

Accuracy of Red Cross Fatality Data in New York City, Hurricane Sandy 2012

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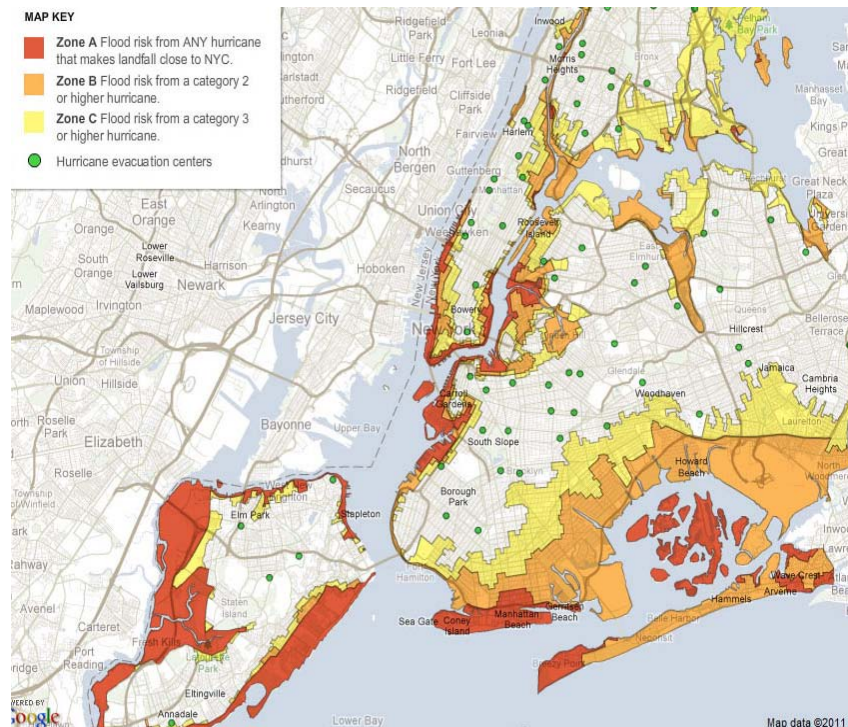
Kacie Seil

Hurricane Sandy in NYC

- Record breaking storm surge
 - resulting in flooding, power/heat outages, transit disruptions, and residential/hospital evacuations
- Active mortality surveillance
 - NYC electronic death registration system (EDRS)
 - Red Cross paper-based fatality form for CDC

Red Cross Mortality Surveillance

- NY State had the greatest number of deaths (53/117), primarily due to drowning
 - 18 within Evacuation Zone A (shown in red)



Question of Accuracy

- Evaluation of Red Cross system after Hurricane Ike in Texas (2008)
- Compared Red Cross to active surveillance conducted by the Texas Health Department
- Found that Red Cross had 47% sensitivity, and 92% positive predictive value
 - Cases were likely accurate, but did not include all

Objectives

1. How well did the Red Cross system capture Sandy-related deaths compared with NYC's electronic death registration system (EDRS)?
2. What was the completeness, accuracy, and timeliness of Red Cross fatality data?

Methods

- Red Cross data linked to EDRS death records using a combination of first/last name, DOB, and address
- Cleaned variables to be in similar format
- Calculated proportion of missing data and proportion of agreement with EDRS by item

RESULTS

How well did the Red Cross system capture Sandy-related deaths?

- Sensitivity = 93% (41/44)

Red Cross	Reported as Sandy-related in EDRS		Total
	YES	NO	
Identified	41	1	42
Not Identified	3	0	3
Estimate	44	1	45

How well did the Red Cross system capture Sandy-related deaths?

- Of the 3 cases missing from Red Cross, 1 discovered after tracking (April 2013)

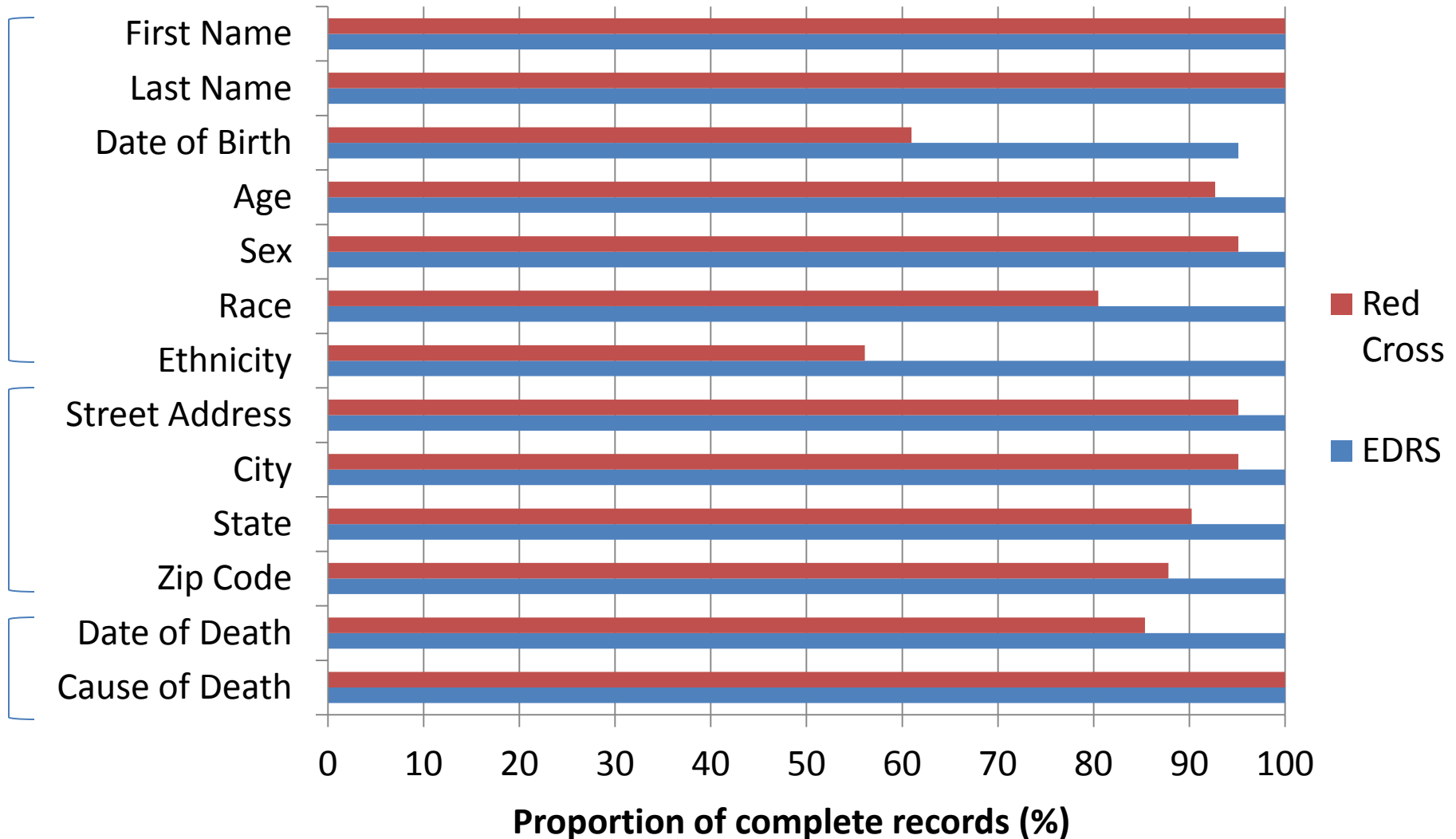
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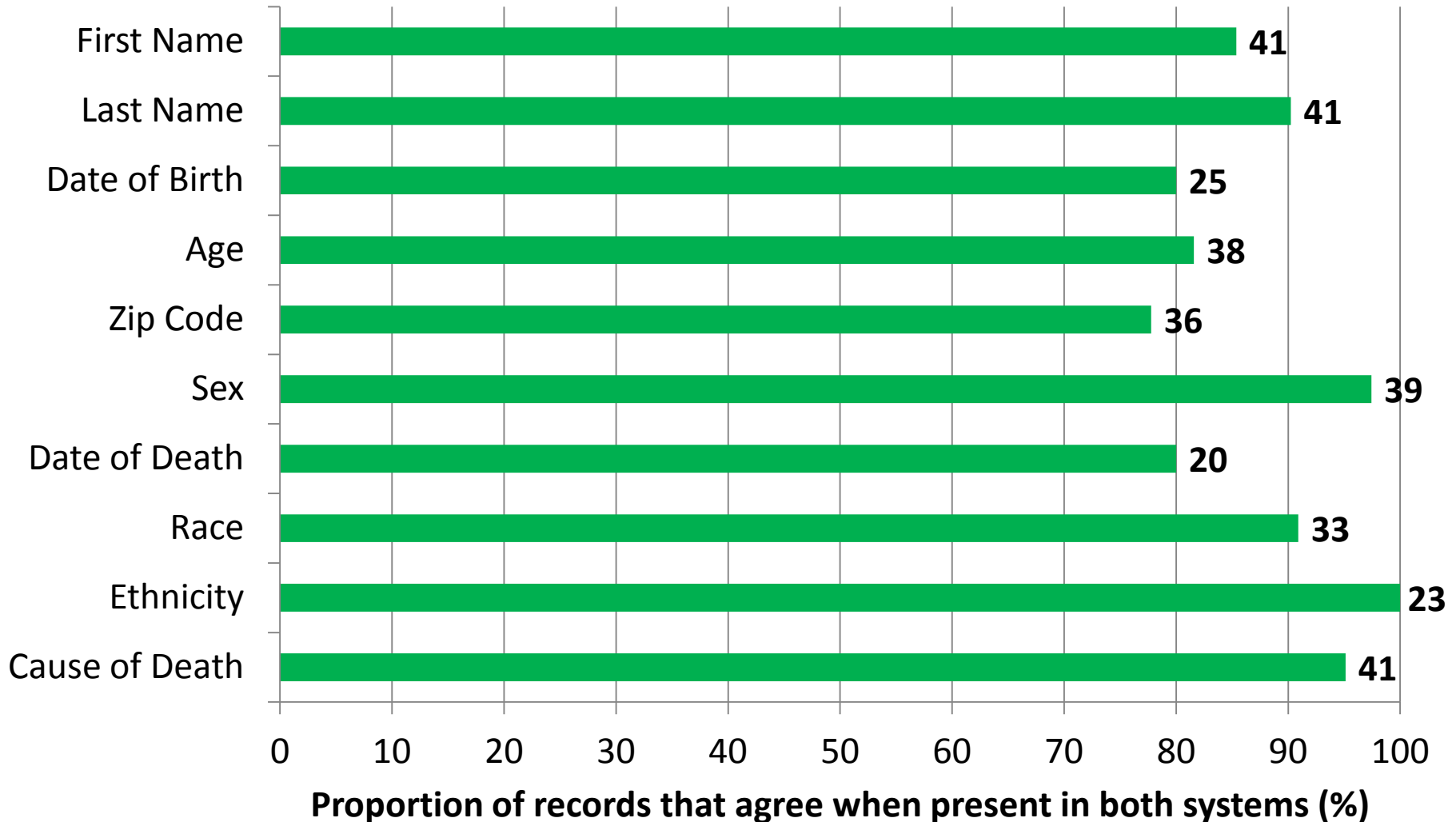
- 1 additional death was investigated by the OCME but manner was undetermined/un-related

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How complete are Red Cross fatality data compared with EDRS data?



How accurate are Red Cross fatality data compared with EDRS data?



Circumstance

	EDRS*	Red Cross
Example 1	Drowned in home - Hurricane Sandy related	Deceased found in home. Did not expect storm to be serious due to experience with Hurricane Irene
Example 2	Trapped under debris during hurricane – related to the flood	Deceased stayed in home to protect family belongings. Found drowned.
Example 3	Drowned at home – Hurricane Sandy related	Drowned in home. Family was unable to assist with evacuation as they had done in previous storm.

*Based on notes from the medical examiner on how the injury occurred

Timeliness

- Red Cross
 - Forms captured date interviewed completed
 - Median interval = 19 days (2 – 45 days)
- EDRS
 - Probable deaths reported directly from the medical examiner within 24 hours
 - Deaths registered in EDRS within a median of 6 days from date of death (0 – 43 days)
 - 43/44 cases were registered with a final cause of death (ICD-10 coded by next business date to X37)
 - One case given “Pending” for roughly 3 months

DISCUSSION

Conclusions

- Red Cross captured 93% of EDRS deaths; likely due to centralized medical examiner system in NYC
- Red Cross data ranged from 56%-100% complete; EDRS very timely and nearly 100% complete
- Description of circumstances in Red Cross was consistent with EDRS and identified barriers to evacuation

Limitations

- Both systems are limited by conservative definition used by OCME for disaster-related death
- Estimate of timeliness was crude

Implications

- Accuracy of Red Cross dependent on local system, families, and volunteers; may vary in other states
- Greater collaboration/linkage between Red Cross and deaths registration systems could improve surveillance
- Health Departments can use circumstances from Red Cross to inform prevention efforts

Next Steps

- Health Department is planning to categorize circumstances for preparedness and to work with the ME to review definition for disaster-related death
- Red Cross is planning to incorporate findings in volunteer trainings and potentially revise worksheets to add additional dates

Thank You!

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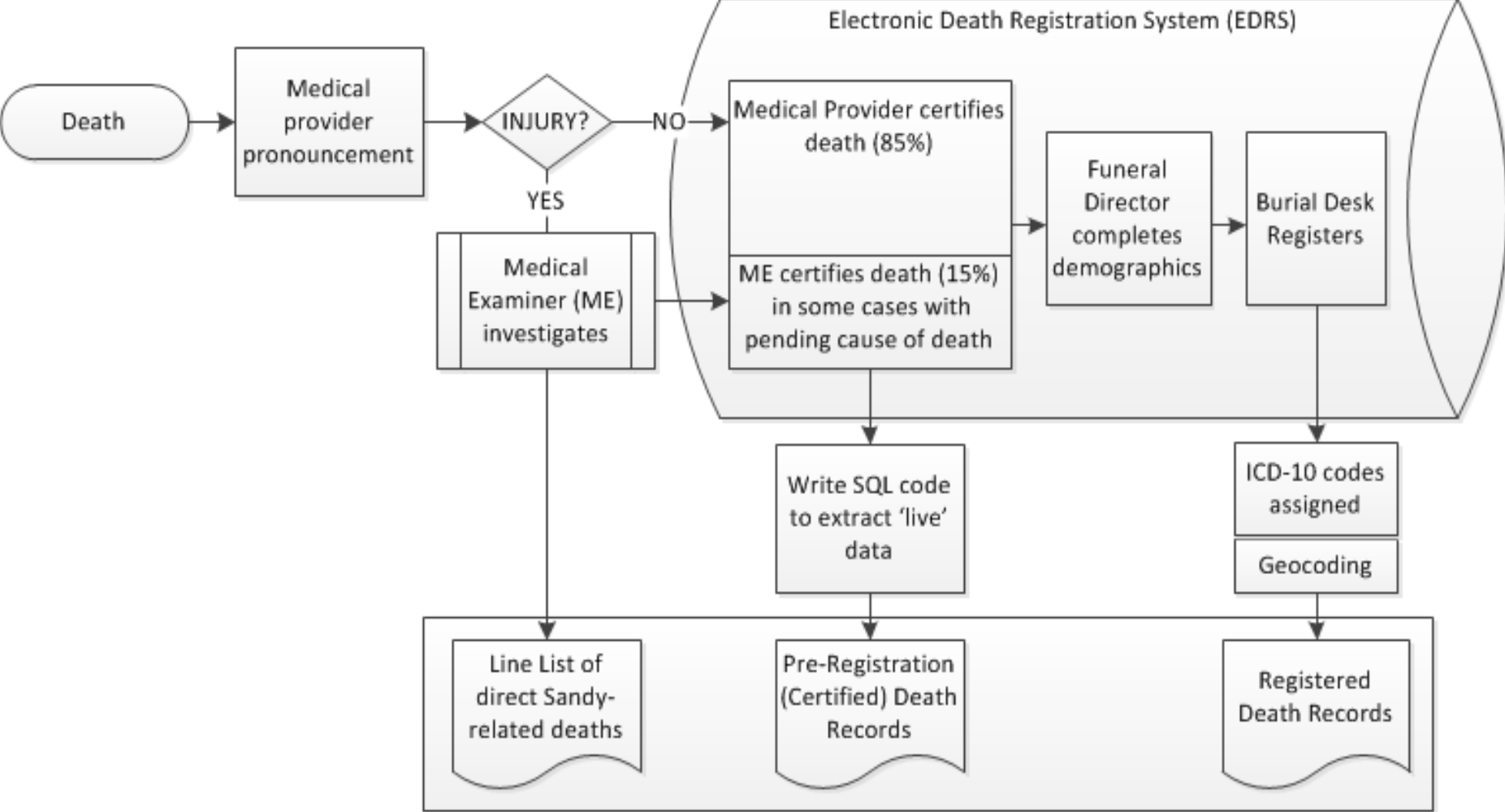
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EXTRA SLIDES

Electronic Death Registration System



EDRS Surveillance Efforts

1. Received line listing via email from OCME
2. Activated EDRS notice for medical providers to prompt referrals
3. Conducted free-text search of cause of death fields for Sandy-related terms
4. Monitored media reports/press inquiries for additional cases

NYC Death Registration

- NYC Health Code reporting requirements
 - Less than 24 hours for certification
 - Less than 72 hours for registration
- 94% are fully reported electronically via EDRS