

# Impact of Managed Care on Publicly Insured Children with Special Health Care Needs

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**Objective.**—The aim of this review was to evaluate the impact of managed care on publicly insured children with special health care needs (CSHCN).

**Methods.**—We conducted a review of the extant literature. Using a formal computerized search, with search terms reflecting 7 specific outcome categories, we summarized study findings and study quality.

**Results.**—We identified 13 peer-reviewed articles that evaluated the impact of Medicaid and State Children's Health Insurance program (SCHIP) Managed Care (MSMC) on health services delivery to populations of CSHCN, with all studies observational in design. Considered in total, the available scientific evidence is varied. Findings concerning care access demonstrate a positive effect of MSMC; findings concerning care utilization were mixed.

Little information was identified concerning health care quality, satisfaction, costs, or health status, whereas no study yielded evidence on family impact.

**Conclusion.**—The available studies suggest that the evaluated record of MSMC for CSHCN has been mixed, with considerable heterogeneity in the definition of CSHCN, program design, and measured outcomes. These findings suggest caution should be exercised in implementing MSMC for CSHCN and that greater emphasis on health outcomes and cost evaluations is warranted.

**KEY WORDS:** child; chronic illness; managed care; Medicaid; review; SCHIP; special health care needs

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Over the last 2 decades, many states have used legislative and regulatory action to move poor children from public insurance fee-for-service (FFS) systems into Medicaid and State Children's Health Insurance Program (SCHIP) managed care.<sup>1</sup> Initially, this shift to managed care was confined to poor children who were generally healthy. More recently, a number of states have extended Medicaid and SCHIP managed care (MSMC) systems to children with special health care needs (CSHCN). This shift in policy reflects the recognition that CSHCN account for a disproportionate share of health care costs and that MSMC could provide a foundation for enhanced coordination of health care services.<sup>2,3</sup> As of June 2005, the latest year for which there are data, 22 states used MSMC to serve these children.<sup>4,5</sup>

Nonetheless, apprehension regarding the appropriateness of managed care for CSHCN enrolled in public insurance systems has also been voiced.<sup>6,7</sup> Of particular note are concerns that managed care could generate disincentives to

providing comprehensive services to children with complex medical needs.<sup>8–10</sup> These concerns, coupled with the growing number of states mandating placement of CSHCN into MSMC systems, have generated recurring calls for data regarding the impact of such policies on health care access, utilization, quality, and costs, as well as patient satisfaction, outcomes, and family impact.<sup>8–13</sup> Care issues linked conceptually for this patient population by Newacheck and colleagues.<sup>10</sup> However, despite these pleas to utilize such empirical insights in developing constructive Medicaid and SCHIP reforms, no consensus exists in the policy arena as to the ultimate utility of moving CSHCN into MSMC systems.<sup>14,15</sup>

In a recent report, Sweet and Moynihan<sup>16</sup> underscored the utility of critical reviews in identifying the scope and quality of evidence supporting health policy decision making and noted that this methodology has been underutilized by the medical community. Given the large-scale implementation of MSMC for CSHCN, the persistent uncertainty regarding its consequences, and the potential utility of critical reviews in guiding policy deliberations, we conducted a systematic review of the literature evaluating the experience of CSHCN enrolled in MSMC. We included literature that addressed SCHIP, a federal program launched in 1997 to insure children in families with incomes too high to qualify for Medicaid but too low to afford private insurance. As of 2008, most states provided SCHIP child health coverage through Medicaid (6 states and the District of Columbia) or through Medicaid combined with other child programs (26 states).<sup>17</sup> Thus, for the purposes of this review, MSMC represents both Medicaid-related managed care and SCHIP-related managed care.

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## METHODS

### Search Strategy

To identify published, peer-reviewed research assessing the effect of MSMC on CSHCN, we conducted an extensive literature search and sought further information from existing bibliographies and interviews of expert colleagues. We excluded the nonpeer-reviewed “gray literature”—conference papers, white papers, technical reports, electronic theses and dissertations, online documents, and oral presentations/abstracts—but examined them for referenced, peer-reviewed studies.

The PubMed database was searched (January 1988 to June 2008; includes HealthSTAR since 2000) using the following MeSH headings and terms:

- *disabled children* or *chronic illness[Multi]* or *chronic disease* or *catastrophic illness* or *special health care needs* or *special needs*, and
- *infant* or *child* or *child, preschool* or *adolescent*, and
- *Medicaid* or *State Children's Health Insurance Program* or *SCHIP*, and
- *managed care programs* or *HMO*, and
- *health care* and *access* or *utilization* or *quality* or *costs* or
- *patient* and *satisfaction* or *outcomes* or *family impact*

We also searched the Cochrane Controlled Trials Register database and the Cochrane Collaboration's Specialized Register of Effective Practice and Organization of Care. For these databases, a free text search strategy was applied, using the following terms (\* indicates wild card symbol):

- *special health care needs\** or *disabil\** or *chronic\**, and
- *infant* or *child* or *preschool\** or *adolesc\**, and
- *Medicaid* or *SCHIP (State Children's Health Insurance Program)*, and
- *managed care* or *HMO*

Finally, the reference lists of located papers were examined for studies of CSHCN in MSMC, and relevant articles were retrieved. We identified 99 publications through this process and entered them into an EndNote bibliographic database (Thompson Reuters, Philadelphia, PA).

### Selection of Eligible Studies

Inclusion criteria stated that articles must be in English and meet the following criteria: 1) they must be empirical; and 2) they must address children, special health care needs, and health care services as provided by Medicaid and SCHIP, as well as patient experiences and outcomes. As noted above and listed below, the conceptual framework for our review focused on 7 outcome categories, suggested by Newacheck and colleagues<sup>10</sup> to be salient for CSHCN and related to health outcomes/status<sup>18</sup>:

- **care access**, with indicators reflecting convenience and physical access, travel and waiting time, provider choice, coverage of services, and availability of services (frequently denoted in measures of unmet need)
- **care utilization**, with indicators reflecting use and frequency of primary medical care, specialized medical care, specialized therapies (eg, physical therapy, mental

health therapy, home health services), family support services, equipment and supplies, and related services (eg, early intervention, special education)

- **care quality**, with indicators reflecting case finding and service coordination, provider training and supply, medical necessity, clinical quality (eg, quality of care standards, quality improvement system), and grievance procedures
- **care satisfaction**, with indicators reflecting family and practitioner satisfaction
- **health care costs**, with indicators reflecting expenditures for care (including out-of-plan services), indirect costs incurred by families, degree to which other funding provides financing (eg, Title V, Early Periodic Screening, Diagnosis, and Treatment Program), and degree to which savings are achieved by managed care
- **health outcomes/health status**, with indicators reflecting global health as well as cognitive, physical, social, and emotional functional status
- **family impact**, with indicators reflecting sibling and parent health status, parent financial burden, parent knowledge of special health care needs, and managed care plan-provided family support.

Exclusion criteria included opinions, commentaries, and reviews; studies with weaker designs (ie, cross-sectional descriptive studies of 1 group, singular case series and registries, and case reports); and articles confined to behavioral or mental health issues specifically.

Two persons (Lynne C. Huffman and Gabriel A. Brat) independently examined the articles generated by the search protocols and determined their eligibility, methodology, and findings. For quality assessment, the 2 reviewers independently extracted the study data directly into an abstraction form. These forms were reviewed and checked for completeness and congruence by 1 reviewer; consensus was achieved through discussion and further review.

### Evaluating the Quality of Individual Studies

Our approach to assessing the quality of individual studies was based on 9 domains proposed by West and colleagues:<sup>19</sup> 1) study question; 2) study population; 3) comparability of subjects; 4) exposure or intervention; 5) outcomes; 6) statistical procedures; 7) results; 8) discussion; and 9) project funding or sponsorship. Five of these domains—subject comparability, intervention, outcomes, statistics, project funding—are noted by West and colleagues<sup>19</sup> to be critical components of a high-quality observational study. Within each domain, there are essential elements (Table 1).<sup>20</sup> The 2 article abstractors independently rated each article on each domain as “addressed domain fully,” “addressed domain in part,” or “did not address domain.”

### Appraising Specific Research Findings

No meta-analysis was planned for this review. The synthesis of data required for meta-analysis was impossible because of the diversity of participants and clinical populations and variety of outcome measures used across studies.

**Table 1.** Domains and Elements Related to Quality of Observational Studies

Domains	Elements
Study question	Description of a clearly focused and appropriate question
Study population	Clear description of population that is appropriate for drawing relevant conclusions
Subject comparability*	Application of specific inclusion/exclusion criteria to all groups Establishment of group comparability at baseline Establishment of participant and non-participant comparability with regard to confounds Use of concurrent controls Maintenance of group comparability at each assessment
Intervention*	Clear definition and measurement of intervention
Outcomes*	Clear definition and measurement of outcomes
Statistical procedures*	Use of multivariate statistical techniques and/or participant restriction, stratification, or randomization to control for confounds Appropriate conduct of analyses Consideration of the effect of multiple comparisons
Results	Measurement of magnitude of effect for outcomes (eg, odds ratio, relative risk)
Discussion	Description of conclusions that are supported by results, with biases and limitations taken into consideration
Project funding or sponsorship*	Record of type and source of support for study (ie, indicating any possible conflict of interest)

\*Critical domains, per West and colleagues.<sup>19</sup>

## RESULTS

From the original set of 116 publications, 61 publications were excluded after abstract review based on 2 exclusion criteria (opinion, commentary, or review and primary focus on nonchronic illness or mental health). Two reviewers independently examined the full text of the remaining 55 articles. Of these, an additional 42 were excluded because of study designs that were too weak to assure internal validity or causal assessment, or because the results did not relate to patient and family outcomes. Therefore, after exclusion, 13 studies were determined eligible for detailed review (Table 2 [only available online]).

The included studies described a variety of financing and delivery mechanisms. Eleven of 13 articles were state specific: one article described a primary care case management program in Maryland,<sup>21</sup> 4 articles described "integrated," capitated plans (inclusive of mental health or specialty services) in 3 states (ie, Tennessee, Oregon, New York),<sup>22-25</sup> and 6 articles addressed managed care systems designed specifically for CSHCN in 3 states (ie, Michigan, Ohio, District of Columbia).<sup>26-31</sup> No articles described capitated plans with specialty service carve outs. Voluntary enrollment into these programs, which introduces possible selection bias associated with plan choice,

was a characteristic of the MSMC plans in New York, Michigan, Ohio, and District of Columbia. The plans in Tennessee, Maryland, and Oregon had mandatory enrollment; in Oregon, there were possible exemptions from mandatory enrollment, including a need for multiple specialists and the use of other health insurance.

Four articles described different aspects of the District of Columbia managed care plan.<sup>27,28,30,31</sup> Two articles described different populations served by the New York SCHIP in 2001 to 2002.<sup>24,25</sup> Two articles reflected analyses using the National Health Interview Survey, a large-scale household interview survey addressing a broad range of health topics.<sup>32,33</sup>

## Evaluation of the Quality of Individual Studies

Thirteen peer-reviewed articles addressed the impact of MSMC on health services delivery to CSHCN (Table 2 [only available online]). All were observational in character, as there were no randomized trials. Four articles described prospective studies, 2 with nonequivalent group designs and preassessments-postassessments<sup>30,31</sup> and 2 with a 1-group design and preassessments-postassessments.<sup>24,25</sup> Nine articles described retrospective studies: 1 with nonequivalent group designs and preassessments-postassessments,<sup>33</sup> 4 with 1-group designs and preassessments-postassessments,<sup>21,22,26,29</sup> and 4 with nonequivalent group designs and postassessments only (cross-sectional).<sup>23,27,28,32</sup> The reviewed studies included diverse populations of CSHCN and varied practice settings. Across all included studies, researchers assessed the MSMC-related experiences of more than 10 000 children with special health care needs. For all studies save one,<sup>26</sup> the sample sizes were adequate for the analytic designs.

Nine domains reflecting study quality (including 5 critical domains) were considered for each of the reviewed studies and the results are presented in Table 3 (only available online). The strengths of the included studies included the description of research questions, the study populations, sources of research funding, and information about the MSMC intervention. Adequate descriptions of the statistical procedures were more mixed, and none of the studies fully addressed the issue of subject comparability and selection bias in the enrollment of children.

## Effects of MSMC: Appraising Specific Research Findings

Attention to various outcome areas varied across the 13 articles: care access (9 articles), care utilization (9), care quality (3), care satisfaction (2), health care costs (1) and health status (1). None of the 13 articles described the impact of MSMC on the families of CSHCN as manifested in financial burden, parental stress, family support, or otherwise. We summarize the findings of the reviewed articles in Table 4.

### Care Access

In general, the reviewed studies demonstrate increased health care access for CSHCN when covered by MSMC,

Table 4. Summary of Research Findings Concerning MSMC and CSHCN\*

Measured Outcomes	Location and Findings of Less Benefit for Children in MSMC	Location and Findings of Similar Benefit for Children in MSMC or FFS†	Location and Findings of More Benefit for Children in MSMC
Care access		<p>(US).<sup>32</sup> CWCHC in Medicaid-FFS and in MSMC programs (of all types) had similar levels of unmet needs (ie, 15% had forgone needed medical care, prescription drugs, dental care, or mental health care).</p> <p>(DC).<sup>27</sup> Caregivers of children in HSCSN‡ and caregivers of children in FFS are equally likely to rate as “fair” or “poor” the office hours and office waiting time.</p> <p>(DC).<sup>28</sup> For FFS and capitated MC§ enrollees, there was the same proportion of children with unmet needs for services, including physician/hospital care, drugs, mental health care, therapy services, and home health care (FFS, 3.8%–10.6% vs capitated MC, 2.0%–8.6%).</p> <p>(OR).<sup>23</sup> Children in FFS and MSMC had same degree of unmet need for services (needed but did not receive visit to specialist 10.6% vs 6.0%, respectively; dental care 16.1% vs 14.0%, respectively; prescription medicine 11.6% vs 11.7%, respectively).</p> <p>(NY).<sup>34</sup> Of the CSHCN who were previously insured (n = 123), enrollment in SCHIP   was associated with same proportion of children with usual source of care (100% and 99%).</p>	<p>(US).<sup>33</sup> Compared to pre-SCHIP, there was a reduction in unmet dental care needs post-SCHIP for CWCHC (–7.44%).</p> <p>(OH).<sup>26</sup> A significant decrease was shown from pre-ABC¶ to ABC in the number of hospitalizations (means: pre-ABC 0.104 vs 0.049 during ABC, P = .043) and in the number of in-hospital days (means: pre-ABC 0.803 vs 0.251 during ABC, P = .019).</p> <p>(DC).<sup>27</sup> Relative to caregivers of children in FFS, caregivers of children enrolled in MSMC are less likely to rate access as “fair” or “poor” for specialty care (7.3%, P &lt; .01) and for ED# care (4%, P &lt; .01).</p> <p>(DC).<sup>28</sup> About 1.4% of children enrolled in the capitated MC plan had no usual source of care compared to 3.4% of FFS enrollees; furthermore, caregivers of capitated MC plan enrollees were less likely than those of FFS enrollees to report that the usual source of care was a clinic, hospital, or community health center (8.6% vs 14%). Also, about 90% of capitated MC plan enrollees had a regular physician compared with 83% of FFS enrollees. A smaller proportion of children in capitated MC had unmet needs for dental service and medical equipment/supplies, compared to children in FFS (capitated MC, 11.0%–17.3% vs FFS, 15.3%–23.0%, P values &lt; .02).</p> <p>(DC).<sup>30</sup> Enrollees in MSMC were more likely than counterparts in FFS to have consistent access to specialty care (78.7% vs 70.7%) and to a regular doctor (84.4% vs 75.6%). Enrollees in MSMC were less likely than counterparts in FFS to have consistent problems with access to specialty care (5.9% vs 9.2%) and to a regular doctor (4.0% vs 6.7%).</p> <p>(NY).<sup>34</sup> Of the CSHCN who were previously insured (n = 123), enrollment in SCHIP was associated with decreased unmet need for any care (decrease from 45% to 17%), and for specialty care (decrease from 48% to 10%).</p> <p>(NY).<sup>25</sup> Of the CSHCN who were previously insured (n = 166), enrollment in SCHIP was associated with smaller proportion of children with problems getting to USC for asthma checkup (decrease from 10% to 0%).</p> <p>(OR).<sup>23</sup> Required less help with activities of daily living.</p> <p>(MD).<sup>29</sup> Compared to pre-Kids Care (FFS), post-Kids Care (MSMC), enrollment was associated with 23% reduction in the probability of ED use (incidence risk ratio = 0.769).</p> <p>(DC).<sup>31</sup> Children enrolled in HSCSN are significantly more likely to frequently obtain school-based occupational therapy (5.3%, P &lt; .01) and physical therapy (6.2%, P &lt; .01) relative to their FFS counterparts (attributed to MSMC case management and coordination services).</p>
Care utilization	<p>(US).<sup>32</sup> Compared to CWCHC** in Medicaid-FFS, CWCHC in MSMC capitated programs with carved-out specialty services had decreased probability of specialist visits (7.4%), vision care visits (8.2%), and prescription drug use (5.9%)</p>	<p>(MD).<sup>21</sup> Pre-MAC†† and ost-MAC, children eligible for SSI‡‡ demonstrated steady rates of preventive care (~.06 visits per quarter).</p> <p>(TN).<sup>22</sup> Hospitalization rates for children with chronic conditions showed minimal changes (0.8% of all children in Medicaid before TennCare vs 0.6% after TennCare).</p> <p>(US).<sup>33</sup> There were no pre-SCHIP versus post-SCHIP differences in service use for CWCHC.</p> <p>(US).<sup>32</sup> CWCHC in Medicaid-FFS and in MSMC programs (of most types) had similar probabilities of service use.</p>	

(Continued)

Table 4. Summary of Research Findings Concerning MSMC and CSHCN\* (Continued)

Measured Outcomes	Location and Findings of Less Benefit for Children in MSMC	Location and Findings of Similar Benefit for Children in MSMC or FFS†	Location and Findings of More Benefit for Children in MSMC
Care quality		<p>(OH).<sup>30</sup> Comparing pre-ABC to ABC, there was no difference in number of urgent/nonurgent ED visits.</p> <p>(OR).<sup>23</sup> For children in FFS vs MSMC, there were no differences in utilization of hospital, physician, dentist, prescription drug services (data not included in paper).</p> <p>(DC).<sup>31</sup> Plan choice had no impact on the probability that CSHCN received occupational, physical, and/or speech-language therapy service from health care sector.</p> <p>(NY).<sup>24</sup> Of the CSHCN who were previously insured (n = 123), enrollment in SCHIP was associated with similar levels of service utilization (outpatient visits, 95% and 94%, respectively; use of prescription medications, 80% and 87%, respectively).</p> <p>(OH).<sup>30</sup> Of 46 respondents, 3 felt care was poorer after enrollment in ABC, 18 felt care was improved, and 21 felt there had been no change (4 did not respond).</p>	<p>(TN).<sup>22</sup> Compared to pre-TennCare, post-TennCare children with chronic conditions had fewer insurance enrollment gaps 1 year post-hospital discharge (23.3% vs 14.3%, respectively; odds ratio = 0.52 [confidence interval 0.46-0.59]).</p> <p>(NY).<sup>24</sup> Of the CSHCN who were previously insured (n = 123), enrollment in SCHIP was associated with increased proportion of children using USC for most or all health care visits (from 71% to 83%), and decreased proportion of parents reporting worry about child (from 22% to 12%). Average ratings of care quality increased from 8.3 to 9.3 (of 10).*</p>
Care satisfaction	(DC). <sup>31</sup> Less choice of providers	(OR). <sup>23</sup> For children in FFS versus MSMC, there were no differences in levels of satisfaction with physicians (data not included in paper).	
Health care costs		(OH). <sup>30</sup> There was no difference in the cost per month of outpatient, inpatient, urgent ED, or nonurgent ED care between the 2 time periods (pre-ABC vs ABC).	
Health status	Not addressed	Not addressed	Not addressed (One study described parent-reported improvements in health status of children with asthma, but compared SCHIP to no insurance <sup>35</sup> )
Family impact	Not addressed	Not addressed	Not addressed

\*MSMC = Medicaid/State Children's Health Insurance Program managed care; CSHCN = children with special health care needs.

†FFS = fee-for-service.

‡HSCSN = Health Services for Children with Special Needs, Inc.

§MC = managed care.

||SCHIP = State Children's Health Insurance Program.

¶ABC = Access to Better Care.

#ED = emergency department.

\*\*CWCHC = children with chronic health conditions.

††MAC = Maryland Access to Care.

‡‡SSI = Supplemental Security Income.

compared to FFS. Three studies concerning access to care for CSHCN in the Washington, DC MSMC plan (compared to those in FFS) noted fewer children with consistent problems accessing specialty care (5.9% vs 9.2%, respectively) and regular medical care (4.0% vs 6.7%, respectively)<sup>30</sup>; fewer children with unmet needs for dental services (17.3% vs 23.0%, respectively) and medical equipment (11.0% vs 15.3%, respectively)<sup>28</sup>; and decreased likelihood that caregivers rated access as "fair" or "poor" for specialty care (by 7.3%) and for emergency department (ED) care (by 4%).<sup>27</sup> Similar findings were noted by Szilagy and colleagues<sup>25</sup> in studies of the New York SCHIP experience, in which analyses compared children with insurance (some with Medicaid) before SCHIP and after enrolling in SCHIP. For children with asthma, SCHIP enrollment was associated with a decrease in proportions of children with problems accessing a usual source of care for asthma checkups (from 10%–0%). For children with a broader range of chronic conditions, SCHIP enrollment was associated with fewer unmet needs for any care (17% vs 45%, respectively) and for specialty care (10% vs 48%, respectively).<sup>24</sup> A national study demonstrated a decrease in unmet dental needs post-SCHIP for children with chronic health conditions.<sup>33</sup>

#### Care Utilization

Here, study findings were more disparate. Most articles suggested that MSMC and FFS had similar levels of service utilization by CSHCN.<sup>21–24,26,31–33</sup> Across studies, there were measurements of hospitalization rates, urgent/nonurgent ED visits, physician and dental care, therapeutic services, and use of prescription medications. One study addressed capitated MSMC programs with carved-out specialty services<sup>32</sup>; children with chronic health conditions in MSMC, compared with those in FFS, demonstrated decreased probability of specialist visits (by 7.4%), vision care visits (8.2%), and prescription drug use (5.9%). This finding is notable, as the proportion of children enrolled in plans with carved-out arrangements has been increasing.<sup>32</sup> Three findings concerning health care utilization suggest that MSMC can have a beneficial effect on CSHCN, with reduced ED use in Michigan<sup>29</sup> and fewer requirements for help with activities of daily living in Oregon.<sup>23</sup> In Washington, DC, CSHCN in MSMC were more likely to obtain school-based occupational and physical therapy at school sites; this was attributed to MSMC case management and coordination services.<sup>31</sup> Drawing any conclusions based on these findings is difficult, as the represented managed care programs are heterogeneous in nature.

#### Care Quality

Two quality-of-care findings suggest a beneficial effect of MSMC compared with Medicaid FFS. In Ohio, quality of care improved,<sup>26</sup> and in Tennessee enhanced continuity of enrollment was noted.<sup>22</sup> In the Ohio-based study, Grossman and colleagues<sup>26</sup> reported little difference in enrollment continuity; however, the sample size was small (N = 46), representing slightly more than 1% of eligible children.

#### Care Satisfaction

Two articles addressed satisfaction with care. Schuster and colleagues<sup>31</sup> noted diminished caregiver satisfaction resulting from decreased provider choice when children were enrolled in the DC managed care plan. In Oregon, Mitchell and colleagues<sup>23</sup> reported similar levels of satisfaction with physicians, whether MSMC or FFS. The Oregon Health Plan is a capitated integrated model with mandatory enrollment, although there are possible exemptions based on need for multiple specialists or other health insurance. Such exemptions may account for the absence of utilization differences.

#### Health Care Costs

The reviewed studies provided little information on health care costs. One study in Ohio reported no difference in cost per month of outpatient, inpatient, urgent ED, or nonurgent ED care between the time period before and during MSMC.<sup>26</sup>

#### Health Status

An important article describing a study of the New York SCHIP program specifically addressed children with asthma.<sup>25</sup> When asthmatic children enrolled in SCHIP were compared with the period with no insurance, significant parent-reported improvements were noted (eg, fewer asthma-related attacks, asthma medical visits, and hospitalizations for acute exacerbations of asthma). However, the article did not describe health outcomes for SCHIP related to other insurance coverage plans.

### DISCUSSION

This review was conducted to provide a detailed, technical foundation for assessing the utility of MSMC for children with complex medical conditions. The need for such a review has been made more acute by the continued enrollment of CSHCN in MSMC programs across the country, as well as the imminent prospect for major revisions in publicly funded health programs as part of health care reform.<sup>34</sup> From this perspective, the findings of this review suggest that there is only a relatively weak evaluative basis for guiding policy decisions regarding the utility of MSMC for CSHCN. There remain relatively few evaluations that have addressed this issue, and the evaluations that have been done are highly heterogeneous in their studied populations and methodologies. Although the examined studies do offer a variety of specific insights into the current experience with MSMC for CSHCN, the general findings of this review underscore the need for a more rigorous and coordinated effort to assess the potential utility of MSMC for CSHCN at a time serious chronic illness in children accounts for a growing portion of all hospitalizations, costs, and mortality in childhood.<sup>35</sup>

It is useful to consider these results in relation to recent evidence concerning Medicaid managed care for children in general and for disabled adults. Overall, studies demonstrate mixed effects on access and utilization. One national study of general populations of children found that

mandatory primary care case management programs improved access and utilization relative to traditional FFS Medicaid.<sup>36</sup> Further, an evaluation of well-child care in Colorado documented major reductions in essential services after MSMC was replaced with a FFS.<sup>14</sup> However, a study of Connecticut's MSMC program noted significant deficiencies in well-baby care.<sup>37</sup> Similarly, mixed findings have characterized evaluations of Medicaid managed care for adults. Bindman and colleagues<sup>38</sup> reported significantly reduced hospitalizations for ambulatory care sensitive conditions associated with the introduction of Medicaid managed care for both children and adults in California, and an earlier study in New York City documented enhanced satisfaction among beneficiaries enrolled in Medicaid managed care.<sup>39</sup> However, a recent study of MSMC for disabled adults suggested that MSMC was associated with reduced access to services, particularly referrals for specialty care.<sup>40</sup>

A central justification for MSMC has been the contention that it would improve the coordination of services, encourage the use of preventive health services, and provide an enhanced infrastructure for a medical home for CSHCN.<sup>3,21,36</sup> However, the examined studies suggest that the record of MSMC in this regard has been mixed. There was some evidence of improved satisfaction as well as improved care utilization when MSMC programs were purposefully designed for CSHCN and included a series of care coordination interventions and enhanced provider reimbursement.<sup>23,28,30</sup> These findings are consistent with general arguments that MSMC programs have the potential to improve the quality and coordination of child health services if such programs are carefully crafted to meet the special requirements of children.<sup>41,42</sup> However, our review did not find substantive support for the expectation that the shift of CSHCN from Medicaid FFS to MSMC will result in reduced costs.<sup>43</sup> Only 1 study examined this issue, and it suggested that MSMC had no effect on the cost per month of outpatient, inpatient, urgent ED, or nonurgent ED care.<sup>26</sup>

The findings of this review strongly support recent calls for expanded research into policy and practice structures that best serve patients with complex medical needs. Although the heterogeneity of MSMC programs present a major challenge to any evaluative strategy, it may also generate opportunities to assess a variety of programmatic innovations, which in turn may provide important guidance for crafting more responsive and efficient delivery systems. Of special concern is the assessment of impact of different financial structures on care coordination, quality, and costs, a task that demands greater integration of economic, health services, and clinical expertise. In addition, the lack of insight into the impact of different MSMC systems on actual health outcomes or the impact on the family deserves urgent attention. Moreover, promising elements of already evaluated MSMC and FFS care coordination programs should be considered an important empirical resource and used as a foundation for innovations on a larger scale, which should be rigorously assessed. However, the scale and complexity of such a research

agenda would require greater coherence in the design and funding of the requisite evaluative efforts, a challenge that might best be addressed by federal initiatives and the involvement of relevant professional organizations.

## Conclusion

Overall, the reviewed body of scientific work provides a complex, though incomplete, picture of the impact of MSMC on CSHCN. The findings of the reviewed studies suggest mixed results regarding access, utilization, unmet needs, and satisfaction. In addition, little information is available on child health outcomes and costs. Such a relatively weak evidence base lies in stark contrast to the large-scale implementation of MSMC and the growing importance of chronic illness among children in the United States. The findings of this review, therefore, suggest some caution should be exercised in implementing managed care programs for poor children with complex medical needs. In addition, a greatly expanded and coordinated research effort into the policy and programmatic requirements of such care will help ensure that the specific requirements of CSHCN will be articulated and that any period of reform will ultimately improve the quality and efficiency of services provided this highly vulnerable population of children.

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## SUPPLEMENTARY DATA

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.acap.2009.09.007.

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