

# Representativeness of Emergency Department Data Reported to the BioSense System

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The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official positions of the Centers for Disease Control and Prevention.



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# Overview

- Background
- Methods
- Results
- Conclusions
- Recommendations



# National Health Ambulatory Medical Care Survey (NHAMCS)

- National representative sample of visits to U.S. emergency departments (EDs)
- 2005 sample
  - Survey done by National Center for Health Statistics
  - Total visits estimated: 115.3 million
- Visits summarized by
  - Major disease categories (e.g., ICD-9 codes 001-139, infectious diseases)
  - Primary diagnosis groups (e.g., ICD-9 codes 920-924, contusions)



# Background--BioSense

- Emergency department data
  - Chief complaints: 546 facilities (411 as of 2007)
  - Diagnoses: 203 facilities (164 as of 2007)
- Most data sent from state/local health departments
- BioSense facilities are not necessarily representative of all U.S. facilities
- Data categorized by 11 syndromes



# Hospital Emergency Department Data Sources—August 2008

Type	No. of Facilities	Percent
State/local health departments	409	72
Hospital systems	152	27
Individual hospitals	8	1
Total	569	100



# BioSense Syndromes

- Botulism
- Fever
- Gastrointestinal
- Hemorrhagic Illness
- Localized Cutaneous Lesion
- Lymphadenitis
- Neurological
- Rash
- Respiratory
- Severe Illness or Death (Infectious Disease)
- Specific Infection

Syndrome Definitions for Diseases Associated with Critical  
Bioterrorism-associated Agents, October 23, 2003

<http://www.bt.cdc.gov/surveillance/syndromedef/index.asp>



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# Purpose

- To assess the representativeness of BioSense emergency department data by comparing with the National Hospital Ambulatory Medical Care Survey (NHAMCS)



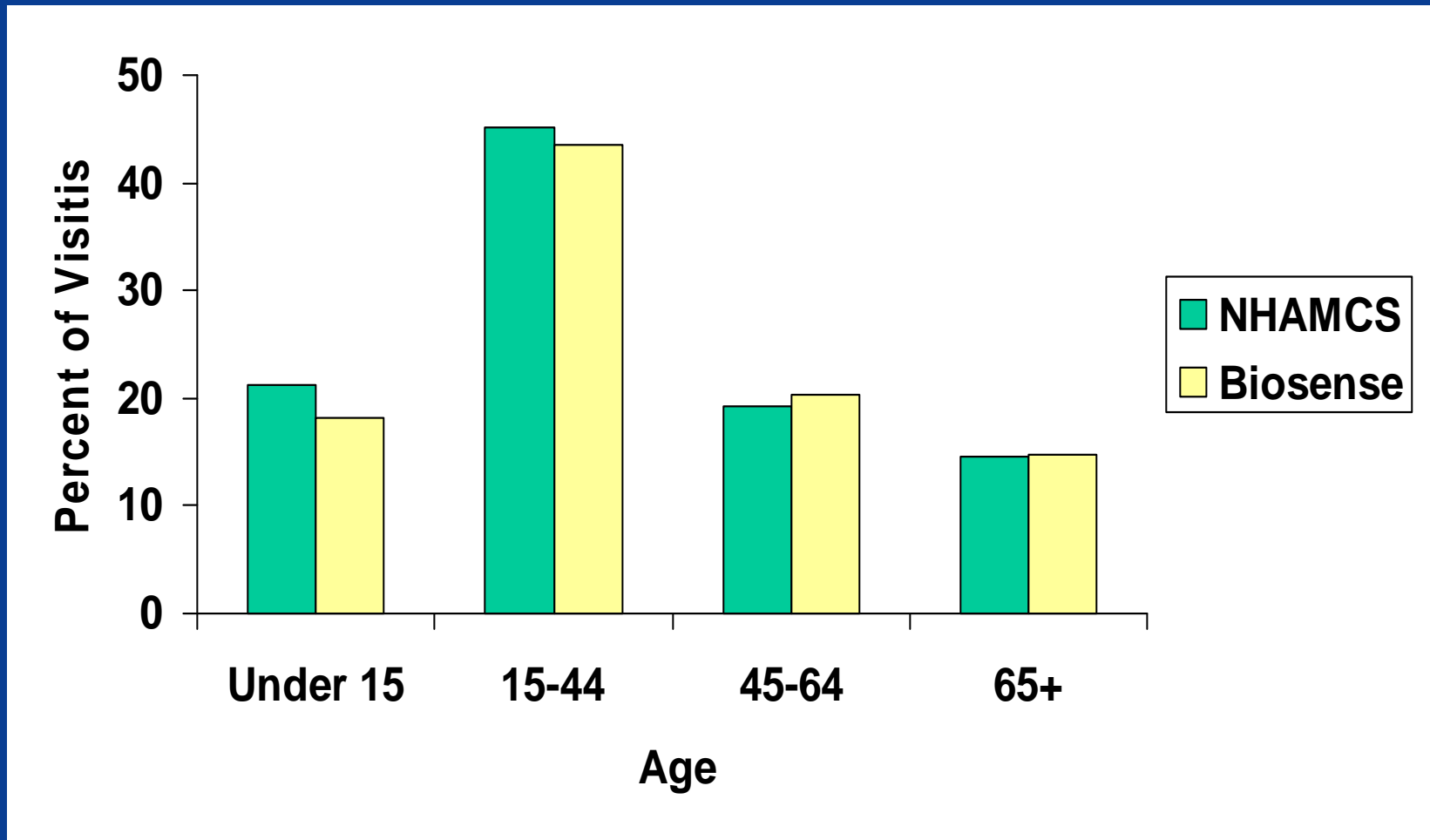
# Total Visits

- NHAMCS
  - Visits sampled: 33,605
  - 2005: 115.3 million visits, increase by 1.7 million per year
  - 2007 estimate: 118.7 million visits
- BioSense (2007)
  - 13.4 million visits
  - 11.3% of total U.S. visits

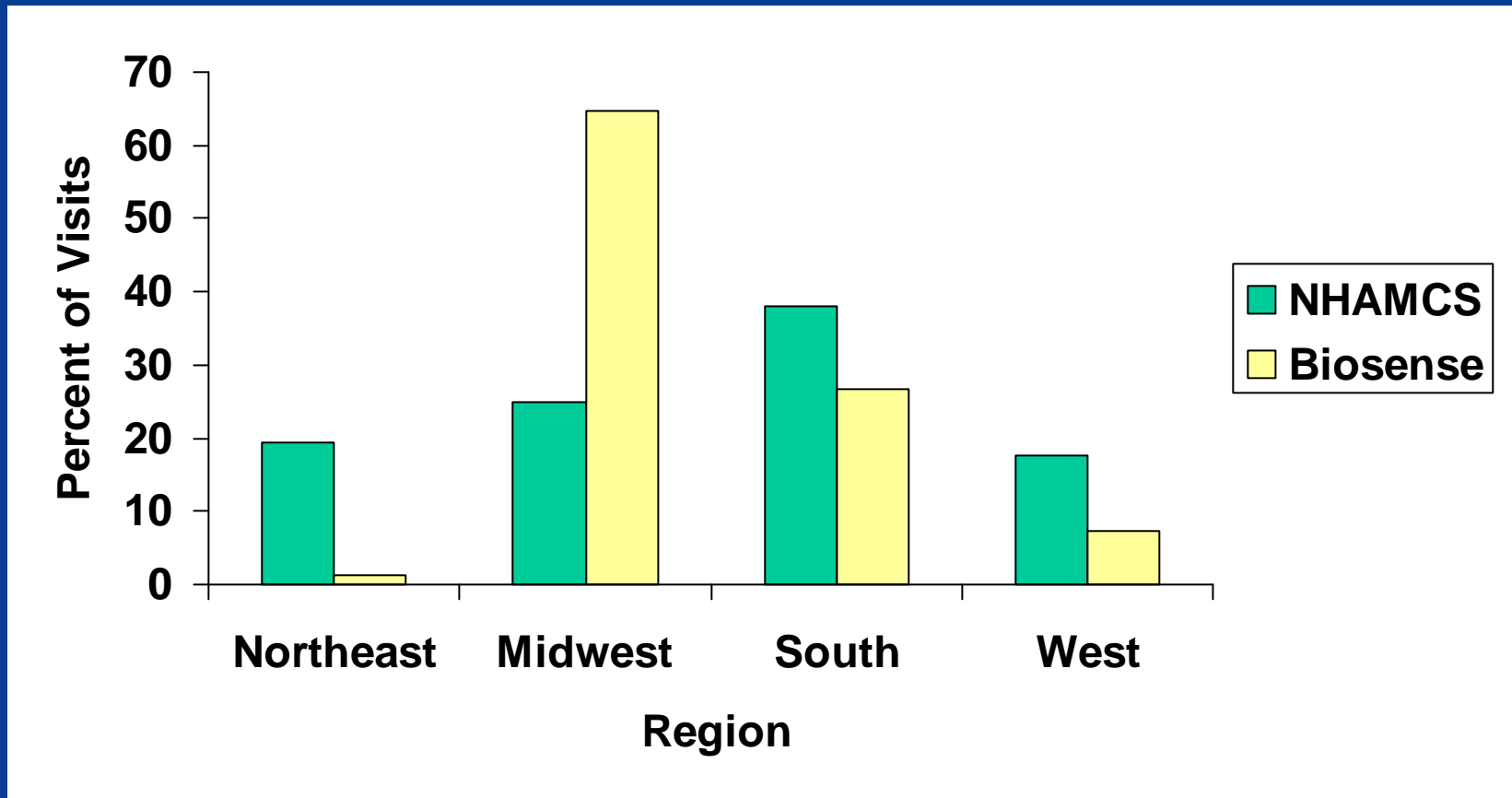




# Percent of Visits by Age Group

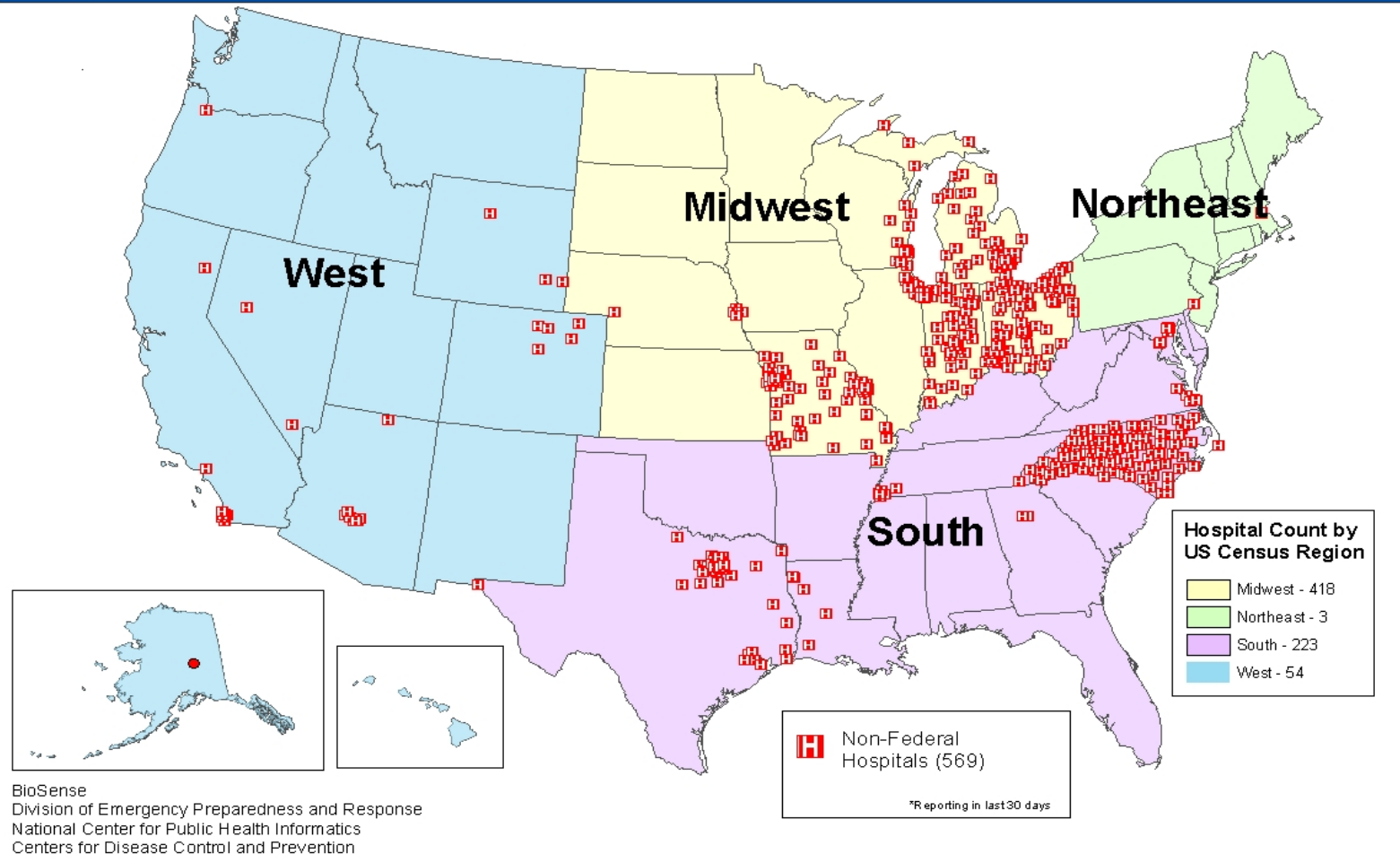


# Percent of Visits by Census Region





# BioSense Facilities by U.S. Census Region - August 2008 -



# Analysis by NHAMCS Categories

- For NHAMCS
  - Only the primary diagnosis is used
  - Percent of visits with the primary diagnosis is presented
- For BioSense
  - No primary diagnosis available
  - All diagnoses used
  - Percent of total diagnoses is presented



Major Disease Categories Used by NHAMCS	ICD-9 Range
<i>*Infectious and parasitic diseases</i>	001-139
Neoplasms	140-239
Endocrine, nutritional and metabolic diseases	240-279
Mental Disorders	290-319
Diseases of the nervous system	320-389
Disease of the circulatory system	390-459
<i>*Diseases of the respiratory system</i>	460-519
<i>*Diseases of the digestive system</i>	520-579
Diseases of the genitourinary system	580-629
Diseases of the skin and subcutaneous tissue	680-709
Diseases of the musculoskeletal system	710-739
<i>*Symptoms, signs, and ill-defined Conditions</i>	780-799
<i>*Injury and poisoning</i>	800-999

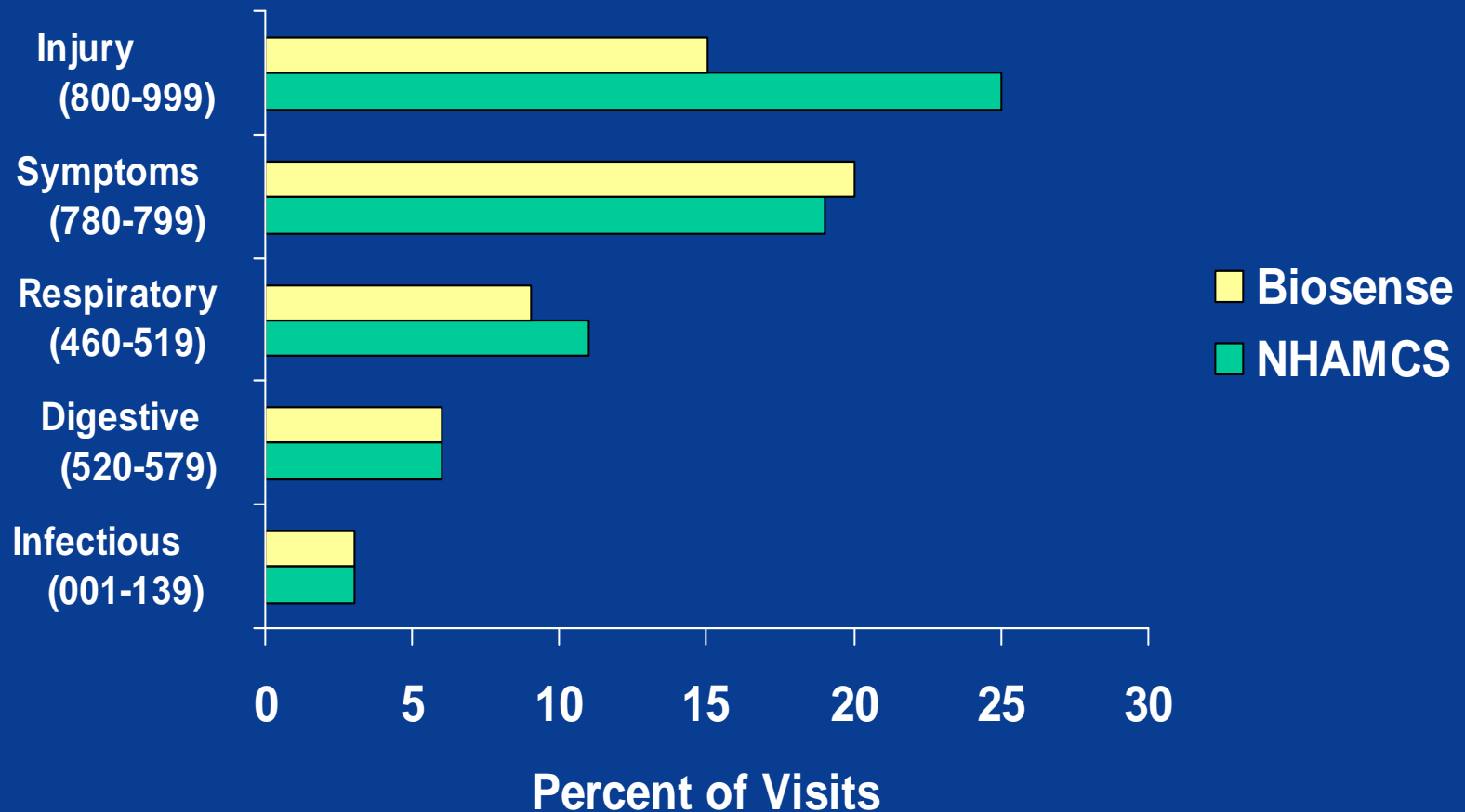


\* Used for our comparison study

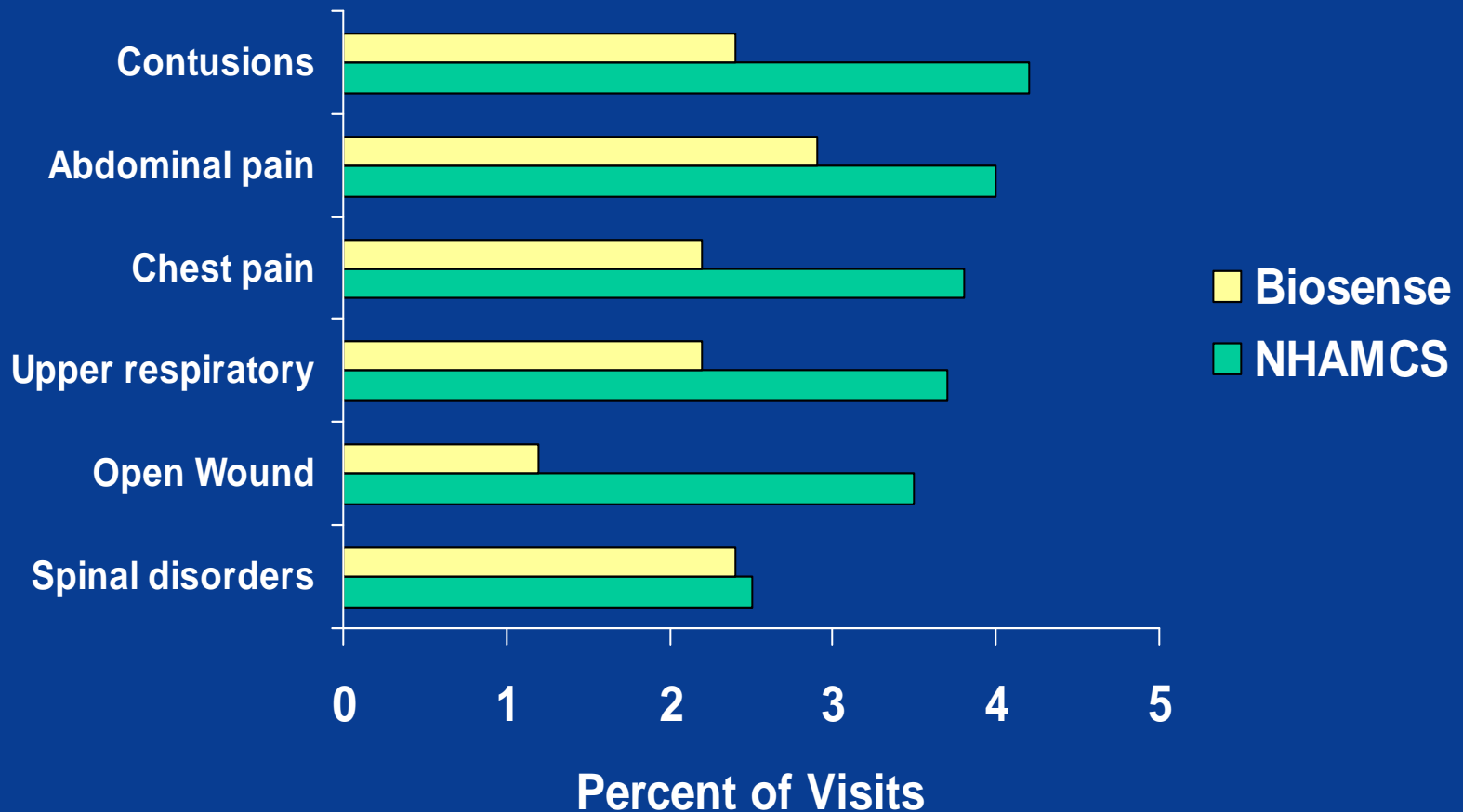
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# Percent of Visits by Major Disease Category



# Percent of Visits Among Most Common Primary Diagnosis Groups



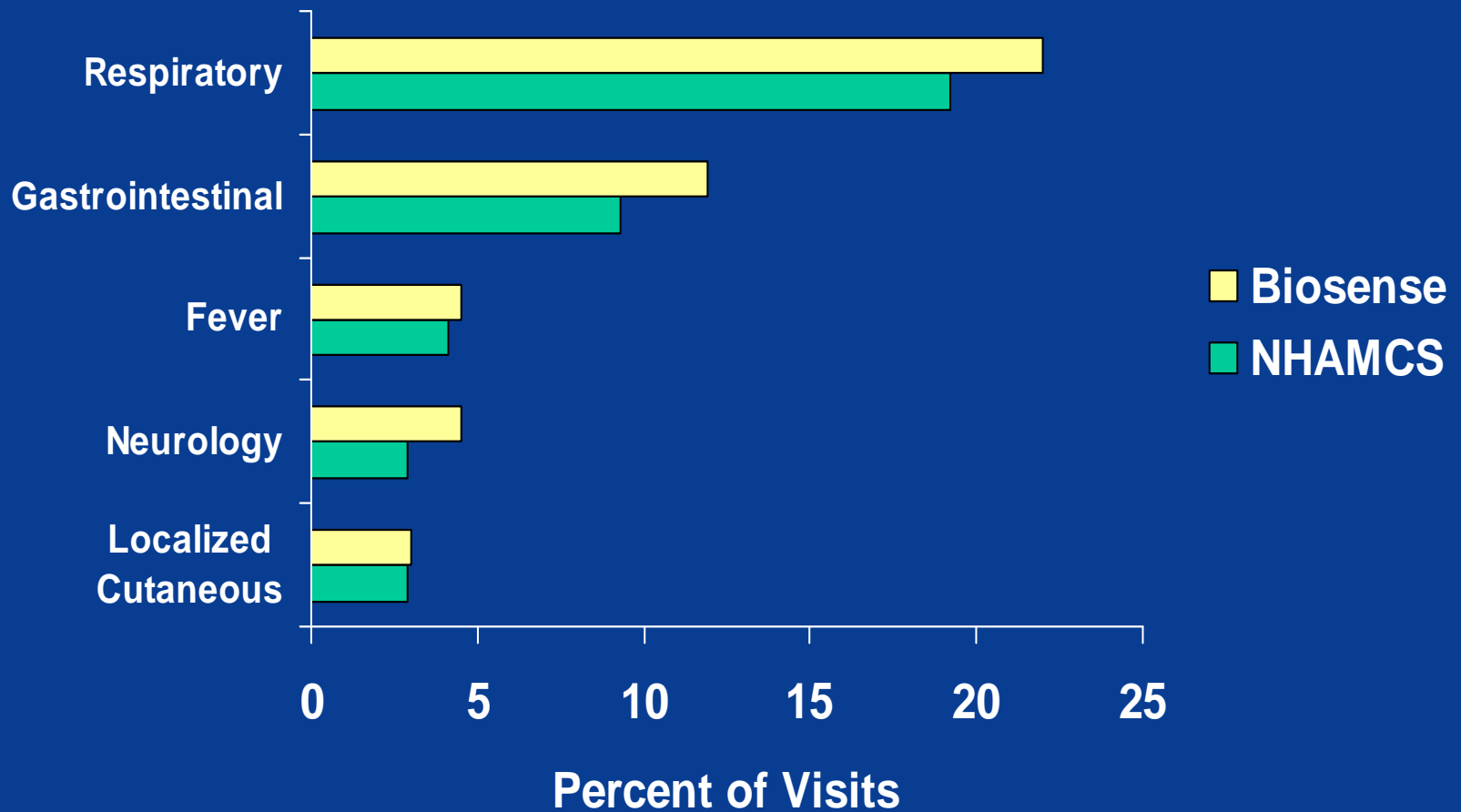
# Analysis by BioSense Syndromes

- NHAMCS: up to 3 diagnoses per visits available
- BioSense: variable number of diagnoses per visit available
- If any diagnosis for the visit fits the definition, then the visit meets the definition
- Percent of total visits presented

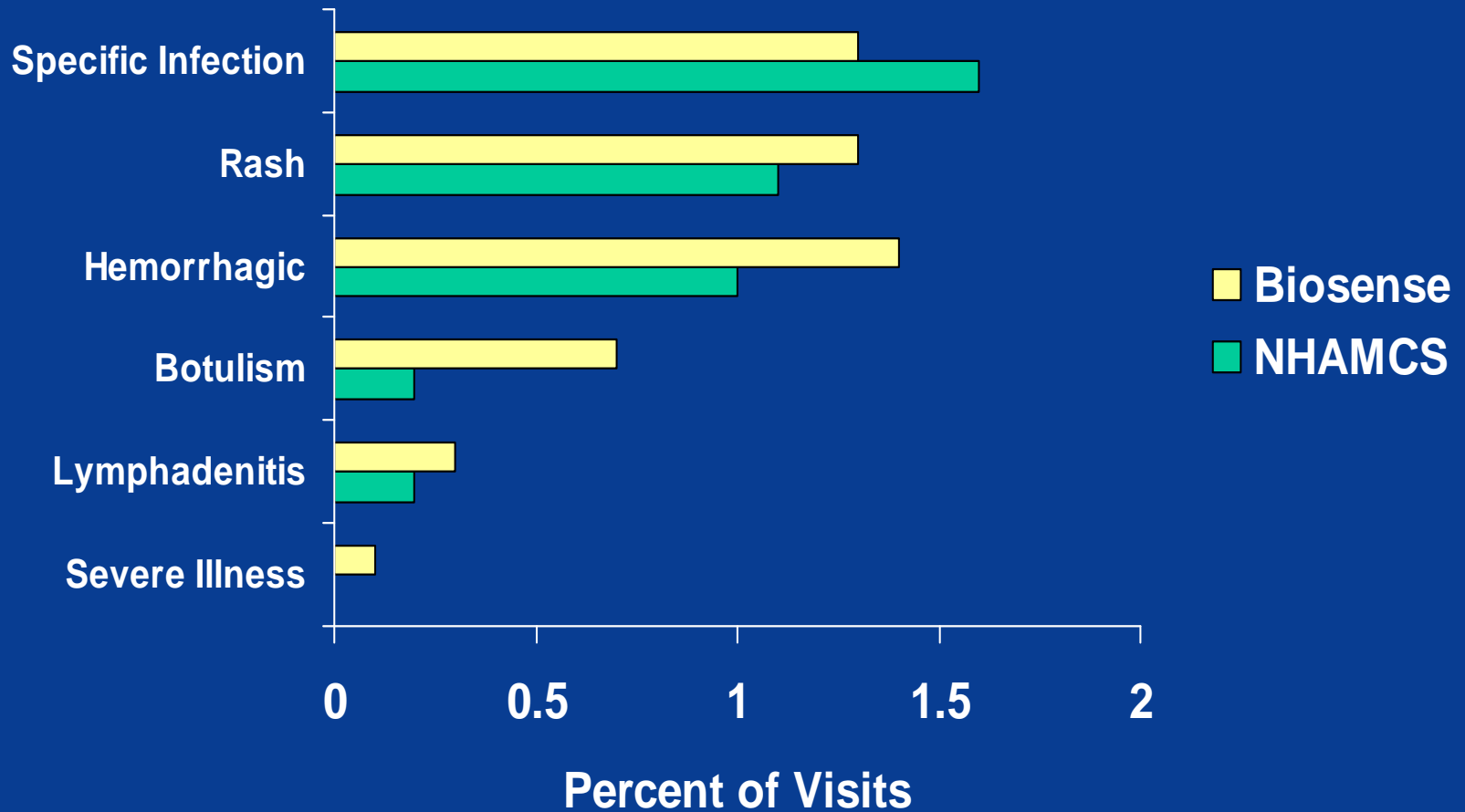




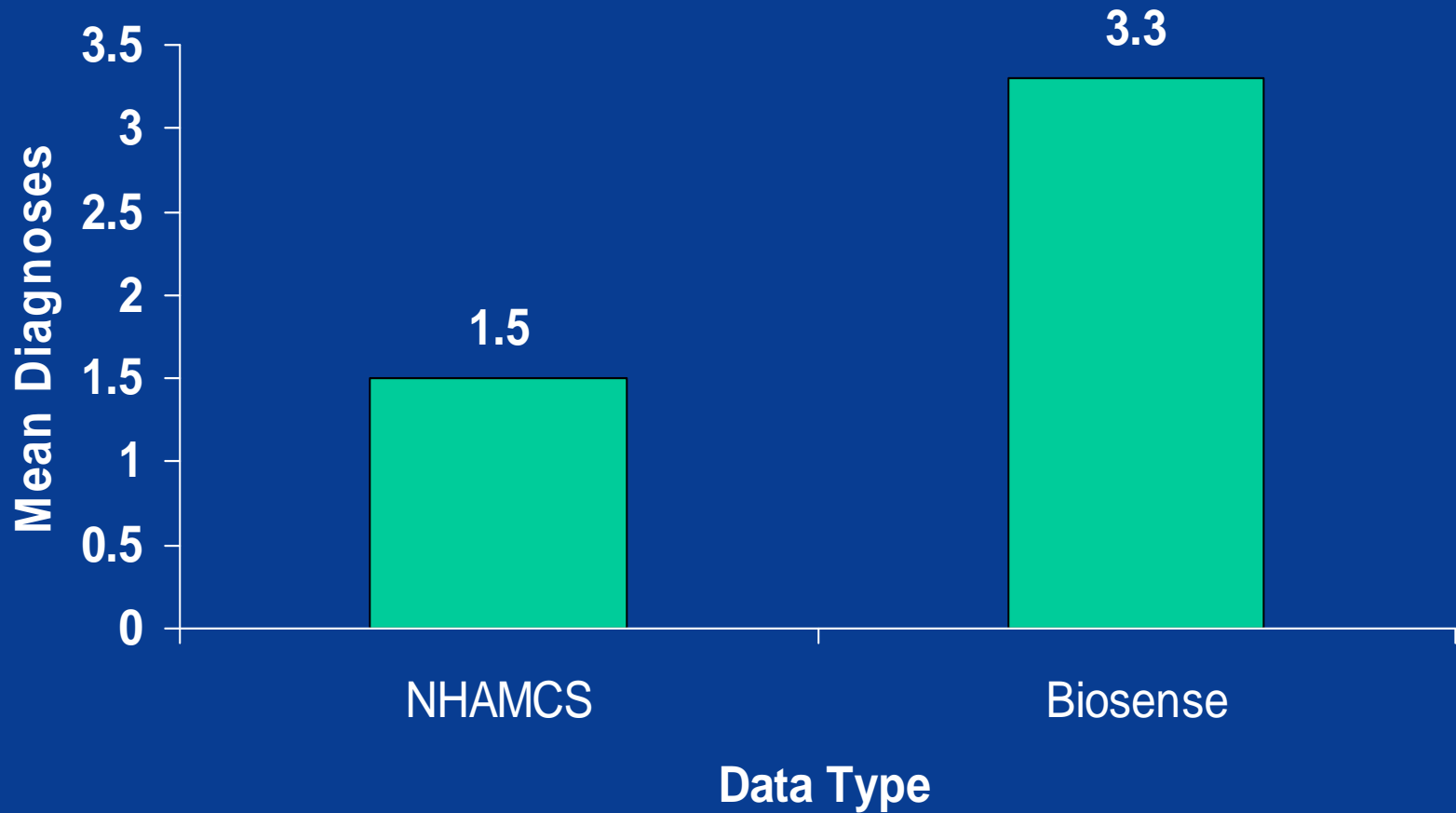
# Percent of Visits by BioSense Syndrome



# Percent of Visits by BioSense Syndrome



# Mean Number of Diagnoses per Visit



# Discussion

- Because of differences in methods, comparisons between NHAMCS and BioSense are approximate
- In 2007, BioSense received >11% of U.S. emergency department visits
- Biosense data are representative by:
  - Age
  - Most major diagnosis categories and syndromes
- Differences may be due to sampling error or designation of primary diagnosis in NHAMCS
- Biosense data are not representative of geographic area



# BioSense Strategic Plan

- Regional collaboratives\*
- Federate data sources\*
- Case detection technologies
- Health Information Exchanges (HIEs)\*
- Open source software
- Incentives for clinicians to participate
- Research to develop surveillance technologies
- Add 8<sup>th</sup> one

\* Geared to improve geographic representation



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# Thank You!!!



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