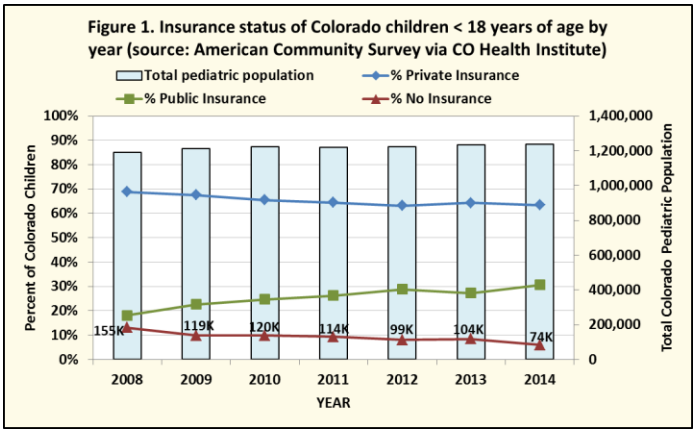
The Business Case for Improving Medical Home Care for Colorado Children While Reducing Their Emergency Department and Hospital Utilization

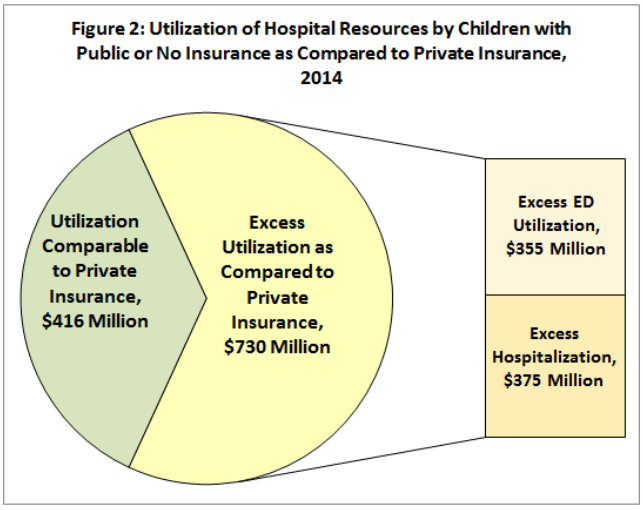
Carl Armon PhD, James Gaensbauer MD, Edwin Asturias MD and James Todd MD

This report summarizes our analysis of 2014 trends in Colorado emergency department (ED) and hospital utilization rates for children with public or no insurance (Public/No) compared to children with private insurance .[1] It reaches four important conclusions:

- Increasing numbers of Colorado children are covered with public health insurance.
- Compared to privately insured children, more Colorado children with public or no health insurance have emergency department visits (66.7 % vs. 15.3%) and hospitalizations (3.3% vs. 1.5%) with excess costs of overutilization amounting to hundreds of millions of dollars per year.
- Proven "medical home" strategies could be implemented to reduce excess ED and hospital utilization, resulting in improved care and significant cost savings for publicly insured children.
- A proposed reduction in primary care provider reimbursement rates will likely decrease medical home access and increase excess ED and hospital utilization costs for publicly insured children.

Since 2000, there has been a gradual increase in the percentage of Colorado children covered by public health insurance, compensating for a decrease in those covered by private insurance while significantly reducing the percentage of children with no health insurance (Figure 1). This trend has continued to accelerate with the implementation of the Affordable Care Act, almost doubling the number of publicly insured children and requiring a substantial expansion of provider access. In spite of improved coverage, there remain substantial, but potentially avoidable, disparities between ED visit rates and hospital discharge rates for children with Public/No insurance as compared to children with private health insurance[1].





The actual costs of such excess utilization ($731 million in annual charges; $194 million adjusted for actual reimbursement) suggest a compelling business case to redirect funding incentives to invest in expanded primary care access, while simultaneously reducing more expensive and often avoidable ED visits and hospitalizations (Figure 2). The return on investment for such a policy redirection could be immediate, if resources were used to expand and improve continuity and care coordination, after-hours and weekend phone triage and acute primary care access. Decreasing primary care reimbursement rates, which currently barely cover breakeven expenses of many of the small business practices that provide medical home care for children in Colorado, will likely result in a decrease in primary care access and the unintended consequence of increased ED and hospital utilization and costs.[2]

ED Utilization

If ED visitation rates for privately insured children are assumed to represent the optimal result of timely, coordinated and readily available primary health care, then the notable statewide differences in ED visits for children with public or no health insurance suggest opportunities to redirect systems and funding to improve access and utilization of the primary care medical home. As summarized in Table 1, ED visitation rates for children with Public/No insurance were 4.4 times greater than children with private insurance, resulting in excess 2014 charges of $355 million. Our data estimates that two thirds of Colorado children with public health insurance visited an emergency department in 2014 rather than a much less expensive primary care setting. Children with public or no health insurance were more likely to be seen in an ED during weekday hours, further suggesting lack of access to and/or under-utilization of a medical home. Similarly, Public/No children are more likely to be seen in the ED for common, self-limited illnesses such as: acute upper respiratory infection, strep sore throat, constipation and viral illness—non-emergent conditions often more effectively resolved with phone triage or same/ next day medical home visits. ED visits for a single, uncomplicated common illness for children with public or no insurance were 5.9 times more frequent than such visits for children for private insurance. These findings all imply that if these children had access to (and appropriately utilized) a readily accessible medical home, many ED visits could have been prevented with lower resultant charges to public insurers.

Table 1: Emergency Department and Hospital Utilization by Colorado Children with Public or No Health Insurance as Compared to Children with Private Health Insurance - 2014

Population	Private Insurance Comparitor	Public or No Insurance Children
Emergency Department	ED visits per 100,000 insured	4.4 times more visits
	Uncomplicated ED visits for common complaints	5.9 times more visits
	Daytime ED visits on a weekday	5.2 times more visits
	Estimated excess annual charges	$355 million more
	Estimated excess annual payments	$70.1 million more
Hospital	Hospitalizations per 100,000 Insured	2.1 times more hospitalizations
	% with High Severity of Illness	5% higher
	Weekend Admission	not significantly more frequent
	After-hours Admission	14% more freqent
	Estimated excess annual charges	$375 million more
	Estimated excess annual payments	$116 million more
Total	Excess charges	$731 million more
	Estimated excess annual payments	$194 million more

Hospitalization Rates for Colorado Children

If hospitalization rates for privately insured children are assumed to reflect timely access to primary health care, children with Public/No insurance have notable statewide differences that suggest the need to improve access and utilization of the medical home and reduce avoidable costs of preventable hospitalizations. Of the 26,875 hospital admissions of Colorado children less than 18 years of age in 2014, 14,814 (55%) were among children with public or no insurance, although this group represents only 37% of Colorado's pediatric population. As shown in Table 1, hospital admission rates in 2014 for children with public or no insurance were 2.1 times the rates for children with private insurance, resulting in excess hospital charges of $351 million. Children with public or no health insurance were more likely than privately insured children to be hospitalized after hours, suggesting a potential role for expanded access to acute primary care in reducing hospital utilization. Furthermore, the severity of illness of children with Public/No insurance was significantly greater than for privately insured children suggestive of delays in seeking appropriate care. For many common conditions, hospitalization rates for children with public or no insurance were significantly greater than those rates for privately insured children. These higher rates may indicate lack of access to a comprehensive medical home that could address acute illness before it becomes severe enough to need more resource-intensive care.

Opportunities to Improve Care and Reduce Cost by Use of the Medical Home

The results of our current analysis indicate that there are significant, potentially reducible, disparities between children with public or no health insurance and children with private health insurance. This should not be interpreted as evidence that public insurance is inferior to private insurance. Rather it would appear families with public or no health insurance utilize primary care, urgent care, EDs and hospital care in ways different from those with private insurance. They are more likely to visit EDs during weekdays for illnesses that could be managed more efficiently and effectively by phone triage or a same/next day primary care visit. They also have higher hospitalization rates that are more likely to occur after hours and may be of higher severity due to a delay in seeking care.

Based on Senate Bill 07-130, the Colorado Revised Statutes requires State departments to: "*maximize the number of children enrolled in the state medical assistance program or the children's basic health plan who have a* ***medical home***". . . *All medical homes shall ensure, at a minimum, the following: health maintenance and preventative care, anticipatory guidance and health education; acute and chronic illness care; coordination of medications, specialists, and therapies; provider participation in the hospital care; and 24 hour telephone care."* They recognize *that: "Infants, children, and adolescents and their families work best with a health care practitioner who knows the family and who develops a partnership of mutual responsibility and trust. Medical care provided through emergency departments, walk-in clinics, and other urgent-care facilities is often more costly and less effective than care given by a physician with prior knowledge of the child and his or her family."* [3,4]

The substantial costs (minimum estimate $194 million) of excess ED and hospital utilization among publicly insured children suggest that there is a business case for a redirection of public funding to invest in a more accessible and effective medical home. It is fair to assert that: not all eligible children in Colorado are enrolled in public health insurance; not all enrolled children have a consistent primary care provider; not all primary care providers provide true medical home services; and not all families know how to access or use these services.[5,6] For the majority of illness in our analysis, ED and urgent care may have the advantage of after-hours availability with the offsetting disadvantages of increased cost, lack of access to the child's medical record, lack of familiarity with the child or his/her family, and lack of appropriate follow-up and/or medical home communication.

These observations suggest that determination of medical home access requires more rigorous measures of process and outcome than mere attestation. In fact, three of the four current Colorado Regional Care Collaborative Organization key performance indicators reflect the priority to improve well-child visit rates, decrease ED visit rates and reduce hospital admission rates.[7] A current proposal to reduce primary care reimbursement rates will likely do the opposite and increase ED and hospitalization costs.

Numerous studies support the concept that enhanced medical home services may improve care while reducing higher-cost utilization.[8,9] Strategies to improve the efficiency and effectiveness of medical home services include: 1) extended office hours for acute primary care that improves satisfaction and reduces ED utilization and overall cost;[10–15] 2) 24/7 phone triage protocols with appropriate content and expertise to decrease unnecessary utilization and improve care;[14–25 26,27] 3) financial disincentives or incentives ;[28–30 31,32] and 4) care coordination to assure that the needs of children with more complex conditions are met.[9,19,33]

The existence of such large disparities in ED and hospital utilization for children in Colorado with public or no health insurance, suggests a strong business case to explore ways to improve access to (and utilization of) an enhanced medical home to improve the efficiency and efficacy of healthcare for all Colorado children. The current proposal to reduce primary-care-provider reimbursement, will likely result in reduced access to true medical home care as defined in Colorado statute and increase avoidable ED and hospitalization costs.

REFERENCES

1. Armon C, Gaensbauer J, Asturias E, Todd J. Insurance-based Disparities in Emergency Department Utilization and Hospitalization in Colorado Children, 2014. Updated March 1, 2016. Available at: http://www.childrenscolorado.org/health-professionals/publications/co-health. Accessed March 1, 2016
2. Berman S, Armon C, Todd J. Impact of a decline in Colorado Medicaid managed care enrollment on access and quality of preventive primary care services. *Pediatrics*. 2005;116(6):1474-1479
3. Colorado Revised Statutes 2013. Colorado Department of Health Care Policy & Financing (pages 2, 7-8,19). Available at: http://tornado.state.co.us/gov_dir/leg_dir/olls/2013TitlePrintouts/CRS%20Title%2025.5%20(2013).pdf. Accessed April 27, 2015
4. State of Colorado. Colorado Senate Bill 07-130: The original medical home legislation in Colorado. Available at: http://www.coloradoafp.org/pdf/SB130.pd. Accessed May 13, 2015
5. Rosenbach ML, Irvin C, Coulam RF. Access for low-income children: is health insurance enough? *Pediatrics*. 1999;103(6 Pt 1):1167-1174
6. Sanders LM, Thompson VT, Wilkinson JD. Caregiver health literacy and the use of child health services. *Pediatrics*. 2007;119(1):e86-92
7. Colorado Department of Health Care Policy & Financing. Creating a Culture of Change: Accountable care collaborative: 2014 annual report. Available at: https://www.colorado.gov/pacific/sites/default/files/Accountable%20Care%20Collaborative%202014%20Annual%20Report.pdf. Accessed May 4, 2015
8. Christensen AL, Zickafoose JS, Natzke B, McMorrow S, Ireys HT. Associations between practice-reported medical homeness and health care utilization among publicly insured children. *Acad Pediatr*. 2015;15(3):267-274
9. Wang C, Villar ME, Mulligan DA, Hansen T. Cost and utilization analysis of a pediatric emergency department diversion project. *Pediatrics*. 2005;116(5):1075-1079
10. Rosenbach ML, Irvin C, Coulam RF. Access for low-income children: is health insurance enough? *Pediatrics*. 1999;103(6 Pt 1):1167-1174
11. Jerant A, Bertakis KD, Fenton JJ, Franks P. Extended office hours and health care expenditures: a national study. *Ann Fam Med*. 2012;10(5):388-395
12. Morgan CL, Beerstecher HJ. Satisfaction, demand, and opening hours in primary care: an observational study. *Br J Gen Pract*. 2011;61(589):e498-507
13. O'Malley AS. After-hours access to primary care practices linked with lower emergency department use and less unmet medical need. *Health Aff (Millwood)*. 2013;32(1):175-183
14. Custer M, O'Rourke KM, Roddy M, King R, Sprinkle L, Horne E. The impact of a nursing triage line on the use of emergency department services in a military hospital. *Mil Med*. 2003;168(12):981-985
15. Piehl MD, Clemens CJ, Joines JD. "Narrowing the Gap": decreasing emergency department use by children enrolled in the Medicaid program by improving access to primary care. *Arch Pediatr Adolesc Med*. 2000;154(8):791-795
16. Poole SR, Schmitt BD, Carruth T, Peterson-Smith A, Slusarski M. After-hours telephone coverage: the application of an area-wide telephone triage and advice system for pediatric practices. *Pediatrics*. 1993;92(5):670-679
17. Kuensting LL. "Triaging out" children with minor illnesses from an emergency department by a triage nurse: where do they go? *J Emerg Nurs*. 1995;21(2):102-108
18. Kempe A, Luberti A, Belman S, et al. Outcomes associated with pediatric after-hours care by call centers: a multicenter study. *Ambul Pediatr*. 2003;3(4):211-217
19. Colorado Medical Home Initiative. Colorado MH standards.doc. Available at: http://coloradomedicalhome.org/wp-content/uploads/2013/08/colo_med_home_standards_assurances_principles.pdf. Accessed May 13, 2015
20. Christine Vestal. New Mexico's Nurse Hotline Touted as a Model in States. Available at: http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2015/2/25/new-mexicos-nurse-hotline-touted-as-model-in-states. Accessed May 11, 2015
21. Campbell JL, Fletcher E, Britten N, et al. Telephone triage for management of same-day consultation requests in general practice (the ESTEEM trial): a cluster-randomised controlled trial and cost-consequence analysis. *Lancet*. 2014;384(9957):1859-1868
22. Bogdan GM, Green JL, Swanson D, Gabow P, Dart RC. Evaluating patient compliance with nurse advice line recommendations and the impact on healthcare costs. *Am J Manag Care*. 2004;10(8):534-542
23. Barber JW, King WD, Monroe KW, Nichols MH. Evaluation of emergency department referrals by telephone triage. *Pediatrics*. 2000;105(4 Pt 1):819-821
24. Baker RC, Schubert CJ, Kirwan KA, Lenkauskas SM, Spaeth JT. After-hours telephone triage and advice in private and nonprivate pediatric populations. *Arch Pediatr Adolesc Med*. 1999;153(3):292-296
25. Allen HF, Yarnie S, Murray MA, Reiter EO. Personnel costs and perceived benefit of telephone care in the management of children with type 1 diabetes. *Pediatr Diabetes*. 2002;3(2):95-100
26. Doctor K, Correa K, Olympia RP. Evaluation of an after-hours call center: are pediatric patients appropriately referred to the emergency department? *Pediatr Emerg Care*. 2014;30(11):798-804
27. Pasini A, Rigon G, Vaona A. A cross-sectional study of the quality of telephone triage in a primary care out-of-hours service. *J Telemed Telecare*. 2015;21(2):68-72
28. Hsia RY, MacIsaac D, Baker LC. Decreasing reimbursements for outpatient emergency department visits across payer groups from 1996 to 2004. *Ann Emerg Med*. 2008;51(3):265-74, 274.e1-5
29. Wharam JF, Landon BE, Galbraith AA, Kleinman KP, Soumerai SB, Ross-Degnan D. Emergency department use and subsequent hospitalizations among members of a high-deductible health plan. *JAMA*. 2007;297(10):1093-1102
30. Sen B, Blackburn J, Morrisey MA, et al. Did copayment changes reduce health service utilization among CHIP enrollees? Evidence from Alabama. *Health Serv Res*. 2012;47(4):1603-1620
31. Coker TR, DuPlessis HM, Davoudpour R, Moreno C, Rodriguez MA, Chung PJ. Well-child care practice redesign for low-income children: the perspectives of health plans, medical groups, and state agencies. *Acad Pediatr*. 2012;12(1):43-52
32. Blumenthal KJ, Saulsgiver KA, Norton L, et al. Medicaid incentive programs to encourage healthy behavior show mixed results to date and should be studied and improved. *Health Aff (Millwood)*. 2013;32(3):497-507
33. Auger KA, Kenyon CC, Feudtner C, Davis MM. Pediatric hospital discharge interventions to reduce subsequent utilization: a systematic review. *J Hosp Med*. 2014;9(4):251-260