Avoidable Emergency Department Usage Analysis

Introduction

The inappropriate use of Emergency Department (ED) services is growing, resulting in care that is more costly and lacks continuity. The ability to measure the inappropriate use of these services is key to addressing this important healthcare issue, but there has been little agreement in how to identify and categorize inappropriate ED visits. When it has been studied, the focus has been primarily on the Medicare, Medicaid, and uninsured populations. However, a 2008 study published by the New England Healthcare Institute and the Institute for Healthcare Improvement suggests that the problem is not confined to Medicare and Medicaid, nor is the increase in inappropriate ED usage limited to the uninsured. People covered by private insurance are just as likely to overuse the ED.

In an effort to identify best practices in this area and to quantify the scope of the problem in the commercially insured population under the age of 65, Truven Health Analytics™ undertook a review of existing methodologies and performed a study based on 2010 data in the commercial Truven Health MarketScan® database for this population. Study results are based on the 6.5 million ED visits contained in the database for this period.

The methodology employed was based on an algorithm originally developed in 2000 by researchers from the NYU Center for Health and Public Service Research and the United Hospital Fund of New York. The algorithm was then updated by Truven Health in 2012 to reflect changes in diagnosis coding. The methodology was developed based on an examination of a sample of 6,000 ED clinical records and used the patient's primary diagnosis on the ED claim to then assign each visit a set of probabilities using the following categories:

- **Nonemergent**: medical care was not required within 12 hours
- **Emergent/Primary Care Treatable**: medical care was required within 12 hours, but care could have safely been provided in the primary care setting
- **Emergent — ED Care Needed (Preventable/Avoidable)**: medical care was required within 12 hours, but an ED visit was potentially preventable had timely and effective outpatient care been delivered prior to the visit
- **Emergent — ED Care Needed (Not Preventable/Not Avoidable)**: medical care was required within 12 hours in the ED setting

For example, a visit with the primary diagnosis of "abdominal pain unspecified site" is given a 67-percent probability of being Emergent/Primary Care Treatable, as well as a 33-percent probability of Emergent — ED Care Needed (Not Preventable/Not Avoidable).

The determination of whether a visit was emergent or nonemergent was made based on basic demographic and symptom-related information recorded in the ED (e.g., initial complaint, age and gender, duration of symptoms, and temperature). The determination of whether care was needed in the ED setting was based on an evaluation of whether or not the resources used were typically available in the primary care setting. An exception was made if the initial complaint alone was sufficient to justify ED use (e.g., chest pain or serious injury). Lastly, the Emergent — ED Care Needed cases were further classified according to whether the emergent nature of the conditions was potentially preventable or avoidable had timely and effective outpatient care been delivered prior to the ED visit (e.g., asthma and diabetes visits).

The reason this methodology was selected by Truven Health was that the resulting algorithm is executable on claims data and the method acknowledges the "gray areas." That is, it recognizes the fact that, based on the diagnosis information on an ED claim, it is impossible to say with certainty that "X" visit was not necessary, only that "Y percent" of the time it has been shown to be unnecessary. This approach also increases the credibility of the research with clinicians and is seen as less punitive.

Results

For the study, 6,135,002 ED visits in 2010 were examined. The results were broken out by industry type, gender, region, age, and clinical condition. Approximately 10 percent of ED visits could not be categorized by the algorithm.

Overall

In total, the probabilities for the visits broke out in the following way. Consistent with other studies, more than half of ED visits were deemed avoidable.

Categories of ED Visits

Emergent — ED Care Needed (Not Preventable/ Not Avoidable) 29%

Nonemergent 24%

Emergent — ED Care Needed (Preventable/ Avoidable) 6%

Emergent/ Primary Care Treatable 42%
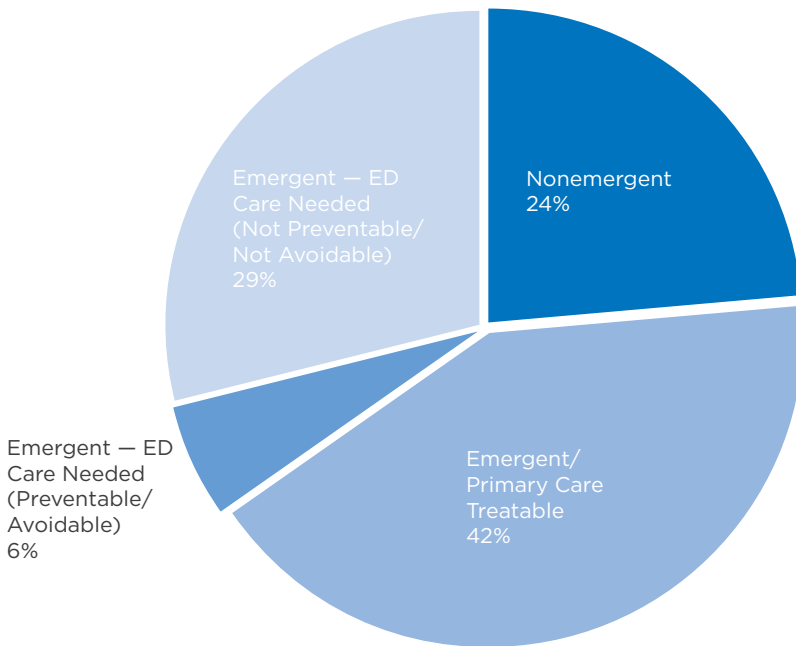
## Industry Type, Region, and Plan Type

Results varied little within any of these three categories.

- Across 10 broad industry types, the percentage of Nonemergent visits differed by only 1.6 percent. At the other end of the severity spectrum, Emergent — ED Care Needed visits varied by only 2.2 percent.
- Between the four major U.S. census regions, the percentage of Nonemergent visits differed by only 1.3 percent. For Emergent — ED Care Needed visits, the rate varied by 1.8 percent.
- Across six broad plan types, the percentage of Nonemergent visits differed by only 2.6 percent and the Emergent — ED Care Needed visit rate varied by 2.5 percent.

Demographics

Substantial and interesting differences were apparent by both age and gender. The overall ED visit rate for females was 17 percent higher than males. Females showed a higher percentage of Nonemergent visits and a lower percentage of Emergent — ED Care Needed visits.

ED Visits by Category
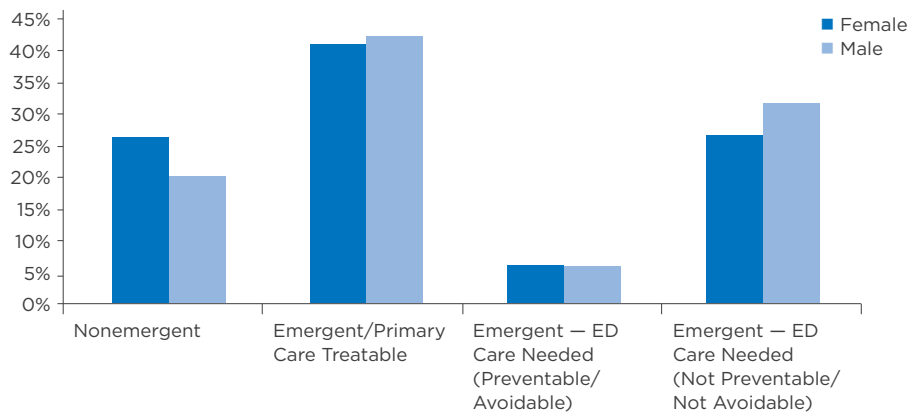
As seen in the graph below, the percentage of potentially avoidable ED visits shows striking variation by age group.

Percentage of Nonemergent or Primary Care Treatable ED Visits by Age
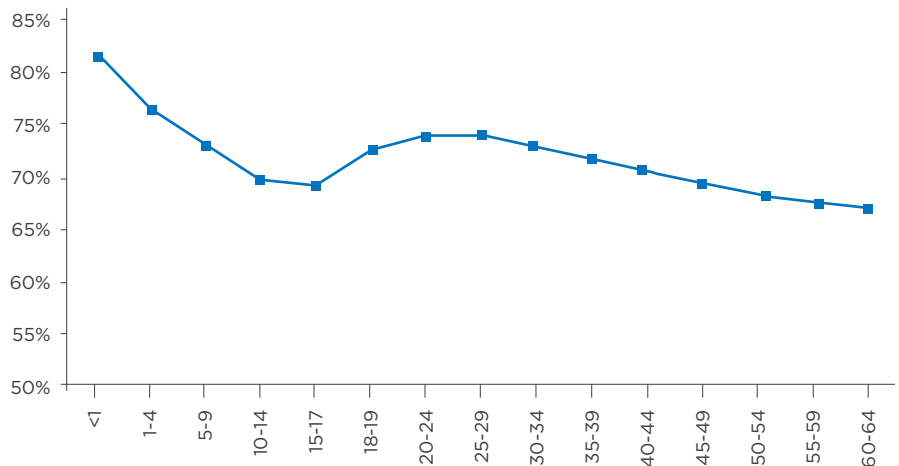
For the youngest patients, the rate may reflect overly anxious parental behavior and suggests an educational opportunity. It may also reflect an underlying shortage of available after-hours pediatric care. The peak observed in the young adult population is most likely a reflection of the lack of established primary care relationships and care access difficulties for a younger working population. Given the extremely high cost of ED care versus care in alternative settings, the impact of any program that shifts even a small percentage of care by helping this population establish appropriate care relationships and providing better access to the appropriate treatment setting will pay large dividends. (See the Estimated Savings section on page 7.)

Clinical Breakout

The top 25 3-digit diagnoses accounted for more than 60 percent of ED visits. Among these, the three most common reasons for ED visits were:

1. Respiratory and Chest Symptoms
2. Abdominal and Pelvic Symptoms
3. General Symptoms

As shown in the graph below, among the top 25 3-digit diagnoses, the types of visits with the highest percentage of Nonemergent visits were:

1. Other Joint Disorders
2. Atopic Dermatitis
3. Other Soft Tissue Diseases

On average, 73 percent of these visits were deemed Nonemergent.

**Percentage of Nonemergent ED Visits: Top Ten 3-Digit Diagnoses**
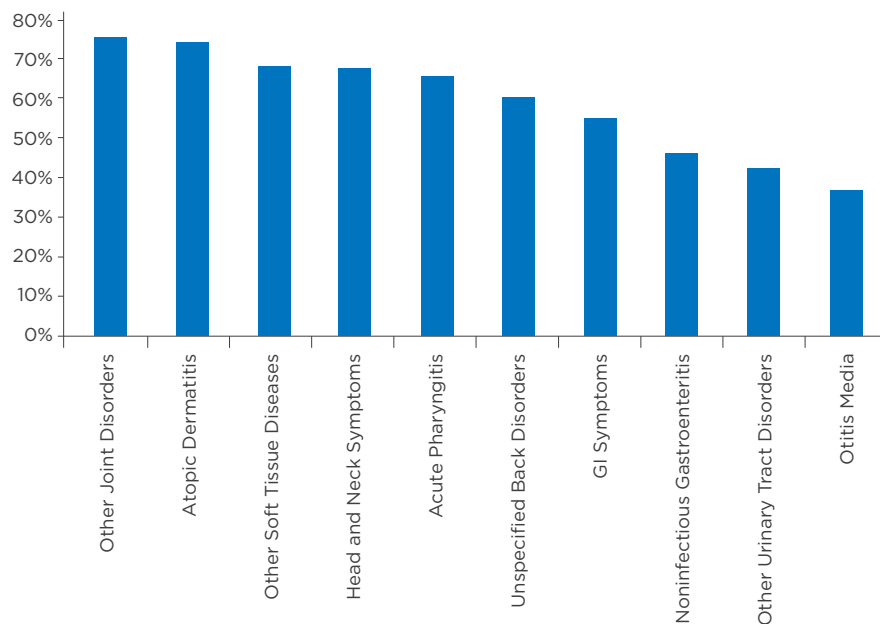
Among these same top 25 3-digit diagnoses, those with the highest percentage of Emergent/Primary Care Treatable visits are shown below. These are visits that could be diverted from the ED setting with appropriate alternative access and education efforts.

Percentage of Emergent/Primary Care Treatable ED Visits: Top Ten 3-Digit Diagnoses
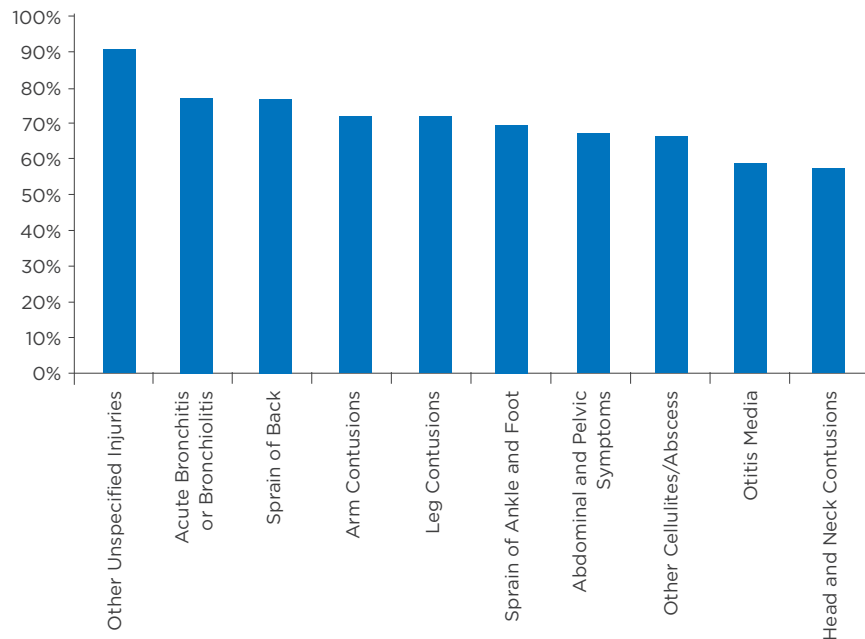
For the top 3-digit diagnoses, only asthma had a percentage of Emergent — ED Care Needed (Preventable/Avoidable) visits higher than 35 percent. The percentages for the remaining clinical condition categories decline markedly. This suggests that actions undertaken to improve preventive and care-managed services "upstream" from the ED visits can be sharply focused.

Percentage of Emergent — ED Care Needed (Preventable/Avoidable) ED Visits: Top Five 3-Digit Diagnoses
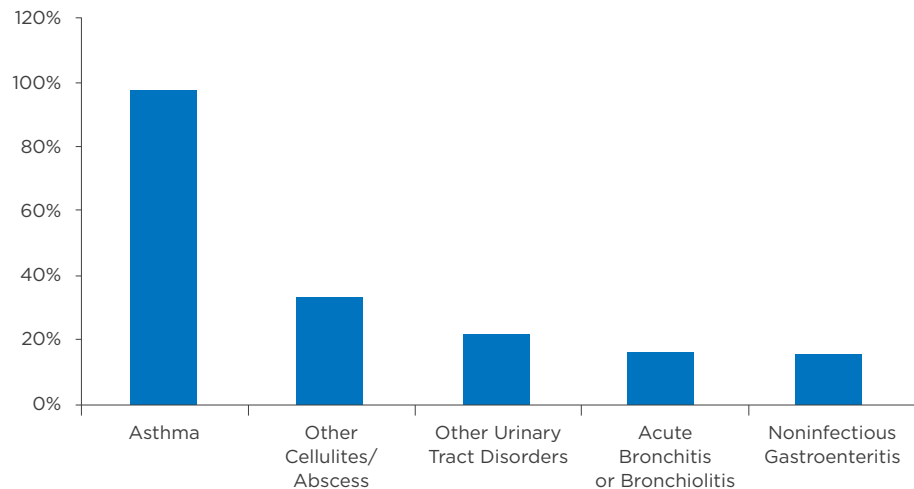
Finally, a look at the types of visits with the highest percentage of Emergent — ED Care Needed visits (e.g., unavoidable emergencies) shows diagnoses that most laypersons would recognize as true emergencies. These includes concussions, lacerations, kidney stones, atrial fibrillation, stroke, and cardiac arrest. These are diagnoses with symptoms that patients should be taught to recognize and that should receive immediate emergency care.

Estimated Savings

Based on an average 2010 cost of $1,316 for an ED visit and an average office visit cost of $145, the net savings of substituting an office visit for an ED visit was approximately $1,171. Using this information, along with the frequency of visits in the categories described in this paper, a diversion of 10 percent of Nonemergent, Emergent/Primary Care Treatable, and Emergent — ED Care Needed (Preventable/ Avoidable) ER visits to an office setting could result in a net savings of $18.68 in total allowed costs per member per year.

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