A Comparison of Two Major Emergency Department Free-Text Chief Complaint Coding Systems

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Classification of Chief Complaints

- First step of syndromic data processing
- Crucial to performance of each subsequent step of surveillance system

Classification of Chief Complaints

- Processing of free-text chief complaint data: unique challenge!
  - Subjectivity in complaint input by triage staff
  - Variability in algorithmic processing

How does chief complaint classification into syndromes compare among various free-text coding systems?

Data Collection & Pre-processing

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Automated Statistical Analysis

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Epidemiologic Analysis and Interpretation

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Investigation (Both Epidemiologic and Forensic)

RODS Complaint Coder, v2.1

- Real-time Outbreak Detection System of the University of Pittsburgh ("CoCo")
- Bayesian classifier that assigns labels to free-text strings based on *probability*
- Default probability file
  - 28,990 complaint strings from 1 ED
  - Manually classified by single physician
- Preprocessing: lower-case, no punctuation

NYCDOHMH Coding System

- Implemented after the events of September 11, 2001
- Classifies chief complaints into syndromes based on *keywords*
- Keywords derived from previous NYC ED chief complaint data
- CDPH has selected certain syndromes for routine use
- Preprocessing: upper-case, punctuation

Data Source

- Free-text triage chief complaint data of 21,736 patients at a Chicago ED
- Preprocessed as necessary
  - Only case/punctuation altered
  - Spelling errors not removed
- Processed separately through each coding system

Comparison of Tracked Syndromes

RODS CoCo v2.1

- Gastrointestinal
- Respiratory
- Constitutional
- Rash
- Hemorrhagic
- Botulinic
- Neurological
- Other

NYCDOHMH/CDPH

- Vomit
- Diarrhea
- Cold
- Respiratory
- Asthma
- FevFlu
- Rash
- Sepsis
- Other

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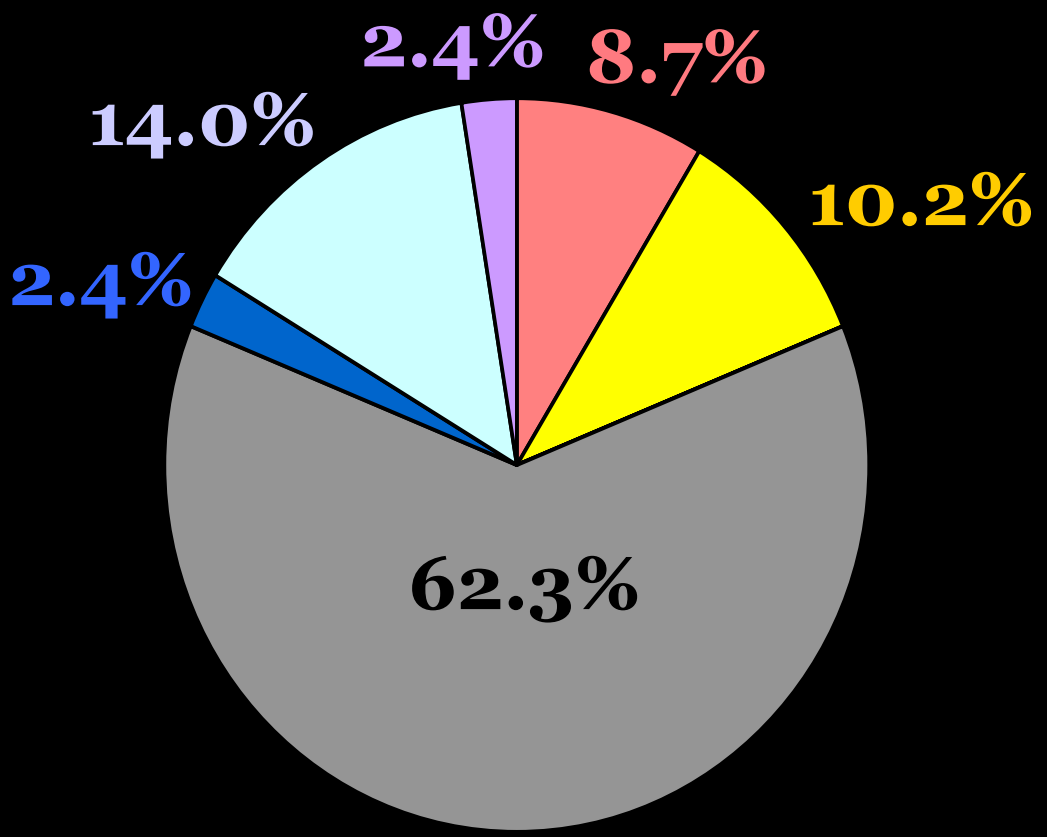
RODS CoCo v2.1 Syndromes



(n = 20,088)

Other

Rash

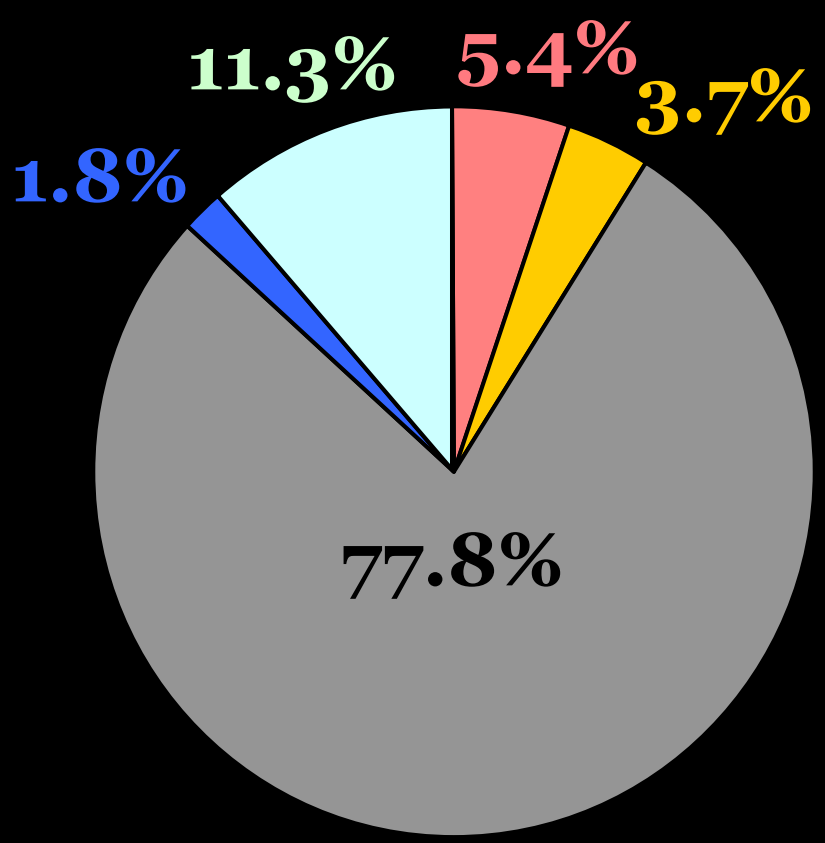
Respiratory

(Unknown)

Constitutional

Gastrointestinal

NYCDOHMH/CDPH Syndromes



(n = 20,088)

Other

Rash

Respiratory

Constitutional

Gastrointestinal

Agreement of Syndrome Coding

<u>OVERALL (kappa statistic)</u>

K = 0.614

- SE = 0.05
- 95% CI = 0.604-0.624
- T = 145.866 ($p<0.0005$)

(Statistical analysis carried out in SPSS)

Agreement of Syndrome Coding

Syndrome	Kappa
• Rash	0.711
• Respiratory	0.594
• Other	0.453
• Constitutional	0.419
• Gastrointestinal	0.270

Conclusions

- Good overall agreement in syndrome coding between RODS CoCo v2.1 and the NYCDOHMH system (as modified by the CDPH)
- However, agreement varied widely by syndrome
- **Highlights need for consensus regarding syndrome definitions and chief complaint classification**

Limitations

- Coding systems not based on Chicago-specific data
- Newer version of NYCDOHMH coding system

Thank you.

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