Evidence base

Return on investment

ROI is a way to analyze and compare the costs of an investment with its benefits, in financial terms. According to the Agency for Healthcare Research and Quality, "a ROI analysis is a way to calculate your net financial gains (or losses), taking into account all the resources invested and all the amounts gained through increased revenue, reduced costs, or both." Taking an in-depth look into a program's ROI is an effective way to help health system leadership finalize decisions. ROI can be used during the planning process as a way to analyze the effects on revenue and operating costs. It also becomes a crucial tool during the evaluation process. Using ROI to assess a program's value can influence change moving forward.[i]

ROI is calculated by taking the return of an investment and dividing it by the cost of that investment. Results can be expressed as a ratio or as a percentage. For example, an ROI expressed as "1.90:1" means that for every $1 invested, $1.90 was gained back.

Table 4 on page 29 provides information regarding preventive services and programs from around the U.S. that have resulted in cost savings, or a positive ROI. These programs utilized a variety of healthcare professionals, and cover a wide range of health domains, or topics. The delivered prevention and self management services from Figure 4 on page 17 are identified for each study.

Each of the featured programs had similar outcomes; however, each was reported differently. There also were differences in program design, duration, target population and purpose. However, multiple themes surfaced during the study of these programs. Key findings include:

- Investing in preventive services can lead to a positive financial ROI.
- Certified health educators, community health workers, diabetes educators, and other health professionals are cost-effective.
- Health outcomes can be improved through the implementation of preventive services.
- Preventive services that result in a financial ROI can cover many health domains; examples include cardiovascular disease, low birth weight, diabetes and substance abuse.

Table 4. Return on investment of prevention and self-management services

Health domain and program	Target population	Intervention	Conducting professional	Prevention and self-management services delivered	Health outcome	Economic outcome	Time to realize	Financial result
Asthma[ii] **Washington:** The King County Asthma Program Streamlined home visit program	Medicaid-enrolled children 3-17 years old with uncontrolled asthma	Community health worker home visit program with asthma education	Certified asthma educator Community health workers	**Health education** **Home assessments** **Home visiting**	↑ Symptom-free days (2.1 more over 2 weeks) ↓ Urgent health care events (1.3 visits fewer over 1 yr)	ROI= 1.90:1 Savings of $1,340 for the $707 invested in the average participant	2 years (2010-2012)	Medicaid health plans obtained a financial ROI
Asthma and COPD[iii] **California:** The University of California San Francisco Impact of disease management program in reducing effects of chronic disease	People with severe asthma and COPD	Chronic Lung Disease Program, at Community Regional Medical Center	Nurse practitioner Respiratory therapist Health educator	**Care planning** **Counseling** **Health education** **Home visiting & assessments**	↓ ED visits by 79 percent ↓ Hospitalizations by 61 percent	↓ Hospital ED costs 66 percent ↓ Inpatient hospital cost 51 percent Total quarterly cost savings = $294,000	1 year (2013-2014)	Both the Community Regional Medical Center and participating health insurance companies obtained a financial ROI
Breastfeeding[iv] **Colorado:** Economic benefit of breast-feeding infants vs. formula fed infants enrolled in WIC	Infants born between August of 1993 and December of 1993; enrolled in both WIC and Medicaid 406 health breast-fed vs. 470 health formula-fed infants	Economic cost and benefit study to see if WIC breastfeeding program is associated with a reduction in Medicaid expenditures during the first 6 months of life	Lactation consultants	**Care planning** **Health education**	Not reported	Savings of $478 in WIC costs and Medicaid expenditures during first 6 months Medicaid cost-savings: $112 saved per infant over 6 month period ↓ Medicaid pharmacy costs	6 months	Both Colorado Medicaid and WIC program obtained a financial ROI

Health domain and program	Target population	Intervention	Conducting professional	Prevention and self-management services delivered	Health outcome	Economic outcome	Time to realize	Financial result
Breastfeeding[v] **Nationwide:** Working Well Moms: CIGNA's corporate lactation program	Breastfeeding mothers Mothers that participated in breastfeeding support program vs. mothers that did not	Worksite breastfeeding support program	Lactation consultants	**Care planning** **Counseling** **Equipment use & technique** **Health education**	↑ Breastfeeding duration rates 74 fewer absent days from work 62 percent fewer prescriptions, per capita in breastfed infants	Pharmacy cost savings among breastfed infants compared to never breastfed infants ($10.32 vs. $13.41) Total medical cost savings= $240,000	1994-1999	CIGNA Health Insurance obtained a financial ROI
Cardiovascular disease- including pre-diabetes[vi] **California:** Prevent- Omada Health: A digital behavioral counseling service designed to promote a healthy diet and physical activity for adults at risk for cardiovascular disease and pre-diabetes	Target population: Adults from 2 groups: - Pre-diabetes (n=1,663) - High cardiovascular disease risk (n=2,152)	16-week core program followed by an ongoing maintenance program Online support groups, curricula, scales, and pedometers connected to internet system	Health coaches	**Behavioral counseling** **Equipment use & technique** **Goal setting** **Health education** **Risk factor evaluation**	↓ Diabetes incidence by 32 percent and stroke by 14 percent over 5 years	ROI break-even point: 3 years ROI for pre-diabetes: - 3 yrs: $9 - 5 yrs: $1,570 - 10 yrs: $7,920 ROI for cardiovascular disease: - 3 yrs: $96 - 5 yrs: $1,510 - 10 yrs: $6,650	Varied in length for each adult	Omada Health obtained a financial ROI
Cardiovascular disease- including other chronic diseases[vii] **New Mexico** Community health workers and Medicaid managed care	New Mexico Medicaid patients High users of health services with poorly controlled cardiovascular disease	CHWs were assigned to work with patients and deliver a set list of care	Community health workers	**Health education** **Home visiting** **Medication adherence**	↓ ED visits	Total cost differential= $2,044,000 less post intervention compared to pre-intervention	2 years (2007-2009)	New Mexico Medicaid obtained a financial ROI

Health domain and program	Target population	Intervention	Conducting professional	Prevention and self-management services delivered	Health outcome	Economic outcome	Time to realize	Financial result
Chronic diseases including multiple health issues (asthma, substance abuse)[viii] **Colorado:** Men's Health Initiative Denver Health Community Health Worker Program	Underserved residents in Denver neighborhoods	Community-based preventative interventions: Screenings, health education, assistance with health coverage, and care management	Community health workers	**Care planning** **Health education & screenings**	↑ Primary care visits ↓Urgent care visits	ROI= 2.28:1 This translates to a savings of $95,900 annually	2 years (2003-2004)	Denver Health obtained a financial ROI by investing in community health workers
Diabetes[ix] **Baltimore:** Community health worker outreach program on healthcare utilization of Baltimore City Medicaid patients	African – American Medicaid patients from Baltimore with diabetes, with or without hypertension	Community outreach diabetes education program Home visits, alternated with weekly phone contacts	Community health workers	**Health education** **Home visiting**	↓ ED visits by 40 percent ↓ ED admissions by 33 percent ↓ Hospital admissions by 33 percent	Average savings of $2,250 per patient per year Total savings of $262,000 for 117 patients 27 percent reduction in Medicaid reimbursement	3 years (1992-1995)	Medicaid obtained direct cost savings and financial ROI Strongly supports use of peer case manager to deliver health messages
Diabetes[x] **Michigan:** Study of the cost and clinical outcomes of integrating certified diabetes educators into patient-centered medical homes	Patients 18-80 years of age with type 1 or type 2 diabetes Each patient was required to not have any formal diabetes education within the past 6 months	Diabetes self-management education Intervention involves self-management education in-person and over the phone, along with several health assessments and surveys	Certified diabetes educator	**Counseling** **Goal setting** **Health education** **Risk Factor evaluation**	↓Following test averages: - A1C tests = 10 percent decreased to 8 percent - Fasting blood glucose= 208 to 130 mg/dL - LDL levels= 122 to 106 mg/dL	Healthcare Effectiveness Data and Information Set (HEDIS) measures improved 27 percent resulting in a savings of $6,500 by using certified diabetes educators	1 year: 2011	Results indicate a financial ROI and other health benefits for the primary care practice

Health domain and program	Target population	Intervention	Conducting professional	Prevention and self-management services delivered	Health outcome	Economic outcome	Time to realize	Financial result
Injury[xi] **Alabama:** Alabama Child Passenger Safety Program; state incentive grants from National Highway Traffic Safety Administration	Alabama families 20,000 individuals participated in program	Child passenger safety program: education, legislation, and services	Child passenger safety technicians Community health workers	**Equipment use & technique** **Health education**	↑ Child restraint usage (59 percent to 86 percent) 193 fewer injuries per year 4.5 fewer child passenger deaths per year	ROI=75:1 Average annual savings= $26,400,000	6 years (1999-2007)	The state of Alabama obtained a financial ROI
Injury[xii] **Nationwide:** Medicaid-based child restraint system disbursement and education: Cost-effectiveness	Children of low-income (<$20,000/yr.) Medicaid participating families	Child restraint system disbursement and education program targeted at low-income children	Child passenger safety technicians	**Equipment use & technique** **Health education**	Per 100,000 low-income children: Prevented 347 injuries and 17 deaths across 8-year program cycle	Per 100,000 low-income children: ↓ medical costs by $1 million, parental work loss costs by $94,000 and future productivity costs by $2.7 million annually	8 years	Medicaid obtained a financial ROI, with a cost-effectiveness comparable to childhood immunization programs
Low birth weight[xiii] **Ohio:** Pathways Community Care Coordination in low birth weight (LBW) prevention Community Health Access Project (CHAP)	Women participating in CHAP and having a live birth in 2001 through 2004	CHAP identified women at risk of having poor birth outcomes, connect them to health and social services, and track health or social to a measurable completion	Community health workers	**Care planning** **Home visiting**	↓ Number of LBW births Intervention group = 7 LBW births (6.1 percent) Control group = 15 LBW births (13.0 percent)	ROI from first year of life = 3.36:1 Long term ROI= 5.59:1	4 years	Ohio obtained a financial ROI through the Pathways program

Health domain and program	Target population	Intervention	Conducting professional	Prevention and self-management services delivered	Health outcome	Economic outcome	Time to realize	Financial result
Low birth weight[xiv] **North Carolina:** Reducing LBW and newborn medical costs through prenatal WIC participation	Women who received Medicaid benefits and prenatal WIC services	Prenatal participants were part of the special supplemental food program for WIC	Information not provided	**Care planning** **Home visiting**	↓ Rate of LBW White women: LBW rate = 22 percent lower Black women: LBW rate = 31 percent lower	ROI= 2.91:1 for WIC services	Not Reported	Medicaid obtained financial ROI and direct cost savings for newborn medical care
Medication management-asthma[xv] **North Carolina:** Economic assessment and outcomes of community-based medication therapy management program	207 adult patients with asthma Age 19 or older	Asthma education by certified asthma educator Regular long-term follow-up by pharmacists (health plan reimbursement)	Certified asthma educators	**Equipment use & technique** **Health education** **Medication adherence**	↑ Number of asthma action plans= 63 to 99 percent ↓ Patients with ED visits= 9.9 to 1.3 percent ↓ Asthma-related medical claims	Combined direct and indirect savings after 5 years= $584,000 Estimated annual net savings= $2,000 per patient each year	5 years	All patients were covered by their own health plans. Program resulted in financial ROI for participating health plans
Medication management-chronic diseases[xvi] **Wisconsin:** Wisconsin Pharmacy Quality Collaborative (WPQC)	Pharmacy patients throughout Wisconsin	Medication therapy management service Medication education Resolve drug therapy issues, improve adherence, and engage patients in their own care	Pharmacists	**Goal setting** **Health education** **Medication adherence**	↓ Hospital readmissions ↓ Medication therapy problems	ROI = 10:1 for services directly impacting medication cost Estimated hospital readmission savings = $35,000 per 100 patients annually Patients saved on average $25.30 per prescription	2015 currently ongoing	Participating insurance payers have obtained a financial ROI

Health domain and program	Target population	Intervention	Conducting professional	Prevention and self-management services delivered	Health outcome	Economic outcome	Time to realize	Financial result
Mental health[xvii] **Washington, California, Indiana, North Carolina, and Texas:** IMPACT: Improving Mood-Promoting Access to Collaborative Treatment	1,800 older adults (age 60+) with depression, from 18 primary care clinics in 5 U.S. states	Collaborative Care The program introduced systematic tracking of clinical outcomes and stepped car, or adjusted treatments	Depression care manager Consulting psychiatrist	**Care coordination** **Counseling** **Goal setting** **Medication management**	↓ Depression (IMPACT doubles effectiveness of usual care) ↓ Physical pain ↑ Functioning ↑ Quality of life	ROI=6.50:1 An initial investment of $522 resulted in net cost savings of $3,370 over 4 years Yielded net savings in every category of health care costs examined	1998-2003	Implementation in Medicaid would yield estimated savings of $15 billion per year 2 percent savings of total annual Medicaid spending
Mental health[xviii] **Utah:** Intermountain's Mental Health Integration (MHI) Program SelectHealth: Health plan owned and operated by Intermountain Healthcare	Adults diagnosed with depression between 2004 and 2006 Retrospective study: MHI patients N=796. Non-MHI patients N=429	Team-based approach: Team includes PCPs and their staff, mental health professionals, care management and other community resources	Mental health coordinator Care manager Mental health specialist	**Care coordination** **Counseling** **Goal setting**	MHI patients were 54 percent less likely to have an ED visit in 12 months following initial diagnosis of depression	Overall MHI patient medical expenses cost SelectHealth $670 less per patient when compared to non-MHI patients	2004-2007	SelectHealth obtained a financial ROI
Obesity - heart disease and hyperlipidemia[xix] **California:** Cost analysis of dietitian intervention to improve obesity and lipid values in men	43 men with combined hyperlipidemia who were being considered for statin therapy	8-week dietitian intervention program 2 to 4 sessions with registered dietitian during 8 weeks	Registered dietitian	**Goal setting** **Health education**	50 percent of patients did not require medication use (statin therapy) after dietitian intervention	ROI= 3.03:1 Annual cost savings of $27,400	1992-1997	A financial ROI was obtained by participating health insurance companies through the use of registered dietitians

Health domain and program	Target population	Intervention	Conducting professional	Prevention and self-management services delivered	Health outcome	Economic outcome	Time to realize	Financial result
Obesity[xx] **Virginia:** Improving Control with Activity and Nutrition (ICAN)	Southern Health Services health plan members with type 2 diabetes and obesity (BMI>27)	Lifestyle case management program Individual and group education, support, and referrals	Registered dietitians	**Goal setting** **Health education**	↓ Hospital admissions	Average health plan costs= $3,600 lower in case management compared to usual care	2001-2003	Sothern Health Services obtained a financial ROI
Substance abuse[xxi] **Wisconsin:** Drug and alcohol screening, brief intervention and referral to treatment services (SBIRT)	14,118 working-age adult Medicaid beneficiaries	Screening, preventative substance abuse intervention, referral to treatment program Designed to prevent at risk population from developing substance abuse disorder	Trained para-professionals	**Care planning** **Risk factor evaluation**	Per 1,000 patients: 1,720 more outpatient days per year 440 fewer inpatient days per year 50 fewer ED admissions per year	For SBIRT services the total 2-year net savings was $782 per patient screened Net annual savings per 1,000 Medicaid patients is $391,000	2007-2011	Wisconsin Medicaid obtained a financial ROI by participating in the SBIRT program
Substance abuse[xxii] **Wisconsin:** Project TrEAT (Trial for Early Alcohol Treatment) Clinical trial designed to test the efficacy of brief physician advice for the treatment of alcohol drinkers	482 men and 292 women who reported drinking above a threshold limit Control group=382 Intervention group=392	Clinical trial designed to test the efficacy of brief physician advice for the treatment of alcohol drinkers	Physician	**Health education**	↓ Alcohol use ↓ ED visits	ROI= 3.2:1 ED and hospital use savings= $195,000 Saving from decreased crime and motor vehicle= $228,000 Total economic benefit= $424,000	4 years	Program resulted in a financial ROI by participating health insurance companies and for health care facilities

Health domain and program	Target population	Intervention	Conducting professional	Prevention and self-management services delivered	Health outcome	Economic outcome	Time to realize	Financial result
Tobacco use[xxiii] **Virginia:** Cost-effectiveness of a smoking-cessation program in a community pharmacy practice compared to self-directed quit attempt	Smokers (men and women) aged 21-70 years, who had tried at least once to quit smoking	Pharmacist-directed smoking-cessation program Cost effectiveness evaluation was based on a pharmacy practice that achieved abstinence for 1 year or more in 25 percent of its patients	Pharmacists	**Care planning** **Goal setting** **Health education** **Medication adherence**	25 percent of patients in program maintained long-term success (at least 12 months of continued abstinence)	Pharmacy program vs. self-quit program: Savings of $720-$1,400 per life-year saved (depending on the smoker's age at the time of cessation) when using pharmacy program compared to the self-quit program	2012	A financial ROI was obtained by individual payers and health insurance companies through their investment in this smoking cessation program
Tobacco use[xxiv] **Nationwide:** Project Toward No Tobacco Use (TNT) Cost-effectiveness study of school-based tobacco-use prevention program among 1,234 students in 8 junior high schools	Youth, grades 5 through 10 (10-15 years of age)	School-based intervention 10-lesson curriculum designed to counteract social influences and misconceptions that lead to tobacco use	Certified health educators	**Health education**	TNT prevented an estimated 35 students from becoming established smokers	Savings of $13,300 per life years saved, along with a savings of $8,500 per quality-adjusted life years saved Estimated medical costs savings of $8,600 per male non-smoker over lifetime	2001 (2 year follow-up study)	TNT proved to be a highly cost-effective program Financial ROI was obtained by participating health insurance payers

Implementing solutions in Wisconsin
Wisconsin has taken steps in specific program areas toward expanding the team-based care model to include and integrate clinical care and prevention and self-management services. We can use these models as a guide and/or to expand this work to a larger population. Below are a few examples in Wisconsin where this type of work has been implemented.

HIV medical home. The AIDS Resource Center of Wisconsin (ARCW) was designated a patient-centered medical home in 2011 by the National Committee of Quality Assurance. The HIV medical home is a Wisconsin Medicaid program and was established as a result Wisconsin 2009 Act 221 and with funding available under the Affordable Care Act. Each patient is assigned to a primary care provider. This provider works with a team to coordinate care. The team could include mental health therapists, dentists, pharmacists and others.[xxv]

The two goals identified for this program include:

- Reduce the risk of complicating opportunistic infections and improve health outcomes.
- Ensure the integration of oral health care and medical health care for HIV patients.[xxvi]

ARCW considers an integrated medical home as one of the most critical components to a successful medical home model. The foundational elements at ARCW include:

- Co-location of services to maximize the care team's ability to support patients by providing multiple opportunities for reengagement
- Shared electronic health record with shared patient rosters among care team members
- Ability to extract meaningful data from the electronic health record with resources dedicated to high quality data management
- Collaborative practice environment where the clinical hierarchy is removed, thus fostering care teams that meet frequently and create individually tailored plans focused on outcomes

Program successes include:

- Significant suppression of HIV viral load overall and narrowed the disparities gap among patients of color and Caucasian patients
- Medicaid cost savings of an estimated $4 million annually
- Access to data through the use of an external population management tool

Foundational elements

- Co-location of services
- Shared electronic health record among team members
- Ability to extract meaningful data
- Collaborative practice environment

Program successes

- Significant suppression of HIV viral load
- Cost savings of estimated $4 million annually
- Increased data access

While the HIV medical home is successful, there are some continued challenges, such as:

- The total cost of care exceeds the per-member per-month payment. Grants and philanthropic dollars cover the additional costs of care.
- All ARCW patients are offered the medical home model of care. Services are financed through a variety of structures. Due to the high churn among Medicaid patients it is sometimes difficult to keep track of which patients are eligible for the Medicaid HIV medical home billing.

- Staying in compliance with standards and ensuring accurate documentation is labor intensive for staff, thus taking time away from serving patients. ARCW would prefer to move toward documentation that is outcome-based.[xxvii]

Care4Kids. Care4Kids is a Medicaid program developed by the Wisconsin Department of Health Services (DHS) and the Wisconsin Department of Children and Families (DCF), and administered in partnership by the program's certified health system provider, Children's Hospital of Wisconsin and Children's Community Health Plan. Care4Kids provides comprehensive coordinated health services for children in out of home care (i.e., foster care). The program recognizes the unique needs of children in foster care and coordinates care for the child in a way that builds relationships between health care providers and the child's caregivers to ensure the care is consistent, managed and organized through a comprehensive health care plan. The Care4Kids program was launched in 2014 in Kenosha, Milwaukee, Ozaukee, Racine, Washington and Waukesha counties. This program operates under a "medical home" philosophy by establishing a primary care medical home team for each child designed to address each child's specific health care needs.

The program goals include:

- An integrated and comprehensive health service delivery system to include physical, behavioral and oral health care
- Timely access to a full range of developmentally appropriate services
- Quality care provided by a healthcare team that utilizes trauma-informed principles and evidence-based practices
- In collaboration with child welfare partners, coordinated transitional planning to assure continuity of care as children achieve permanency or age out of foster care
- Improved child well-being including physical, behavioral and mental health outcomes, increased positive permanency outcomes and enhanced resiliency[xxviii]

Care4Kids is an innovative and unique program to Wisconsin, with an average monthly enrollment of approximately 3,000 foster care children. This complex, high-cost population now receives comprehensive health care coordination services via the Care4Kids program and its partners using a primary care medical home model.

The Care4Kids program is currently establishing baseline outcomes utilizing 15 key outcome measures. Since its inception, several outcomes have shown improvement in both timeliness to care and overall completion rates with certain measures showing significant improvement.

Initial program successes

- Collaborative initiative involving multiple public and private partners serving a complex population
- Promising initial success and ongoing progress with outcome measures
- Establishment of primary care medical home providers as "Centers of Excellence"
- Development of innovative processes for enrollees with acute conditions (e.g., polypharmacy interdisciplinary case review and initial risk triage stratification upon enrollment)
- Lower overall medical costs compared to planned budget
- Development of a comprehensive health care plan to share amongst the child's stakeholders to enhance collaboration

While the Care4Kids partnership between DHS, DCF and Children's Hospital and Health System has experienced several initial successes and continues to make progress toward achieving its goals, there are continued challenges including:

- Requires complex, detailed and labor-intensive routine reporting based upon complexity of the population, reporting timelines and variety of reporting sources (e.g., claims, medical records)
- Overcoming barriers to package and share information among broader care team members (e.g., HIPAA, legal implications)
- Identifying the effective strategies to address social determinants that present barriers to improved health for the child and the child's caregiver and/or family
- Timely parental/guardian consent for mental health assessment and treatment
- While improvements in dental outcomes have been made overall, access to dental providers accepting Medicaid patients in Wisconsin remains a challenge
- Timely access to outpatient psychiatry care[xxix]

Obstetrics (OB) medical home initiative. This pilot began in 2011 to reduce poor birth outcomes in southeast Wisconsin and has been expanded to Dane and Rock counties. The Wisconsin Department of Health Services (DHS) contracts with HMOs to recruit clinics. DHS pays the HMO $1,000 for each woman who meets the criteria and is enrolled in the program. Then an additional $1,000 is paid for each healthy birth outcome. Payments are then passed to the clinics.

Participating HMOs include Anthem Blue Cross Blue Shield, Children's Community Health Plan, Dean Health Plan, Group Health Cooperative South Central Wisconsin, iCare, MercyCare, MHS Health Wisconsin, Molina Healthcare, Network Health Plan, Physicians Plus, Trilogy, United Healthcare Community Plan and Unity.

To be enrolled in the OB medical home, a woman must be pregnant and meet one of the following criteria:

- Had a prior poor birth outcome or be listed on the Birth Outcome Registry Network (BORN) of high-risk women
- Have a medical condition that will negatively impact the pregnancy
- Be less than 18 years old
- Be African American
- Be homeless

The program is available for both BadgerCare Plus and Medicaid Supplemental Security Income (SSI) pregnant women enrolled in a participating HMO. Members must be enrolled within 16 weeks of pregnancy and must have a minimum of 10 visits with an OB provider. The member remains enrolled in the program for 60 days postpartum.[xxx]

There are four core principles that guide this work. These include:

- Having a designated OB care provider to serve as the team leader and point of entry. This provider is defined as a physician, nurse midwife, nurse practitioner or physician assistant with specialty in OB.
- Providing ongoing care over the duration of the pregnancy and postpartum period.
- Providing comprehensive care.
- Coordinating care across a person's conditions, providers and settings.[xxxi]

Wisconsin Pharmacy Quality Collaborative (WPQC). As shared previously, limited reimbursement is currently received through the WPQC for pharmacist interventions. WPQC-accredited pharmacies receive payment for medication therapy management services provided by pharmacists to eligible patients in the outpatient setting. The ultimate goal of the program is to resolve drug therapy problems, improve adherence and engage patients in their own care.[xxxii] Health plans participating in the program include: Wisconsin Medicaid, Unity, UnitedHealth Care, Network Health Plan, Gundersen Health Plan, and United Way of Dane County for low income seniors in Dane County.[xxxiii]

During the pilot phase (2008-2010), with Unity Health Insurance and Group Health Cooperative of South Central Wisconsin, WPQC showed a 10:1 ROI for service which directly impacted medication cost. ROI was maintained at 2.5:1 when combining services which directly impacted medication cost and comprehensive medication reviews. "Pharmacist services contributed to a positive ROI via:

- Adherence to payer medication formularies when clinically appropriate
- Patient access to medications with decreased out-of-pocket costs contributing to increased adherence
- Proper use of medication devices, such as inhalers
- Avoidance of inappropriate medication regimens, reducing adverse effects and hospitalizations, while increasing adherence"[xxxiv]

References

[i] Agency for Healthcare Research and Quality. *Toolkit for Using the AHRQ Quality Indicators: Return on Investment Estimation.* October, 2014.

[ii] Campbell, J., Brooks, M., Hosokawa, P., Robinson, J., & Song, L. et al. Community Health Worker Home Visits for Medicaid-Enrolled Children With Asthma: Effects on Asthma Outcomes and Costs. *American Journal of Public Health*, 105.11 (Nov 2015): 2366-2372.

[iii] Jain, V., Allison, R., Beck, S. J., & Mills, P. K. et al. Impact of an Integrated Disease Management Program in Reducing Exacerbations in Patients with Severe Asthma and COPD. *Respiratory Medicine, Volume 108 (Issue 12).* December 2014, Pages 1794–1800.

[iv] Montgomery, D. & Splett, P. Economic Benefit of Breast-Feeding Infants Enrolled in WIC. *Journal of the American Dietetic Association, Volume 97 (Issue 4). April 1997, Pages 379–385.*

[v] The Health Project. *Working Well Moms Program*. Retrieved from http://thehealthproject.com/wp-content/uploads/2015/02/CIGNA_Working-Well-Moms-Program.pdf. March 19th, 2016.

[vi] Su W, Chen F, Dall TM, Lacobucci W, Perreault L. Return on Investment for Digital Behavioral Counseling in Patients With Pre-diabetes and Cardiovascular Disease. Prev Chronic Dis 2016;13:150357.

[vii] Johnson, D., Saavedra, E., Sun, E., et al. Community Health Workers and Medicaid Managed Care in New Mexico. *Journal of Community Health, Volume 37 (Issue 3).* June 2012, pp 563-571.

[viii] Whitley, E., Everhart, R., & Wright, R. Measuring Return on Investment of Outreach by Community Health Workers. *Journal of Health Care for the Poor and Underserved, Volume 17(Issue 1).* February, 2006, pp. 6-15.

[ix] Fedder, D., Chang, R., Curry, S., & Nichols, G. The Effectiveness of a Community Health Worker Outreach Program on Healthcare Utilization of West Baltimore City Medicaid Patients with Diabetes, with or without Hypertension. *Ethnicity & Disease, Volume 13.* Winter 2003.

[x] Moran, K., Burson, R., Critchett, J., & Olla, P. Exploring the Cost and Clinical Outcomes of Integrating the Registered Nurse–Certified Diabetes Educator Into the Patient-Centered Medical Home. *The Diabetes Educator, Volume 37.* November/December 2011 pp. 780-793.

[xi] King, W., Monroe, K., Applegate, J., & Cole-Farmer, J. The Impact of Education, Legislation and Service on Alabama Child Passenger Safety. *The Journal of Trauma, Injury, Infection, and Critical Care, Volume 63 (Issue3).* September 2007, pp S23-S28.

[xii] Goldstein et al., 2008. Medicaid-Based Child Restraint System Disbursement and Education and the Vaccines for Children Program: Comparative Cost-effectiveness. *Ambulatory Pediatrics. Volume 8, Number 1.* January-February 2008.

[xiii] Redding et al., 2015. Pathways Community Care Coordination in Low Birth Weight Prevention. *Maternal and Child Health Journal*. 19.3 (Marc 2015): 643-650.

[xiv] Buescher, Paul; Larson, Linnea; Nelson M.D.; Lenihan, Alice. Prenatal WIC Participation Can Reduce Low Birth Weight and Newborn Medical Costs: A Cost-Benefit Analysis of WIC Participation in North Carolina. *Journal of the American Dietetic Association.* Volume 93 (Issue 2). February 1993. Pages 163-166.

[xv] Cranor, C., & Christensen, D. The Asheville Project: Short-Term Outcomes of a Community Pharmacy Diabetes Care Program. *The Journal of the American Pharmacists Association, Volume 43 (Number 2).* March/April 2003.

[xvi] *Wisconsin Pharmacy Quality Collaborative*. What WPQC Can DO for Your Members. Retrieved from http://www.pswi.org/WPQC/WPQC-Payers/Benefits-to-Payers.

[xvii] Unutzer, J., Schoenbaum, M., & Harbin, H. (2011). Collaborative Care for Primary/Co-Morbid Mental Disorders. Brief for CMS Meeting. July 27, 2011/updated August 4, 2011.

[xviii] Reiss-Brennan, B., Briot, P. C., Savitz, L. A., PhD., Cannon, W., M.D., Staheli, R., & Gordon, T. E., F.A.C.H.E. (2010). Cost and quality impact of intermountain's mental health integration Program/PRACTITIONER APPLICATION. Journal of Healthcare Management, 55(2), 97-113; discussion 113-4. Retrieved from http://search.proquest.com/docview/206731880?accountid=26724

[xix] Sikand, G., Kashyap, M., Wong, N., & Hsu, J. Dietitian Intervention Improves Lipid Values and Saves Medication Costs in Men with Combined Hyperlipidemia and a History of Niacin Noncompliance. *The Journal of the American Dietetic Association, Volume 100 (Issue 2).* February 2000, pp. 218-224.
[xx] Effects of Lifestyle Intervention on Health Care Costs: Improving Control with Activity and Nutrition (ICAN). *Journal of the American Dietetic Association, Volume 107 (Issue 8).* August 2007, pp. 1365-1373.
[xxi] Paltzer et al. Substance Use SBIRT Impacts Healthcare Utilization. *Journal of Behavioral Health Services & Research,* 2016. 1-10. Published online: 24 May 2016.
[xxii] Fleming, M. F., Mundt, M., French, M., et al. Benefit-Cost Analysis of Brief Physician Advice with Problem Drinkers in Primary Care Settings. *Medical Care, Volume 38 (Number 1)* pp 7-18.
[xxiii] Tran, M., Holdfor, D., Kennedy, D., & Small, R. Modeling the Cost-Effectiveness of a Smoking-Cessation Program in a Community Pharmacy Practice. *Pharmacotherapy, Volume 22 (Number 12), 2002 pp. 1623-1631*.
[xxiv] Wang et al. Cost-Effectiveness of a School-Based Tobacco-Use Prevention Program. *JAMA Pediatrics,* September 1, 2001, Vol. 155, No. 9.
[xxv] AIDS Resource Center of Wisconsin. (2016). ARCW Designated as HIV medical home by Wisconsin Medicaid Program. http://www.arcw.org/whats-new/about_the_arcw_medical_home/index.php
[xxvi] National Academy for State Health Policy. (2014). Wisconsin – Medical Homes. http://www.nashp.org/wisconsin-618/
[xxvii] Endean, D; Kastner, M; Keeton, B. (2016, September 19). Personal interview.
[xxviii] Wisconsin Department of Health Services. (2016). Care4Kids. https://www.dhs.wisconsin.gov/care4kids/index.htm
[xxix] Boeder, M. (2016, September 29). Personal interview.
[xxx] Davis, A. and Gessler, T. Wisconsin Department of Health Services. (2015). OB medical home updates. [PowerPoint slides]
[xxxi] Obstetric medical home initiative (OB MH) for high-risk pregnant women. 2016-2017 BadgerCare Plus and Medicaid SSI HMO Contract Language. https://www.forwardhealth.wi.gov/WIPortal/Tab/42/icscontent/Managed percent20Care percent20Organization/OBMH/OBMHome.htm.spage
[xxxii] Pharmacy Society of Wisconsin. (2015). Wisconsin Pharmacy Quality Collaborative (WPQC) medication therapy management (MTM) services program. http://www.pswi.org/Portals/17/WPQC/Wisconsin percent20Pharmacy percent20Quality percent20Collaborative percent20Medication percent20Therapy percent20Management percent20Services percent20Program.pdf
[xxxiii] Pharmacy Society of Wisconsin. (2015). Payer-specific resources. http://www.pswi.org/WPQC/WPQC-Payers/Payer-Specific-Resources
[xxxiv] Pharmacy Society of Wisconsin. (2015). What WPQC can do for your members. http://www.pswi.org/WPQC/WPQC-Payers/Benefits-to-Payers