

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



Automated Statistical Analysis



**Epidemiologic Analysis and
Interpretation**



**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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Comparison of Tracked Syndromes

RODS CoCo v2.1

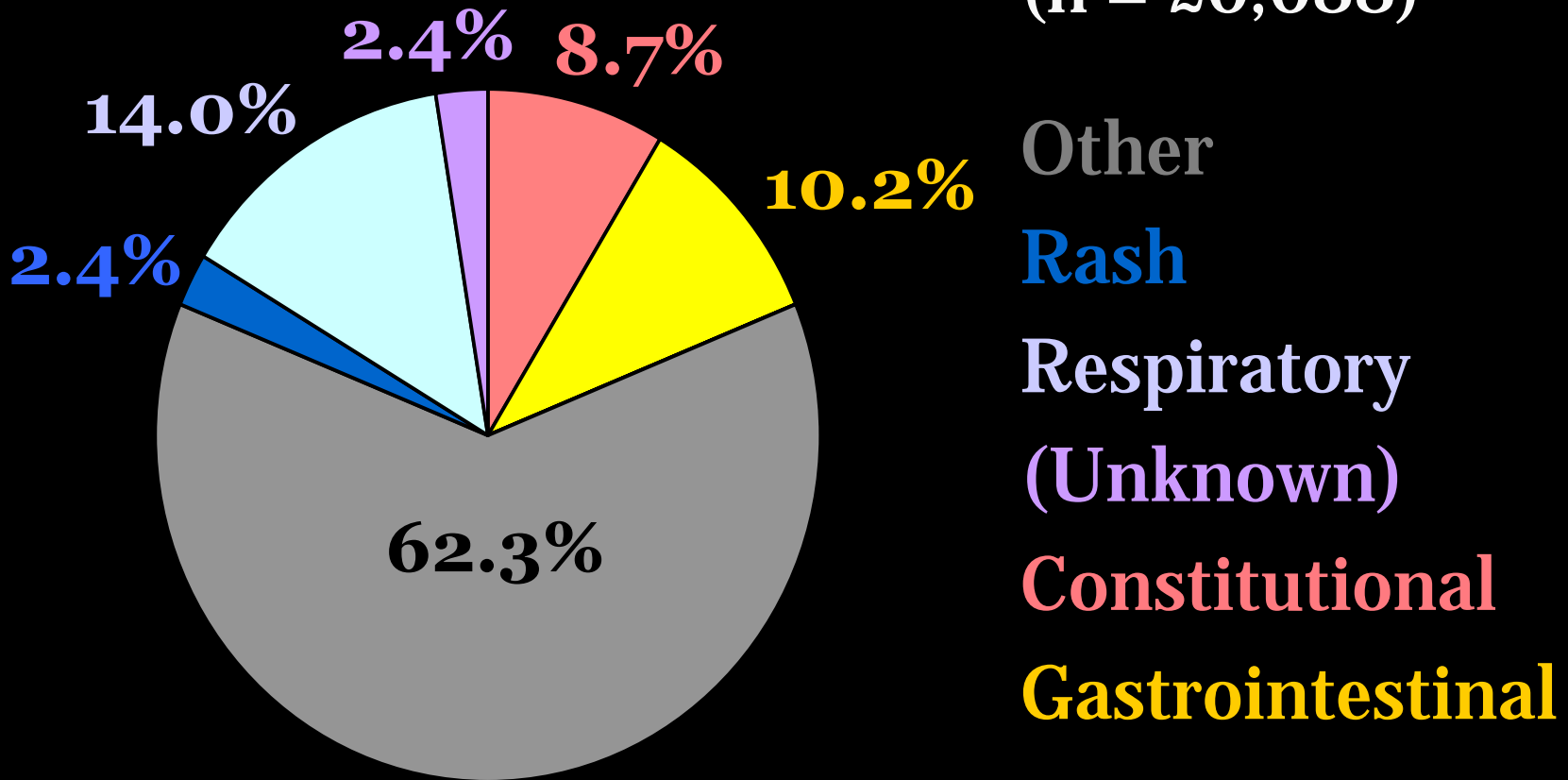
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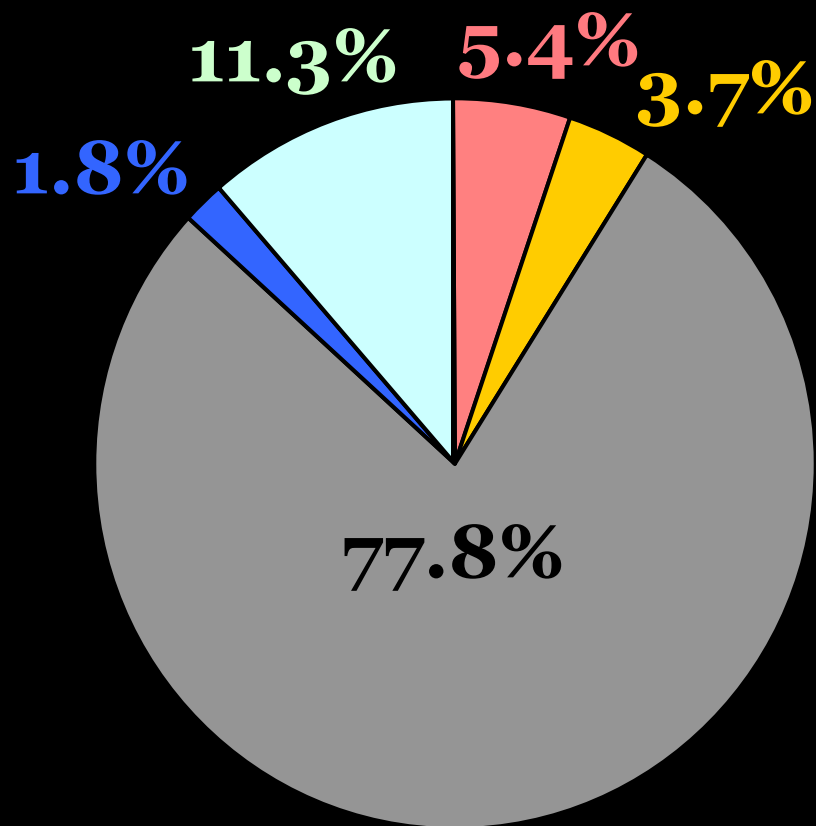
RODS CoCo v2.1 Syndromes

(n = 20,088)



NYCDOHMH/CDPH Syndromes

(n = 20,088)



Other

Rash

Respiratory

Constitutional

Gastrointestinal

Agreement of Syndrome Coding

OVERALL (kappa statistic)

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

<u>Syndrome</u>	<u>Kappa</u>
• 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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