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Using Data to Inform Program Design and Implementation and Make the Case for School Mental Health

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Introduction

Few children in the United States who need mental health services actually receive them. It has been estimated that 12–38% of children and young people under the age of 18 experience mental, emotional, and behavioral problems to an extent that mental health services would be appropriate or recommended (Adelman & Taylor, 2006; Roberts *et al*, 1998; Weist *et al*, 2005), and yet as few as 15–33% of those in need actually receive any mental health treatment (Congressional Office of

Technology Assessment, 1991; Dwyer, 2002; Knitzer, 1990; Owens & Murphy, 2004; Owens *et al*, 2005; U.S. Department of Health and Human Services, 2001; Weist *et al*, 2005). School-based mental health can increase access to services by providing mental health services on-site at the student's school. Expanded school mental health (ESMH) is a more recent formulation of SBMH. ESMH builds on mental health services already present in schools (such as nursing, school psychology, school counseling, and social work) to provide comprehensive mental health services to children in one of their natural settings (Weist, 1997). ESMH refers to programs that represent partnerships between schools and community organizations to provide a full array of

A B S T R A C T

This article describes an evaluation and research system developed over many years by the Minneapolis Public Schools Expanded School Mental Health Program. The authors describe the rationale underlying the systems development, the challenges encountered and solutions developed throughout building the system, and the future directions for research and evaluation. Use of data to continuously inform

program design and implementation will be discussed. Examples of preliminary program evaluation outcomes and results from two quasi-experimental studies will be presented. Recommendations for future research are discussed, and the need for more longitudinal studies investigating the impact of expanded school health on educational behaviors and academic achievement is emphasized.

therapeutic services to young people in the school setting (Flaherty & Osher, 2003; Weist, 1997; Weist *et al*, 2003).

There is research that supports the effectiveness of certain aspects of school-based mental health services, such as access to treatment and use of services (Hoagwood *et al*, 2007). However, there is a lack of research on the impact of SBMH on the social and emotional symptoms that SBMH is designed to address (Hoagwood *et al*, 1995; Nabors *et al*, 2003; Nastasi, 2004). Research on SBMH to date has focused on number of clients served and types of service provided, suggesting a lack of consensus on which social, emotional, and academic outcome variables are important to target or to study (Nabors *et al*, 2003; Nabors & Reynolds, 2000; Nastasi, 2004). More consistent and theoretically driven evaluation procedures are needed to advance the field of SBMH, and ESMH in particular. It is increasingly important that we build a research base to validate ESMH programs already in place (Owens & Murphy, 2004). In addition to evaluation and research studies, ESMH programs need to develop the infrastructure to collect and analysis program data to give clinicians, supervisors, and program administrators the ability to monitor the impact of their programs at multiple levels (individual student, school, and agency).

An OvidSP search for articles based on the keywords 'program evaluation', 'school health services', and 'mental health services' yielded 68 total results, 52 of which were published in the past ten years. Of these 52 articles, 26 (50.0%) focused on evaluation of health prevention services such as nutrition counseling, drug use and teen pregnancy prevention, and after-school programming for children with health and behavioral difficulties. Eighteen other articles (34.6%) were theoretical or editorial papers on the development of mental health services in the school setting. The eight remaining articles (15.4%) included some evaluation of SBMH services. One of these studies provided a review of school-based programs in general, focusing on services provided and collaborations used (Brener *et al*, 2001). Three of these articles were non-US studies on SBMH interventions in Great Britain, Australia, and New Zealand (Chipman & Gooch, 2003; Dickinson *et al*, 2003; Maloney *et al*, 2008). This left four studies that were evaluations of existing SBMH programs in the United States in the past ten years (Fox *et al*, 2005; Stormshak *et al*, 2005; Vernberg *et al*, 2004; Walrath *et al*, 2004).

This dearth of hands-on, evaluative research on existing SBMH programs highlights the need to examine what is already being implemented in order to improve

existing services. As a field, ESMH needs to develop evaluation and research protocols that provide relevant data and outcomes on the effectiveness of ESMH and are feasible and not cost-prohibitive for programs to implement. The purpose of this article is to describe a feasible, multi-phase approach for ESMH programs to develop and sustain their own evaluation and research programs. In addition to presenting the evaluation program developed, the authors will share preliminary data from the first five years of the program.

Minneapolis Expanded School Mental Health Program

In 2004, the Minneapolis Public Schools (MPS) ESMH Program was started as part of the Safe Schools Healthy Students (SSHS) federal grant. The program is modeled on the ESMH framework developed by Mark Weist and colleagues at the Center for School Mental Health at the University of Maryland (Weist, 1997). At each school, a mental health agency places a full-time mental health professional to provide clinical mental health services and supports to students. The program started in 5 K-5 (children aged 5-10) or K-8 (children aged 5-13) schools working with two mental health agencies from the community. Currently, the program is working with four mental health agencies that are contracted to provide clinical mental health services in 15 Minneapolis schools.

Building an evaluation and research system: why, what and how

Why build it?

Increasingly, programs in education and mental health have to demonstrate evidence of effectiveness (Dimmitt, 2009). Even with a growing literature base on the effectiveness of ESMH, local stakeholders often require programs to provide their own evidence of success. The MPS ESMH program was developed with a focus on sustaining services beyond the funding of their SSHS grant, so the program developers knew it would be critical to have data and outcomes on the impact of the program. Programs must develop the ability to continuously demonstrate evidence of their effectiveness and that their programs have had their intended impact. The financial sustainability model for the MPS ESMH program relies on ongoing contributions from stakeholders, so the program had to be able to demonstrate outcomes that were important to each of the stakeholders

and answer the questions that were important to each stakeholder from their own perspective. The program realized that if they did not build an evaluation infrastructure that would be sustainable over time, the program would struggle to continue ongoing evaluation and research activities. The partners also were committed to developing the ability to use data to drive programmatic decision making and inform clinical decision making and treatment planning. Finally, the program wanted to build a data system that could be used for more rigorous evaluation and research studies in the future, even though at the time of development the program did not have the capacity to conduct such studies.

What do you build?

When developing an evaluation system, two of the most challenging components are getting buy-in from all partners involved and then selecting the measurement tools. The partners in MPS ESMH program all agreed on the necessity of collecting evaluation data, so initial buy-in in this case was not difficult. However, when discussions started about what types of measure and evaluation data should be collected, program administrations from the mental health agencies worried about how much of a burden the data collection would be for the therapists. The honest answer proved to be 'a fair amount of burden'. It was decided, therefore, whenever possible to use measures and data that were already being collected by either the mental health agency or the school district. In collaboration with stakeholders and partners, the MPS ESMH program was able to develop a minimum set of variables critical to evaluating the outcomes identified by stakeholders. This minimum set of variables included:

- demographic information on each student served
- service data as recorded for third-party reimbursement
- data on ancillary services such as teacher consultation and care coordination
- a standard mental health outcome measure
- individual student suspension, attendance and academic achievement records.

The program developers selected this set of variables because it is existing data already collected by either the mental health provider or the school district, so was a limited additional burden on the organizations.

The parent version of the Strength and Difficulties Questionnaire (SDQ; Goodman, 1997) was already being used by the mental health agencies, but the program evaluators wanted multiple informants, so the program also used the teacher version of the SDQ and the self-report version of the SDQ of students 11 years old or older (Goodman *et al*, 1998). For most of the student demographic data, parts of that data were already being collected by either the mental health agency or the school district and only a few additional questions had to be added to the database. The program also collected data on several process variables that were important to the partners and stakeholders regarding the impact of the program on access and effective engagement in treatment. These variables were percentage of students who were referred and seen, percentage of students for whom this was their first time receiving mental health services, time from referral to first visit, and effective engagement in services (the number of treatment services in a school year).

How do you build it?

It was critical that the partners and stakeholders were committed to developing an evaluation framework and data collection system that was feasible, flexible and sustainable. The development of the system was a multi-phase process. The first phase was to develop a set of evaluation questions important to stakeholders and the minimum set of evaluation variables (see above). Also during the first phase, we needed to create a data-collection system that was low-cost and could be replicated (discussed in more detail below). Finally, we needed to build the internal capacity to conduct our own program evaluation, including reliable evaluation design, consultation on statistical analysis, and setting up analyses that could be repeated over time. To build our internal capacity, we partnered with researchers at the University of Minnesota and the Minneapolis Public School Department of Research, Evaluation and Assessment (REA), but made it clear that, in addition to their help with conducting the first program evaluation, we wanted consultation to enable us to continue the program evaluation on our own.

An important component of how we built it was reducing the data collection burden as much as possible and using the data that was collected. The program developers were committed to reducing or eliminating duplicate entry of data whenever possible, using all the data elements that were collected, and developing

a system that would inform program development at multiple levels (for example student, clinician, district, and county-wide system). In the first four years of the program, data was collected through the use of a Microsoft Office Access database developed specifically for the MPS ESMH program. Each clinician would enter data on his or her students (such as student demographic data, clinical and ancillary service data, and data from the parent and teacher SDQ). The program evaluator would routinely collect copies of the data from each clinician and would merge and clean the data twice a year. This system worked well for several years until the program grew in size. The advantage of this database system was the low cost of its development and the flexibility the program developers had to add additional variables to the database. The disadvantages were that the program evaluator had to travel to each school to collect the data and, once the data was cleaned, it was difficult to transfer the cleaned data back to the individual clinicians' databases. The process was time-intensive, making it difficult to use the data to quickly inform program design and guide program implementation.

The next two phases of development built on the evaluation system already developed. The second phase involved exploring the program's impact on educational variables. After consultation with REA, it was determined that we should examine the program's impact on out-of-school suspensions and percent annual attendance. The preliminary results are described below. The third phase involved beginning to standardize the data collection system, developing a new database and conducting two quasi-experimental studies.

The challenges of the Access database were continuing to frustrate the program partners. A possible solution to these challenges was to put the database online. In

2008, several mental health agencies, Hennepin County, Wilder Research and the Hennepin County Children's Mental Health Collaborative created a partnership to collaboratively develop an online data management system (named the MN Kids' Database) that was modeled in part on the Microsoft Access database developed from the MPS ESMH program. **Table 1**, below, shows a timeline of the development of the MPS ESMH evaluation and research system. The partners were able to start using the online data management system from School Year 2010. The development of the database took over a year and reconfirmed the partners' commitment to developing an evaluation and research system that could both inform program development and implementation and provide the outcome data to make the case for ESMH.

Preliminary results

Phase I

The initial program evaluation was conducted in the summer of 2006 in partnership with researchers from the University of Minnesota. The evaluation focused on four main areas: access to services, parent report on mental health symptoms, teacher report on mental health symptoms, and assessing the frequency of both clinical and ancillary services. The evaluation data for the one and a half years (February 2005 – June 2006) of the program showed that 346 students had been identified for services and 82.7% of students had been seen once face-to-face by a clinician. Of these students 66.5% were seen within 14 days, and for 63.7% of the students this was the first time of receiving mental health services (**Table 2**, opposite). This preliminary data suggested an increase in access to services, which for

TABLE 1 *Timeline of Development of Evaluation and Research System in Minneapolis Expanded School Mental Health Program*

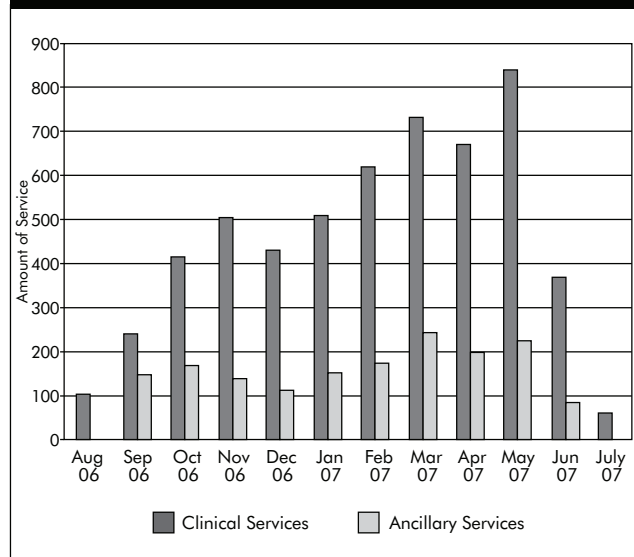
Year	Activity
2005–2006	Development and implementation of initial program evaluation including measurement selection and creation of Access database
2005–2007	Partnership with University of Minnesota to implement and ongoing refinement of initial program evaluation design
2007–2011	Ongoing use, refinement and expansion of MPS ESMH program evaluation
2008–2010	Began development of MN Kids' Database (online database for collection and reporting of ESMH program data)
2008–2009	First quasi-experimental study through collaboration with graduate student doctoral dissertation
2009–2010	Further analysis of doctoral dissertation study data set
2010	Began collecting data electronically through MN Kids' Database
2010–2011	Second quasi-experimental longitudinal study through collaboration with graduate student doctoral dissertation
2011–2013	Further analysis of 2nd doctoral dissertation study data set; continued development and expansion of MN Kids' Database

TABLE 2 February 2005–June 2006 Demographic Data

Characteristic	2/2005–6/2006 N	N (%)
Gender	346	
Male		203 (58.7)
Female		138 (39.9)
Missing		5 (1.4)
Ethnicity	346	
African American		117 (33.8)
African Immigrant		36 (10.4)
Hispanic		82 (23.7)
White/non-Hispanic		55 (15.9)
American Indian/Alaskan Native		27 (7.8)
Asian/Pacific Islander		10 (2.9)
Unknown/Missing		19 (5.5)
Special Education	346	
Yes		89 (25.7)
No		251 (72.5)
Referred/seen	346	
Student Seen		286 (82.7)
1st time receiving mental health services	215	
Yes		137 (63.7)
No		55 (25.6)
No Answer		23 (10.7)

stakeholders was an important finding. Stakeholders wondered whether student and families remained involved in services. The evaluation showed that the mean number of clinical visits during a school year was 12, providing some limited evidence that students and families were staying engaged in services over time.

The analysis of the SDQ showed that both parent and teacher responses showed decreases in emotional and behavioral problems from the beginning of treatment. Since this was a formative evaluation, developers were interested in the balance of clinical services to ancillary and support services (for example consultation with school staff, classroom presentations, training for school staff on mental health topics). The analyses found that about 63.8% of the services were clinical, which was similar to what had been hypothesized by the developers. The volume of clinical services provided per month increased over the course of the school year (**Figure 1**, below). The analysis also found an interesting trend in student referrals over the course of the school year (**Figure 2**, below). Both of these pieces of information were critical in program planning, especially of how clinicians spend their time at the beginning of each school year. When the program developers investigated the monthly referrals trends for SY2009 for established school sites, the analysis showed a change in referral patterns,

FIGURE 1 School Year 2007 Service Trends by Month

especially for the months of September, October, and November (**Figure 3**, overleaf). This potential change in referral patterns after a clinician has become established in a school site suggests that a shift in program planning might be necessary to make best use of a clinician's time.

Phase II and Phase III

After the initial promising findings of the program, the evaluators examined the program's impact on school variables, specifically out-of-school suspensions. The analysis examined SY2007. During that year 298 students were seen at least once, but the program wanted to investigate students who were seen at least four times

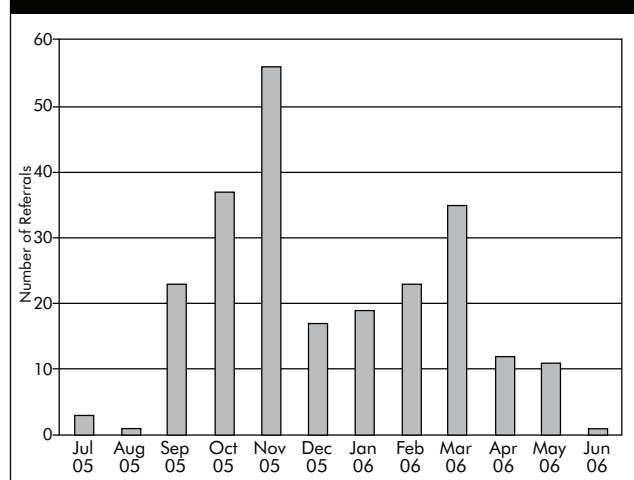
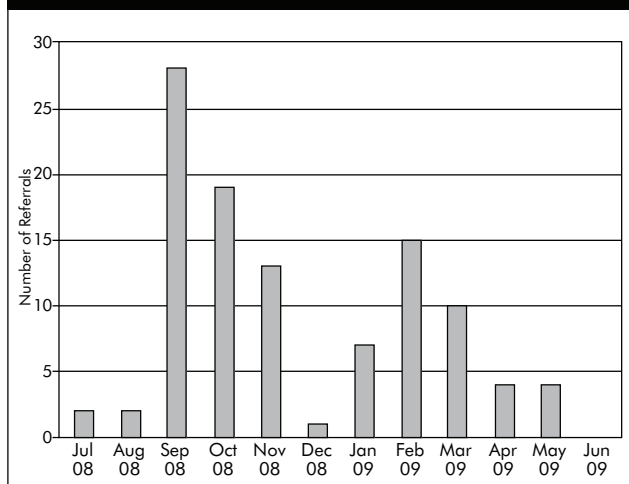
FIGURE 2 Monthly Referral Patterns School Year 2006

FIGURE 3 Monthly Referral Patterns School Year 2009 in Established Schools

(minimum dosage) and students who had one or more out-of-school suspensions and SY2006 (indicator of risk for future suspensions). The findings were that only 82 students (27.5%) were seen four times or more and had a suspension in SY2006. The analysis then examined the reduction in suspensions for those 82 students from SY2006 to SY2007 and found that 50% had between one and six fewer suspensions in SY2007.

In 2008–2009, the first quasi-experimental study was conducted on the MPS ESMH program as part of a doctoral dissertation (Ballard, 2009). The researchers collaborated with the REA to identify 159 students who had participated in the MPS ESMH program and matched them with 133 non-participant students. The researchers first matched ESMH schools with non-ESMH schools, and then matched students within those schools on several variables, which were (in order of priority) grade, gender, free/reduced lunch status, race/ethnicity, number of suspensions, special education classification, achievement test scores, English language learner (ELL) status, and attendance rates. The study compared students at baseline (School Year 2006) and one school year after treatment began (School Year 2007). The results depicted in **Figure 4**, below, show that the treatment group significantly decreased their mean number of out-of-school suspensions, while the comparison group increased their mean number of suspensions from school year 2006 to school year 2007 (Ballard, 2009).

In 2010–2011, a second doctoral dissertation study on the MPS ESMH program used a repeated measures longitudinal cohort design to detect changes in social/emotional symptoms, suspension rates, attendance rates,

and standardized test scores over a four-year cumulative sample (Everts, 2011). For each school year from 2005–2006 (SY2006) to 2008–2009 (SY2009), baseline and follow-up data was analyzed for students who had received ESMH services. For the 805 ESMH participants in this study who had received at least four services, dosage ranged from four to 180 sessions, with an average dosage of 25.16 (median = 17 sessions) over the four years from SY06 to SY09. Seventy-five percent of the sample had some family involvement in ESMH treatment, with a mean dosage of 6.69 family services (for example family therapy, family therapy without client present, and parent consultation). This study found support for the Minneapolis Public Schools' ESMH program in its primary target outcome, reduced mental health symptoms (**Figure 5**, opposite), and moderate support for improving some academic outcomes, specifically reducing out-of-school suspensions. The program was successful in reaching low-income and under-served minority populations, and the fact that 72.3% of all referred students received four or more face-to-face services indicates a high level of engagement in mental health services. Receiving ESMH services had positive effects on suspension rates, though changes were delayed after treatment began (**Figure 6**, opposite).

Summary and future directions for research and evaluation

The MPS ESMH evaluation and research system has taken many years to establish and has been successful

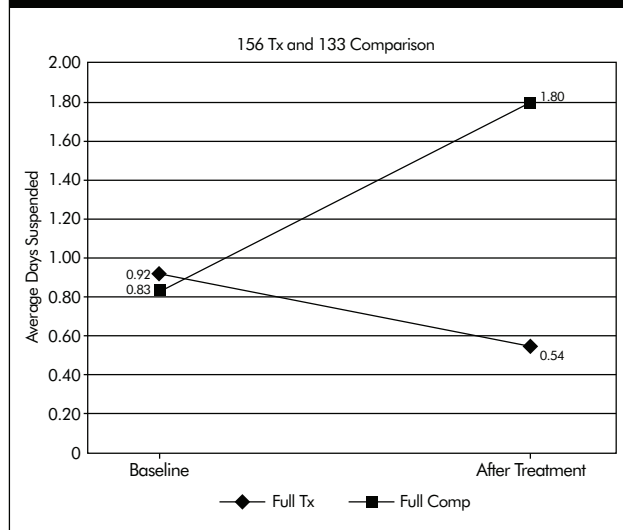
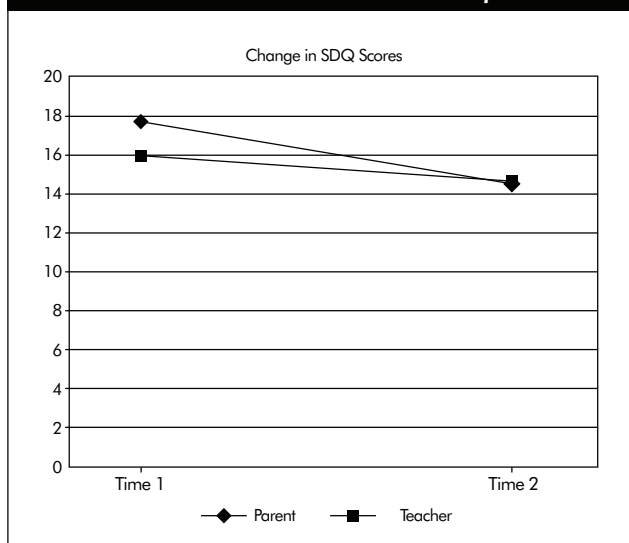
FIGURE 4 Matched Comparison Analysis of Impact on Out-of-School Suspensions in School Year 2006-2007

FIGURE 5 *Changes in Parent and Teacher Strengths and Difficulties Questionnaire (SDQ) Scores from Baseline to First Follow-Up*



because of the strong partnerships and collaborations. These partnerships have been committed to creating feasible systems to collect and analyze program data and developing a data-driven program. The major partners making this evaluation system work have been mental health agencies, Hennepin County, Wilder Research, University of Minnesota, Hennepin County Children's Mental Health Collaborative, and the Minneapolis Public Schools. For the MPS program, ongoing use of data, evaluation and research has been critical to the success of the program. The program has analyzed and reviewed its data and outcomes routinely with program partners and stakeholders. The evaluation and research findings have helped the program secure and sustain critical program and funding support from stakeholders in health care, education, mental health and local and state government. Having reliable process and outcome data has been vital to making the case for school mental health. The program is continuing to develop ways to use the data collected by clinicians on individual students to provide better information on student progress and help with treatment planning, and to measure our results.

This article has described the development and implementation of an evaluation and research system, and provide preliminary data from the past five years. We hope that more ESMH programs will begin publishing descriptions of their evaluation and research systems to better inform the field on how programs can develop and sustain these critical components of ESMH. Further research is needed to understand the impact of ESMH on school variables like school suspen-

sions, attendance and academic achievement. Given our experience, these studies should be longitudinal, spanning at least three to four years, because it can take that long to detect changes in those school variables.

Further research is needed to determine how and why ESMH treatment might influence academic and social/emotional outcomes. ESMH programs could benefit from further exploration of the complex relationships between presenting problem (or cluster of symptoms), intervention type, dosage, family involvement, and mental health and academic outcomes. ESMH programs that develop their own capacity to conduct evaluation and research studies of this type would greatly benefit the field.

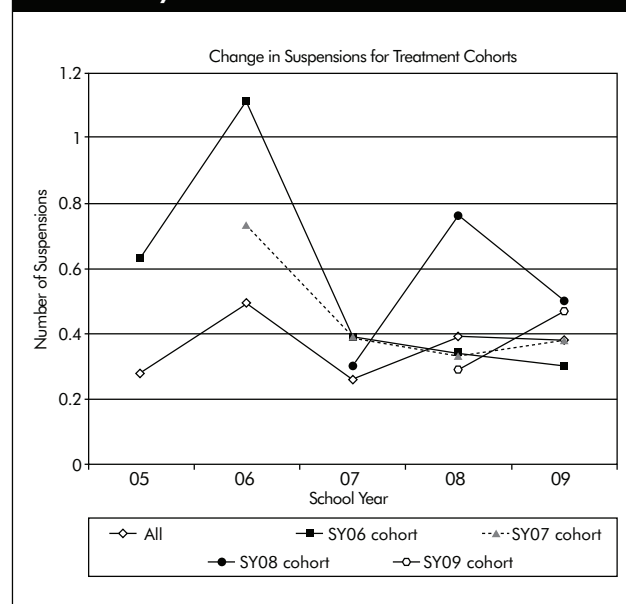
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FIGURE 6 *Change in Number of Suspensions from SY05 to SY09 for all ESMH Participants and by Cohort*



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