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Outpatient Utilization by Infants Auto-assigned to Medicaid Managed Care Plans

Joseph S. Zickafoose, Lisa M. Cohn, and Sarah J. Clark

Child Health Evaluation and Research Unit, Division of General Pediatrics, University of Michigan, 300 North Ingalls, Ann Arbor, MI 48109, USA

Joseph S. Zickafoose: jzickafoose@mathematica-mpr.com

Abstract

To test the hypothesis that infants auto-assigned to a Medicaid managed care plan would have lower primary care and higher emergency department (ED) utilization compared to infants with a chosen plan. Retrospective cohort study. Medicaid administrative data were used to identify all children 0–3 months of age at enrollment in Michigan Medicaid managed care in 2005–2008 with 18-months of subsequent enrollment. Medicaid encounter and state immunization registry data were then acquired. Auto-assigned infants were compared versus chosen plan infants on: (1) well-child visits (WCVs); (2) immunizations; (3) acute office visits; and (4) ED visits. Chi squared and rank-sum tests and logistic and negative binomial regression were used in bivariate and multivariable analyses for dichotomous and count data, respectively. 18 % of infants were auto-assigned. Auto-assigned infants were less likely to meet goal number of WCVs in 18-months of managed care enrollment (32 vs. 53 %, $p < 0.001$) and to be up-to-date on immunizations at 12 months of age (75 vs. 85 %, $p < 0.001$). Auto-assigned infants had fewer acute office visits (median: 4 vs. 5, $p < 0.001$) but were only slightly more likely to have 2 or more ED visits (51 vs. 46 %, $p < 0.001$) in 18-months of enrollment. All results were significant in multivariable analyses. Auto-assigned infants were less likely to use preventive and acute primary care but only slightly more likely to use emergency care. Future work is needed to understand mechanisms of differences in utilization, but auto-assigned children may represent a target group for efforts to promote pediatric preventive care in Medicaid.

Keywords

Medicaid; Managed care; Primary care; Pediatrics

Introduction

Most states have turned to mandatory managed care in Medicaid as a mechanism to meet goals for controlling costs while maintaining or improving access and quality [1]. In 2009, over 70 % of Medicaid enrollees nationally were enrolled in some form of managed care [2], and healthy children are a key target group for mandatory managed care enrollment [2]. The economic recession and related state budget crises have accelerated states efforts to shift more Medicaid enrollees into mandatory managed care [3].

When managed care is mandatory, Medicaid enrollees are typically given a choice of more than one plan. When enrollees do not choose a managed care plan, Medicaid programs need a mechanism to assign enrollees to a plan [4]. This process is typically referred to as auto-assignment. Early in the advent of Medicaid managed care, concerns were raised about the potential for auto-assignment to lead to geographic, cultural, or linguistic mismatches between enrollees and their managed care plan and primary care provider, resulting in negative effects on preventive health care utilization [4, 5]. However, there are few published studies of auto-assignment [6, 7], and none that examine associations between auto-assignment and health care utilization at the patient level.

There are compelling reasons to examine the association between auto-assignment and health care utilization for children in Medicaid. In addition to potential mismatches between family's needs and plan services [4, 5], auto-assignment could disrupt primary care continuity if the child is assigned to a plan that their current provider does not accept. Alternatively, the lack of plan selection by parents could be an endogenous marker for other factors associated with health care utilization, such as pre-existing barriers to care, including language differences, low literacy, parental mental health problems, or other complex social needs [8]. Auto-assignment could also represent a lower priority placed on preventive primary care by some parents [8]. These possibilities raise concern about the potential for low interaction with primary care and increased reliance on the emergency department (ED) for auto-assigned children.

Michigan Medicaid has had mandatory managed care for most populations statewide since 1995, including healthy children [5]. During the period of this study (2005–2008), infants were eligible for Michigan Medicaid if household income was 185 % of the federal poverty level. Parents of children enrolling in Michigan Medicaid were given the option of choosing a managed care plan when more than one plan operated in their county. If the parent did not select a plan within 2–3 weeks, their information was referred to a local community-based organization who attempted to contact the parent to encourage choice of a plan. When parents did not choose a plan for their child within 30 days, the child was auto-assigned to a plan. Despite state and local outreach to encourage plan selection, nearly 30 % of enrollees of all ages in Michigan Medicaid were auto-assigned [9]. Auto-assigned individuals were allowed to change plans within the first 3 months of enrollment and then at annual re-enrollment.

This study sought to address the following research objectives: (1) to compare preventive primary care utilization between infants with an auto-assigned versus chosen managed care plan; and (2) to compare acute primary care and ED utilization between infants with an auto-assigned versus chosen plan. We hypothesized that auto-assigned infants would attend fewer well-child visits (WCVs) and be less up-to-date on immunizations. We also hypothesized that auto-assigned infants would have fewer acute office visits and consequently more ED visits, as a result of substitution of the ED for visits that could have occurred in the primary care setting. Additionally, we assessed how many auto-assigned infants changed managed care plans within the first 3 months of enrollment, as an indicator of parents' engagement in the managed care enrollment process after auto-assignment and potential additional administrative burdens for the state Medicaid program and managed care plans, and compared utilization for these infants to those who did not switch plans.

Methods

Sample and Design

We performed a population-based cohort study of infants 0–3 months of age at the time of their enrollment in Michigan Medicaid managed care during 2005–2008. We chose this

young age group because of the higher intensity of routine preventive and acute health care interactions in the first 2 years of life. Michigan Medicaid had 12-month continuous eligibility for children during this time period, but in order to track utilization over multiple time intervals during early childhood, we required 18-months of continuous enrollment in the study sample. We used Medicaid claims data to construct a longitudinal analysis file of outpatient and ED utilization, and this was linked to the state immunization registry. Infants were excluded if they were exempted from mandatory managed care in Medicaid, including those enrolled in the state Title V program for children with special health care needs and those residing in a county with only one managed care plan. We also excluded infants with auto-assignment after managed care enrollment, which occasionally occurs for administrative reasons, such as plan closure or consolidation. All included children had 18-months of claims data following their enrollment in Medicaid; no children were excluded for censored data.

Measures of Utilization

Preventive care utilization measures included attendance at an expected number of WCVs and up-to-date immunizations. WCVs were identified using ICD-9-CM diagnosis (V202, V700, V703, V705-6, V708-9) and CPT procedure codes (99381-3, 99391-3, 99432); a visit was classified as a WCV if any of these codes were present, regardless of whether it was a primary or secondary code for the visit. Children were expected to attend six or more WCVs in the first 18-months of enrollment in managed care based on the schedule recommended by the American Academy of Pediatrics [10]. Although not identical, this approach is similar to a core quality measure in the Healthcare Effectiveness Data and Information Set (HEDIS) for well-child visit attendance in the first 15-months of life [11]. We then divided WCV attendance into 6-month intervals, with an expectation of two or more visits in each interval, to assess whether any differences in utilization were specific to the time period immediately following auto-assignment or were persistent through the 18-months following auto-assignment. Immunization status was determined at 7 and 12 months of age based on the 2005 Advisory Committee on Immunization Practices schedule, allowing a 1-month catch-up period after the recommended interval for each immunization [12]; immunization status was coded as a dichotomous measure (up-to-date vs. not up-to-date). We also assessed the proportion of infants who received any routine immunizations (not including influenza) in a health department.

Acute care utilization in the first 18-months of managed care enrollment was measured using counts of acute office visits (procedure codes 99201-5, 99211-5, 99241-5, 99354-5) and ED visits (revenue code 045x, representing hospital based care received in an ED). The acute office visit measure was designed for the purposes of this study from standard non-preventive care outpatient visit procedure codes. The ED visit measure differs from the HEDIS ED visit measure in that it is over an 18-month time frame and limited to the facility revenue code, not including professional claims [11]. We did not include ED professional claims to avoid an over-count of ED visits that can occur when a single visit spans two calendar dates with a professional claim on one date and a facility revenue code on another date. We report these results using medians and interquartile ranges due to the highly skewed distribution of these count variables. Additionally, as a measure of repeat ED use, we examined the proportion of infants with two or more ED visits in the full 18-month study period. As with WCVs, we then assessed acute office and emergency care utilization in 6-month intervals after enrollment to assess whether any differences in utilization were specific to the time period immediately following auto-assignment or were persistent through the 18-months following auto-assignment.

Independent Variables

Auto-assignment to a managed care plan was the primary independent variable of interest and was determined by an indicator in the Medicaid data for the first month of managed care enrollment. In multivariable models, we adjusted for covariates known or hypothesized to be associated with preventive and acute care utilization, including age at enrollment (in months), race/ethnicity [13], residence in an urban versus rural county [14], and the level of neonatal care received, as a proxy for early increased medical needs. The level of neonatal care was classified as routine versus more than routine, using newborn nursery revenue codes (0171 representing routine newborn nursery care and 0172–0174 representing increasing levels of care, including intensive care). We also adjusted for region of the state and the specific managed care plan enrolled into control for differences in access to provider networks that could influence utilization. Additionally, we identified infants with any other insurance listed, which could result in incomplete capture of utilization in the Medicaid data.

Analysis

For the dichotomous measures of meeting a goal number of WCVs and up-to-date immunizations, we compared infants with an auto-assigned versus a chosen plan in bivariate analyses using the Chi squared test and in multivariable analyses using logistic regression with results reported as adjusted odds ratios. To control for potential WCV attendance in the lag-time between Medicaid enrollment and managed care enrollment, logistic models for WCVs also controlled for WCVs attended prior to managed care enrollment. In a sensitivity analysis, results were unchanged after exclusion of this variable.

Due to the count data for acute office and ED visits, we used the rank-sum test and negative binomial regression for bivariate and multivariable analyses, respectively, with results reports as adjusted incidence rate ratios. The Chi squared test was used to compare the proportion of infants with two or more ED visits in 18-months of managed care enrollment.

We performed sensitivity analyses for preventive and acute care utilization measures, excluding infants with any other insurance listed. We then repeated all analyses comparing utilization by infants who changed managed care plans in the first 3 months of enrollment with those who did not change plans, for both the auto-assigned and chosen plan groups.

Data on auto-assignment were complete for the study population. In merging Medicaid claims data with the state immunization registry, we were unable to match immunization data for 2.9 % of the population. Data on race/ethnicity was missing in 1.1 % of the population, and the level of neonatal care was missing in 18.6 %. All other independent and outcome variables had complete data. All analyses were performed using Stata 10.1 (StataCorp LP, College Station, TX).

Human Subjects Review

This study was approved by the University of Michigan Institutional Review Board.

Results

The final sample included 50,087 infants 0–3 months of age at enrollment in Medicaid managed care with 18-months of continuous enrollment (Fig. 1). Compared to the study population, excluded infants were slightly older, more likely to be Caucasian, and more likely to reside in a rural county; 30 % of excluded infants were auto-assigned to a managed care plan. The median number of plans to choose from per county with more than one plan was four (mean = 3.9).

Eighteen percent of infants in the study were auto-assigned (Table 1). Compared to infants with a chosen plan, the group of auto-assigned infants had higher proportions who were older at managed care enrollment, from racial/ethnic minority groups, and who lived in a rural county (Table 1). The intensity of neonatal care was similar between the two groups.

Preventive Care Utilization

Auto-assigned infants were significantly less likely to meet a goal of six or more WCVs in the first 18-months of managed care enrollment (32 vs. 53 %, $p < 0.001$). This difference remained significant after adjusting for age at enrollment, WCVs prior to enrollment, and other covariates [adjusted odds ratio (AOR): 0.52 (95 % CI 0.50–0.55)]. Auto-assigned infants were less likely to attend 2 or more WCVs in each of the 6-month intervals after enrollment (Table 2). These differences were also significant in multivariable analyses (data not shown).

Auto-assigned infants were less likely to be up-to-date on immunizations at age 7 months (53 vs. 67 %, $p < 0.001$). The difference in up-to-date immunizations between groups was smaller but still significant at 12 months of age (75 vs. 85 %, $p < 0.001$) (Table 2). These differences remained significant in multivariable analyses [AOR at age 7 months: 0.52 (95 % CI 0.49–0.55) and age 12 months: 0.67 (95 % CI 0.59–0.76)]. Auto-assigned infants were slightly more likely to have received one or more immunization(s) at a health department (22 vs. 16 %, $p < 0.001$).

Acute Care Utilization

Auto-assigned infants had fewer acute office visits in the first 18-months of enrollment compared to infants with a chosen plan [unadjusted incidence rate ratio (IRR): 0.78 (95 % CI 0.77–0.81), $p < 0.001$]. In multivariable analyses, the rate of acute office visits was 19 % lower for auto-assigned infants in the first 18-months [adjusted IRR: 0.81 (95 % CI 0.79–0.83), $p < 0.001$], and this lower rate of utilization was consistent across each of the 6-month intervals (Table 3).

However, auto-assigned infants had only slightly more ED visits over the first 18-months [unadjusted IRR: 1.13 (95 % CI 1.10–1.16), $p < 0.001$]. In other terms, slightly more auto-assigned infants had 2 or more ED visits in 18-months (51 vs. 46 %, $p < 0.001$). In multivariable analyses, this equated to only a 9 % higher rate of ED visits [adjusted IRR: 1.09 (95 % CI 1.06–1.12), $p < 0.001$] (Table 3). This difference in ED visit utilization was highest in the first 6-months and approached non-significance by the third 6-months of the study period (Table 3).

Sensitivity Analyses

There was a minimal difference between the groups in the proportion of infants reporting other insurance for any period of time during managed care enrollment (auto-assigned plan: 2.1 % versus chosen plan: 2.5 %, $p = 0.049$). There were no substantive differences in overall preventive and acute care utilization in sensitivity analyses excluding infants with any other insurance listed.

Preventive and Acute Care Utilization by Infants Who Changed Managed Care Plans After Enrollment

A significantly higher proportion of auto-assigned infants changed managed care plans in the first 3-months of enrollment compared to infants with a chosen plan (19 vs. 6 %, $p < 0.001$). Compared to those who did not change their plan, auto-assigned infants whose parent changed their plan were more likely to meet goals for WCVs and to be up-to-date on

immunizations (Table 4). However, they were still less likely to meet these goals than infants with a chosen plan. Auto-assigned infants who changed plans attended more acute office visits [visits in 18-months of enrollment, median (interquartile range): 4 (2–9)] than auto-assigned infants who did not change plans [3 (1–7)], with utilization closer to that of infants with a chosen plan (Table 4). Auto-assigned infants who changed plans did not differ from other auto-assigned infants in ED use.

Discussion

In Michigan Medicaid, we found that auto-assigned infants are significantly less likely to meet goals for preventive care compared to infants with a chosen plan. To our knowledge, this is the first study to document patterns of utilization for an auto-assigned population. Auto-assigned infants attended fewer WCVs, which may put them at risk for missing a wide range of preventive care. We found that auto-assigned infants were less likely to be up-to-date on immunizations, although differences were likely mitigated by obtaining immunizations at local health departments. Decreased interactions with primary care may also put auto-assigned infants at risk for missing other preventive care screenings and interventions with implications for long-term health, including longitudinal growth assessment, developmental screening and referral, and lead and anemia screening.

Mandatory Medicaid managed care is increasingly used by states as a mechanism to control costs while maintaining primary care access and quality [2, 15]. Auto-assignment to a managed care plan is a necessary process when enrollees do not choose a plan and will likely be a necessary part of future expansions of Medicaid managed care. As mandatory managed care expands in Medicaid programs, it will become increasingly important to document auto-assignment rates and utilization patterns for auto-assigned populations. It will become important to understand how utilization patterns are influenced by the process of auto-assignment itself versus inherent differences in the auto-assigned population.

Auto-assigned infants were also less likely to have office visits for acute care. It is not clear if this is due to fewer visits that could be considered discretionary or delay in care for more serious conditions. Whatever the cause of fewer acute office visits in the auto-assigned group, this did not lead to an equivalent increase in ED utilization. The minimal differences in ED use are unlikely to be clinically meaningful and suggest that parents of auto-assigned infants were not substantively more likely than their chosen plan counterparts to substitute ED care for primary care or delay attention to illness until it required ED care.

Our findings suggest potential opportunities to decrease the rate of auto-assignment. A significant proportion (19 %) of auto-assigned infants change Medicaid managed care plans within the first 3-months of enrollment, and these children were more likely to receive preventive and acute care in the primary care setting. These findings suggest that there is at least a sub-group of parents of auto-assigned infants who become more engaged in selecting a managed care plan for their child after the initial enrollment process. It is possible that changes could be made to better engage parents during the initial enrollment process and avoid the later administrative burden of a plan change. Birth hospitals are potentially efficient sites of intervention to encourage parents of infants eligible for Medicaid to select a plan and provider and to engage in preventive health care for their children.

The findings of this study should be viewed in light of several key limitations. First, our analyses were for a single state and may not generalize to other Medicaid programs. Second, there is the potential for administrative claims and immunization registries to have incomplete data on utilization. However, we have no reason to suspect that missing data would be systematically different between the auto-assigned and chosen plan groups. Third,

without more direct measures of unmet need, it is unclear if lower rates of WCVs are likely to impact the health status of auto-assigned children. Finally and most notably, we cannot determine if the differences found by auto-assignment status in this study were due to a direct effect of the auto-assignment process, such as through assignment to a plan that is not accepted by a preferred primary care provider, or to underlying differences between the groups in barriers to care or the priority placed on preventive health care.

Despite these limitations, the results of this study have several important implications for state Medicaid programs and Medicaid managed care plans. First, auto-assignment could be used as a prospective marker for children at risk for low utilization of primary care. Well-child care is the cornerstone of preventive care for children and visit attendance in the first 15-months of life is a core quality measure in the HEDIS [11]. Auto-assigned children could represent a key target group for efforts to promote preventive care for children in Medicaid, including reminder/recall systems at the practice or plan level, incentive programs for attending preventive care visits or more intensive care management programs. If interventions can be designed to be effective in the challenging auto-assigned population, they are likely to be highly effective in the broader Medicaid population.

Second, the process of auto-assignment has the potential to disrupt continuity between families and their established primary care provider if the provider does not accept the auto-assigned plan. Medicaid programs and managed care plans should consider examining whether auto-assignment disrupts connections to primary care. Additionally, further study is needed to understand the reasons for reduced primary care utilization among the auto-assigned group. Future research should assess whether the auto-assigned population has increased barriers to care, such as low literacy, language barriers, competing family needs, or low priority placed on preventive care.

Third, utilization by the auto-assigned population could have significant effects on managed care plans' quality measures. Notably, several states direct more auto-assigned enrollees managed care plans with higher quality scores, using the capitated payments of more enrollees as an indirect financial incentive for plan quality improvement [6]. If the auto-assigned population has low utilization on important quality measures such as WCVs and immunization and are less responsive to traditional quality improvement initiatives, a higher percentage of auto-assigned enrollees could lower a plan's quality rankings.

Fourth, more information is needed about the benefits and risks of different strategies to minimize auto-assignment. Since the time period of this study, Michigan Medicaid has begun to enroll newborns of women on Medicaid into the same managed care plan as their mother, unless the mother actively requests another plan. While this strategy may minimize delays in managed care enrollment and work well in settings of broad managed care participation by pediatric providers, it may be disruptive if a significant proportion of pediatric providers are not part of the same managed care networks as obstetrics providers. Ongoing efforts will be needed to ensure that parents are aware of the need for and importance of plan choice.

Finally, additional research is needed to understand the roles of health plans and providers in successfully engaging challenging groups such as the auto-assigned population. Plans frequently engage in efforts to promote preventive care through outreach and incentives [16]; the effectiveness of these efforts should be assessed in the auto-assigned population. Providers may also play a role in engaging auto-assigned enrollees through outreach, including preventive care reminders, and the accessibility of office hours and location.

In conclusion, infants in Medicaid who are auto-assigned to a managed care plan have important differences in health care utilization from those with a chosen plan, most notably

decreased use of preventive primary care. Future work is needed to better understand the mechanisms of differences in utilization, but auto-assigned children may represent a key target group for efforts to promote pediatric preventive care in Medicaid programs.

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Fig. 1.
Cohort diagram for infants 0–3 months of age at enrollment in Michigan Medicaid managed care, 2005–2008

Table 1

Characteristics of infants 0–3 months of age at enrollment with 18-months of continuous enrollment in Michigan Medicaid managed care, 2005–2008

	Auto-assigned plan infants	Chosen plan infants
% of total population (n)	18 (9,078)	82 (41,009)
Female (%)	49	49
Age (%)		
0–1 month	38	52 ^a
2 months	21	28
3 months	41	20
Race/ethnicity (%)		
Caucasian	47	56 ^a
African-American	42	34
Hispanic	9	7
Other/unknown	2	3
Rural county of residence (%)	14	11 ^a
Level of neonatal care (%)		
Routine	75	71 ^a
More than routine	11	10
Unknown	14	19

^a
 $p < 0.001$

Table 2

Well child visit attendance and immunization status for infants 0–3 months of age at enrollment in Michigan Medicaid managed care by auto-assignment status, 2005–2008

	Auto-assigned plan children %	Chosen plan children %	Adjusted ^b odds ratios for auto-assigned versus chose plan children (95 % CI)
Well child visit (WCV) attendance			
2 WCV in 1st 6 months of enrollment	70	86 ^a	0.46 (0.44–0.49) ^c
2 WCV in 2nd 6 months of enrollment	44	58 ^a	0.60 (0.57–0.63)
2 WCV in 3rd 6 months of enrollment	28	41 ^a	0.62 (0.59–0.65)
6 WCV in 18 months of enrollment	32	53 ^a	0.52 (0.50–0.55) ^c
Immunization status			
Up-to-date at age 7 months	53	67 ^a	0.53 (0.51–0.56)
Up-to-date at age 12 months	75	85 ^a	0.51 (0.48–0.55)

^aDifferences between groups significant at $p < 0.001$

^bAdjusted for age at enrollment, race/ethnicity, urban versus rural county, managed care plan, and the level of neonatal care received

^cAdditionally, adjusted for WCVs attended prior to managed care enrollment

Table 3

Acute office and ED utilization for infants 0–3 months of age at enrollment in Michigan Medicaid managed care by auto-assignment status, 2005–2008

Time interval after managed care enrollment	Auto-assigned plan, median (IQR)	Chosen plan, median (IQR)	Adjusted incidence rate ratio ^a for infants with an auto-assigned versus chosen plan (95 % CI)
Acute office visits			
18 months	4 (1–7)	5 (2–9)	0.81 (0.79–0.83)
1st 6 months	1 (0–3)	1 (0–3)	0.83 (0.81–0.85)
2nd 6 months	1 (0–3)	2 (0–3)	0.81 (0.79–0.83)
3rd 6 months	1 (0–2)	1 (0–3)	0.80 (0.77–0.82)
ED visits			
18 months	2 (0–3)	1 (0–3)	1.09 (1.06–1.12)
1st 6 months	0 (0–1)	0 (0–1)	1.15 (1.10–1.19)
2nd 6 months	0 (0–1)	0 (0–1)	1.08 (1.04–1.11)
3rd 6 months	0 (0–1)	0 (0–1)	1.04 (1.00–1.08)

ED emergency department; IQR interquartile range

^a Adjusted for age at enrollment, race/ethnicity, urban versus rural county, managed care plan, and the level of neonatal care received

Table 4

Preventive and acute care utilization for infants 0–3 months of age at enrollment in Michigan Medicaid managed care by auto-assignment status and change of managed care plan within the first 3-months of enrollment

	Auto-assigned plan infants		Chosen plan infants	
	No change in plan	Changed plan	No change in plan	Changed plan
6 WCVs ^a , %	31	37	53	59
Immunizations up-to-date ^b , %	74	81	85	88
ED visits ^a , median (IQR)	2 (0–3)	2 (0–3)	1 (0–3)	1 (0–3)
Acute office visits ^a , median (IQR)	3 (1–7)	4 (2–9)	5 (2–9)	5 (2–10)

IQR interquartile range

^a In 18-months of managed care enrollment

^b At 12 months of age