

# Cost-Effectiveness of a Low-Cost, Hospital-Based Primary Care Clinic

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1-8

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## Abstract

This study assesses the cost-effectiveness of an insurance administration-free, hospital-based clinic designed to provide a full array of primary care services to low-income individuals at little or no cost. In addition to low/no-cost visits, individuals have the option to purchase a low-cost health insurance plan similar to any traditional health plan (eg, prescriptions, primary care, specialty care, durable medical equipment, radiology, laboratory test results). We used 3 years of data (2009-2012) on emergency department (ED) visits and inpatient hospital admissions from clinic patients and patients at the community's 2 largest private physician groups to assess the cost-effectiveness of the hospital-based clinic in terms of ED and inpatient admission costs avoided and financial sustainability of the low-cost insurance plan. Estimated annual savings in hospital inpatient and ED costs were approximately 1.4 million. Insurance plan data indicated sound fiscal sustainability with modest provider reimbursement growth and zero annual premium growth.

## Keywords

health care for the uninsured, low-cost health insurance, hospital-affiliated clinics, case study, health care finance

## Introduction

Although the Patient Protection and Affordable Care Act, when implemented in full, projects 32 million additional Americans will acquire health insurance coverage, the Congressional Budget Office estimates that 23 million will remain without coverage, including nonelderly individuals who are eligible for but not enrolled in Medicaid, undocumented immigrants, and those who are exempt from the individual mandate because they have no affordable insurance option. Since most of the uninsured in the United States are low-income working households, their health care options are severely limited even if they qualify for Medicaid. As a result, the uninsured often delay or forego necessary primary and preventive health care due to cost and/or access problems. Most policy makers, health care industry leaders, and health care providers agree that accessible primary care for the uninsured can facilitate cost savings in the long run. Preventive care costs less than use of emergency department (ED) or inpatient services that might later be needed for under-treated chronic health conditions.<sup>1-4</sup>

Present sources of primary care for the 50 million uninsured in the United States include federally qualified health centers (FQHC), public clinics, and charity care provided by private physician offices and hospital ED and outpatient departments. Charity care by private physicians has been trending downward since the 1990s for various reasons including growing financial

and time pressures on physicians as well as ongoing changes in the medical marketplace including an increase in managed care and the trend away from physician ownership of practices. The number of public free or low-cost clinics has gained ground over the last decade. In 2010, 1007 public clinics operated in 49 states and the District of Columbia.<sup>5-7</sup> These clinics provided care for approximately 1.8 million individuals annually or 3.5 million medical and dental office visits. Different from federally funded FQHCs, public clinics typically operate with smaller mostly privately financed budgets, have diverse organizational structures, scopes of services, and compositions of staff. Although public clinics offer an alternative and varied model of primary care delivery to the under- or uninsured, little is known about the benefits of such clinics in terms of improved health outcomes or other cost savings to the health care safety net. The limited data suggest that public clinics may offer meaningful outcome improvements in chronic disease control,

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**Table 1.** Partnering for Health Services Operating Costs 2009-2012 (2009 Dollars).

Budget Years	2009-2010	2010-2011	2011-2012	2009-2012 Annual Average
Operating cost to ARHS	US\$212 950	US\$295 040	US\$397 876	US\$301 955

Abbreviation: ARHS, Altoona Regional Health System.

improved patient wellness strategies, and reduced hospital admissions and ED visits.<sup>8-11</sup>

One public clinic model, called Partnering for Health Services (PHS), provides access to low- or no-cost health care for approximately 5000 patients per year, and among those, 1500 were considered “active charts” or patients encountered on a regular basis. PHS is a hospital-based family practice clinic started by Altoona Regional Health System (ARHS), located in Altoona, Blair County, Pennsylvania. The clinic does not accept health insurance for its primary care services, although approximately 30% of PHS patients carry hospitalization-only coverage. PHS is not a free clinic; rather it functions as a traditional full-service doctor’s office, open 4.5 days per week, providing all types of primary care services, diagnostic services, medications, and referrals to specialists within its network. PHS is an affiliate of ARHS as a cooperative effort among ARHS, volunteer and part-time paid physicians, full-time paid physician assistants, nurses, and professional and clerical staff. Patients are accepted into the clinic by proof of no primary care insurance, have household income up to 300% of the federal poverty level, and do not qualify for Medicaid. For unlimited visits to the clinic with no copays or deductibles, patients pay a monthly capitation fee based on income. Patients with household income up to 150% of poverty level pay no fee; patients with income up to 300% of poverty level pay US\$99 per month. Small business owners can also purchase an employee-based plan for US\$169 per month per employee.

The PHS clinic model was designed to aggressively manage chronic health conditions of its patients by moving them from the inpatient setting to the outpatient setting. By design, the clinic provides more face-to-face time with physicians, physician assistants, and nurses to provide care for chronic illnesses. For example, diabetic patients are accepted at PHS as often as once or twice per week until control over their diabetes is established. Patients with chronic obstructive pulmonary disease (COPD) are also encouraged to visit the clinic as early as possible at the onset of an exacerbation in order for the clinic to monitor changes in their condition. PHS also uses a “nurse closer” whose role is to review test results, explain and reinforce the treatment information provided by the physician, review medications, arrange referral appointments with any specialists, and order all tests, prescriptions, and refills. The nurse closer sees every patient at the end of each visit. Dietitians and diabetic educators are also embedded into the clinic model as part of a comprehensive treatment strategy for managing chronic conditions.

Is the PHS model cost effective? This article used 3 years of data (2009-2012) on patients’ chronic health conditions, ED visits, inpatient hospital admissions, and insurance reimbursements to ARHS to assess the cost-effectiveness of PHS to

ARHS. To assess the overall savings in hospital admissions, we compared PHS admissions data with data from the 2 largest private primary care groups in Blair County, Pennsylvania, that is, Blair Medical Associates (BMA) and Mainline Medical Associates (MMA). Both BMA and MMA provide primary care under the traditional insurance fee-for-service payment method to approximately 60% of Blair County’s 130 000 residents. BMA is a large multispecialty group with a total of 40 physicians. To maintain consistency with PHS, we limited our focus to the family practice portion of BMA, which consists of 12 physicians (16.5 full-time equivalents [FTEs]). MMA is the second largest family practice group in Blair County with 11 physicians (12.84 FTEs). Data used in this study consisted of all patients in the age range of 18 to 64 years currently active at PHS, BMA, or MMA from 2009 to 2012.

## Data and Methods

Tables 1 to 7 summarize the data used to compare the 2009 to 2012 annual cost of the PHS clinic with the estimated savings to ARHS in terms of reduced ED visits, reduced hospitalizations, and insurance reimbursements from the limited indemnity health insurance plan designed to complement the existing clinic model. Tables 1 and 2 summarize the clinic’s total annual costs; Tables 3 to 7 summarize the estimated annual cost savings to ARHS. All dollar figures are in 2009 dollars. The PHS clinic’s total annual operating costs for 2009 to 2012 are reported in Table 1. Altoona Regional Health System started PHS in 1999 as a way to divert uninsured patients away from the ED for nonurgent services yet still provide the care they need. In 2009 to 2012, PHS employed 1 part-time physician who served as clinic medical director, 2 volunteer part-time physicians, 2 full-time physician assistants, 2 full-time (LPN) nurses and 2 medical assistants, 1 full-time (RN) nurse/manager, 2 full-time clerical personnel, 1 part-time pharmacist, and 1 part-time dietician. Funding for the clinic is provided by a subsidiary company bearing the clinic’s name, PHS, which is part of the ARHS Lexington holding company. A pediatric and adult Medicaid dental clinic is also part of PHS, but its budget and operations were not considered in this study. The PHS clinic’s annual operating costs include salaries (approximately 35% of the annual budget) and outpatient costs including radiology and laboratory services (approximately 65% of the annual budget).

In 2009 to 2010, operating costs totaled US\$212 950. Costs increased modestly from 2010 to 2012 due to construction expenditures for expansion of the PHS facility and hiring of a clinic medical director with an annual salary of US\$24 000. Also added during this period was a new Division of Psychology Services, funded in part by a grant from The Robert Wood Johnson

**Table 2.** Gross Charges for All Procedures, Radiology, and Other Services Provided by Altoona Regional Health System, Fiscal Year July 1 to June 30 (2009 Dollars).

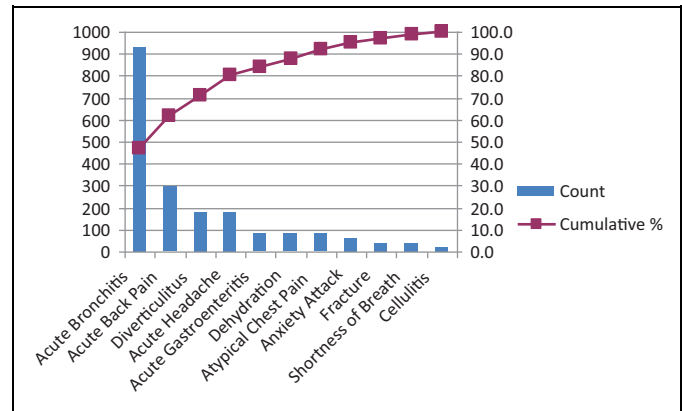
Year	Gross Charges	Actual Cost at 37%	Percentage Change
2009-2010	US\$2 339 297	US\$865 540	N/A
2010-2011	US\$2 330 130	US\$862 148	-0.39%
2011-2012	US\$2 704 919	US\$1 000 820	13.86%
2009-2012 Annual average	US\$2 458 115	US\$909 503	6.7%

Foundation. In 2010 to 2011, costs totaled US\$295 040, a 38% increase over 2009 to 2010 levels. In 2011 to 2012, operating costs increased to US\$397 876, an annual increase of 26%.

The clinic's total annual outpatient services costs for 2009 to 2012 are reported in Table 2. According to the PHS Board Report, the vast majority of the clinic's outpatient services were for preventative care and chronic disease management. The PHS has no traditional fee-for-service insurance-related administrative and billing responsibilities and operates with fixed overhead costs (Partnering for Health Services Board Reports on Budget: Quarterly Reports for May 2009, 2010, and 2011). In column 2 of Table 2, gross charges represent the full cost plus prices of ARHS services prior to any negotiated discounts to private insurers and government insurance programs. Column 3 reports the actual costs to ARHS of all PHS services as reported by Charles Zorger, chief financial officer, ARHS. Actual costs remained nearly constant from 2009 to 2011. In 2012, actual costs increased by 13.86% to just over US\$1 million due to higher testing and other procedures costs. In 2012, PHS instituted a policy in which all testing is standardized according to American College of Physicians guidelines.<sup>12</sup> This policy yielded significant reductions in annual radiology and laboratory costs for the clinic; in 2012 to 2013, actual outpatient services costs fell to US\$949 815 (2009 dollars), a 5.4% reduction from 2011 to 2012 costs.

### Estimated Cost Savings for ARHS: Fewer ED Visits

Since 2009, PHS has regularly collected and archived patient "sick call" data to monitor the clinic's effectiveness in reducing ARHS ED visits from its patients. PHS records a sick call if a patient confirms in writing that their current visit to the

**Figure 1.** Partnering for Health Services (PHS) sick-call visits.

clinic would have resulted in an ED visit had the clinic not been available. All visiting patients are surveyed. According to these data, from 2009 to 2012, the number of PHS patients who chose to make a sick call visit to the clinic instead of the ED averaged 55 each month with little or no variation (standard deviation = 0.414). Of the total 2009 to 2012 sick call visits to PHS, the majority (over 60%) were due to acute bronchitis (among the clinic's COPD population) and back pain (see Figure 1). The remaining visits were due to diverticulitis, acute headache, acute gastroenteritis, dehydration, atypical chest pain, anxiety attacks, fractures, shortness of breath, and cellulitis.

Table 3 reports data on the average annual actual cost per visit to the ARHS ED by PHS clinic patients who actually visited the ED between 2009 and 2012. The average number of annual visits by PHS patients was 77.67 with a low of 49 and high of 100. Column 5 of Table 3 calculates the average annual actual cost per PHS patient for an ED visit by dividing total actual cost (column 4) by total ED visits in the indicated year (column 2).

In Table 3, the average annual actual cost per PHS patient for an ED visit was US\$1706 with a low of US\$1499 and high of US\$1990. This average is slightly higher than the US\$1233 national average as reported by Caldwell et al based on data from the Medical Expenditure Panel Survey.<sup>13</sup>

Using the average actual cost per ED visit figures in Table 3, Table 4 calculates the total annual actual ED costs avoided for

**Table 3.** Visits to ARHS Emergency Department by PHS Clinic Patients 2009-2012 (2009 Dollars).

Year	Total Emergency Department Visits by PHS Patients	Gross Charges	Actual Cost at 37%	Average Actual Cost Per PHS Patient Visit
2009-2010	49	US\$263 522	US\$97 503	US\$1990
2010-2011	84	US\$369 967	US\$136 889	US\$1630
2011-2012	100	US\$405 154	US\$149 907	US\$1499
2009-2012 Annual average	77.67	US\$346 214	US\$128 100	US\$1706

**Table 4.** Patient-Confirmed Sick-Call Visits to the PHS Clinic and Cost of ED-Likely Visits Avoided (2009 Dollars).

Year	Total Monthly Emergency Department Visits Rerouted to PHS	Total Annual Emergency Department Visits Rerouted to PHS	Emergency Department Average Annual Actual Cost per Visit	Total Annual Actual Emergency Department Costs Avoided
2009-2010	55	660	US\$1990	US\$1 313 400
2010-2011	55	660	US\$1630	US\$1 075 800
2011-2012	55	660	US\$1499	US\$989 340
2009-2012 Annual average	55	660	US\$1706	US\$1 126 180

Abbreviations: ARHS, Altoona Regional Health System; PHS, Partnering for Health Services.

**Table 5.** Provider Population Percentages by Chronic Disease Diagnosis.<sup>a</sup>

	PHS	MMA	Difference From PHS	P	BMA	Difference From PHS	P
HTN	36.8	43.0	-7.0	<.001	35.6	1.2	.438
CVA	2.5	2.4	0.1	.795	2.0	0.5	.243
CAD	7.6	9.7	-2.1	.031	8.3	-0.7	.442
DM	12.7	18.9	-6.2	<.001	12.2	0.5	.656
COPD	16.6	4.8	11.8	<.001	3.4	13.2	<.001
Average household income	US\$28 848	US\$41 980	-US\$13 132	<.001	US\$43 243	-US\$14 395	<.001

Abbreviations: BMA, Blair Medical Associates; CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease; CVA, cerebral vascular accident; DM, diabetes mellitus; HTN, hypertension; MMA, Mainline Medical Associates; PHS, Partnering for Health Services.

<sup>a</sup>Group percentages were compared using the  $\chi^2$  test; household income was compared using the t test.

ARHS. With the number of sick call visits rerouted to PHS nearly constant at 55 patients per month or 660 annual reroutes, column 5 of Table 4 calculates total annual ED costs avoided as the product of 660 and average annual actual ED costs per PHS patient (column 4). The 660 annual reroutes saved ARHS an average of US\$1.126 million annually in avoided ED costs between 2009 and 2012.

### Fewer Hospital Admissions

In a prior study, we compared 2009 to 2012 nonelective hospital admission rates between PHA and Altoona, Blair County's 2 largest private physician groups, namely BMA and MMA.<sup>14</sup> Using data on patients' health conditions and inpatient hospital admissions from PHS and the private physician groups, we compared patients' prevalence of hospitalization-likely chronic diseases, average annual number of physician office visits, and annual hospital admission rates per 1000 patients. Results of this study indicated that while PHS patients had significantly lower incomes, no primary care insurance (30% had hospitalization insurance), and exhibited an equal or higher number of chronic conditions compared to patients in the private physician groups, PHS patients recorded significantly higher annual numbers of physician office visits and lower numbers of nonelective inpatient admissions from 2009 to 2012. In subsequent paragraphs, we summarize evidence from this prior study of the benefits of PHS's chronic care model in terms of reducing hospital admissions of patients with chronic disease. Combining this evidence with ARHS cost data, we then assess (in Table 6) the potential savings to ARHS in the form of reduced hospital admissions of PHS patients.

Table 5 lists 2009 to 2012 health statistics on the patient populations based on data from the prior study (data collected in 2012 from Val Migongna, Practice Manager, Mainline Medical Associates; data collected in 2013 from Charles Zorger, CFO, Altoona Regional Health System; data collected from 2009, 2010, and 2011 annual practice reports provided by David Duncan, CEO, Blair Medical Associates). In particular, Table 5 compares BMA, MMA, and PHS patients according to Vital and Health Statistics' top 5 diagnoses responsible for a chronic patient's inpatient admission by way of an ED.<sup>15</sup> Ranked highest to lowest in terms of ED to admission potential, the diagnoses are hypertension (HTN), cerebral vascular accident (CVA), coronary artery disease (CAD), diabetes mellitus (DM), and COPD. Percentages of provider population are calculated as the total number of active patients with each condition divided by total number of annual active patients.

In Table 5, BMA patients exhibited the lowest prevalence of 4 of the 5 top diseases. With the exception of COPD prevalence (the fifth-ranked disease), PHS patients did not differ significantly from BMA patients. In contrast, group percentages of HTN, CAD, and DM were significantly higher among MMA patients. Higher COPD prevalence among the PHS population is not surprising, as COPD has been found to be more common among lower income groups who have higher propensities to smoke and/or work in jobs involving respiratory hazards.<sup>16</sup> Higher rates of HTN, CAD, and DM have also been associated with lower income, although no income gradient is apparent in Table 5 for these conditions. In sum, figures of Table 5 suggest that, from 2009 to 2012, PHS patients were comparable to BMA and MMA patients with reference to hospitalization-likely chronic diseases. The BMA patients appeared to rank

**Table 6.** Comparison of Nonelective Hospital Admission Rates and Physician Office Visits per Thousand Patients: BMA, MMA, and PHS (2009 dollars).

Year	Hospital Admissions Per Provider Per 1000 Patients (Average Physician Office Visits Per Provider per 1000 Patients)				(E) Difference for PHS Clinic per 1000 Patients (C – D)	(F) Difference for PHS Clinic Adjusted per 1500 Patients (E × 1.5)	(G) Average Actual Cost of a 4-day Hospital Admission at 37%	(H) Total Annual Actual Cost Savings (F × G)
	(A) Admissions for BMA	(B) Admissions for MMA	(C) Average Admissions for BMA & MMA ([A + B]/2)	(D) Admissions for PHS Clinic				
2009-2010	50.9 (2.4)	48.6 (2.6)	49.75 (2.5)	25 (4.92)	24.75 (2.42)	37.125	US\$6280	US\$233 145
2010-2011	51.5 (2.41)	49.2 (2.69)	50.35 (2.55)	34 (5.21)	16.35 (2.66)	24.525	US\$7349	US\$180 234
2011-2012	52 (2.62)	50.8 (2.61)	51.4 (2.615)	23 (5.1)	28.4 (2.485)	42.6	US\$7955	US\$338 883
2009-2012 Annual average	51.47 (2.48)	49.53 (2.63)	50.5 (2.56)	27.33 (5.08)	23.17 (2.52)	34.75	US\$7195	US\$250 754

Abbreviations: BMA, Blair Medical Associates; MMA, Mainline Medical Associates; PHS, Partnering for Health Services.

healthiest among the populations followed by PHS and MMA patients in no definitive order.

Columns A to D in Table 6 summarize nonelective hospital admissions per 1000 patients for BMA, MMA, and PHS as reported in the prior study. Also listed in parentheses beside admissions numbers are the average annual number of physician office visits per provider per 1000 patients. Lexington Hospitalist provided all admissions data for 2009 to 2012. Data obtained from ARHS billing services were used to cross-check Lexington Hospitalist data for accuracy.

In columns A to C, the 2009 to 2012 nonelective admission rates for BMA and MMA were quite similar, averaging 50.5 admissions per provider per 1000 patients. Also similar was the number of physician office visits; BMA and MMA averaged 2.56 visits per provider per year, with a low of 2.4 and high of 2.69. Column E calculates the difference between average annual admissions for BMA and MMA (column C) and the PHS clinic (column D). Column E shows that from 2009 to 2012, PHS had 16.35 to 28.4 fewer annual admissions per 1000 patients than the BMA and MMA average. PHS admissions were also well below the 2009 to 2012 annual US average of 112 admissions per provider per 1000 patients.<sup>16</sup> Figures in parentheses in columns D and E show that PHS patients averaged nearly 5 physician office visits annually, nearly twice that of BMA and MMA.

It is important to note here that PHS, BMA, and MMA used the same hospitalist service, Lexington Hospitalist, for all inpatient admissions. The 11-member group hospitalist was responsible for determining the appropriateness and coordination of patient admissions and follow-up visits, provision of bedside care, managing consultations and communications with specialists, ordering laboratory tests and procedures, and managing patients' discharge. Lexington Hospitalist had no access to insurance information of the patients and treated each patient with predesigned treatment protocols to assure zero variability in management of patients among the primary care physicians, regardless of practice.

Why were PHS's inpatient admission rates so much lower than the community's 2 largest private physician groups? We offer 2 possible explanations. First, PHS's capitation fee structure with zero copays and deductibles frees patients' access to the clinic's full array of primary care services available 4.5 days per week. That is, PHS patients' access to primary care is comparable to or better than BMA or MMA patients who have private insurance. Moreover, ARHS imposed no inpatient admission restrictions on PHS patients. Second, the clinic's delivery of care model, which encourages more office visits and thus face-to-face time with providers, is designed to aggressively manage chronic health conditions. The success of PHS's chronic care model is consistent with prior research linking greater physician contact to improvements in patients' health outcomes.<sup>17-19</sup> Whether greater provider contact improves patients' ability to follow treatment guidelines and/or encourages them to actively self-manage their health and care, evidence from this research found that even after disease severity and demographic characteristics were controlled for, more frequent patient-provider contact resulted in reduced utilization of costly health care services such as hospitalizations and ED visits. Albeit limited, there is also prior research suggesting that patient engagement strategies applied to uninsured patients in a low- or no-cost clinic setting results in significant improvements in patients' management of their chronic illnesses.<sup>20,21</sup> The treatment and patient activation strategies examined in these prior studies, which included a nurse-managed delivery system, evidence-based disease management guidelines, and promotion of patient self-management, are very similar to the PHS model.

To estimate the annual number of ARHS inpatient admissions saved due to the PHS clinic model (column F in Table 6), we averaged the yearly inpatient admissions per provider per 1000 patients for BMA and MMA (column C) and differenced these figures by the yearly inpatient admissions for PHS (column E). Since this difference reflects admissions per 1000 patients, column F adjusts upward by 1.5 times the column E

figures to account for the clinic's 1500 actual patients. We then estimated the total annual cost savings to ARHS using the average actual cost of a nonelective inpatient admission based on 2009 to 2012 ARHS hospitalist data (column G). This cost estimate, which includes an average 4-day stay, ranges from US\$6280 to US\$7955 in 2009 dollars. The product of column G and column F yields the estimated annual cost savings to ARHS in nonelective inpatient admissions avoided (column H). Column H shows that PHS saved ARHS an estimated average of US\$250 754 annually in avoided inpatient admission costs.

### Hospital Limited Indemnity Insurance Reimbursements

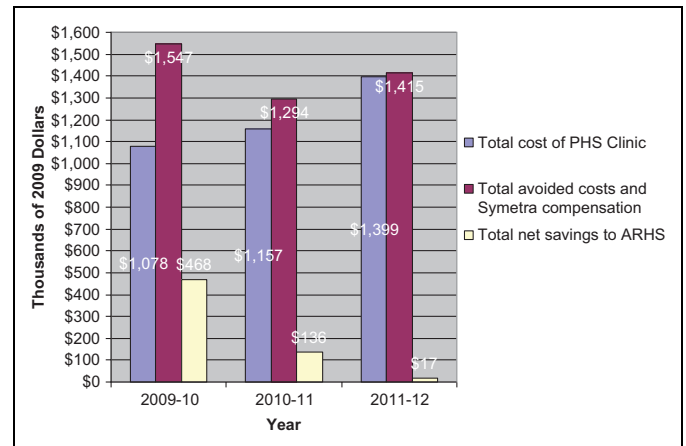
In September 2010, the PHS clinic launched a limited indemnity health insurance plan designed to complement the existing clinic model. The plan, underwritten by Symetra Insurance, covers ARHS hospital admissions, outpatient surgery, ED visits, and inpatient physician payments.<sup>22</sup> The plan costs patients US\$99 per month and has been purchased and continuously renewed by 154 of PHS's 1500 patients. Since the clinic population is considered vulnerable (predominantly low income) for care purposes, adverse selection in a group of this type is generally considered extremely high. Thus, unless only the risk portion of health care is covered, that is, coverage of adverse health events requiring hospital admission, surgery, and/or an ED visit (for care beyond PHS's capacity), the resulting premium growth rate would simply mirror existing private health insurance market rates, rendering the policy unaffordable to its low-income holders. The challenge for PHS, ARHS, and Symetra was to determine how the insurance-free office concept could be maintained, for example, keeping the copay-free, highly accessible primary care model designed to aggressively manage uninsured patients' chronic health conditions while allowing ARHS and medical providers to recoup at least some of the sunk costs associated with caring for the community's uninsured. Another valid reason to add an affordable health insurance element was to provide predictability to the patient who might avoid medical care due to the unknown cost of treatment. This avoidance behavior has been shown in many studies to exacerbate the expected future cost of care to the providers as well as deteriorate the quality of life for the individual.

The low-cost insurance policy was/is offered to clinic patients on a voluntary basis conditioned on receiving all of their medical care at PHS. That 154 of 1500 patients initially decided to purchase the expanded coverage was encouraging to PHS, ARHS, and Symetra and proved that not everyone is seeking to benefit from the health care safety net for free. Purchasers remarked that they liked the idea of having health insurance but had merely been priced out of the market by the high and rising cost of health insurance. As of June 2013, the insurance program has exhibited sustainability at the correct price point if packaged together with the community provider (ie, ARHS) that previously obligated to provide care with zero revenue in return.

**Table 7.** Insurance Payments to ARHS Including Recaptured Medicaid Payments (2009 Dollars).

Plan Years	2009-2010	2010-2011	2011-2012
Revenue Received	N/A	US\$37 598	US\$86 987

Abbreviations: ARHS, Altoona Regional Health System; N/A, not available.



**Figure 2.** Total annual savings to Altoona Regional Health System (ARHS) from Partnering for Health Services (PHS).

With 2 full years of premium collections and paid claims, the insurance underwriter confirmed the ability to maintain plan premiums as originally quoted (a zero 2-year premium inflation rate). By comparison, the private insurance market with current medical cost trend-related inflation alone accounted for a steady 10% to 12% annual increase in group premiums since 2010. Symetra's latest premium to claims data reflect a pattern of decreasing costs per claim as of June 2013. Moreover, as of June 2013, Symetra's loss ratios have actually widened, implying a lessening of carrier risk. Since this project is a unique collaboration between ARHS and Symetra, communication between these 2 entities has allowed reasonable increases in reimbursements to ARHS while maintaining the stable and affordable premium of US\$99 per month. Table 7 reports reimbursements from Symetra to ARHS for all covered services. From 2010 to 2012, reimbursements to ARHS totaled US\$124 585, a nontrivial contribution from a population that previously provided zero revenue.

## Results

Figure 2 summarizes the total annual cost and estimated savings data compiled in Tables 1, 2, 4, 6, and 7. In Figure 1, the total annual cost of PHS is the sum of operating costs (Table 1) and actual costs of all clinical services (Table 2, column 3). The total annual savings to ARHS from PHS is the sum of ED actual costs avoided (Table 4, column 5), reduced hospitalizations (Table 6, column 9), and hospital-limited indemnity insurance reimbursements (Table 7). From 2009 to 2012, the PHS clinic's total annual costs ranged from US\$1.078 to

US\$1.415 million (2009 dollars), averaging US\$1.211 million. Annual avoided costs to ARHS and insurance reimbursements ranged from US\$1.294 to 1.547 million, averaging US\$1.419 million. By comparison, if ARHS and the PHS clinic were to operate as a traditional fee-for-service primary care office accepting only private health insurance, based on the insurance industry's current average price for an individual health plan, the total cost would be US\$8.4 million per year for 1500 patients covered by commercial health insurance plus another US\$5.5 million for Medicaid.<sup>23</sup>

## Discussion

A consequence of the 1986 Emergency Medical Transport and Labor Act is that nearly 4000 EDs in the United States serve as a health care portal for large numbers of uninsured patients. As a result, many hospitals are turning to local access to care programs as a way to provide care to the uninsured in a more cost-effective way. By providing patients with better access to preventive care, these programs further enhance cost savings by helping patients better manage their chronic illnesses such as diabetes and COPD, thereby averting future potentially more costly ED or inpatient services.<sup>24-28</sup> This study evaluated the impact of the PHS clinic on hospital inpatient admissions, ED visits, and patients' purchase and use of a low-cost health insurance plan. The 1500 enrolled patients in PHS exhibited lower inpatient annual admissions as well as intended ED utilization rates. These results provide further evidence that private and/or public investment in quality primary care services for the uninsured yields potentially significant private and social benefits even in the short run.

Our results, although consistent with prior studies evaluating local access to care programs, do differ somewhat from those studies. These differences are largely attributable to variation in scope and concentration of each exercise. Herein, our objective was to perform a multiyear case study assessment, using individual patient data, of the impact on hospital costs averted (and insurance reimbursements earned) from a uniquely designed low-/no-cost clinic model providing a full array of primary care services to a low-income population. By comparison, prior studies have measured the expected impact of investments in specific public programs, for example, expanded eligibility for Medicaid-covered health care services,<sup>29</sup> increased public investments in FQHCs,<sup>5,30</sup> or state or locally funded access to care programs.<sup>24-28</sup> Thus, in each of these cases, the base populations who participated in these programs varied in terms of their current and expected access to care and their demographic characteristics, resulting in different program-specific savings in hospitalizations, ED visits, and/or improvements in health outcomes. Moreover, these programs had diverse organizational structures, operations, scopes of services, and compositions of staff. This diversity suggests that there is a high degree of variability across the individual clinics in terms of their capacity to serve the basic health care needs of uninsured patients.

Hospital sponsored care programs for the uninsured are becoming an increasingly important component of the US health care safety net, especially in light of continued high number of uninsured adults, increasing costs of health coverage in individual and employer-funded plans, higher out-of-pocket costs, and pressures on state budgets to continue to limit enrollment in Medicaid. Results of this study offer evidence that such private and public sector investments designed to aggressively manage chronic health conditions of the uninsured could result in significant cost savings as well as health benefits to uninsured families.

## Declaration of Conflicting Interests

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