RUTGERS
THE STATE UNIVERSITY OF NEW JERSEY

Storms, Immigrants, and Locals: Mixed Methods Study of Tree Care Workers

Collaboration of Rutgers University School of Public Health, School of Management and Labor Relations, New Jersey Department of Health, and New Labor

Elizabeth G. Marshall, PhD, Rutgers School of Public Health
Department of Biostatistics and Epidemiology
marshaeli@sph.rutgers.edu

RUTGERS

Outline of Presentation

- Why Tree Care?
- Why Mixed Methods?
- Summary of Different Components Discussed Today
  - Emergency department tree-related injuries
  - Interviews with stakeholders
  - Focus groups of workers
- Summary and Conclusions

2

RUTGERS

Why Tree Care?

- Known high risk of fatal occupational injury
- General awareness of disparities within the industry and the employment of vulnerable workers.
- Increase in storms and infected trees will result in expansion of future tree work.
- Need to better understand the health and safety culture and risks of tree work, especially related to major storms.

3

RUTGERS

RUTGERS

Storm-related Job Duties?

RUTGERS

Why Data, Interviews, and Focus Groups?

- Known high risk of fatalities but very limited assessment of non-fatal injuries.
  - Tree care worker identified as an "occupation" but present in many industries.
  - Many small businesses and informal labor relationships result in poor injury data.
- Information on advance planning, industry status, and roles of different sized companies only known by industry insiders.
- Accurate representation of working conditions at the time of the storm only known by workers themselves, especially immigrant workers.

5

RUTGERS

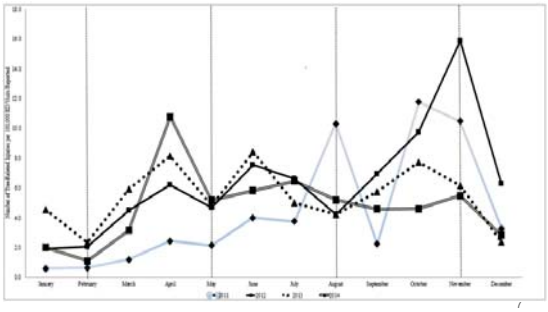
New Data Source for Tree-related Injuries

- Chief complaints recorded by hospital and other urgent care facilities and reported to New Jersey DOH
- Statewide for over 90% of emergency departments now (2011 still missing a few)
- Based on development and application of Key Word process.
- Excluded unrelated and unknown cases and those <18 or >65
- Keyword search resulted in 1324 potential cases-→698 final cases
- Examples:
  - PT STS WOOD CHIP IN LEFT **EYE**
  - LEFT ARM **LAC** ON CHAIN SAW
  - PT STS **FELL** OUT OF TREE
  - **STRUCK** IN RIGHT SHOULDER BY BRANCH
  - LAC RIGHT THIGH DONE BY **SAW**
  - ~~BECAME ANGRY AND **HIT** TREE~~

6

RUTGERS

Tree Related Injuries 2011-2014 NJ Emergency Departments Chief Complaints



7

RUTGERS

Results of Data Analysis: Tree Related Injuries and Hurricane Sandy

- Injuries increased the quarter after Hurricane Sandy, compared to previous year and subsequent year. Other extreme weather also showed upticks (e.g. snowstorm).
- Increase was primarily demonstrated by a 2-4 fold increase in injuries classified as Struck By Injuries
- Smaller increases in falls and machine related injuries.
- Overall, injuries involving chainsaws were a substantial hazard, associated with 34% of tree related injuries.

8

RUTGERS

23 Stakeholder Interviews Summarized Storm and other Health and Safety Issues (Ochsner et al AJIM 2018)

- Interview protocol included:
  - Observations about cleanup efforts (locations, hazards encountered, time frame);
  - Health and safety concerns (training and safety protocols, accidents and injuries, working conditions);
  - Changes in H & S protocols made in response to the storm;
  - Implications and recommended policy changes
- Key stakeholders in the Tree Care Industry:
  - Employees and managers of large and small tree care companies,
  - Municipal managers and workers,
  - Health and safety trainers,
  - Representatives of arborist associations, government and insurance
  - Mostly from NJ and the Northeast US.

9

RUTGERS

Interviews: Summary of Storm Response Aspects

- Storms exacerbate the already significant hazards of tree work and require more and different equipment.
- Improved coordination by utilities and emergency management might lead to more efficient response.
- Some workers lack the appropriate health and safety training, PPE, and supervision to participate to remove and manage downed trees.
- Workers from some municipalities, most landscaping companies, and unqualified tree care firms are at highest risk.
- A number of tree planting and tree care practices increase the vulnerability of trees to storm damage and could be modified.
- Interventions needed to encourage consumers and agencies to hire companies that work safely.

10

RUTGERS

Four Focus Groups Engaged Workers

- Four (3 Spanish, 1 English) focus groups were conducted over six months in 2016 four towns in NJ.
- Topics covered: Experiences after storms, major hazards, experience with and suggestions for training, communication about safety, and relationships among workers and with supervisors.
- Spanish-speaking participants were primarily front-line workers with 2-3 having some supervisory role, while the English speakers included workers and supervisors.
- TENTATIVE themes identified from informal review

11

RUTGERS

Themes Identified from Focus Groups (Draft)

- Hurricane Sandy (and other extreme weather events) generate difficult conditions, including hazardous downed trees, long hours, electrical risks, and shortages of equipment
- Tree hazard assessment is particularly important, especially for workers on the ground. Language barriers definitely affect health and safety.
- Access to hands-on training is uneven, with (often) less training in small companies compared to large companies. There is generally less training and fewer licensing opportunities for Spanish speakers compared to English speakers.

12

RUTGERS

Other Themes Identified from Focus Groups

- Production and scheduling demands are important and sometimes impede safety practices.
- Tree care work is inherently dangerous with major risks; electrical and falling branches especially.
- There are substantial disparities in supply and use of PPE (hard hats, gloves, eye protection) and technology (lifts, trucks, newer equipment).
- Maintenance of equipment is crucial for smooth operations and for safety; difficult to do and responsibility unclear.

13

RUTGERS

Overall Topical Conclusions for Preventing Injury and Improving Health and Safety Culture in Tree Care

1. Focus prevention on specific conditions post-storms
2. Overcome disparities in training and access to preventive equipment
3. Improve and expand reach of positive health and safety culture among workers and employers

14

RUTGERS

Advantages of Mixture of Interviews, Data, and Focus Groups

- Best way to hear perspectives from as many stakeholders as possible.
- Data generally confirmed the broader version of what individuals reported.
- Collaboration among different levels and types of expertise vastly enriched the understanding of both qualitative and quantitative data.

15

RUTGERS

Disadvantages of Mixture of Interviews, Data, and Focus Groups

- Three or more components did not always agree on historical record or conclusions.
- Injury data on tree care workers and industry are very limited and may not represent all involved.
- Required substantial collaboration and clear management of roles within each organization
- Some tasks were tied to funding and some were not-uneven response.

16

RUTGERS

Next Steps

- More research funding.
- Assessment of interventions for more training
- Evaluation of NJ Licensing law and impact
- Intervention related to Emerald Ash Borer
- Further evaluation of industries with small-medium sized concentration.

17

RUTGERS

ACKNOWLEDGEMENTS

- Rutgers Schools of Public Health and Management and Labor Relations
- New Jersey Department of Health
- New Labor Worker Center
- Committee to Advance Arboriculture New Jersey
- Project Team:
  - Elizabeth Marshall, Mitch Rosen, SPH
  - Dan Lefkowitz, Marija Borjan, Margaret Lumia, NJDOH
  - Heather Jordan, Gloria Mejia, Abimbola Williams, Ozlene Greene SPH
  - Louis Kimmel, Germania Hernandez, New Labor
  - Michele Ochsner, SMLR
- TREE CARE ADVISORY GROUP
- *Funding Source: Assoc Secy Preparedness and Response, US DHSS, Hurricane Sandy Funding 2014-2016; NIOSH funding 2013-2015*

Further Information:
Elizabeth G. Marshall, PhD, Rutgers School of Public Health
marshaeli@sph.rutgers.edu

18

RUTGERS

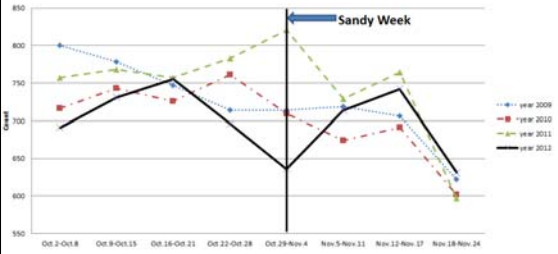
EXTRA DATA SLIDES

19

RUTGERS

NJ Health New Jersey Department of Health

Results Aim #1: Hospitalization and ED Visits for Work-Related Injury Immediately Before and After Sandy's Arrival-2012 Compared to Previous Years, All New Jersey

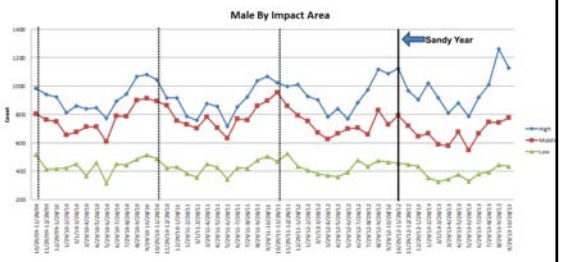


20

RUTGERS

NJ Health New Jersey Department of Health

Hospital Visits for Work Related Unintentional Trauma Injuries from 2009-2013 Before and After Hurricane Sandy, Men only, By Impact Area



21

RUTGERS

NJ Health
New Jersey Department of Health

Aim #1: Relative Risks for Work-Related Unintentional Injuries After Hurricane Sandy (2012) Compared to Prior Three Years (2009-2011), Men only, High Impact Area New Jersey Only

	Oct29-Jan29 RR (95% CI)	Jan29-Apr29 RR (95% CI)	Apr29-Jul29 RR(95% CI)	Jul29-Oct29 RR(95% CI)
Work-Related Injuries	1.09(0.94,1.27)	1.13(0.97,1.31)	1.18(1.03,1.35)	1.01(0.88,1.17)
Age				
18-30	1.13(0.95,1.34)	1.13(0.95,1.35)	1.20(1.04,1.39)	1.08(0.93,1.27)
30-50	1.06(0.91,1.24)	1.12(0.96,1.31)	1.13(0.98,1.31)	0.98(0.84,1.14)
50-65	1.12(0.95,1.33)	1.14(0.96,1.35)	1.27(1.09,1.49)	0.99(0.84,1.17)
Race/Ethnicity				
Non-Hispanic White	1.06(0.91,1.24)	1.07(0.91,1.26)	1.13(0.98,1.30)	0.98(0.84,1.14)
Non-Hispanic Black	1.20(0.98,1.48)	1.30(1.07,1.58)	1.28(1.07,1.54)	0.98(0.81,1.20)
Hispanic	0.99(0.83,1.18)	1.13(0.95,1.34)	1.27(1.09,1.48)	1.10(0.95,1.29)
Asian/Other Race	1.73(1.41,2.11)	1.50(1.22,1.85)	1.34(1.12,1.61)	1.16(0.96,1.40)
Unknown	0.83(0.50,1.38)	1.12(0.74,1.69)	1.04(0.69,1.56)	1.11(0.74,1.67)
Mechanism/Cause (E-Code)				
Motor Vehicle	1.07(0.85,1.35)	1.30(1.01,1.67)	1.07(0.85,1.35)	1.02(0.81,1.30)
Falls	1.02(0.84,1.24)	1.29(1.06,1.58)	1.39(1.13,1.70)	1.15(0.94,1.42)
Cut/Pierce	1.20(0.99,1.46)	1.16(0.95,1.43)	1.32(1.13,1.55)	1.12(0.94,1.32)
Struck by/Against	1.09(0.89,1.32)	1.16(0.95,1.41)	1.26(1.05,1.50)	1.08(0.90,1.31)
Overexertion	1.03(0.84,1.26)	1.19(0.98,1.45)	1.35(1.14,1.61)	1.14(0.94,1.38)
Other Causes	1.15(0.98,1.36)	0.98(0.83,1.16)	0.99(0.86,1.15)	0.86(0.73,1.01)

22