



Ambulatory Care Sensitive Emergency Department Visits Chronic Disease Conditions New Hampshire, 2001-2005

Background:

Hospital Emergency Departments (ED) provide a spectrum of medical care, some of which for non-urgent conditions including chronic illnesses¹. According to federal legislation, anyone requesting services at the ED should be properly screened and treated within the means of the hospital's ED, regardless of the ability to pay for the services². Thus, ED personnel deal not only with individuals requiring immediate and necessary medical care but also with preventable and non-emergent visits that may be managed by primary care providers.

Not all ED preventable visits are completely avoidable; in some instances, even the best care cannot prevent the progression of a health condition to a stage that requires an ED visit and possibly hospitalization. Nonetheless, any increasing trend in ED visits for avoidable conditions necessitates attention and careful evaluation as these visits place an undue organizational and financial burden on hospitals.

Methods:

The New Hampshire (NH) Outpatient Hospital Discharge dataset includes ED visits from all licensed EDs in NH as well as records of NH residents who visited an ED in Maine, Vermont and Massachusetts. ED encounters during calendar years 2001-2005 that did not result in admission into the hospital were analyzed. Records for those transferred from an ED to another hospital and then hospitalized were included. Additionally, in the dataset one person might account for multiple visits. ED visits for individuals with unknown residence or residence outside of NH were excluded.

Selected ICD-9 diagnoses for ambulatory care sensitive (ACS) chronic disease conditions as proposed by Billings, et al.³, were used for asthma, chronic obstructive pulmonary disease (COPD), angina, hypertension, congestive heart failure (CHF), hypoglycemia, diabetes and dental conditions. The ACS conditions entail diagnoses where timely and effective primary care may reduce or prevent the need for emergency care and hospitalizations.

Age-adjusted rates of ED visits per 10,000 NH residents were calculated to allow comparability among conditions and geographic locations, and over time. Additional analyses included rates of the chronic ACS conditions above by age group (<19, 19-64, 65+), gender, county, primary payor and charged amount. The 95% confidence intervals were used to assess statistical significance.

Results:

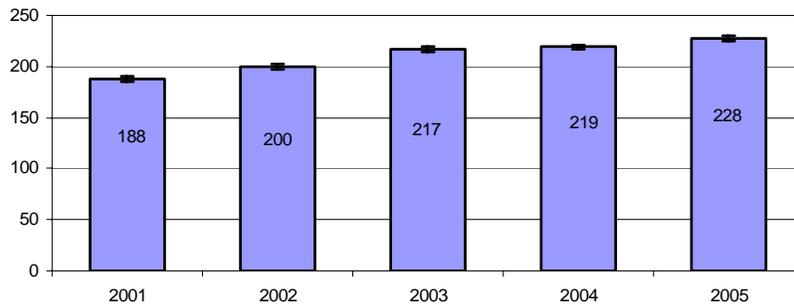
Overall Chronic Disease Related ACS Conditions

The number and rate of visits for chronic ACS conditions have steadily increased from 2001-2005, and the increase was significant for all the chronic ACS conditions combined, as well as CHF and dental conditions individually (Table 1 and Figure 1).

The most notable increase was among the rates for dental conditions, which increased from 89.5/10,000 NH residents in 2001 to 129.9/10,000 NH residents in 2005.

Table 1: Number of ED visits and age-adjusted rate per 10,000 area population										
Chronic ACS Conditions	2001		2002		2003		2004		2005	
	N	Rate 95%CI								
Asthma	6,527	52.7 51.8-53.6	6,304	50.3 49.5-51.2	6,652	53.0 52.1-53.9	5,956	47.2 46.3-48.0	6,294	49.7 48.8-50.5
COPD	2,267	18.1 17.0-19.2	2,080	16.1 15.0-17.2	2,172	16.4 15.3-17.4	2,263	16.7 15.6-17.8	2,445	17.8 16.7-18.9
Hypoglycemia	150	1.2 1.0-1.4	135	1.1 0.8-1.3	125	0.9 0.7-1.2	121	0.9 0.7-1.2	150	1.1 0.9-1.4
Diabetes	1,424	11.2 10.5-11.9	1,417	11.0 10.2-11.7	1,480	11.2 10.5-11.9	1,431	10.7 10.0-11.4	1,585	11.7 10.9-12.4
Angina	429	3.4 2.7-4.0	441	3.4 2.7-4.0	387	2.9 2.4-3.4	400	3.0 2.4-3.5	425	3.1 2.5-3.7
Hypertension	811	6.3 5.7-7.0	864	6.6 5.9-7.3	862	6.4 5.8-7.1	933	6.9 6.2-7.6	927	6.7 6.1-7.3
CHF	691	5.6 4.6-6.6	726	5.8 4.8-6.7	827	6.4 5.4-7.4	843	6.4 5.4-7.4	1,160	8.7 7.5-9.9
Dental Conditions	11,067	89.5 88.6-90.5	13,132	105.8 104.8-106.9	14,876	119.7 118.6-120.7	15,847	127.2 126.2-128.3	16,230	129.9 128.8-131.0
Total	23,366	187.9 185.7-190.2	25,099	200.0 197.7-202.3	27,381	217.0 214.6-219.3	27,794	219.0 216.6-221.3	29,216	228.6 226.1-231.0

**Figure 1: ED Visits for Selected Chronic Disease Related ACS Conditions
Age-Standardized Rate per 10,000 Population
NH, 2001-2005**



Figures 2-4 display ED visits for all chronic ACS conditions during 2005, by condition and payor. The most common chronic ACS conditions reported were dental conditions and asthma. Dental conditions accounted for 56% of all chronic ACS conditions-associated visits in 2005 and asthma accounted for 22%. Accordingly, ED visit charges for asthma and dental conditions represent 49% (9.3 million dollars) of the total dollars associated with chronic ACS conditions visits in 2005.

Charges associated with ED visits for the combined chronic disease ACS conditions studied were over 19 million dollars in 2005. These charges incorporated all hospital charges, including physicians' fees. The major payor for all chronic ACS conditions was Medicare, which covered 39% (7.5 million dollars) of all chronic ACS conditions-associated charges in 2005.

Figure 2: ED Visits for Selected Chronic Disease Related ACS Conditions, NH, 2005

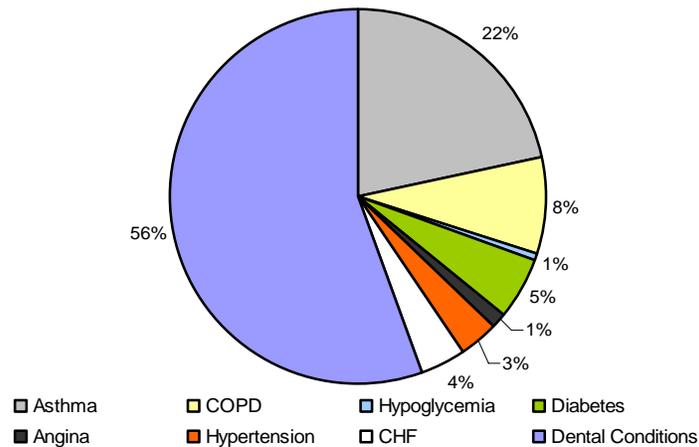
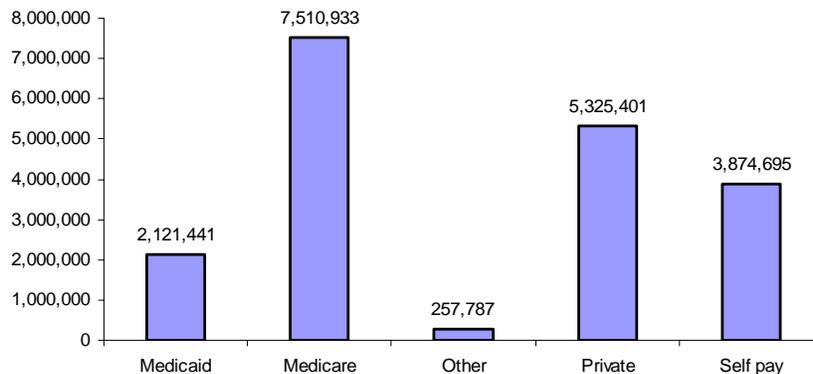
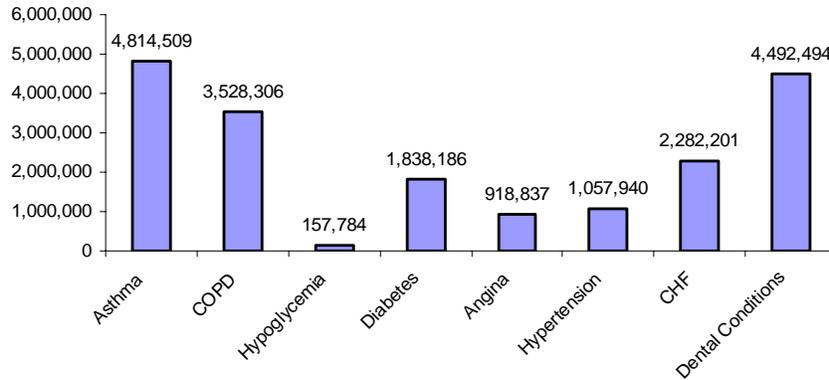


Figure 3: ED Visit Charges for Selected Chronic Disease Related ACS Conditions, by Payor, NH, 2005



**Figure 4:
ED Visit Charges (\$\$) for Selected Chronic Disease Related
ACS Conditions, NH, 2005**



Figures 5 and 6 depict the age and gender specific differences in chronic ACS conditions visits during 2005. Children and adolescents younger than 19 years of age were less likely to seek emergency care for chronic ACS conditions when compared to other age groups. There is a difference in overall chronic ACS conditions visits by gender, with women more likely to make a visit than men. Figure 7 presents the geographic differences in the rate of chronic ACS conditions visits with significant variability by county of residence.

**Figure 5: ED Visits for Selected Chronic Disease
Related ACS Conditions,
Age-Specific Rate, per 10,000, NH, 2005**

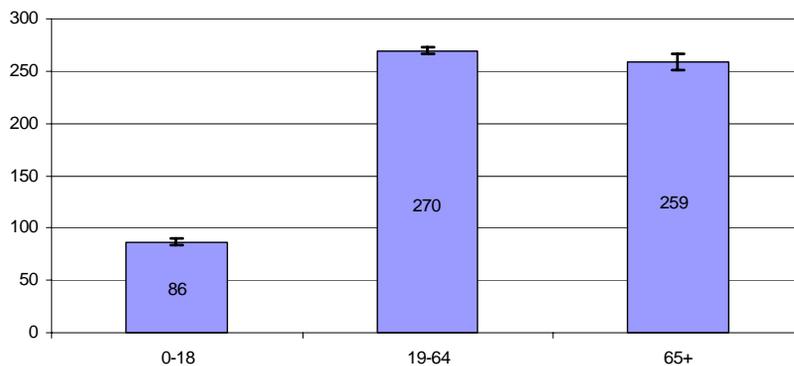


Figure 6: ED Visits for Selected Chronic Disease Related ACS Conditions, Age-Standardized Rate, by Gender, per 10,000, NH, 2001-2005

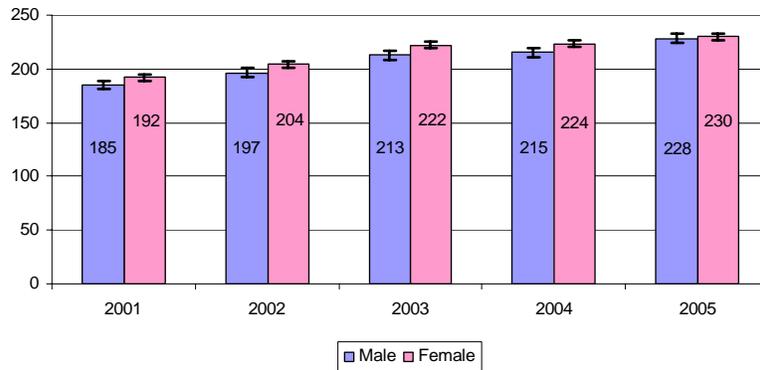
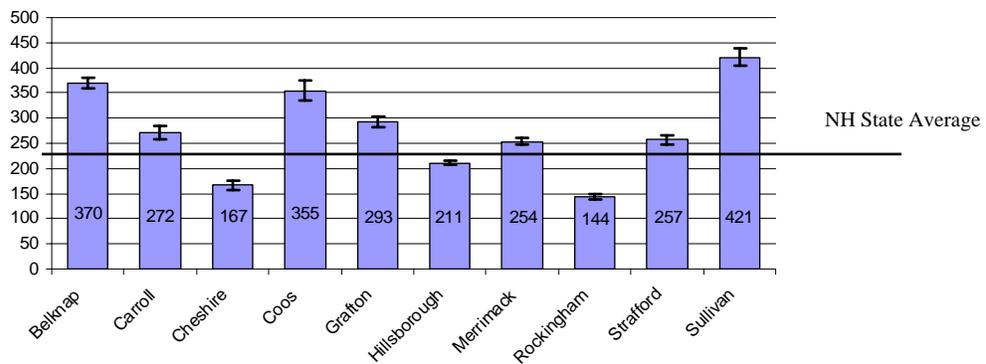


Figure 7: ED Visits for Selected Chronic Disease Related ACS Conditions, Age-Standardized Rate, by County, per 10,000, NH, 2005



Dental Conditions and Asthma

Because we found dental conditions and asthma to be the two largest contributors among chronic ACS conditions, additional analysis was performed on these data. (Figures 8-15). ICD-9 codes for dental conditions include diagnoses of dental caries, diseases of pulp, gingival and other diseases of the oral soft tissues that are all preventable and treatable in a primary care setting. Asthma is a common chronic inflammatory condition of the lung airways that can also be effectively managed by the primary care provider most of the time.

For dental conditions, males were as likely to visit an ED as females; and individuals 19-64 years of age were the most frequent ED users. Self-pay was indicated as the major payor (49%) of all dental conditions associated visits (4.5 million dollars). There was a significant difference in ED dental visits by county of residence in 2005.

For asthma, females were significantly more likely than men to visit an ED, and private insurance was the major payor (47%) for asthma associated visits (4.8 million dollars). There was a significant difference in asthma related ED visits by county of residence in 2005.

Figure 8: ED Visits for ACS Dental Conditions, Age-Standardized Rate per 10,000, by Gender, NH, 2001- 2005

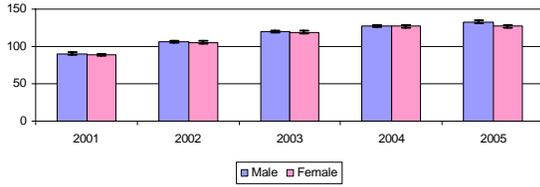


Figure 12: ED Visits for ACS Asthma Conditions, Age-Standardized Rate per 10,000, by Gender, NH, 2001-2005

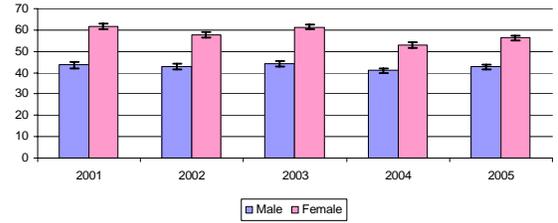


Figure 9: ED Visits for ACS Dental Conditions, Age-Specific Rate per 10,000, NH, 2005

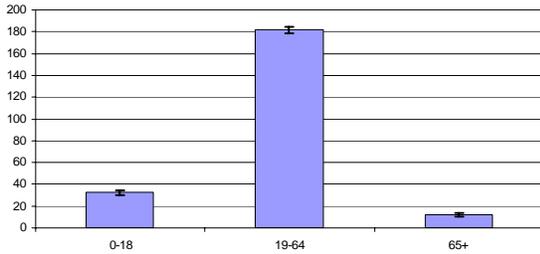


Figure 13: ED Visits for ACS Asthma Conditions, Age-Specific Rate per 10,000, NH, 2005

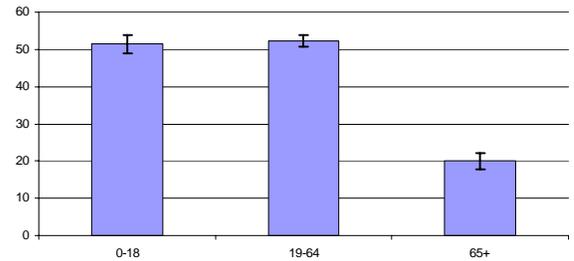


Figure 10: ED Visits for ACS Dental Conditions, Age-Standardized Rate per 10,000, by County, NH, 2005

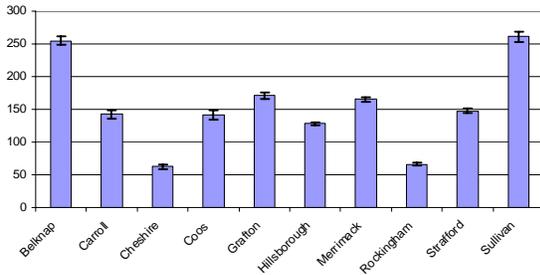


Figure 14: ED Visits for ACS Asthma Conditions, Age-Adjusted Rate, by County, per 10,000, NH, 2005

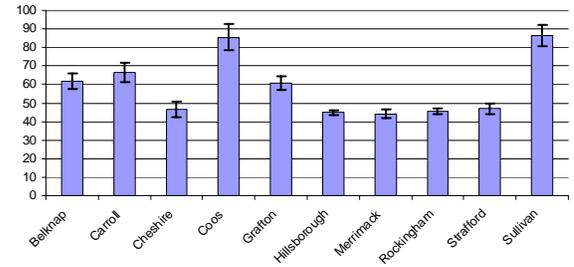


Figure 11: ED Visits for ACS Dental Conditions, by Payor, NH, 2005

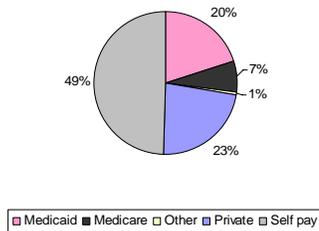
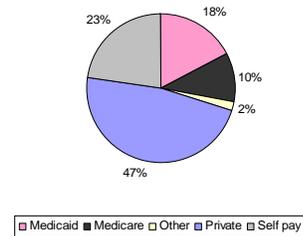


Figure 15: ED Visits for ACS Asthma Conditions, by Payor, NH, 2005



Conclusion: The findings of this analysis showed an overall increase in the number of ED visits for non-urgent preventable care, with notable geographic differences by county of residence. High ACS rates may indicate a lack of access to needed primary care, a lack of patient education regarding symptoms and disease self-management, unwillingness to wait for treatment or dissatisfaction with an existing primary care provider³. High ACS rates may also indicate an inappropriate use of resources and a lack of continuity of care. Future studies need to examine specific barriers to timely and effective ambulatory care including economic, structural and personal obstacles, especially those for dental conditions and asthma.

Selected ICD-9 codes for chronic disease conditions:

Chronic obstructive pulmonary disease [491, 492, 494, 496, 466.0] (comments: acute bronchitis [466.0] only with secondary diagnosis of 491, 492, 494, 496)

Asthma [493]

Congestive heart failure [428, 402.01, 402.11, 402.91, 518.4] (comment: exclude cases with the following surgical procedures: 36.01, 36.02, 36.05, 36.1, 37.5, or 37.7)

Hypertension [401.0, 401.9, 402.00, 402.10, 402.90] (comment: exclude cases with the following procedures: 36.01, 36.02, 36.05, 36.1, 37.5, or 37.7)

Angina [411.1, 411.8, 413] (comment: exclude cases with a surgical procedure [01-86.99])

Diabetes [250.0, 250.1, 250.2, 250.3, 250.8, 250.9]

Hypoglycemia [251.2]

Dental Conditions [521, 522, 523, 525, 528]

References:

1 Utah Office of Health Care Statistics. *Primary Care Sensitive Emergency Department Visits in Utah, 2001*. Utah Department of Health. April 2004. health.utah.gov/hda/Reports/Primary_Care_ERvisits_Utah2001.pdf. Suruda A, Burns TJ, Knight S, Dean JM. Health insurance, neighborhood income, and emergency department usage by Utah children 1996-1998. *BMC Health Serv Res*. 2005 Apr 13;5(1):29.

2 U.S. Code Collection, available at: <http://www4.law.cornell.edu/uscode>; accessed on 11/12/2008

3 Billing, J, Parikh N, Miljanovich T. Emergency Room use: The New York Story. *The Commonwealth Fund*. Issue Brief. November 2000.

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