

# **New Mexico Alliance for School-Based Health Care Final *EV-ROI* Report**

**October 16, 2013**

**Presented by:  
MSA Management, LLC**

**Melanie Shaw Ginn  
President & CEO**

**William Wubbenhorst, MBA  
Andrew Gluck, MBA**

Data provided by the New Mexico Department of Health Office of School and Adolescent Health and Apex Education



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## Summary Explanation of the *EV-ROI* Cost Benefits Worksheet – 10.16.13

### Analysis of 56 School-Based Health Centers in New Mexico

#### Executive Summary

This report was requested by the New Mexico Alliance for School-Based Health Care (NMASBHC) with data supplied by the New Mexico Department of Health Office of School and Adolescent Health. **An analysis of school-based health care administered to 14,500 students aged 14 – 19 in New Mexico in school year 2012 - 2013 yields a return of \$6.07 for every dollar expended.** This number was derived by comparing the total projected savings of \$20.1 million from 8 measures against the total annual budget of \$3.3 million. This is a conservative estimate based on an analysis of only 8 measures accounting for 47% of all patient visits, meaning that many other measures were not counted and the outcomes from 53% of patient visits have yet to be monetized.

#### Background

The Expected Value-Return On Investment (*EV-ROI*) methodology allows organizations to represent the impact and outcomes produced by their programs and services in a monetized form. Below is a brief overview of the methodology and assumptions applied for the calculation of the benefits and impact of a number of specific programs and initiatives of SBHCs funded by the New Mexico Department of Health. These *EV-ROI* measures reflect ROI values associated with those 56 New Mexico schools with a School-Based Health Center (SBHC).

#### Intervention-Specific ROI Calculations

In addition to providing a global value for these 56 SBHCs, we also project *EV-ROI* values specific to each intervention (e.g., administration of flu vaccines, STI screenings). The specific costs for providing a particular intervention are based on a cost per encounter (calculated by dividing the total SBHC budget by the total number of encounters at those SBHCs) times the estimated number of encounters associated with a specific intervention (e.g., the number of visits for STI screenings, the number of mental health counseling sessions to complete therapy).

#### Projected Savings and Gains from Eight Measures

There are eight interventions/categories of *EV-ROI* for which we were able to capture enough data in order to make a credible and defensible estimate of benefit. Therefore, the following list of results and the global return should be seen as a subset of the total universe of actual benefits and savings experienced by the students, teachers and their families due to the presence of these SBHCs. The first six measures are considered “direct” since they can be tied directly to specific interventions and have their own intervention-specific *EV-ROI*. **These direct measures, by themselves, have an estimated *EV-ROI* of \$2.08 for every dollar of SBHC service.** The seventh and eighth measures are classified as “indirect” since they are a result of the collective effect of these SBHCs.

## Direct EV-ROI Measures

Direct *EV-ROI* measures refer to those interventions that produce a direct effect on the students' health (i.e., interventions that prevent the contraction of the flu, avoid cavities, etc.). There are six aspects of direct projected *EV-ROI* effects included in this study. Below is a brief explanation of the rationale and assumptions behind each category:

- 1. Projected Annual Net Hospitalization Savings of \$206,725 for Asthmatic Students** – This intervention is built around the finding from one study that the average annual Medicaid costs for asthmatics in a school with an SBHC were \$464 less than for asthmatic students in a school without an SBHC<sup>1</sup>.
- 2. Projected Annual Net Savings of \$692,827 from Early Detection and Treatment of Gonorrhea and Chlamydia** – These savings are based on research findings that show that 40% of undetected cases of chlamydia in female students result in Pelvic Inflammatory Disease (PID), and those female students with PID are eight times more likely to test positive for AIDS. The savings projected here are based on the assumption that these SBHCs successfully detect and treat the estimated 219 students that come to the SBHCs with Chlamydia or gonorrhea.
- 3. Projected Annual Net Savings of \$54,092 from reduced incidence of flu cases due to SBHC immunizations** – This is based on an average probability of one in eight persons catching the flu in a given year, combined with a conservative 59% vaccine effectiveness rate<sup>2</sup>, and the assumption that 36.7% of students would have received a flu vaccination from another source. We estimate that the 492 students receiving the flu vaccine (of which 311 are estimated to not have received the vaccination from any other source) resulted in the prevention of close to 24 cases of flu. Savings are based upon the average medical costs to treat the flu, and the estimated lost family earnings (e.g., for taking a child from school to the doctor or ER and for time spent recuperating at home) times these 24 cases. Due to the simplicity of administering flu vaccine (by mist or injection), the cost to administer the vaccine was estimated at only one third of an encounter.
- 4. Projected Lifetime NPV Net Savings of \$1,033,216 due to Mental Health Service** – The estimated savings from SBHC mental health services is confined to the estimated 670 students that completed therapy and maintained or improved their grades based<sup>3</sup> on a subset of therapy treatments for which ROI analysis was conducted<sup>4</sup>.

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<sup>1</sup> Evaluation of Healthcare Costs and Utilization among Medicaid Recipients in Schools with School-Based Health Centers; Guo, Jeff J. PhD; Jang, Raymond PhD; Cluxton, Robert J. Pharm. D.; Submitted to the Health Foundation of Greater Cincinnati (2005)

<sup>2</sup> This refers to the percentage of individuals for whom the vaccine “works” (i.e., prevents contracting the flu).

<sup>3</sup> This estimate, based on research conducted on other SBHCs, assumes that 86% of students using the SBHC for Mental Health counseling finish their therapy, and that 27% of these students maintained or improved their grades following therapy.

<sup>4</sup> This meta-analysis of various mental health treatments was conducted by the Washington State Institute for Public Policy.

5. **Projected Annual Net Savings of \$690,557 due to a projected decrease in prescription drug costs** – An SBHC study in Cincinnati found that the average annual prescription drug cost for students in SBHCs was \$347 (adjusted for 2013 dollars) less than for students in comparable schools without SBHCs. The report’s authors contend that at least some of these savings are from SBHCs prescribing less expensive, prevention-oriented drugs at an earlier stage of the disease than would be prescribed for students without access to an SBHC. Savings may also be due to improved medication adherence/compliance due to SBHC involvement and follow-up. These savings were only attributed to the 5,332 students (of the total 14,412 seen by these SBHCs) that made at least three visits to the SBHC during the course of the year.
  
6. **Projected Annual Net Savings of \$119,501 from application of dental sealants** – These SBHCs also provide dental check-ups and treatment on-site for students in some of the SBHCs. The application of dental sealants is among the various treatments provided through this intervention<sup>5</sup>. The savings of about \$335 (in 2013 dollars) per dental sealant is based upon a similar program in Oregon<sup>6</sup>, which demonstrated how dental sealants prevented future cavities as well as the associated costs. SBHC costs were likewise based on the estimate from this program of \$75 (in 2013 dollars) per sealant.

### Indirect EV-ROI Measures

Indirect *EV-ROI* measures refer to cost savings that result from SBHC services beyond the immediate benefits described above. Some of these savings are near-term, such as the benefit of parents avoiding the need to leave work to pick up a sick child who can instead be treated through an SBHC. Most significantly, and likewise difficult to capture, is the degree to which these SBHCs contribute to high school graduation rates by keeping students healthier, reducing school absences, and thus reducing the likelihood of dropping out of high school. Due to the indirect nature of these savings, there are no specific SBHC costs identified with indirect measures (as opposed to the calculation methodology applied to the direct measures described above).

7. **Projected Annual Savings of \$736,262 from avoidance of parents’ productivity losses (i.e., time off work)** – The savings articulated here are based on the premise that the presence of an SBHC in a school reduces the number of times a parent would have to take time off work in order to pick up a sick child from school. A related study estimated that 50% of SBHC encounters would have required a parent to pick up his or her child from school in the absence of an SBHC. 50% of the encounters with these SBHCs, times an average of four hours of a parent’s time off of work to pick up that child, yields an estimated 62,838 hours of parents’ time taken off of work<sup>7</sup> (half of the 45,535 annual encounters times four hours per encounter times an estimated 69% of the parent’s population in the workforce). In instances where the parent is

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<sup>5</sup> We believe there are additional savings from other dental treatment services provided, and will include these projected savings upon further research.

<sup>6</sup> Based on data from the study of School-Based Dental Prevention Efforts of the Happy Smiles Program in Oregon (2004-2011).

<sup>7</sup> Our projections are further reduced by the assumption that only about 69% of SBHC students’ parents are actually in the work force.

paid on an hourly basis, the cost is borne by the parents. In instances where the parent is salaried, the cost would be borne by the employer.

- 8. Projected Net Present Value (NPV) of \$14.0 million for lifetime incremental tax revenues generated by a higher number of high school graduates in SBHC schools** – A sampling of the 2011 graduation rate of students from SBHCs (in another study of comparable SBHCs<sup>8</sup>) compared to those schools without SBHCs showed a 5.3% higher percentage of SBHC students graduating high school. Using this same logic and 5.3% higher graduation rate applied to the 56 NM SBHCs resulted in a projected 115.5 students in SBHC schools that would not have otherwise graduated. A study examining the lifetime impact of earnings and income tax revenues derived from those earnings estimates an additional \$121,187 (NPV) in income tax revenues (adjusted for 2013 dollars) for each high school graduate. This yields a total benefit, in terms of additional income tax revenues, of close to \$14 million.

### Observations and Recommended Next Steps

1. The *EV-ROI* estimate is based upon 47% of all visits. An analysis of the other 53% of visits could be undertaken to yield an even higher return on investment.
2. Certain interventions that are known to yield very significant returns were reported at an unusually low rate. For instance, flu immunizations are a very low-cost highly effective public health intervention. Yet in school-year 2012-2013 only 492 (or 3.4%) of the 14,500 students participating in SBHCs received a flu immunization. A potential of close to \$1.5 million more in net return could be realized if flu vaccinations were made a priority.
3. Similarly, the rate of students served for asthma was 5.65%. We believe that if students served through these 56 SBHCs are similar to the national profile, then at least an equal amount of children with asthma are failed to be seen. Finding and serving these children would double the return from asthma-related interventions, saving an additional \$200,920 plus related productivity losses of parents.
4. This entire analysis was based upon numbers served by these NM SBHCs, but with health outcomes attributed to studies done on other similar populations. A more credible and defensible case could be made for the effects of these NM SBHCs if students' health outcomes and graduation rates were tracked over time.

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<sup>8</sup> The study was based on 22,522 visits in school year 2011-2012 to 11 SBHCs run by East Baton Rouge's Health Care In Schools.

**WORKSHEET FOR *EV-ROI* MEASURES FOR 56 SCHOOL-BASED HEALTH CENTERS IN NEW MEXICO  
FUNDED BY THE NEW MEXICO DEPARTMENT OF HEALTH**

Reference	Assumptions About SBHC Utilization and Cost	
I	Number of schools with SBHCs	56
I	Total students utilizing SBHC services (ages 14-19)	14,500
II	Number of female SBHC users	9,135
III	Number of students with 3 or more visits to SBHC (2012-13)	5,365
IV	Estimated number of students who completed mental health therapy	2,481
V	Number of SBHC users receiving asthma care	573
VI	Estimated number of students receiving dental sealants annually	135
VII	Number of students receiving flu vaccinations per year	492
VIII	Total net annual costs to operate and staff the 56 SBHCs	\$3,311,225
IX	Total number of SBHC visits in school year 2012-2013	45,535
X	Cost per encounter	\$73
XI	Number of students screened for STIs	553

Direct <i>EV-ROI</i> Cost-Benefit Measures		Annual Savings	Estimated Costs	Projected <i>EV-ROI</i>	Net Annual Savings
XII	Savings from Reduced Hospitalization Costs for Asthmatic Students	\$265,918	\$59,193	\$4.49	\$206,725
XIII - XVI	Savings from Early Detection of Chlamydia and Gonorrhea	\$743,003	\$50,176	\$14.81	\$692,827
XVII - XX	Savings from Reduced Cases of Flu Due to Vaccination	\$66,018	\$11,926	\$5.54	\$54,092
XXI - XXIII	Projected Net Present Value of Lifetime Savings from Mental Health Services	\$2,296,114	\$1,262,898	\$1.82	\$1,033,216
XXIV - XXV	Savings from Decreased Use of Prescription Drugs Due to Prevention	\$1,860,958	\$1,170,400	\$1.59	\$690,557
XXVI - XXVIII	Savings from Application of Dental Sealants	\$149,008	\$29,507	\$5.05	\$119,501
	<b>Subtotal</b>	<b>\$5,381,017</b>	<b>\$2,584,099</b>	<b>\$2.08</b>	<b>\$2,796,919</b>
Indirect <i>EV-ROI</i> Cost-Benefit Measures					
XXIX - XXXII	Savings from Avoidance of Parents' Productivity Loss	\$736,262		N/A	
XXXIII - XXXIV	Net Present Value of Increased Income Tax Revenue from Improved Earnings due to Better High School Graduation Rates at Schools with SBHCs	\$13,996,190		N/A	
<b>TOTAL PROJECTED SAVINGS FROM ALL ABOVE EFFECTS</b>		<b>\$20,113,469</b>		<b>N/A</b>	
<b>TOTAL ESTIMATED ANNUAL COSTS FOR OPERATING 56 SBHCs</b>		<b>\$3,311,225</b>			
<b>ESTIMATED ANNUAL <i>EV-ROI</i> PER DOLLAR OF FUNDING THE SBHCs</b>		<b>\$6.07</b>			

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## Assumptions About SBHC Utilization and Cost

Reference	Finding	Citation
I	There were a total of 14,412 SBHC users (students) at one of 56 SBHCs in New Mexico in the 2012-13 academic school year.	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
II	63% of SBHC visits were from female students	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
III	37% of SBHC users had three or more visits.	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
IV	There were 2,885 patients with 14,567 visits for mental health services. Based on data from another SBHC analysis, we estimated that 86% of students (2,481) completed their therapy.	<i>2012-13 Welligent Summary data for New Mexico Alliance for School-Based Health Care.</i>
V	573 asthmatic students received care from NM SBHCs	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
VI	135 students received dental sealants.	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
VII	492 students received a flu vaccination during academic school year 2012-2013.	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
VIII	The total annual budget to operate these 57 SBHCs, inclusive of the \$450,000 federal Medicaid match, in academic school year 2012-13 was approximately \$3.3 million.	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
IX	There was a total of 45,535 encounters at the 56 schools with SBHCs in New Mexico.	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
X	The average cost per encounter for the New Mexico Health Alliance SBHCs is approximately \$73.	<i>Calculation derived from VIII and IX above.</i>
XI	553 students received STD detection and treatment services.	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>

## Assumptions About Costs and Benefits of Outcomes

Reference	Finding	Citation
XII	Pre-SBHC hospitalization costs per asthmatic student was \$1,150 over 2.5 years (\$460 annually). Post-SBHC hospitalization costs for asthmatic students over 2.5 years dropped to \$180 (\$72 annually). Adjusting for inflation, the 2013 estimated dollar savings per asthmatic student is \$464.	<i>Evaluation of Health Care Costs and Utilization among Medicaid Recipients in Schools with School-Based Health Centers; Guo, Jeff J. PhD; Jang, Raymond PhD; Cluxton, Robert J. Pharm. D.; Submitted to the Health Foundation of Greater Cincinnati (2005)</i>
XIII	Approximately 63% of STDs detected are chlamydia or gonorrhea.	<i>High Prevalence and Incidence of Sexually Transmitted Diseases in Urban Adolescent Females Despite Moderate Risk Behaviors; Bunnell, Rebecca E. et al; The Journal of Infectious Diseases, 1999; Volume 180, pp. 1624-1631.</i>
XIV	An 40% of undetected chlamydia/gonorrhea cases results in Pelvis Inflammatory Disease. Women with PIDs are 8 times more likely to test positive for HIV.	<a href="http://www.womenshealth.gov/publications/our-publications/fact-sheet/chlamydia.cfm#h">http://www.womenshealth.gov/publications/our-publications/fact-sheet/chlamydia.cfm#h</a>
XV	The average lifetime cost for treating PIDs (in 2013 dollars) is \$2,731.	<a href="http://www.ncbi.nlm.nih.gov/pubmed/12916126">http://www.ncbi.nlm.nih.gov/pubmed/12916126</a>
XVI	The average lifetime cost for treating HIV/AIDS is PIDs (in 2013 dollars) is approximately \$1.48 million (29,610 times 50 years).	<a href="http://www.ncbi.nlm.nih.gov/pubmed/12916126">http://www.ncbi.nlm.nih.gov/pubmed/12916126</a>
XVII	Percentage of the U.S. population that will get the flu, on average, each year: between 5% and 20%.	<a href="http://www.webmd.com/cold-and-flu/flu-statistics">http://www.webmd.com/cold-and-flu/flu-statistics</a>
XVIII	The estimated annual effectiveness rate of a flu vaccine is approximately 59%.	<a href="http://www.huffingtonpost.com/2011/10/27/flu-shot-only-59-percent-effective_n_1032916.html">http://www.huffingtonpost.com/2011/10/27/flu-shot-only-59-percent-effective_n_1032916.html</a>
XIX	The estimated transmission rate of the flu to other family members is approximately 5.6%.	<i>Burden of influenza in healthy children and their households; Authors: Principi N et al; Archives of Disease in Childhood; Volume 89 (2004), pp. 1002-1007.</i>

Reference	Finding	Citation
XXI	The average Net Present Value of lifetime savings associated with students that complete mental health therapy, up through the end of high school, is estimated a \$3,428.	<i>Return On Investment: Evidence-Based Options to Improve Statewide Outcomes; Washington State Institute for Public Policy; April 2012.</i>
XXII	An estimated 27% of students completing therapy either maintained or improved their grades after therapy.	<i>Based on data provided by the East Baton Rouge Health Centers in Schools for students completing therapy.</i>
XXIII	The average length of a complete mental health therapy engagement is seven visits.	<i>Information provided by the East Baton Rouge Health Centers in Schools.</i>
XXIV	The average Medicaid prescription drug cost for students in non-SBHC schools was \$640, as compared to only \$350 for students in schools with SBHCs. Updated to 2013 dollars, this results in an average savings per student of \$347.	<i>Evaluation of Health Care Costs and Utilization among Medicaid Recipients in Schools with School-Based Health Centers; Guo, Jeff J. PhD; Jang, Raymond PhD; Cluxton, Robert J. Pharm. D.; Submitted to the Health Foundation of Greater Cincinnati (2005)</i>
XXV	The estimated SBHC costs and benefits associated with this measure was limited to the number of students that had three or more visits to an SBHC. Cost per student was projected based on 3 visits at the \$73 cost/encounter, totaling \$240 per student.	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
XXVI	Each student receives, on average, 2.92 dental sealants.	<i>Based on data from the study of School-Based Dental Prevention Efforts of the Happy Smiles Program in Oregon (2004-2011)</i>
XXVII	An estimated 183 students in SBHCs in New Mexico received dental sealants.	<i>Information provided by the New Mexico Alliance for School-Based Health Care.</i>
XXVIII	Estimated savings (in the form of averted future dental costs for cavities) per tooth is \$300, as compared to a cost/tooth of only \$67).	<i>Based on data from the study of School-Based Dental Prevention Efforts of the Happy Smiles Program in Oregon (2004-2011)</i>

Reference	Finding	Citation
XXIX	Estimate that 50% of SBHC encounters would have required an average of four hours that a parent would need to take off of work to pick up their child and either bring them home or bring them to a clinic or doctor's office.	<i>Evaluation of Health Care Costs and Utilization among Medicaid Recipients in Schools with School-Based Health Centers; Guo, Jeff J. PhD; Jang, Raymond PhD; Cluxton, Robert J. Pharm. D.; Submitted to the Health Foundation of Greater Cincinnati (2005)</i>
XXX	There was an estimated 45,535 encounters among the 56 SBHC in New Mexico.	<i>Encounters with Students in East Baton Rouge Parish; Health Centers in Schools, East Baton Rouge (2009-10).</i>
XXXI	Low-wage employees, whose earnings fall in the bottom 25% of the earnings distribution, earned \$9.73 per hour in 2005 dollars (\$11.72 in 2013 dollars).	<i>Families and Work Institute; Research Brief No. 1; November, 2006.</i>
XXXII	An estimated 69% of SBHC students' parents were in the workforce.	<i>Estimate requiring verification.</i>
XXXIII	The average graduation rate in 2011 from a sampling of two high schools with SBHCs in Louisiana was 70%, as compared to only 64.7% among a sampling of demographically-comparable non -SBHC high schools.	<i>Information provided by the East Baton Rouge Health Centers in Schools.</i>
XXXIV	Including Social Security contributions, a high school dropout will contribute nearly \$98,000 less in taxes than a high school graduate.	<i>Labor Market Consequences of an Inadequate Education; Rouse, Cecilia Elena; Princeton University and NBER; Prepared for the Equity Symposium on "The Social Costs of Inadequate Education" at Teachers' College, Columbia University; September 2005.</i>

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