



JOHNS HOPKINS  
M E D I C I N E

---

JOHNS HOPKINS  
HEALTHCARE

# Emergency Department Utilization by Medicaid Enrollees: Defining the Problem and Reviewing the Strategies

Peter Fagan, PhD

Melissa Sherry, B.A.

Johns Hopkins HealthCare Research and Outcomes Unit

# Overview

1. Description of problem
2. ED population characteristics
3. ED community (system) characteristics
4. ED use in Maryland and Baltimore
5. Strategies to reduce ED utilization
6. Conclusions and suggestions



# Search of Literature

- PubMed Database
- Reports published 1999 - 2009
- Inclusion criteria:
  - Characteristics of ED users
  - Interventions to reduce ED utilization
- Exclusion criteria:
  - ED crowding , hospital patient flow
- Search Terms:  
Emergency department or Emergency room or Emergency use and:
  - Medicaid
  - utilization
  - users
  - frequent fliers
  - insurance
  - access
- Total number of articles included: 54



# Description of the problem



# 9 patients made nearly 2,700 ER visits in Texas

Wed Apr 1, 9:19 pm ET

AUSTIN, Texas – Just nine people accounted for nearly 2,700 of the emergency room visits in the Austin area during the past six years at a cost of \$3 million to taxpayers and others, according to a report. The patients went to hospital emergency rooms 2,678 times from 2003 through 2008, said the report from the nonprofit Integrated Care Collaboration, a group of health care providers who care for low-income and uninsured patients.

"What we're really trying to do is find out who's using our emergency rooms ... and find solutions," said Ann Kitchen, executive director of the group, which presented the report last week to the Travis County Healthcare District board.

The average emergency room visit costs \$1,000. Hospitals and taxpayers paid the bill through government programs such as Medicare and Medicaid, Kitchen said.

Eight of the nine patients have drug abuse problems, seven were diagnosed with mental health issues and three were homeless. Five are women whose average age is 40, and four are men whose average age is 50, the report said, the Austin American-Statesman reported Wednesday.

"It's a pretty significant issue," said Dr. Christopher Ziebell, chief of the emergency department at University Medical Center at Brackenridge, which has the busiest ERs in the area.

Solutions include referring some frequent users to mental health programs or primary care doctors for future care, Ziebell said.

"They have a variety of complaints," he said. With mental illness, "a lot of anxiety manifests as chest pain."

Is this really the problem?



# NHAMCS 2006 ED Summary

ED Utilization	1996	2006
Visits	90.3 M	119.2 M
ED facilities	4,019	3,883
Visits per 100	34.2	40.5

(Pitts SR et al., 2008)



# ED population characteristics



# NHAMCS 2006 ED Summary

Pt Characteristics	1996 - 2006
< 12 months old	84.5 per 100
=> 75 years	60.2 per 100
African American	2x Caucasian; 4x Asian, P.I.
Nursing home residents	139.5 per 100 (1.7%)
Homeless	83.6 per 100 (0.5%)

(Pitts SR et al.; 2008)



# NHAMCS 2006 ED Summary

Leading primary DX - all ages	National NHAMCS	Maryland Medicaid 2006
Injuries & poisoning	24.3%	18.0%
Ill- defined conditions	20.1%	15.5%
Upper respiratory	10.0%	14.0%

(Pitts SR et al.; 2008); (DHMH Report to General Assembly, 2007))



# NHAMCS 2006 ED Summary

Disposition	Discharge Plan
Referred to ambulatory clinic or physician	64.2%
Return to ED as needed	36.2%
No plan	5.6%

(Pitts SR et al.; 2008)



# NHAMCS 2006 ED Summary

Payment Source	ED population	ED rate in Payor Group
Private Ins	39.7%	21 per 100
Medicaid/SCHIP	25.5%	82 per 100
Medicare	17.3%	48 per 100
Uninsured	17.4%	48 per 100

(Pitts SR et al.; 2008)



# NHAMCS 2006 ED Summary

Non Obstetric Admissions to hospital	1996	2006
Admissions from ED	36.1%	50.2%
Other	17.1%	14.8%

(Pitts SR et al.; 2008)



# Heterogeneity of ED population: Age

**Average Number of ER Visits by Age Group for All Maryland Medicaid Recipients, CY 2006**

	<b>All Members, N = 866,028</b>	<b>Members with at Least 1 ER Visit, N = 240,503</b>	<b>Number of ER Visits, N = 498,089</b>	<b>Average Visits Per User</b>
<b>Age Group</b>	<b>Frequency</b>	<b>Frequency</b>	<b>Frequency</b>	<b>Average</b>
0 to <1	36,296	10,418	17,388	1.7
01-02	67,596	27,787	52,790	1.9
03-05	85,068	24,570	38,970	1.6
06-09	99,106	22,046	32,605	1.5
10-14	110,775	23,359	35,408	1.5
15-18	86,374	23,372	40,370	1.7
19-20	27,867	8,434	18,389	2.2
21-39	158,768	41,169	106,797	2.6
40-64	118,396	39,448	118,543	3.0
65+	75,782	19,900	36,829	1.9
<b>ALL</b>	<b>866,028</b>	<b>240,503</b>	<b>498,089</b>	<b>2.1</b>

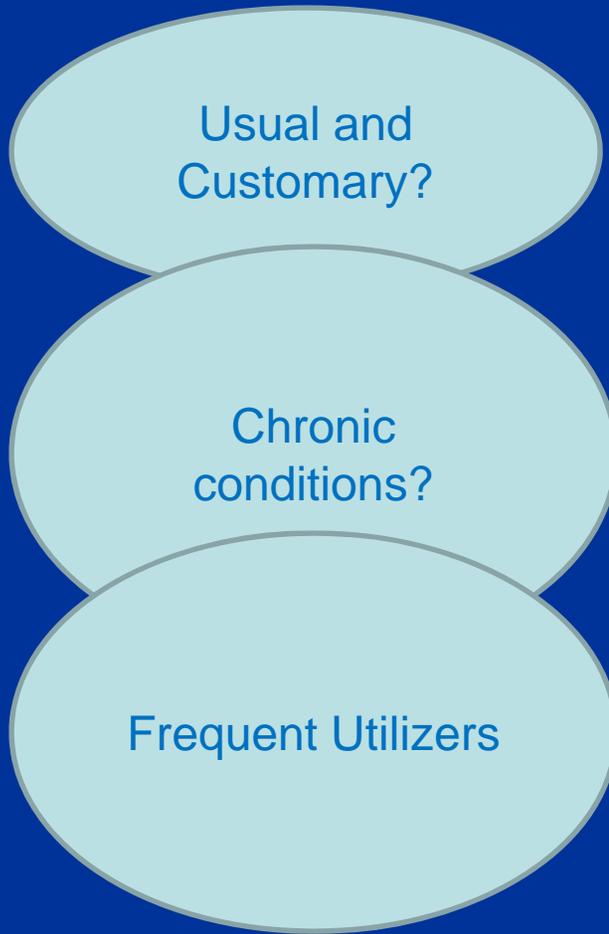
(DHMH Report to Maryland General Assembly, 2007)

# Heterogeneity of ED population: Frequency

**Table 1: Number of ER Visits for All Medicaid Recipients CY 2006, N = 866,028**

Number of Visits	Frequency	Percent
0	625,525	72.20%
1	137,272	15.90%
2	51,990	6.00%
3	22,626	2.60%
4	11,178	1.30%
5	6,066	0.70%
6	3,513	0.40%
7	2,189	0.30%
8	1,366	0.20%
9	959	0.10%
10	629	0.10%
10-20	2,132	0.20%
21-30	316	0.00%
31-40	115	0.00%
41-50	58	0.00%
51-100	80	0.00%
101+	14	0.00%
<b>ALL</b>	<b>866,028</b>	<b>100.00%</b>

88.1% =  
1 or 0 visits



# ED population characteristics: Children



# Target Population: Children

- 50% of ED visits were rated as high appropriateness; one third for illness not serious
- 41% of parents/caregivers listed “reassurance” as reason for ED visit, 37% listed “emergency situation”
- Medicaid patients who could name a PCP were more likely to have appropriate ED visit (54% to 38%)
- Timeliness and access to primary care = less ED use
- Parents uneducated about asthma preventive care and care management available

(Stanley, Zimmerman, Hashikawa, & Clark, 2007); (Frederickson et al, 2004)  
(Moon, Laurens, Weimer, & Levy, 2005); (Brousseau et al., 2009)



# Reasons for non-emergent PED utilization for an inner-city pediatric population

- Questionnaires and interviews: why using ED as primary care?
- N = 210, Univ. Hospital New Orleans (73% Medicaid; high AA)

Advantages of PER	Frequency of response (N=210)
Short wait time	92
Quality of care	74
Friendly staff	53
Knowledgeable staff	44
Convenient	14
Clean	12



# Decreasing ED use by Medicaid children by improving access to primary care

## Mechanism:

- 1) Expansion and identification of PCPs for children
- 2) 24-hour primary care access through call-a-nurse system

Health Plan	ED use per 1000 1995	ED use per 1000 1997	
Carolina Access Medicaid (N=20,663)	33.5	25.6	37% decrease in non-urgent
Non-Medicaid (N=34,079)	12.2	13.3	Slight increase in non-urgent

(Christakis et al., 2001)



# Factors associated with decreased utilization of ED by children

- Access to primary care
- Increased parental education about childhood illness
- Continuity of care

Continuity of Care level	Hazard Rate	Conf Interval
High	-	-
Medium	1.28	(1.20-1.36)
Low	1.58	(1.49-1.66)

(Christakis et al., 2001)



# ED population characteristics: **Chronic conditions**



## Chronic Care Patients: national samples

- 2004 MEPS: ED visits made by Medicaid patients with average 1.48 chronic conditions
- Chronic conditions more frequent in Medicaid enrollees than the uninsured
- 1996-2006
  - Diabetes visits up 43%
  - Hypertension visits up 51%
- Asthma in children



# Chronic conditions and ED use

**Table 5: Average Number of ER Visits by Comorbidity Level for All Maryland Medicaid Recipients, CY 2006\***

	<b>All Members, N = 866,028</b>	<b>Members with at Least 1 ER Visit, N = 240,503</b>	<b>Number of ER Visits, N = 498,089</b>	<b>Average Visits Per User</b>
<b>Comorbidity Level</b>	<b>Frequency</b>	<b>Frequency</b>	<b>Frequency</b>	<b>Average</b>
Low Comorbidity	468,374	59,873	77,002	•1.3
Moderate Comorbidity	214,278	88,870	157,529	•1.8
High Comorbidity	94,450	50,589	118,731	•2.3
Very-High Comorbidity	53,754	40,979	144,598	•3.5
Other	35,172	192	229	1.2
<b>ALL</b>	<b>866,028</b>	<b>240,503</b>	<b>498,089</b>	<b>2.1</b>

(DHMH Report to Maryland General Assembly, 2007)



# ED population characteristics: **Frequent Utilizers**



# Target Population: Frequent ED users

## Demographics

- Male, single/divorced,  $\leq$ HS Ed, low income

## Health status

- Recent hospitalization
- Psychological distress
- Asthma
- High use of other health resources, but poor referral follow-up

(Sun, Burstin, & Brennan, 2003); (Ruger, Richter, Spitznagel, & Lewis, 2004)



# Target Population: Stratified frequent ED users

Visit ED 3-20 times /year

- More likely to be hospitalized than patients visiting once or twice

Visit ED > 20 times/year (MD 2006 N=583/866,028)

- Less likely to be hospitalized
- Non-urgent conditions
- Lower severity scores than only one visit patients
- More likely to leave ED AMA than only one visit patients
- Lower average costs than only one visit patients



# Prevalence of psychiatric diagnoses among frequent users of rural EDs

- 93% of frequent (avg. 12 visits/year) ED users had at least 1 psychiatric diagnosis
- MDD, GAD, Alc abuse, somatoform pain, BPD, dysthymia most common diagnoses
- Under-documentation of psychiatric disorders (9% recorded by treating physician)
- Medicaid > Commercial



(Mehl-Madrona, 2008)



# Strategies: Target Frequent Users?

- Oregon Medicaid (2002): ED costs = 6.8% of total medical costs. 50% of all ED expenditures could be attributed to 3% of Medicaid enrollees. “...target selected enrollees rather than attempting overall ED use reduction.”
- MSW intensive case management pilot (N=53) x 1 yr
  - Sig. reduction in homelessness, drug & alcohol use
  - Sig. reduction in ED visits, increase in OP visits
  - ROI of \$1.44



# Strategies: Other Interventions to Reduce ED Utilization?

- Greater onsite medical care in low and moderate volume drug treatment clinics
- Mailing out books on non-urgent conditions = n.sig.
- Assigning non-acute patients in the ED to next day care = no AE



(Washington et al. 2002); (Laine, Lin, Hauck, & Turner, 2005); (Rector, Venus, & Laine, 1999)



# Strategies: Managed Care to Reduce ED Utilization

- Care management and uninsured:
  - Annual call = n.sig.
  - PCP assigned + benefits = n. sig
- MC enrollment associated with 23% reduction in ED use among Medicaid special needs children (Michigan)
- Stepped up care for adults with ED anxiety diagnoses = lower ED
- MC reduces ED use for all Medicaid racial groups; does not reduce disparities (Florida)
- Multiple asthmatic children studies lower ED use



(Kwack et al., 2004); (Dombkowski, Stanley, & Clark, 2004); (Powers, 2000)(Kolbasovsky, Reich, Futterman, & Meyerkopf, 2007); (Cook, Emiliozzi, Waters, & El Hajj, 2008); (Kominski, Morisky, Afifi, & Kotlerman, 2008); (Pollack, Wheeler, Cowan, & Freed, 2007)



# ED community (system) characteristics



# Community (system level) Characteristics affecting ED use by Medicaid Enrollees

Predictors of **Higher** ED Utilization Rates in Oregon Primary Care Service Areas (PCSAs)

- **Lower** Primary Care Capacity
- **Shorter** Distance to Emergency Department

Predictors of **Higher** ED Utilization Rates in Oregon Medicaid children

- **Closer** to ED
- **Farther** from primary care



## Impact of Medicaid Cutbacks on ED Use: the Oregon Health Plan's 2003 Experience

Payer	2002	2004	Change
Commercial	17,654	15,814	-1,840
Oregon Health Plan	13,964	11,973	-1,991
Uninsured	6,682	9,058	+2,376
Medicare	10,341	10,830	+489
Other	4,808	4,792	-16
Total	53,449	52,467	-982

(Lowe et al., 2006); (Lowe & Fu, 2008); (McConnell, Wallace, Gallia, & Smith, 2008); (Rimsza, Butler, & Johnson, 2007); (Wallace, McConnell, Gallia, & Smith, 2008)



# Strategies: Increase Access to Medical and PCP Services?

- Less ED utilization and lower pmpm costs resulted from:
  - Extending office hours at PCP offices
  - Increasing access locations
  - Care coordination
  - Lower ratio of active patients per clinician hour of practice time
  - Telephone triage systems

(Wang, Villar, Mulligan, & Hansen, 2005); (Lowe et al. 2005); (Piehl, Clemens, & Joines, 2000)



# Cost and Utilization Analysis of a Pediatric Emergency Department Diversion Project

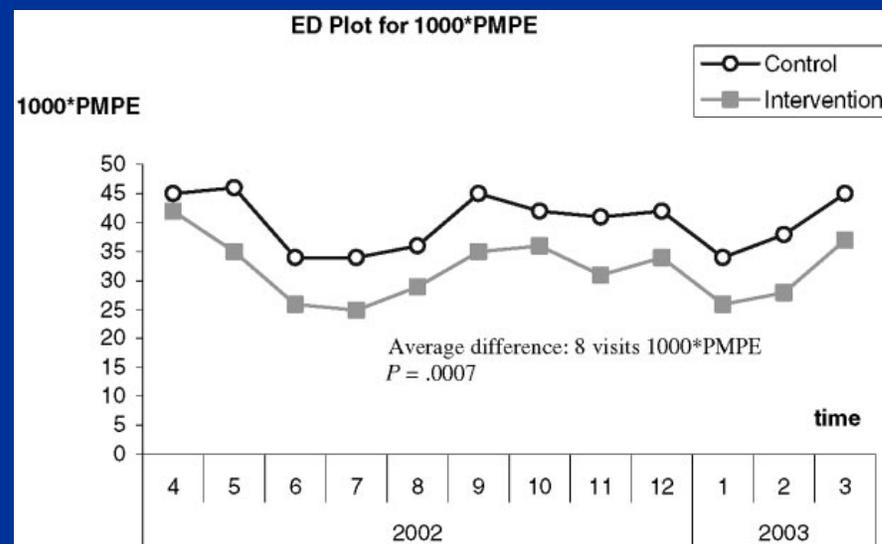
Large, private, primary care group offered:

- extended office hours
- multiple access locations
- care coordination

Population: < 18 years of age;  
Medicaid or Medicaid eligible

Intervention Practice: N = 17,382  
Comparison Practices: N = 26,066

Result: PMPM ED \$1.36 less in  
Intervention practice.



# ED community (system) characteristics: Baltimore City and Maryland



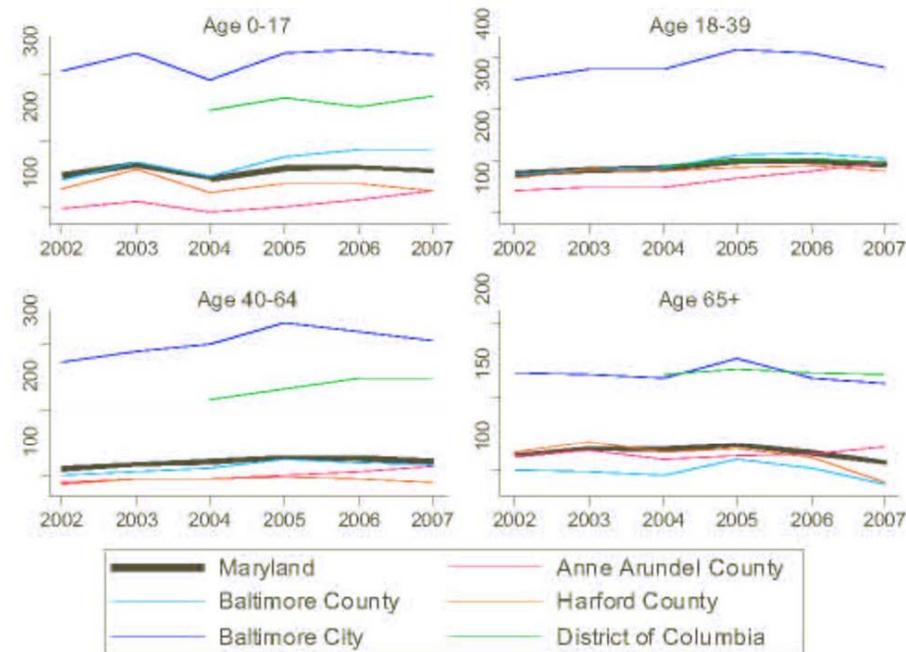
## Report to the General Assembly: ED Visits for Medicaid Enrollees, October 2007

- In 2006, there were 866,028 ED visits for all Medicaid enrollees
- Enrollees age 40-64 make up 13.7% of total Medicaid population with 118,396 enrollees, but account for 23.8% of ED visits
- Enrollees with high comorbidity conditions accounted for 28% of all ED visits but only 6.2% of the population
- 47.3% of visits were for a form of ED care which could have been avoided or prevented



# Ambulatory Care Sensitive Emergency Department Visits (per 1000) in Baltimore City

Figure 8: ACS- ED Rates in Baltimore City and Selected Comparison Locations

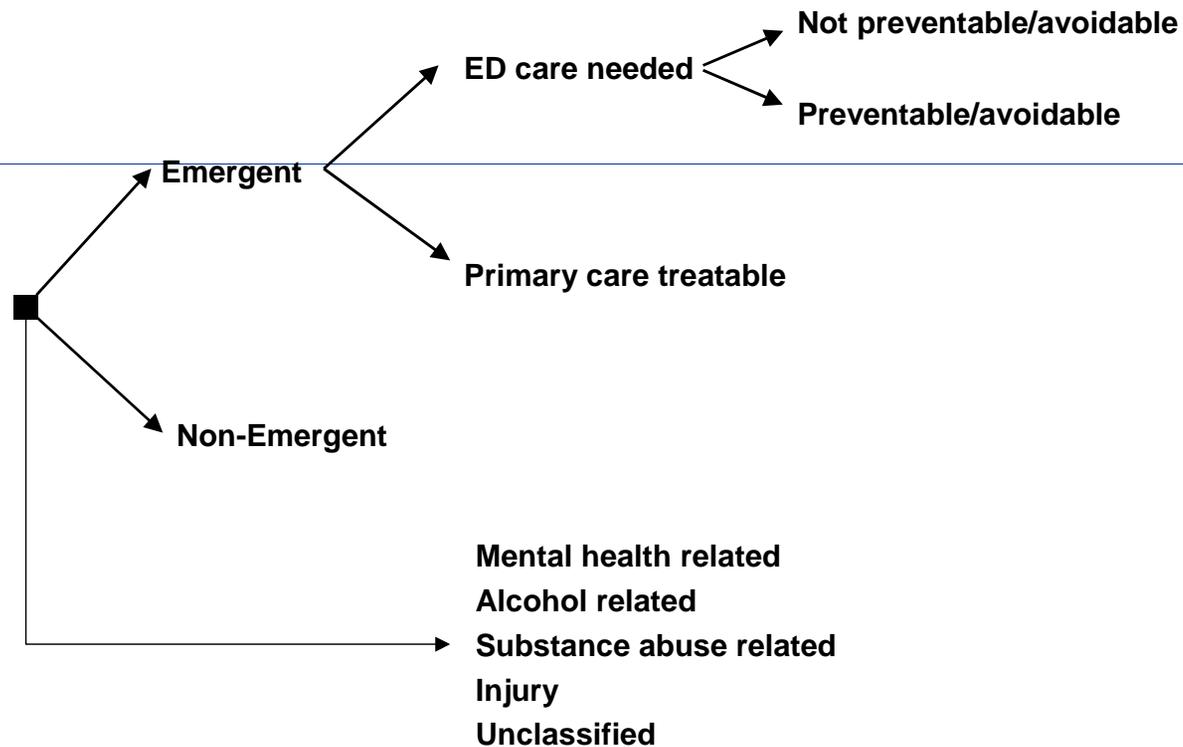


“Ambulatory care sensitive (ACS) rates have been used as indicators of the availability and effectiveness of the primary care system.”

(Gresenz, Ruder & Lurie, 2009)



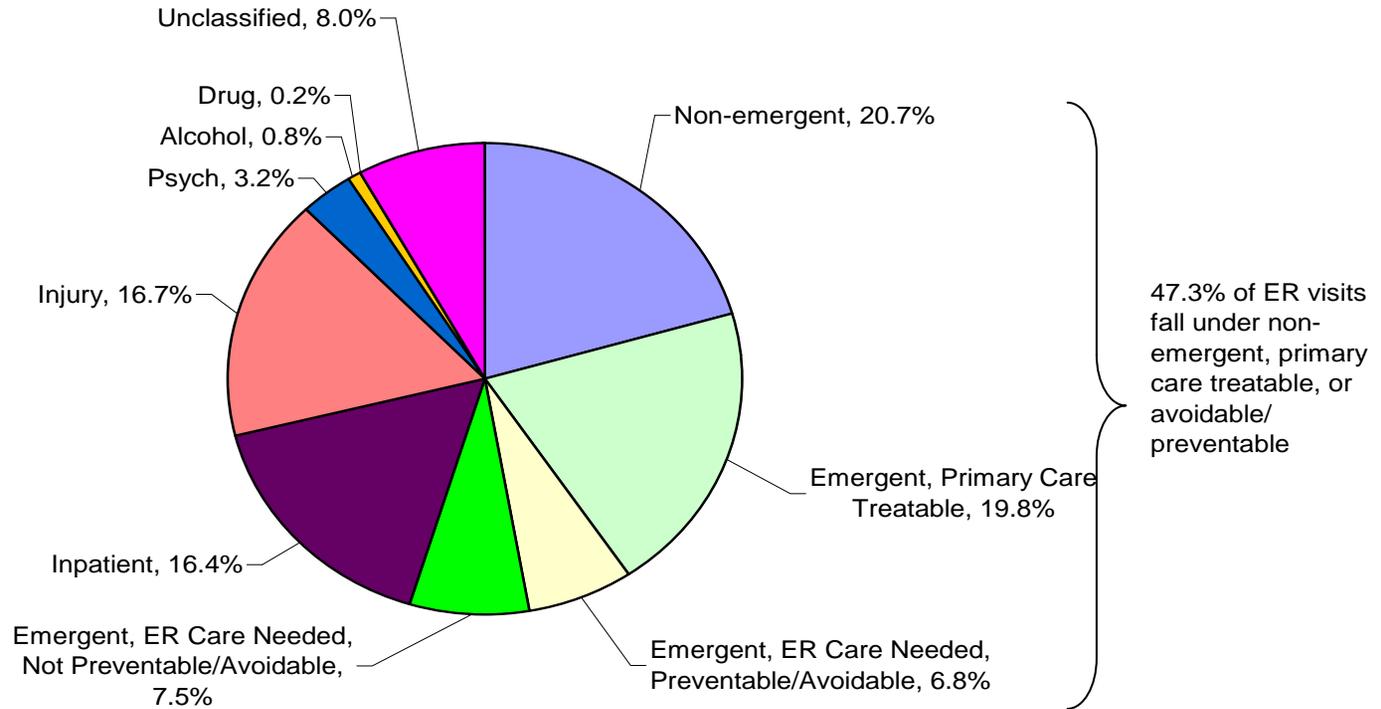
## NYU EMERGENCY DEPARTMENT CLASSIFICATION ALGORITHM [V2.0]



(Source: NYU, Robert F.Wagner School of Public Service;  
<http://wagner.nyu.edu/chpsr/index.html?p=25>)



### Classification of All ER Visits for the Medicaid Population, CY 2006



■ Non-emergent	■ Emergent, Primary Care Treatable
■ Emergent, ER Care Needed, Preventable/Avoidable	■ Emergent, ER Care Needed, Not Preventable/Avoidable
■ Inpatient	■ Injury
■ Psych	■ Alcohol
■ Drug	■ Unclassified

(DHMH Report to Maryland Legislature, 2007)



# The Rand Report Recommendations

- Increase access to primary care (est. additional 130,000 to 159,000 primary care visits)
- Urgent care centers with walk-in capacity; evening and weekend capacity
- Better coordination of care



## Review conclusions

- Geographic factors, chronic health conditions, and primary care access are all predictors of ED utilization patterns for Medicaid enrollees.
- Potentially successful strategies include increased access to primary care and managed care interventions.
- Managed care associated with decreased ED use; disenrollment from Medicaid associated with cost-shifting.



# Going Forward...

## 1. Interventions

- a) What characteristics (patient, community, plan) are modifiable?
- b) New interventions that have not been tried?
- c) Which interventions are the best use of resources?

## 2. Case Finding and Matching

- a) Whom do we target for interventions?
- b) What types of interventions are appropriate for each group targeted?



# Going Forward...Measurement

## 1. ED population

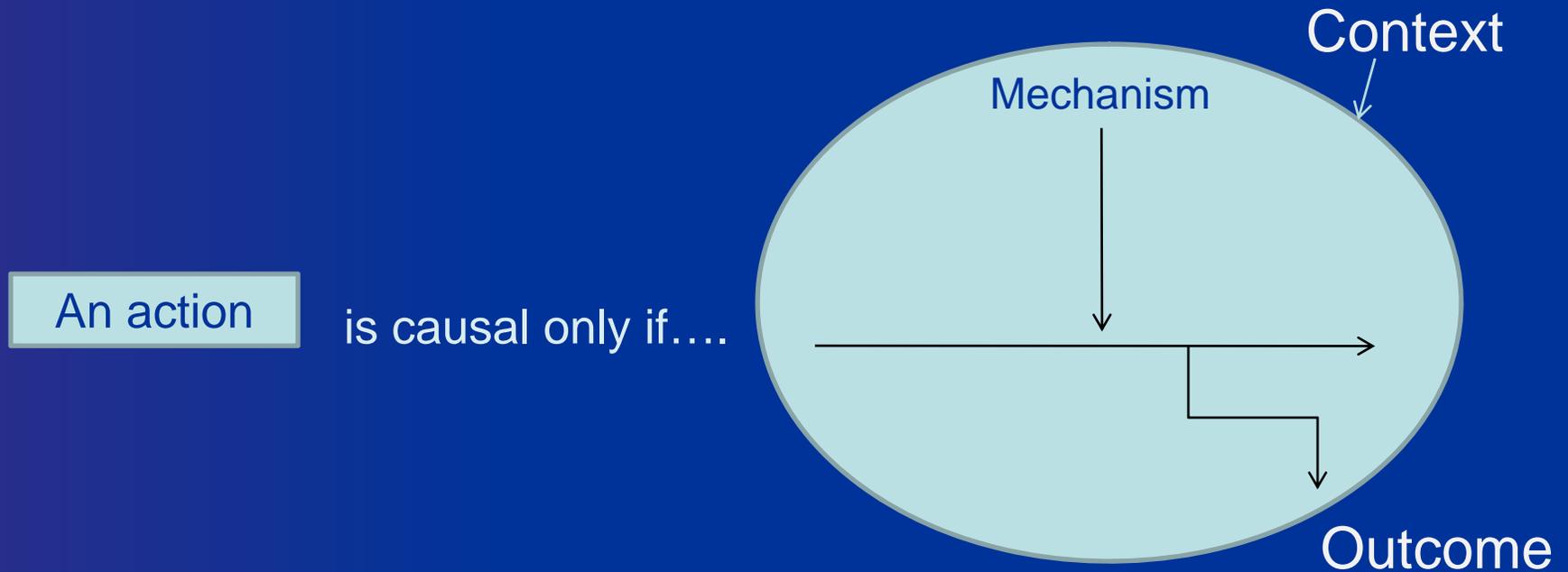
- a) Target population for intervention
- b) Metric's denominator should reflect the characteristics of the (sub)population, e.g., age range, chronic condition, frequent ED user status, residence locality.
- c) Comparison group to avoid simple pre-post validity challenges

## 2. Intervention

- a) Describe the theorized causality and context
- b) Measure the intervention, e.g., intensity, frequency, duration



# Quality Improvement Initiatives, Random Controlled Trials and Outcomes Evaluation



... its outcome is triggered by a mechanism acting in context.



# Review

- 1. Description of problem**
- 2. ED population characteristics**
- 3. ED use in Maryland and Baltimore**
- 4. Strategies to reduce ED utilization**
- 5. Conclusions and suggestions**



## **Contact information**

**Peter J. Fagan, PhD**

**Director of Research**

**Johns Hopkins HealthCare LLC**

**410 424-4958**

**[pfagan@jhmi.edu](mailto:pfagan@jhmi.edu)**

