

# HIEs to Facilitate Integration of Care

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Integrated Care Collaboration  
Improving Access to Healthcare in Central Texas

# Outline

- HIE
  - Definition
  - Classification
  - Functions
  - Economics
- The Integrated Care Collaboration's Use of HIE
  - Dynamic Framework for Coordinated System of Care
  - Community metrics
  - Evaluation of community programs
  - Delivery system changes

# Health Information Exchange (HIE)

- Mobilizing health care information electronically across organizations within a given region or community

Rudin, et al. *Amer J Pub Health*, 2009

# Regional Health Information Organizations (RHIO)

- A RHIO is a legally defined, neutral organization that adheres to a defined governance structure, which is composed of and facilitates collaboration among stakeholders in a given medical trading area, community, or region, and is dedicated to the promotion and use of secure digital health information exchange in order to advance the effective and efficient delivery of healthcare for individuals and communities

HIMSS RHIO Definition Workgroup, 2006

# Types of HIE

- Geographic
  - Community (CHIN)
  - Regional (RHIO)
  - State
  - National (NHIN)
- Architectural
  - Centralized
  - Federated
  - Hybrid

# Types of HIE

- Functional
  - Patient Management Systems
  - Electronic Medical Records
  - Financial/Billing Data
- Organizational
  - Nonprofit
  - Public
  - Private

# HIE Functions

- Point of care (transaction layer)
  - Two-way, real-time exchange of patient data
- Data Repository (community analytics layer)
  - Community-wide health management function
  - Much of the benefit comes from data aggregation and analytics across cohorts

# HIE Role in Healthcare Reform

- Healthcare reform is initiated at the Federal level but its actual implementation will be at the community level, at the grass roots level
- Evidence-based quality measures
- Linked to Medical Home (clinic side) and Accountable Care Organization (financial side) concepts to create virtual care coordination zones
- Anchor role for PCP in the referral network

# HIE Development & Operation

- 1. Engaging multiple and diverse stakeholders
- 2. Building consensus on regional or community health needs and developing the vision, goals and objectives, principles, policies and functions/services for HIE
- 3. Developing an organizational and governance structure
- 4. Developing and implementing a sustainable business plan
- 5. Identifying and agreeing upon policies for information sharing
- 6. Developing and implementing a technical infrastructure
- 7. Supporting clinical process change and clinician adoption of HIT

# Challenges to HIEs

- 2007 survey revealed more than 100 RHIOS
- In mid-2008, 131 RHIOs responded to the survey
- 20% failure rate over 17 months\*
- Only 55 RHIOs operational and actively exchanging information
- Only 20 exchanges operational and exchanging clinical data while serving more than 5,000 patients
- Another study by Healthcare Information and Management Systems Society (HIMSS) found 21 HIEs actively exchanging data for >6 months\*\*

\*Adler-Milstein, *Health Affairs* 2009

\*\* HIMSS, 2009

# Economics of HIE

# Value of HIEs nationally

- Walker et al (Health Affairs, 2005)
  - Net savings from national implementation of fully standardized interoperability between providers, labs, payers and radiology centers could yield \$77.8 billion annually
  - Clinical payoff in improved patient safety and quality of care could dwarf financial benefits (avoided redundancies and saved administrative time)

# Value of HIEs to states

- Hook et al (JAMIA, 2006)
  - Standardized HIE in New York state can yield a net value of \$4.54 billion annually
  - Value seen mainly due to
    - Reduction of redundant tests,
    - Decreased delays and costs in paper-based ordering
    - Quicker reporting of results

# Value of HIEs to communities

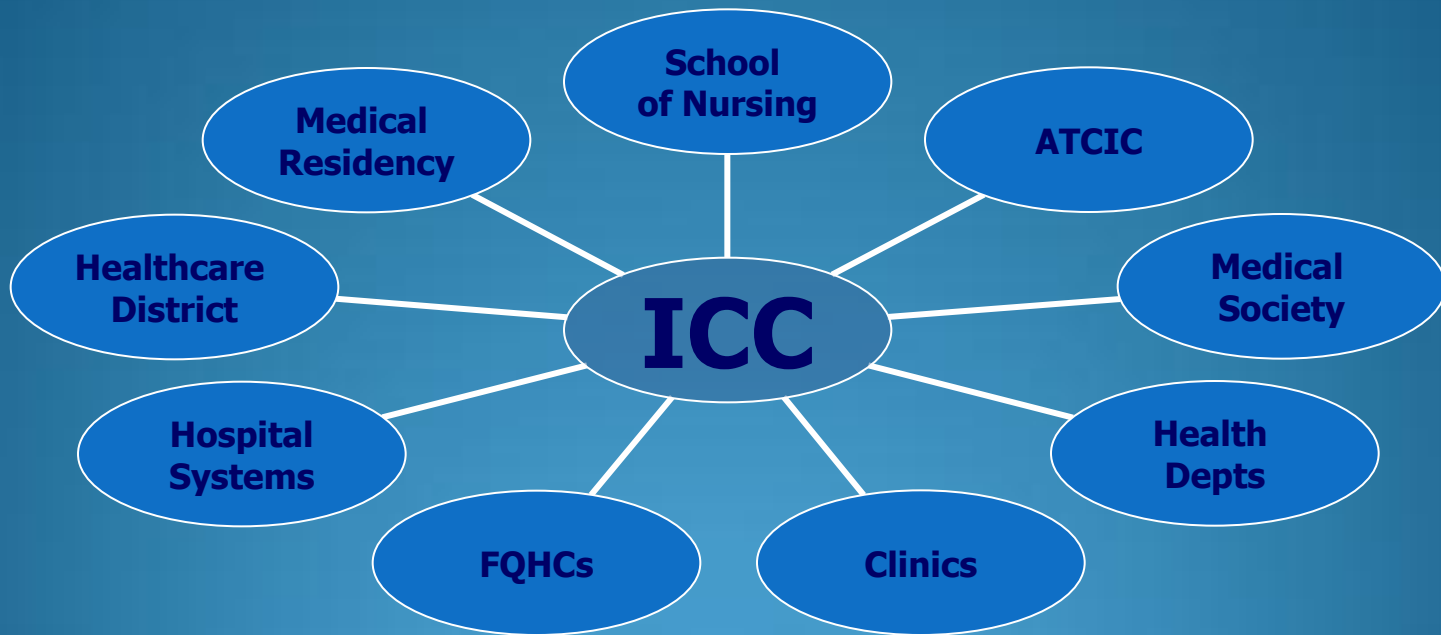
- Frisse & Holmes (J Biomed Informatics, 2007)
  - Urban region can realize significant and measurable annual saving if RHIO data are used at point of care
  - Improving quality and safety of medical care while reducing expenditures by >\$20 million in a 5-year period

**Example of Central Texas HIE**

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**The Integrated Care  
Collaboration**

# ICC: Regional Convener & Incubator



# ICC Functions

- **Community Collaboration**
  - Develop community standards through dashboards
  - Act on opportunities for collaborative interventions
  - Set priorities for coordinated efforts
- **Point of care**
  - Access patient clinical history
  - Avoid duplicative procedures, tests & prescriptions
  - Manage care coordination for patients with chronic diseases
- **Communication and reporting**
  - Manage daily operations
  - Plan and evaluate programs (ROI analysis)
- **Community health analytics**
  - Track population care patterns
  - Measure community health outcomes

# ICare Database

- MPI/CDR (Master Patient Index/Clinical Data Repository)
  - Accessed through an internet software application
- Data collected via electronic interfaces
  - For uninsured or those on assistance programs (Medicaid, CHIP, MAP, Seton Plus etc.)
  - Demographics, encounters, diagnoses, primary care physician, PHI disclosure authorizations

# I-Care Database

- Patient-specific data is only viewable if that patient has signed an ICC Authorization
  - Aggregate data used for de-identified reporting
- Data is “view only” for users
  - No manual data entry
- System is available for access to authorized ICC members

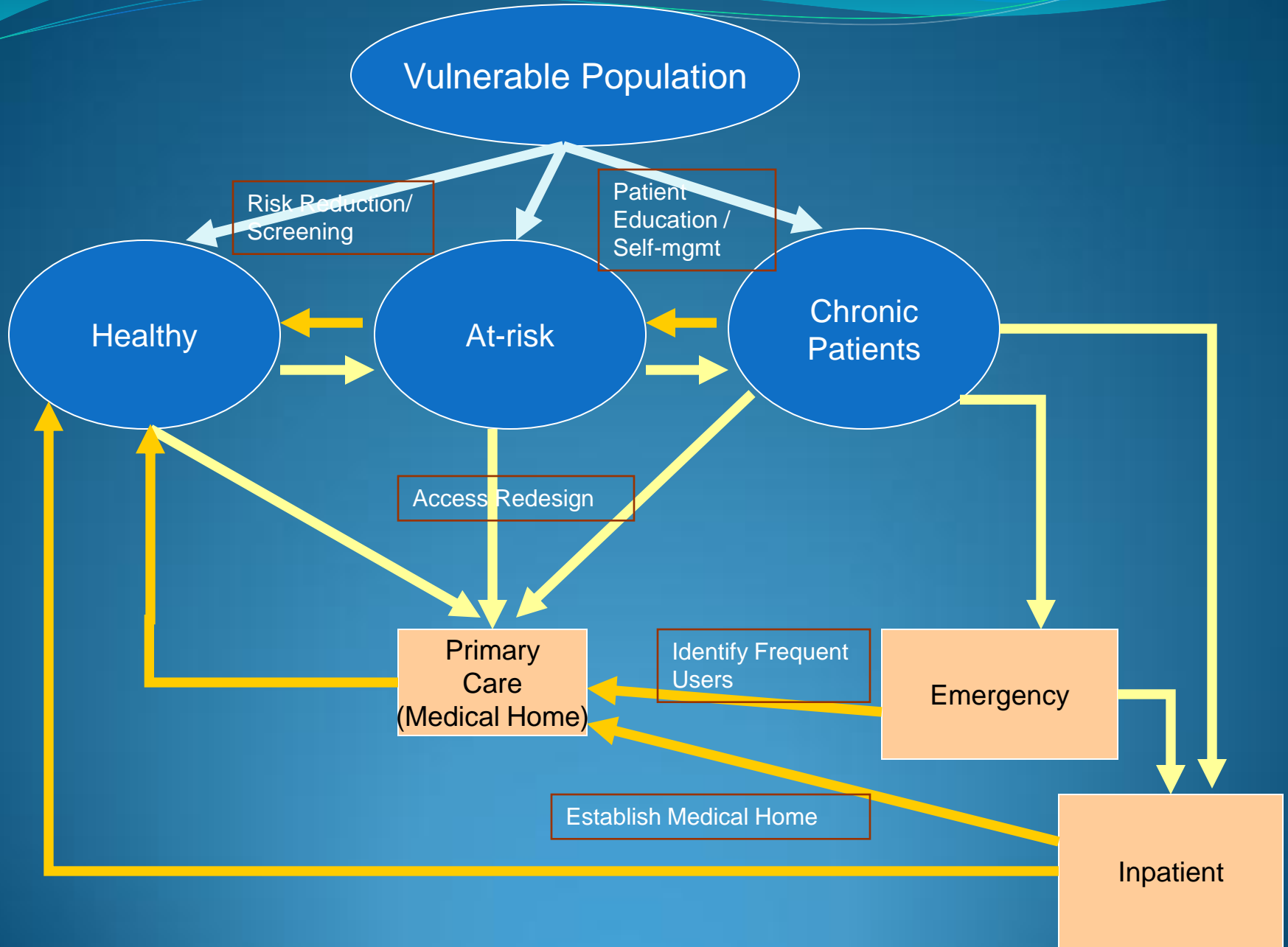
# ICare Snapshot

- Over 70 locations contributing data: 16 hospitals, 50 clinics, 1 Mental Health Authority, 2 Physician Networks
- Nearly 900,000 patients (uninsured/underinsured)
- About 5.5 million encounters (2002-present)
- More than 700,000 prescriptions

# ICC's efforts to Integrate Care

- Point of Care
  - Use cases
  - High alert programs
  - Eligibility screening
- Analytics
  - Community metrics/dashboard
  - Chart audits for chronic disease
  - Frequent users of emergency departments
  - Evaluation of community programs
  - Management of chronic patients

# Dynamic Framework for a Coordinated System of Care (DFCSC)



# Community Systems

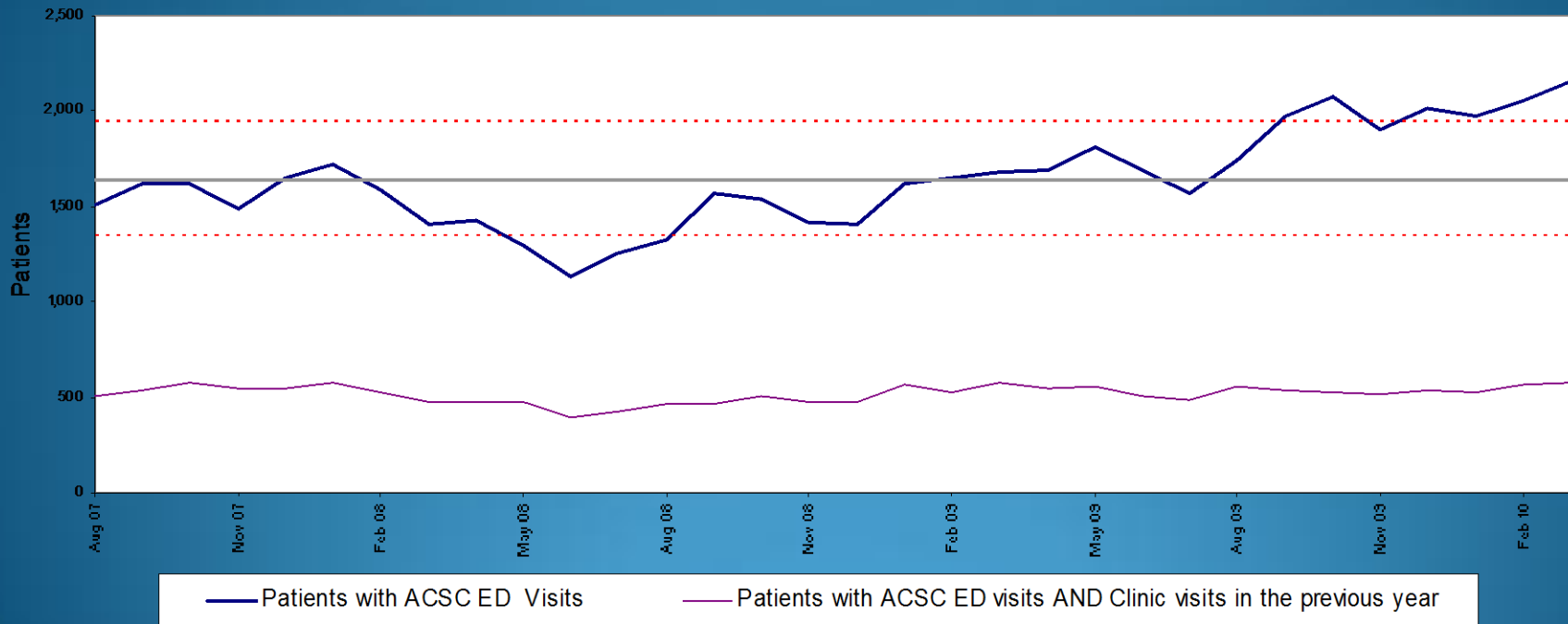


Integrated Care Example 1

# Management of Ambulatory Care Sensitive Conditions (ACSC)

# Quarterly Dashboard, Jan-Mar'10

**ICare Patients with ACS\* Conditions in Emergency Department Visits and the Subgroup with any Clinic Visit in the Previous Year**



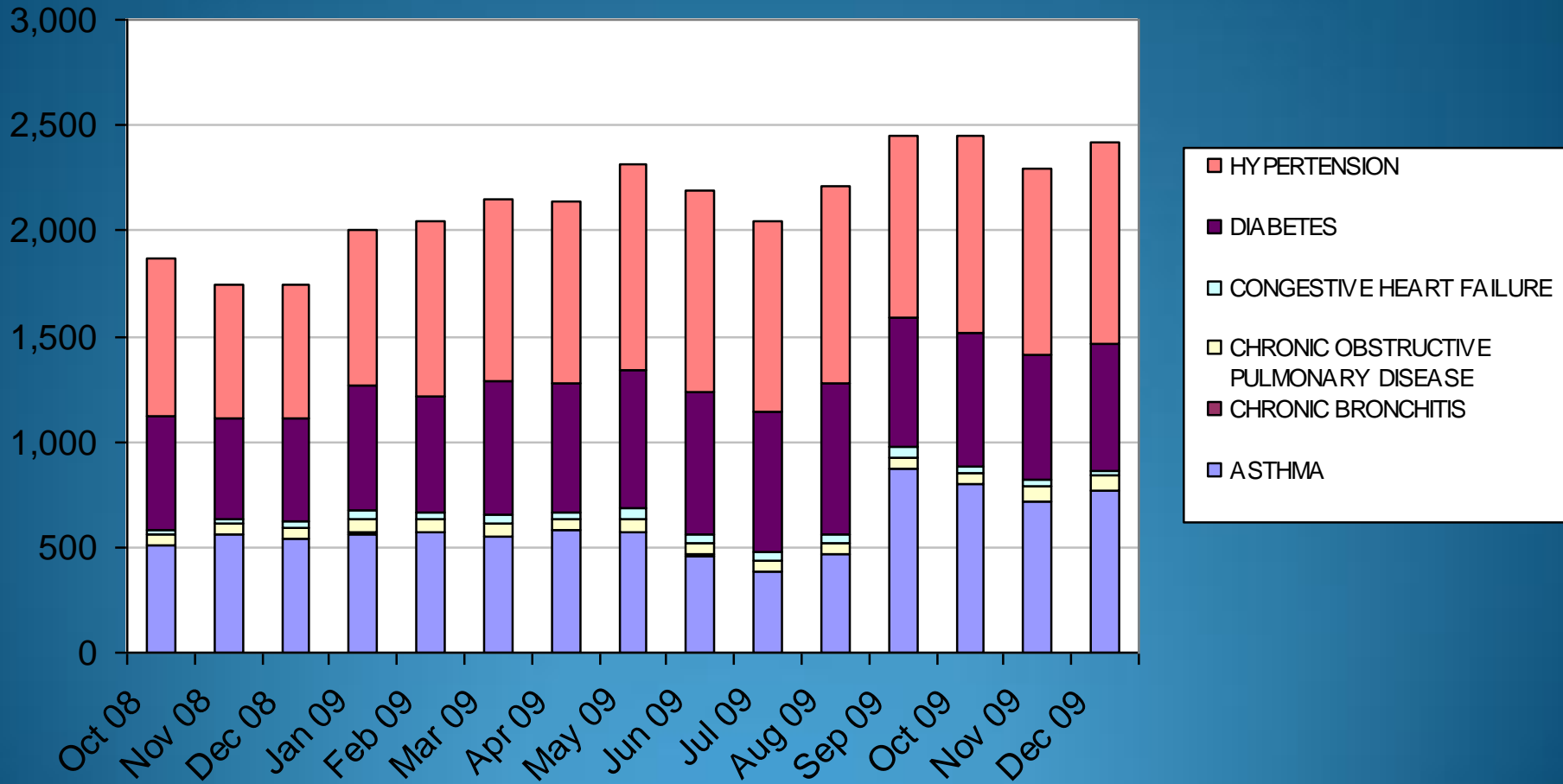
\* ACS (Ambulatory Care Sensitive) conditions include Asthma, Diabetes, COPD, Chronic Bronchitis, CHF, & Hypertension

# Scope of Data Analysis

- Patients with any ED visit with a primary or secondary diagnosis of ACSC chronic conditions\*
- Identify patients with prior clinic visits in the system
- Identify Medical Home for these patients based on more than one visit in past 18 months to the same clinic system
- Establish system of care coordination across ICC

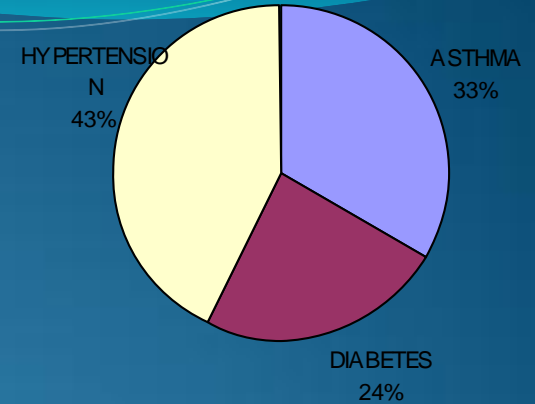
\*asthma, diabetes, COPD, CHF, chronic bronchitis, hypertension

# ED Chronic Dx Patients by Disease

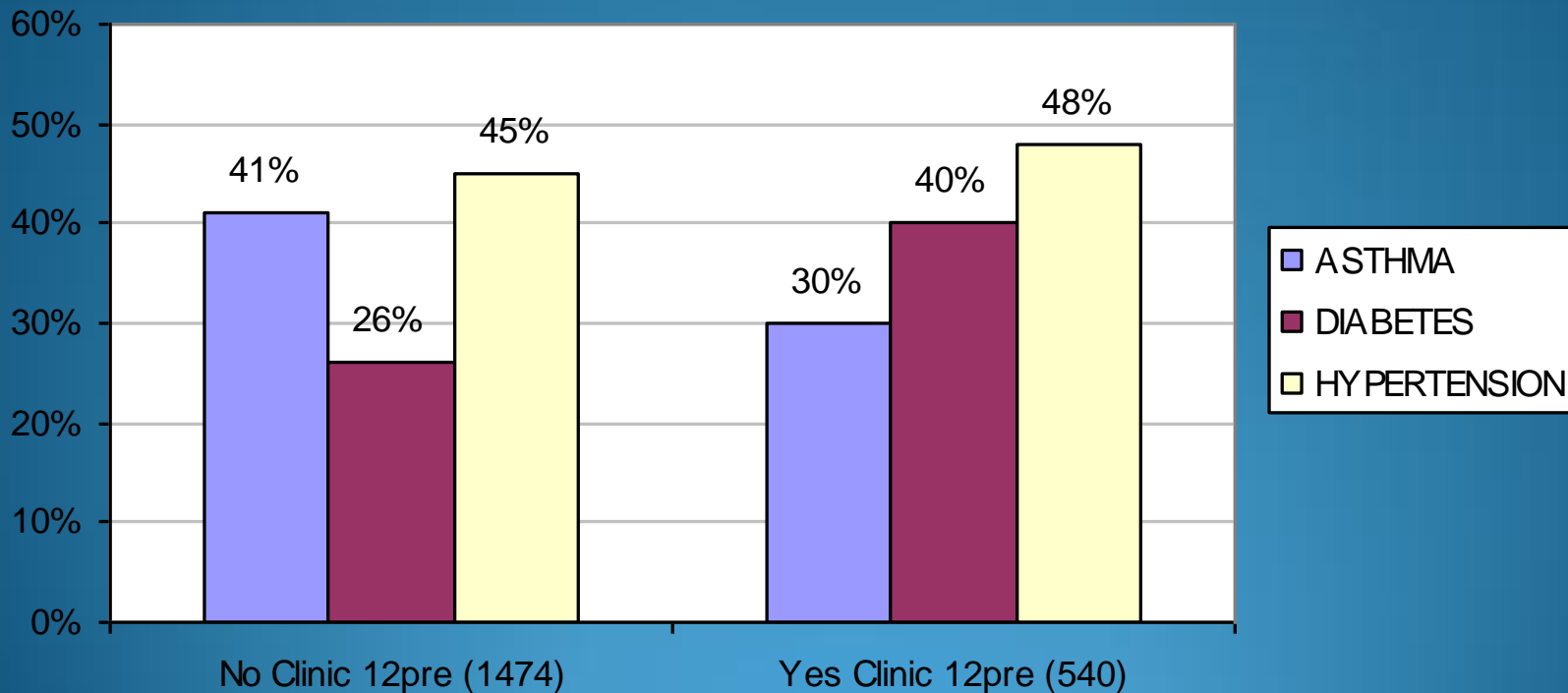


All ED Dec'09 (17,672)

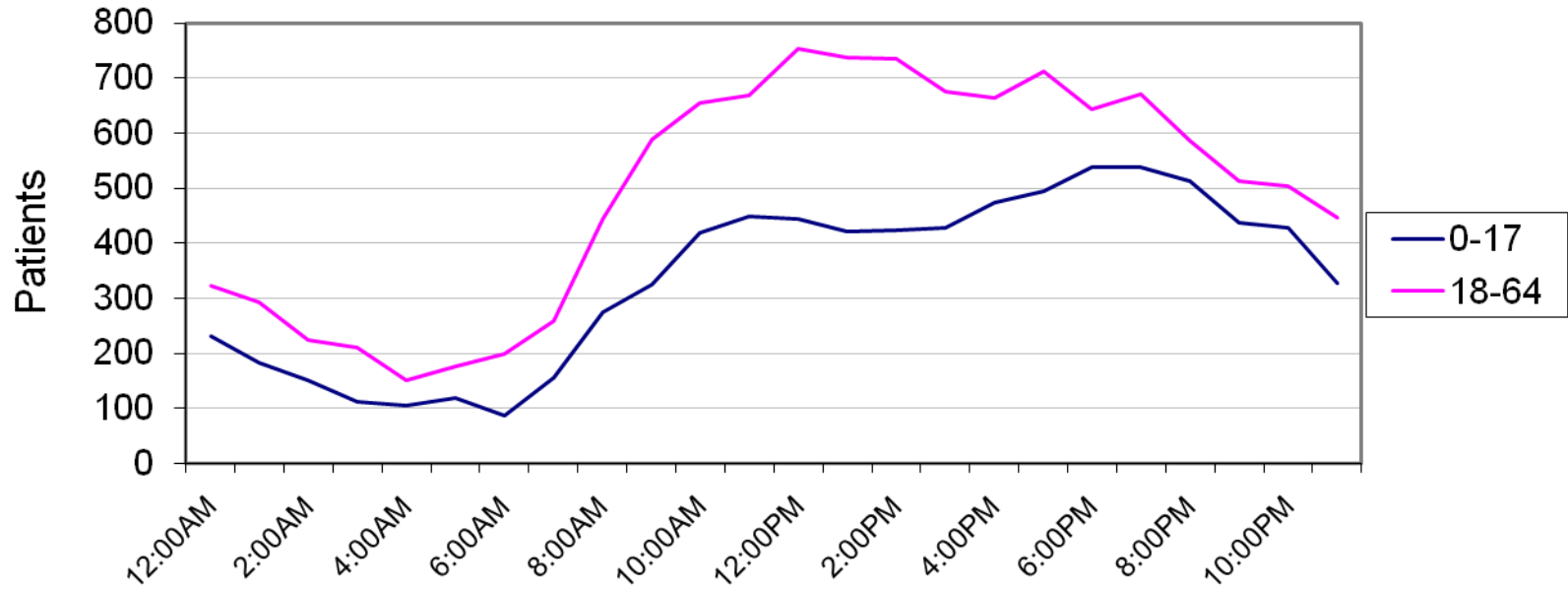
# Chronic Disease Dx & Previous Clinic Visit



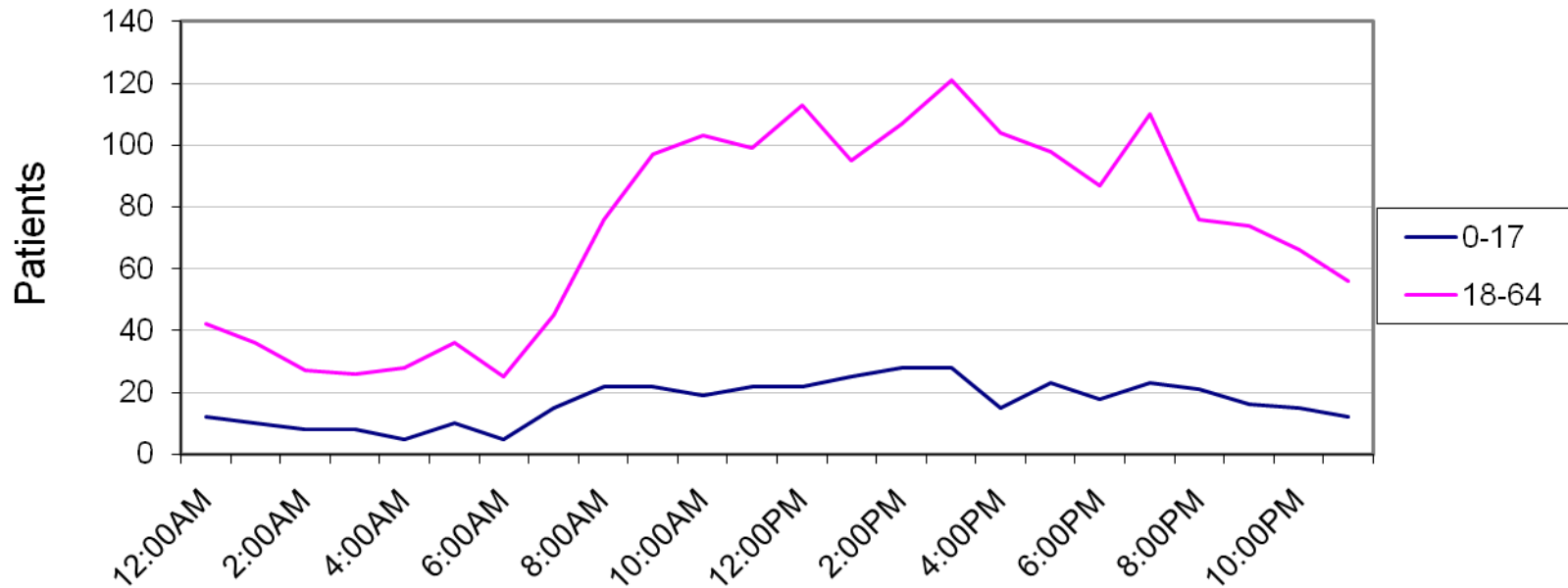
ED Patients with Chronic Conditions, Dec '09



### ICare All Patients in ED, Dec 2009



### ICare Patients with Chronic Dx in ED, Dec 2009



Integrated Care Example 2

# Evaluation of “ICC – Asthma Network” Project

# ICC/Seton Asthma Network

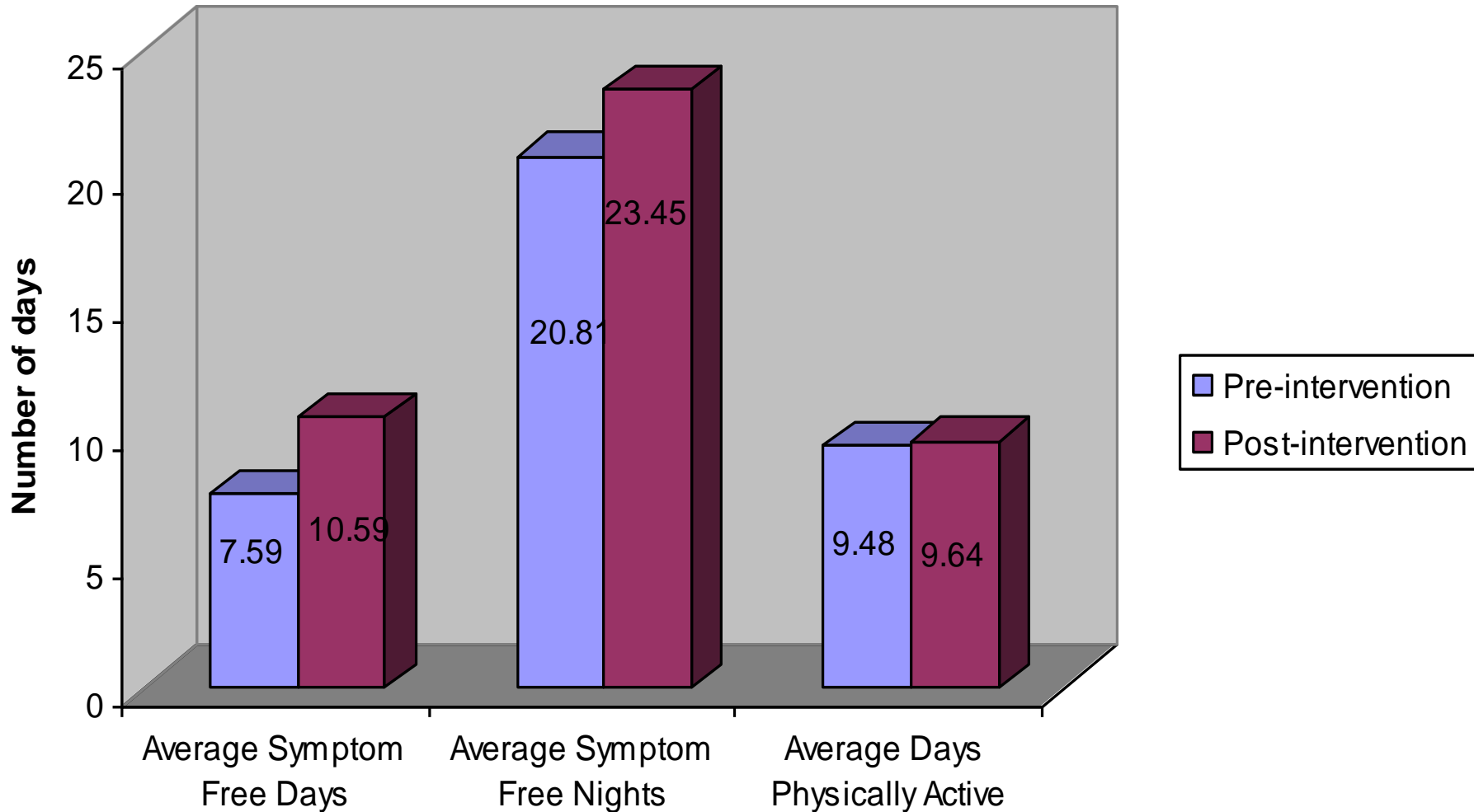
- ICare reports automated on MyEpic to generate a weekly referral list for Asthma education and case management
- Reports show patients with Asthma who had ED encounters or unusually frequent clinic visits where Asthma diagnosis was present

# Program Intervention

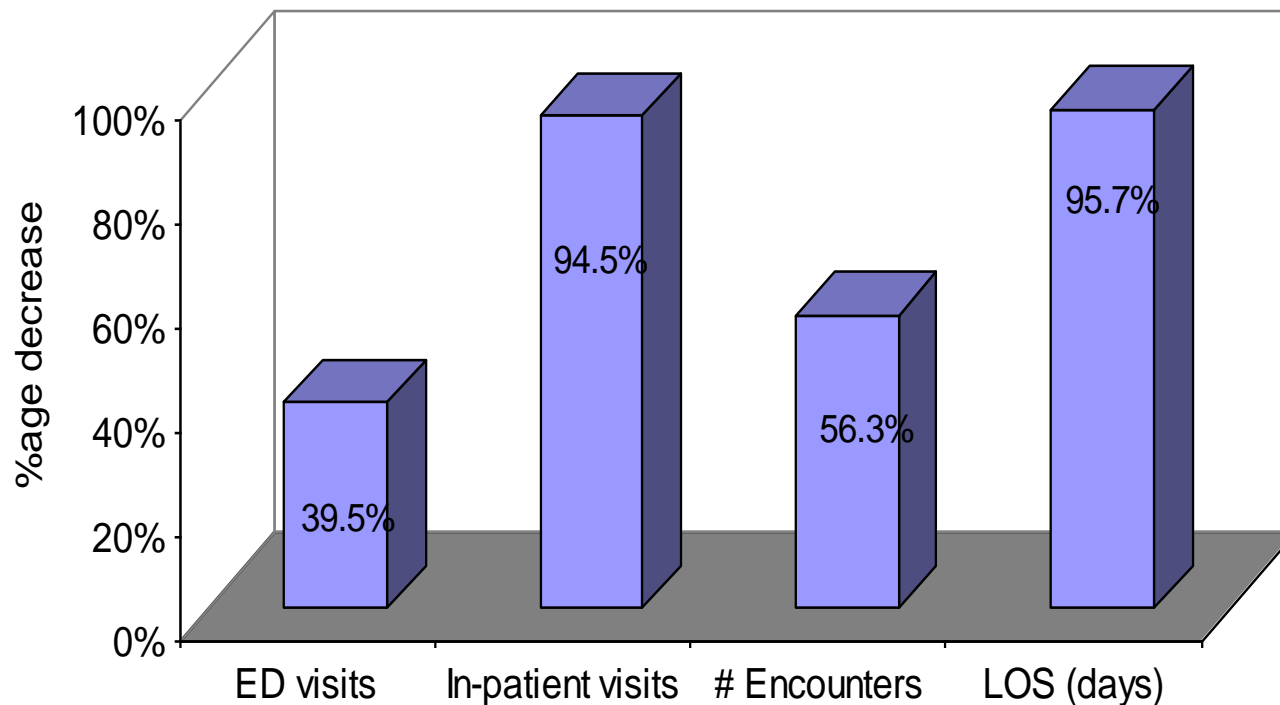
Interventions provided through Certified Respiratory Therapist:

- Asthma education program
- Asthma Action Plan
- Case Management/ Care Coordination
- ICC's *Medicaider*<sup>®</sup> Program
- Quality of Life Surveys

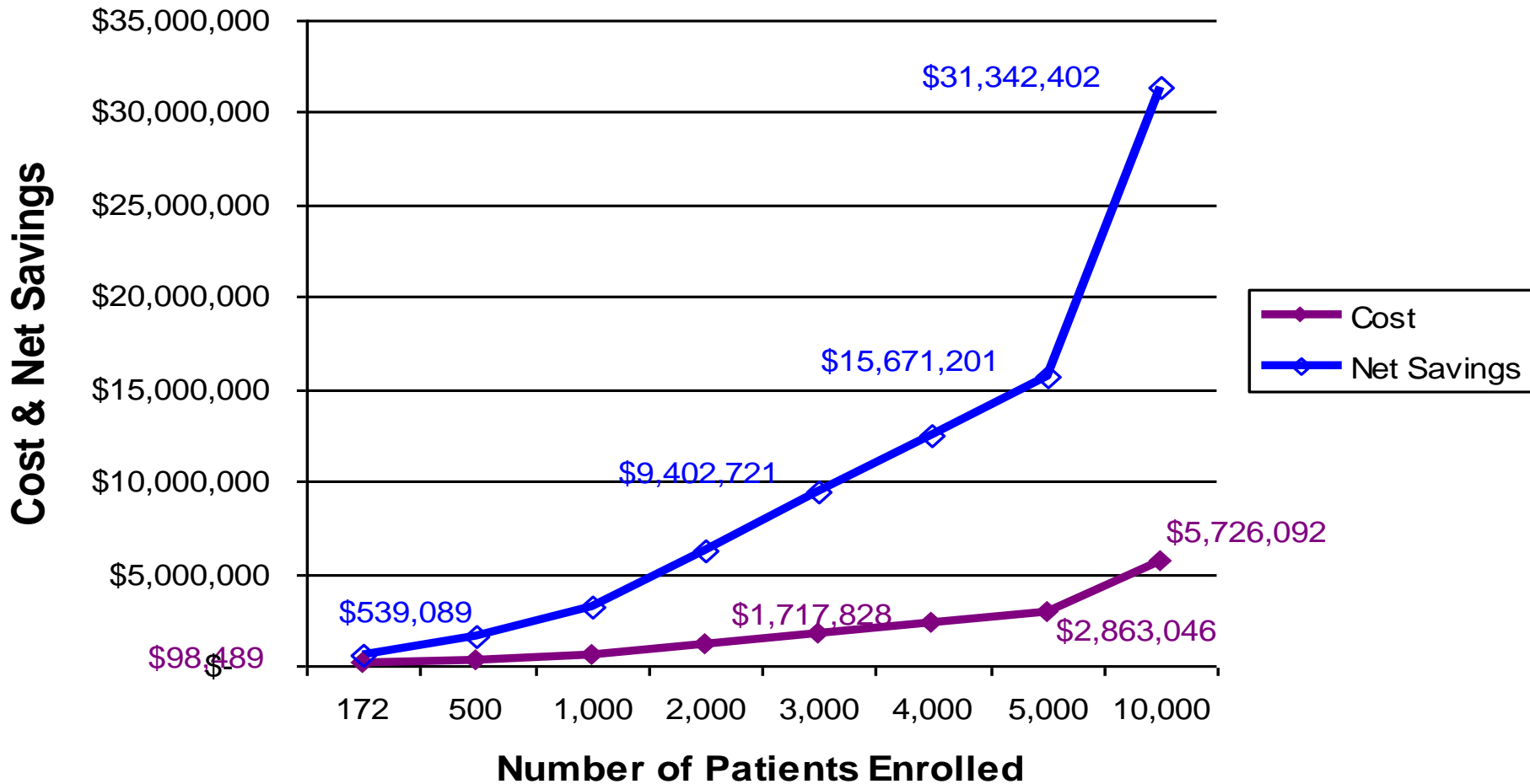
# Quality of Life Survey Results



# Percentage decrease in utilization by enrolled patients



# Projections based on asthma program evaluation



Integrated Care Example 3

# Analysis of Emergency Department Frequent Users

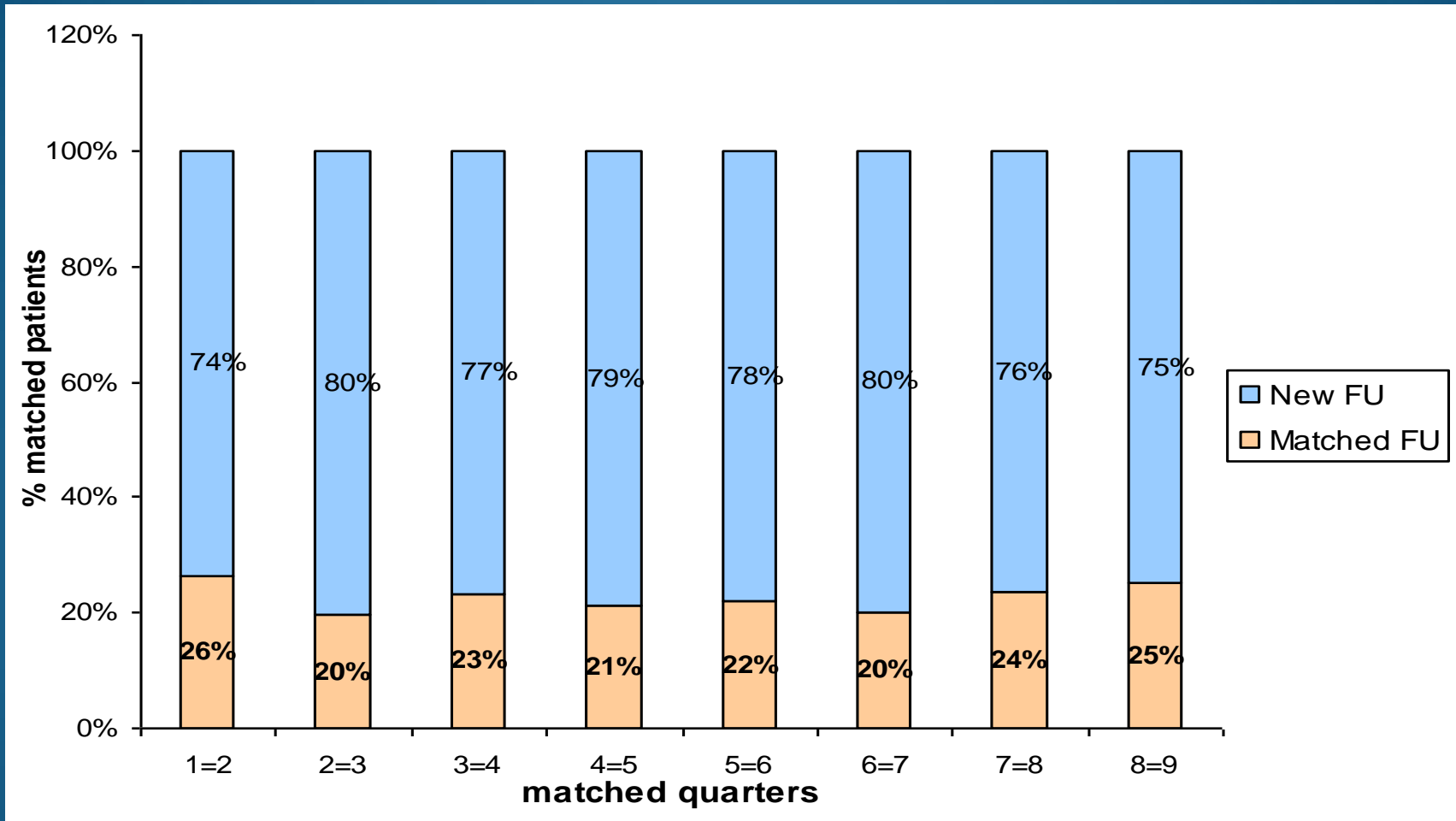
# Analysis of ED Frequent Users

- Problem Statement
  - ED services are overburdened\*
  - Some patients use ED services far more than others\*\*
- Project Scope
  - To identify and stratify frequent users of ED services and design interventions to improve care
  - Define frequent user of ED based on utilization:  $\geq 6$  ED visits in a quarter

\* American College of Emergency Physicians, 2009

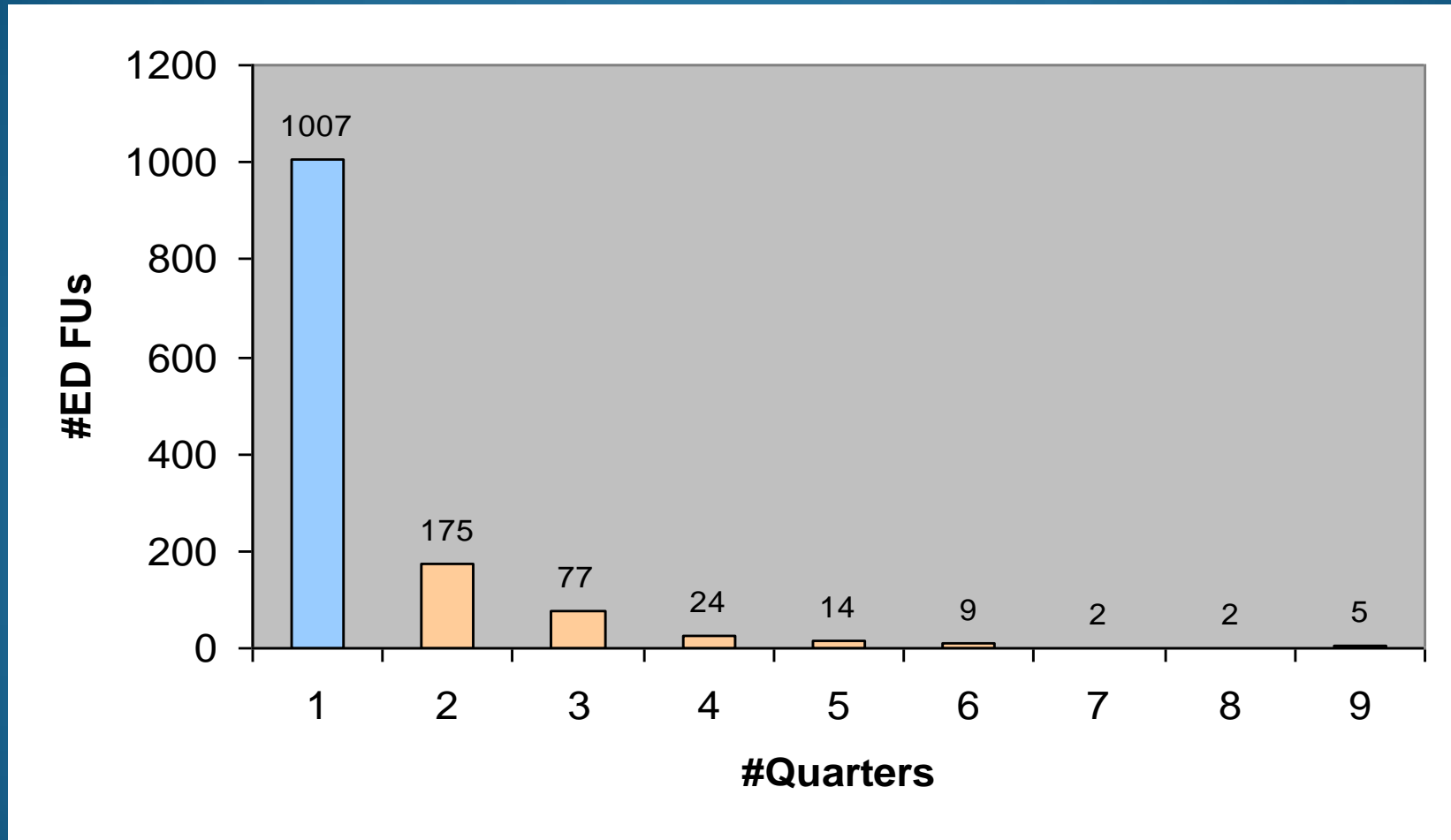
\*\* Shumway 2008, Huang 2008, Byrne 2003

# ED Frequent Users Matched in Consecutive Quarters, 2006-08



*\*ED Frequent Users defined as patients with  $\geq 6$  ED visits in a quarter (3months)*

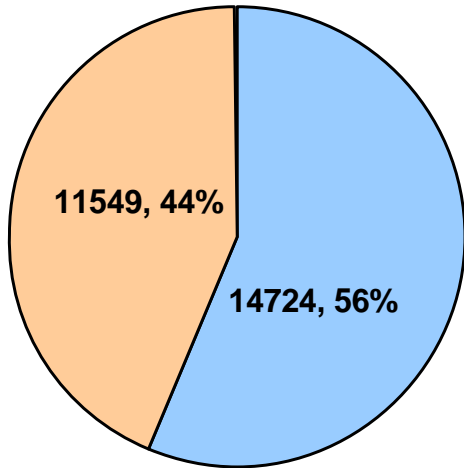
# ED FUs in Quarters, 2006-08



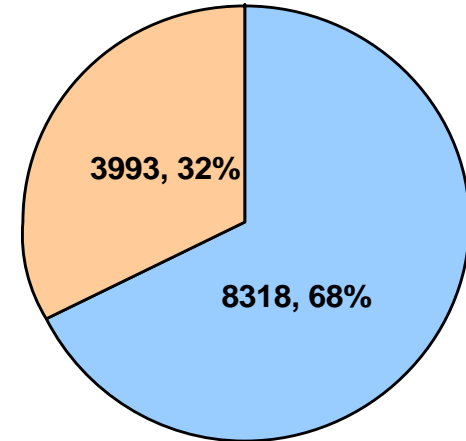
Total ED FUs, 2006-08=1315

# Utilization by ED FUs, 2006-2008

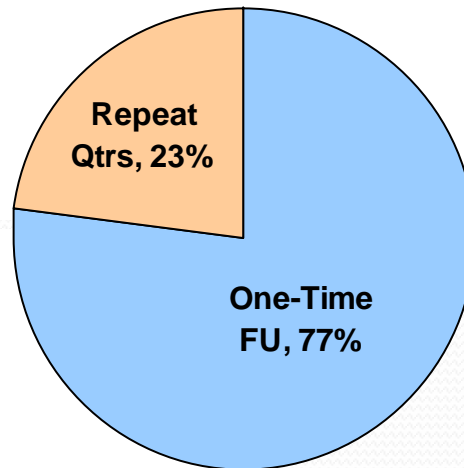
ED 06-08



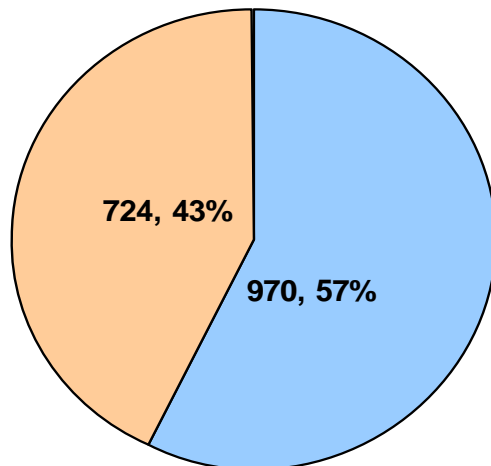
CV 06-08



ED FUs



IP 06-08

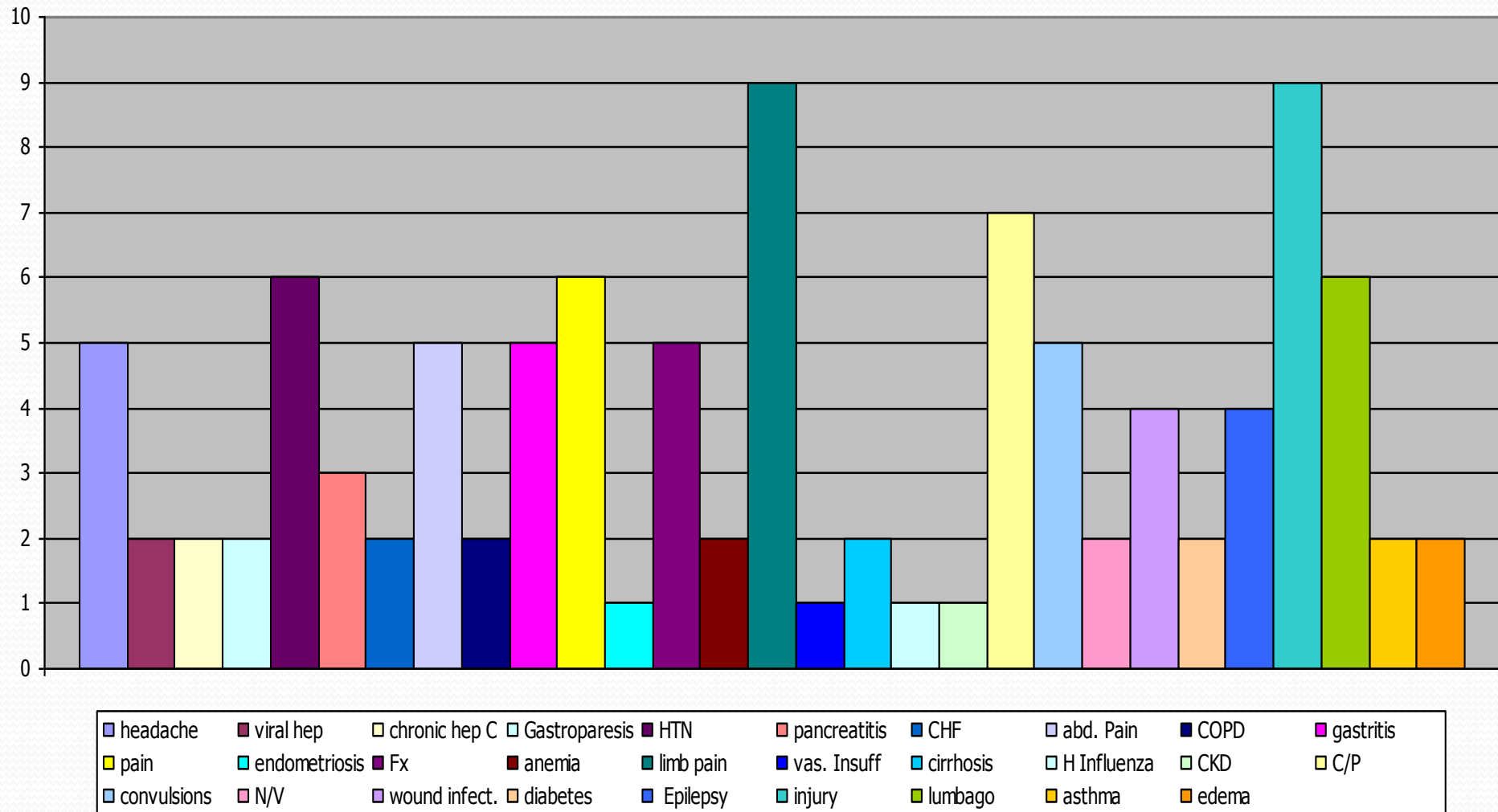


N=1315

# ED Use of Most Frequent Users

Patient	2003	2004	2005	2006	2007	2008	Individual Pt. total
#1	27	15	27	80	36	31	<b>216</b>
#2	39	34	55	108	97	50	<b>383</b>
#3	0	7	14	17	31	16	<b>85</b>
#4	4	12	29	43	37	7	<b>132</b>
#5	43	83	87	78	42	51	<b>384</b>
#6	10	9	17	39	38	27	<b>140</b>
#7	6	48	49	94	84	75	<b>356</b>
#8	22	73	94	116	68	55	<b>428</b>
#9	23	110	111	103	62	145	<b>554</b>
<b>Total ED visits per year</b>	<b>174</b>	<b>391</b>	<b>483</b>	<b>678</b>	<b>495</b>	<b>457</b>	<b>2,678</b>

# Medical Dx of Top ED FUs



# Case Study

- Complex patient who had >100 ED encounters each year for 4 years
- City-wide care plan involving hospital, mental health authority, EMS, criminal justice dept
- Various strategies attempted: tokens, everyday cash, door to door 20 minutes
- Care team worked to find a group home for the patient in December 2008
- Drastic reduction in emergency department visits in 2009

# Benefits of HIE

- Reduction of duplicative tests
- Reduction of unnecessary radiology
- Focused case management
- Improved care coordination
- Medication reconciliation
- Avoid adverse drug reaction
- Improved patient safety by reducing medical errors
- Public health surveillance
- Decision support systems
- Predictive analytics