



September 2015

Community Based Approaches for Optimal Asthma Outcomes and Accountable Population Health

Authors

Steven Farmer

Merkin Fellow, Center for Health Policy

Frank McStay

Research Assistant, Center for Health Policy

Meaghan George

Project Manager, Center for Health Policy

Mark McClellan

Director of the Health Care Innovation and Value Initiative, Center for Health Policy
Senior Fellow, Economic Studies

Cary Sennett

President and CEO, Asthma and Allergy Foundation of America

We would like to acknowledge the **Asthma and Allergy Foundation of America** and **The Merkin Family Foundation** for their support of this research and publication.

Contents

Introduction	1
Health System and Health Care Innovation: Lessons Learned	2
Broadening the Concept of Health Care	3
Payment and Organizational Structures: Aligning Finances and Paying for Outcomes	4
Development of Meaningful and Valid Metrics of Success	7
Vision of the Ideal System and Recommendations	9
Define Core Asthma Services for High Risk Patients.....	9
Use Payment Reform to Support Integration, System Transformation, and Service Coverage.....	9
Improve Information Sharing and Coordination for Asthma.....	11
Conclusion.....	12
Appendix A. Brookings-AAFA Roundtable Agenda	A-1
Appendix B. Brookings-AAFA Roundtable Participants	A-2
Appendix C: Brookings-AAFA Webinar	A-3
References	A-4

Introduction

The United States health care system has begun a significant transformation toward a population oriented delivery model. Support for this transformation comes from reforms in how health care is paid for and regulated that are intended to address shortcomings in care today: rising costs, substantial gaps in quality, and increasing demand for services. While traditional medical care can have a tremendous impact on health outcomes, the social determinants of health also contribute substantially. Consequently, the shift toward population health improvement requires stronger collaboration and coordination between traditional health services, public health, and non-clinical services to achieve lower overall costs and improved patient outcomes. New models that link clinical, social, community, public health, and governmental programs are needed. To improve value, health system transformation that shifts the emphasis from health care to health is needed.

The opportunities and challenges for effective health care reform are particularly evident in pediatric asthma. Asthma is highly prevalent and is consistently one of the top five most costly health conditions.¹⁻⁴ While effective clinical treatments have long existed, poor asthma control is strongly affected by factors largely outside the control of clinicians, including patient beliefs and behavior and environmental factors such as smoking, indoor air pollution, and household pests. Therefore, pediatric asthma represents an excellent example where improved outcomes will require greater coordination of clinical, non-clinical, and community resources than currently exists. New payment models are needed to support these collaborations and to increase the value of healthcare spending.

To enable better outcomes for conditions where social determinants matter, the mechanisms used to reimburse providers, the types of services delivered, the roles of providers, and the expectations of patients need to change. These changes have already begun at the local, state, and federal levels. To succeed, they will require engagement and leadership by patients, clinicians, community organizations, government agencies, non-governmental agencies, patient advocates, and payers. However, such potentially far-reaching changes can be very difficult to implement effectively.

This paper reviews the evidence on opportunities for improving outcomes and lowering costs by better addressing the social determinants of asthma. It describes a broadened care delivery model that can be implemented through practical and incremental reforms. It is based on a joint Brookings and Asthma and Allergy Foundation of America (AAFA) roundtable that was convened in March 2015 (see Appendix A for the agenda). The meeting brought together a diverse group of stakeholders to explore opportunities to improve the care of pediatric asthma patients through enhanced coordination of clinical services, community organizations, and public health entities (see Appendix B for a list of participants). Experts from the federal government, health and social agencies, successful community-based asthma programs, physicians, patients, school nurses, pharmacists, and payers met to discuss: (1) opportunities to improve care through community interventions; (2) improved access and efficiency of community interventions; and (3) the relationship between payment reform, health system transformation, and sustainability of community interventions. Although the discussion focused on asthma, the themes also apply to other chronic conditions. The findings of the roundtable are detailed throughout this paper and were also disseminated during a Brookings-AAFA webinar held in May 2015 (see Appendix C for the webinar agenda and a link to the recording).

The first section of this paper details the limitations of conventional asthma treatment, opportunities for improvement, and the major barriers to implementing these innovations. The subsequent three sections detail three broad themes that have emerged from Brookings and AAFA research and the roundtable

discussion on how to improve care. The paper concludes with lessons learned and presents a path forward.

Health System and Health Care Innovation: Lessons Learned

Seventeen million adults and seven million children suffer with asthma in the United States.⁵ As is true with many conditions, the 20 percent of the population with the highest risk drive 80 percent of the costs of care.⁶ For the highest risk patients, conventional diagnosis, treatment, and care fall short because they fail to address the underlying factors that result in poor asthma control, such as low health literacy and environmental triggers. The medical community is often poorly equipped to address these factors, though some support is available from non-medical federal agencies such as the Environmental Protection Agencies (EPA) and the Department of Housing and Urban Development (HUD).

There are nearly 1,000 community-based asthma programs nationwide that are designed to improve outcomes by addressing the underlying causes of poor control.⁷ These programs either augment existing clinical models of care or link clinical programs with local resources. The most successful programs:

- Target the highest risk patients;
- Provide education and home-environment assessment;
- Coordinate community, public health, and social services; and
- Plan for sustainability.

Several successful community-based initiatives were profiled for this project. For example, the Community Asthma Initiative at Boston Children's Hospital uses nurse case managers to identify asthma patients with recurrent emergency department (ED) visits and hospital admissions, and prioritizes home education and environmental remediation based on patient risk.⁷ The St. Louis chapter of the Asthma and Allergy Foundation of America has worked with the state legislature and school authorities to supply schools with rescue inhalers that prevent ED usage and reduce absenteeism. Improving Pediatric Asthma Care (IMPACT) in Washington, DC offers a 90 minute asthma education intervention, and facilitates access to prescription assistance programs, financial counseling, Medicaid enrollment, legal services, smoking cessation, and other social programs. Assistance with scheduling follow-up appointments with primary care and specialists (allergist, pulmonologists) is also provided when needed. The Asthma Network of West Michigan receives financial support from five local health plans to provide up to 18 home-based asthma education visits. Each program evaluated community needs and developed interventions to address the underlying determinants of poor asthma control.

Despite evidence that the above interventions decrease costs and improve outcomes related to asthma, many of these programs have struggled to establish sustainable funding.⁸⁻¹³ Critical barriers to widespread adoption of these programs include:

- **Competing priorities:** Although asthma generally falls in the top five most costly chronic conditions, other chronic conditions like heart disease, cancer, behavioral and mental health, and diabetes often receive greater attention.¹⁴
- **Burden of evidence:** Payers often expect each community-based program to independently demonstrate cost savings and improved outcomes. This costly requirement is beyond the evaluation capabilities of many programs.
- **Barriers to data sharing:** Schools, pharmacists, private practices, hospitals, housing authorities, and public health entities are often prohibited from sharing patient data without consent, and data standards for electronic record systems are often inconsistent.

- **Weak coordination:** Physicians and hospital leadership are often unaware of existing local resources and may have difficulty accessing them.

Care transformation will lead to broader and more patient-centered conception of patient care (**Figure 1**). Changes are needed to improve care delivery for the subset of patients with poorly controlled asthma. First, clinicians should be well-positioned to participate in sustainable payment models if they adopt a team-based approach to care, which allows all providers to practice at the “top of their license”¹ and better supports effective patient self-management. Second, engagement with non-clinical providers is essential to improving patient outcomes, including community, social, and public health providers. A broad array of national and local partners can help to prevent exposure to asthma triggers and improve patient adherence with care. Finally, new payment models are needed, which offer greater clinical autonomy and shift the emphasis from paying for volume to paying for value.

Figure 1: Practice transformation can improve outcomes for patients with poorly controlled asthma.



Broadening the Concept of Health Care

Asthma, like many chronic diseases, is complicated by social and environmental factors outside the control of the medical community such as irritants and triggers related to substandard housing. Although clinicians are often aware of these factors, they have limited capacity to affect them. Improved coordination between medical, social, and community resources is needed to improve patient health. As stated by Dr. Teach during the Brookings-AAFA roundtable, the majority of what will make an impact for asthma will not be done by doctors in the clinic. Addressing non-clinical factors will require a shift from a system that emphasizes *medical care* to one that emphasizes *health*. This broader approach to patient care can also reduce racial and ethnic health disparities.¹⁵

There is a well-established correlation between asthma triggers and low socioeconomic status, especially increased exposure to pests, dust, mold, cockroaches, and mildew.¹⁶ Poor asthma control is also associated with poor academic performance, work absenteeism, and poverty.^{15,17,18} Working across clinical, social, community, environmental, housing, and public health silos can create system efficiencies and generate savings while meeting the needs of each individual patient and family. For

¹ In other words, all members of the care team contribute to patient care at the level of their education and training. This team-based approach allows for greater efficiency in care delivery and improves access to important services. For example, a medical assistant might spend 15 or 20 minutes teaching good nebulizer technique to a struggling patient.

example, improving indoor air quality in homes and schools can prevent ED visits and hospitalizations, and reduce absenteeism for both children and working parents.^{8,19}

Team-based care incorporates physicians, mid-level providers (e.g., physician assistant, nurse practitioner), and other participants (e.g., nurses, social workers, and community health workers) to offer more efficient, patient-centered care. Engagement of non-clinical partners can break down silos and leverage existing infrastructure. For example, targeted enforcement of housing codes may be more efficient than provision of environmental remediation services through clinical entities.²⁰ These broader relationships are not well established, and communication between disparate entities has been challenging. In some cases there are legal and regulatory barriers in addition to the typical infrastructural barriers (e.g. payer resistance to reimbursing services provided by nontraditional providers in non-clinical settings, such as community health workers providing home-based interventions). Moving forward with patient-centered health models will require a conscious effort to align the system across the care continuum.

Payment and Organizational Structures: Aligning Finances and Paying for Outcomes

The current payment structure, dominated by fee-for-service (FFS), rewards a high volume of clinical services with insufficient accountability for patient outcomes.^{21,22} It supports traditional and often expensive medical services such as inpatient hospital stays and ED visits, but often does not cover important non-medical services such as culturally appropriate education, assistance by social workers, provision of supplies like bed and pillow encasements, and environmental remediation. FFS often only reimburses for patient education during in-person physician or mid-level encounters, which limits the time available for this crucial activity. As a result, high cost clinicians are providing services that could be more efficiently and effectively delivered by other staff, such as administrative staff, nurses, medical assistants, community health workers, or social workers. Pharmacists are similarly not reimbursed for counseling patients or for providing feedback to physicians about a patient's medication adherence. Important services like care coordination and proactive population health management are uncompensated or undercompensated.

Anecdotes from roundtable participants suggest that payers and grantors often resist covering innovative services in the FFS system because they lack confidence that services will be provided only to patients where improvements in health outcomes and savings will occur. They tend to require that each individual community-based program demonstrate a positive return on investment, which is costly, inefficient, and time consuming. Indeed, since many of the benefits of these programs materialize over several years, longer than in a feasible evaluation period, evaluations may not catch the true impact of the intervention.

Increased spending on conventional health care has often come at the expense of support for social and public health services that can improve asthma control, particularly at the state level.²³ Services relevant to public health often function in silos, including conventional medical care and activities performed by other agencies such as the Centers for Disease Control and Prevention (CDC), the EPA, and departments of public health, housing, social services, and education. Establishing and sustaining linkages between disparate service entities has been challenging, and thus coordination between clinical services, social services, and public housing services is rare.

Commercial and public payers are testing a range of Alternative Payment Models (APMs) that better reward value in healthcare delivery. These APMs address many of the problems inherent in the FFS

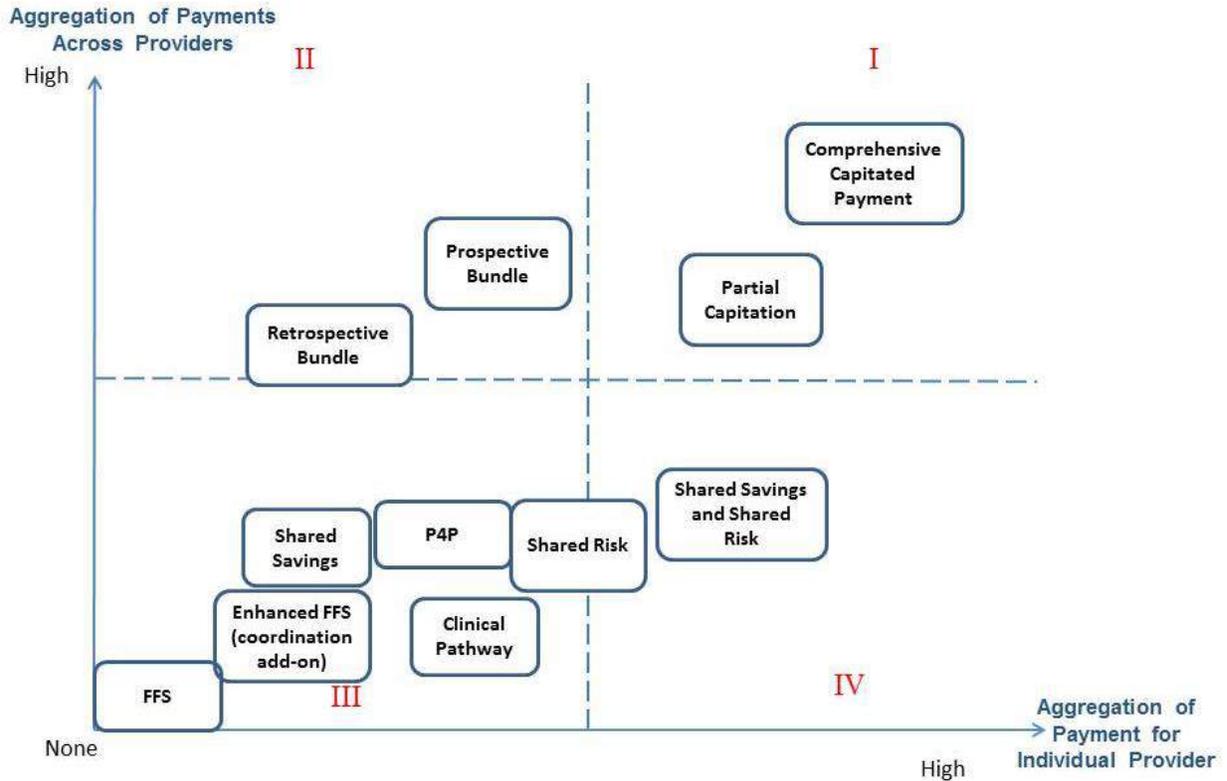
payment model by supporting more efficient clinical care and improved coordination across clinical, non-clinical, and community silos. They also can improve the balance between medical, social, and public health services by sharing financial resources and accountability across previously unrelated service providers within and outside the conventional health system.

A combination of FFS with other models allows clinicians greater discretion to address factors outside of traditional medical care that can lead to poor asthma control, while limiting their exposure to additional risks or other undesirable consequences of payment reform. During the roundtable, several funding mechanisms were explored:

- **Expanded FFS:** Reimburse clinical support staff and community health workers to provide enhanced education and environmental assessments, with additional payments for case management.
- **Pay for performance:** Offer bonus payments for good performance on asthma specific measures such as reduced ED visits, reduced use of systemic steroids, and the percentage of patients with a documented asthma action plan. Several states have established measures related to utilization, morbidity, and disease management.^{24,25}
- **Social impact bonds/pay for success:** Financing mechanism where the costs of health or social interventions are raised through investments and recovered through resulting savings.²⁶ For example, one asthma program in California will use social impact bonds to sustain and expand a community-based asthma program after its two-year \$660,000 grant expires at the end of 2015.²⁷ In this case, investors will receive a portion of the projected net savings of \$5,000 per child through reductions in ED usage and hospitalizations.
- **Shared savings:** Allow organizations to keep portions of savings achieved if care provided is lower than target benchmark costs and quality metrics are met. Providers who reduce asthma costs compared to expected expenditures can capture a portion of those savings, and/or; state Medicaid programs that establish a state-wide asthma program can capture savings generated by the program and reinvest them.
- **Bundled payments:** Provides a fixed reimbursement for a defined set of services over a limited time period. The provider is responsible for all included treatment costs for patients within a bundle. For an acute care bundle, a payment would likely cover the ED visit or hospitalization and short-term follow-up by the primary care and/or local asthma program. For a chronic care bundle, a set fee is paid to providers for managing chronic asthma services, potentially including enhanced educational interventions as well as environmental assessment and remediation.
- **Capitation:** Service providers receive a fixed payment per member per month (PMPM) or per year for all of a patient's care. Capitated payments provide the greatest flexibility to providers, but come with accountability for outcomes.

Figure 2 depicts the spectrum of payment reforms based on aggregation across and among providers. The models in “Quadrant I” hold the greatest potential for transforming traditional care to population based health practice. Partial capitation, full capitation, and global budgets give health care professionals the flexibility to direct resources where they will be most impactful, including clinical and non-clinical services. However, these models also hold providers accountable for costs and outcomes. Consequently as noted above, health systems with less experience taking on financial risk may be more comfortable applying payment models like those in Quadrants II and IV, including bundled payments, add-on payments, and shared savings. These latter models remain based on a FFS framework but allow providers to introduce some high value practice changes without assuming excessive financial risk and can shift to greater accountability for population health as experience and confidence accumulate.

Figure 2: Aggregation of Payments in Alternative Payment Models



Some payment reforms may be achieved through Medicaid waivers and other state initiatives like the State Innovation Models, which are multi-payer payment and delivery models that are led by states and supported by the federal government.²⁸ Several roundtable participants encouraged the federal government to streamline reforms for asthma care through a standardized Medicaid waiver that incorporates an evidence-based suite of services. Other payment reforms may be initiated through commercial payers and ad hoc collaborations between hospitals, providers, and non-profit groups. Different payment models may be needed depending on local circumstances. Moreover, different settings may require several models that work together to achieve the triple aim.

At the practice level, APMs can drive change in several fundamental ways. New payment models can reward efficient, high value services through team-based care. Instead of tying payments to physician encounters, practices are paid a fixed amount for patient care, often with incentives tied to patient outcomes. In these models, providers have greater flexibility to determine which services are highest value and who should deliver them. Physicians can spend more time with high risk asthma patients, developing detailed treatment plans and coordinating care with outside providers, while delegating simple, routine tasks to other members of the team. Team-based care can better support patient self-management by offering detailed education about trigger avoidance and medication adherence.

Early experiences with APMs by commercial and public payers have been promising, although evidence is still limited for models with greater provider risk. Bundled payments, the APM with the longest track record, have reduced expenditures by as much as 10% without harming quality.²⁹⁻³¹ Accountable care organizations (ACOs) in Medicare’s Shared Savings Program and Pioneer programs have saved nearly \$417 million over three years, while improving quality on a number of key measures.^{32,33} Additionally

there are numerous partial or fully capitated population-based programs that share budgets and accountability across sectors with promising results, including:

- **Oregon's Coordinated Care Organizations (CCOs):** Sixteen regional health organizations are accountable for the health of Oregon's Medicaid population. These organizations receive a fixed budget (e.g. PMPM), which they distribute to hospitals, physicians, public health entities, and home and community providers, and are held accountable to a variety of quality metrics in addition to 17 incentive metrics. Since implementation began, ED visits have been reduced by 21%, the rate of hospital stays due to chronic obstructive pulmonary disease (COPD) or asthma has decreased by 48%, and the rate of adult patients with hospital stays due to an acute exacerbation have decreased nearly 10%.³⁴
- **Hennepin Health:** The Hennepin County collaboration (Hennepin County Medical Center, NorthPoint Health and Wellness, Human Services and Public Health Department, and Metropolitan Health Plan) addresses the total health and social needs of nearly 10,000 members in Minnesota. The organization receives a full-risk capitated payment from the state and distributes payments to hospitals, physicians, public health and social services, and community providers. Over three years, Hennepin Health has achieved a 16% decrease in PMPM rates, 9% reduction in ED visits across the entire population, and a 52% and 72% reduction in ED and inpatient costs for those members who received housing assistance.³⁵ The percentage of patients receiving optimal asthma care increased.³⁶
- **Community Care of North Carolina (CCNC):** The CCNC is a virtual patient-centered medical home (PCMH) / accountable care organization (ACO) built on public-private partnerships between physicians, nurses, pharmacists, hospitals, local health departments, social service agencies, and community organizations. The state funds coordinating and supporting staff to link 750,000 Medicaid patients with medical and non-medical services. The North Carolina government estimates annual state savings between \$60 and \$160 million. Much of this savings has been achieved through a 23% reduction in ED visits, a 25% reduction in outpatient visits, and an 11% reduction in prescription drug costs.^{37,38}

Development of Meaningful and Valid Metrics of Success

Metrics that move beyond clinical process measures to directly assess health outcomes enable providers in APMs to demonstrate success, and thus to increase confidence in more significant shifts in care delivery. Roundtable participants urged that both clinical and non-clinical measures must be developed within a realistic time horizon to assure that asthma care is delivering value for money. A combination of clinical, non-clinical, short-, intermediate-, and long-term measures could be used to demonstrate these benefits.

To optimize value, clinicians, public health entities, and community organizations need timely feedback on their performance. Social service providers, public health providers, and schools often lack even basic data on patient health. Impediments to communication between these disparate entities result in weak coordination. Better integration of electronic health records and other public health data can improve decision-making and allow for program adjustments when needed. Although patient privacy is a legitimate concern, policy solutions that allow for improved coordination are desperately needed and are in development. For example, data systems may be established to share fully or partially de-identified patient data or to provide data aggregated at a population level. This data can provide important feedback to health and public health entities so that targeted interventions can reach patients with the greatest need.

Access to timely data is particularly important for program evaluation. Currently, payers are skeptical about reimbursing community asthma programs because of a lack of quantitative evidence supporting their outcomes; they will not be cost-effective if applied indiscriminately. Payers are also concerned that they will end up paying twice: once for the preventive intervention and again for treatment if prevention does not work. New performance measures could address this concern by providing more meaningful and comparable outcome results across providers. Standardization of quality measures is particularly important to ensure evaluations can be carried out consistently and fairly. Developing robust measures will help improve services and satisfy payers that their investments are worthwhile.

Shared resources and shared accountability are needed to improve coordination across disparate entities and to implement a truly population based asthma strategy. Practices will continue to need conventional process measures such as establishment of an asthma action plan, provision of controller medications and outcome measures such as the use of rescue inhalers, oral steroids, and emergency rooms. However, additional measures beyond the clinical environment are needed to support the shift to population health, including the number of school days missed due to asthma, attainment of acceptable indoor air quality in schools and public housing, and enforcement of smoke-free public housing. These disparate measures will need measure stewards, which are organizations that are responsible for developing, testing, and maintaining them. For example, the Agency for Healthcare Research & Quality, the Health Resources and Services Administration, and Medicaid may serve as stewards for asthma related clinical measures.³⁹⁻⁴² The Department of Education may serve as a measure steward for absenteeism rates in schools. These measures need to be reported back to clinical, community, education, housing, and public health related organizations, and they should be used to hold these entities accountable for improved population level outcomes. The Institute of Medicine suggests in their 2015 Vital Signs report that widespread application of a limited set of standardized measures could reduce the burden of unnecessary measurement and align the incentives and actions of multiple organizations at multiple levels.⁴³

New Jersey’s Delivery System Reform Incentive Payment (DSRIP) program has implemented a number of new pediatric asthma measures, including “percent of patients who have visited an ED for asthma in the past six months” and “percent of patients evaluated for environmental triggers other than environmental tobacco smoke.”⁴⁴ Additional outcome-driven measures that address non-clinical contributors to poor asthma control are needed. See **Table 1** for examples of measures and the agency responsible for tracking them.

Table 1. Potential measures and tracking agency for asthma surveillance

MEASURE	AGENCY RESPONSIBLE
Number of school days missed due to asthma	Department of Education
Asthma attacks reported by school nurse	Department of Education
Indoor air quality within acceptable range	Housing and Urban Development
Percentage of patients with timely controller medication refills	Public and Commercial Payers
Reduction in rescue inhaler use over 3 years	Public and Commercial Payers
Percentage of high risk patients with environmental assessment	Public and Commercial Payers
Enforcement of smoke-free public housing	Housing and Urban Development
Assessment for pest infestation	Housing and Urban Development

Vision of the Ideal System and Recommendations

There are numerous opportunities for improved value in health care. Important opportunities require improved communication and coordination between the health care, social service, and public health sectors and drive aligned resources to support these efforts. A shift toward a public health focus, development of meaningful and valid metrics, and APMs that facilitate shared accountability will better align payments with value. Below we present a set of actionable recommendations that clinicians, hospitals, payers, and governments can implement in the path toward system transformation.

Define Core Asthma Services for High Risk Patients

Long Term Vision: Payers will have confidence that community-based asthma services are delivering value, using evidence-based, enhanced asthma services. Evidence on these services will be used to help providers gain confidence and succeed in implementing APMs that include accountability for costs and patient outcomes.

Recommendation 1: Fund focused research that identifies the optimal components of community-based asthma services for high risk patients.

In addition to the Expert Panel Report 3 (known as EP3) guidelines for the targeting, diagnosis and management of asthma, existing evidence demonstrates that provision of non-clinical services improves outcomes and decreases costs for high risk asthma patients.^{45,46} There are over 1,000 asthma programs across the nation. Although there are similarities between these programs there are also important differences, including high risk inclusion criteria, the number of home visits provided, and whether environmental remediation supplies are offered. While there is substantial evidence on the efficacy of enhanced services over standard clinical procedures, it is unknown which components contribute the greatest value. Each component may be beneficial under the right circumstances, but the optimal combination of core services is not well defined.

Use Payment Reform to Support Integration, System Transformation, and Service Coverage

Long Term Vision: Community-based asthma programs are sustainable within reformed health care financing and are not reliant on grant funding. Rather, APMs allow the flexibility to offer high value, non-traditional services in exchange for accountability for costs and outcomes. As payment reforms evolve over time with a shift to more provider risk and flexibility to support effective community-based services, APMs will better support an integrated medical, public health, and social service system. Collaboration and coordination is encouraged through these models, and payment rewards high value care that reduces costs, improves population health, and improves the patient experience.

Recommendation 2: New payment models sustainably support community based asthma services for high risk patients and should be linked with improved patient outcomes.

APMs enable clinicians to direct a proportion of medical resources to address underlying causes of poor health where these investments will efficiently drive improved health outcomes. Provision of population outcome measures is essential for providers to practice population-oriented health care. New models offer greater support than FFS for coordination of patient services and offer some flexibility to directly provide services that address social determinants of health. In some cases, practices will directly provide services; where a greater need exists (e.g., poverty or poor housing) practices should engage existing public services. APMs should financially reward providers for introducing innovation that drives greater value in care delivery. There are administrative overhead costs for participating in APMs, and the associated financial incentives must justify the effort and expense of participation.

The transition from FFS to add-on payment to risk-bearing models will take time. Moreover, shifting revenue from service to population based reimbursement will change accounting and practice financials, and occur on different time horizons in different settings. Transitional payments will be needed in some circumstances, depending on providers' ability to assume financial risk. Examples of intermediate steps practices can take to gain experience with APMs include:

- Shared savings models. Under these arrangements if a primary care provider or hospital is able to avoid one hospitalization (an average cost of \$3,600) based on past utilization patterns through extended in-clinic education, they could be eligible to receive a proportion of that cost savings.⁴⁷ Some of these funds may support community based asthma services.
- Small to medium sized PMPMs. These payments may cover enhanced coordination and in-clinic educational services by a nurse or social worker. This payment is akin to those made in Arkansas's PCMH initiative where enrolled providers receive a small PMPM payment for all patients to support care coordination activities (\$1-\$30, risk adjusted, with the average of around \$4).
- Larger PMPM add on payments. These payments would allow practices to provide targeted supplies (e.g., HEPA Vacuums, bed and pillow encasements) or subcontract some services (e.g., environmental remediation, pest control). An example of this is being implemented by MassHealth (Massachusetts's Medicaid program) for high-risk pediatric patients enrolled in their capitated primary care payment reform initiative or already enrolled in a Medicaid managed care organization. The total amount of the PMPM is dependent on performance on quality metrics and on achievement of savings.
- Prospective bundled payments. These payments could be distributed to the hospital or attributed primary care physician (PCPs) for an asthma patient with one or more asthma related ED visits or hospitalizations in the past six months. These funds could support enhanced services including a home visit by a trained nurse or community health worker (CHW). With increased payment comes increased accountability for outcomes. For example, during the course of the program, health providers must report a number of outcomes including peak flow results, ED/hospitalization visits, whether an action plan has been developed or updated, and if medications have been filled. If providers do not meet the predetermined benchmarks for care improvement, a percentage of their other payments, FFS or otherwise, could be prospectively adjusted to recoup bundled payments.

As previously stated, population based payments, including partial and full capitation, offer the greatest potential for health system transformation. The global budgeting mechanism incents effective coordination across the continuum of medical, public health, social, and community service providers. Moreover, this gives medical providers the flexibility to invest the resources that will have the most efficient impact for their patients at the population level.

Recommendation 3: Reimbursement should support access to, and alignment of, medical, public health, and social service providers.

Supported by new payment models, new organizational structures can be implemented to facilitate population-oriented health care. There is a broad range of asthma stakeholders, including the EPA, the CDC, HUD, federal and state Departments of Education, local housing authorities, departments of public health, physician practices, hospitals, public and commercial payers, non-profits, patient advocacy organizations, and other community organizations. Full alignment of all of these entities will require major changes. However, even short term steps can go a long way towards improving access to existing services and enhancing coordination between them. For example, practices can use some funds from

APMs to jointly offer social workers for high risk patients to facilitate and streamline access to social and public health services. These social workers may assist patients with a variety of services like housing, transportation, and food assistance.⁴⁸ In settings where there is a high need, coordination with social services may be facilitated by co-locating clinical and social services in clinics and hospitals.

These disparate parties will collaborate more effectively if they share accountability for costs and patient outcomes. Broader health system transformation will therefore require changes well beyond the individual practice level, and mechanisms are needed to share resources between many different stakeholders. Broad collaboration is possible. Hennepin Health, Oregon's Coordinated Care Organizations, and Community Care of North Carolina are examples. Even in the absence of large structural changes like these, greater investments in social workers and community health workers can better connect patients with existing services.

Improve Information Sharing and Coordination for Asthma

Long Term Vision: In addition to payment models that align medical, social, and public health services, there is a need for improved coordination between a diverse set of providers who participate in community-based asthma care. Improved data sharing and a clearinghouse of community providers with a description of services and costs would be valuable. The information exchange should be easy to access and should build on existing investments. The exchange will allow providers to better assess which resources already exist in their community, which need to be improved upon, and which need to be built from scratch.

Recommendation 4: Extend existing information exchange services to identify locally available resources and publicize the exchange to a wide range of providers.

There are already several highly reputable communication tools for providers, including the EPA's Asthma Community Network² and the CDC's National Asthma Control Program³. These should be linked into a single, easily accessible clearinghouse. Despite the many community-based asthma programs nationwide, many communities lack an established program. The clearinghouse should be extended to include detailed contact information for a broad array of local stakeholders. The exchange can facilitate linkages between providers, establish a central repository for patient educational materials in multiple languages, and provide feedback on population-level performance. As more primary care providers participate in APMs, they will need to efficiently engage community providers to obtain services for high risk asthma patients. An information exchange will facilitate these connections, while preventing needless duplication of services.

Recommendation 5: Modify regulations that hinder collaboration and communication.

Efficient bi-directional communication between clinicians, schools, pharmacists, and public health entities is often impaired by Health Insurance Portability and Accountability Act (HIPAA) and Family Educational Rights and Privacy Act (FERPA) rules. Community-based asthma programs would be more effective if existing rules were modified to facilitate communication between these entities for the purposes of improving patient care. Regulatory changes will need to balance the legitimate interest in patient privacy with the benefits of more efficient care delivery and communication. For example, school nurses can alert the pediatrician if a child has poor asthma control and can facilitate implementation of established asthma action plans. A requirement that schools ask parents of all enrollees to voluntarily identify a primary care provider and sign a HIPAA waiver (or opt out) might be a

² The EPA Asthma Community Network is available here: <http://www.asthmacommunitynetwork.org/>.

³ The CDC's National Asthma Control Program is available here: <http://www.cdc.gov/asthma/nacp.htm>.

simple short-term step. Payers, hospitals, and providers can collaborate with local health departments and housing agencies to identify and remediate “hot spots” of poor asthma control. Aligned payment structures will be much more likely to succeed if patient-level information can be shared between these entities, even in a partially or fully de-identified form.

Conclusion

Asthma is a leading opportunity for needed change in the American health care system. The roots of poor asthma control often lie outside the conventional health care system, and changes are needed beyond the walls of the clinic or hospital to decrease costs and improve outcomes for these patients. The reforms outlined here aim to shift the focus from individual patient health care toward a greater population health orientation. While some of the reforms may seem daunting, perfect alignment of the many disparate stakeholders identified in this document is not required to make progress. **Table 2** summarizes potential short and long term steps that can improve population based asthma management.

Table 2. Summary of Short- and Long- Term Action Steps

RECOMMENDATION CATEGORY	INITIAL STEPS	LONG-TERM STEPS
Define core asthma services for high risk patients	<ul style="list-style-type: none"> Standardize definition of high risk patient Identify gaps in existing evidence Fund comparative effectiveness research to identify highest impact components 	<ul style="list-style-type: none"> Align benefit design with highest value services for high risk patients
Use payment reform to support integration, system transformation, and service coverage	<ul style="list-style-type: none"> Define population outcome measures Offer small add-on payments to practices to support the costs of a shared social worker Identify best practices used by successful community asthma programs that have aligned medical, public health, and social services 	<ul style="list-style-type: none"> Implement sustainable APM funding mechanisms Establish management structures, which share resources and accountability across health care and social services silos
Improve information sharing and coordination for asthma	<ul style="list-style-type: none"> Establish mechanism to collect and update contact information of local stakeholders and service providers Increase provider awareness of available services by working with specialty societies, state medical associations, and hospitals to disseminate information Establish task force with community stakeholders (schools, local health departments, housing) to identify regulations which could be improved 	<ul style="list-style-type: none"> Build information exchange clearinghouse Identify gaps in community asthma programs and offer technical assistance to address them

Through Brookings and AAFA research, three themes emerged that help chart a clear path forward for optimizing and sustaining asthma outcomes: broadening the concept of health care, leveraging payment and organizational structures to align finances and pay for outcomes, and the development of meaningful metrics of success. This white paper presents a broad vision for reform, but small, incremental steps can be effective in forging collaboration across stakeholders and improving the lives of patients with asthma.

Appendix A. Brookings-AAFA Roundtable Agenda

Brookings-AAFA Roundtable on Asthma Payment and Delivery Innovation

The Brookings Institution
1775 Massachusetts Ave NW
Washington, DC 20036

March 6, 2015

- 8:30 a.m.** **Arrival and Breakfast**
- 9:00 a.m.** **Welcome, Introductions, and Plan for the Day**
- 9:15 a.m.** **Discussion: Sharing Experiences, Lessons Learned, and Opportunities for Improvement/Identification of Barriers and Problems**
- Goal: Identify specific interventions in the community that can be accomplished in the near-term to improve asthma care.*
- 9:45 a.m.** **Discussion: Asthma and Public Health Interventions and Coordination**
- Goal: Examine opportunities for public health interventions to improve asthma care and for more effective coordination between local, state and federal agencies/ programs.*
- 10:45 a.m.** **Break**
- 11:00 a.m.** **Discussion: Payment Innovation and System Transformation**
- Goal: Explore the potential of payment reform to support asthma care innovations and health system transformation*
- 12:00 p.m.** **Lunch and Facilitated Discussion: Policy Recommendations and Next Steps**
- 1:30 p.m.** **Adjourn**

Appendix B. Brookings-AAFA Roundtable Participants

Peter Ashley

Director, Policy and Standards Division, HUD Office of Healthy Homes and Lead Hazard Control

Jim Bender

Executive Director, National Education Association Health Information Network

Meryl Bloomrosen

Senior Vice President, Policy, Advocacy and Research, Asthma and Allergy Foundation of America

Julie Bluhm

Clinical Program Manager, Hennepin Health

Stephen Cha

Chief Medical Officer, Center for Medicaid and CHIP Services

Stacey Chacker

Executive Director, New England Asthma Innovation Collaborative (NEAIC)

Judy Dolins

Associate Executive Director, American Academy of Pediatrics

Brenda Doroski

Director, Center for Asthma and Schools, EPA

Steven Farmer

Visiting Scholar, Economic Studies, Engelberg Center for Health Care Reform

Eliot Fishman

Director, Children and Adults Health Programs Group, Center for Medicaid and CHIP Services

Paul Garbe

Director, CDC National Asthma Control Program

Alisa Haushalter

Senior Director, Department of Population Health, Nemours

Joy Krieger

Executive Director, Asthma and Allergy Foundation of America St. Louis Chapter

Donna Mazyck

Executive Director, National Association of School Nurses

Mark B. McClellan

Director, Health Care Innovation and Value Initiative; Senior Fellow, Economic Studies, Brookings Institution

Karen Meyerson

Manager, Asthma Network of West Michigan

Amy Mullins

Medical Director for Quality Improvement, American Academy of Family Physicians

Ruth Ann Norton

President/CEO, Green and Healthy Homes Initiative

Jim Perrin

Past President, American Academy of Pediatrics

Francis Rienzo

Vice President, Partners in Patient Health, Corporate Affairs, Sanofi U.S.

Alice M. Rivlin

Leonard D. Schaeffer Chair in Health Policy Studies and Director, Center for Health Policy; Senior Fellow, Economic Studies, Brookings Institution

Cary Sennett

President & CEO, Asthma and Allergy Foundation of America

Joshua Sharfstein

Associate Dean for Public Health Practice, Johns Hopkins Bloomberg School of Public Health

Stephen Teach

Chair of the Department of Pediatrics, George Washington University; Director and Principal Investigator of IMPACT DC (Improving Pediatric Asthma Care in the District of Columbia),

Ellen Marie Whelan

Senior Advisor, Center for Medicare and Medicaid Innovation

Roxeanne Ward Zaghab

Director of Operations & Business Development, Center for Innovative Pharmacy Solutions

Appendix C: Brookings-AAFA Webinar

B Center for
Health Policy
at BROOKINGS

 Asthma and Allergy
Foundation of America

**Practical Strategies for
Integrating Clinical and
Community Asthma
Innovation with
Sustainable Payment**

May 4, 2015
2:00 p.m. ET



B Center for
Health Policy
at BROOKINGS

 Asthma and Allergy
Foundation of America

Agenda

- Joy Krieger, *Executive Director, St. Louis Chapter, Asthma and Allergy Foundation of America*
- Dr. Cary Sennett, *President and CEO, Asthma and Allergy Foundation of America*
- Dr. Stephen Cha, *Chief Medical Officer, Center for Medicaid and CHIP Services, Center for Medicare and Medicaid Services*
- Dr. Steven Farmer, *Visiting Scholar, Brookings*
- Question and Answer, moderated by Dr. Mark McClellan, *Director, Health Care Innovation and Value Initiative, Brookings*

The entire webinar with slides can be found online: <http://www.brookings.edu/events/2015/05/04-webinar-asthma-payment-reform>.

References

1. Agency for Healthcare Research and Quality. Statistical Brief #331: Top 10 Most Costly Conditions among Men and Women, 2008: Estimates for the U.S. Civilian Noninstitutionalized Adult Population, Age 18 and Older. http://meps.ahrq.gov/mepsweb/data_files/publications/st331/stat331.shtml Accessed August 5, 2015.
2. Stanton MW. The High Concentration of U.S. Health Care Expenditures. http://meps.ahrq.gov/mepsweb/data_files/publications/ra19/ra19.pdf Accessed August 5, 2015.
3. Agency for Healthcare Research and Quality. Statistical Brief #434: The Five Most Costly Children's Conditions, 2011: Estimates for U.S. Civilian Noninstitutionalized Childre, Ages 0-17. http://meps.ahrq.gov/mepsweb/data_files/publications/st434/stat434.shtml Accessed August 5, 2015.
4. Agency for Healthcare Research and Quality. Statistical Brief #470: Trends in the Five Most Costly Conditions among the U.S. Civilian Noninstitutionalized Population, 2002 and 2012. http://meps.ahrq.gov/mepsweb/data_files/publications/st470/stat470.shtml Accessed August 5, 2015.
5. Centers for Disease Control and Prevention. 2013 National Health Interview Survey (NHIS) Data. <http://www.cdc.gov/asthma/nhis/2013/table3-1.htm>. Accessed June 17, 2015.
6. Szeffler SJ, Zeiger RS, Haselkorn T, et al. Economic burden of impairment in children with severe or difficult-to-treat asthma. *Ann Allergy Asthma Immunol*. 2011;107(2):110-119 e111.
7. Farmer SA, Kirkpatrick JN, Heidenreich PA, Curtis JP, Wang Y, Groeneveld PW. Ethnic and racial disparities in cardiac resynchronization therapy. *Heart Rhythm*. 2009;6(3):325-331.
8. Woods ER, Bhaumik U, Sommer SJ, et al. Community asthma initiative: evaluation of a quality improvement program for comprehensive asthma care. *Pediatrics*. 2012;129(3):465-472.
9. Sommer SJ, Queenin LM, Nethersole S, et al. Children's hospital boston community Asthma initiative: partnerships and outcomes advance policy change. *Progress in community health partnerships : research, education, and action*. 2011;5(3):327-335.
10. Kearney GD, Johnson LC, Xu X, Balanay JA, Lamm KM, Allen DL. Eastern Carolina Asthma Prevention Program (ECAPP): An Environmental Intervention Study Among Rural and Underserved Children with Asthma in Eastern North Carolina. *Environ Health Insights*. 2014;8:27-37.
11. Barton A, Basham M, Foy C, Buckingham K, Somerville M, Torbay Healthy Housing G. The Watcombe Housing Study: the short term effect of improving housing conditions on the health of residents. *J Epidemiol Community Health*. 2007;61(9):771-777.
12. Bryant-Stephens T, Kurian C, Guo R, Zhao H. Impact of a household environmental intervention delivered by lay health workers on asthma symptom control in urban, disadvantaged children with asthma. *Am J Public Health*. 2009;99 Suppl 3:S657-665.
13. The Brookings Institution. A Case Study in Payment Reform to Support Optimal Pediatric Asthma Care. April 27, 2015. <http://www.brookings.edu/~media/research/files/papers/2015/04/27-asthma-case-study/asthma-case-study.pdf> Accessed August 5, 2015.
14. MEPS: Medical Expenditure Panel Survey. Statistical Brief #470. Trends in the Five Most Costly Conditions among the U.S. Civilian Noninstitutionalized Population, 2002 and 2012 http://meps.ahrq.gov/mepsweb/data_files/publications/st470/stat470.pdf. Accessed June 17, 2015.
15. Kirkpatrick JN, Ky B, Rahmouni HW, et al. Application of appropriateness criteria in outpatient transthoracic echocardiography. *J Am Soc Echocardiogr*. 2009;22(1):53-59.

16. Guidelines for the Diagnosis and Management of Asthma. National Institutes of Health: National Heart Lung and Blood Institute; 2007.
17. Meng YY, Babey SH, Wolstein J. Asthma-Related School Absenteeism and School Concentration of Low-Income Students in California. *Prev Chronic Dis*. 2012;9:110312.
18. Singh A, Syal M, Grady SC, Korkmaz S. Effects of green buildings on employee health and productivity. *Am J Public Health*. 2010;100(9):1665-1668.
19. Bhaumik U, Norris K, Charron G, et al. A cost analysis for a community-based case management intervention program for pediatric asthma. *The Journal of asthma : official journal of the Association for the Care of Asthma*. 2013;50(3):310-317.
20. Beck AF, Huang B, Chundur R, Kahn RS. Housing code violation density associated with emergency department and hospital use by children with asthma. *Health Aff (Millwood)*. 2014;33(11):1993-2002.
21. Frist B, Schroeder S. Changing the Way Physicians Are Paid: Report of the National Commission on Physician Payment Reform. March 4, 2013. . *HealthAffairs Blog*.
<http://healthaffairs.org/blog/2013/03/04/changing-the-way-physicians-are-paid-report-of-the-national-commission-on-physician-payment-reform/>.
22. Miller HD. From volume to value: better ways to pay for health care. *Health affairs (Project Hope)*. 2009;28(5):1418-1428.
23. Health Policy Brief. The Prevention and Public Health Fund.
http://healthaffairs.org/healthpolicybriefs/brief_pdfs/healthpolicybrief_63.pdf. Accessed July 15, 2015.
24. Lyon M, Markus AR, Gerstein MT, et al. Addressing the Challenges of Reporting on Childhood Asthma in a changing Health Care System: Building Better Evidence for High Performance.
http://www.mcanonline.org/static/images/files_ChallengesReportingChildhoodAsthmaBrief.pdf
. Accessed June 17, 2015.
25. An Opportunity to Innovate: White paper on Asthmapolis and Healthcare Quality Measures.
<http://propellerhealth.com/wp-content/uploads/2012/12/Quality-Measures-White-Paper.pdf>.
Accessed June 17, 2015.
26. Centers for Disease Control and Prevention; Office for State, Tribal, Local and Territorial Support. Public Health Law and Policy Innovations: Social Impact Bonds.
<http://propellerhealth.com/wp-content/uploads/2012/12/Quality-Measures-White-Paper.pdf>.
Accessed June 17, 2015.
27. The California Endowment Awards Grant to Social Finance and Collective Health: Asthma Management Demonstration in Fresno, CA Paves Way for Social Impace Bond [press release]. March 25, 2013.
http://payforsuccess.org/sites/default/files/fresno_asthma_demonstration_project_press_release.pdf.
28. Centers for Medicare & Medicaid Services. State Innovation Models Initiative: General Innovation. <http://innovation.cms.gov/initiatives/state-innovations/>. Accessed June 17, 2015.
29. The Lewin Group. CMS Bundled Payments for Care Improvement (BPCI) Initiative Models 2-4: Year 1 Evaluation & Monitoring Annual Report. February 2015.
<http://innovation.cms.gov/Files/reports/BPCI-EvalRpt1.pdf> Accessed August 5, 2015.
30. Delbanco S. The Payment Reform Landscape: Bundled Payment. Health Affairs Blog. July 2, 2014. <http://healthaffairs.org/blog/2014/07/02/the-payment-reform-landscape-bundled-payment/> Accessed August 5, 2015.
31. Agency for healthcare Research and Quality. 1. Bundled Payment: Effects on Health Care Spending and Quality. Closing the Quality Gap: Revisiting the State of the Science.

- http://www.effectivehealthcare.ahrq.gov/ehc/products/324/1235/EvidenceReport208_CQGBundedPayment_FinalReport_20120823.pdf Accessed August 5, 2015.
32. U.S. Department of Health and Human Services. Affordable Care Act payment model saves more than \$384 million in two years, meets criteria for first-ever expansion. May 4, 2015. <http://www.hhs.gov/news/press/2015pres/05/20150504a.html> Accessed August 5, 2015.
 33. Centers for Medicare & Medicaid Services. Fact sheets: Medicare ACOs continue to succeed in improving care, lowering cost growth. September 16, 2014. www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2014-Fact-sheets-items/2014-09-16.html Accessed August 5, 2015.
 34. Oregon Health Authority, Office of Health Analytics. Oregon's Health System Transformation: 2014 Mid-Year Report. <http://www.oregon.gov/oha/Metrics/Documents/2014%20Mid-Year%20Report%20-%20Jan%202015.pdf> Accessed June 18, 2015.
 35. Hennepin County, Minnesota; Hennepin Health. <http://www.commonwealthfund.org/~media/files/events/2014/hennepin-health--commonwealth-sept-2014.pptx>. Accessed June 17, 2015.
 36. MN Community Measurement. Data Collection Guide; Direct Data Submission. Optimal Asthma Care 2014. http://mncm.org/wp-content/uploads/2014/05/Optimal_Asthma_Care_2014-MDH-FINAL-5.8.2014.pdf. Accessed July 15, 2015.
 37. Community Care of North Carolina. Our Results: Making Headway on Cost, Utilization and Quality. <http://communitycarenc.com/our-results/>. Accessed June 17, 2015.
 38. Groeneveld PW, Farmer SA, Suh JJ, Matta MA, Yang F. Outcomes and costs of implantable cardioverter-defibrillators for primary prevention of sudden cardiac death among the elderly. *Heart Rhythm*. 2008;5(5):646-653.
 39. Centers for Medicaid, CHIP and Survey & Certification. <http://downloads.cms.gov/cmsgov/archived-downloads/SMDL/downloads/SHO11001.pdf>. Accessed June 17, 2015.
 40. National Improvement Partnership Network. Asthma Measures: Core and Optional Process and Outcome. <http://www.uvm.edu/medicine/nipn/documents/NIPNAsthmaMeasures.pdf>. Accessed June 17, 2015.
 41. Dougherty D, Mistry K, Lindly O, et al. Supplemental Document No. 3. 2013 SNAC Child Core Set Measure Retirement Process Summary of SNAC Scoring: Round 2 Final Scoring. AHRQ Publication No. 14-0066-EF-3. 2014.
 42. National Quality Forum. Measure Search; Quality Positional System. www.qualityforum.org/QPS/QPSTool.aspx. Accessed June 17, 2015.
 43. *Vital signs: Core metrics for health and health care progress*. Washington DC: Institute of Medicine; 2015.
 44. McIntyre MG. DSRIP on My Mind: Delivery System Reform Incentive Payment Programs in Medicaid. <http://www.nashpcloud.org/2014-presentations/public/SESSION.4.MCINTYRE.M.pdf>. Accessed July 15, 2015.
 45. Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. National Institutes of Health. National Heart, Lung, and Blood Institute; 2007.
 46. Crocker DD, Kinyota S, Dumitru GG, et al. Effectiveness of home-based, multi-trigger, multicomponent interventions with an environmental focus for reducing asthma morbidity. A community guide systematic review. *Am J Prev Med*.;41(2S1):S5-S32.
 47. Barrett ML, Wier LM, Washington R. Healthcare Cost and Utilization Project. Statistical Brief #169. Trends in pediatric and Adult Hospital Stays for Asthma, 2000-2010. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb169-Asthma-Trends-Hospital-Stays.pdf> Accessed August 5, 2015.

48. ACHP Innovation Profile. Community Health Plan Strategies for Improving Mental Health.
<http://www.achp.org/wp-content/uploads/ACHP-Mental-Health-Profile-11.12.14-SHORT.pdf>.
Accessed June 17, 2015.