



Healthcare & Life Sciences

**Reduce high costs of care associated with avoidable ER visits**

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INTELLIGENCE FOR IMAGINATION

## The Big Picture

The high cost of maintenance and limited availability of Emergency Rooms (ER) facilities are under intense scrutiny by payers, the government, providers and employers. According to the Centers for Disease Control and Prevention (CDC), Americans made 136 million ER visits in 2014, which is likely to increase further. Yet a study in the American Journal of Managed Care cites more than 30% of ER visits could have been avoided.

Avoidable ER visits stem from a lack of coordinated medical attention that drives higher costs of care, longer wait times and sub-standard health outcomes. Redirecting only 20% of ER visits to lower-cost alternatives, such as urgent care or Primary Care Physicians (PCP), could save \$4.4 billion, according to HealthAffairs.org.

A multi-billion dollar healthcare payer wanted to identify members likely to make avoidable ER visits, and steer them to more cost effective alternatives.

## Transformative Solution

Members may be visiting an ER unnecessarily for convenience, desire for a more effective PCP, insufficient co-pay funds, or an unmanaged condition. To address these challenges, clinical rules were used to identify low intensity conditions where an ER visit could have been avoided. The approach offered more than 50 hypotheses for factors which could be predictive of avoidable ER visits.

To test these hypotheses, we identified different structured and unstructured data sources such as call center notes, geographic details for members and providers, and the availability of providers.

For unstructured data, we applied multiple feature selection algorithms such as InfoGain1 and BNS2. For structured data, we tested hypotheses such as distance of the Primary Care Physician or urgent care facilities, ease of access to an ER, and difficulty finding quality providers. An ensemble of classifier models was developed to predict the likelihood of visiting an ER for low intensity conditions, using advanced analytics such as machine-learning, text mining, and traditional modeling techniques.

The solution identified 65% of all avoidable visits among 30% of the population. This yielded an opportunity to save more than \$10M annually by targeting a small group of members for alternative care management and provider interventions.

## The Change

The payer was able to gather from this project that.

- Members with past ER visits were 8 times more likely to visit the ER unnecessarily.
- Members visiting multiple PCPs were twice as likely to make an avoidable ER visit.
- Each avoided ER visit could reduce costs by \$1,500, leading to \$10M in potential cost savings.
- Optimized ER utilization could substantially improve member health outcomes.
- Creating a framework of text-mining and machine-learning methods could improve accuracy in rare event scenarios.

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