Major Problems

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	*	*	*	*	*
	Medicaid	620	57.14%	7.2	14,312	6,543
	Private insurance	345	31.80%	5.7	11,694	5,327
	Uninsured	35	3.23%	5.7	7,899	3,709
	Other	79	7.28%	5.1	6,892	2,907
	Missing	*	*	*	*	*
All Discharges		1,085	100.00%	6.5	12,711	5,790

Values based on 10 or fewer discharges or fewer than 2 hospitals in the State statistics (SID) are suppressed to protect confidentiality of patients and are designated with an asterisk (*).

Table 10 Prematurity without Major Problems

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	n/a	n/a	n/a	n/a	n/a
	Medicaid	520	49.90%	5.5	8,809	4,003
	Private insurance	410	39.35%	4.9	8,182	3,722
	Uninsured	48	4.61%	3.6	6,022	2,838
	Other	58	5.57%	3.8	3,471	1,467
	Missing	*	*	*	*	*
All Discharges		1,042	100.00%	5.1	8,148	3,703

For consistency purposes Medicare has been left in the payer category and values designated as n/a when no patient records where relevant to this DRG. Values based on 10 or fewer discharges or fewer than 2 hospitals in the State statistics (SID) are suppressed to protect confidentiality of patients and are designated with an asterisk (*).

Table 11 Prematurity with Major Problems

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	*	*	*	*	*
	Medicaid	279	63.27%	15.1	38,774	17,391
	Private insurance	137	31.07%	10.9	26,264	11,859
	Uninsured	*	*	*	*	*
	Other	12	2.72%	12.3	26,154	11,400
	Missing	*	*	*	*	*
All Discharges		441	100.00%	13.5	34,068	15,304

Values based on 10 or fewer discharges or fewer than 2 hospitals in the State statistics (SID) are suppressed to protect confidentiality of patients and are designated with an asterisk (*).

Table 12 Extreme Immaturity or Respiratory Distress Syndrome of Neonate

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	*	*	*	*	*
	Medicaid	400	59.44%	26.4	91,346	40,718
	Private insurance	241	35.81%	23.2	77,116	34,470
	Uninsured	*	*	*	*	*
	Other	23	3.42%	14.8	38,838	17,258
	Missing	*	*	*	*	*
All Discharges		673	100.00%	24.6	83,645	37,320

Values based on 10 or fewer discharges or fewer than 2 hospitals in the State statistics (SID) are suppressed to protect confidentiality of patients and are designated with an asterisk (*).

Table 13 Neonates, Died or Transferred to Another Acute Care Facility

		Total Discharges		Length of Stay	Charges	Costs
		Number	Percentage	Days (mean)	Mean \$	Mean \$
Payer	Medicare	*	*	*	*	*
	Medicaid	246	50.83%	5.9	28,076	12,665
	Private insurance	183	37.81%	2.8	14,094	6,392
	Uninsured	25	5.17%	2.2	11,054	5,069
	Other	26	5.37%	0.9	3,648	1,561
	Missing	*	*	*	*	*
All Discharges		484	100.00%	4.3	20,573	9,293

Figure 5 shows the comparison of hospital costs for West Virginia newborns covered by Medicaid in 2008. The highest hospital costs were incurred in the DRG group extreme immaturity or respiratory distress of a neonate. This category of births had a mean cost of \$40,718 over 53 times that of a normal newborn. Medicaid covered births in this category accounted for 59.44 percent of the 673 discharges in 2008.

Figure 5 Hospital Cost Comparisons by DRG for Neonates, 2008

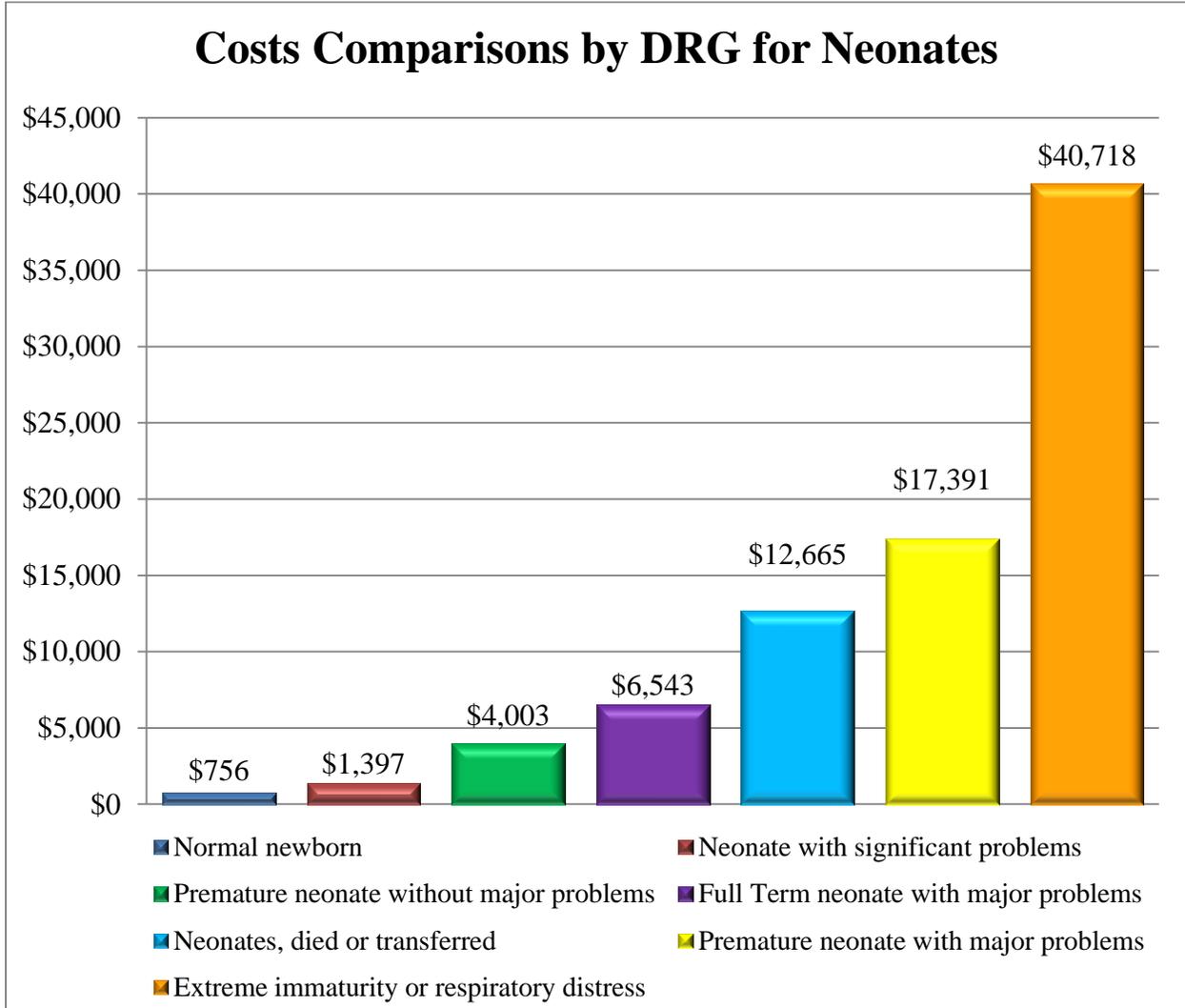


Figure 6 illustrates the percentage of Medicaid deliveries by DRG in West Virginia in 2008. Normal newborns comprise 65 percent of all deliveries. The other six categories encompass the remaining 35 percent. Again there is an inverse relationship between the number of births per category and the total expenditures for hospital costs per category. While normal newborns comprise 65 of births account for only 13 percent of total hospital costs leaving the outstanding 35 percent of births to account for 87 percent of total hospital costs as shown in Figure 7.

Figure 6 Percentage of Medicaid Deliveries in WV by DRG, 2008

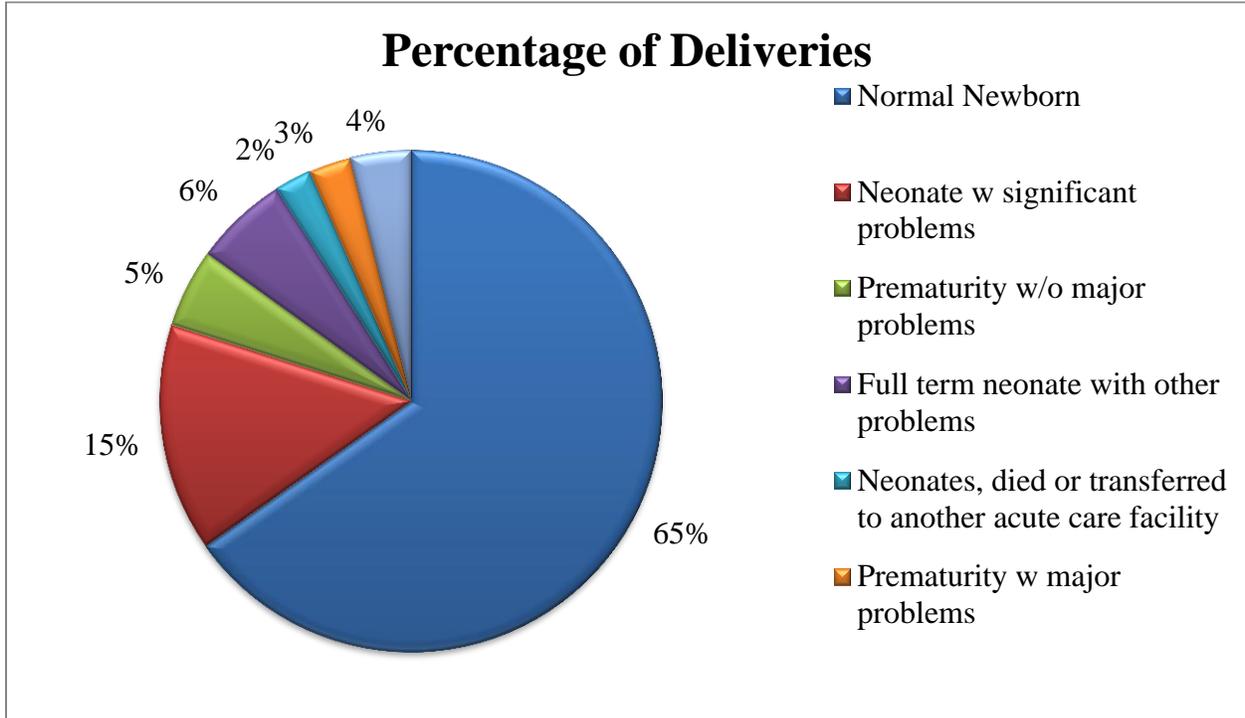
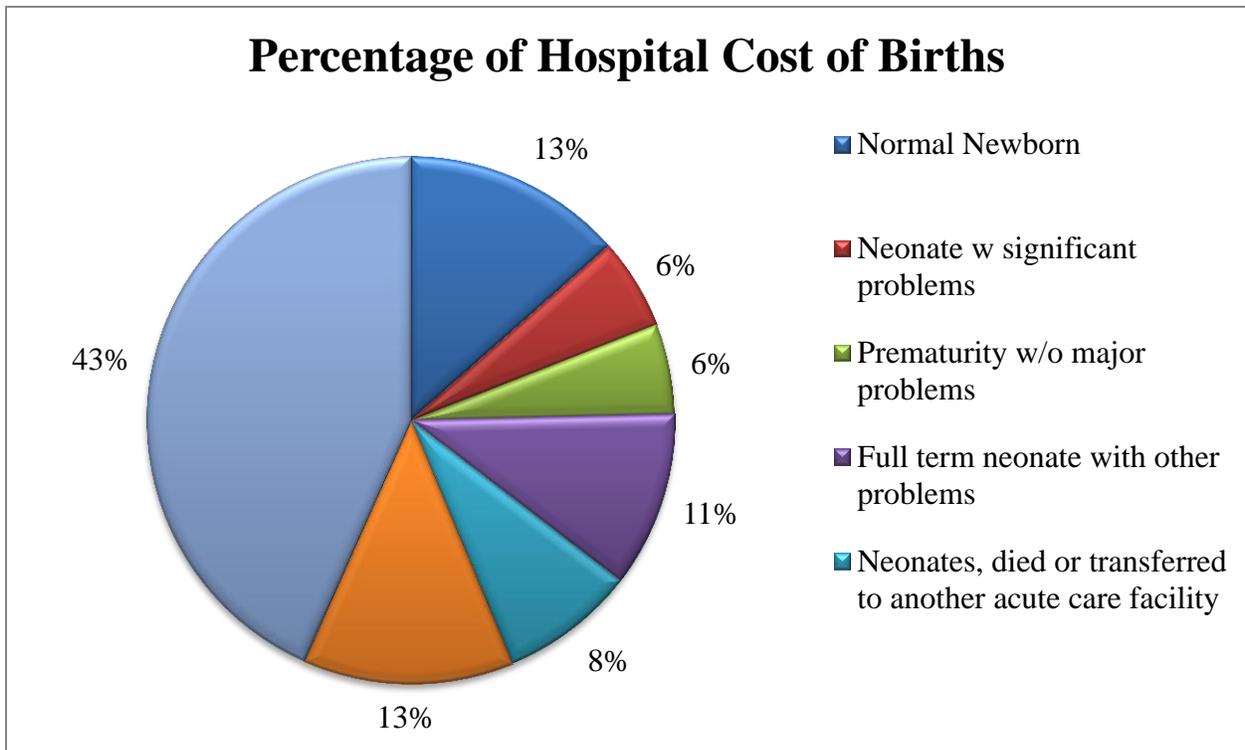


Figure 7 Percentage of Total Cost of Medicaid Deliveries in WV by DRG, 2008



Physician and Anesthesia Costs

Hospital costs are only part of the overall bill for maternity and newborn care. Physician charges and anesthesia are major components as well. Medicaid reimbursement rates for physicians include the mother's office visits, delivery and any routine post-op care. The total Medicaid reimbursement for these services adjusted for 2008 was \$1,703 for a vaginal delivery and \$1,896 for cesarean section. Consistent data were not available for additional physician charges due to complications for Medicaid patients nor were anesthesia charges available.

The results from the survey of the literature indicate that as a minimum a two percent reduction in these charges is achieved due to the influence of a home visitation program similar to RFTS. Table 14 shows potential hospital costs savings for the four main DRGs for mother's delivery. Just a two (2) percent reduction in the number of mothers delivering by other than a vaginal delivery without complications could result in annual savings of \$119,853. If a five (5) percent reduction were achieved savings increase to just over \$300,000 annually.

Table 14 Hospital Cost Savings Projections (Mothers)

Mother	Vaginal w CC	Cesarean	Cesarean w CC	Total Cost Savings
Number in 2008	751	2,100	1,197	-
Cost above Normal	\$819	\$1,180	\$2,417	-
2 percent reduction	15	42	24	-
Cost Savings	\$12,285	\$49,560	\$58,008	\$119,853
5 percent reduction	38	105	60	-
Cost Savings	\$31,122	\$123,900	\$145,020	\$300,042

Table 15 demonstrates the potential cost savings for Medicaid covered births across the six DRGs for newborn births with some form of complication. A 2 percent reduction in the numbers of births in each category could result in direct annual savings of almost \$600,000 annually. Almost \$1.5 million (nearly double the annual budget of the RFTS program) could be saved if the number of newborns with complications could be reduced by 5 percent.

Table 15 Hospital Cost Savings Projections (Newborns)

Newborn	Neonate with Other Significant Problems	Full Term Neonate with Major Problems	Prematurity without Major Problems	Prematurity with Major Problems	Extreme Immaturity or Respiratory Distress Syndrome	Neonates Died or Transferred to Another Acute Care Facility	Total Cost Savings
Number in 2008	1,508	620	520	279	400	246	-
Cost above Normal	\$641	\$5,787	\$3,247	\$16,635	\$39,962	\$11,909	-
2 percent reduction	30	12	10	6	8	5	-
Cost Savings	\$19,333	\$71,759	\$33,769	\$92,823	\$319,696	\$58,592	\$595,972
5 percent reduction	75	31	26	14	20	12	-
Cost Savings	\$48,331	\$179,397	\$84,422	\$232,058	\$799,240	\$146,481	\$1,489,929

To summarize: this analysis indicates total savings from hospital costs alone at the two (2) percent level of \$715,825 and at the five (5) percent level of \$1,789,971. It bears repetition that these are minimal figures as they are based only on hospital costs and do not include physician costs or other costs associated with the birth.

Since the RFTS program targets this high-risk population it would be safe to say there are significant costs savings in any reduction of these complications to either the mother or the newborn child. In addition to direct hospital and physician costs billed to Medicaid there are many other areas in which the RFTS program's efforts contribute to lowering economic costs related to poor birth outcomes.

Unpublished data from the West Virginia University Birth Score Office supports the contention that savings of these magnitudes may be possible. The data indicates in 2009 there were 3,414 prenatal women meeting the criteria for enrollment that enrolled but another 10,919 who were eligible that did not enroll for an enrollment rate of 23.8 percent.

- Good birth outcomes are associated with adequate prenatal care utilization according the review of the literature. For women enrolled in the RFTS program 80 percent received this level of care as opposed to only 66 percent who were eligible who did not enroll
- The result was infant birth factors which were lower for children born to enrolled mothers that for those who did not enroll.
 - Birth weight of less than 2,500 Grams : 7 percent compared to 14 percent
 - Birth weight of less than 1500 Grams: 1percent compared to 4 percent
 - Gestational Age less than 37 weeks: 10 percent compared to 14 percent

Increasing the enrollment of eligible mothers would produce additional cost savings from RFTS due to improved birth outcomes.

Costs of Childhood Maltreatment

West Virginia state-level expenditures on child welfare amounted to nearly \$98 million dollars in FY 2006 (Child Trends, 2008). These expenditures encompass all state fiscal year expenditures for the program case management, administration, and operation (including field and administrative staff expenses) for the State's welfare service system excluding capital costs, unexpended funds and the recoupment of federal reimbursements from prior years.⁷ The welfare service system includes all services directly related to services for children and families to prevent abuse and neglect, family preservation services, child protective services, in-home services, out-of-home placements, and adoption services.⁸ The number of child abuse and neglect victims are provided in Table 16 and Figure 8, while a breakdown of victims by type of maltreatment is presented in Table 17 using data from the Administration on Children, Youth and Families, Children's Bureau in the U.S Department of Health and Human Services⁹.

⁷ 2007 Casey Child Welfare Financing Survey.

⁸ Ibid

⁹ U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. (2010). *Child Maltreatment 2009*. Available from http://www.acf.hhs.gov/programs/cb/stats_research/index.htm#can.

Figure 8 West Virginia Child Abuse and Neglect Victim 2005-2009

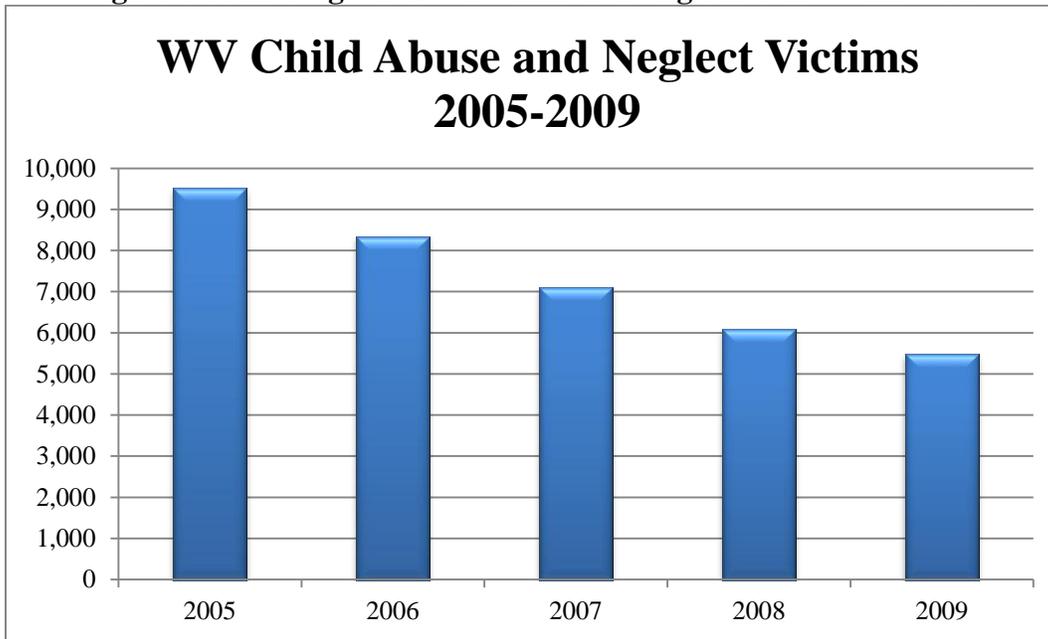


Table 16 West Virginia Child Abuse and Neglect Victims 2005-2009

Year	Child Population	Victims	Rate per 1,000 in population
2005	387,931	9,511	24.5
2006	387,915	8,345	21.5
2007	387,184	7,109	18.4
2008	386,158	6,077	15.7
2009	386,449	5,473	14.2

Table 17 West Virginia Child Abuse and Neglect Victims by Maltreatment Type 2005-2009

Year	Medical Neglect	Neglect	Physical Abuse	Psychological Maltreatment	Sexual Abuse	Other
2005	112	5,223	2,588	2,169	448	751
2006	124	4,635	2,047	2,046	382	668
2007	37	3,005	1,166	1,083	224	359
2008	88	3,331	1,468	1,524	320	625
2009	62	2,796	1,111	1,614	244	600

Using the 2005 West Virginia figure for Child Abuse and Neglect Victims¹⁰ a per-victim expenditure of approximately, \$10,298 of state-level funds was derived. A two percent reduction in the number of child abuse and neglect victims from 2009 estimates (110 less victims) would result in an estimated savings of a little more than \$1.1 million. A five percent reduction would result in an estimated savings of a little more than \$2.8 million. The calculations are given in equations 1 and 2.

1.) 2% Calculation:

FY 2006 per-victim state expenditure \times 2% reduction \times 2009 victims = Estimated annual savings

$$\$10,298 \times [(1 - 2\%) \times 5,473] = \text{Estimated annual savings}$$

$$\$10,298 \times 110 = \$1,132,780$$

2.) 5% Calculation:

FY 2006 per-victim state expenditure \times 5% reduction \times 2009 victims = Estimated annual savings

$$\$10,298 \times [(1 - 5\%) \times 5,473] = \text{Estimated annual savings}$$

$$\$10,298 \times 274 = \$2,821,652$$

Benefit/Cost Analysis of West Virginia’s Right From the Start Program

CBER has made every attempt not to exaggerate the benefits received from the West Virginia RFTS. Data has been included only on two aspects of cost savings: those from reduced hospitalization costs and reduced direct expenditures related to child abuse, neglect and maltreatment. These do not include any indirect costs such as the impact on society of dealing with the problems created over the lifetime of either the LBW or premature child which are extensive as these children experience higher lifetime medical expenses, higher rates of teen pregnancy, lower academic achievement and greater rates of delinquency. (Aos et. al. 2004)

Also, omitted from the study are the indirect costs to society from abuse, neglect and maltreatment of children. These are the costs associated with welfare, substance abuse, domestic violence, unemployment and incarceration (Aos et al. 2004).

For example the Pew Center on the States estimates the following lifetime per-person costs of “bad outcomes” (January 11, 2011).

- Child abuse \$30,000 to \$200,000
- Teen Pregnancy \$120,000 to \$138,000
- High School Dropouts \$250,000 to \$450,000
- Illegal Drug Abuse \$250,000 to \$750,000
- Alcohol Abuse \$250,000 to \$650,000

¹⁰ U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children’s Bureau. (2010). *Child Maltreatment 2008*. Available from http://www.acf.hhs.gov/programs/cb/stats_research/index.htm#can.

The Pew Report concludes “All these expensive social ills could be significantly diminished though investments in . . . evidence based programs”.

As the review of the literature cited earlier in this report indicates benefit/cost ratios for home visitation programs range from 1.47: to 5.7:1 depending on the extent of the program, the method used in the calculations, and benefits included. The most common ratio is 2.25:1 which indicates a return on each dollar spent of \$2.25.

The Pew Center further notes that \$2,755,000 was spent in FY 2009-2010 on the West Virginia programs, Right from the Start and the In-Home Family Education Program under the Department of Health and Human Resources.¹¹ This expenditure total is made up of \$750,000 in West Virginia general funds, with the remaining \$2,005,000 coming from Medicaid and Maternal and Child Health (MCH) Block Grants. Combining the conservative two (2) percent reduction scenarios outlined in this section provides an estimated benefit from the RFTS program of a little more than \$1.8 million. Using the state level expenditures and expected benefit figures produces a benefit to cost ratio of 2.46:1, indicating a return on each dollar spent of \$2.46. Adding in the federal Medicaid and MCH Block Grant expenditures still provides for a positive benefit to cost ratio for the five (5) percent reduction scenario at 1.67:1.

¹¹ http://www.pewcenteronthestates.org/initiatives_detail.aspx?initiativeID=60656

Summary and Conclusions

The following conclusions about the RFTS program in West Virginia can be reached.

First, RFTS contains all the features found in the research and in successful programs which relate to home visitation including:

- Using trained nurses and social workers
- Delivery in a home based setting
- Provision to high risk families
- Family engagement including the mother, child and others present in the home setting.
- A curriculum which is focused on desired outcomes:
 - Training of care givers on prenatal and infant care
 - Education on parenting skills
 - Family planning assistance
 - Smoking cessation
 - Alcohol and substance abuse remediation
- Linkage to other community services
- Transportation assistance
- Voluntary enrollment

Second, the RFTS program is cost effective returning benefits in excess of expenditures.

This ratio is low and conservative as it does not include any of the direct or life-costs associated with poor home environments for pregnant mothers and their children that are remedied by the program.

Third, the effectiveness of the program would be increased if a higher percentage of those eligible enrolled and remained with the program. While not low compared to programs elsewhere, with less than 30 percent of those eligible being enrolled, the benefits of expanded coverage should be pursued. This may require investigation of the reasons for non-enrollment and design of a specific implementation program.

Fourth, the program is underfunded compared to the national average. On a per low-income child, spending is only 62 percent of the national average.

Fifth, RFTS needs to continue improving and expanding its data collection system. While significant efforts have been made to improve the accuracy and functionality of the data collection system some work remains to be done. Most significantly, the current system contains inconsistencies including repeated entries and administratively closed cases (without verifiable outcome documentation) that substantially impair efforts toward trend analysis and client tracking. A new web-based entry system has been implemented and a revision of the coding system protocol (which in its current form often necessitates administratively closed cases) is underway. This evaluation strongly recommends that these efforts are maintained to help ensure the availability and reliability of data for future evaluations.

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**Appendix A Designated Care Coordination and Regional Lead Agency
Providers 2010**

