

Budnitz DS, Pollock DA, Weidenbach KN, et al. National surveillance of emergency department visits for outpatient adverse drug events. *JAMA* 2006;296:1858-66.

Methods

Specially trained coders reviewed emergency department records at 63 hospitals in 2004 and 2005. These hospitals were chosen as a representative sample of all U.S. hospitals. The coders identified emergency department visits attributed to medications by the treating physician and abstracted pertinent information.

The main outcome measure was emergency department visits due to adverse drug events. Need for hospitalization was a secondary outcome measure. Adverse events included allergic reactions, secondary effects (e.g., falls), unintentional overdose due to high dose or slow elimination, and adverse effects at normal doses.

Results

Based on data from the sample hospitals, 701,547 patients (95% CI 509,642 to 893,452) presented to U.S. emergency departments due to adverse drug events annually. One quarter of these visits were by elderly patients (i.e., 65 and older). Almost 3,500 patients were admitted. About half of the hospitalizations due to adverse drug events were in the elderly.

Over 700,000 patients are treated in emergency departments each year for adverse drug events...or 2.4 out of every 1000. And one in six of these are hospitalized.

Adverse Drug Event Statistics

Institute of Medicine The case for electronic drug information systems is best made by their impact on adverse drug events (ADEs). The **Institute of Medicine (IOM)** report, released in December 1999, heightened public awareness of the problems of ADEs, and resulted in responses from both **Congress** and the **President**.

Adverse Drug Events (ADEs) result in more than **2.1 million injuries each year** and the Journal of the American Medical Association reported that **100,000 Americans die annually** of adverse reactions to prescription drugs.

Potential causes of ADEs

- Incorrect dose
- Lack of dosing modification for renal or liver failure, CHF
- Unrecognized drug interaction
- Therapeutic duplication
- Inadequate knowledge about new drugs
- Sound-alike medications
- Lack of drug information available at the point of care
- Unrecognized contraindication
- Misinterpretation of written orders
 - Increased demands on nursing and pharmacy; 'not having the time to look things up'
 - Improper administration
 - Increasing complexity of medical treatments



In another recent article, there was an estimated **34 fold discrepancy in the number of deaths attributed to adverse drug events** in the United States



The FDA's Office of Drug Risk Assessment calculates **only 1% of ADEs are reported.**

Studies show that **26.5% of all patients experience an allergic reaction** from prescribed medication.

Dosage errors cause most ADEs - Two studies attribute 42-60 percent of ADEs to excessive drug dosage for the patients age, weight, underlying condition, and renal function - Classen DC, Pestotnik SL, Evans RS, et al. "Adverse drug events in hospitalized patients." *JAMA* 1997;277(4):301-6 and Evans RS, Pestotnik SL, Classen DC, et al. "Prevention of adverse drug events through computerized surveillance." *Proc Annu Symp Comput Appl Med Care* 1992:437-41.

9.7% of ADEs caused permanent disability - This study estimated that **9.7 percent of ADEs caused permanent disability** - Thomas EJ, Studdert DM, Burstin HR, et al. "Incidence and types of adverse events and negligent care in Utah and Colorado." *Med Care* 2000;38(3):261-71.

Risk of death doubles due to ADEs - This study estimated that the increased risk of death for a patient who experiences an ADE is nearly twice that of a patient who does not - Classen DC, Pestotnik SL, Evans RS, et al. "Adverse drug events in hospitalized patients." *JAMA* 1997;277(4):301-6.

Treating ADEs has topped \$5 billion - This estimate does not include ADEs causing admissions, malpractice and litigation costs, or the costs of injuries to patients. Further, recent figures from the FDA have suggested cost from \$20 to 75 billion. - Bates DW, Spell N, Cullen DJ, et al. "The costs of adverse drug events in hospitalized patients." *JAMA* 1997;277(4):307-11.

ADEs average more than 3 per physician per year - At present, there are approximately 710,000 licensed physicians in the United States. That translates to over **3 ADEs per physician each year**. It must be noted, this figure (2.2 million) does not include ADEs to those being treated on an outpatient basis out of doctor's offices or clinics.

It is estimated that **38% of all prescribed medication passes directly from the physician to the patient**. This practice bypasses any precautionary tools used by the patient's pharmacists.

ADE Lawsuits are rapidly increasing - With deaths and injuries on the rise, the medical malpractice segment of the legal community has caught the scent of blood in the water. Further, easily affordable clinical systems are just as available to them as to the medical community. It has become a new type of arms race.

The annual national cost of **drug-related morbidity and mortality** is estimated to be as high as **\$76.6 billion**. About \$47 billion of that is related to hospital admissions associated with drug therapy or the absence of appropriate drug therapy. **By comparison, the cost of diabetes care has been estimated at \$45.2 billion.**



In a large, tertiary care hospital, the estimated annual costs associated with preventable ADEs are estimated to be \$2.8 million. **For all ADEs, the estimated costs are \$5.6 million.**

The **additional length of stay associated with an ADE** in the above study was **2.2 days**, and the increase in cost associated with an ADE was \$3,244. **For preventable ADEs, the increases were 4.6 days in length of stay** and \$5,857 in total costs.

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