2018 Report to the Chairmen of the House Appropriations and Senate Finance Committees

Feasibility Study on the Development of a Home Visiting Pay for Success Pilot Program

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Executive Summary

Evidence-based and evidence-informed home visiting is a voluntary early childhood strategy that can enhance parenting and promote the growth and development of young children beginning as early as pregnancy. Home visiting programs are focused, individualized, and culturally competent services for expectant parents, young children, and their families within safe homes and connected communities. These programs are available in the home and help families strengthen attachment and promote optimal development of their children, promote health and safety, and reduce the risk of child maltreatment. Pay for Success is a funding mechanism that has been tested by some state and local governments to scale the reach of critical human service programs when funding and resources are limited.

In the 2018 Appropriation Act, required the Virginia Department of Health (VDH) to lead a workgroup consisting of home visiting and early childhood organizations to evaluate the feasibility of developing a Pay for Success home visiting pilot program. As part of this effort, VDH was directed to report on: 1) a feasibility analysis; 2) availability of federal funding; and 3) the steps necessary to proceed with a pilot program.

In completing this study, VDH built upon prior work completed in the Virginia Home Visitation Pay for Success (PFS) Feasibility Study concluded in 2017. The Virginia Home Visitation PFS Feasibility Study focused on the feasibility of expanding prenatal home visitation for high-risk, low-income mothers through a Pay for Success project. VDH was one of the partner organizations that enabled the manifestation of the prior feasibility study. The scope of the prior study closely aligns with the current 2018 study mandate. To this end, VDH determined that it would be most prudent and fiscally responsible to consider the results of the prior feasibility study and use those lessons learned to make recommendations regarding the feasibility of developing a home visiting PFS pilot program. The 2018 workgroup made recommendations for next steps based on the prior assessment, current Pay for Success opportunities, and future federal funding availability for home visiting Pay for Success projects.

Background

Study Mandate

The 2018 Virginia Appropriation Act – HB5002, Item 297 E states:

The Virginia Department of Health shall assess the feasibility of developing a home visiting Pay for Success pilot program. The department shall develop a workgroup comprised of Virginia home visiting organizations and early childhood education organizations in examining this issue. The department shall determine if the recent provisions of the federal Bipartisan Budget Act of 2018 allow for the department to access federal funding to develop a pilot Pay for Success program for home visiting. The department shall report on the feasibility analysis, the availability of federal funding and the steps necessary to proceed with a pilot program, if feasible, to the Chairmen of the House Appropriations and Senate Finance Committees by December 1, 2018.

Home Visiting

Evidence-based and evidence-informed home visiting is a voluntary early childhood strategy that can enhance parenting and promote the growth and development of young children beginning as early as pregnancy. Home visiting programs are focused, individualized, and culturally competent services for expectant parents, young children and their families within safe homes and connected communities. These programs are available in the home and help families strengthen attachment and promote optimal development of their children, promote health and safety, and reduce the risk of child maltreatment.[1]

According to the 2017 Improving Virginia's Early Childhood Development Programs report completed by the Joint Legislative Audit and Review Commission (JLARC), Virginia's seven voluntary home visiting programs served 10,679 families and 8,092 children in FY16. These voluntary home visiting programs include three evidence-based models – Healthy Families Virginia, Nurse-Family Partnership and Parents as Teachers – as well as Comprehensive Health Investment Project (CHIP) of Virginia, Loving Steps/Healthy Heart, Resource Mothers and Project Link. The JLARC study found that these seven voluntary home visiting programs demonstrate effective performance and participants often have better outcomes than those who do not participate, both nationally and in Virginia. However, the report also indicates that funding for home visiting programs in Virginia is unstable and difficult to predict each year.[2]

Pay for Success Concept

The Pay for Success concept is considered an alternative funding mechanism to scale home visiting programs in Virginia. According to the Nonprofit Finance Fund, a community

[1] Virginia Department of Health. Family home visiting. Retrieved September 17, 2018 from: http://www.vdh.virginia.gov/family-home-visiting/

[2] Joint Legislative Audit Review Commission. (2017, December). Improving Virginia's early childhood development programs. Retrieved September 24, 2018 from: http://jlarc.virginia.gov/2017-early-childhood-programs.asp

development financial institution in the social sector, Pay for Success (PFS) is a contracting approach that drives resources towards programs that deliver results for people in need. Under PFS programs, payments (typically from government) are conditional on demonstrated impact (or "outcomes"). These outcome-based funding arrangements are a departure from the typical approach of payment based on the amount of services provided ("outputs"). PFS can shift public funds toward preventative services with measurable positive results.

In the typical PFS model, a government will partner with a service provider to deliver services to address a high priority social need. The government (often referred to as the "payor" or "back-end payor") agrees to pay for agreed upon measurable outcomes. The amount of payment is usually related to an estimate of the future cost savings associated with achieving the desired outcomes. In many PFS programs, investors (banks, foundations, individuals) provide an upfront investment of capital to enable service providers to deliver preventative interventions over a multi-year period. Evaluators measure outcomes to ensure programs are delivering impact. Payors only pay if the program is successful in meeting positive outcomes.[3]

The Pay for Success approach has been applied in various parts of the country to address many issue areas, including affordable housing, early childhood education, homelessness, healthcare, foster care, juvenile justice, and substance abuse. Currently, there are two home visiting PFS initiatives. The Connecticut Office of Early Childhood launched a year-long PFS outcomes rate card pilot in early 2018. The Office of Early Childhood is incorporating bonus payments into the contracts of existing service providers for achievement of the following outcomes: full-term births; caregiver employment; safe children; and family stability.[4] Now in its second year, the South Carolina Nurse-Family Partnership implemented a four-year PFS social impact bond project in 2016 to scale home visiting services to an additional 3,200 families beyond the 1,200 families that are currently receiving services.[5]

According to the Urban Institute, PFS projects are only five years old in the U.S. and most of the initial PFS project models integrated rigorous evaluation designs. However, there have been recent developments in the past two years toward implementing the rate card approach, which sidesteps rigorous evaluation but has a shorter project design phase and development timeline.[6] Additional information regarding PFS models is provided in the next section of this report.

Stakeholder Workgroup Feasibility Analysis

To address the 2018 study mandate, VDH invited representatives from Virginia's home visiting and early childhood organizations and various state agencies to participate on a stakeholder

[3] Nonprofit Finance Fund. PFS Learning Hub Frequently Asked Questions. Retrieved September 4, 2018 from: https://www.payforsuccess.org/learn/basics/#what-is-pay-for-success

[4] Connecticut Office of Early Childhood. Maternal, Infant, and Early Childhood Home Visiting Outcomes Rate Card Pilot Fact Sheet. Retrieved September 24, 2018 from: https://www.ct.gov/oec/lib/oec/ct_oec_miechv_rate_card_fact_sheet.pdf

[5] Nonprofit Finance Fund. Pay for Success Projects. Retrieved September 4, 2018 from: https://www.payforsuccess.org/project/south-carolina-nurse-family-partnership

[6] Urban Institute. Pay for Success. Retrieved September 24, 2018 from: https://pfs.urban.org/pay-success/pfs-perspectives/future-pfs-bringing-rate-cards-united-states

workgroup to explore feasibility of developing a home visiting Pay for Success pilot program. Leadership and staff of the following organizations were included: CHIP of Virginia, Early Impact Virginia, Families Forward, Voices for Virginia's Children, CapTech Ventures, Family Lifeline, Robins Foundation, Virginia Pay for Success Council, Office of the Secretary of Health and Human Resources, Department of Education, Department of Health, Department of Behavioral Health and Developmental Services, Department of Medical Assistance Services, Department of Social Services, Senate Finance Committee, and University of Virginia Pay for Success Lab.

VDH convened two meetings to involve key stakeholders knowledgeable and experienced in the areas of home visiting and early childhood education. A total of thirty-five participants participated in the process. Participants were provided background materials in advance of the meeting to include a Home Visiting Basics fact sheet and two Pay for Success introductory videos. The full list of stakeholder workgroup participants is available in Appendix A.

The first stakeholder workgroup meeting was held on August 16, 2018. Workgroup participants completed a number of activities outlined below as part of the analysis process.

- *Pay for Success Overview:* A presentation of the Pay for Success concept – what it is and why it is used by governments – was provided by experts who currently work in this field. This was followed by a question and answer session in which all workgroup participants were given the opportunity to seek clarity and express opinions about applying the PFS concept to government human service programs.

- *Inputs/Outputs vs. Outcomes Group Discussion:* Workgroup members deliberated over the topic of paying for inputs and outputs vs. outcomes. Members discussed the challenge of defining and measuring outcomes in some human services-oriented programs that often lack adequate resources to operate at optimal capacity levels. Participants discussed examples of government programs that have shifted from purchasing inputs and outputs from service providers by implementing PFS contract models designed to procure results.

- *Overview of Virginia's Pay for Success Council:* The Chair of the council shared a historical perspective of the establishment of the council and a high-level overview of the work undertaken to lay the groundwork in efforts to establish a home visiting prenatal PFS model in Virginia. Workgroup members engaged in discussion regarding securing investors; the perception of investors earning profits; implementing multi-year contracts in state government; which programs have more success using the PFS model; and implementation barriers specific to Virginia's one-year contracting method.

- *Review of the Virginia Home Visitation Pay for Success Feasibility Study:* The workgroup completed a comprehensive review of the previous feasibility study that was conducted in 2016 - 2017. The 2017 study overview document was provided to each workgroup participant. Participants examined the information contained in the overview and asked questions to gain a better understanding on the information presented. The

workgroup discussed and considered the study's key findings. Background information regarding the study is provided in the next section of this report.

- *Review of Federal Legislation:* A summary of the language included in the 2018 Federal Bipartisan Budget Act was provided to highlight current and future funding opportunities that will allow for the development of a Pay for Success pilot program. Workgroup members deliberated approaches for pursuing the funding opportunities such as which agency should apply; the types of home visiting models to implement; potential target populations and related outcomes; and political considerations relative to the competitive federal funding opportunities. Federal funding details are provided later in this report.

The second stakeholder workgroup meeting was held on September 6, 2018. The workgroup resumed activities to examine the feasibility of developing a PFS pilot program. The bulk of the meeting time was allocated to analyzing a comparison of PFS financing models. An abbreviated summary definition as described in the book, *What Matters: Investing for Results*, is provided below for each of the following financing models: 1) social impact bond; 2) social impact guarantee; 3) rate card; and 4) performance-based contract.

- A *social impact bond*, also considered a traditional PFS model, is a contracting mechanism that uses an intermediary to bring together impact investors, high-impact service providers, and government payers to implement preventative social services. The risk is transferred from government to the funders because investors provide the upfront funding. If successful, this will lead to improved social outcomes and reduced government costs, generating both fiscal and intangible value for society.[7]

- A *social impact guarantee* is a contract model that is structured so that the government gets its money back if a government-backed social program fails to achieve social impact targets. The government provides the upfront funding. Private funders can offer social impact guarantee financing; therefore, if the social service provider is called upon to pay back the government, social impact guarantee funders will step in to write the check. Instead of the government, private funders make a contingent promise to pay in the future.[8]

- *Rate card* finance models require that government officials go a step beyond setting policy priorities and goals. They must define how much they think those goals are worth and determine how much they will pay to achieve those goals. Typically, the rate card will set a payment for a number of outcomes and populations. Prices on an outcomes rate card may be informed by policy priorities, in addition to potential monetary savings.[9]

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[7] Palandjian, T. (2017). Financing outcomes through social impact bonds. In *What Matters: Investing in Results to Build Strong, Vibrant Communities* (p. 150). San Francisco, CA: Federal Reserve Bank.

[8] Overholser, G. (2017). Social impact guarantees could enable pay for success contracting to scale more rapidly. In *What Matters: Investing in Results to Build Strong, Vibrant Communities* (p. 157). San Francisco, CA: Federal Reserve Bank.

[9] Metcalf, L. & Levitt, A. (2017). Outcomes rate cards: A path to paying for success at scale. In *What Matters: Investing in Results to Build Strong, Vibrant Communities* (pp.242-244). San Francisco, CA: Federal Reserve Bank.

- A *performance-based contract* is a finance mechanism that makes compensation partially or fully contingent upon performance achievement. These contracts provide incentives to services providers that deliver measurable results in the form of outcomes, as opposed to outputs.[10]

Each of the four financing models assist government programs in allocating resources in a manner that will deliver the best outcomes.

The stakeholder workgroup assessed the four financing models based on the following criteria: how to operationalize the model; timeline for model implementation; cost factor (low to high) related to administrative expenses; legal/regulatory mechanics of funding; and potential political challenges. Stakeholders discussed the general pros and cons of each model to include the challenges and or drawbacks of implementing a particular model in Virginia (Appendix B, comparison chart of the four financing models).

Stakeholders were fully engaged over the course of the two workgroup meetings. There was a high level of information sharing and thoughtful analysis contributed to the recommendation regarding the feasibility of developing a home visiting PFS pilot program. Additionally, though not required in the mandate, the workgroup reached general consensus on identifying the type of home visiting model and the preferred PFS financing model that would be suitable for a pilot program in Virginia. Given that the previous feasibility study largely informed the workgroup's overall recommendation, it is essential to provide some context for this prior work.

Review of the Virginia Home Visitation Pay for Success Feasibility Study

The Virginia Pay For Success Council partnered with the VDH and Third Sector Capital Partners, Inc. in early 2015 to begin conducting a feasibility study of expanding prenatal home visiting across Virginia using a PFS financing model. The Virginia Pay for Success Council is a nonstock corporation with a mission of initiating a PFS financing model designed to implement proved, productive early childhood programs. Third Sector Capital Partners, Inc. is a nonprofit advisory firm that addresses social needs through PFS initiatives. The feasibility study was conducted in 2016 - 2017. The final report and study results were shared with partner organizations in July 2017.

The scope of the prior feasibility study closely aligns with that of the current 2018 study mandate. To this end, VDH determined that it would be most prudent and fiscally responsible to consider the results of the prior feasibility study and use those lessons learned to make recommendations regarding the feasibility of developing a home visiting PFS pilot program. As mentioned previously, the stakeholder workgroup reviewed the overview of the prior study and discussed its findings as part of the feasibility analysis. The following sections summarize the study's purpose, design and key findings.

[10] Gustaffson-Wright, E. (2017). Performance-based contracting can provide flexibility, drive efficiency, and focus resources on what works in social services. In *What Matters: Investing in Results to Build Strong, Vibrant Communities* (p.48). San Francisco, CA: Federal Reserve Bank.

Purpose

The purpose of the study was to determine the feasibility of using outcomes-oriented contracting to expand prenatal home visiting for high-risk, low-income mothers.

Design

A retrospective study designed and conducted on the state's two largest home visitation service providers—CHIP of Virginia and Healthy Families Virginia—to validate the impact of prenatal home visitation programs on birth outcomes and health care costs for Virginia mothers and their children. The study workgroup obtained records for women and children who received home visiting services from the two service providers between 2009–2012. Data from the home visiting provider records were matched to VDH electronic birth records and Medicaid-funded health expenditures for care provided to the mother and infant during pregnancy through two years post-birth. The workgroup identified a comparison group and similarly matched infant electronic birth certificates and Medicaid-funded health expenditures for care provided during pregnancy through the child's second birthday.

Key Findings

The 2016-2017 feasibility study determined the following key findings:

1. Prenatal home visitation has the potential to reduce preterm birth rates and low birthweight incidences.
2. Linking birth outcomes to medical costs is a significant challenge within the existing data infrastructure.
3. Identified outcomes align with the mission of state agencies, making them logical potential government end payers.
4. There are several ways to pursue outcomes-oriented contracting within the Commonwealth of Virginia's legal and regulatory system.
5. A PFS project would benefit from exploring additional potential end payers or sources of funding.
6. There is growing interest in performance-based contracting in the Commonwealth.

In addition to the key findings, the study also concluded it may be feasible to conduct a Prenatal Home Visitation PFS demonstration project using birth outcomes as the basis for payments. The study workgroup designed a demonstration project building upon the results of the retrospective study. Full details regarding the Virginia Home Visitation Pay for Success Feasibility Study and demonstration project are in the 2017 final report (Appendix C).

Federal Funding Availability for Pay for Success Projects

VDH researched the Federal Bipartisan Budget Act of 2018[11] and determined it allows for the provision of federal funding for evidence-based home visiting on a pay for outcome basis. The authorizing language is in the Maternal, Infant and Early Childhood Home Visiting Program and Social Impact Partnerships to Pay for Results Act sections of the 2018 Budget Act.

Maternal, Infant and Early Childhood Home Visiting (MIECHV) Program

Title VI – Child and Family Services and Support Extenders includes continued funding for the Maternal, Infant and Early Childhood Home Visiting (MIECHV) Program. Specifically, section 50605 of Subtitle A includes the option to fund evidence-based home visiting on a pay for outcome basis. Key points of the funding provisions include:

- This section allows states to use up to 25 percent of their MIECHV funding to pay for home visiting services on a "pay for outcomes" basis.
- "Pay for Outcomes Initiative" is defined as a performance-based grant, contract, cooperative agreement, or other agreement awarded by a public entity in which a commitment is made to pay for improved outcomes achieved as a result of the intervention that results in social benefit and direct cost savings or cost avoidance to the public sector.
- Such an initiative shall include:
    - a feasibility study that describes how the proposed intervention is based on evidence of effectiveness;
    - a rigorous, third-party evaluation that uses experimental research methodologies that allow for the determination of whether the initiative has met its proposed outcomes as a result of the intervention;
    - an annual, publicly available report on the progress of the initiative; and
    - a requirement that payments are made to the recipient of a grant, contract or cooperative agreement only when agreed upon outcomes are achieved.

Social Impact Partnerships to Pay for Results Act (SIPPRA)

Title VIII – Supporting Social Impact Partnerships to Pay for Results, section 50802 includes $100 million for the federal government to pay for outcomes through Social Impact Partnership projects. Under these projects, state and local governments would raise their own money and pay for a social service, then be repaid by the federal government only if a rigorous, independent evaluation showed the service achieved the intended result. Some highlights of this funding provision include:

[11] U.S. Congress. Summary of Bipartisan Budget Act Public Law 115-123. (February 9, 2018). Retrieved from: https://www.congress.gov/bill/115th-congress/house-bill/1892?q=%7B%22search%22%3A%5B%222018+bipartisan+budget+act%22%5D%7D&r=1

- To qualify as a social impact partnership project, the project must produce one or more measurable, clearly defined outcomes that result in social benefit and federal, state or local savings.
- Approximately $70 - $80 million of the allocation will provide outcome payments for state or local government social impact partnerships
- Up to $10 million will be made available to assist states or local governments in developing feasibility studies to apply for social impact partnership funding.
- Up to $15 million will be allocated for evaluation of social impact partnerships. An independent evaluation to determine whether the state or local government project has achieved a specific outcome as a result of the intervention is required in order for the state or local government to receive outcome payments.
- The timeline for all projects under this funding shall not exceed ten years.

Recommendations

Based on the analysis and results of the prior feasibility study, the stakeholder workgroup discussions went a step beyond the study mandate to reach the following feasibility determination and related recommendations:

- **It is feasible to develop a home visiting Pay for Success pilot program in Virginia.**
    - **Center the Pay for Success pilot program on a prenatal home visiting model that targets birth outcomes.** Stakeholders determined that birth outcomes can be defined and measured within existing data systems, notwithstanding data integration challenges across state agencies.
    - **Utilize the social impact guarantee model as the Pay for Success financing mechanism to implement the pilot program.** Under this model, the state government would provide the initial upfront funding to contract/pay for services, similar to the current practice in state government. However, if the service provider does not achieve the target outcomes, the investors write a check to the state government at a predetermined time in the future.

Steps Necessary to Proceed with a Pilot Program

A significant amount of work has already been completed to lay the groundwork for developing a home visiting PFS pilot program. The 2016 retrospective study results show that prenatal home visitation has the potential to reduce preterm birth rates and low birthweight incidences. Building on this work, the following steps will be necessary:

- **Designate the Office of the Secretary of Health and Human Resources as the state entity to coordinate any future home visiting PFS initiatives.** Current home visiting programs are administered by multiple state agencies within OSHHR.
- **Determine which state agency will complete the application for federal funding under SIPPRA and develop a plan for responding when the official Notice of**

Funding Opportunity is announced in early 2019. Though MIECHV includes a provision of 25% of the funding award for PFS projects, it is important to emphasize that Virginia's current FFY19 MIECHV funds are fully allocated to support existing home visiting projects throughout Virginia. There are no available FFY19 MIECHV funds to support a home visiting PFS pilot program.

- **Determine the outcomes that should and can be measured with existing data sources and systems.**
- **Develop a project workplan for implementing a home visiting PFS pilot program.** The previous 2016 feasibility study includes a plan for a prenatal home visiting PFS demonstration project. The demonstration project plan can be used as a starting point for the pilot program.

Appendix A: Home Visiting Pay for Success Stakeholder Workgroup Participants

Laurel Aparicio, MPA Director Early Impact Virginia	**Sarah Moore** Part C Monitoring Consultant Virginia Department of Behavioral Health and Developmental Services
Gena Boyle Berger Deputy Secretary of Health and Human Resources Office of Governor Ralph Northam	**Joshua Ogburn** Director University of Virginia Pay for Success Lab
Robin Buskey Policy Analyst Virginia Department of Health	**Meagan Robinson** MCH Epidemiology and Evaluation Supervisor Virginia Department of Health
Jenna Conway Chief Deputy Virginia Department of Education	**Kathy Sardegna, MD** Pediatric Medical Director Virginia Department of Medical Assistance Services
Emily Creveling, MSW Maternal and Child Health Supervisor Virginia Department of Medical Assistance Services	**Jim Seevers** Chairman Virginia Pay for Success Council
Cornelia Deagle, PhD, MSPH Director, Division of Child and Family Health MCH & Title V Director Virginia Department of Health	**Lisa Specter-Dunaway** CEO Families Forward
Alex DerHovhannessian Director CapTech Ventures, Inc.	**Consuelo Staton, MEd** State Resource Mothers Program Coordinator Virginia Department of Health
Rob Dugger, PhD Managing Partner, Hanover Provident Capital & Co-founder, ReadyNation	**Amanda Stehura** Women's Services Coordinator Virginia Department of Behavioral Health and Developmental Services
Jessica Fallen Office Services Specialist Virginia Department of Health	**Jeff Stover** Operations Director for Population Health Office of the Commissioner Virginia Department of Health
Joseph Flores Deputy Secretary of Finance Office of Governor Ralph Northam	**Amy Strite** CEO Family Lifeline

Stephanie Gilliam Deputy Director, Budget Operations Virginia Department of Health	**Mike Tweedy** Legislative Analyst Virginia Senate Finance Committee
Emily Griffey Policy Director Voices for Virginia's Children	**Vanessa Walker Harris, MD** Director, Office of Family Health Services Virginia Department of Health
Jacque Hale Collective Impact Manager Early Impact Virginia	**Elizabeth Whalley Buono** Member Virginia Pay for Success Council
Elliot Haspel Program Officer, Education Policy & Research Robins Foundation	**Massey Whorley** Senior Advisor Virginia Department of Social Services
Janice Hicks, PhD Policy Analyst Virginia Department of Health	**Trinita Wright** MIECHV Program Specialist Virginia Department of Health
Joe Hilbert Deputy Commissioner for Governmental and Regulatory Affairs Virginia Department of Health	**Neal Younce** Grants and Accounting Manager Virginia Department of Health
Leslie Hoglund, PhD, MEd Director, Division of Population Health Data Virginia Department of Health	**Emily Yeatts** Supervisor, Reproductive Health Unit Virginia Department of Health
Aleta Lawson Director, Head Start Collaboration Office Division of Child Care and Early Childhood Development Virginia Department of Social Services	

Appendix B: Comparison of Pay for Success Financing Models

Criteria	Traditional PFS	Social Impact Guarantee	Rate Card	Performance-Based Contract
How to operationalize	Status quo + substantial planning process	Status quo + moderate planning process	Status quo + moderate/light planning process	Status quo + light planning process
Timeline	1-2 Years	1-2 Years	6 Months - 1 Year	6 Months - 1 Year
Total Cost Projection	Status quo + highest admin expenses	Status quo + moderate admin expenses	Status quo + medium/low admin expenses	Status quo + lowest admin expenses
Fiscal issue – mechanics of funding	May require legislation	Unlikely to require legislation	Unlikely to require legislation	Unlikely to require legislation
Savings, including source of savings	Tracked, hopefully leading to greater outcome improvement over-time			
Political challenges	May be pushback regarding the high admin costs and use of outside investors	Paying an insurance policy may be perceived as a give away to financial institutions	Monetarily quantifying social outcomes such as preterm birth could invite concerns	May face criticism for not paying attention to longer-term outcomes
Pros	Government pays nothing until outcomes achieved	Government funding "guaranteed"	Moderate implementation difficulty while staying outcome oriented. Also, it is easily replicable for future RFP cycles.	Low implementation difficulty while staying outcome oriented. Also, it is easily replicable for future RFP cycles.
Cons	Hardest to implement	Never has been implemented	Likely will not utilize outside funders, thereby losing that extra layer of accountability.	Does not utilize outside funders, thereby losing that extra layer of accountability. Also, contract is generally short-term thereby reducing opportunity to focus on longer-term outcomes

Source: University of Virginia Pay for Success Lab, 2018

Appendix C: Virginia Home Visitation Pay for Success Feasibility Study

Third Sector
capital partners

Virginia Home Visitation Pay for Success: Feasibility Study

PREPARED FOR: VIRGINIA PFS COUNCIL

JULY 2017

EXECUTIVE SUMMARY

The Virginia Pay for Success Council (the "Council"), Virginia Department of Health ("VDH"), and Third Sector Capital Partners, Inc. ("Third Sector") conducted a feasibility study to explore the impact of prenatal home visiting programs on birth and early childhood outcomes. The feasibility study, which began in late Spring 2016, focused on expanding prenatal home visitation for high-risk, low-income mothers through a Pay for Success (PFS) project. PFS is an innovative contracting model that drives government resources toward high-performing social programs. PFS contracts track the effectiveness of programs over time to ensure that funding is directed toward programs that succeed in measurably improving the lives of people most in need. The study was conducted with the support of a Social Innovation Fund federal grant that enabled Third Sector to assist the Commonwealth in conducting the feasibility study.

KEY FINDINGS

The feasibility analysis addressed a number of key criteria to provide evidence-based prenatal home visiting to the highest risk population of pregnant mothers through a PFS contract. Key findings from the feasibility study revealed the potential for the Commonwealth to construct a PFS demonstration project aimed at improving birth outcomes for low-income mothers. The feasibility study also revealed a number of important gaps in current health data systems that posed an impediment to the accurate assessment of the impact of the program on health outcomes and costs.

- **Prenatal home visitation has the potential to reduce preterm birth rates and low birthweight incidence.** Retrospective data analysis supports the hypothesis that home visitation decreases preterm birth rates and that preterm births lead to longer hospitalization stays associated with the birth episode. The retrospective analysis found that there was a 40% reduction in preterm birth rates for individuals who received home visitation versus the comparison group. National research suggests the average inpatient cost of a preterm birth is around $30,000.[1] The results of the data analysis are consistent with prior national and local evaluations of the home visitation model.
- **Linking birth outcomes to medical costs is a significant challenge within the existing data infrastructure**. The feasibility study sought to determine the impact of home visitation on healthcare utilization and costs. This required linking birth record information with Medicaid claims. The analysis revealed a number of significant issues that make it difficult to reliably link birth records and Medicaid claims in order to help drive policy.
- **Identified outcomes align with the mission of state agencies, making them logical potential government end payers.** These outcomes provide both benefits and cost avoidance to multiple agencies within the Department of Health and Human Resources (HHR). The Secretary of Health and Human Resources oversees VDH, Virginia's Department of Social Services (DSS), and Virginia's Department of Medicaid Assistance Services (DMAS). One of the benefits of home visitation is a reduction in preterm births, which aligns with the goals of VDH. DMAS would benefit from an anticipated reduction in inpatient days for mother and child and reduced birth episode costs.
- **There are several ways to pursue outcomes-oriented contracting within the Commonwealth of Virginia's legal and regulatory system**. A Social Impact Guarantee (SIG), or contingent clawback, appears to be the

[1] Sources: Kowlessar NM (Social & Scientific Systems, Inc.), Jiang HJ (AHRQ), and Steiner C (AHRQ). Hospital Stays for Newborns, 2011. HCUP Statistical Brief #163. October 2013. Agency for Healthcare Research and Quality, Rockville, MD. ; Institute of Medicine (US) Committee on Understanding Premature Birth and Assuring Healthy Outcomes; Behrman RE, Butler AS, editors. Preterm Birth: Causes, Consequences, and Prevention. Washington (DC): National Academies Press (US); 2007. 12, Societal Costs of Preterm Birth. See footnote 25 for further information.

most suitable contracting mechanism for the Commonwealth. In a SIG model, the state agency provides traditional direct funding to a project through a biennial appropriation and budget, with a contingent claim for repayment from a letter of credit or escrow account funded by private funders based on success in achieving targeted outcomes.

- **A PFS project would benefit from exploring additional potential end payers or sources of funding to supplement the funding from HHR.** The preliminary economic model indicates that the benefits of decreased preterm birth covers a portion of the cost of the intervention. To improve the economics of the project, the initiative could (i) explore additional outcomes, including child welfare or other early childhood metrics, or (ii) pursue a Medicaid waiver to partially offset half of the costs of the intervention.
- **There is growing interest in performance-based contracting in the Commonwealth.** The feasibility study team hosted several events during the feasibility assessment to educate stakeholders in government, the private sector, and the nonprofit sector about PFS. The events also served to garner support for the home visitation PFS feasibility work and PFS initiatives more broadly within Virginia.

NEXT STEPS

The feasibility analysis indicates that it may be feasible to construct a Home Visitation Pay for Success demonstration project using birth outcomes as the basis for payments. Gaps in the data infrastructure limit the ability to evaluate mother and child Medicaid utilization or costs outcomes. **These findings create two potential short-term next steps – (i) engage in project construction for a demonstration project based on birth outcomes and (ii) collaborate with key stakeholders to develop an integrated data system that enables the Commonwealth to rigorously evaluate the outcomes of early childhood services. Before pursuing either step, the PFS initiative must secure commitments from government partners to drive the next phase of the home visitation PFS initiative.**

I. *Demonstration Project*. The retrospective analysis indicates that it may be feasible to construct a Prenatal Home Visitation Pay for Success demonstration project using birth outcomes as the basis for payments. The next step in constructing a demonstration project is to secure a commitment from an end payer. The PFS feasibility study has engaged stakeholders within the government of the Commonwealth of Virginia who could potentially serve as end payers. However, before moving forward with project construction, the initiative should agree on which partners will pay for the defined target outcomes.

   If the project secures a committed end payer, the project could move into project construction. However, funding for technical assistance, evaluation, and project management during the project construction phase will still need to be secured. During project construction, all project parties need to work collaboratively to refine the data analysis and intervention design, procure an independent evaluator and finalize the evaluation design, refine the economic model, and finalize the contracting mechanism:

II. *Finalize contracting mechanism and procure partners.* During project construction, the contracting mechanism and required legal and regulatory measures associated with the contracting model will be addressed.
   - *Finalize target population and intervention design.* The PFS project could focus on a higher risk population by refining the eligibility and enrollment processes. This focus could enable the project to have larger impact and, thus, greater cost savings. Risk factors associated with preterm births include: previous preterm births, late or no healthcare during pregnancy, smoking or drug use during pregnancy,

age, and race.[2] The project should assess whether or not serving a higher risk population would increase the cost of the intervention.

- *Determine impact targets and refine outcomes analysis.* During project construction, parties could refine and/or expand the retrospective data analysis to gain more confidence in the baseline preterm birth rate and intervention impact rate. Additionally, outcomes from more recent cohorts of families served by CHIP and Healthy Families could continue to be tracked against a comparison group even without a demonstration project. This would increase the sample size of the outcomes analysis, increasing the evidence-based and providing an opportunity to analyze impact by demographic or other risk factors.
- *Engage funders and refine economic model.* During project construction, local and national funders focused on the issue area would be engaged and briefed on the project. Funders will be engaged to support project construction as well as to provide funding to the future demonstration project.

III. *Data Infrastructure Collaborative.* Gaps in the current data infrastructure limit the ability to evaluate mother and child healthcare utilization and costs during, and two years after, birth. This analysis requires linking data from multiple data systems, including home visitation provider data, VHI birth records, and DMAS Medicaid claims. The home visitation retrospective study revealed that while individual databases are structured to contain all the necessary data, it is currently difficult to access databases and procure and link data to build the comprehensive dataset that would have facilitated a robust analysis. The study found that current system operations, agency and privacy regulations, and lack of an integrated system compromised the construction of the required dataset.

The home visitation PFS initiative could benefit from recent momentum within the Commonwealth around data sharing.[3] HHR staff could work collaboratively with PFS team and data partners to build new infrastructure to enable data sharing. This refined retrospective study could serve as a working case study for improving data infrastructure design and could document the value of these types of analyses for the Commonwealth. A key first step is to secure commitment from HHR to support the effort and ensure adequate capacity to support this data infrastructure improvement case study.

Refining the retrospective study would be an important step toward creating a feasible PFS prenatal home visitation project that rigorously evaluates healthcare utilization *and costs*. The initiative could also be a key step toward developing an ongoing performance management process that identifies and analyzes the high- priority outcomes of healthcare programs, in order to improve quality and outcomes and reduce overall costs.

The successes and challenges of the prenatal home visitation feasibility study have demonstrated the benefits that can result from measuring outcomes and innovating in social sector contracting. Through this feasibility study, the Council has gained expertise in data sharing to track outcomes, outcomes-oriented contracting, and the key steps needed to build a successful PFS project. These lessons learned could position the PFS Council to assist other organizations in the Commonwealth of Virginia interested in advancing a culture of data driven policy-making.

[2] 2016 Premature Birth Report Card: Virginia. 2016; "What Are the Risk Factors for Preterm Labor and Birth?" National Institutes of Health. U.S. Department of Health and Human Services, 2015. Web. 02 Feb. 2017.

[3] Virginia (State). Legislature. House of Delegates. Health and Human Resources Secretariat; single state agency for data collection and sharing; report, 2017. Virginia Legislative Information System. Web. 6 Jun. 2017.

ABOUT THE VIRGINIA PAY FOR SUCCESS COUNCIL

VIRGINIA PAY FOR SUCCESS COUNCIL

The Virginia Pay for Success Council is collaboration of like-minded members of Virginia's private industry, human service organizations, and government organizations that have collaborated since October 2013, and incorporated as a non-stock corporation in late 2014. The mission of the Council is to initiate a PFS financing model designed to implement proven, productive early childhood programs that increase the life outlook for thousands of Virginia children, strengthen Virginia's workforce development and competitiveness, and reduce taxpayer burdens.

ABOUT PAY FOR SUCCESS

Pay for Success (PFS) projects are about measurably improving environmental conditions and/or the lives of people in need. PFS is an innovative contracting model that drives government resources toward high-performing social and environmental programs in areas such as poverty, education, conservation, recidivism, homelessness, and habitat management. PFS contracts track the effectiveness of programs over time to ensure that funding is directed toward programs that succeed in measurably improving environmental conditions and/or the lives of people most in need.

This novel contracting model allows all parties to benefit by aligning incentives. Underserved initiatives gain access to the high-quality support they need to thrive. Implementers achieve the stability of upfront, flexible funding that enables them to scale and focus on delivering proven, outcomes-focused services. Governments obtain the flexibility to support preventive services that lead to reduced costs, better outcomes in the long term, and more effective data to identify what works. Taxpayers are secure in knowing that government resources are directed toward programs that produce demonstrated results for society.

ABOUT THE PFS FEASIBILITY STUDY

The Virginia Pay for Success Council, VDH, and Third Sector conducted a feasibility study to explore the impact of prenatal home visiting programs on birth and early childhood outcomes. The feasibility study, which began in late Spring 2016, focused expanding prenatal home visitation for high-risk, low-income mothers through a PFS project. The study was conducted with the support of a federal grant from the Social Innovation Fund for technical assistance and a grant from the J.B. and M.K. Pritzker Family Foundation.

The feasibility study explored innovative public-private partnerships and funding approaches to align reimbursements and increase allocation of resources to evidence-based interventions. The feasibility study was supported by VDH and the Commonwealth of Virginia:

- **Virginia Department of Health.** The initiative aligns with the mission of VDH, which is to promote and protect the health of all Virginians. VDH is focused on addressing the healthcare needs of Virginia's low- income populations and recognizes that the path toward improved health includes a strong focus on data analytics with significant stakeholder engagement to promote a specific role and connection for all in this effort.

- **Commonwealth of Virginia.** Governor McAuliffe has a strong interest in early childhood development, forming the Children's Cabinet co-chaired by the Secretary of Health and Human Resources, William Hazel, to increase access to healthcare and cultivate a solid foundation for children and families through supportive measures. Workforce and human capital development have emerged as top priorities of business and government with clear recognition of the importance of early childhood development and education. "Pay for Performance" in all aspects of government activity is a key priority of the Virginia Chamber of Commerce.

OVERVIEW OF PRENATAL HOME VISITATION

OVERVIEW OF THE PRENATAL HOME VISITATION MODEL

Prenatal home visitation is a voluntary, relationship-based counseling program that includes regular visits by a trained professional to a family's home when the mother is expecting. Home visitation generally serves women who have low-income and are at risk for poor birth outcomes, including preterm birth or low birthweight. There are a number of health and lifestyle factors and medical conditions, which are risk factors for a preterm birth. These include the mother's age at pregnancy (younger than 18 or older than 35), late or no prenatal care, smoking, drinking, or using drugs during pregnancy, having had a previous preterm birth, multiple births, and a short time period between pregnancies (fewer than six months). The effectiveness of this model in reducing Medicaid costs and improving birth outcomes for mother and child has been reinforced by a number of empirical studies over the past several decades.

Nurse Family Partnership (NFP) is a leading nationwide provider of home visitation services wherein a registered nurse visits a family's home during the mother's pregnancy and continuing until the child is two years old. They conducted a 2012 study focused on assessing the return on investment that home visitation can provide. This study concluded that NFP's services have a positive effect on both the outcomes for children and families served and cost savings to Medicaid. It found that families who received NFP services reported an improvement in infant and child language development and a reduction in the number of poor outcomes, including crime, substance abuse, child maltreatment, preterm births and associated special needs, and infant mortality. The study also reported that the NFP program resulted in $12,308 Medicaid savings per family served. If Medicaid fully funds the program, it recoups its costs before the child's sixth birthday and recoups 1.4 times its costs by the child's eighteenth birthday. After including its reductions in special education, Child Protective Services, and criminal justice costs, NFP can save the government a total of $19,054 per family served.[4]

In 2002, Sentara Healthcare's OPTIMA Medicaid managed care organization and CHIP of Virginia, a nurse home visitation program, conducted a pilot project on home visitation in Virginia. They developed the Partners in Pregnancy (PnP) program, a community-based pregnancy care collaborative based on the Nurse Family Partnership model. Home visits were provided by trained nurses and social workers who coordinated access to medical care, linked families to community resources, and provided education on prenatal and infant care. The University of North Carolina conducted an analysis and found significant improvements in birth outcomes between the CHIP mothers and a control group, as well as significantly lower short-term medical costs. Overall, the analysis estimated a 26% return on the investment. These savings exclude cost avoidance savings beyond the first year of infancy, which can include savings from fewer subsequent health problems, child abuse and neglect, and special education assignments.[5]

In 2016, the South Carolina Department of Health and Human Services and Nurse Family Partnership launched a Pay for Success (PFS) project to bring home visitation to 3,200 first-time, low-income mothers across the state in the first ever statewide PFS project. The project is funded by both philanthropic funders and through a $13 million 1915(b) Medicaid waiver, which enables the project to be sustainable if it proves to be successful in achieving the

[4] Miller, Ted R., PhD. Nurse-Family Partnership Home Visitation: Costs, Outcomes, and Return on Investment. Rep. Beltsville, MD: HBSA, 2012. Print.
[5] Dubno, Janis A., MBA, Robert H. Dugger, PhD, Debra L. Gordon, MS, David Levin, MD, and Philip A. Peterson, FSA. Early Health "Pay for Success" Social Impact Finance: Scaling Up Prenatal Healthcare in Virginia. Rep. Washington DC: ReadyNation, 2014. Print.

desired outcomes. There are four key outcomes on which NFP's performance will be evaluated: i) Reduction in preterm births; ii) Increase in healthy spacing between births; iii) Increase in the number of first-time moms served in specified high-poverty ZIP codes; and iv) Reduction in child hospitalization and emergency department usage due to injury.[6]

The outcomes in the NFP South Carolina project reference some of the additional, non-medical benefits that home visitation can provide. Some of the most often measured additional outcomes are reductions in child abuse or neglect, as the South Carolina project does, and reductions in family crime and violence. In order to help reduce child abuse and neglect, home visitors can work with parents to improve their childrearing knowledge and skills and to reduce behaviors that are associated with maltreatment. They may also attempt to decrease the numbers of stressors that may make families vulnerable to inappropriate parenting.[7] Home visitation can also work to reduce risky parental behaviors by addressing mental health, substance abuse, and family violence, either directly or through collaboration with other service providers.[8]

OVERVIEW OF VIRGINIA PRENATAL HEALTHCARE & EARLY CHILDHOOD NEEDS

PRENATAL HEALTHCARE AND OUTCOMES

Over the past few years the Commonwealth has leveraged collective action to address the unmet prenatal healthcare and early childhood health needs. However, poor birth outcomes still pose significant challenges to the Commonwealth in terms of the long-term costs and lost productivity as a result of disabilities resulting from preterm birth or low birthweight. Some of the key early childhood challenges posed to the Commonwealth include:

- *Birth Outcomes.* Virginia's birth outcomes closely mirror the national average, with 9.2% of babies being born preterm (national average was 9.7% in 2016). However, poor birth outcomes in Virginia are still an issue and vary significantly across different demographics or geographic areas. In Virginia, the preterm birth rate among black women is 47% higher than the rate among all other women. In 2014, 7.9% of live births in Virginia were born under 2,500 grams. The rate of low birthweight rate incidence varies significantly across planning districts, from 6.0% to 12.3%.[9] In 2016, Virginia was ranked 30th state in the country in the rate of infant mortality, with a rate of 6.5%.[10]
- *Prenatal Care.* In 2014, about one in nine infants (11.8% of live births) was born to a woman receiving inadequate prenatal care in Virginia. Prenatal care refers to pregnancy-related care. During 2010-2012, on average about one in six women of childbearing age (17.7%) was uninsured in Virginia.[11] As discussed above, studies have shown that birth outcomes are closely aligned with prenatal care, income, and other health and lifestyle factors.

[6] South Carolina Department of Health and Human Services. " Fact Sheet: South Carolina Nurse-Family Partnership Pay for Success Project." Fact sheet. Columbia, SC. 16 February 2016. Web.
[7] "Reductions in Child Maltreatment." *Home Visiting Evidence of Effectiveness*. US Department of Health and Human Services. Web. 03 May 2017.
[8] "Reductions in Juvenile Delinquency, Family Violence, and Crime." *Home Visiting Evidence of Effectiveness*. US Department of Health and Human Services. Web. 03 May 2017.
[9] Resident low weight live births and very low weight births by race with percents of resident total live births by planning district and city or county. 2014. Raw data. Virginia Department of Health, Virginia.
[10] Virginia infant and maternal health data. 2016. Raw data. March of Dimes, Virginia.
[11] "Quick Facts: Health Insurance/Income." March of Dimes: Peristats. March of Dimes Foundation. Web. 6 June 2017.

- *Medicaid.*[12] According to DMAS, Virginia's Medicaid eligibility criteria are among the strictest in the nation. Medicaid coverage is primarily available to children in low-income families, pregnant women, elderly, individuals with disabilities, and parents meeting specific income thresholds. Medicaid covers one in every three births in Virginia and over half of its enrollees are children. Medicaid eligibility requirements for pregnant women include: residency in the Commonwealth of Virginia, United States citizenship or meeting certain immigration status requirements, written proof of pregnancy signed by a medical practitioner, and an income below 133% of the federal poverty line.[13]

The short- and long-term costs associated with these adverse outcomes are significant and align with the long-term development goals of the Commonwealth. Nationally, the estimated cost of medical care services for preterm births was $16.9 billion in 2005. The estimated costs associated with disabilities prevalent in preterm infants include $611 million in early intervention services, $1.1 billion special education services, and $5.7 billion in lost household and labor market productivity.[14] Recently, Virginia has been making steady progress in developing and improving services to address unmet needs to its population. With budget challenges of unprecedented scale, elected leaders of both parties are looking for innovative approaches to social sector reform and outcome improvements. Some of the most notable efforts to address these disparities are as follows:

- *Government action.* Establishment of the Children's Cabinet and the Commonwealth Council on Childhood Success to assess programs, services, and resources serving children prenatal to age eight and to develop comprehensive funding recommendations.
- *Public-private partnerships.* The Virginia Early Childhood Foundation was established to forge partnerships with the private sector and focus on advancing school readiness to create a competitive workforce in the Commonwealth.
- *Catalytic advocacy.* The Virginia Chamber of Commerce put early childhood at the top of its priorities in its 2014 strategic plan to the Commonwealth and considers "Pay for Performance" a key priority in all aspects of government activity.
- *Healthcare delivery.* The Virginia Home Visiting Consortium was founded and the Virginia Center for Health Innovation (VCHI) was formed to accelerate the adoption of value-driven coordinated models of wellness and health care throughout Virginia.
- *Workforce.* Workforce and human capital development have emerged as top priorities of business and government with clear recognition of the importance of early childhood development and education.

VDH and the members of the PFS Council recognized the potential role for PFS and home visitation to address an unmet need, provide an innovative approach to improve birth outcomes, and generate value for a number of government agencies. Often, low-income families have limited access to preventative medical care, relying instead on limited and reactive services from emergency clinics or hospitals.[15] Home visitation works to improve healthcare outcomes by helping children and their families gain access to reliable and consistent preventative medical care.

[12] Medicaid provides health and long-term care coverage for 1.3 million Virginians. In Virginia, Medicaid is administered by the Department of Medicaid Administered Services (DMAS), which is under the Secretary of Health and Human Services. Generally, Medicaid is funded 50% by the Commonwealth and 50% by the federal government. Medicaid in Virginia is delivered primarily through Managed Care Organizations (75% of enrollees).

[13] "Medicaid for Pregnant Women." *The William & Mary Healthy Beginnings Project*. The College of William and Mary. Web. 6 June 2017.

[14] Behrman, RE, ed. "Societal Costs of Preterm Birth." Institute of Medicine (US) Committee on Understanding Premature Birth and Assuring Healthy Outcomes (2007). Print.

[15] "What Is Home Visiting?" About CHIP. CHIP of Virginia. Web. 6 June 2017.

The Virginia Department of Health (VDH) and Department of Social Services (DSS) tend to receive the following benefits:

- Decrease in preterm births
- Increase in appropriate birth spacing
- Improved early childhood development
- Avoidance of child neglect and maltreatment
- Improved coordination of care for pregnant women
- Increase enrollment in Medicaid and FAMIS

The Virginia Department of Medicaid Assistance Services (DMAS) receives the following cost avoidance as a result of home visitation:

- Reduction in NICU days
- Reduced birth episode costs
- Reduction in other early childhood and maternal healthcare admissions and utilization

BACKGROUND ON HOME VISITATION IN VIRGINIA

Home visitation has the potential to improve birth and health outcomes for pregnant women and their infants across Virginia. There are a number of agencies within the Commonwealth that provide prenatal home visitation services, the largest of which are CHIP of Virginia and Healthy Families America. Early Impact Virginia (formerly the Virginia Home Visiting Consortium) was established in 2006 to represent the six state-level public and non-profit organizations that deliver home visitation services. Early Impact Virginia provides these organizations with advocacy, professional development, and resources for providers and is supported by the Maternal and Child Health Bureau of the federal Department of Health and Human Services.[16]

The Commonwealth of Virginia has supported home visitation programs using a variety of different models for decades. However, over the past several years there have been a number of significant innovations in home visitation within the Commonwealth. First, there has been new investment in home visitation through the federal Maternal Infant Early Childhood Home Visiting (MIECHV) program. The MIECHV program has enabled home visitation providers in Virginia to expand the reach of their service delivery models. In addition, the Commonwealth has demonstrated interest in enabling public-private collaborations in the home visitation field, which would increase the amount of resources available to home visitation providers to continue to provide high-quality services.

One factor that has led to increased government interest, in Virginia and nationwide, in home visitation and other early childhood interventions have been recent studies on child development showing the detrimental impact of early traumas and stress. This increased understanding of child brain development has also been coupled with a growing evidence base about how home visitation, and similar programs, can help to avoid or mitigate these negative outcomes at a critical juncture in the child's life. [17]

CURRENT HOME VISITATATION FUNDING SOURCES

Home visitation is funded by a combination of federal, state, and Medicaid funding, as well as private donations. In 2015, federal grants from the Maternal, Infant, and Early Childhood Home Visiting Program (Home Visiting

[16] "Early Impact Virginia." Early Impact Virginia. U.S. Department of Health and Human Services. Web. 6 June 2017.
[17] The State of Early Childhood Home Visiting in Virginia. Rep. Early Impact Virginia, Jan. 2017. Web. 6 June 2017.

Program) funded 15,374 home visits to 2,373 parents and children in 1,449 families.[18] Home visitation services are delivered through a variety of different program models and providers, including CHIP of Virginia, Early Head Start, Healthy Families, Parents as Teachers, Project Link, Nurse Family Partnership, and Resource Mothers.

In terms of federal funding, approximately 1,100 families in 45 communities in Virginia receive home visitation services through MIECHV grants awarded to local programs. In addition, approximately 280 families receive home visitation services through the federally funded Healthy Start program, which specifically targets reducing infant mortality. On the state level, VDH contracts with both Resource Mothers and CHIP of Virginia to provide home visitation to a further 27 communities. Finally, DSS contracts with 34 Healthy Families programs that receive state funding, which serve 80 communities.[19] This feasibility study engaged two of the largest home visitation providers in the Commonwealth – CHIP of Virginia and Healthy Families.

[18] Home Visiting Program: Virginia. Rep. Health Resources and Services Administration, 2016. Web. 6 June 2017.
[19] The State of Early Childhood Home Visiting in Virginia. Rep. Early Impact Virginia, Jan. 2017. Web. 6 June 2017.

FEASIBILITY FINDINGS AND INSIGHTS

INTERVENTION ASSESSMENT & DATA ASSESSMENT

An important part of any PFS contract is a complete understanding of how the program model delivers impact to the intended beneficiary population and the particular metrics by which that impact can be measured. The Data Assessment was designed to determine whether there is sufficient access to administrative data to enable measurement of outcomes of interest to potential end payers. The Intervention Assessment was designed to identify the impact of home visiting on priority outcomes that could be used in a Pay for Success contract to help decide which communities to target and scale HV services and provide feedback on evaluation design.

The feasibility study concluded that it is viable to connect PFS success payments to birth record outcomes. The intervention analysis found a 40% reduction in preterm birth rates and a 15% reduction in low birthweight incidence, for individuals who received home visitation vs. the comparison group. The study found that a preterm baby spent an average of 15 more days in the hospital for the birth than a non- preterm baby (19.6 days vs. 4.4 days).

Gaps in the current data infrastructure limited the ability to share and link data across multiple agencies. This limited the study's ability to fully examine mother and child healthcare utilization and costs during, and two years after, birth. In March 2017, Governor McAuliffe signed the Virginia House Bill (HB) 2457 encouraging data sharing from the agencies under the Secretary of Health and Human Resources. HB 2457 could serve as a driving function to convene stakeholders and develop a more modern data infrastructure for the Commonwealth of Virginia that can be used to drive evidence-based change to the Virginia Medicaid system.

To execute the intervention and data assessment, the feasibility study collaborated with key stakeholders to design a retrospective study that linked data from multiple sources and analyzed the data for three primary outcomes – low birthweight, preterm births, and Medicaid expenditures following birth. The study found a 40% reduction in preterm birth rates and a 15% reduction in low birthweight incidence for individuals who received home visitation versus the comparison group. Limitations in sample size and gaps in the data infrastructure limited the feasibility study's ability to further analyze which communities could benefit most from expanded HV services.

Gaps in the current data infrastructure limited the ability to fully examine mother and child healthcare utilization and costs during, and two years after, birth. In March of 2017, the Virginia legislature passed HB 2457, which enables data sharing between agencies within the Department of Health and Human Resources to streamline administrative processes, reduce paperwork and administrative burdens, and improve access to and quality of services provided by the agencies. HB 2457 presents an opportunity to significantly improve upon the current data system and enable stakeholders to identify strategies that could improve maternal and infant health. The home visitation retrospective study can serve as key step in improving data sharing processes to track the outcomes of early childhood services.

The feasibility study concluded that it is viable to connect PFS success payments to birth record outcomes. The results of the retrospective analysis were used to develop economic model scenarios for potential PFS projects using birth outcomes as the basis for payments. Based on the findings of the retrospective study, and local and national research on the cost of home visitation and preterm births, the benefits of reducing preterm birth would

cover about forty percent of the cost of the home visitation intervention. The study also explored a number of potential alternative economic scenarios where the value of the outcomes could more fully cover the cost of the intervention. Alternative scenarios include (i) pursuing a Medicaid waiver to offset intervention costs, (ii) extrapolating Medical costs, (iii) exploring alternative, non-medical outcomes, and (iv) increasing the impact of the intervention by serving a higher risk population or providing wraparound services. As discussed in more detail in the Next Steps section, government end payer commitment and priorities will influence the viability of these economic scenarios. The choice of whether full short-term cost coverage is necessary is dependent on the end payer's priorities.

RETROSPECTIVE DATA STUDY

The feasibility study designed and conducted a retrospective analysis to assess the impact of home visitation on reducing preterm births, incidence of low birthweight, and Medicaid expenditures for low-income pregnant women and their infants.

- *Outcome Question*. Would scaling home visitation services improve birth and maternal health outcomes and reduce Medicaid outlays for women at high risk of preterm or low birthweight infants?
- *Process Question*. Can evaluators leverage existing administrative data systems to analyze birth outcomes and Medicaid funded healthcare costs?

Methodology

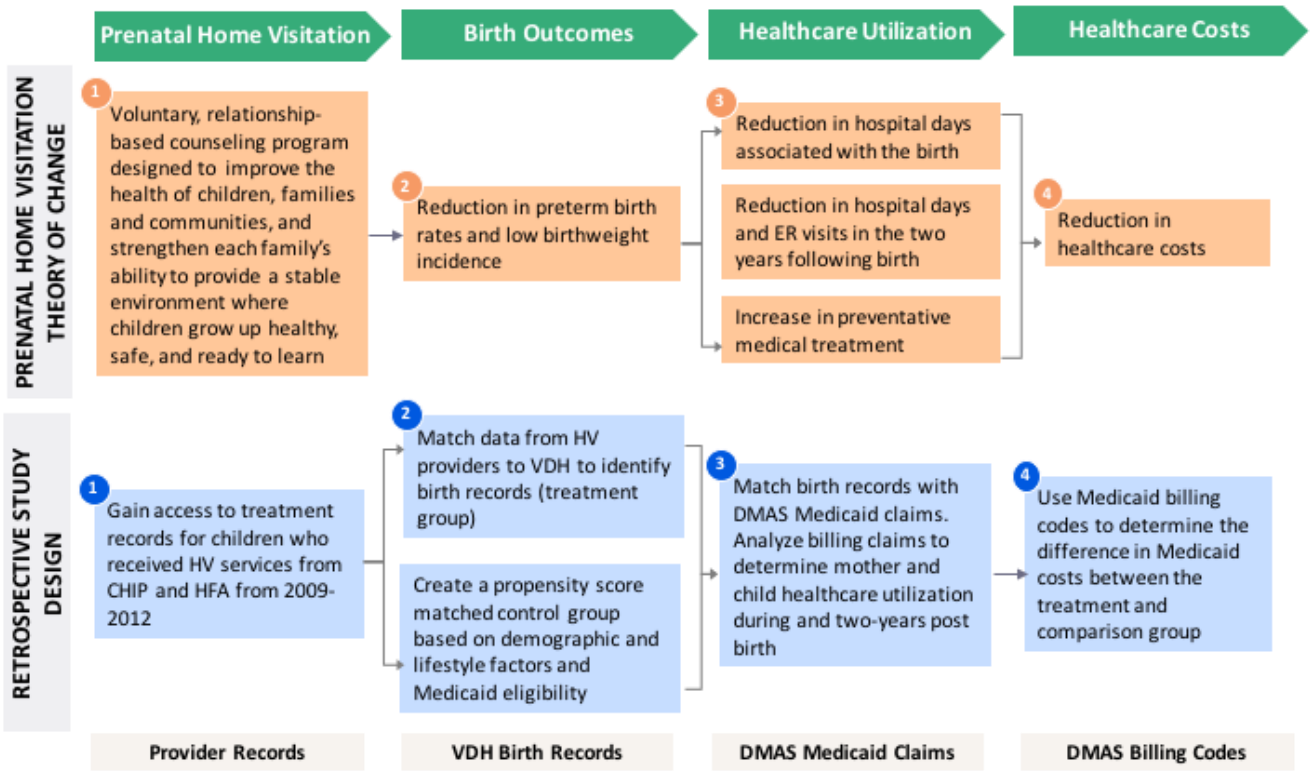
In the summer and fall of 2015, the Data Workgroup established a research design, submitted Institutional Review Board (IRB) protocols, and established public-private data sharing agreements between the University of Virginia (UVA), CHIP of Virginia, Prevent Child Abuse Virginia (Healthy Families), Virginia Department of Health, and Department of Medical Assistance Services (DMAS).

The study gathered data from women who received prenatal home visitation services from CHIP and Healthy Families from 2009-2012. This information was matched with VDH electronic birth records and Medicaid funded health expenditures for care provided to the mother and infant during pregnancy through two years post-birth. The study also identified a matched comparison group, utilizing propensity score matching based on VDH electronic birth records, and similarly matched the infants' electronic birth certificates and Medicaid funded health expenditures for care provided during pregnancy through the child's second birthday. Figure 1 illustrates the home visitation theory of change and how the retrospective study was designed to test this theory of change.

Findings

One of the primary goals of this study was to evaluate the effectiveness of the CHIP and Healthy Families home visitation models using retrospective data analysis. The retrospective study specifically measured birth and early childhood outcomes for treatment groups that received services from either the CHIP or Healthy Families models of home visitation and a comparison group for each. The goal was to compare the outcomes of the treatment and comparison groups and determine the effectiveness of home visitation in avoiding poor birth outcomes and assess which outcomes could generate a cost savings to the Commonwealth.

Figure 1: Home Visitation Theory of Change & Retrospective Study Design



Data Matching

The University of Virginia collected data from 611 women who received prenatal home visitation services from CHIP and Healthy Families from 2009-2012 and met the income requirements for Medicaid. Approximately 68% of the women received prenatal home visitation services from Healthy Families, with the remainder receiving services from CHIP of Virginia. Data matching between the home visitation providers and VDH allowed the project to identify birth records for 486 children (80%) whose mothers received home visitation services. These birth records were propensity score matched to a comparison group of 428 women. However, only 29% of the mothers and 74% of the children from the VDH birth records could be matched to Medicaid claims. Figure 2 (right) illustrates the matching process.

Figure 2: Retrospective Study Data Matching Process

	CHIP		Healthy Families		All	
Original	196		415		611	
VDH	131 (67%)		355 (86%)		486 (80%)	
DMAS	Mom	Child	Mom	Child	Mom	Child
	41 (31%)	92 (70%)	98 (28%)	264 (74%)	139 (29%)	356 (74%)

In discussion with DMAS, VHI, and other healthcare professionals, the project was able to gain some insight into possible causes of the missing Medicaid claims:

i. *Self-reporting.* The medical payer on the birth record is a self-reported data field and does not always reflect the true payer. The matched comparison group for the study is entirely comprised of individuals who mark Medicaid as the payer on the birth record, but only 70% of these children actually had Medicaid

as the payer. Both VHI and DMAS were not surprised by this finding and were aware of the mismatch between the self-reported data on the birth record and Medicaid claims.

Given these findings, if success payments were based on savings to Medicaid, the PFS project would need to be aware of this limitation when refining the target population and referral pathway and when pricing success payments. The project could either (i) create a referral pathway that ensures all participants are enrolled in Medicaid or (ii) discount success payments based on the assumption that only some participants will be enrolled in Medicaid.

ii. *Medicaid enrollment*. Medicaid enrollment for the mother, even for emergency birth coverage, is very onerous. Medicaid is the payer of last resort and, even if the mother is eligible, the application process is difficult and many people do not complete it. Before moving forward, the project needs to learn more about the categories for Medicaid eligibility, the process for enrollment, and what alternative payment mechanisms the mothers might be utilizing.

iii. *DMAS and VDH data infrastructure and matching process.* DMAS matches birth records and claims based on four factors (first name, last name, date of birth, and social security number). If one of these four criteria do not match, the Medicaid claim cannot be released. For example, if the mother has Sue on the birth record, but the name on the Medicaid claim is Susan, then the claim cannot be released. This is because HIPAA requires DMAS to be sure that they are releasing the correct claim to the correct person and therefore need all four criteria to match. The limitations in matching between DMAS and VDH highlight the need for an integrated data system.

Project partners are unable to confirm if the missing Medicaid claims represent a particular sub-population and therefore could be skewing the results. VHI and DMAS have been unable to provide any guidance on if the matching process could have produced any selection bias. A review of literature indicates that at least some studies have found that preterm birth and low birthweight reported from Medicaid claims may underestimate the actual rate.[20]

Birth Records

The study found a 40% reduction in preterm birth rates and a 15% reduction in low birthweight incidence for individuals who received home visitation as compared to the comparison group. The comparison group had a preterm birth rate of 11.93%. The treatment group had a preterm birth rate of 7.21%. This treatment group preterm birth rate is also lower than the average preterm birth rate in Virginia, which is 9.21% (Figure 3).[21]

Figure 3: Treatment and Control Group Outcomes for LBW and Preterm Birth

Prenatal Treatment Group			
Preterm Flag (< 37 Weeks)	LBW Flag (< 2,500 Grams)		
	No	Yes	Total
No	87.86%	4.94%	92.80%
Yes	2.67%	4.53%	**7.20%**
Total	90.53%	**9.47%**	100.00%

Prenatal Control Group			
Preterm Flag (< 37	LBW Flag (< 2,500 Grams)		
	No	Yes	Total
No	83.74%	4.32%	88.07%
Yes	5.14%	6.79%	**11.93%**
Total	88.89%	**11.11%**	100.00%

[20] Emmanual A. Anum, et al. "Medicaid and Preterm Birth and Low birthweight: The Last Two Decades." *Journal of Women's Health,* 2010 Mar, 19(3): 443-451

[21] 2016 Premature Birth Report Card: Virginia. Rep. March of Dimes Foundation, 2016. Web. 6 June 2017.

The project analyzed a number of sub-groups of the population to gain insight on how impact differs by provider, intensity of services, and demographics. These findings are discussed in Appendix A.[22]

Medicaid Records

The study found that a preterm baby spent an average of 15 more days in the hospital for the birth than a non-preterm baby (19.6 days versus 4.4 days). Limited technical assistance and the lack of a DMAS data dictionary led to confusion in the Medicaid coding and multiple Medicaid billing types, which prohibited the study from understanding the difference in Medicaid costs between the treatment and control group.[23]

Discussion on Retrospective Study

The study revealed that home visitation likely has a positive impact on preterm birth and low birthweight. The feasibility study also highlighted several key areas where the Commonwealth's health data infrastructure could be improved. Specifically, two critical gaps limited the ability to measure health and human services program outcomes and understand how that data could be shared to enable ongoing improvement of programs and services.

- *Lack of an Integrated Data System*. The current system is not designed to easily or comprehensively link VDH birth records and DMAS claims. When birth records were linked to DMAS, only about 75% of the children in the treatment group had Medicaid claims. Within this group, only about 30% of the children with birth records had a corresponding mother with Medicaid claims. The study was able to identify some potential causes for this drop-off, including inaccuracies in self-reported Medicaid status and the complexities of the current four-part matching process between the VDH and DMAS databases. If comprehensive health data is included in the Virginia Longitudinal Data System (VLDS), many of these problems could be overcome.

- *Technical Expertise and Partner Capacity*. State agencies often do not have the time or expertise to thoroughly examine the data they collect. Agency regulation, lack of resource commitment, and disjointed and infrequent communication made it difficult to access databases and procure data to build the comprehensive dataset that would have facilitated a robust analysis. Capacity constraints prohibited DMAS from being able to provide specific utilization categories and actual paid cost for each of these utilizations. Instead, they could only provide the raw claim and encounter data and Fee-for-Service claim cost data.[24]

In March 2017, Governor McAuliffe signed the Virginia House Bill 2457 encouraging data sharing from the agencies under the Secretary of Health and Human Resources. HB 2457 states that "agencies within the Department of Health and Human Resources will share data, records, and information about applicants for and recipients of services from across all agencies, including individually identifiable health information. The goal of this measure is

[22] This report reflects data from the retrospective study through May 2017. The Virginia Home Visiting Outcome Analysis was updated in June 2017.

[23] DMAS was unable to provide a data dictionary that explains each variable in the data set, making it extremely complicated to categorize and understand the over 800,000 claims and encounters in the data set. The lack of data led to confusion in what each variable means and delays in data analysis as the project worked to figure out a data dictionary. The project was able to work around this hurdle by formulating a request with Virginia Health Information (VHI), which provided proxy costs for each utilization.

[24] VDH and DMAS were unable to provide specific points of contact that could be fully engaged and buy-into the project. The lack of specific points of contact caused delays and gaps in the data later in the project. Additionally, Obtaining the DMAS data proved to be a challenge. The original data sharing agreements, IRB protocols, and research design explicitly states in specific utilization categories (inpatient, NICU, office visits, etc.) and the actual paid cost for each of these utilizations. During the summer of 2016, DMAS informed the Data Workgroup that it was unable to provide this critical information. DMAS stated they could only provide the raw claim and encounter data (not in utilization categories) and only Fee-for-Service claim cost data, not the encounter cost data from the MCOs. Moreover, DMAS would only provide the data if they received at least $6,000 payment.

to streamline administrative processes, reduce paperwork and administrative burdens, and improve access to and quality of services provided by the agencies." This bill is a significant step toward modernizing the Commonwealth's Medicaid data system. This bill is instrumental in starting the process of improving these antiquated systems and improving the Commonwealth's health data so that it can be used to drive evidence-based change to the Virginia Medicaid system. Moving forward, using the challenges faced in this study as an impetus for modernizing Virginia's health data infrastructure is essential.

Government initiatives, non-profit organizations, academic partners, and healthcare organizations have developed innovative approaches to improve access to high-quality health services. Yet these key stakeholders have not come together to identify which shared outcomes are the highest priority, what data they would need to measure progress toward those outcomes, or how that data can be shared to enable ongoing improvement of programs and services. HB 2457 could serve as a driving function to convene stakeholders and develop a more modern data infrastructure for the Commonwealth of Virginia.

PAY FOR SUCCESS ECONOMIC SCENARIOS

The economic analysis demonstrates the interaction between assumptions of the status quo outcomes of the target population, the intervention's cost, and the intervention's impact. The intent of the hypothetical models is to present the considerations that will need to be addressed and negotiated with project parties during the construction of a PFS project.

The retrospective study used the findings above to develop economic model scenarios for potential PFS projects using birth outcomes as the basis for payments. Below are the primary assumptions for the economic model.

- *Number of Children.* The economic model assumes the PFS project serves a total of 2000 mothers (500 mothers per year for 4 years).
- *Cost of the Intervention.* The economic model assumes that cost of prenatal home visitation is $2,500. This assumption is based on conversations with CHIP.
- *Success Payment Outcome*. Reduction in preterm birth rates
- *Impact Rate.* The target impact level for the PFS project is set as a 30% reduction in preterm birth.[25]
- *Cost per Preterm Birth.* The cost per preterm birth is estimated to be $30,000.[26]

[25] The retrospective study found that home visitation was associated with a 40% reduction in preterm births. To decrease the risk of the project for funders and service providers, the target impact level for the demonstration project will be a 30% reduction in preterm births.

[26] Limitations in the Virginia healthcare data infrastructure prevented the retrospective study from being able to determine the medical costs of preterm versus non-preterm births. Therefore, the feasibility study relied on national studies to estimate the cost of a preterm birth. When analyzing national studies and developing a cost estimate for the Virginia PFS feasibility study, the team considered - (i) costs included in the studies estimates (i.e. inpatient and outpatient costs, child costs, mother costs, etc.), (ii) inflation rates, and (iii) characteristics of the babies included in the study (i.e. average days spent in the hospital, gestational ages, etc.). The feasibility study assumed that the cost of preterm and low birthweight births is similar in Virginia as the national average and considered the cost of inflation. Based on this information, the feasibility study estimated the avoidable inpatient costs associated with a preterm birth at $30,000. Two studies that helped influence this number were:

- An analysis from the Agency for Healthcare Research and Quality found that average hospital costs (2011 dollars) were significantly higher for newborns with conditions such as preterm birth ($21,500), low birth weight ($27,200), and/or respiratory distress syndrome ($54,900) compared to all newborns ($3,200). Newborns born preterm stayed in the hospital for an average of 14.3 days, compared to an average of 17.7 days for low birthweight babies, and 3.4 days for all live hospital births. (Source: Kowlessar NM (Social & Scientific Systems, Inc.), Jiang HJ (AHRQ), and Steiner C (AHRQ). Hospital Stays for Newborns, 2011. HCUP Statistical Brief #163. October 2013. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb163.pdf.)
- In 2007, the Institute of Medicine estimated that the medical care costs (inpatient and outpatient) for preterm births were $31,571 (2005 dollars). The medical care costs for babies by gestational age were; $11,415 (32-36 weeks), $100,725 (28-31 days), $198,945 (<28 weeks). The report did not provide a breakdown on the number of preterm babies that fell into each gestational age category. (Source: Institute of Medicine (US) Committee on Understanding Premature Birth and Assuring Healthy Outcomes; Behrman RE, Butler AS, editors. Preterm Birth: Causes, Consequences, and Prevention. Washington (DC): National Academies Press (US); 2007. 12, Societal Costs of Preterm Birth. Available from: https://www.ncbi.nlm.nih.gov/books/NBK11358/)

Based on the findings of the retrospective study, and local and national research on the cost of home visitation and preterm births, the benefits of reducing preterm birth would cover about forty percent of the cost of the home visitation intervention (Figure 4: Economic Scenario A). The average medical benefits associated with a preterm birth episode per family served is $1,074. This finding is similar to the findings of the 2012 Cost-Benefit analysis, which concluded that the average benefits of fewer preterm first births per family served were $1,944 (Medical/Mental health benefits made up 67% ($1,300) of the benefits, special education costs and work loss costs represented the remaining 33% ($650)).[27]

Figure 4. Economic Scenario A

Project Assumptions	
Number of Children	2000
Cost of the Intervention	$2,500
Cost per Preterm Birth (Medicaid)	$30,000

Preterm Birth Rates	
Baseline Preterm Birth Rate	11.93%
HV Impact: Reduction of Preterm Birth Rates	30.00%
Treatment Group Preterm Birth Rates	8.35%

Project Costs	
Treatment Group Preterm Birth Costs	$5,010,600
Control Group Preterm Birth Costs	$7,158,000
Savings from Avoided Preterm Births	$2,147,400
Avoided Cost per Child Enrolled in Treatment	$1,074
Portion of Funding Covered by Savings	43%

Number of Children
X
Preterm Birth Rates
X
Control Group Preterm Birth Costs
-
Savings from Avoided Preterm Births
/

The costs benefit analysis above only includes average cashable medical benefits associated with avoided preterm birth incidents and assumes the Commonwealth is the primary funder of home visitation services. To develop a viable PFS project, the government could (i) use the economic analysis above and enter a partial pay for success project, (ii) pay a larger price per outcome based on additional value generated from the project, or (iii) explore alternatives to increase the portion of funding covered by cashable savings. A partial PFS scenario is discussed in more depth on page 24.

To increase the portion of government funding covered by savings, the project could explore a number of alternatives to evaluate additional outcomes, increase impact, increase the price per outcome, or decrease costs to the Commonwealth. Figure 5 below illustrates a number of these scenarios.

Pay for Success drives government resources toward high-performing social sector programs. PFS projects evaluate outcomes and align incentives to ensure the efficient use of government resources and taxpayer dollars. The value of each outcome can be based on (i) cashable savings, (ii) social benefits and (iii) political mandates. Political mandates recognize the importance of providing services to address unmet needs gaps in traditional services. The value placed on each outcome will be based on the priorities of the government end payer and their motivations for pursuing the PFS model.

[27] Miller, Ted R., PhD. Nurse-Family Partnership Home Visitation: Costs, Outcomes, and Return on Investment. Rep. Beltsville, MD: HBSA, 2012. Print.

The viability of any of the scenarios below will depend on the preferences of the government end payer. Pay for Success projects evaluate outcomes and align incentives to ensure the efficient use of government resources and taxpayer dollars. The value of each outcome can be based on (i) cashable savings, (ii) social benefits (i.e. work loss, family functioning, social or emotional well-being, etc.), and (iii) political mandates. Political mandates recognize the importance of providing services to address unmet needs gaps in traditional services. Scenario A above only includes the cashable savings value of avoided preterm birth. Scenario B below places a larger value on the outcome, and serves as a hypothetical value that includes some social benefits. The value placed on each outcome will be based on the priorities of the government end payer and their motivations for pursuing the PFS model.

Figure 5: Economic Scenarios B&F

Project Assumptions					
	Scenario B	**Scenario C**	**Scenario D**	**Scenario E**	**Scenario F**
Number of Children	2000	2000	2000	2000	2000
Cost of the Intervention	$2,500	$2,500	$2,500	$2,500	$2,500
Cost covered by Medicaid Waiver	$0	$0	$1,250	$1,250	$0
Cost covered by Commonwealth	$2,500	$2,500	$1,250	$1,250	$2,500
Cost per Preterm Birth (Medicaid)	$50,000	$30,000	$30,000	$30,000	$30,000
Preterm Birth Rates					
	Scenario B	**Scenario C**	**Scenario D**	**Scenario E**	**Scenario F**
Baseline Preterm Birth Rate	11.93%	16.00%	11.93%	14.00%	11.93%
HV Impact: Reduction of Preterm Birth Rates	30.00%	40.00%	30.00%	35.00%	30.00%
Treatment Group Preterm Birth Rates	8.35%	9.60%	8.35%	9.10%	8.35%
Project Costs					
	Scenario B	**Scenario C**	**Scenario D**	**Scenario E**	**Scenario F**
Treatment Group Preterm Birth Costs	$8,351,000	$5,760,000	$5,010,600	$5,460,000	$5,010,600
Control Group Preterm Birth Costs	$11,930,000	$9,600,000	$7,158,000	$8,400,000	$7,158,000
Savings from Avoided Preterm Births	$3,579,000	$3,840,000	$2,147,400	$2,940,000	$2,147,400
Savings from Avoided Child maltreatment					$3,000,000
Savings from Addition Medical Costs					$1,000,000
Avoided Cost per Child Enrolled in Treatment	$1,790	$1,920	$1,074	$1,470	$3,074
Portion of Funding Covered by Savings	72%	77%	86%	118%	123%

Scenario B: Larger payments per outcome. The cost per preterm birth in Scenario A only considers the child's medical costs directly associated with the birth episode. Studies have shown that preterm babies continue to have higher than average medical costs. The project could explore ways to value medical costs associated with the hospital or ER visits during the first two years of the child's life. Scenario B models a potential demonstration project if the cost per preterm birth was valued at $50,000. The viability of this scenario depends on the government's willingness to pay for costs beyond the cashable savings associated with the preterm birth episode.

Scenario C: Higher risk population and/or larger impact. The baseline preterm birth rate in Scenario A is based on the preterm birth rate in the retrospective study's comparison group. The project could refine the eligibility to target a higher risk population. Risk factors associated with preterm births include: previous preterm births, late or

no healthcare during pregnancy, smoking or drug use during pregnancy, age, and race.[28] The project should consider if serving a higher risk population would increase the cost of the intervention. The service providers could also expand wraparound services (i.e. substance use treatment), or partner with other organizations that provide additional services to increase the impact of the intervention. The viability of this option depends on the operational ability to refer and enroll a higher-risk population and the intervention's ability to achieve impact for the higher risk population.

Scenario D: Medicaid waiver. The preliminary economic model in Scenario A assumes Health and Human Resources pays for the full cost of the intervention. The project could pursue a Medicaid waiver to partially cover the cost of the intervention. Scenario C below models a scenario where a Medicaid waiver cover half the cost of the intervention.

Scenario E: Medicaid waiver and higher risk population: Scenario E presents a combination of Scenario C and Scenario D.

Scenario F: Alternative Outcomes. Home visitation is designed to improve the medical, social, and educational outcomes of families.[29,30 ,31] To date, the feasibility study has focused on health outcomes. The project could potentially expand its range of potential outcomes to include child welfare outcomes or additional health outcomes beyond preterm birth, low birthweight, and other poor birth outcomes.

RECAP AND NEXT STEPS

The Data Assessment was designed to determine whether or not there is sufficient access to administrative data to enable measurement of outcomes of interest to potential end payers. The data assessment revealed that, under the current data infrastructure, a PFS project could use VDH electronic birth records to evaluate home visitation's impact on preterm birth or low birthweight. Given the limitations in the data infrastructure, outcomes could not currently be linked to Medicaid utilization and costs.

The Intervention Assessment was designed to identify the impact of home visiting on priority outcomes that could be used in a Pay for Success contract, decide communities in which to target and scale HV services, and provide feedback on the evaluation design. The intervention analysis found a 40% reduction in preterm birth rates and a 15% reduction in low birthweight incidence for individuals who received home visitation versus the comparison group. Limitations in sample size and complexities in the data analysis limited the ability of the project to explore communities in which it could target and scale HV services.

[28] 2016 Premature Birth Report Card: Virginia. 2016; "What Are the Risk Factors for Preterm Labor and Birth?" National Institutes of Health. U.S. Department of Health and Human Services, 2015. Web. 02 Feb. 2017.

[29] Home visitation studies nationwide have studied the effect of home visitation on a reduction of childhood injuries and child maltreatment, along with a number of other early childhood costs. A systematic review of randomized controlled trials of interventions designed to decrease child abuse in high-risk families found that Healthy Families New York, and other home visiting programs, demonstrated a significant reduction in child abuse. (source: Elizabeth J. Level, et al. "A systematic review of randomized controlled trials of interventions designed to decrease child abuse in high-risk families." *Child Abuse and Neglect,* vol 65, March 2017, pp. 48-57)

[30] A systematic review of 30 Nurse-Family Partnership (NFP) evaluations found a 38% reduction in injuries treated in emergency departments (ages 0-2) and a 31% reduction in child maltreatment (ages 4-15) when first-time low-income mothers received NFP home visitation services. (source: Ted R. Miller, Ph.D. "Nurse-Family Partnership Home Visitation: Cost, Outcomes, and Return on Investment." April 2013, DOI: 10.13140/2.1.1508.54400)

[31] The South Carolina NFP Home Visitation project has a payable outcome based on a reduction in child emergency department visits (outpatient) and hospitalizations (inpatient) of the index birth due to acute injury within the 24-month period following the first child's date of birth. (source: Pay for Success Contract among South Carolina Department of Health and Human Services and Nurse-Family Partnership and The Children's Trust of South Carolina. Dates April 1, 2016.)

Given the limited sample size and binary nature of the birth record outcomes, the project recommends using a rate card evaluation approach. In a rate card approach, the government end payer would identify outcomes of interest and the amounts they are willing to pay for each outcome. For this project, that would be paying for each full-term birth and each birth >2500 grams. The evaluation will use available Commonwealth administrative resources to pull electronic birth certificates from the Virginia Department of Health (VDH) to assess targeted birth records. All data will be pulled on an individual basis and de-identified prior to transmission to the evaluator.

The economic analysis revealed that, based on the findings of the retrospective study and existing research on the cost of home visitation and preterm births, the benefits of reducing preterm births would cover about 40% of the cost of the home visitation intervention. Based solely on economic savings, a partially contingent PFS project could be constructed based on the evidence to date. To increase the portion of government funding covered by savings, the project could explore a number of alternatives to evaluate additional outcomes, increase impact, increase the price per outcome, or decrease costs to the Commonwealth.

The viability of exploring these alternatives will depend on the preferences of the government end payer. Pay for Success projects evaluate outcomes and align incentives to ensure the efficient use of government resources and taxpayer dollars. The economic value of each outcome can be based on (i) cashable savings, (ii) social benefits (i.e. work loss, family functioning, social or emotional well-being, etc.), and (iii) political mandates. Political mandates recognize the importance of providing services to address unmet needs gaps in traditional services. The value placed on each outcome will be based on the priorities of the government end payer and their motivations for pursuing the PFS model.

END PAYER, LEGAL AND REGULATORY ASSESSMENT

Performance-based funding requires an end payer to transition standard service reimbursement contracts into outcomes-based payments contracts. The feasibility study explored options for potential success payments for meeting certain infant, maternal, and health outcomes. The study also conducted a legal and regulatory assessment to determine how the Commonwealth could structure an outcomes-oriented contract. Although the legal and regulatory assessment was conducted for the home visitation feasibility study, it can also be applied more broadly to outcomes-oriented initiatives across the Commonwealth.

The feasibility study determined that agencies under the Secretary of Health and Human Resources could serve as the home visitation end payer entity through a social impact guarantee (SIG) model (Figure 6). The targeted outcomes of home visitation provide benefits and cost avoidance to multiple Health and Human Resources (HHR) agencies, including VDH, Virginia's Department of Social Services (DSS), and Virginia's Department of Medicaid Assistance Services (DMAS). The preliminary economic model indicates that there may be a benefit in continuing to explore additional potential end payers or sources of funding to supplement the funding from HHR.

Performance-based funding requires an end payer to transition standard service reimbursement contracts into outcomes-based payments contracts. The feasibility study determined that agencies under the Secretary of Health and Human Resources could serve as the home visitation end payer entity through a social impact guarantee (SIG) model.

The SIG structure presents the most promising pathway to address funder concerns and Virginia regulatory requirements. In the SIG model, the government provides upfront financing to the service provider and receives a repayment from a letter of credit or escrow account funded by private funders only if social service providers do not achieve target outcomes. To test an outcomes-oriented model, the Commonwealth would launch a demonstration project in which the HHR agency holds or claws back a portion of existing home visiting (HV) funding from the State budget for a small-scale PFS pilot with payments contingent on

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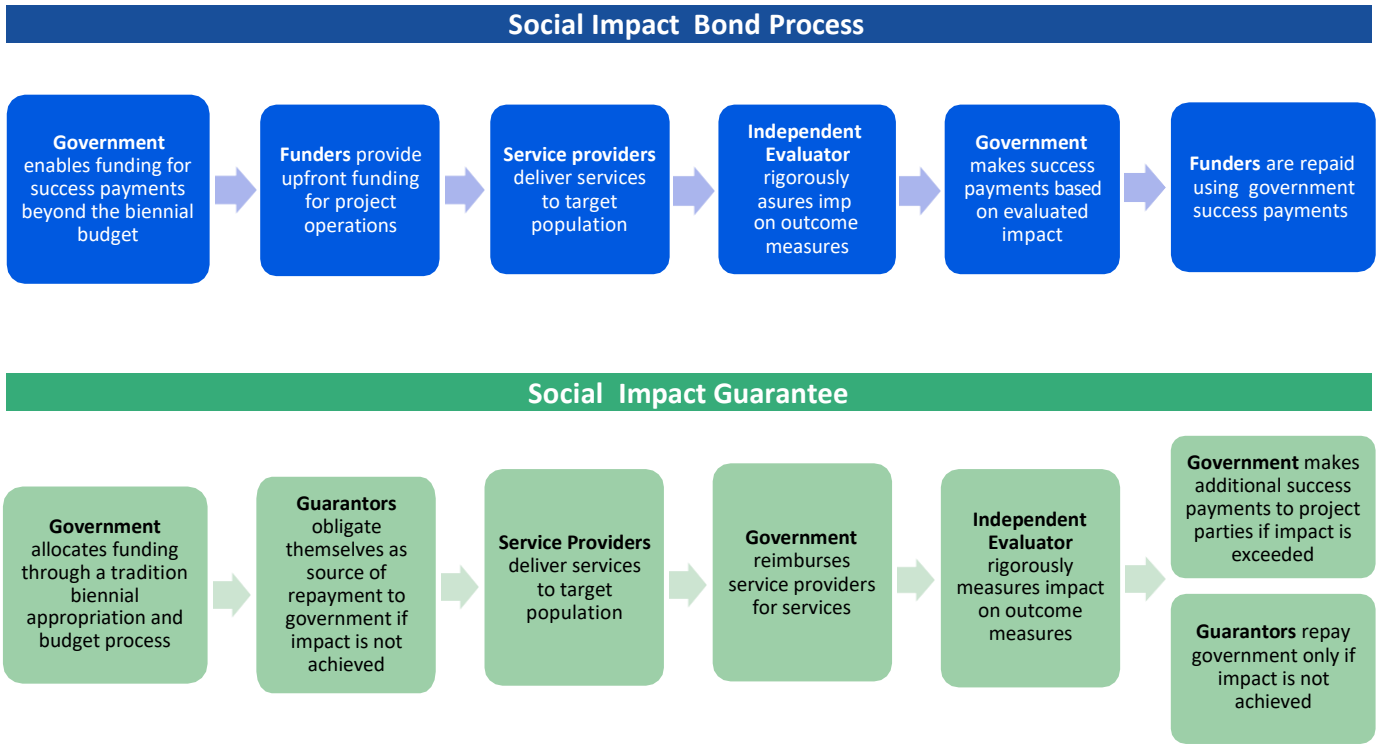
A government agency can structure full or partial contingent funding in a project with no additional funding required. There would also be no funding withheld beyond the contracting year, enabled by amending the funding stream's budget language to induce a provision to claw back a portion of payments if the predetermined outcomes are not achieved. A language-only budget amendment would substantially accelerate not only the home visitation PFS project, but also the PFS model generally. It could also help to generate philanthropic attention to, and funding for, other programmatic issues in the Commonwealth.

Figure 6: Social Impact Guarantee Process Compared to a Social Impact Bond



END PAYER ASSESSMENT

The feasibility study explored four potential end payers who receive either the benefits or cost avoidance resulting from home visitation. The three potential end payers are: the Department of Health (VDH), the Department of Social Services (DSS), and the Department of Medicaid Assistance Services (DMAS), all of which lie within the Virginia Department of Health and Human Resources. A fourth potential end payer considered were managed care organizations (MCOs), which could benefit from improved outcomes and decreased costs. Below are the types of payer arrangements considered:

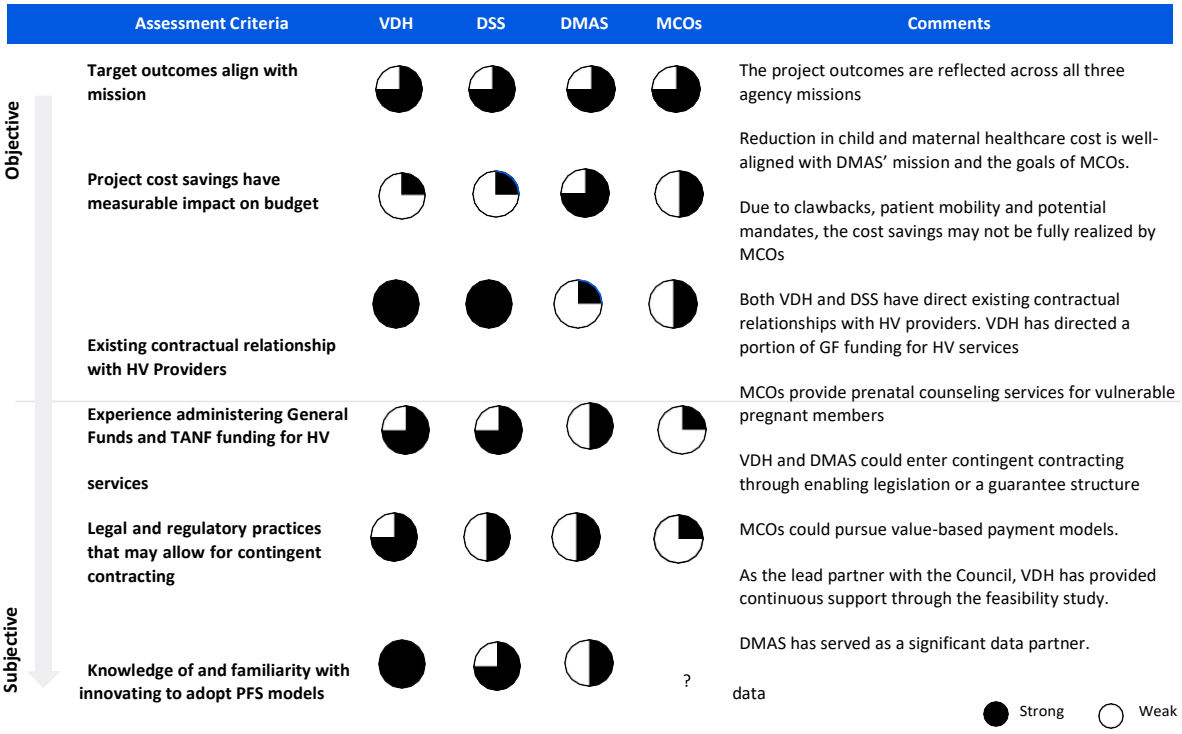
- *Medicaid Payer.* State and Federal Medicaid agencies make PFS payments based on realized savings and on health outcomes achieved. However, the process and regulations to navigate and gain approval for Medicaid waivers present a longer pathway to execution.
- *Managed Care Organization.* An MCO makes success payments on their direct cost savings accrued for targeted Medicaid members (compared to a baseline or control group) and clinical outcome improvements. MCOs primarily raised concerns about the annual capitated rate setting arrangement with the Commonwealth, which could potentially claw back any cost savings achieved, thereby losing flexibility from State-mandated programming. Another area of concern is the movement of participants from their MCO insurance coverage after fee for service (FFS) payments are made but before longer term savings have been accrued.
- *Government / MCO Payer.* Government entities and MCOs agree to maintain capitated payment rates on the beneficiary population and make shared PFS payments based on a realized savings and outcome improvements. The option would require collaborative interest and engagement from MCOs.

- *Government Payer.* A Commonwealth Health and Human Resource agency (VDH or VDSS) serves as the end payer entity through (i) state legislation that enables contingent payments to be made for a PFS project over multiple years or (ii) a language only budget amendment enabling an outcomes-based contingent clawback. These agencies currently hold home visitation contracts, which could be repurposed to enable contingent payments.

The feasibility study assessed the viability of each end payer arrangement by engaging key stakeholders, capturing their areas of interest and concern, and examining each organization against a set of key criteria (Figure 7). The criteria sought to:

- *Identify* which entity stands to benefit the most from achieving target outcomes.
- *Determine* the availability of funds within each organization for performance-based home visitation services.
- *Assess* the support within each organization for data-driven evidence-based policymaking.

Figure 7. Considerations for Determining an End Payer Agency(s)



The assessment, and conversations with key stakeholders, revealed that HHR, the umbrella organization above DSS, VDH, and DMAS, was the most suitable end payer. HHR can best align its strategic initiatives with the long- term value of the project:

- HHR provides oversight of DMAS and therefore has potential to capture cost savings through the long-term reduction of Medicaid capitated payments.[32]

[32]Reduction in child and maternal healthcare cost is well-aligned with DMAS' mission and the goals of MCOs. MCOs representatives expressed a number of concerned about their ability to realize cost savings for several reasons, including (i) high-member turnover. Members frequently move between MCOs based on relocations, choice, or random assignment when a first covered child is born. If MCOs invest in providing expanded home visitation services, it may be that the child will not be a member of the MCO for long enough for the MCO to recoup the child's costs through reduced downstream medical costs, (ii) Capitation rate adequacy. Capitation rates do not reflect the true costs of serving high-risk infants, and there is the risk that future capitation rates could be adjusted to reflect savings. If the capitated rates were adjusted, the Commonwealth and Federal government would recognize more of the benefits than the MCO, and (iii)

- HHR provides oversight to Health and Human Resources and improvement of health outcomes for pregnant women and children align with the mission of the organization.
- HHR's role includes systems transformation and health reform, which aligns with data-driven policy- making.
- HHR serves as a steward of taxpayer money. Clawback rights or justified bonus payments will help to ensure the responsible use of taxpayer money.

LEGAL AND REGULATORY ASSESSMENT

Performance-based contracts can be structured in several ways. The different structures all link rigorously measured outcomes to payment. To launch a traditional PFS project, the Commonwealth would need to reform standard service reimbursement contracts into outcomes-based payment contracts. It will also need to mitigate appropriation risk by establishing a mechanism to maintain funding for success payments beyond a biennial budget. State regulations restrict any funding to be carried over beyond a two year budget. For a traditional Pay for Success project, an explicit constitutional amendment would be required to enable a sufficient payment mechanism appropriate for the PFS structure. The amendment would then authorize Commonwealth offices, departments, and agencies to enter into a standard PFS contract. Alternative performance-based contracting approaches include:

- *Partial PFS.* Government and private funders provide upfront financing to cover project costs for a service provider. If the service provider achieves outcomes, they receive success payments from the government. Under this structure, as with the traditional PFS structure, the risk remains that any project requiring longer than two years of evaluation to determine outcomes will not have a feasible payment mechanism.
- *Performance-Based Contract with Bonus Payments.* Government provides upfront financing to a service provider and makes bonus payments only if outcomes are achieved.
- *Social Impact Guarantee (SIG).* Government provides upfront financing to a service provider, and receives a re-payment from a predetermined guarantee provided by private funders only if social service providers do not achieve target outcomes.

The Social Impact Guarantee presents the most promising pathway to address funder concerns and Virginia regulatory requirements. A Government agency would provide traditional direct funding to a project through a biennial appropriation and budget with a contingent claim for repayment from a bond or escrow account funded by private funders based on evaluation of outcomes. Guarantors and the Government agency would share any upside benefit above program, project, and financing costs.

A Government agency can structure an outcomes-based project with no additional funding required and no funding withheld beyond the contracting year by using a language-only budget amendment. A language-only budget amendment works by amending the funding stream's budget language to introduce a provision to claw back a portion of payments if the predetermined outcomes are not achieved. This language only budget amendment would (i) distinguish and impose conditions on previously authorized spending for program services,
(ii) direct applicable Government agencies to deploy these funds for service delivery pursuant to the parameters outlined for the demonstration project, (iii) require that the contingent funding be subject to clawback if

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Mandates. If a demonstration is successful in reducing costs, the Commonwealth might design to mandate that MCOs provide home visitation services, resulting in losses because of the above reasons.

achievement of the specified performance metrics are not met, and (iv) consider the outcomes of the independent evaluation of those services and the results of the PFS study to determine the feasibility of a large-scale PFS project. A language-only amendment would substantially accelerate not only the home visitation PFS project, but PFS more generally. It will also increase philanthropic attention to, and funding for, various programmatic issues in the Commonwealth.

ILLUSTRATIVE HOME VISITATION OUTCOMES-ORIENTED CONTRACTING SCENARIOS

The feasibility study created a draft economic model to demonstrate how the full or partial SIG structure could be applied to contracts in the Commonwealth. The illustrative projects are specific to the home visitation, but represent the overall SIG structure and could be adapted for other performance-based projects. Key project features and assumptions are shown in Figure 8.

Figure 8: Key Project Features & Assumptions

Timeline	July 2018-June 2023 (FY19-FY24)
Target Population	Low-income and high-risk pregnant women
Enrollment Period	July 2018-June 2022 (Four annual cohorts)
Average Service Period	One year from enrollment date
Evaluation Observation Period	18 months from enrollment date
Target Outcome Metrics	• Reduction in pre-term births • Increase in birth spacing • Reduction in child & maternal healthcare costs • Reduction in child maltreatment
Program & Admin Costs	• Direct home visitation service • Other program administrative and overhead
Evaluation, Financing and Other Project Costs	• Evaluation • Financing (interest) cost of private funding • Intermediary fiscal agent • Transaction coordination • Legal Advisory
Maximum Contract Value	State Direct Program Funding + Bonus Success Payment capped at $6,000,000
Commonwealth/Funder Shared Upside	50/50 shared upside aboce program, project, and financing costs

Partially Contingent Project Assumptions	
Number of children/year	500
Cost of the Intervention	$2,500
Number of years	4
Cost of Services	$5,000,000
Contigent Funding	$1,500,000

Preterm Birth Rates		
	Scenario A-1	Scenario A-2
Baseline Preterm Birth Rate	11.93%	11.93%
HV Impact: Reduction of Preterm Birth Rates	30.00%	15%
Treatment Group Preterm Birth Rates	8.35%	10.14%

Illustrative Project Success Earnings		
	Scenario A-1	Scenario A-2
Pre-term Birth Reduction	$2,147,400	$1,073,700
Total Project Success Earnings	**$2,147,400**	**$1,073,700**

Under the SIG structure, the Commonwealth provides both direct program funding through traditional contracted direct service and program administration funding and bonus success payments that are contingent on success earnings calculated based on evaluation outcomes achieved. The direct program funding is eligible for a clawback if target outcomes are not met. Bonus success payments are calculated as the amount of success earning net of direct program funding.

Private funders provide (i) funds to the contingent match account or letters of credit, (ii) funding evaluation, and (iii) other PFS project costs. Funders simultaneously deposit an equal amount as the State Direct Program funding. The funds are eligible to be released to funders contingent on successful evaluation outcomes. Funds are eligible to be released to the Commonwealth contingent on outcomes being lower than targets. Funders also provide upfront funding for project costs not included in the Commonwealth's direct program funding. Additional assumptions made for the illustrative projects can be found in Figure 8. The scenarios below build on the economic model

scenarios in intervention assessment and data findings section and illustrate the timing and flow of funds under the SIG model.

The economic analysis revealed that based on the findings of the retrospective study, and local and national research on the cost of home visitation and preterm births, the benefits of reducing preterm birth would cover about forty percent of the cost of the home visitation intervention. A partially contingent PFS project could be constructed based on the evidence to date.

In the scenario below, $1.5M of the $5M contract would be contingent on the home visitation provider achieving impact. Private capital provides funding for the evaluation, financing, and other project costs and deposit $375,000 per year into a contingent matching account.

As shown in Figure 8, using these project assumptions, if the project achieves its target impact rate the Commonwealth will save around $2.15 million in medical costs associated with preterm births. At this level of impact, funds in the matching account are released back to the funder and Commonwealth bonus success payments are shared between the Commonwealth and funders. If the project does not achieve its target impact rate, funds in the matching account are released to the Commonwealth. Scenario A-1 (Figure 9) shows a project that achieves its target impact rate. Scenario A-2 (Figure 10) shows a project that does not achieve target impact rate, activating the state clawback function.

Figure 9: Scenario AG1G Illustrative Project Budget

Scenarion A-1 Illustrative Project Budget

State Fiscal Year (July-June)	2019	2020	2021	2022	2023	Total
Home Visitation Program and Administrative Costs	$1,250,000	$1,250,000	$1,250,000	$1,250,000		$5,000,000
Evaluation, Financing and Other Project Costs	$60,000	$60,000	$60,000	$60,000	$60,000	$300,000
Total PFS Project Costs	$1,310,000	$1,310,000	$1,310,000	$1,310,000	$60,000	$5,300,000

Illustrative State Project Payments

State Fiscal Year (July-June)	2019	2020	2021	2022	2023	Total
State Direct Program Funding	$1,250,000	$1,250,000	$1,250,000	$1,250,000		$5,000,000
Contingent Match Account Funds Released to State						
State Contingent Project Bonus Payments					$ 323,700	$ 323,700
Total	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$323,700	$5,323,700

Illustrative Funder Project Payments

State Fiscal Year (July-June)	2019	2020	2021	2022	2023	Total
Funders Match Account Funding	$ 375,000	$ 375,000	$ 375,000	$ 375,000		$1,500,000
Contingent Match Account Funds Released to Funders					$ (1,500,000)	$ (1,500,000)
Funders Project Funding	$60,000	$60,000	$60,000	$60,000	$60,000	$300,000
Funders Contingent Project Bonus					$ (323,700)	$ (323,700)
Total Net Funder Project Payments/(Returns)	$435,000	$435,000	$435,000	$435,000	$ (1,763,700)	$ (23,700)

Figure 10: Scenario AG2 Illustrative Project Budget

Scenario A-2 Illustrative Project Budget

State Fiscal Year (July-June)	2019	2020	2021	2022	2023	Total
Home Visitation Program and Administrative Costs	$1,250,000	$1,250,000	$1,250,000	$1,250,000		$5,000,000
Evaluation, Financing and Other Project Costs	$60,000	$60,000	$60,000	$60,000	$60,000	$300,000
Total PFS Project Costs	$1,310,000	$1,310,000	$1,310,000	$1,310,000	$60,000	$5,300,000

Illustrative State Project Payments

State Fiscal Year (July-June)	2019	2020	2021	2022	2023	Total
State Direct Program Funding	$1,250,000	$1,250,000	$1,250,000	$1,250,000		$5,000,000
Contingent Match Account Funds Released to State					$ (426,300)	$ (426,300)
State Contingent Project Bonus Payments						
Total	$1,250,000	$1,250,000	$1,250,000	$1,250,000	$ (426,300)	$4,573,700

Illustrative Funder Project Payments

State Fiscal Year (July-June)	2019	2020	2021	2022	2023	Total
Funders Match Account Funding	$ 375,000	$ 375,000	$ 375,000	$ 375,000		$1,500,000
Contingent Match Account Funds Released to Funders					$ (1,073,700)	$ (1,073,700)
Funders Project Funding	$60,000	$60,000	$60,000	$60,000	$60,000	$300,000
Funders Contingent Project Bonus						
Total Net Funder Project Payments/(Returns)	$435,000	$435,000	$435,000	$435,000	$ (1,013,700)	726,300

RECAP AND NEXT STEPS

Finding a government end payer will be critical to the success of any demonstration project or further feasibility study going forward. Outreach to key stakeholders at the agencies highlighted in this document is a key next step to assess the interest level and concerns from the different agencies and which agency would best fit the goals and priorities of this study moving forward. Ultimately, whichever agency becomes the end payer will play a key role in finalizing the list of target outcomes and how the payment structure will work. The lessons learned in end payer identification will be able to be applied to future PFS engagements in the Commonwealth.

After identifying a willing end payer within the Department of Health and Human Resources, the next step will be to explore the Social Impact Guarantee (SIG) model. In this instance, a SIG will facilitate a PFS project without the need for enabling legislation, which would present an additional hurdle within the government. In order to implement a SIG, the government would need to provide fee-for-service (FFS) payments to the service provider for home visitation services. If the project does not meet a certain impact level on predetermined outcomes, then the government is repaid a portion of its FFS payments. The SIG financing model could enable either a demonstration project to test the model or a full PFS project if it is proven successful in achieving its target outcomes.

A final key next step will be the implementation of a language-only budget amendment by the Virginia legislature. This amendment will enable the end payer agency to structure the funding contingent on outcomes with no additional funding required and no funding withheld beyond the contracting year. It will also introduce a provision that claws back a portion of payments if the outcomes are not achieved. This amendment can be enacted through support and sponsorship in the legislature from the director of the Department of Health and Human Resources (HHR) or other key leaders within HHR agencies. The language-only budget amendment would also be able to be applied not only to the home visitation PFS project, but future PFS projects in the Commonwealth as well.

INTERVENTION, INTENDED BENEFICIARY, & SERVICE PROVIDER ASSESSMENT

INTEVENTION AND INTENDED BENEFICIARY ASSESSMENT

Pay for Success contracts require an intended beneficiary population with unmet needs and a high risk of negative outcomes. They also require service providers with the ability to scale services for this high-risk population and implement outcomes-oriented contracts. The intervention and intended beneficiary assessment is designed to refine the target population and/or program model based on an understanding of the unmet need within the community and indicators of high risk.

This goal of this assessment is to improve the intervention's impact on priority outcomes by serving the highest risk population suitable for the intervention or adding services to the intervention that would allow the providers to achieve maximum impact. For example, in a homelessness PFS project, if the intended beneficiary population analysis revealed that a number of eligible participants had behavioral health disorders, the homelessness intervention could add wraparound services to address behavioral health. Identifying the high-risk population increases the potential impact of the program, as shown in economic scenarios C and E on page 18. Figure 11 shows the program model and intended beneficiary population selection criteria:

Figure 11. Program Model and Intended Beneficiary Population Selection Considerations

Program Model	Evidenced-based or innovative program • Scalability of program and service provider • Effective historical implementation and/or outcome performance • Motivation to manage an outcomes-based contract • Open to financial partnership with private commercial and philanthropic funders • Inclination to data-driven operations • Network of local partners
Intended Beneficiary Population	High risk and/or low income population group experiencing poor outcomes • Sizable population • Poor outcomes contributing to government costs • Identifiable referral pathway • Measurable outcomes of interest • Underserved with complex needs

The feasibility study was unable to provide an assessment of the program model or intended beneficiary population due to limitations in the retrospective study and the sample size of the data. Specifically, the retrospective study tried to analyze home visitation's impact based on demographic factors, but the small sample size limited the ability to detect differences. As discussed in further detail in the Next Steps section, if the project pursues a demonstration project, one of the next steps would be to refine the intended beneficiary population and gain confidence in the intervention's impact.

SERVICE PROVIDER ASSESSMENT

Pay for Success provides several motivations for service providers to get involved. Providers can focus on achieving impact while also having sustained multi-year funding, an opportunity to scale, and impact data to facilitate

continuous improvement. Depending on the contracting structure, service providers may also have access to bonus payments contingent on achieving specific outcome levels.

While PFS offers the unique opportunity for multi-year contracts to scale programs and measure outcomes, they also require service providers to adapt and refine program models, forge new partnerships, scale rapidly (while sometimes modifying referral pathways and service beneficiaries), integrate data into program management, and manage internal risks and communicate those risks to funders. The purpose of the service provider assessment is to determine whether service providers (i) can implement and scale the program with fidelity and (ii) have the desire and capacity to manage outcomes. In order for the PFS contract to be successful, communicating the responsibilities and opportunities of Pay for Success for their organization to the service provider up front is essential. If the initiative moves into the project construction phase, project partners will need to work collaboratively to refine the intervention and referral assessment. The below case study provides an example of why Roca was a great fit into their Pay for Success program.

CASE STUDY: ROCA SCALES SERVICES THROUGH MASSACHUSETTS JUVENILE JUSTICE PFS INITIATIVE

In 2014, the Commonwealth of Massachusetts launched a $27 million juvenile justice PFS initiative to serve 929 at-risk young men, aged 17 to 23, who are in the probation system or exiting the juvenile justice system. The service provider, Roca, offers a high-impact intervention that aims to reduce recidivism and increase employment through intensive street outreach and targeted life skills, education, and employment programming. The Roca intervention is delivered over an intensive two-year period, followed by two years of follow-up engagement.

Roca is a nonprofit that, for 25 years, has delivered an evidence-based program model to young people in the Chelsea and Springfield, Massachusetts areas. Roca's mission is to disrupt the cycle of incarceration and poverty by helping young people transform their lives.[1] The PFS initiative provides Roca with the opportunity to serve a wider population across Massachusetts and to demonstrate the efficacy of its model through a rigorous evaluation. Roca believes this project will create a sustainable public funding source to support the expansion of its impact and improve outcomes for this population of high-risk young men. In this PFS project, Roca deferred 15% of its service fees, meaning it will only be paid that portion of its fees if impact levels are achieved.

During project development, Roca refined their evidence-based service delivery model, demonstrated the potential for the program to be an efficient use of government resources, and gained trust from funders that it understood program outcomes and could manage risks. Additionally, Roca maintains a comprehensive, performance-based data management system which enables it to measure results and use data for continuous improvement of their service delivery model. Prior to the launch of the PFS project, Roca underwent three Theory of Change processes which helped it to hone and refine the model and has engaged in a cycle of research, design, action, data tracking, and use of data for continuous improvement.[2]

1 http://rocainc.org/about/our-story/

2 http://rocainc.org/wp-content/uploads/2016/09/SanFranFedPFSArticle.pdf

KNOWLEDGE SHARING AND OUTREACH

Pay for Success requires multi-stakeholder support and participation. Third Sector and the PFS Council led several events during the feasibility assessment to educate stakeholders in the government, private sector, and nonprofit sector about PFS, and to garner support for the home visitation PFS feasibility work and PFS initiatives more broadly within Virginia.

Pay for Success requires multi-stakeholder support and participation. Third Sector and the PFS Council led several events during the feasibility assessment to educate stakeholders in government, the private sector, and the nonprofit sector about PFS, and to garner support for the home visitation PFS feasibility work and PFS initiatives more broadly within Virginia. On the whole, the government stakeholders that the feasibility study has engaged have been supportive of the project. However, increased government commitment will be essential to moving the project forward.

The feasibility assessment engaged the Governor's office, members of the money committees in the State House and State Senate, coordinated with Secretaries from Health and Human Resources and Finance, as well as engaged leadership in the Department of Planning and Budget (DPB). Throughout the feasibility process, the team received encouraging support in meetings with the Governor, the Lieutenant Governor, the Children's Cabinet, and the Secretary of Health and Human Resources. In Fall 2016, a successful discussion with the Secretary of Finance and Secretary of Health and Human Resources facilitated a meeting with the Department of Planning and Budget. In the meeting with DPB, the project team gained insight on the budget amendment process for a pilot project and the pathway to develop a long-term regulatory mechanism for executing full-scale PFS projects.

Outreach to Government: Third Sector and the PFS Council conducted direct outreach through targeted meetings and broader events to gain support from legislators. The project gained the support of Senator Siobhan Dunnavant from the 12th District of Virginia. Senator Dunnavant is a member of the Senate Finance Committee and, after initial correspondence with the PFS Council, agreed to be a panelist during a PFS event held at the Richmond Federal Reserve Bank on June 6, 2016 discussing the PFS landscape in Virginia. Outreach and preliminary support has also been gained in discussions with House Representative Tag Greason.

In November 2016, Third Sector and the PFS Council met with Deputy Secretary of Health and Human Resources Pam Kestner and to hopefully gain Secretary Hazel's support in passing a language-only budget amendment to enable a demonstration project for home visitation, specifically to impose contingencies on the previously appropriated funding. Although the government remained broadly supportive of the project following this meeting, Secretary Hazel was not able to submit the budget amendment to the Governor, though he left the possibility of supporting any language submitted by the Council independently. Ultimately, the Council decided not to move forward with the budget amendment at that time and focused on concluding the feasibility study.

In March of 2017, the Virginia legislature passed HB 2457, which enables data sharing between agencies within the Department of Health and Human Resources to streamline administrative processes, reduce paperwork and administrative burdens, and improve access to and quality of services provided by the agencies. It also presents the opportunity to significantly improve upon the current data system and enable stakeholders to identify strategies that could improve maternal and infant health. The home visitation retrospective study can serve as key step in improving data sharing processes to track the outcomes of early childhood services. Secretary Hazel mentioned in a

conversation with PFS Council members that he is interested in finding a case study through which to test the data sharing provision in the legislation. The PFS Council reached out to Secretary Hazel with a two-page brief on the feasibility study and how it could work as a case study for HHR but did not receive a response. On the whole, the government stakeholders that the feasibility study has engaged have been supportive of the project. However, increased government commitment will be essential to moving the project forward.

Knowledge Sharing Events. Third Sector and the members of the PFS Council have attended and participated in several of UVA's PFS events, including the Pay for Success and Social Impact Finance 2.0 convening in February 2017 and the Governor's Data Analytics Summit in April 2017. These knowledge sharing events helped to launch the long term PFS movement in within Virginia.

Funder Development. The feasibility study was awarded $100,000 of initial funding from a federal Social Innovation Fund grant and a grant from the Robins Foundation. The study later secured $125,000 of partial follow-on project development funding from the Pritzker Family Foundation. Third Sector has also explored additional funding opportunities with Nonprofit Finance Fund (NFF) and Green and Healthy Homes Initiative (GHHI) for both funding and technical assistance. Further outreach was also conducted to the Robins Foundation to potentially secure additional funding for the University of Virginia's, and specifically Josh Ogburn's, continued work on the project.

NEXT STEPS

The feasibility study indicates that there is potential to construct a Home Visitation Pay for Success demonstration project using birth outcomes as the basis for payments.

The retrospective study conducted during the feasibility assessment found a 40% average reduction in preterm births in the home visitation treatment groups (7.20%) compared to the propensity score matched comparison groups (11.93%). The study also found that a preterm baby spent an average of 15 more days in the hospital for the birth than a non-preterm baby (19.5 days versus 4.5 days). Gaps in the data infrastructure limited the ability to evaluate mother and child Medicaid utilization or costs outcomes.

The legal and regulatory assessment determined that agencies under the Secretary of Health and Human Resource are the most logical end payers for a home visitation PFS project. The Social Impact Guarantee (SIG) model presents the most promising pathways to address funder concerns and Virginia regulatory requirements. Throughout the feasibility process, the team received encouraging support from VDH and the Secretary of Health and Human Resources. The feasibility team presented proposed demonstration projects that included the HHR agencies as end payers and met with the Department of Planning and Budget to discuss the budget amendment process. Knowledge sharing and outreach conversations enabled the project to gain support from legislators and Governor McAuliffe's office.

The successes and challenges of the feasibility study have exposed the importance of measuring outcomes and innovating social sector contracting. The immediate next step for the PFS Council is to engage government representatives and secure government commitment to drive the home visitation PFS initiative and data sharing initiatives that enable the rigorous evaluation of outcomes. Given the upcoming gubernatorial election, the Council should engage candidates to gain commitment to outcomes-oriented contracting and urge candidates to integrate PFS into their priorities and goals.

Once the project secures government commitment, the feasibility study identifies two next steps – (i) engage in project construction for a PFS demonstration project based on birth outcomes and (ii) collaborate with key stakeholders to develop an integrated data system that enables the Commonwealth to rigorously evaluate the outcomes

The successes and challenges of this feasibility study have exposed the importance of measuring outcomes and innovating social sector contracting. The immediate next step for the PFS Council is to engage government representatives and secure government commitment to drive the home visitation PFS initiative and data sharing initiatives that enable the rigorous evaluation of outcomes. While the government has been supportive of the Home Visitation PFS Initiative, all next steps will require government leadership to help drive the initiative and gain support from key stakeholders. A PFS demonstration project will also require the government to commit as an end payer. The construction and launch of Pay for Success projects require a day-to-day government champion that can serve as a thought partner, key connector to other government agencies, and driver of the political and regulatory workstreams.

PFS government champions are the internal driving forces behind the outcomes-oriented initiative. The day-to-day government representative serves as a thought partner, connector, navigator, and driver of the political and regulatory workstreams. The government champion must have the trust of the executive leader and be empowered to engage individuals from multiple government agencies to drive the project forward.

A leader who will be able to provide connections to other government representatives and the authority to leverage these connections is critical to a success Pay for Success initiative. In previous County and State levels PFS initiatives, day-to-day internal government champions have been sourced from the following positions:

- Director of Special Projects, Executive Office of Administration and Finance,
- Director of Innovation, County Executive Office
- Recidivism Reduction and Reentry-Senior Project Manager, County Executive Office
- Deputy County Counsel, Office of the County Counsel
- Deputy Director of Workforce and Policy Development
- Administrator of Health and Human Services

The government champion should be able to commit around 10%-20% of their time to the initiative. The internal government champion may be called upon to:

- Convene and garner support from representatives from agencies that are impacted by the proposed intervention.
- Navigate the legislative, regulatory, or budgetary processes to implement the changes needed to enable contingent financing.
- Help external project parties navigate political priorities and sensitivities.
- Provide issue area expertise and engage other internal partners with specific issue area expertise.
- Understand the government decision making process.
- Leverage internal and external connections to help push the project forward under tight timelines.

Given the upcoming gubernatorial election, the Council should engage candidates to integrate PFS into their priorities and goals. The conversation should include a discussion about why outcomes-oriented contracting is needed, the key findings of the home visitation feasibility study, and the government commitment needed to engage in PFS projects. Appendix B provides a discussion guide for conversations with government representatives, including government candidates, the new administration, and key legislators.

Once the project secures commitment from a government end payer, the feasibility study identifies two next steps specific to the home visitation initiative:

1. *Collaborate with key stakeholders to develop an integrated data system that enables the Commonwealth to rigorously evaluate the outcomes of home visitation services.* The feasibility study uncovered gaps in the data infrastructure that severely limit the ability to retrospectively analyze data and track outcomes in a potential project. The PFS Council could drive an initiative to improve the quality of the data infrastructure and data sharing within the Commonwealth of Virginia, thereby laying the groundwork for future PFS projects as well as enabling improved service delivery. Appendix D provides a two-page memo on this option drafted for Secretary Hazel.
2. *Engage in project construction for a demonstration project based on birth outcomes.* The study concluded that it may be feasible to create a demonstration pilot on home visitation, focused on improving birth and maternal health outcomes. This pilot would integrate the lessons learned from the feasibility study to test outcomes-based payments in the Commonwealth, with the potential to transition into a larger scale PFS project. Appendix C outlines a straw man for the demonstration pilot in further detail.

In addition to the home visitation-specific next steps, the PFS Council should also consider its long-term role in guiding PFS initiatives in the Commonwealth. Through this feasibility study, the Council has gained expertise on outcomes-oriented contracting and the key criteria that must be in place to build a successful PFS project. They can

build upon this experience to both assist other PFS projects as subject matter experts, expand upon some of the lessons learned from this feasibility study, and work with legislators to advance PFS as a model within the Commonwealth's government. Depending on their priorities, the Council can use their status as experts in the field to find a more permanent home under the umbrella of organizations like the Commonwealth government, Virginia Chamber of Commerce, or the University of Virginia or other academic institutions.

CASE STUDY: MULTIGLEVEL GOVERNMENT LEADERSHIP DRIVING PFS IN CUYAHOGA COUNTY

The January 2015 launch of the Partnering for Family Success PFS program was the culmination of nearly three years of preparatory work within Cuyahoga County. In preparation for the PFS project, the County assembled internal stakeholders and potential external partner organizations. The internal orientation briefed County management staff on the PFS model and the specifics of the project, which addresses homelessness and the foster care system. During this process, the County learned the requirements to develop a PFS project, which includes leadership and commitment from multiple agencies within the government. The work was initiated by staff from the County Executive Office and drew in subject matter experts from the County Law Department, the Fiscal Office, the Sheriff's Office, the Division of Children and Family Services, and the Office of Homeless Services.

The former County Executive put his full public support behind exploring the prospect of PFS. A staff member within the Executive's Office served as the project champion and the Division of Children and Family Services assisted with project construction. The project champion devoted significant time and resources to move the project forward and navigated multiple facets of County agencies and the County legislature. Together, the Division of Children and Family Services and project champion worked to build a PFS model that would address the unique needs of the child welfare population. Later in project construction, the County added a full-time PFS Coordinator with extensive experience in child welfare and homelessness who provided critical input on the design of the program intervention, operations, and referral processes.

The time and resources spent by internal staff throughout project development was invaluable to the County. The development process facilitated a new model for human services. The multi-disciplinary team observed how the County's shared clients were not being effectively served through disconnected services and systems. Individually, these services supported the pursuit of positive outcomes including child safety and homelessness reduction. However, the lack of coordination across agencies led clients to prioritize service engagement in ways that could produce unanticipated outcomes or diminished impact.

[1]http://www.thirdsectorcap.org/wp-content/uploads/2016/02/Final-Cuyahoga-Partnering-for-Family-Success-Program-Lessons-Learned-Report.pdf

DEMONSTRATION PILOT

The feasibility analysis indicates that it may be feasible to construct a Prenatal Home Visitation Pay for Success demonstration project using birth outcomes as the basis for payments. The demonstration project would build on the feasibility study's learnings that home visitation decreases preterm births, test outcomes-based payments that creates a path for providers to transition to a potential large-scale PFS project, and demonstrate the Commonwealth's commitment to PFS. Appendix C provides an overview of the proposed demonstration project.

If the project successfully secures a committed end payer, the project could move into project construction. Funding for technical assistance, evaluation, and project management during the project construction phase will need to be secured. During project construction, all project parties should work collaboratively to refine the data

analysis and intervention design, procure independent evaluators and finalize the evaluation design, refine the economic model, and finalize the contracting mechanism:

- *Finalize contracting mechanism and procure partners.* During project construction, the contracting mechanism and required legal and regulatory measures associated with the contracting model will be addressed.
- *Finalize target population and intervention design.* The project could refine the eligibility to enroll a higher risk population. This allows the project to potentially create a larger impact. Risk factors associated with preterm births include previous preterm births, late or no healthcare during pregnancy, smoking or drug use during pregnancy, age, and race.[33] The project should consider if serving a higher risk population would increase the cost of the intervention.
- *Determine impact targets and refine outcomes analysis.* During project construction, parties could refine and/or expand the retrospective data analysis to gain more confidence in the baseline preterm birth rate and intervention impact rate. In addition, outcomes from more recent cohorts of families served by CHIP and Healthy Families could continue to be tracked against a comparison group even without a demonstration project. This would increase the sample size of the outcomes analysis, increasing the evidence base and providing an opportunity to analyze impact by demographic or other risk factors.
- *Engage funders and refine economic model.* During project construction, local and national funders focused on the issue area will be engaged and briefed on the project. Funders will be engaged to both support project construction and provide funding to the future demonstration project.

DATA INFRASTRUCTURE IMPROVEMENT COLLABORATIVE

The feasibility study uncovered gaps in the data infrastructure that limit the ability to link databases, share data, and rigorously evaluate outcomes. This finding is not unique to the Commonwealth of Virginia and Third Sector has found that a foundational component of PFS engagements is to help stakeholders create the building blocks to support performance-oriented contracts. There is much work that needs to be done to engage government officials, nonprofit service providers, and data experts in a structured, collaborative environment to define outcomes of interest, develop mechanisms to share the data needed to work toward those outcomes, and establish the working relationships that will enable continuous improvement. The PFS Council is in a unique position and could drive an initiative to address these disconnects, laying the groundwork for PFS projects designed to improve birth and early childhood health outcomes in the Commonwealth of Virginia**.** This initiative would fill a critical gap the PFS feasibility study revealed and therefore be a step toward a viable PFS project using Medicaid data.

The initiative would build off the HB 2457, which was signed into law in March 2017 and encourages data sharing from the agencies under the Secretary of Health and Human Resources. This bill is a significant step toward modernizing the Commonwealth's Medicaid data system. This bill is instrumental in starting the process of improving these antiquated systems and improving the Commonwealth's health data so that it can be used to drive evidence-based change to the Virginia Medicaid system. HB 2457 could serve as a driving function to convene stakeholders and develop a more modern data infrastructure for the Commonwealth of Virginia. Appendix D provides a two-page overview of the proposed initiative. This document was sent to Secretary Hazel in April 2017.

[33] 2016 Premature Birth Report Card: Virginia. 2016; "What Are the Risk Factors for Preterm Labor and Birth?" National Institutes of Health. U.S. Department of Health and Human Services, 2015. Web. 02 Feb. 2017.

LONG TERM: PFS COUNCIL AS A GUIDING AUTHORITY ON PFS

The mission of the PFS Council is to initiate a Virginia PFS financing model designed to implement proven and, productive early childhood programs that increase the life outlook for thousands of Virginia children, strengthen Virginia's workforce development and competitiveness, and reduce taxpayer burdens. Through this feasibility study the Council has gained expertise on outcomes-oriented contracting and the key criteria that must be in place to build a successful PFS project. The successes and challenges of this feasibility study have exposed the importance of measuring outcomes and innovating social sector contracting.

During the January 2017 meeting, the Council brainstormed potential ways to institutionalize the future of a VA PFS Council. These options included the Council being (i) an individual non-profit entity, (ii) embedded within the Chamber of Commerce, (iii) a partnership with an academic organization, (iv) a multi-party collaborative between the Council, Chamber, and UVA, or (V) a multi-party collaborative including a governmental organization such as the Council of VA Futures.

The PFS Council can leverage these learnings and transition to become the guiding authority on PFS in the Commonwealth of Virginia. The Council can leverage its expertise to promote the rigorous evaluation of outcomes and outcomes-oriented contracting in the Commonwealth of Virginia through a variety of ways. Broadening the focus of the Council may require the organization to reevaluate its mission and membership, perhaps expanding membership to include a wide range of stakeholders. Potential stakeholders include representatives from government, the private sector, academic institutions, and nonprofit organizations. Activities of the PFS Council could include:

- **Exploring PFS initiatives in a number of issue areas.** The PFS Council could establish working groups within the Council around different issue areas. These issue areas could include:
    - *Early Childhood Working Group***.** PFS projects are currently being implemented in Utah and Chicago, to expand access to high-quality pre-kindergarten, and in Cuyahoga County, to reduce the length of stay in out-of-home foster care placement for children whose families are homeless. The Council could explore the feasibility of a PFS project in an additional area of early childhood development and determine the best strategy for the future of child development investments.[34]
    - *Workforce or Homelessness Working Group***.** The working group could also support ongoing PFS initiatives currently being conducted in Virginia. Specifically, the SkillSource Group Inc., the fiscal agent the Northern Virginia Workforce Board, is currently exploring the feasibility of a PFS project in workforce development. In addition, the City of Richmond is currently looking into a PFS initiative addressing homelessness. Both projects will require state-level advocacy as they progress and the Council would be well-positioned to play that role.

- **Advocacy and Stakeholder Engagement.** The PFS Council could also transition its efforts to focus on facilitating a culture of data driven policy-making to address outcomes of interest in Virginia. As discussed in January 2017, the Council could utilize lessons learned and specific examples from the feasibility study to spread awareness of Commonwealth challenges and facilitating the Commonwealth to reach the tipping point improving data accessibility. The Council could put together some key talking points for the new administration and brief key legislators on the project, including top candidates for Governor (Lt. Governor Northam and Gillespie) and Senate/House Money Committees. This advocacy work, along with a collaborative approach to improving data infrastructure, aligns with the recent bill enacted by Governor McAuliffe to encourage data sharing from the agencies under the Secretary of Health and Human Resources.

[34] "Current Work." Joint Legislative Audit and Review Commission (JLARC). Virginia General Assembly, May 2017. Web. 6 June 2017.

APPENDIX A: VIRGINIA HOME VISITING OUTCOMES ANALYSIS

VIRGINIA HOME VISITING OUTCOME ANALYSIS

A BIRTH OUTCOME ANALYSIS OF CHIP OF VIRGINIA AND HEALTHY FAMILIES VIRGINIA

INTRODUCTION

In early 2015, a working group composed of the Virginia Pay for Success Council, Virginia Department of Health (VDH), Third Sector Capital Partners, and other interested partners began a feasibility study of expanding prenatal home visiting across several regions in Virginia using Pay for Success (PFS) finance. As part of the feasibility study, the working group initiated a retrospective study of the two largest home visitation service providers in Virginia: CHIP of Virginia (CHIP) and Health Families Virginia (HFV). These two providers primarily serve a population of at-risk low-income mothers and their young children. The purpose of the retrospective study was to inform whether prenatal home visiting from CHIP and HFV improved birth outcomes including preterm birth (<37 weeks gestation) and low birthweight (< 2,500 grams of birthweight), and reduced Medicaid expenditures for the mother and child within two years of the childbirth.

BACKGROUND

CHIP and HFV service staff include social service workers, medical paraprofessionals, and other trained professionals. Both providers deliver prenatal and postnatal home visiting services to at-risk mothers in their homes. Although each provider has slightly different recruitment criteria, they both recruit families who are low-income (<200 Federal Poverty Level) and whose children are at-risk for poor birth and early childhood development outcomes.

Home visiting services provided to socially high-risk families has been shown to improve a variety of birth, medical, child welfare, and educational outcomes for the child as well as medical and labor market outcomes for mothers.[1,2]

METHODS

The retrospective study was a propensity scored matched comparison group design. The study Treatment and Comparison groups were limited to singleton births. The Treatment Group was composed of the families who enrolled in home visiting for the first time from CHIP or HFV in 2009. The study then utilized propensity score matching to generate a comparison group of families who did not receive home visiting services from CHIP or HFV by matching on numerous demographic characteristics contained in the VDH birth record, zip codes, and the birth payer indicator (limited to Medicaid).

The data sources included service data from each provider indicating the dates of service enrollment and termination, and dates when each family received a home visit (Treatment Group only); birth records from VDH containing numerous demographic characteristics for the mother, father, and child; Department of Medical Assistance Services (DMAS) Medicaid claims and encounters for the mother and child through 2012; and proxy Medicaid cost data from Virginia Health Information (VHI). The study connected all of the datasets using a unique and random child identifier variable.

Table 1 – Treatment and Comparison Groups

CHIP of Virginia		***Healthy Families VA***	
Prenatal Treatment	Postnatal Treatment	Prenatal Treatment	Postnatal Treatment
Prenatal Comparison	Postnatal Comparison	Prenatal Comparison	Postnatal Comparison

Since the purpose of the study was to examine the effect of *prenatal* home visiting, the study divided the Treatment Groups for each provider into prenatally vs postnatally enrolled families. In addition, the study

[1] *Healthy Families America* (Rep.). (2016). Olympia, WA: Washington State Institute for Public Policy. Retrieved May 15, 2017, from http://www.wsipp.wa.gov/BenefitCost/Program/119

[2] Peacock, S., Konrad, S., Watson, E., Nickel, D., & Muhajarine, N. (2013). Effectiveness of home visiting programs on child outcomes: a systematic review. *BMC Public Health*, *13*, 17. http://doi.org/10.1186/1471-2458-13-17

divided the comparison families into these matched groups. See Table 1 for an illustration.

RESULTS

This section discusses the retrospective study data matching process, statistics on service delivery, and the birth outcome and Medicaid cost analysis.

DATASET MATCHING

The CHIP Prenatal Treatment Group was 191 children. Of those, the study identified 131 birth records. The HFV Prenatal Treatment Group was 415 children. Of those, the study identified 355 birth records. See Table 2 for all statistics on the number of prenatally and postnatally enrolled families in each service provider dataset and the number of Treatment Group records identified in the VDH records. There could be several reasons the data matching process did not locate a Treatment Group birth record including that the child may have been born in a different state or that the service provider maintained a slightly different name than that recorded in the vital records.

Table 2 – Number of Resulting Treatment Group Families After VDH Dataset Matching

Dataset	*CHIP of Virginia*		*Healthy Families*	
	Prenatal	Postnatal	Prenatal	Postnatal
Provider	196	518	415	461
VDH	131	436	355	406

Table 3 shows the number of *prenatally* enrolled Treatment Group families that the study identified in each dataset. The VDH row shows the number of birth records found in the VDH records. The DMAS row shows the number of mothers and children found in the DMAS Medicaid records. Unfortunately, there was a high percentage of children identified in the VDH birth records but not found in the DMAS data. Moreover, an even larger percentage of the children's mothers did not have DMAS records.

While the study expected some unmatched Medicaid records, the high percentage of unmatched records especially among mothers presents at least two major problems. First, it is possible that there is an underlying reason why some mothers and children had records, introducing the potential of increased bias. Secondly, the smaller number of DMAS records reduces the sample size, making it more difficult to detect any outcome differences that may have existed.

Table 3 – Number of Prenatally Enrolled Families After Each Level of Dataset Matching

Dataset	*CHIP of Virginia*		*Healthy Families*	
Provider	196		415	
VDH	131		355	
DMAS*	*Mothers*	*Children*	*Mothers*	*Children*
	41	92	98	264

** Number of families broken down by mothers and children since DMAS maintains the records separately*

COMPARISON GROUP

There was a total number of 567 CHIP and 761 HFV Treatment Group children found in the VDH birth records. The study identified the same number of Comparison Group children. The study utilized propensity score matching of several Treatment Group demographic variables found in the VDH birth records to identify the Comparison Group. The study matched on the following variables: child gender (male/female), child race/ethnicity (four groups), maternal education level at birth (three groups), maternal age at birth (five groups), plurality (two groups), marital status at birth (two groups), and paternal education at birth (three groups), zip code of residence, and payer of the birth (limited to Medicaid). Because there are about 30,000 Medicaid paid births each year in Virginia, the pool of potential Comparison Group matches was quite large. Using a one-to-one "nearest available" propensity score matching algorithm, 98.8 percent of the Treatment Group families matched to a comparison family.

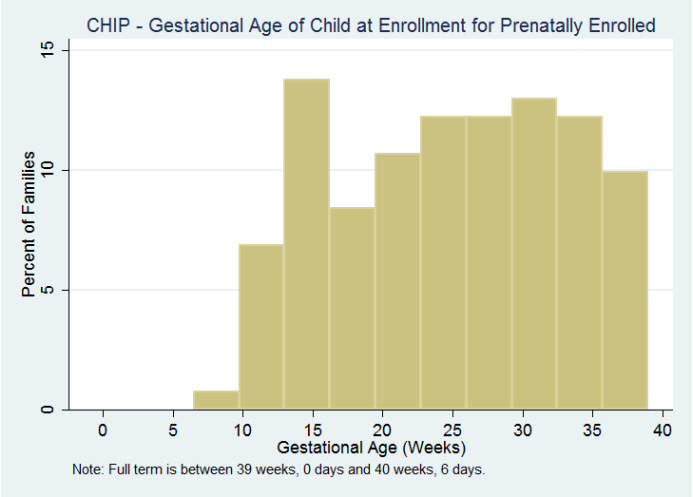
PRENATAL SERVICE DELIVERY

This section provides statistics for each provider on the gestational age of children for families who enrolled in prenatal home visiting and the number of services they received.

CHIP of Virginia

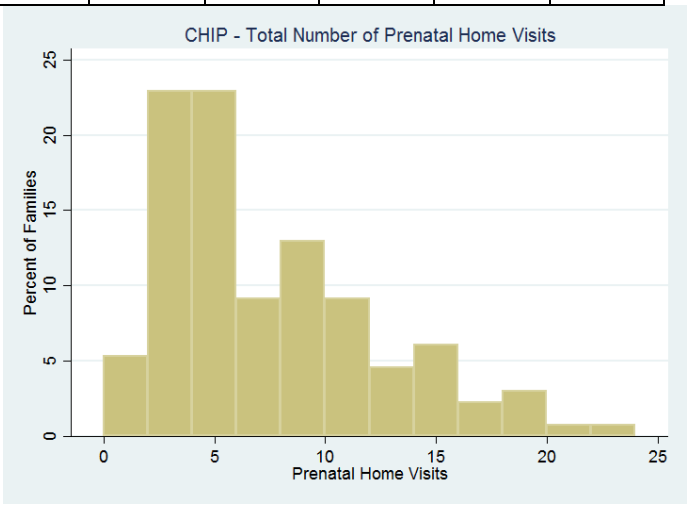
Shown in Table 4, CHIP enrolled pregnant women at a median gestational age of 25 weeks with 80 percent of women between 14 and 35 weeks of pregnancy.

Table 4 – CHIP – Gestational Age of Child at Enrollment for Prenatally Enrolled					
Obs.	***Mean***	***SD***	***10%***	***50%***	***90%***
131	24.7	8.3	14	25	35



Shown in Table 5, CHIP provided prenatally enrolled women a median of 7 prenatal home visits with 80 percent of women receiving 2 to 14 home visits.

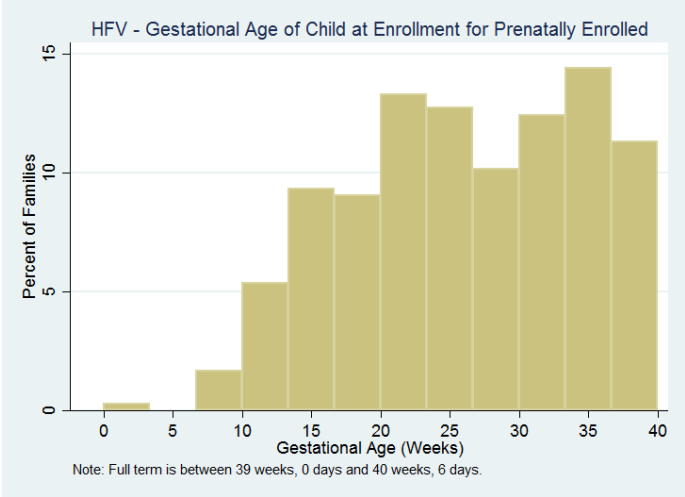
Table 5 – CHIP –Prenatal Home Visits					
Obs.	***Mean***	***SD***	***10%***	***50%***	***90%***
131	7.0	4.9	2	5	14



Healthy Families Virginia

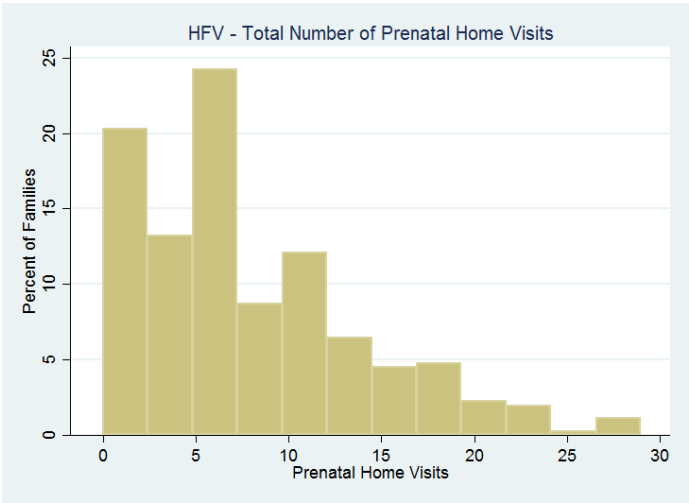
Shown in Table 6, HFV enrolled pregnant women at a median gestational age of 26 weeks with 80 percent of women between 14 and 37 weeks of pregnancy.

Table 6 – HFV – Gestational Age of Child at Enrollment for Prenatally Enrolled					
Obs.	***Mean***	***SD***	***10%***	***50%***	***90%***
355	25.9	8.6	14	26	37



Shown in Table 7, HFV provided prenatally enrolled women a median of 6 prenatal home visits with 80 percent of women receiving 1 to 17 home visits.

Table 7 – HFV – Prenatal Home Visits					
Obs.	***Mean***	***SD***	***10%***	***50%***	***90%***
355	7.8	6.1	1	6	17



OUTCOME ANALYSIS

This section contains an outcome analysis of whether prenatal home visiting improved preterm birth and low birthweight, and reduced Medicaid costs.

Birth Outcome Analysis

For the birth outcome analysis, the study utilized logistic regression with robust standard errors to calculate the p-values.

Table 8 – CHIP Prenatal vs Comparison Group		
Preterm Birth		
	CHIP of VA	***Comparison***
Perc. (%)	6.1 %	16.0 %
Freq. (#)	8 / 131	21 / 131
P>|z|	P-Value: 0.014	
Low Birthweight		
	CHIP of VA	***Comparison***
Perc. (%)	12.2 %	9.2 %
Freq. (#)	16 / 131	12 / 131
P>|z|	P-Value: 0.426	
Preterm Birth and Low Birthweight		
	CHIP of VA	***Comparison***
Perc. (%)	5.3 %	6.1 %
Freq. (#)	7 / 131	8 / 131
P>|z|	P-Value: 0.790	

CHIP of Virginia

Table 8 contains the birth outcome statistics for the CHIP Prenatal Treatment and Comparison Groups. The Treatment Group had a 6.1 percent preterm birth rate, 12.2 percent low birthweight rate, and 5.3 percent of children were in both categories. The Comparison Group had rates of 16.0 percent, 9.2 percent, and 6.1 percent, respectively. Only the difference in preterm birth rates was statistically significant.

Healthy Families Virginia

Table 9 contains the birth outcome statistics for the HFV Prenatal Treatment and Comparison Groups. The Treatment Group had a 7.6 percent preterm birth rate, 8.5 percent low birthweight rate, and 4.2 percent of children were in both categories. The Comparison Group had rates of 10.4 percent, 11.8 percent, and 7.0 percent, respectively. None of the differences were statistically significant.

Medicaid Outcome Analysis

As explained in the Dataset Matching section, DMAS was unable to locate a large percentage of children and mothers that were in the Prenatal Treatment Groups. The study did not identify an exact cause for this situation. Because the data loss could introduce the risk of a significant bias, the study decided against comparing the difference in Medicaid claims and encounters between the Prenatal Treatment and Comparison Groups. Instead, the study utilized a large Combined Comparison Group to examine the relationship between the birth outcomes (preterm birth low birthweight) and Medicaid claims and encounters.

Table 9 – HFV Prenatal vs Comparison Group		
Preterm Birth		
	Healthy Fam.	***Comparison***
Perc. (%)	7.6 %	10.4 %
Freq. (#)	27 / 355	37 / 355
P>|z|	P-Value: 0.192	
Low Birthweight		
	Healthy Fam.	***Comparison***
Perc. (%)	8.5 %	11.8 %
Freq. (#)	30 / 355	42 / 355
P>|z|	P-Value: 0.138	
Preterm Birth and Low Birthweight		
	Healthy Fam.	***Comparison***
Perc. (%)	4.2 %	7.0 %
Freq. (#)	15 / 355	25 / 355
P>|z|	P-Value: 0.104	

Combined Comparison Group Outcome Analysis

The combination of all four Comparison Groups resulted in a total of 960 children with DMAS records. As shown in Table 10, this Combined Comparison Group had a preterm birth rate of 10.2 percent and a low birthweight rate of 10.0 percent.

6.2 percent of children were both preterm and low birthweight.

Table 10 – Comparison Group: Percentage Preterm, Low Birthweight, and Both Categories			
	Low Birthweight		
Preterm	***No***	***Yes***	***Total***

No	825 (85.9%)	37 (3.9%)	862 (89.8%)
Yes	39 (4.1%)	59 (6.2%)	98 (10.2%)
Total	864 (90.0%)	96 (10.0%)	960 (100%)
Note: Figures rounded to one decimal place			

MEDICAID COSTS: INPATIENT DAYS

Table 11 shows the number of inpatient days in the hospital that children in the Combined Comparison Group incurred through the first two years of their life, broken down by preterm and low birthweight status. Children born not preterm and not low birthweight had about 2 inpatient days, on average. Children born preterm or low birthweight had about 17 inpatient days, on average. Those born both preterm and low birthweight had over 25 inpatient days, on average.

Table 11 – Comparison Group: Number of Inpatient Days of Children Born Preterm, Low Birthweight, and Both Categories

	No	***Yes***
Preterm	2.2 days	16.8 days
Low Birthweight	2.2 days	17.2 days
Preterm & LBW	2.3 days	25.8 days

The VHI Medicaid cost data shows that each inpatient day in the hospital for a child cost about $2,000. As shown in Table 12, this reveals that babies born preterm or low birthweight accrue nearly $30,000 in additional inpatient Medicaid costs over those born in neither category. Babies born both preterm and low birthweight accrue about $47,000 in additional inpatient costs. Importantly, these figures do not include other costs for the baby, such as outpatient visits, or any costs for the mother.

Table 12 – Comparison Group: Inpatient Medicaid Costs for Children Born Preterm, Low Birthweight, and Both Categories

	No	***Yes***	***Diff.***
Preterm	$4,480	$33,580	$29,100
Low Birthweight	$4,460	$34,380	$29,920
Preterm & LBW	$4,540	$51,580	$47,040
Note: Based upon a $2,000 per day inpatient cost estimate			

A more in-depth analysis shows that children born preterm but not low birthweight or low birthweight but not preterm do not have a statistically significant difference of inpatient days to those born in neither category. There is only a statistically significant difference of inpatient days for children born both preterm and low birthweight, representing 6.2 percent of the Combined Treatment Group.

CONCLUSION

First, the only statistically significant difference in birth outcomes between the Prenatal Treatment and Comparison Groups was for CHIP's preterm birth rate. HFV did not a statistically significant improvement for either outcome. The small sample sizes of the Treatment Groups made it difficult to track small changes in the outcome measures. While the study could have included additional years of service provider enrollments, increasing the sample sizes, doing so would have introduced the tradeoff of utilizing older and potentially outdated data. Regardless, future studies should perform upfront power analyses and utilize large sample sizes so that they do not face the same issue.

Secondly, one issue that contributed to the small sample sizes was that the dataset matching process resulted in fewer than expected matches. Future studies should develop a more robust plan to ensure that a higher percentage of families have VDH birth records and Medicaid data. For example, a future study could only include children whose families provide a copy of their Virginia birth certificate and who have a verified Medicaid registration form.

Finally, the co-incidence of preterm birth and low birthweight appears to result in the largest increase in Medicaid costs for the child over the first two years of life. While a future PFS project could track just preterm birth or low birthweight, the resulting cost savings from improving just one these outcomes will be lower because a percentage of the children born in either category will not have the co-incidence of both outcomes. This analysis shows that about 60 percent preterm babies are also low birthweight, and that 60 percent of children born low birthweight are also preterm, meaning that 40 percent of children born in one category do not have the co-incidence of the other. Although, one tradeoff to consider is that utilizing the co-incidence of both preterm birth and low birthweight categories as a PFS project outcome will require a larger sample size since the co- incidence occurs less often than the incidence of one category or the other.

APPENDIX B: DISCUSSION GUIDE FOR ADVANCING CONVERSATIONS WITH GOVERNMENT REPRESENTATIVES

OVERVIEW

PAY FOR SUCCESS

Pay for Success (PFS) projects are about measurably improving environmental conditions and/or the lives of people in need. PFS is an innovative contracting model that drives government resources toward high-performing social and environmental programs in areas such as poverty, education, conservation, recidivism, homelessness, and habitat management. PFS contracts track the effectiveness of programs over time to ensure that funding is directed toward programs that succeed in measurably improving environmental conditions and/or the lives of people most in need.

This novel contracting model allows all parties to benefit by aligning incentives. Underserved initiatives gain access to the high-quality support they need to thrive. Implementers achieve the stability of upfront, flexible funding that enables them to scale and focus on delivering proven, outcomes-focused services. Governments obtain the flexibility to support preventive services that lead to reduced costs, better outcomes in the long term, and more effective data to identify what works. Taxpayers are secure in knowing that government resources are directed toward programs that produce demonstrated results for society.

VIRGINIA PAY FOR SUCCESS COUNCIL

The Virginia Pay for Success Council is collaboration of like-minded members of Virginia's private industry, human service, and governmental organizations that have collaborated since October 2013, and incorporated as a non-stock corporate in late 2014. The mission of the Council is to initiate a Virginia PFS financing model designed to implement proven, productive early childhood programs that increase the life outlook for thousands of Virginia children, strengthen Virginia's workforce development and competitiveness, and reduce taxpayer burdens.

PAY FOR SUCCESS

The feasibility analysis that was funded by a federal Social Innovation Fund (SIF) grant and was led by the Virginia Pay for Success Council, the Virginia Department of Health, and Third Sector Capital Partners, Inc. The study analyzed the impact of home visitation services on reducing preterm births, low birth-weight incidences, and Medicaid expenditures for low-income pregnant women and their children. The study sought to determine if scaling home visitation would reduce Medicaid costs by comparing the birth outcomes and healthcare costs of individuals who received prenatal home visitation to a propensity score matched comparison group.

The retrospective study involved execution of public-private data agreements between the University of Virginia, CHIP of Virginia, Prevent Child Abuse Virginia (Healthy Families), VDH, and Department of Medical Assistance Services (DMAS). The study revealed that there is a possibility for home visitation to produce significant impact across a broad array of measurements. However, gaps in the current data infrastructure limited the ability to determine the impact of prenatal home visitation on mother and child healthcare utilization and costs during, and two-years after, birth. Below are key activities and findings from the study.

Collected data from 451 women who received prenatal home visitation services from CHIP and Healthy Families from 2009-2012. Matched data from home visitation providers with VHI birth records and created a propensity score matched comparison group of 428 women. The study found a 40% reduction in preterm birth rates between individuals who received home visitation and the comparison group.

Matched birth records for treatment and comparison group to DMAS Medicaid claims. The analysis revealed a number of significant issues that make it difficult to link birth records and Medicaid claims reliably so as to identify cost savings with precision.

VALUE FOR THE COMMONWEALTH OF VIRGINIA

SOCIETAL BENEFIT

This intervention addresses a critical issue facing women across the Commonwealth. Despite significant recent improvements in prenatal service delivery for women, there are still a number of women who are at high risk of poor birth outcomes and are not receiving services. Interventions during birth and early childhood have been shown to pay substantial dividends over the long-term in terms of a child's future life success. While these longer- term benefits are difficult to translate into definitive budgetary savings, they represent additional likely benefits of such investments.

COST-BENEFIT ANALYSIS

The working group conducted a cost-benefit analysis under several different scenarios. Two of the scenarios enabled the government to recoup cash savings over and above the initial funding provided. The first scenario involved obtaining a federal Medicaid waiver, which would cover 50% of the total program cost, as well as serving a higher risk, and thus higher cost, population. This scenario was estimated to yield 118% of its funding covered by savings.

The second scenario involved taking additional, non-medical outcomes into account when evaluating success. To date, the feasibility study has focused primarily on the short-term medical outcomes of home visitation. If the project expands its range of potential outcomes to include child welfare outcomes or additional health outcomes beyond the birth incident, it could result in additional cost savings. This scenario was modeled to yield at least 123% of program costs covered by savings. These findings suggest that expanded funding for home visitation has the potential to pay for itself.

DATA-DRIVEN DECISIONMAKING

One key benefit of PFS studies is that they help reveal the capacity of existing data systems to enable data-driven decisions about the value of programs to government. This study pointed out opportunities to strengthen the health data systems in the Commonwealth to enable better decision-making.

MOVING FORWARD

The PFS Council identified two paths for continuing the progress made with the PFS feasibility study.

- Data systems improvement. The PFS Council could work with key staff within Health and Human Resources in implementing the provisions of the recently passed bill on data sharing, HB 2457. The PFS retrospective

analysis could serve as a useful case study, and the analysis could then be subsequently re-run after these data issues are addressed.

- Health and Human Resources could continue to work with the Council on constructing a home visiting PFS project. The next phase of activity would involve: Identify a specific government agency and a designated point of contact within that agency to serve as a government end payer for a potential demonstration project and a to serve as a champion and liaison for the project within the government.

APPENDIX C: DEMONSTRATION PROJECT STRAWMAN

DEMONSTRATION PROJECT OBJECTIVES

1. Supplement retrospective baseline study of home visiting (HV) with a prospective evaluation to better assess the potential outcome improvements of home visitation.
2. Continue the momentum statewide with outreach to create contracts that enable the reporting of outcomes and recognition of the mechanism to implement PFS. Execute PFS contractual elements statewide to demonstrate with Commonwealth's commitment to outcomes-oriented contracting.
3. Incentivize government and service providers to contract, administer, and deliver services with contingent outcomes-based payments.
4. Reduce operations and funder risk by testing outcomes-based payments through a pilot period to prepare and transition into a full-scale project.

INTERVENTION MODEL AND TARGET POPULATION

Several home visitation intervention models have been extensively evaluated nationally and have been found to be effective in improving a variety of outcomes for children and families[33]. Intervention models for the PFS demonstration project must display: effectiveness in their historical performance, an ability to scale, a network of community partners, use of data-driven decision making, and motivation to implement an outcomes-based contract.

CHIP of Virginia (CHIP) and Healthy Families America (HFA) are the two largest, evidence-based home visitation providers in the Commonwealth. A lead provider will be selected with a subcontracting provider to allow the assessment of two programs while enabling the project's ability to increase referral and enrollment of participants within the project timeline. The cost of the intervention is estimated to be $2,500.

High-risk and low-income pregnant women are the target population of the demonstration project. Risk factors for the population may include: inadequate access to prenatal care, low-income, single marital status, limited educational attainment, mental health issues, substance abuse, and unstable housing.

Eligible participants must begin receiving HV services within the first or second trimester of their pregnancy; enrolled in Medicaid or have family incomes under 200 percent of the Federal Poverty Level; reside in the project's service areas, and meet risk factor thresholds identified in a screening assessment. **The demonstration project will serve 500 high-risk, low-income pregnant women.**

OUTCOMES METRICS AND TARGET IMPACT

The proposed project will align current provider targeted outcomes such as the improvement of birth outcomes through **reducing the incidence of preterm births.** The retrospective study conducted in the feasibility assessment found a 40% average reduction in preterm births in the home visitation treatment groups (7.20%) compared to the propensity score matched comparison groups (11.93%). The study also found that a preterm baby spent an average of 15 more days in the hospital for the birth than a non-preterm baby (19.5 days vs. 4.5 days). To decrease the risk

[33] "What Is Home Visiting Evidence of Effectiveness?" Home Visiting Evidence of Effectiveness. U.S. Department of Health & Human Services. Web. 6 June 2017.

of the project for funders and service providers, **the target impact level for the demonstration project will be a 30% reduction in preterm births.**

Limitations in the data infrastructure prevented the retrospective study from being able to determine the medical costs of preterm vs. non-preterm births. Therefore, the demonstration project will rely on national studies and local Medicaid payment code calculations to estimate the cost of a preterm birth. **The demonstration project estimates the avoidable cost associated with a preterm birth at $30,000.**[34]

EVALUATION DESIGN AND DATA SOURCES

The PFS demonstration project will be evaluated using a rate card approach. The evaluation will use available State administrative resources to pull electronic birth certificates from the Virginia Department of Health (VDH) and assess targeted birth records. All data will be pulled on an individual basis and de-identified prior to transmission to the evaluator.

FUNDING AND CONTRACTING DESIGN

Virginia Health and Human Resources (HHR), or a State Agency under HHS, will serve as the government end payer for the PFS demonstration project. The demonstration project may be funded using existing funds already budgeted for the expansion of home visiting services or it may access new funds to further expand services.

The PFS demonstration project will be contracted through a Social Impact Guarantee (SIG) model. In a SIG, government provides traditional direct funding to a project through a biennial appropriation and budget with a contingent claim for repayment from a bond or escrow account funded by private funders only if social service providers do not achieve target outcomes.

A combination of national and local philanthropic, and private, capital will be sought to provide payments to match the amount of contingent funding provided by the government. This money will be used to repay the government for insufficient impact on selected outcome metrics.

PRELIMINARY ECONOMIC MODEL

Based on the assumptions above, the **benefits of reducing preterm births will cover about forty percent of the cost of the home visitation intervention.** This economic model for the proposed demonstration project is shown

[34] Limitations in the Virginia healthcare data infrastructure prevented the retrospective study from being able to determine the medical costs of preterm versus non-preterm births. Therefore, the feasibility study relied on national studies to estimate the cost of a preterm birth. When analyzing national studies and developing a cost estimate for the Virginia PFS feasibility study, the team considered - (i) costs included in the studies estimates (i.e. inpatient and outpatient costs, child costs, mother costs, etc.), (ii) inflation rates, and (iii) characteristics of the babies included in the study (i.e. average days spent in the hospital, gestational ages, etc.). The feasibility study assumed that the cost of preterm and low birthweight births is similar in Virginia as the national average and considered the cost of inflation. Based on this information, the feasibility study estimated the avoidable inpatient costs associated with a preterm birth at $30,000. Two studies that helped influence this number were:

- An analysis from the Agency for Healthcare Research and Quality found that average hospital costs (2011 dollars) were significantly higher for newborns with conditions such as preterm birth ($21,500), low birth weight ($27,200), and/or respiratory distress syndrome ($54,900) compared to all newborns ($3,200). Newborns born preterm stayed in the hospital for an average of 14.3 days, compared to an average of 17.7 days for low birthweight babies, and 3.4 days for all live hospital births. (Source: Kowlessar NM (Social & Scientific Systems, Inc.), Jiang HJ (AHRQ), and Steiner C (AHRQ). Hospital Stays for Newborns, 2011. HCUP Statistical Brief #163. October 2013. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb163.pdf.)
- In 2007, the Institute of Medicine estimated that the medical care costs (inpatient and outpatient) for preterm births were $31,571 (2005 dollars). The medical care costs for babies by gestational age were; $11,415 (32-36 weeks), $100,725 (28-31 days), $198,945 (<28 weeks). The report did not provide a breakdown on the number of preterm babies that fell into each gestational age category. (Source: Institute of Medicine (US) Committee on Understanding Premature Birth and Assuring Healthy Outcomes; Behrman RE, Butler AS, editors. Preterm Birth: Causes, Consequences, and Prevention. Washington (DC): National Academies Press (US); 2007. 12, Societal Costs of Preterm Birth. Available from: https://www.ncbi.nlm.nih.gov/books/NBK11358/)

below – Scenario A. The preliminary economic model below does not include PFS project costs, like evaluation or legal costs. These costs would need to be added to future models.

Scenario A: Preliminary Economic Model of Demonstration Pilot

Project Assumptions	
Number of Children	2000
Cost of the Intervention	$2,500
Cost per Preterm Birth (Medicaid)	$30,000

Preterm Birth Rates	
Baseline Preterm Birth Rate	11.93%
HV Impact: Reduction of Preterm Birth Rates	30.00%
Treatment Group Preterm Birth Rates	8.35%

Project Costs	
Treatment Group Preterm Birth Costs	$5,010,600
Control Group Preterm Birth Costs	$7,158,000
Savings from Avoided Preterm Births	$2,147,400
Avoided Cost per Child Enrolled in Treatment	$1,074
Portion of Funding Covered by Savings	43%

Number of Children
X
Preterm Birth Rates
X

Control Group Preterm Birth Costs
-

Savings from Avoided Preterm Births
/

APPENDIX D: VIRGINIA PAY FOR SUCCESS RETROSPECTIVE STUDY

A fully-integrated data system would enable the Commonwealth of Virginia evaluate the impact of its investments in early childhood services

The Virginia Pay for Success Council

The Virginia Pay for Success Council ("Council"), partnering with the Virginia Department of Health ("VDH"), and Third Sector Capital Partners, Inc. ("Third Sector"), began a feasibility study in spring 2016 to validate the impact of prenatal home visitation programs on birth outcomes (particularly low-birth weight and preterm delivery) and health care costs for mothers and their children in Virginia. The purpose of the study was to determine the feasibility of using outcomes-oriented contracting to expand prenatal home visiting for high-risk, low-income mothers.

Current Data Infrastructure Case Study: Home Visitation Retrospective Study

Several home visitation intervention models have been extensively evaluated nationally and have been found to be effective in improving a variety of outcomes for children and families.[1] The targeted outcome improvements align benefits and cost avoidance across multiple health and human resources agencies.

The Council **designed and conducted a retrospective study to analyze the impact of home visitation on reducing preterm births, incidences of low birth-weight, and Medicaid expenditures for low-income pregnant women and their infants.**

Outcome Questions: Would scaling home visitation services improve birth and maternal health outcomes and reduce Medicaid outlays for women at high risk of preterm or low birth-weight infants?

Process Question: Can evaluators leverage existing administrative data systems to analyze birth outcomes and Medicaid funded healthcare costs?

The study revealed that home visitation likely has a positive impact on preterm birth and low birth weight. **However, gaps in the current data infrastructure limited the ability to fully examine mother and child healthcare utilization and costs during, and two-years after, birth.** Key activities and findings from the study include:

- ✓ Executed a data sharing agreement between the University of Virginia, CHIP of Virginia, Prevent Child Abuse Virginia (Healthy Families), VDH, and Department of Medical Assistance Services (DMAS). Collected data from 451 women who received prenatal home visitation services from CHIP and Healthy Families from 2009-2012. Matched data from home visitation providers with VDH electronic birth records.
- ✓ Identified a comparison group, utilizing propensity score matching based on VDH electronic birth records. The study found a **40% reduction in preterm birth rates and a 15% reduction in low-birth weight incidences,** for individuals who received home visitation vs the comparison group.
- ✓ Matched birth records for the treatment and comparison groups to Medicaid funded health expenditures for healthcare provided prenatally through the child's second birthday. The analysis revealed a number of issues that made it difficult to reliably link birth records and Medicaid claims so as to identify cost savings.

Two critical gaps limited our ability to measure health and human services program outcomes and understand how that data could be shared to enable ongoing improvement of programs and services.

- **Integrated Data System.** The current system is not designed to easily or comprehensively link VDH birth records and DMAS claims. When birth records were linked to DMAS, only about 70% of the children in the treatment group had Medicaid claims. Within this group, only about 30% of the children with birth records had a corresponding mother with Medicaid claims. The study was able to identify some potential causes for this drop- off, including inaccuracies in self reported Medicaid status and the complexities of the current four-part matching process between the VDH and DMAS databases. If comprehensive health data is included in the Virginia Longitudinal Data System (VLDS), many of these problems could be overcome.
- **Technical Expertise and Partner Capacity.** State agencies often do not have the time or expertise to thoroughly examine the data they collect**.** Agency regulation, lack of resource commitment and disjointed and infrequent communication made it difficult to access databases and procure data to build the comprehensive dataset that would have facilitated a robust analysis. Capacity constraints prohibited DMAS from being able to provide specific utilization categories and actual paid cost for each of these utilizations. Instead, they could only provide the raw claim and encounter data and Fee-for-Service claim cost data.

An opportunity to show improved birth outcomes and decreased Medicaid funded healthcare costs for high-risk pregnant women and their infants in the Commonwealth

Opportunity Overview

HB 2457 helps enable data sharing within the Department of Health and Human Resources to streamline administrative processes, reduce paperwork and administrative burdens, and improve access to and quality of services provided by the agencies. HB 2457 presents the opportunity to significantly improve upon the current data system and enable stakeholders to identify strategies that could improve maternal and infant health. The home visitation retrospective study can serve as key step in improving data sharing processes to track the outcomes of early childhood services.

- **HB 2457 offers to opportunity to re-run and improve the home visitation retrospective analysis.** The retrospective study is dependent on the ability to use existing administrative data system to evaluate birth and healthcare outcomes. While those systems are structured to contain all the necessary data, it is currently difficult to access databases and procure data to build the comprehensive dataset that would have facilitated a robust analysis. The study found that current system operations, agency and privacy regulations, and lack of an integrated system compromised the construction of the required dataset. The bill provides momentum and incentives for partner agencies to engage in the study design and data sharing process. To be most effective a refined retrospective study should be conducted so as to:
    - *Engage partners early and often to identify and overcome barriers.* Matching and sharing birth records with Medicaid claims requires a four-factor matching criteria to ensure DMAS is complying with HIPAA requirements. Problems with this matching process is one of the primary reasons the original study was unable to obtain a significant percentage of the Medicaid records. Partners should be engaged early to identify ways to decrease the number of cases lost through linking VDH and DMAS databases and to improve the data sharing process.
    - *Ensure technical experts have the capacity to analyze the data.* Capacity constraints prohibited DMAS from being able to provide a clean data set with claims organized in specific utilization categories. HB 2457 coincides with increased capacity at DMAS which may enable them to clean and organize its data to facilitate the creation of usable data sets. Alternatively, the state agencies could work with State universities as research partners, as Illinois does with Chapin Hall at the University of Chicago.
    - *Use an updated data set.* Healthcare is a rapidly changing system and therefore a more recent cohort of participants is necessary for a more accurate analysis.
- **HB 2457 offers an opportunity to address disconnects in the data infrastructure and lay the groundwork to improve health outcomes.** Government initiatives, non-profit organizations, academic partners, and healthcare organizations have developed innovative approaches to improve access to high quality health services. Yet these key stakeholders have not come together in Virginia to identify which shared outcomes are the priorities for moving the needle, what data they would need to measure progress towards those outcomes, or how that data can be shared to enable ongoing improvement of programs and services. We urge the Commonwealth to use HB 2457 as a driving function to engage collaboratively with stakeholders and develop modern data-infrastructure whose ultimate purpose is to lend insight and help government leaders address complex social problems.

Our Request. The retrospective study is designed to share data and evaluate outcomes to identify and potentially expand high-performing early childhood healthcare models. In order for VDH and the Council to achieve its original goals, we request that the feasibility study be revisited and informed by the type of data that will be available through the enactment and implementation of HB 2457.

The refined feasibility study can serve as a working case study for data infrastructure design and can document the value of this type of analyses for the Commonwealth. This would be a step towards an ongoing performance management process that identifies and analyzes the high-priority outcomes of home visitation, and other healthcare programs, to improve access to and the quality of services.

[1]Department of Health and Human Services review of Home Visitation Evidence of Effectiveness (HomVEE) http://homvee.acf.hhs.gov/