



Cost Effectiveness of Schools Based Health Centers

National Alliance for Medicaid in
Education (NAME)

Minneapolis, MN

Sept 27, 2007



Research Team

- Jeff J. Guo, PhD
- Terrance J. Wade, PhD
- Kate Keller, MPA
- Ann McCracken, PhD

Acknowledgment

- Health Foundation of Greater Cincinnati (Patricia O'Connor).
- Research team for pQOL study and cost study.
- SBHC Coordinators.
- Ohio Medicaid Agency (ODJFS).
- Institute for the Study of Health.
- Study review panel members.
- Student and parent participants



Agenda

- History of the Health Foundation of Greater Cincinnati SBHC Initiative
- Evaluation of Health Outcomes and Absenteeism
- Evaluation of Health Care Costs and Utilization among Medicaid Recipients
- Results from Linking Health Outcome dataset and Medicaid Utilization dataset
- Discussion



The Health Foundation of Greater Cincinnati

The Foundation supports initiatives that improve access to health care in the 20 counties that surround Cincinnati, Ohio.

School-Aged Children's Healthcare Focus Area

- School-Based Health Centers Initiative
 - Began in 1999
 - 15 SBHCs
 - \$10.5 million



SBHC Studies Background

Why conduct the studies?

- To document the effectiveness of SBHCs in Greater Cincinnati
- To help set future funding priorities
- To improve the quality of information about SBHCs



SBHC Studies Background

Design and Review Process

- Literature review; local school-linked study at Cincinnati Children's Hospital Medical Center
- Study designed internally; refined and implemented by investigators
- Expert and scientific review panels- before and after



Evaluation of Health Outcomes and Absenteeism among Students Using SBHCs

Dr. Terrance J. Wade,
Canada Research Chair in Youth and Wellness
Brock University
(formerly from Cincinnati Children's Hospital Medical Center/
University of Cincinnati)



Collaborators

- **Cincinnati Children's Hospital Medical Center**
- **Institute for Health Policy and Health Services Research**
- **Participating schools with SBHCs (8) and comparison schools without SBHCs (4)**



Overall Study Design

The Study:

- 3 years duration; longitudinal
- Looks at outcomes
- Also measures the process



Schools and Survey Design

	Urban	Rural
Ohio	2 Intervention 1 Comparison	2 Intervention 1 Comparison
Kentucky	2 Intervention 1 Comparison	2 Intervention 1 Comparison



Study Goals

Outcomes

To evaluate:

- Healthcare access and utilization
- Students' health-related quality of life (HRQL)
- Student absenteeism

Process Measurement:

To evaluate:

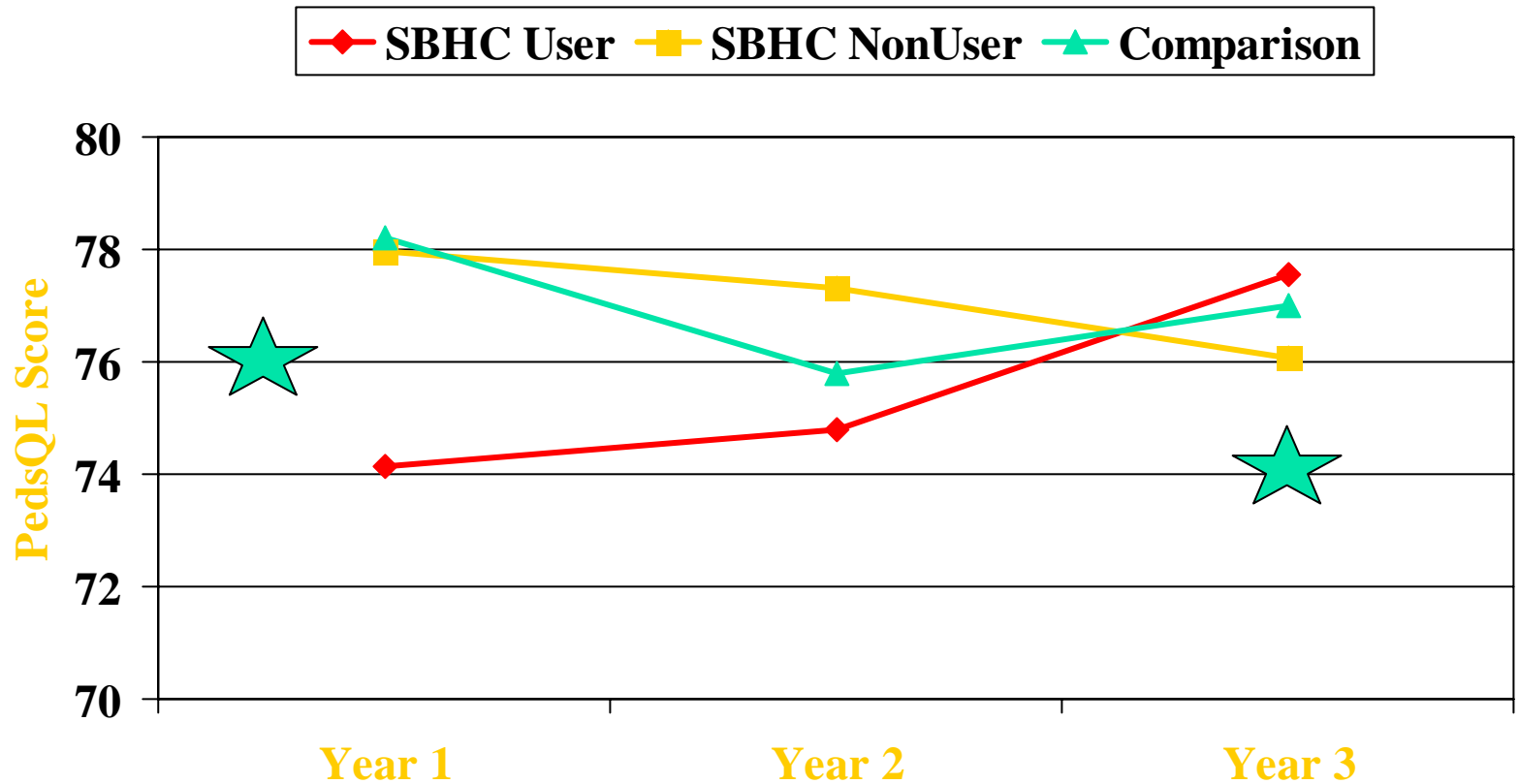
- Type and volume of services provided
- School personnel and parent perception of the SBHC
- Descriptions of the SBHC



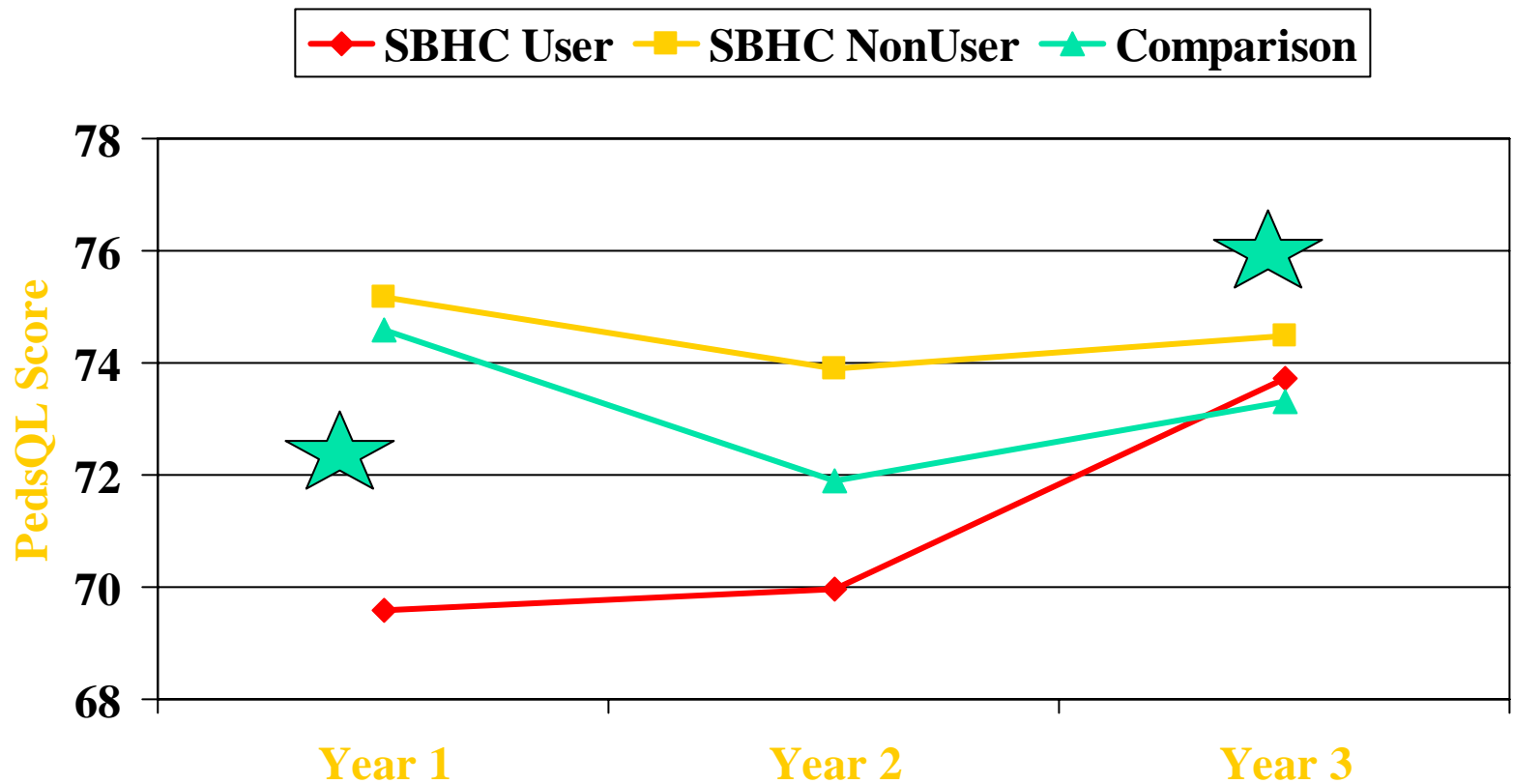
Utilization Summary

- Greater use among urban SBHC students with public or no insurance than urban SBHC students with private insurance
- Among rural students, insurance status didn't really matter – the utilization rates were the same
- Over the three years, we see a large increase in mental health and behavioral health service utilization

Child-Reported Total HRQL (N=588)



Child-Reported Psychosocial HRQL (N=588)

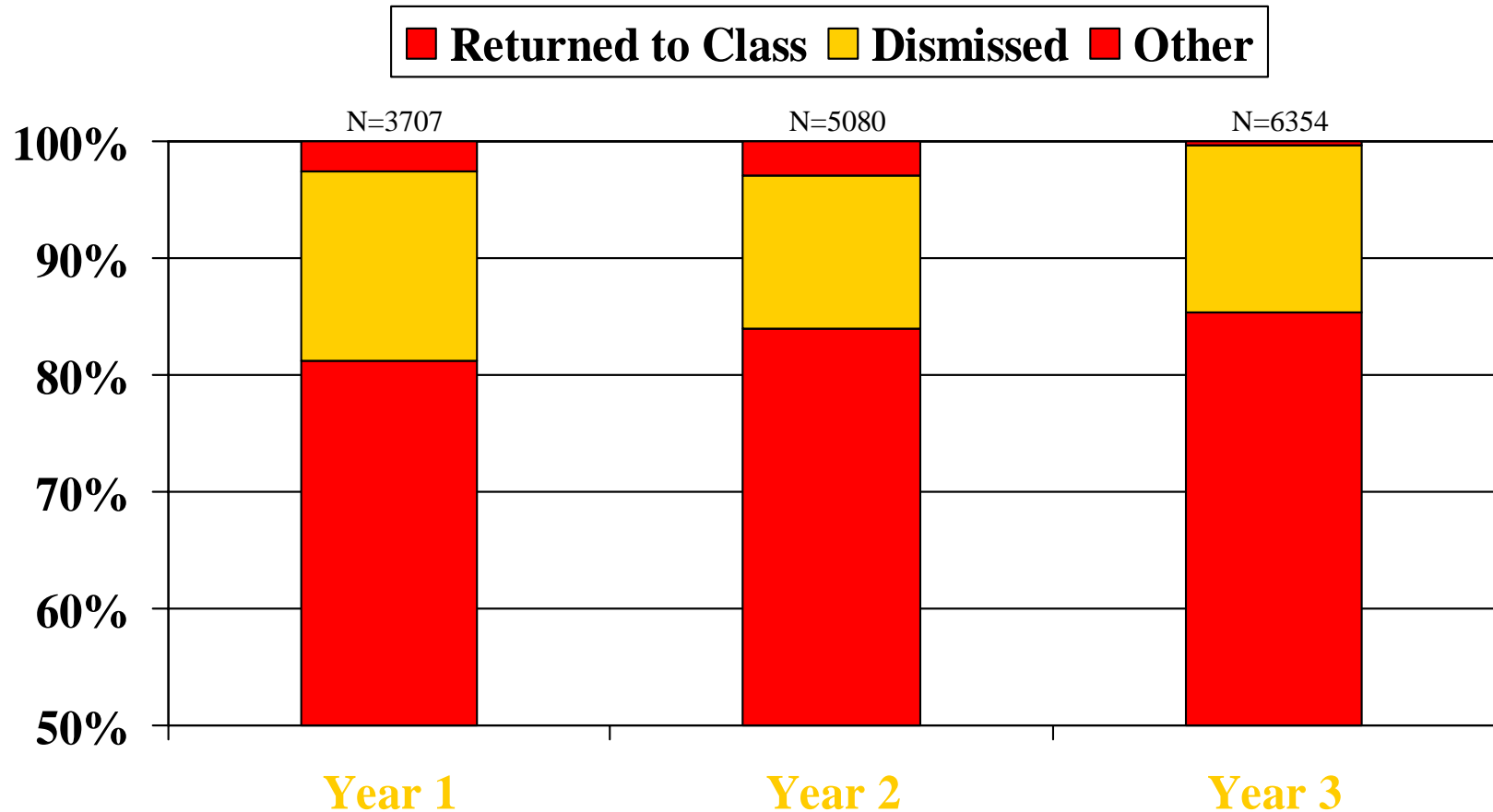




Health Related Quality of Life Summary

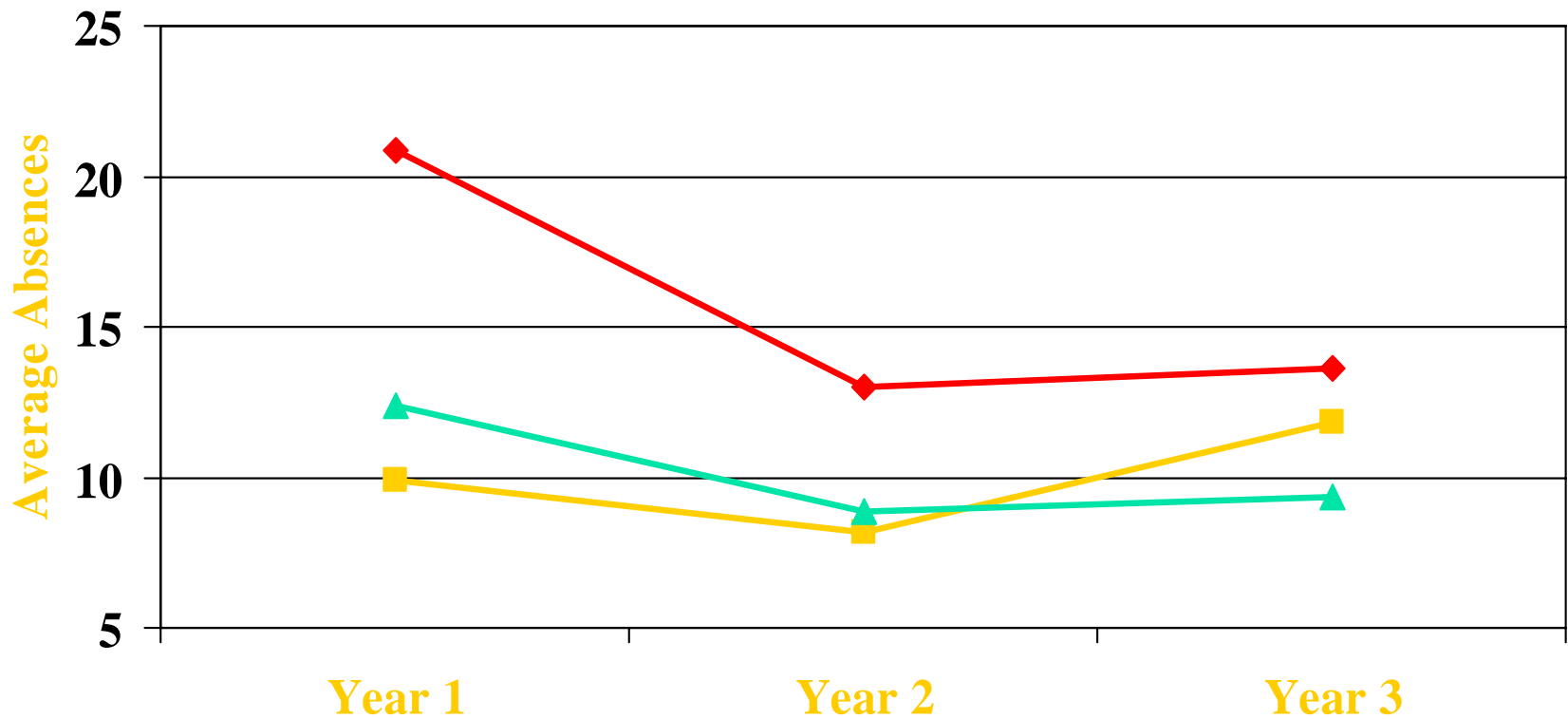
- SBHC users' total and psychosocial scores were similar to a chronically ill pediatric population
- SBHC users' HRQL was lower than nonusers' and comparisons' HQRL at Year 1 baseline, but were equal or higher by year 3

SBHC Visit Outcome



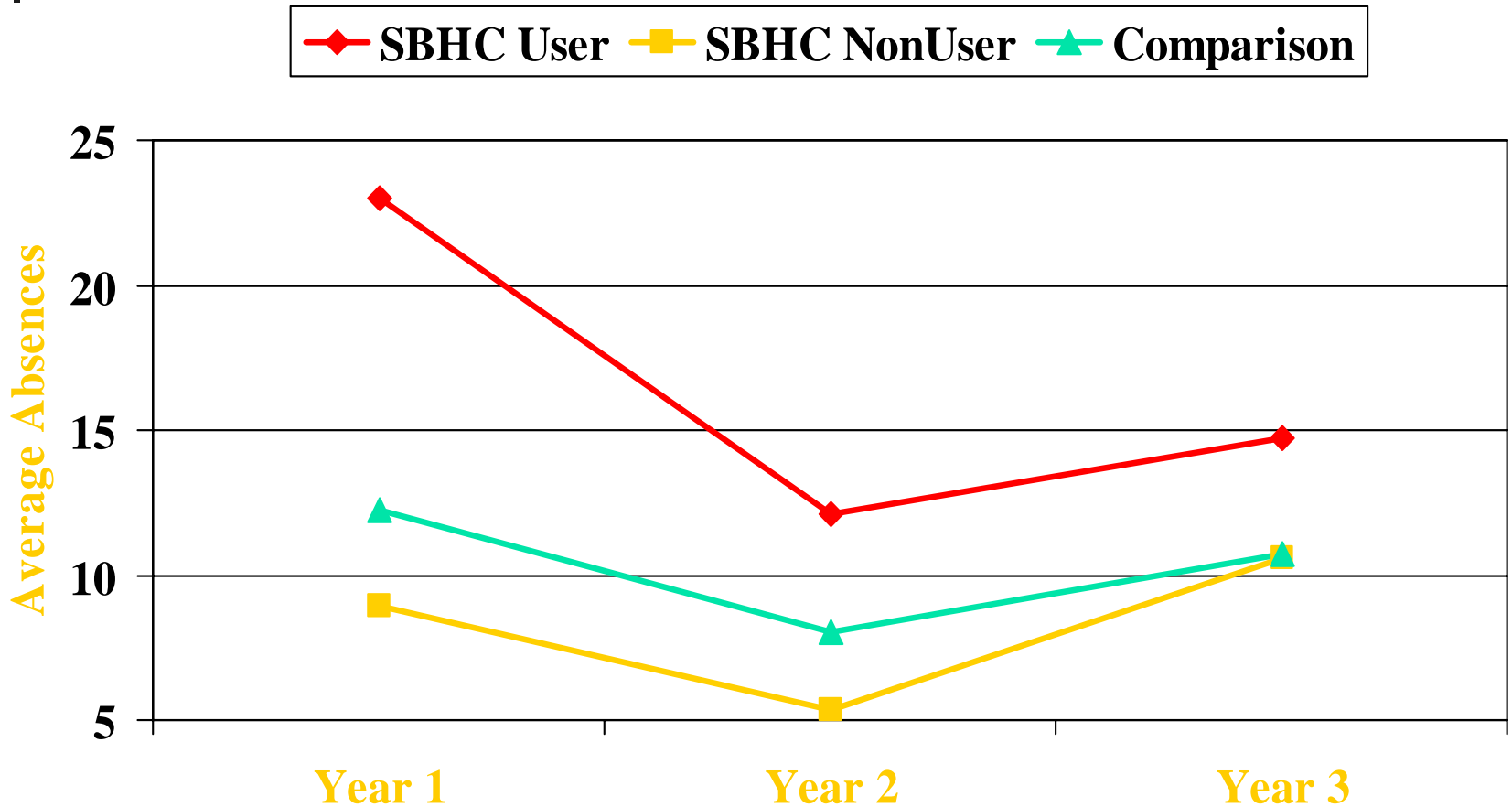
Yearly Absences among Those Reporting Learning Disabilities across SBHC Users, Nonusers and Comparison

—◆— SBHC User —■— SBHC NonUser —▲— Comparison



Note: Statistical 3-way interaction

Yearly Absences among Those Reporting ADHD across SBHC Users, Nonusers and Comparison



Note: Statistical 3-way interaction



Access to Healthcare Summary

- Increased perception of access by parents of SBHC students
- Increased well-child care of SBHC users
- Decrease in ill-child visits of SBHC users



Evaluation of Health Care Costs and Utilization among Ohio Medicaid Recipients in Schools with and without School-Based Health Centers

Dr. Jeff Guo
University of Cincinnati



Study Objectives

1. To evaluate the health care costs and utilization of Medicaid students in SBHC schools compared to those in comparable school districts (non-SBHC) before and after the implementation of SBHC programs
2. To evaluate health costs and utilization of students with any asthma and mental health illnesses in SBHC schools and non-SBHC schools



Study Design

- Study Period: 9/1/1997 to 2/28/2003
- Data sources:
 - Ohio Medicaid Claims Database
 - School Enrollment/Absence Data
 - SBHC Encounter Data

Health Economic Framework of School-Based Health Centers

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graph TD; A[Timely appropriate primary care] --> B[Better health for students]; B --> C[Lower need for costly medical care and service];
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Timely appropriate primary care

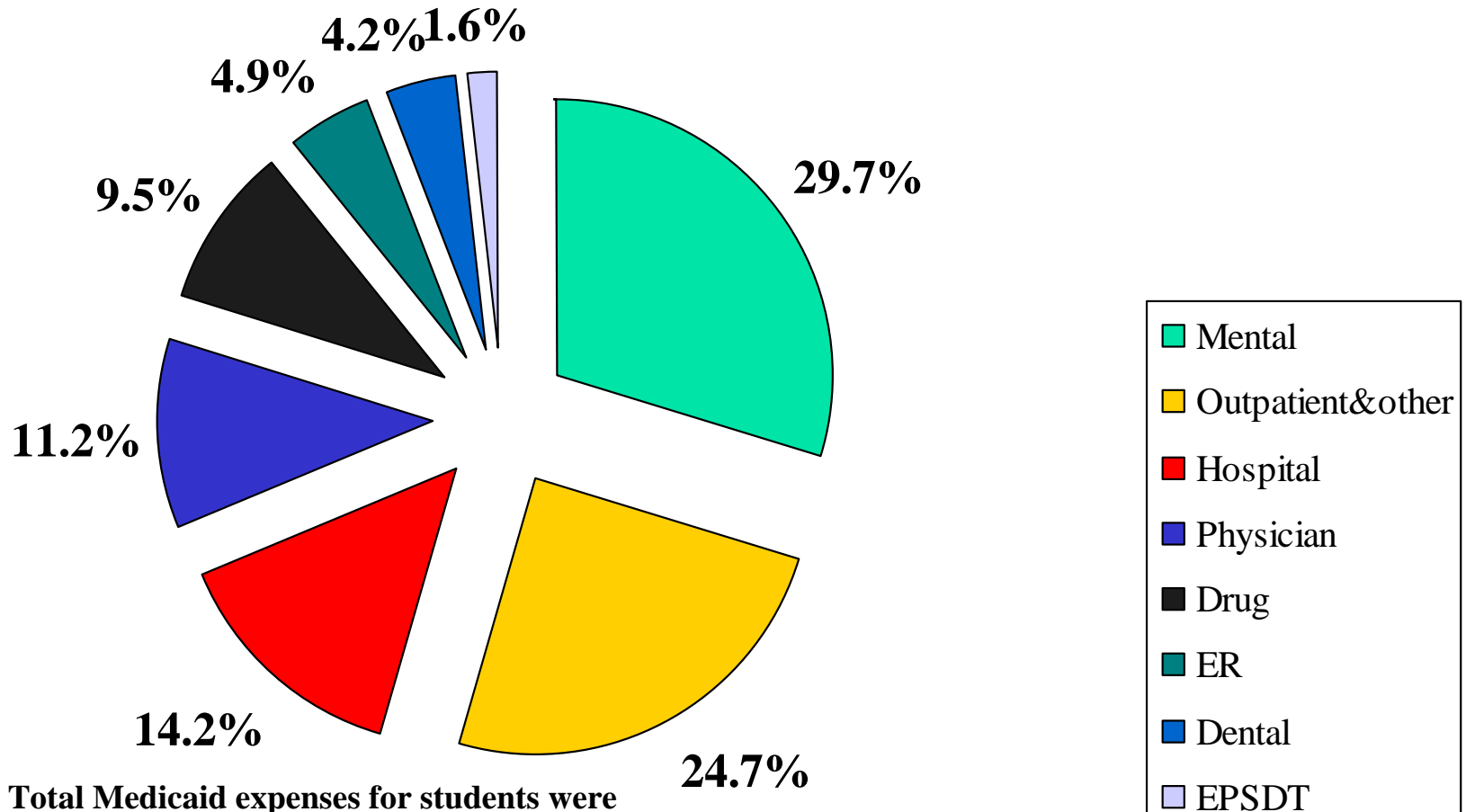
Better health for students

Lower need for costly medical care and service



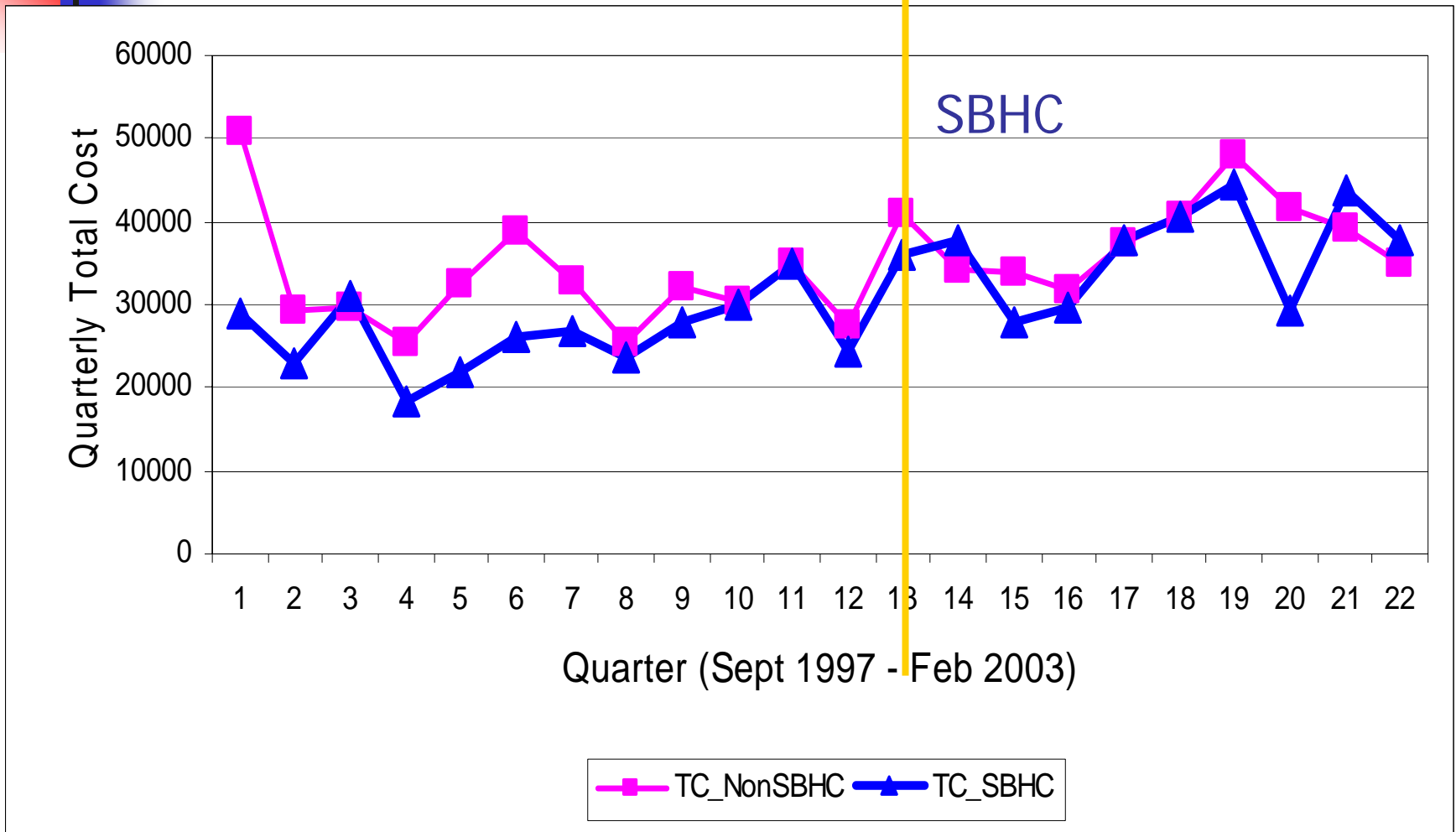
Total Medicaid Costs

Medicaid Health Care Costs by Categories for Students (N=5056)

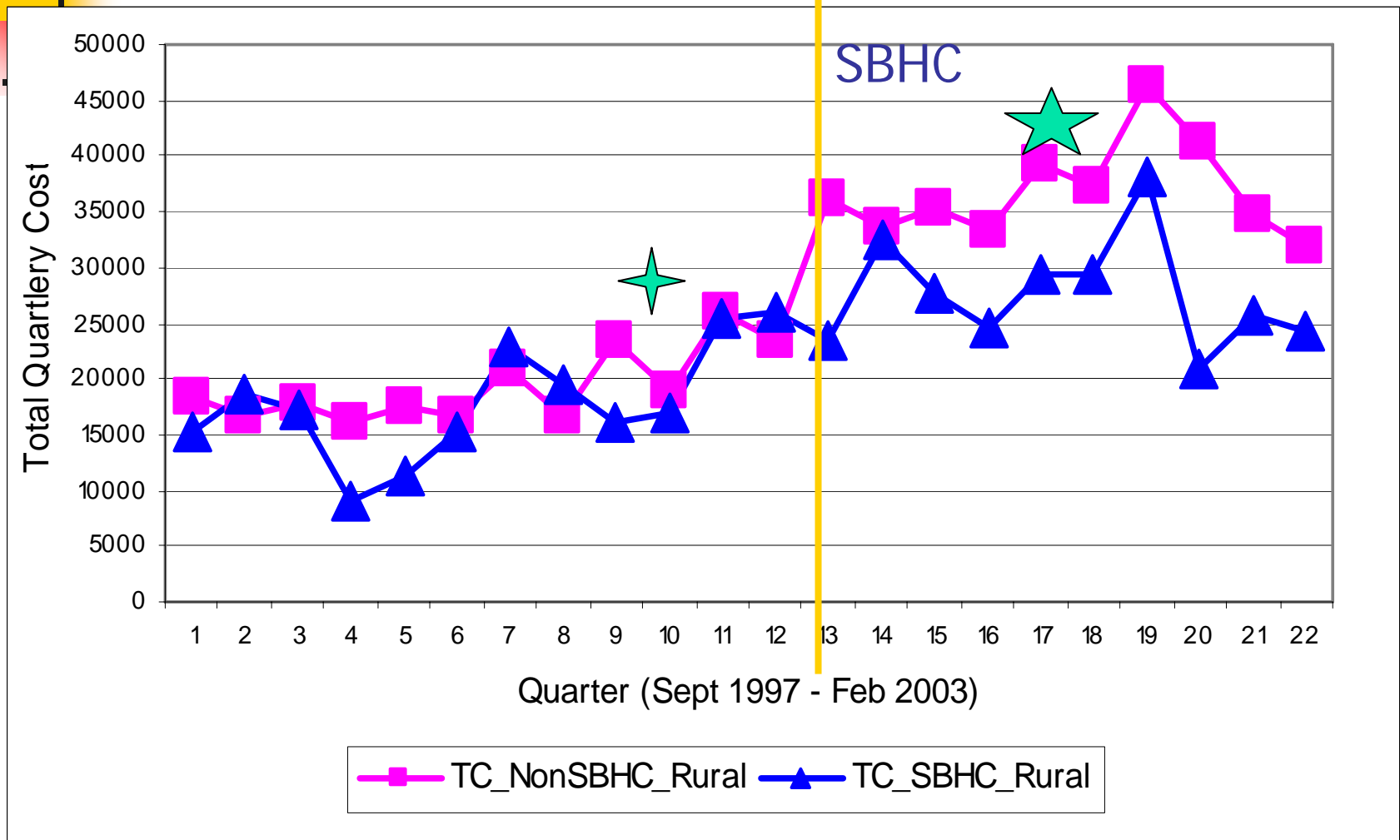


Total Medicaid expenses for students were \$29,851,889 from Sept 1997 to Feb 2003.

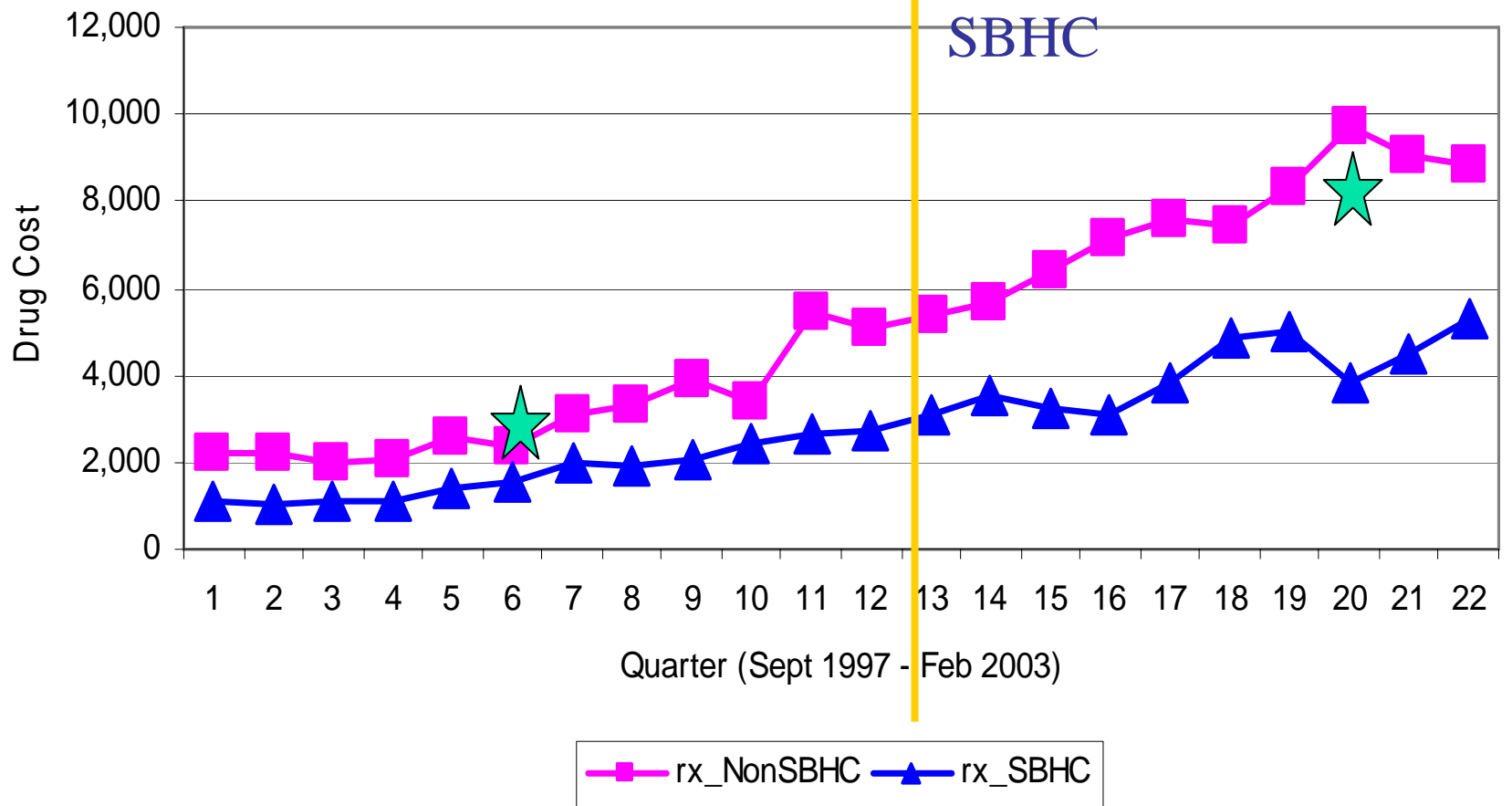
Trend of Total Medicaid Costs by SBHC per 100 Students for 22 quarters(N=2153)



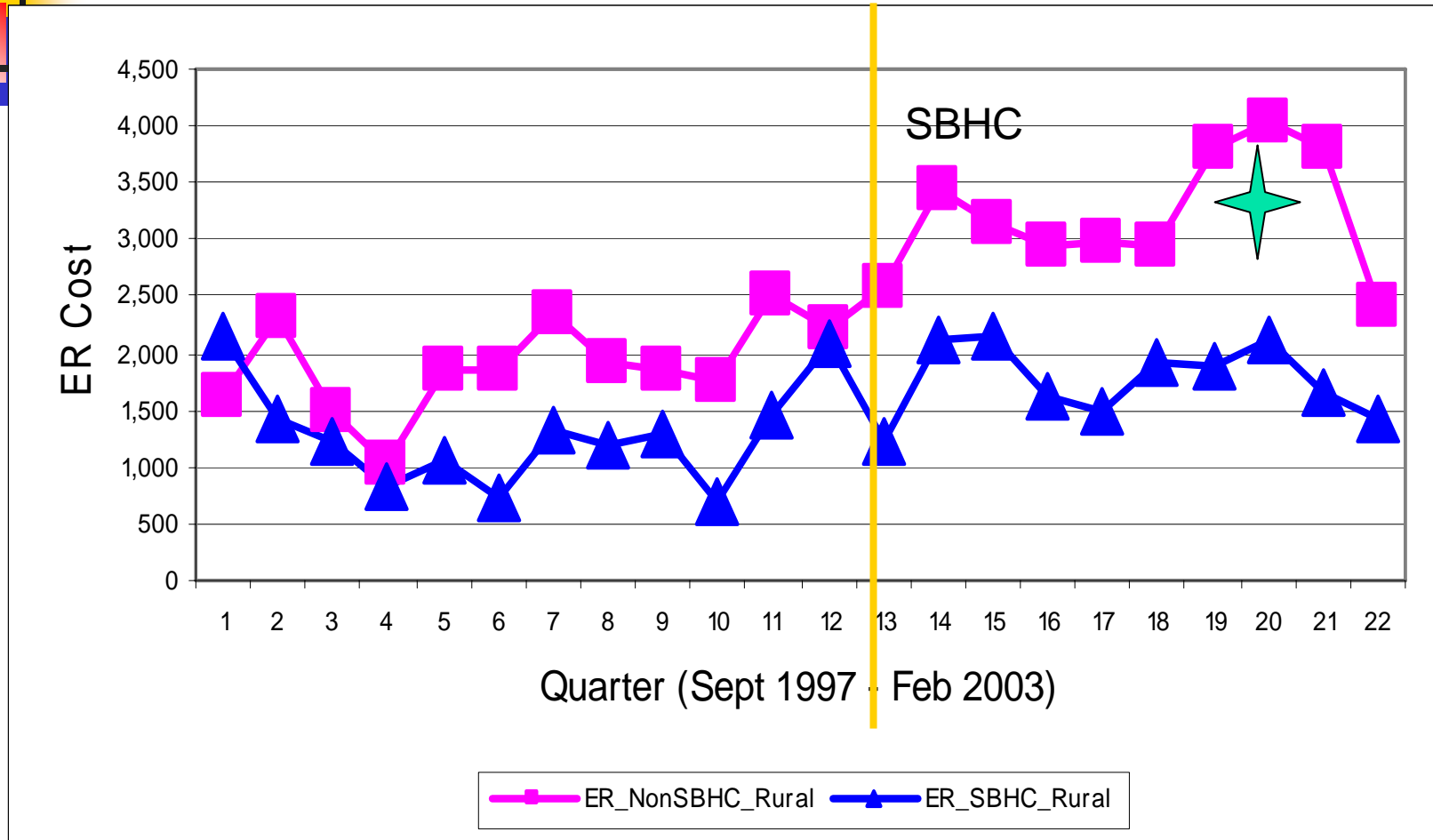
Total Quarterly Medicaid Costs for Rural Schools per 100 Students (N=725)



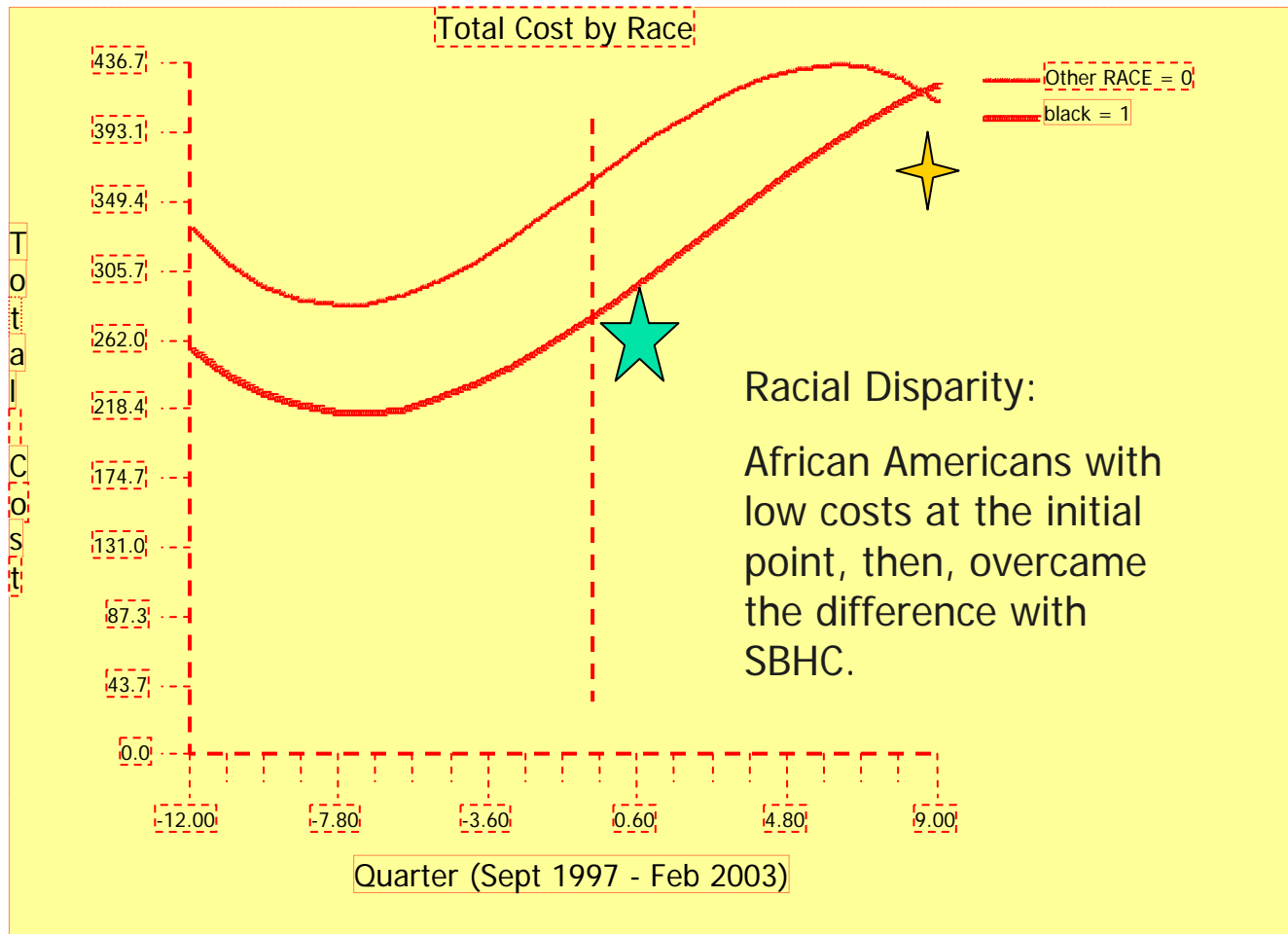
Trend of Costs for Prescription Drugs per 100 Students (N=2153)



Quarterly ED Cost for Rural Schools per 100 Students (N=725)



Growth Trend of Quarterly Total Costs by Race (N=5056)





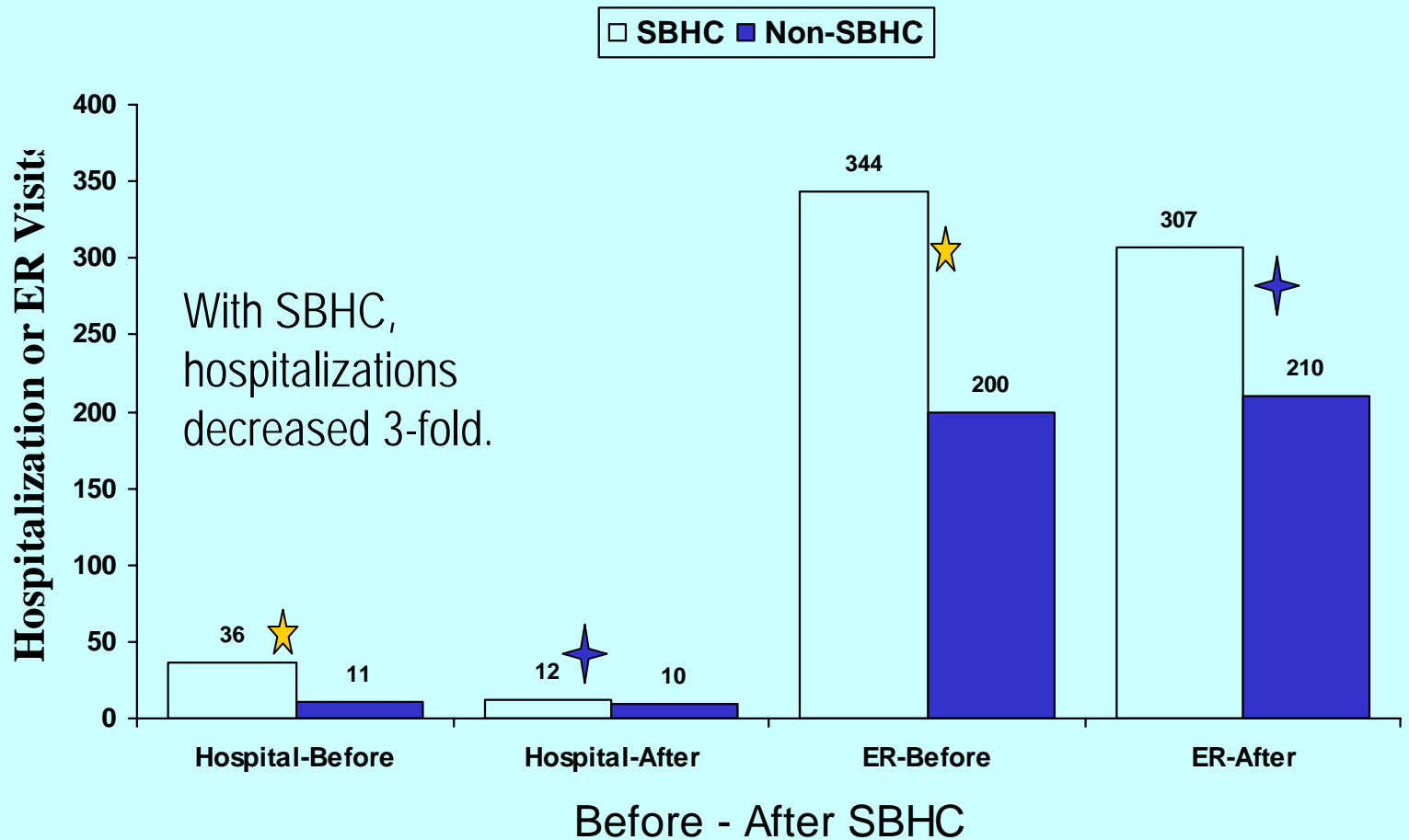
Major Findings #1- Medicaid Costs

- The overall expenses were not significantly different between children in schools with SBHCs and those in schools without.
- Prescription costs were significantly reduced.
- With access to an SBHC, African-American students received increasing health care services and reduced health disparities.
- Children in rural schools with an SBHC had lower Medicaid expenses than those in rural schools without an SBHC.

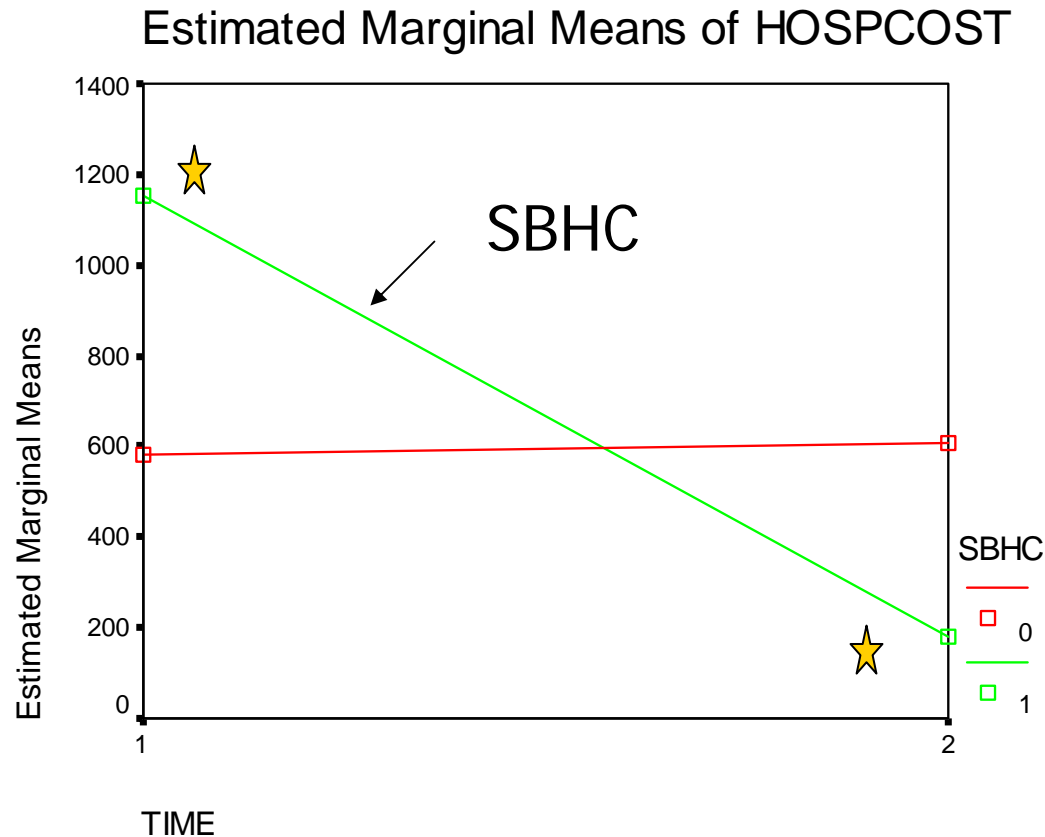


Asthma Subgroup

Numbers of Hospitalization and ER Visits for Children with Asthma in SBHC Schools (N=196) and Non-SBHC Schools (N=77)

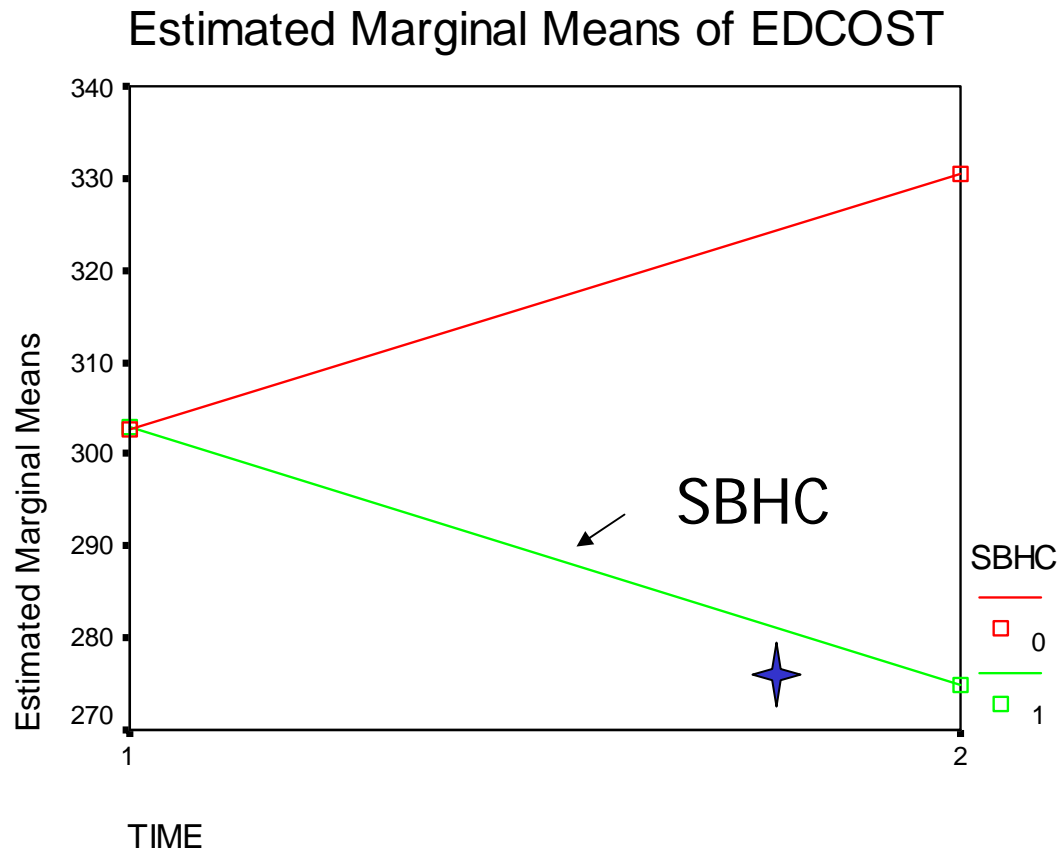


Hospitalization Costs Before and After SBHC for Students with Asthma (N=273)



Hospitalization costs decreased \$970 per student.

Emergency Room Costs Before and After SBHC for Students with Asthma (N=273)

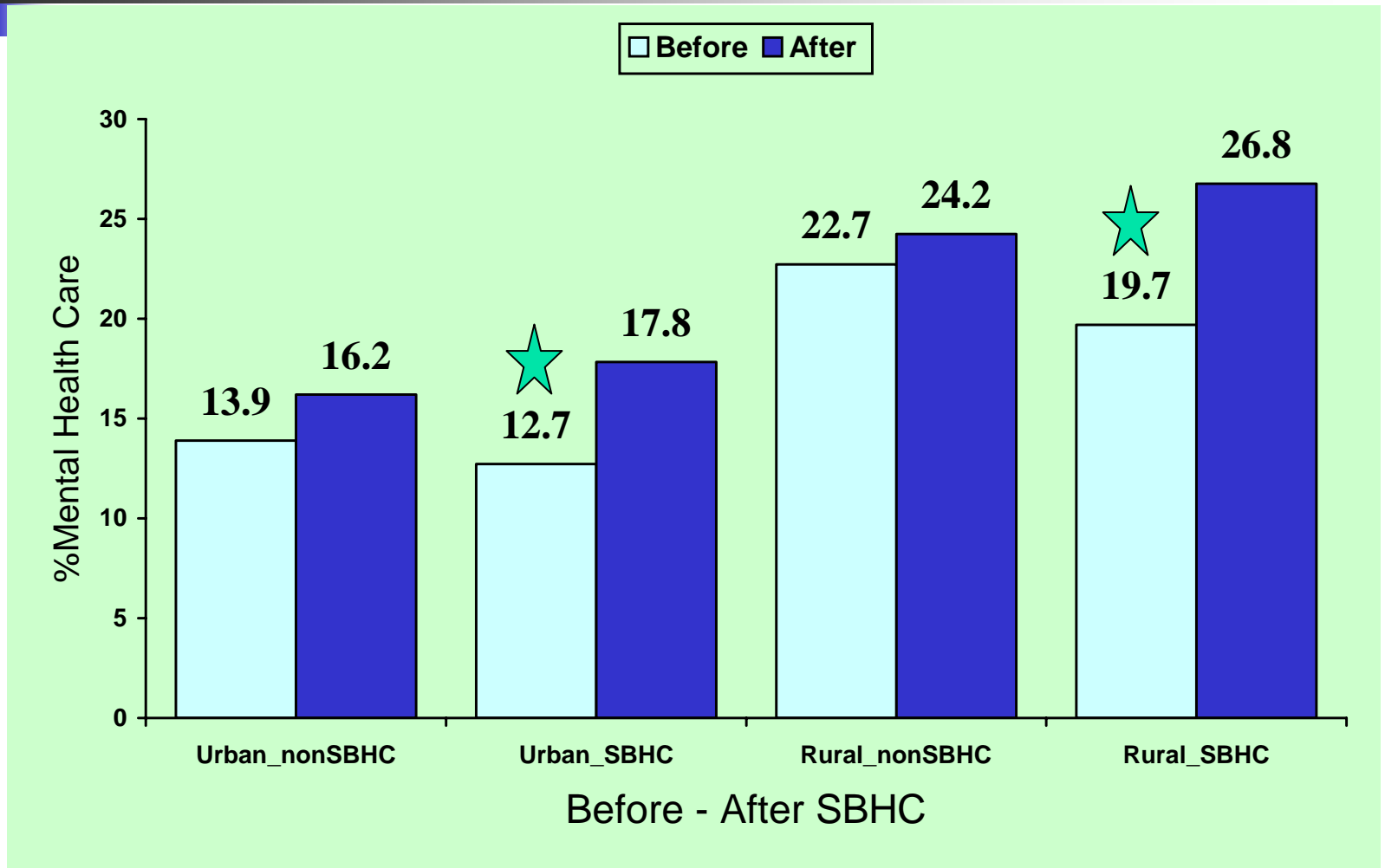


ER costs per student also decreased.

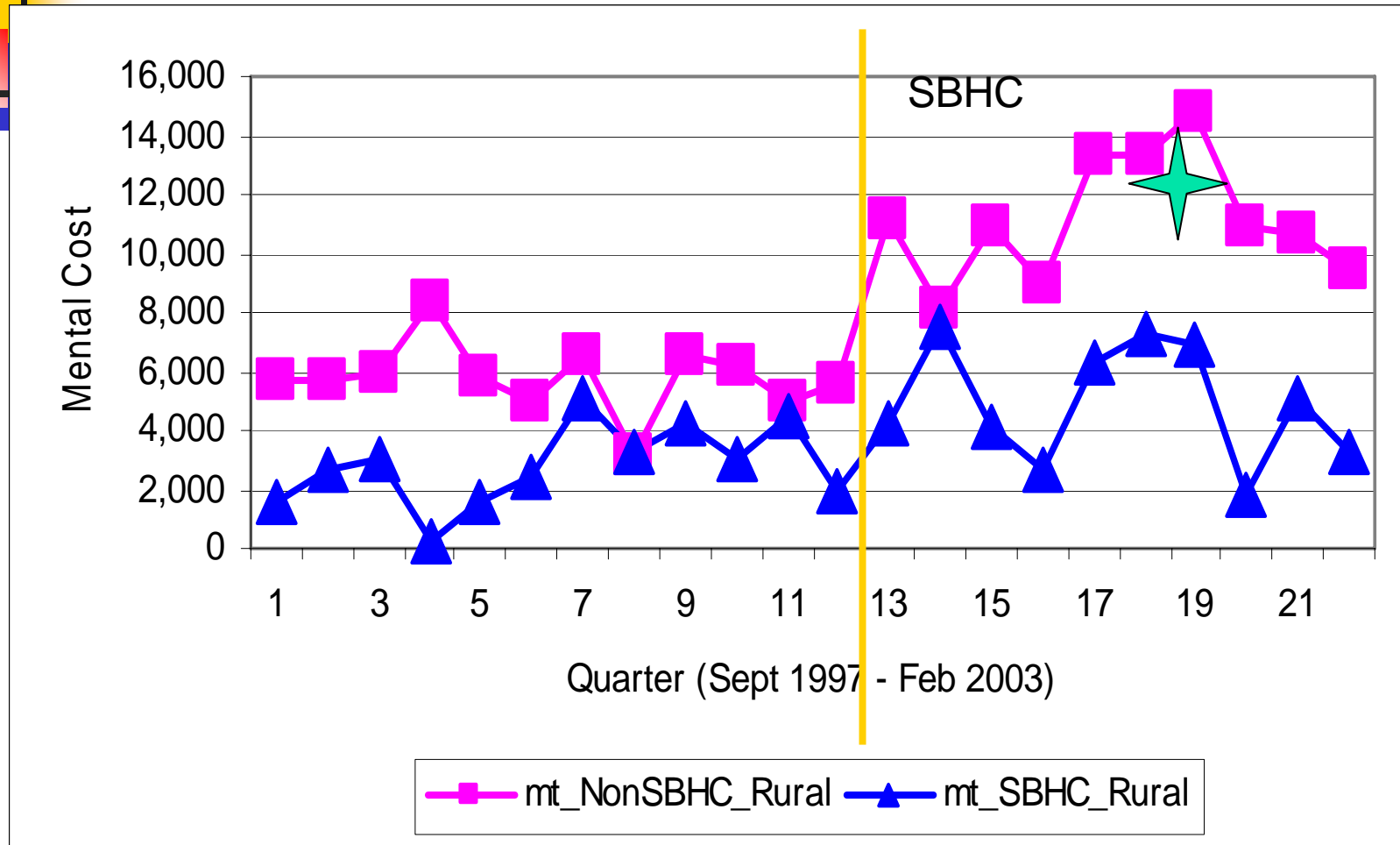


Mental Health Subgroup

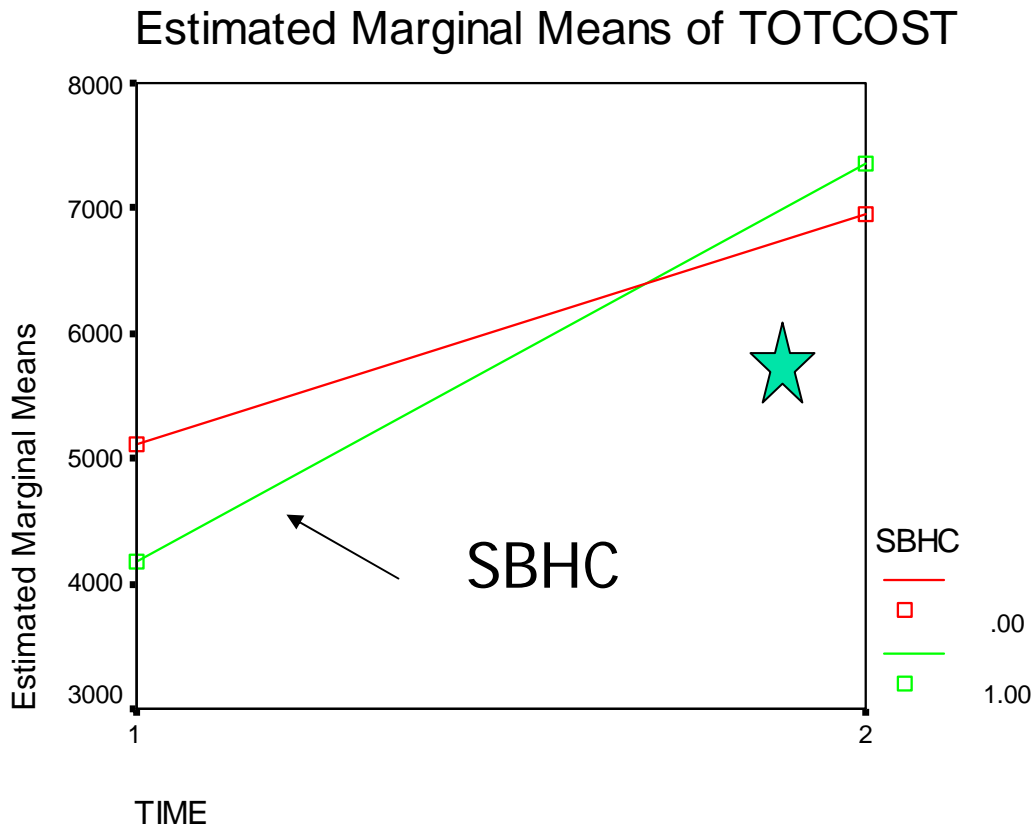
Percentage of Students Who Received Mental Health Services Before and After SBHC (N=2153)



Mental Service Costs for Rural Schools per 100 Students (N=725)

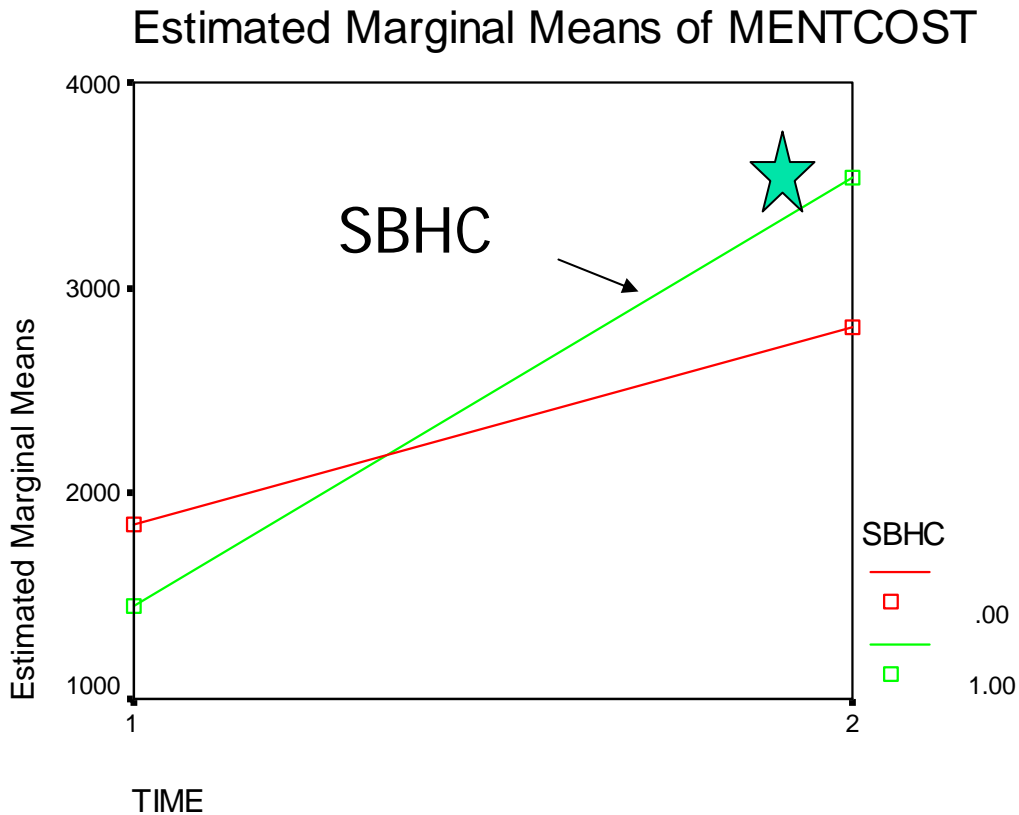


Total Medicaid Costs before and after the SBHC Program for Students with Mental Health Problems (N=551)



Students with mental health illnesses had more total costs.

Medicaid Mental Health Service Costs before and after the SBHC Program for Students with Mental Health Problems (N=551)

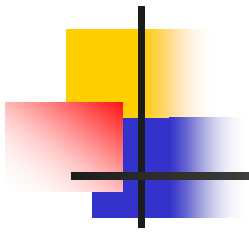


Students with mental health illnesses had more mental service costs.



Major Finding #2- Asthma Subgroup

Asthmatic students with access to an SBHC had lower hospitalization and ER expenses than students without access to an SBHC.



Major Finding #2 - Mental Health Subgroup

Mental health expenses increased for students with access to an SBHC, indicating increased access to services



Does SBHC Use Translate Into Cost Savings for Medicaid? An Empirical Study

The Linked Datasets

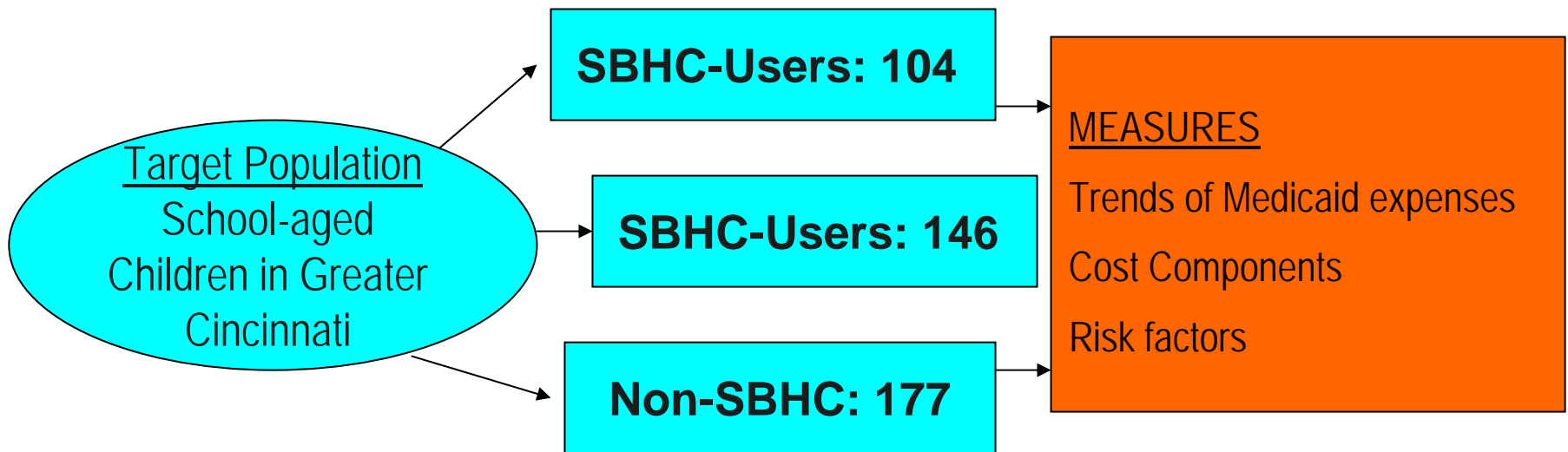


Study Objectives

- To assess the impact of health care costs and utilization based on linked data;
- To evaluate students with mental health illnesses in SBHC-Users, SBHC, and non-SBHC.
- To examine cost-effectiveness of improved HRQL on Medicaid costs.

Linked Students & Study Design

- The study period is from 9/1/1997 to 5/31/2003.
- Data sources: 1) Ohio Medicaid; 2) pQOL survey data; 3) School Enrollment/Absence data; and 4) SBHC encounter data.

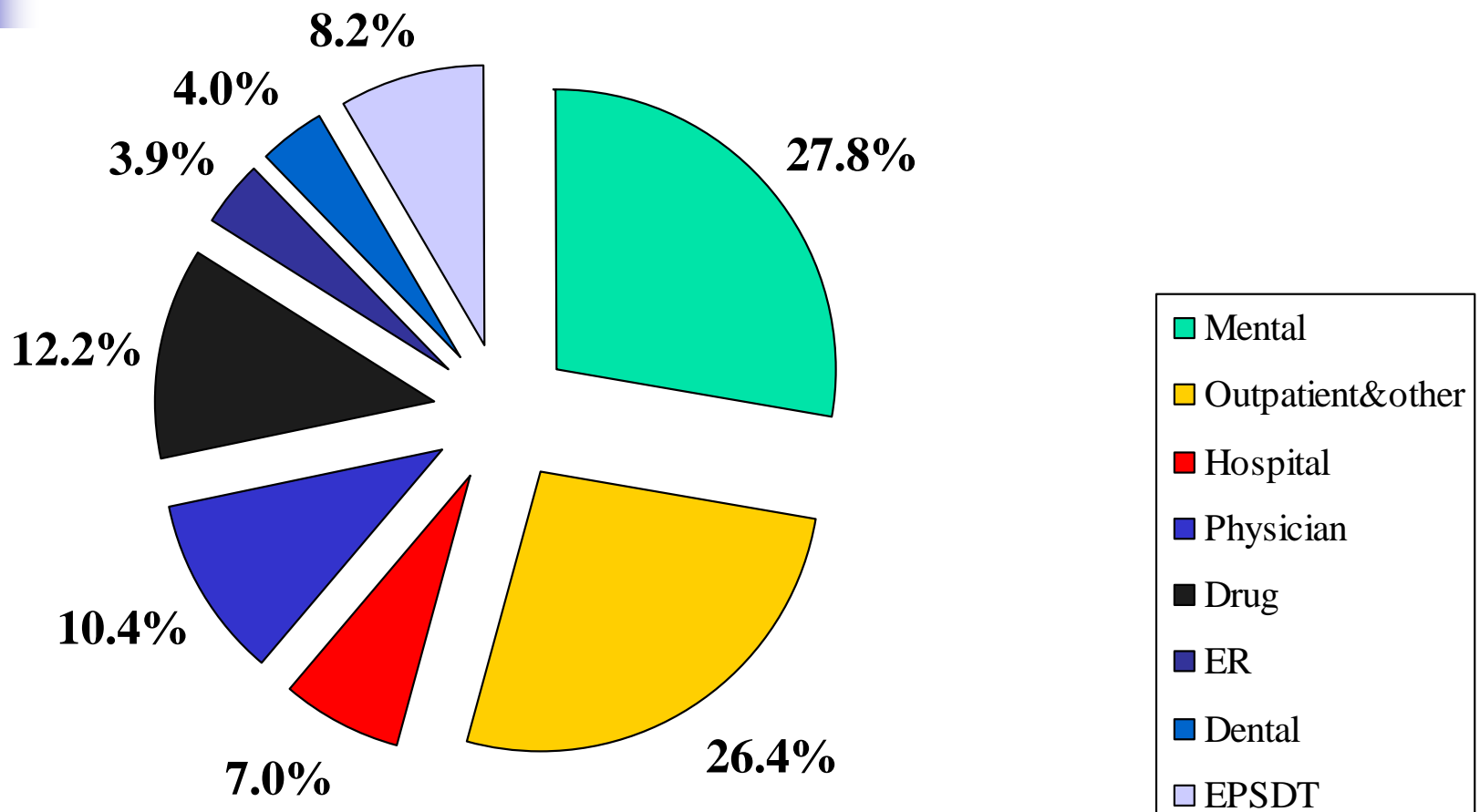




Major Findings #1

- The overall expenses seem not significantly different between children in schools with SBHC_Users, SBHC, and those in schools without.
- Students in non-SBHC schools might have higher trends in:
 - Emergency Department visits; and
 - Prescription drug uses.

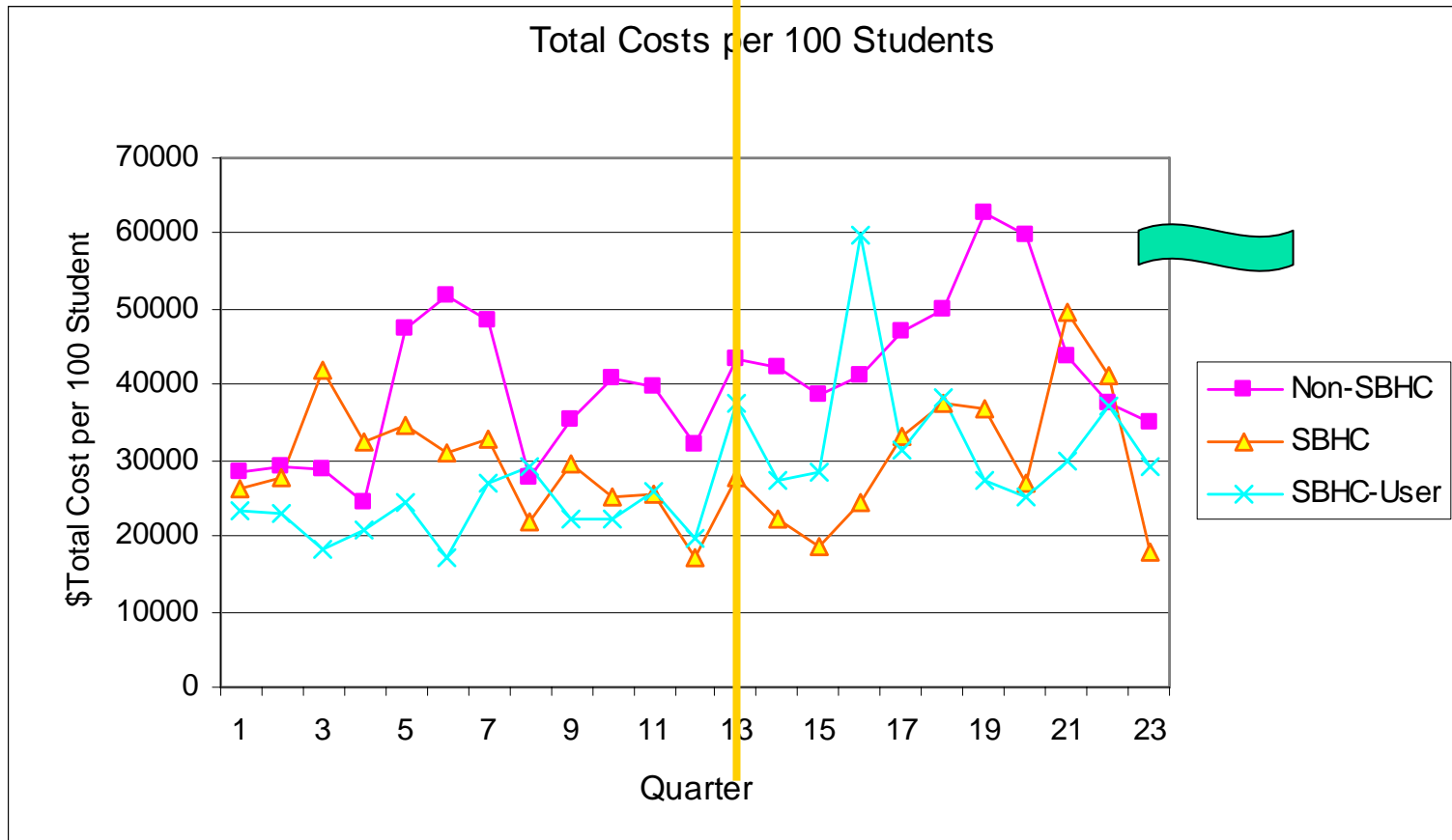
Health Care Costs by Categories for Students (N=427)



Total Medicaid expenses for students were \$2.52 million from Sept 1997 to May 2003.

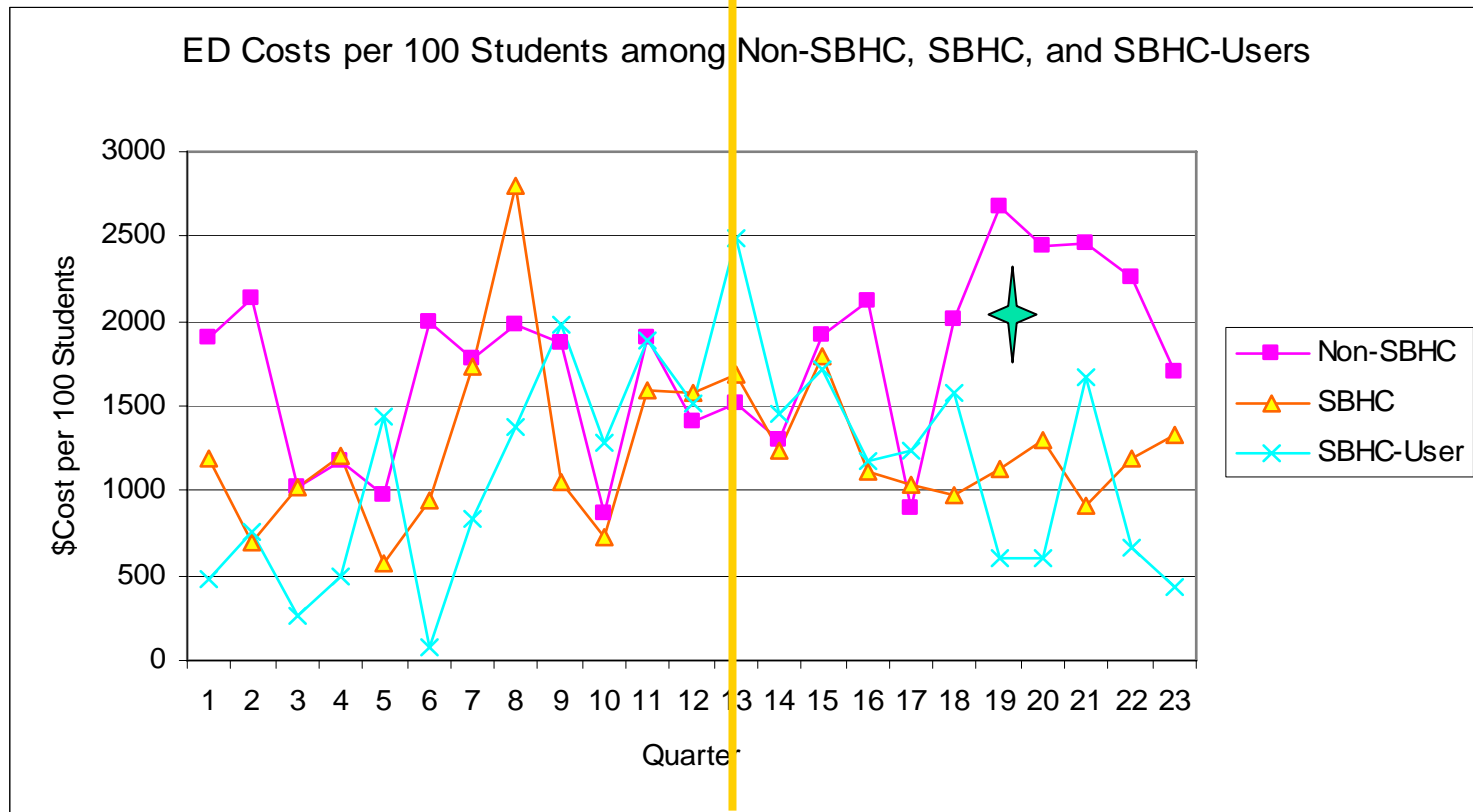
Trend of Total Medicaid Costs by SBHC per 100 Students (N=427)

SBHC



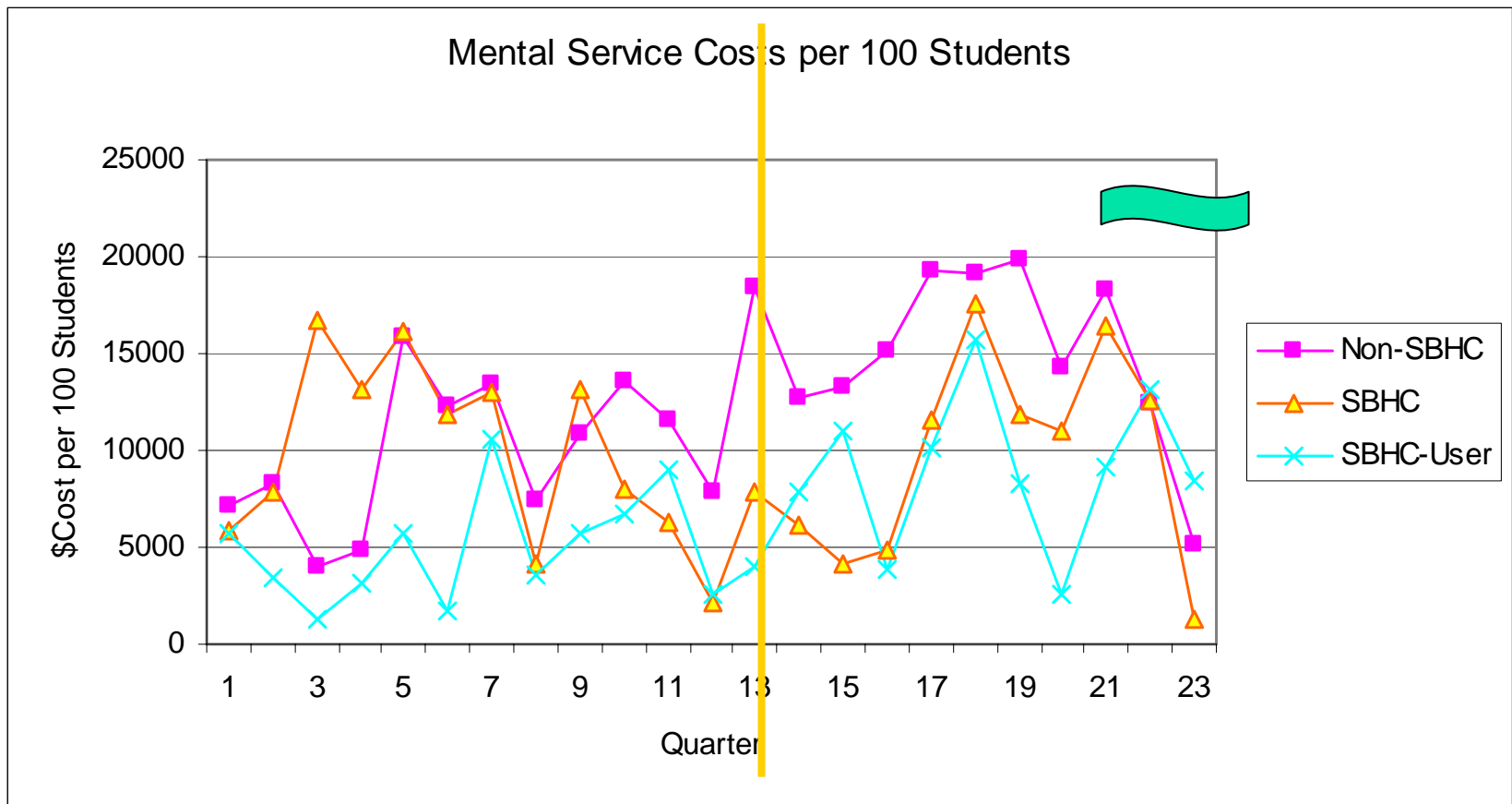
Trend of Costs for Emergency Room Visits by SBHC per 100 Students (N=427)

SBHC



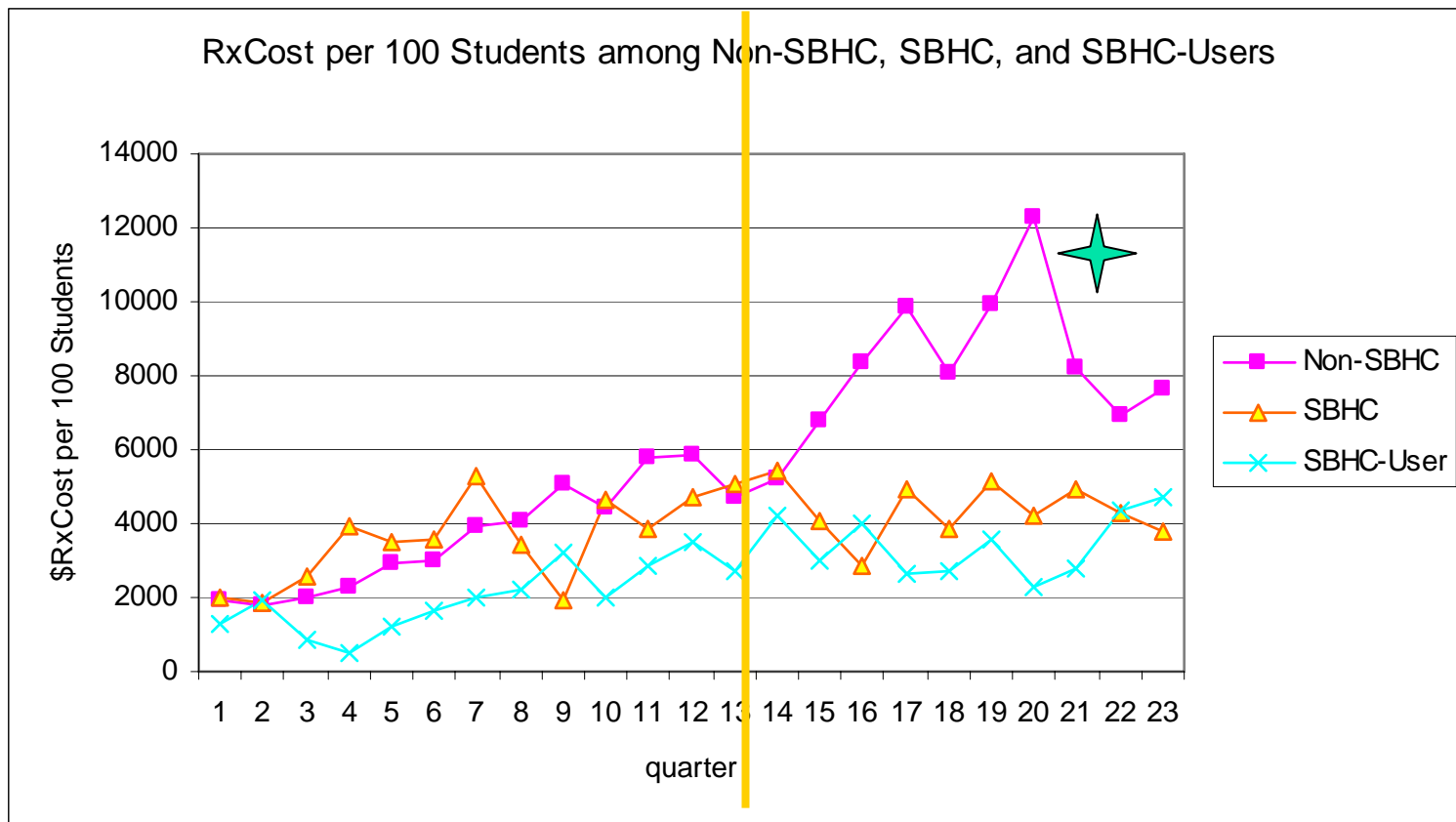
Trend of Costs for Mental Health Services by SBHC per 100 Students (N=2154)

SBHC



Trend of Costs for Prescription Drugs per 100 Students (N=427)

SBHC



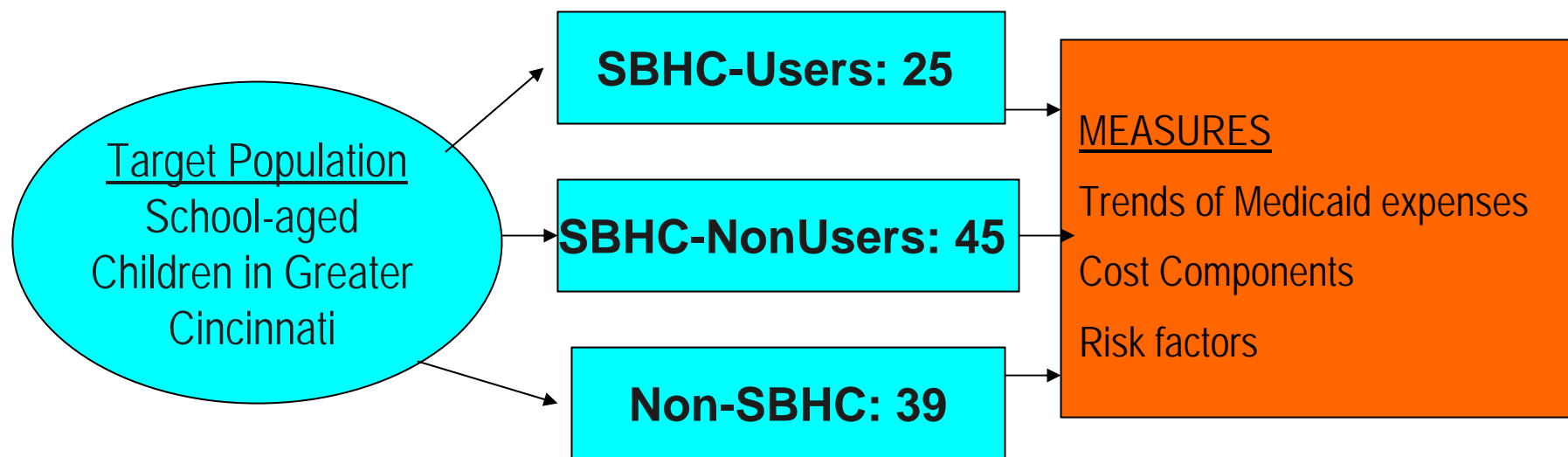


Major Finding #2: Mental Health Sub-cohort

- Total health care expenses increased more rapidly for students in non-SBHC schools compared to students in SBHC schools (SBHC_Users and SBHC).
- Specifically, students in non-SBHC schools had more hospitalizations, ED visits, physician encounters, prescription drugs, and mental services.

Mental Health Sub-Cohort

- The study period is from 9/1/1997 to 5/31/2003.
- Students who had at least one diagnosis of mental illness and at least one prescription related to psychotropic medications.



ANCOVA Repeated Measures before and after the SBHC Program



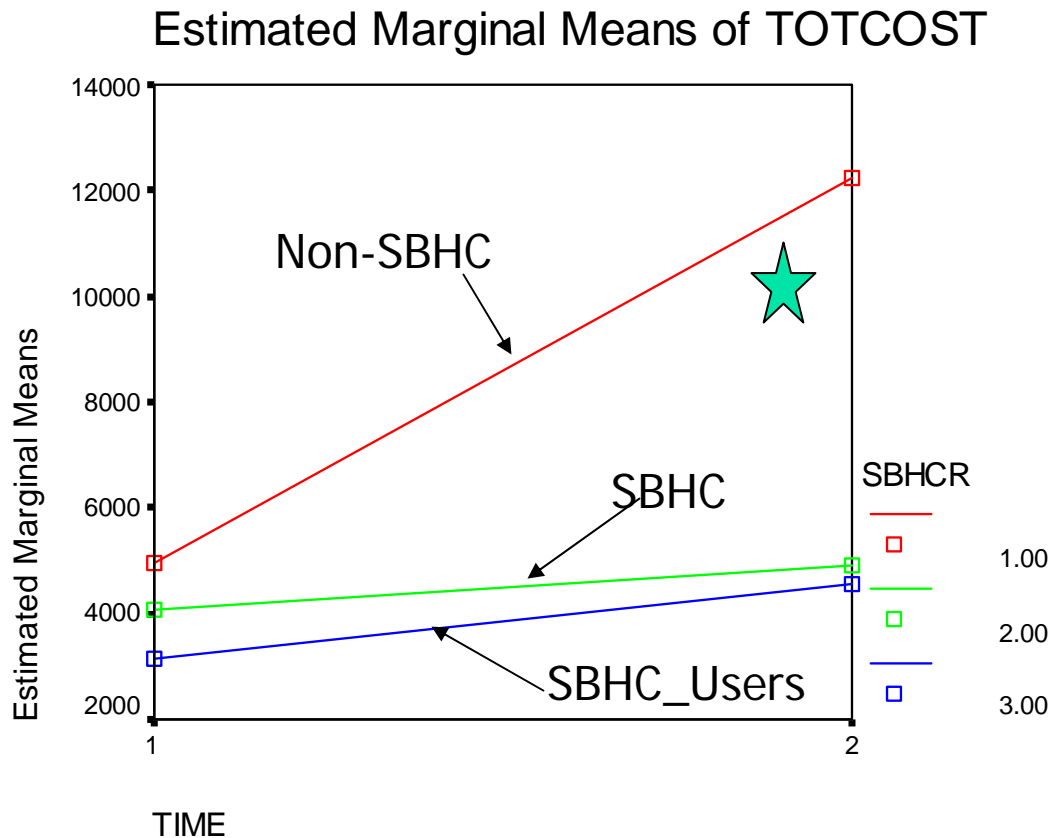
Students with Mental Health Illness



Table 1. Demographic and cost variables for students with mental health illnesses (N=109)

Variables	Non-SBHC (n=39)		SBHC (n=45)		SBHC Users (n=25)	
Age (years, mean, SD)	8	2.1	8.5	2.1	9.3	1.8
Race (White, n, %)	24	61.5%	23	51.10%	16	64%
Sex (male, n, %)	26	66.7%	31	68.90%	19	76%
enrolled months (mean, SD)	61.8	11.3%	54	15.90%	60	11.5%
AFDC (mean%)	82.50%		86.4%		80.7	
CHIP (mean%)	29.40%		34.7%		22.4	
ADB (mean%)	17.50%		9.1%		18	
HMO (mean%)	17%		16.1%		22.5	
Depression (n, %)	4	10.3%	0	0%	5	20%
Bipolar (n, %)	6	15.4%	2	4.4%	3	12%
ADHD (n, %)	21	53.8%	28	62.2%	16	64%
Total Cost Before(\$)	4912		3879		3557	
Total Cost After(\$)	11357		5180		5417	

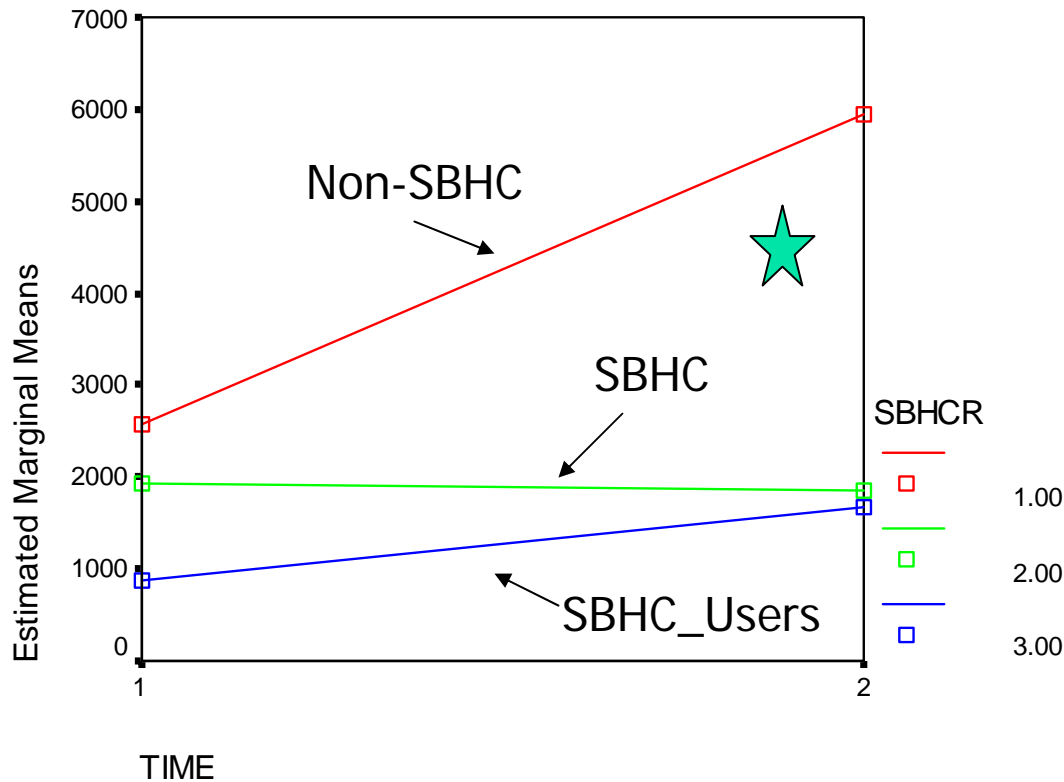
Total Costs before and after the SBHC Program for Students with Mental Health Problems (N=109)



Students with mental health illnesses in Non-SBHC schools had more total costs.

Mental Health Service Costs before and after the SBHC Program for Students with Mental Health Problems (N=109)

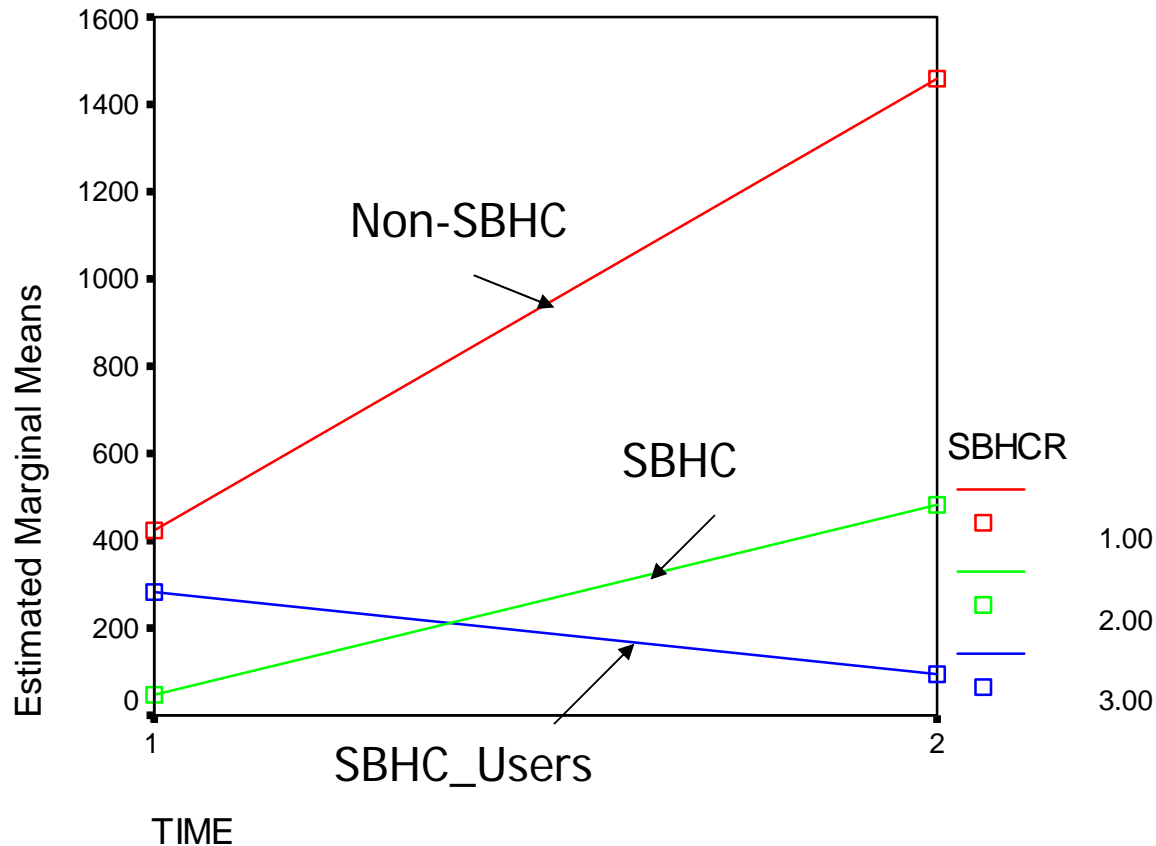
Estimated Marginal Means of MENTCOST



Students with mental health illnesses in non-SBHC schools required more mental service costs.

Hospitalization Costs before and after the SBHC Program for Students with Mental Health Problems (N=109)

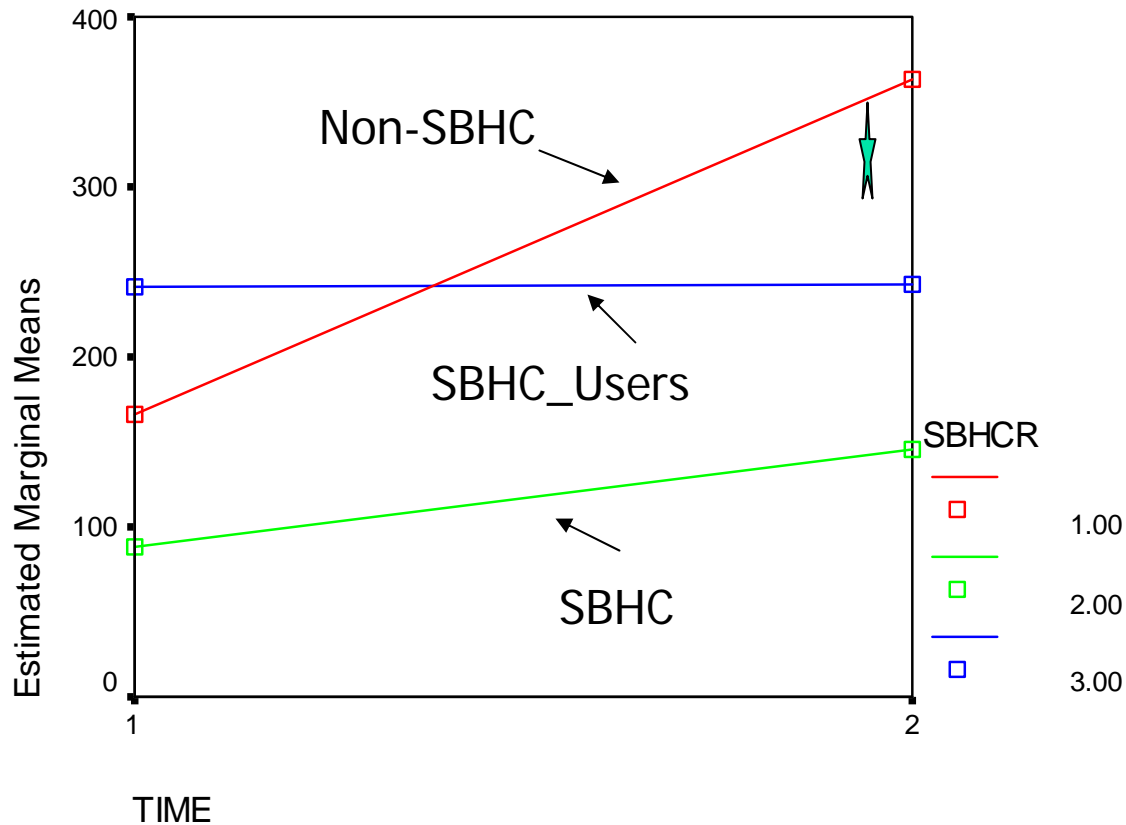
Estimated Marginal Means of HOSPCOST



Students with mental health illnesses in non-SBHC schools required more hospitalization costs.

Emergency Department Costs before and after the SBHC Program for Students with Mental Health Problems (N=109)

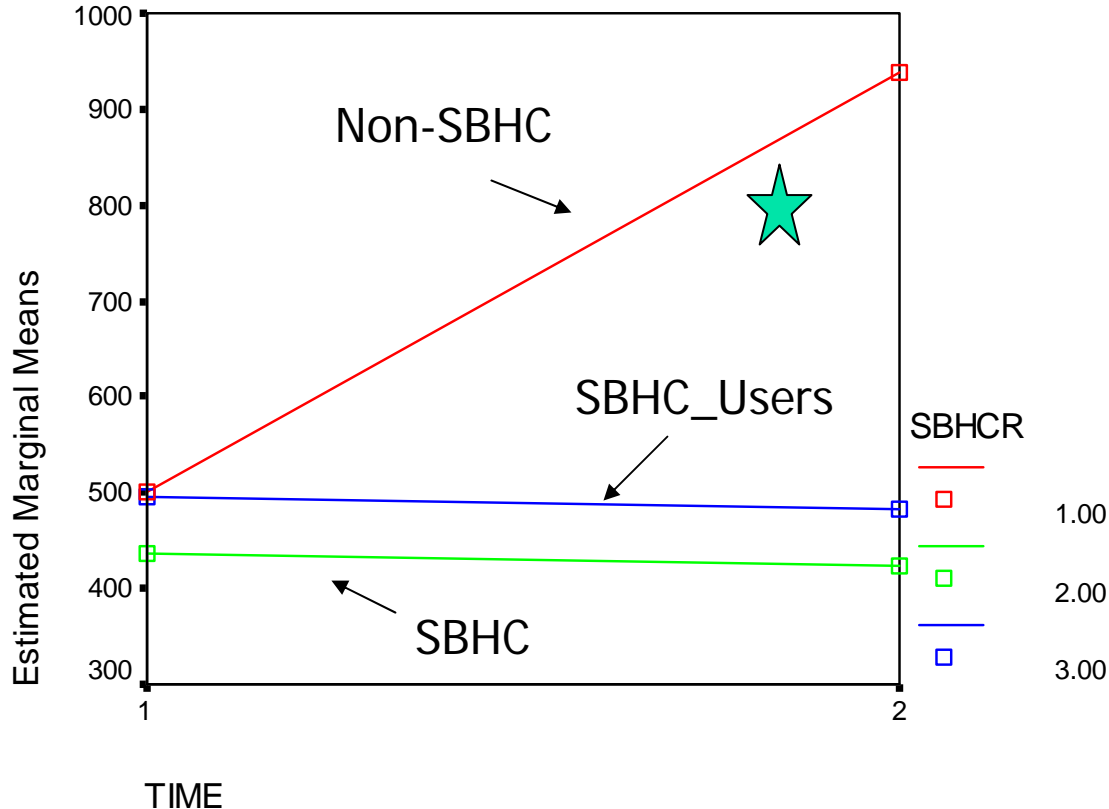
Estimated Marginal Means of EDVCOST



Students with mental health illnesses in non-SBHC schools might require more ED costs.

Physician Encounter Costs before and after the SBHC Program for Students with Mental Health Problems (N=109)

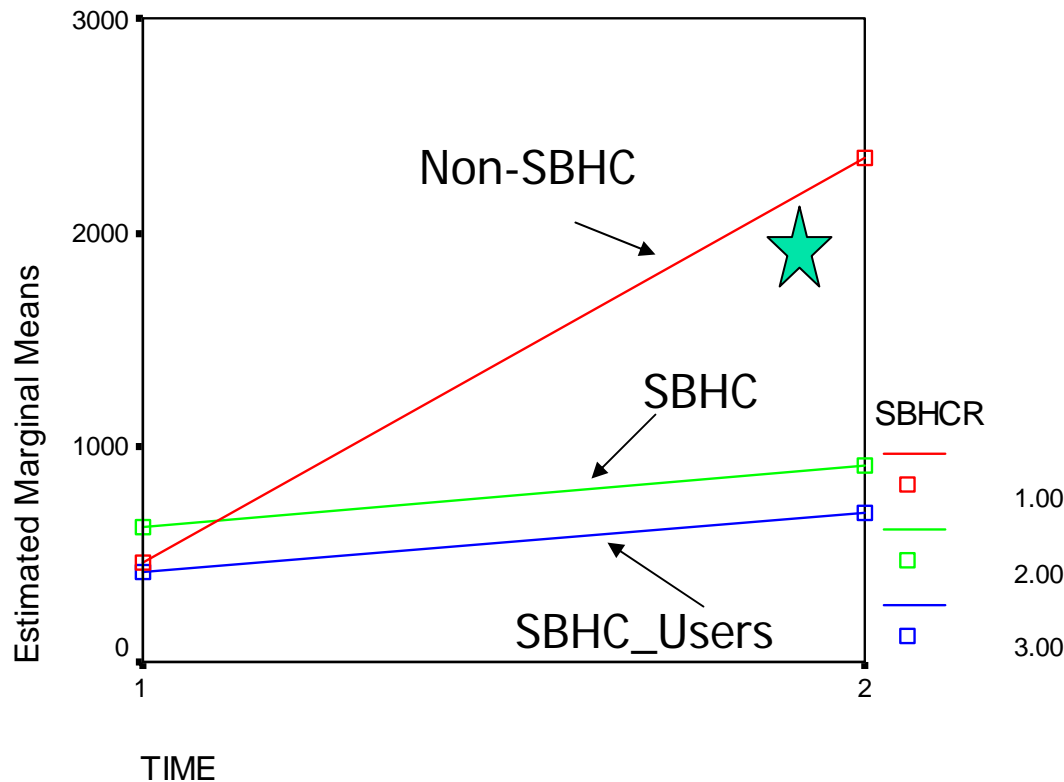
Estimated Marginal Means of PHYSCOST



Students with mental health illnesses in non-SBHC schools required more physician encounter costs.

Prescription Drug Costs before and after the SBHC Program for Students with Mental Health Problems (N=109)

Estimated Marginal Means of RXCOST



Students with mental health illnesses in non-SBHC schools required more prescription drug costs.



ANCOVA Repeated Measures over Six Years

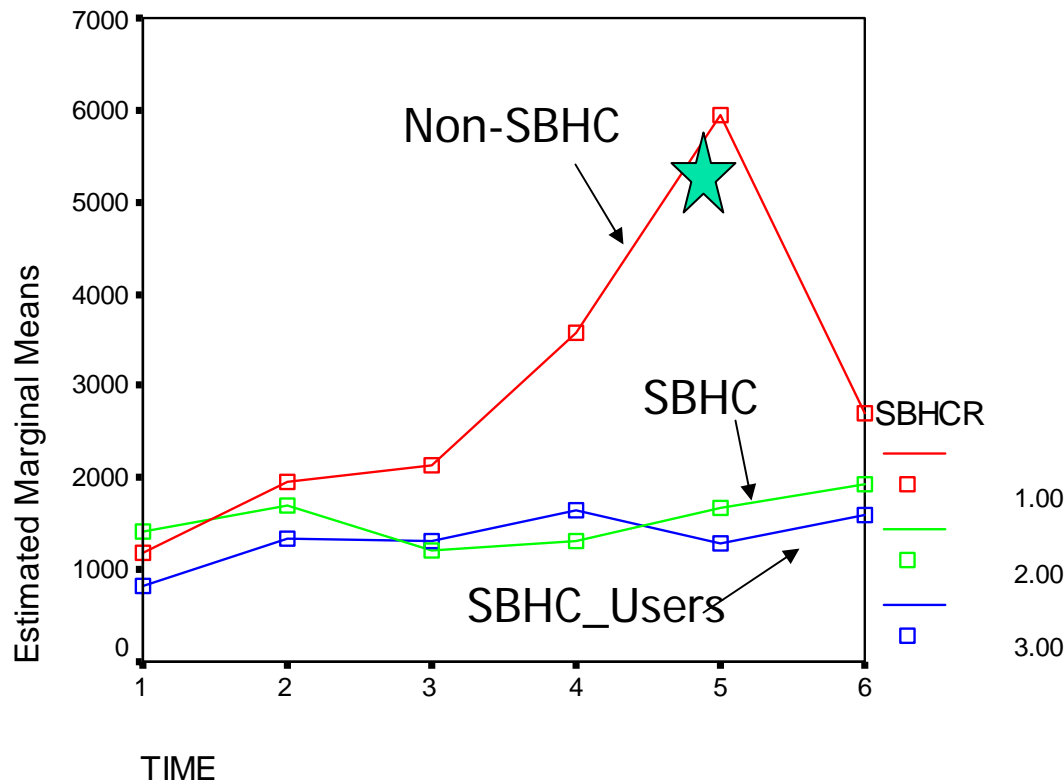
Students with Mental Health Illness

Table 2. Demographic and cost variables for students with mental health illnesses (N=109)

Variables	Non-SBHC (n=39)		SBHC (n=45)		SBHC_Users (n=25)	
Age (years, mean, SD)	8	2.1	8.5	2.1	9.3	1.8
Race (White, n, %)	24	61.50%	23	51.10%	16	64%
Sex (male, n, %)	26	66.70%	31	68.90%	19	76%
enrolled months (mean, SD)	61.8	11.30%	54	15.90%	60	11.50%
AFDC (mean%)	82.50%		86.4		80.7	
CHIP (mean%)	29.40%		34.7		22.4	
ADB (mean%)	17.50%		9.1		18	
HMO (mean%)	17%		16.1		22.5	
Psychiatric Conditions						
Depression (number, %)	4	10.3	0	0	5	20
Bipolar Disorder (number, %)	6	15.4	2	4.4	3	12
ADHD (number, %)	21	53.8	28	62.2	16	64
Total Health Care Cost						
year1 (\$, mean, SD)	1082	1525	1404	3243	999	1223
year2 (\$, mean, SD)	2055	3013	1525	4123	1493	2677
year3 (\$, mean, SD)	2073	2574	1212	1754	1393	1354
year4 (\$, mean, SD)	3494	5207	1277	2115	1888	1801
year5 (\$, mean, SD)	5321	8413	1991	4024	1688	1116
year6 (\$, mean, SD)	2551	4463	1928	3411	1858	2685

Total Costs over Six Years for Students with Mental Health Problems (N=109)

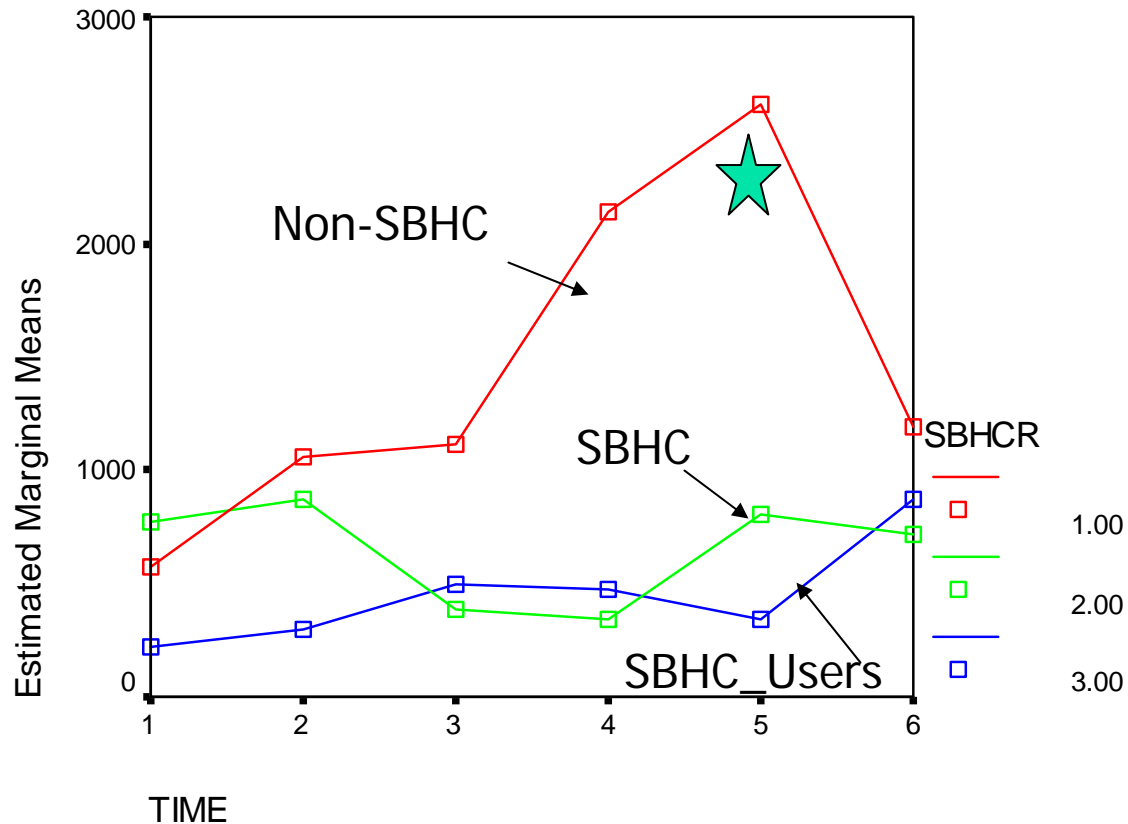
Estimated Marginal Means of TOTCOST



Students with mental health illnesses in Non-SBHC schools had more total costs.

Mental Health Service Costs over Six Years for Students with Mental Health Problems (N=109)

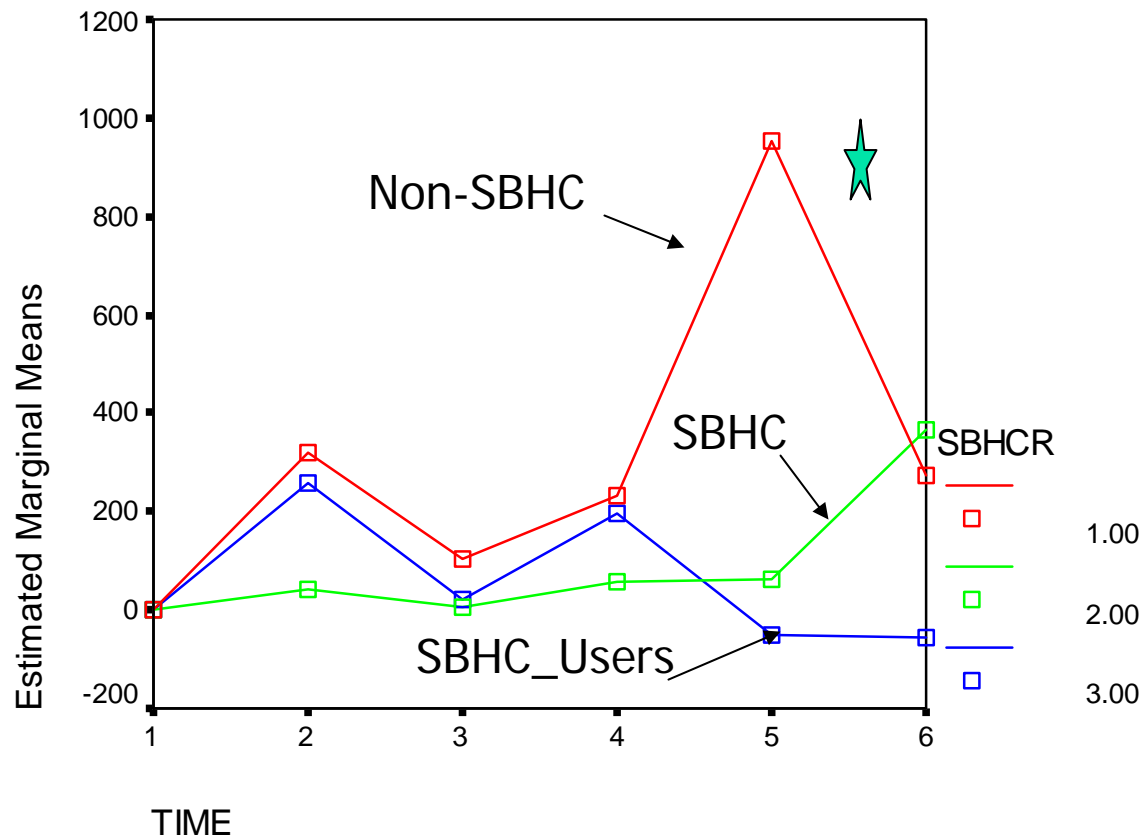
Estimated Marginal Means of MENTCOST



Students with mental health illnesses in non-SBHC schools required more mental service costs.

Hospitalization Costs over Six Years for Students with Mental Health Problems (N=109)

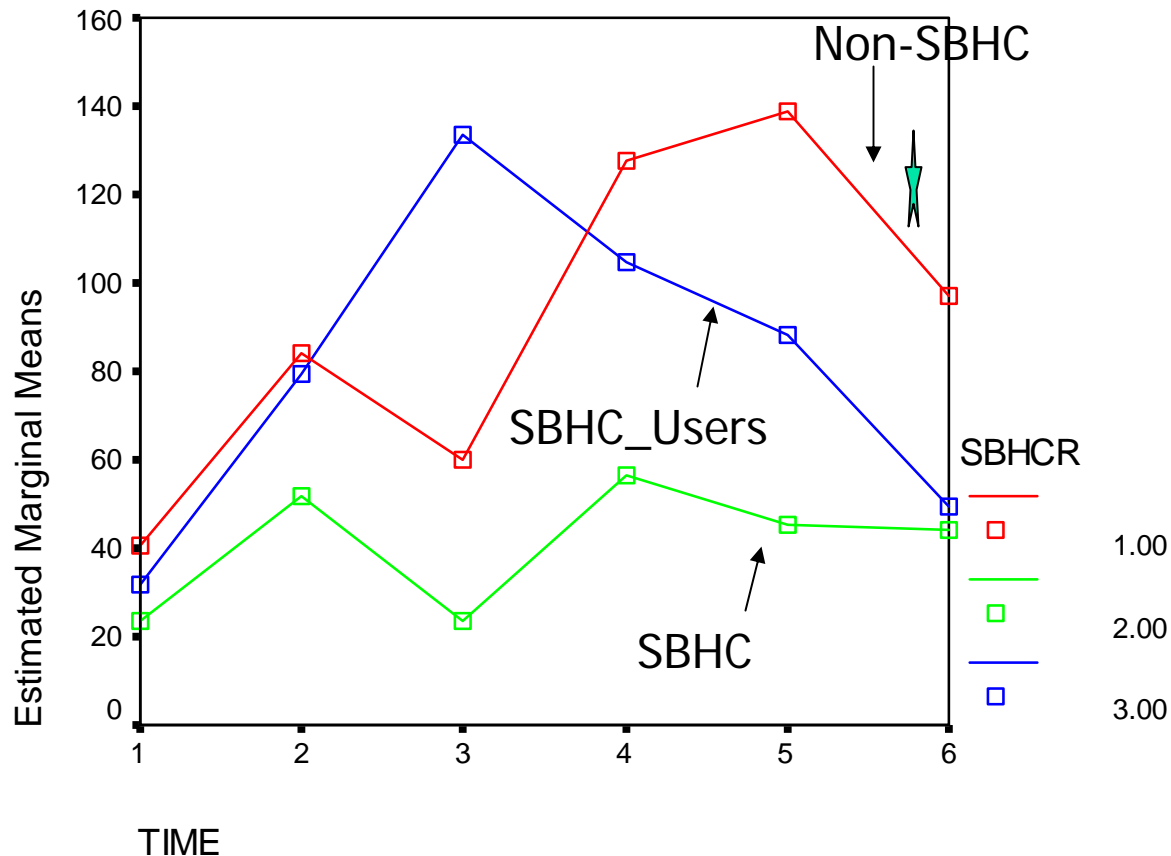
Estimated Marginal Means of HOSPCOST



Students with mental health illnesses in non-SBHC schools required more hospitalization costs.

Emergency Department Costs over Six Years for Students with Mental Health Problems (N=109)

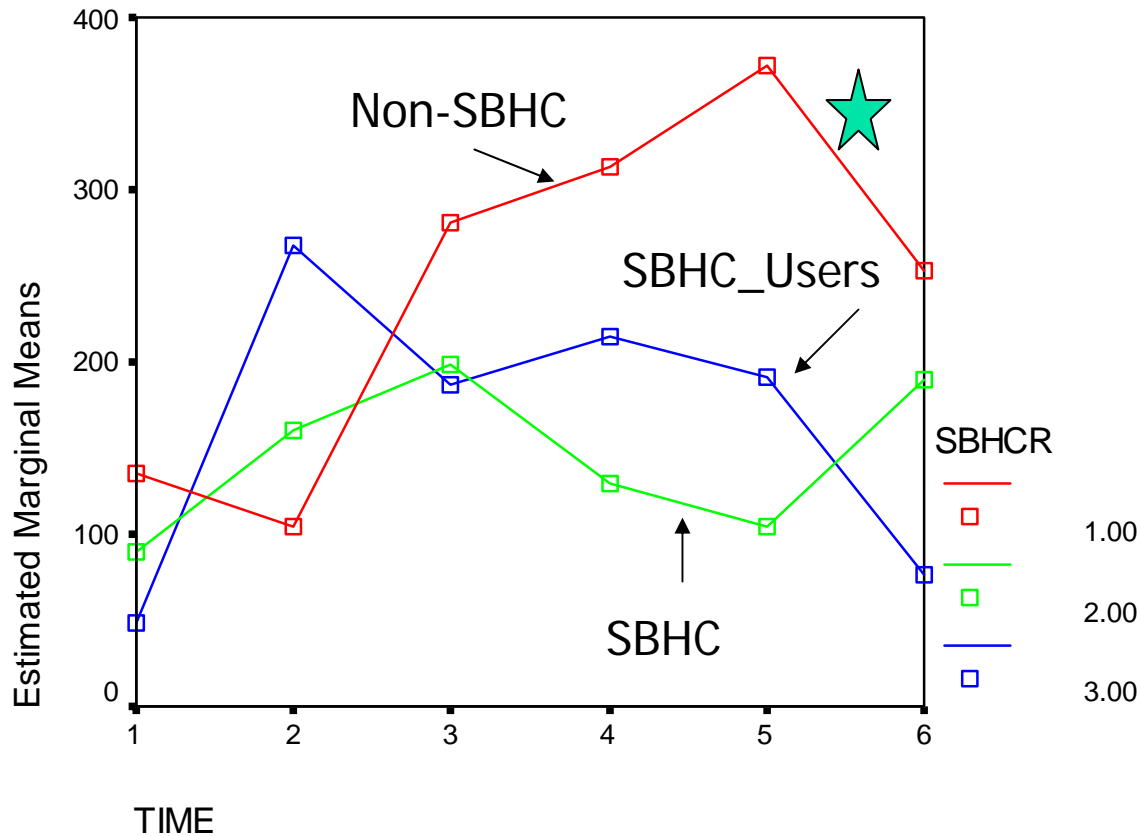
Estimated Marginal Means of EDCOST



Students with mental health illnesses in non-SBHC schools might require more ED costs.

Physician Encounter Costs over Six Years for Students with Mental Health Problems (N=109)

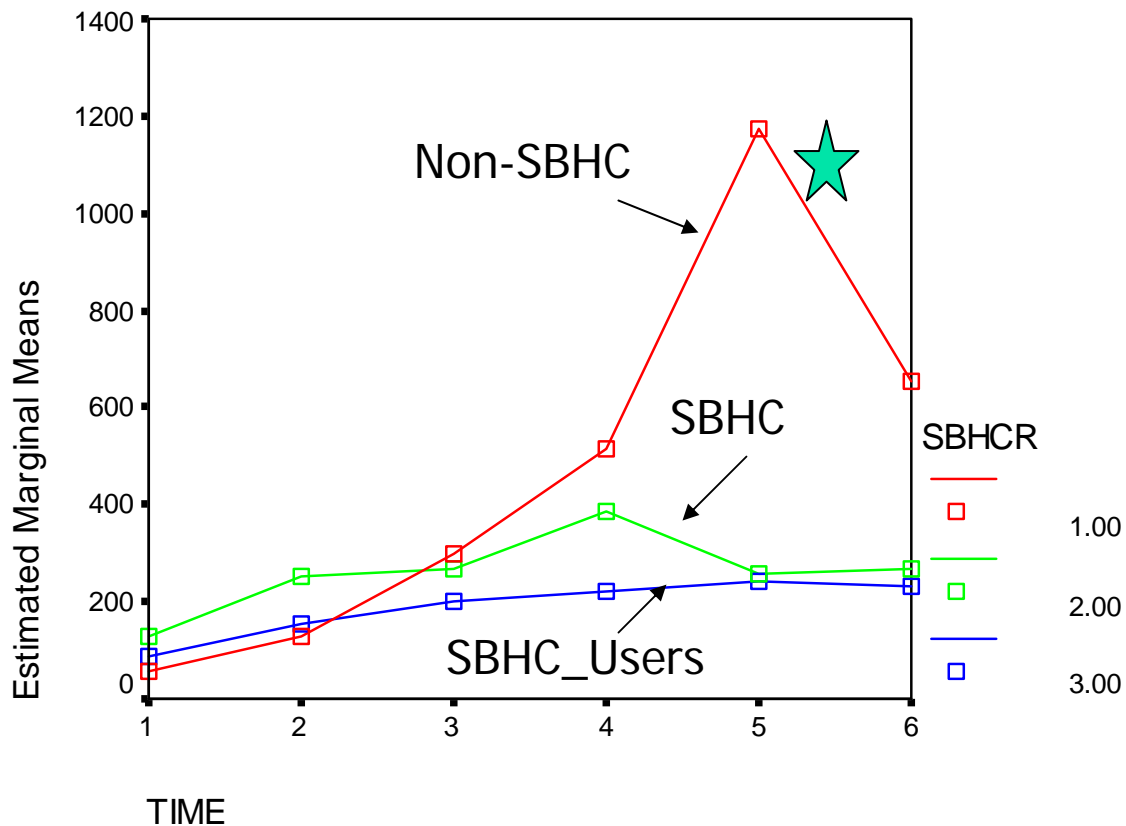
Estimated Marginal Means of PHYSCOST



Students with mental health illnesses in non-SBHC schools required more physician encounter costs.

Prescription Drug Costs over Six Years for Students with Mental Health Problems (N=109)

Estimated Marginal Means of RXCOST



Students with mental health illnesses in non-SBHC schools required more prescription drug costs.



Major Finding #3: HRQL and Medicaid Costs

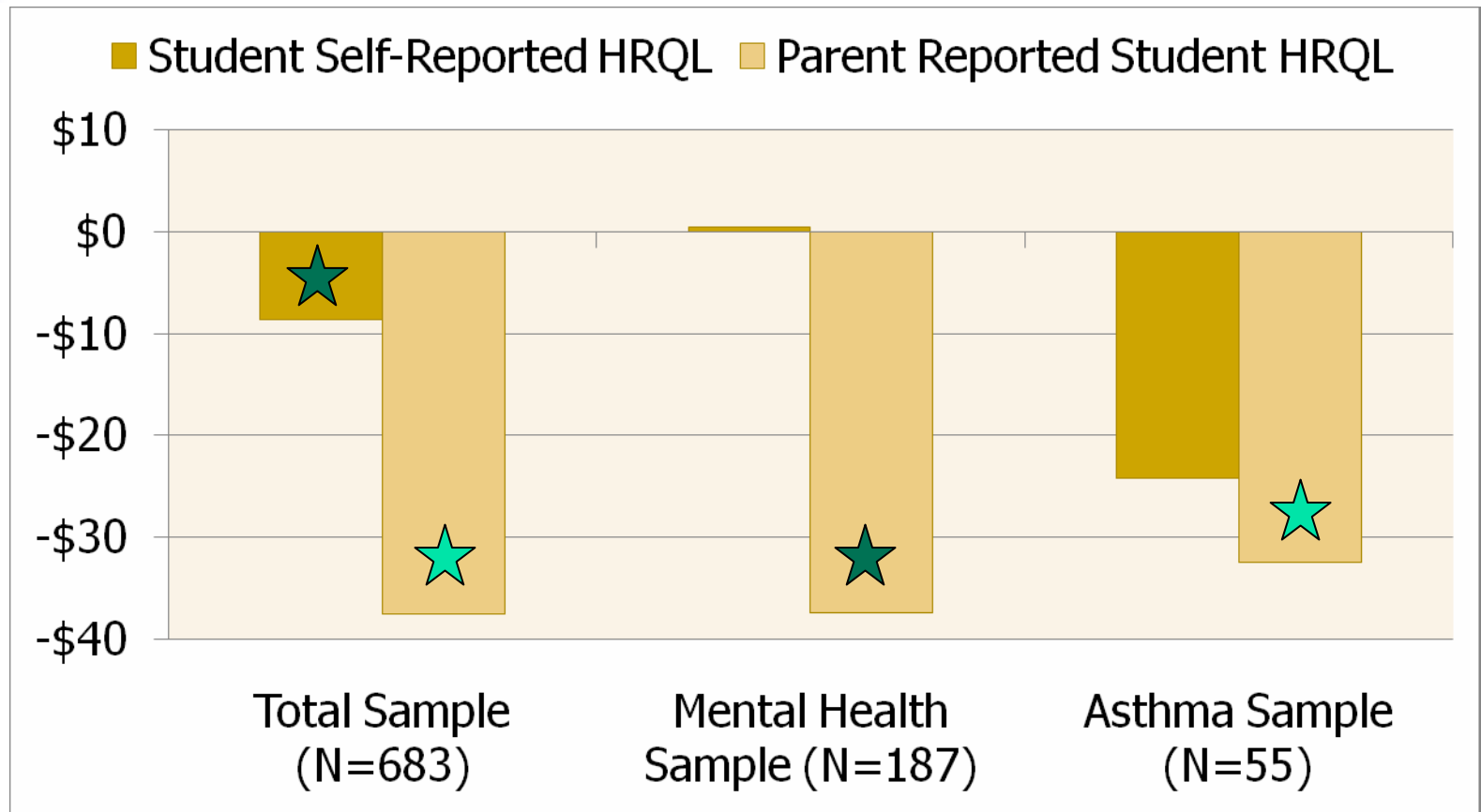
- Reduction in Medicaid costs with incremental improvements in measured HRQL



Sample Disposition for Longitudinal Combined Analysis of the SBHC Health Outcomes Study and the SBHC Medicaid Cost Study (Study III)

	SBHC Users	SBHC School	NonSBHC School	Total Sample
Year 1	63	103	124	290
Year 2	72	78	97	248
Year 3	52	40	54	148

Change in Medicaid Costs for Every One Unit Increase in Student HRQL as Rated by Student and Parent



Note: Sample sizes are based on a person-time unit over 3 waves of data.



Summary

- For all linked students, the overall expenses seem not significantly difference between children in SBHC schools (SBHC_Users & SBHC) and those in schools without.
- For sub-cohort students with mental illness, students in non-SBHC schools had more health care costs than those in SBHC schools (SBHC_users & SBHC).



Summary

- Higher levels of HRQL are associated with lower Medicaid costs as rated by both the student and the parent.
- This was significant for the total sample for student and parent ratings as well as among both mental health and asthma subsamples for parent ratings.



Limitations & Future Implications

- Sample limited to school-age children in the Ohio Medicaid program; It might not be generalizable to other state populations.
- We are planning to conduct this study for the Northern Kentucky area.
- The sample size and rates of attrition over waves in the linked data limits the complexity of the analytic strategy we are able to employ



Q & A

Thank You!