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Injuries and fatalities among EMTs and paramedics: Using Bureau of Labor Statistics data to identify risks

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Emergency Medical Services Personnel

- 900,000 providers
 - 180,000 full time
 - 154,000 paramedics
- Includes paramedics, emergency medical technicians and other responders
- 31 million responses and 22 million patients treated per year in the U.S.

Research Objectives

Examine data from the Department of Labor (DOL) Bureau of Labor Statistics to identify

- the rate of non-fatal injuries and
- the characteristics of fatal injuries among emergency medical technicians (EMT) and paramedics in the U.S.

Literature Review

Two main papers:

- Maguire BJ. Hunting KL. Guidotti TL. Smith GS. Occupational Injuries Among Emergency Medical Services Personnel. *Prehospital Emergency Care*. 2005; 9: 405-411.
- Maguire BJ. Hunting KL. Smith GS. Levick NR. Occupational Fatalities in EMS: A Hidden Crisis. *Annals of Emergency Medicine*. 2002; 40(6): 625-632.

Data sources

Department of Labor (DOL) Bureau of Labor Statistics:

- Survey of Occupational Injuries and Illnesses (SOII)
- Census of Fatal Occupational Injuries (CFOI)

Methods

- We examine 21,690 injury and illness cases with lost work days in private industry and 59 fatality cases DOL identified as occurring to EMTs and paramedics between 2003 and 2007; the fatality cases included workers in both private industry and in the public sector.
- We describe rates and relative risks by various demographic and incident characteristics.

Findings

Table 1. Number of cases and median days away from work for occupational injuries and illnesses involving days away from work to EMTs and paramedics from 2004 to 2007.

| Characteristic | Emergency medical technicians and paramedics | | | | | | | |
|----------------|--|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
| | 2004 | | 2005 | | 2006 | | 2007 | |
| Age | Number of cases | Median days | Number of cases | Median days | Number of cases | Median days | Number of cases | Median days |
| 16 to 19 | 80 | 2 | N/A | N/A | 20 | 2 | 50 | 15 |
| 20 to 24 | 960 | 3 | 430 | 4 | 760 | 5 | 530 | 3 |
| 25 to 34 | 2,010 | 4 | 1,420 | 4 | 2,390 | 4 | 1,580 | 8 |
| 35 to 44 | 1,200 | 3 | 690 | 5 | 1,330 | 5 | 1,350 | 7 |
| 45 to 54 | 720 | 7 | 390 | 4 | 420 | 5 | 470 | 5 |
| 55 to 64 | 130 | N/A | 100 | 19 | 100 | 18 | 150 | 18 |
| 65 + | N/A | N/A | 20 | 30 | 20 | 180 | N/A | N/A |
| Gender | | | | | | | | |
| Male | 2,790 | 3 | 1,720 | 4 | 2,870 | 5 | 2,360 | 5 |
| Female | 2,390 | 4 | 1,330 | 4 | 2,200 | 6 | 1,990 | 8 |
| Total | 5,170 | | 3,050 | | 5,070 | | 4,360 | |

Chart 1. Number of cases and percent by gender of occupational injuries and illnesses involving days away from work to EMTs and paramedics from 2004 to 2007.

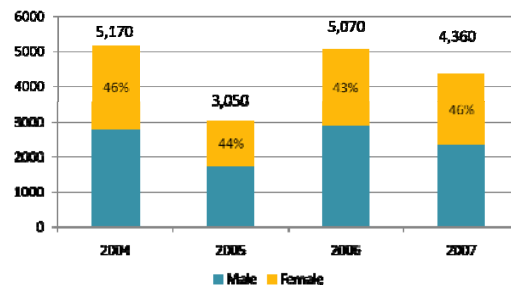


Table 2. Incidence rates for injuries and illnesses with days away from work per 10,000 fulltime employees for emergency medical technicians and paramedics (EMTs) and private industry for the years 2006 and 2007. With relative risk (RR) and 95% confidence interval (CI).

| | EMTs | Private industry | RR | CI low | CI high |
|------|-------|------------------|------------|--------|---------|
| 2007 | 349.9 | 122.2 | 2.9 | 2.7 | 3.0 |
| 2006 | 453.8 | 127.8 | 3.6 | 3.4 | 3.7 |

Table 3. Rates per 10,000 full time workers by body part for cases with lost work days in 2007; EMTs compared to private industry with relative risk and 95% confidence intervals.

| Part of body affected | EMTs | Private industry | RR | CI low | CI high |
|-----------------------|-------|------------------|------------|--------|---------|
| Trunk | 170.6 | 40.6 | 4.2 | 3.9 | 4.5 |
| Back | 121.7 | 24.9 | 4.9 | 4.4 | 5.3 |
| Shoulder | 22.3 | 8 | 2.8 | 2.2 | 3.4 |
| Lower extremities | 75.5 | 27.5 | 2.7 | 2.4 | 3.1 |
| Knee | 29.9 | 10 | 3.0 | 2.4 | 3.6 |
| Ankle | 19.3 | 6.6 | 2.9 | 2.2 | 3.6 |

Table 4. Injury and illness rates per 10,000 full time workers for cases resulting in lost work days for EMTs and private industry in 2007. With relative risk and 95% confidence interval by nature of injury and event.

| Nature of injury or illness | EMTs | Private industry | RR | CI low | CI high |
|-----------------------------|-------|------------------|-----|--------|---------|
| Sprains, strains | 217.8 | 47.3 | 4.6 | 4.3 | 4.9 |
| Back pain | 18.8 | 3.9 | 4.8 | 3.7 | 6.0 |
| Event or exposure | | | | | |
| Overexertion | 177.6 | 27.9 | 6.4 | 5.9 | 6.9 |
| Overexertion in lifting | 127.8 | 14.8 | 8.6 | 7.8 | 9.4 |
| Transportation accidents | 26.2 | 5.6 | 4.7 | 3.7 | 5.6 |
| Assault, violent act | 5.2 | 2.6 | 2.0 | 1.1 | 2.9 |

Fatal occupational injuries among emergency medical technicians and paramedics.

All United States, 2003 to 2007.

| | Characteristic | Number of cases | Percent |
|--------------------------|---------------------------|-----------------|---------|
| Total | | 59 | |
| Gender | Men | 42 | 71 |
| | Women | 17 | 29 |
| Event or exposure | Transportation incidents | 51 | 86 |
| | Worker struck by vehicle | 3 | 5 |
| | Aircraft incidents | 20 | 34 |
| | Assaults and violent acts | 5 | 8 |

Discussion

Non-fatal injuries – comparison to Maguire 2005

- Leading cause by Nature – Sprains & strains
- Leading cause by Body Part – Back
- Leading cause by Event – Overexertion

Comparison of fatal injuries

| | 2002 | | 2009 | |
|----------------|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Transportation | 86 | 75 | 51 | 86 |
| Assault | 10 | 9 | 5 | 8 |

Limitation – no “cardiovascular” in 2009 data.

Transportation incidents



- Leading cause of fatal injuries
- Non-fatal Injury rate many times higher than the national average

Violence

- A fatal assault a year
- Over 100 non-fatal assaults every year resulting in days away from work

Suicide

- No data
- Rate could be many times higher than the national average

Conclusions

- Data from the US Department of Labor shows that EMS workers have a rate of injury that is about three times higher than the national average.
- Similar to previous studies, the rate for EMS workers is much higher than the national average and the vast majority of fatalities are secondary to transportation related incidents; assaults are also identified as a significant cause of fatality.

- The findings also indicate that female EMS workers may have a disproportionately high incidence of injuries.

- There is no longer any doubt that EMS workers have a rate of injury well above the national average.
- Support is recommended for further research related to causal factors and for the development and evaluation of interventions to mitigate this problem.

Where do we go from here

Immediate interventions must be initiated to mitigate this problem

Challenges

- Problems with existing data
- No standard terminology
- No linkages to other databases
- Poor awareness of problem
- Limited resources
- Untested “solutions” such as ballistic vests

Recommendations

- Improved databases (local and national) with uniform data
- Money for research
- Injury epidemiology research
- Development, implementation and evaluation of risk reduction interventions
- Mechanism to develop and share best practices related to training/education, enforce/enact and engineering (including patient transfer equip, PPE and clothing/footwear.

A team approach

- EMS personnel
- Managers
- Epidemiologists
- Engineers
- Physicians/nurses
- Local officials

Questions



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- Maguire BJ, Smith S. Injuries and Fatalities among Emergency Medical Technicians and Paramedics. Submitted but not yet published
- Maguire BJ, Hunting KL, Smith GS, Levick NR. Occupational Fatalities in EMS: A Hidden Crisis. *Annals of Emergency Medicine*. 2002; 40(6): 625-632.
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Related research

- Maguire BJ, Kahn CA. Ambulance Safety and Crashes. In Cone DC. (Ed) *Emergency Medical Services: Clinical Practice & Systems Oversight*. NAEMSP Pub. 2009.
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Presenter Disclosures

Brian J Maguire

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"No "