Terrorism Preparedness: Have Office-based Physicians Been Trained?

National Ambulatory Medical Care Survey (2003-2004)

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Background

- Preparedness for biological, chemical and radiological terrorism became a national priority after 2001 anthrax outbreak.

- Important for ambulatory care physicians because patients may have undifferentiated symptoms.

- Evaluated by National Center for Health Statistics (NCHS).

Objective

• To study associations between terrorism preparedness training and physician demographic and practice characteristics

• Terrorism preparedness items added to the 2003—2004 National Ambulatory Medical Care Survey (NAMCS)
Methods

- 3,968 nonfederal office-based physicians surveyed in 2003–2004
  - Identified from Masterfiles of American Medical Association and American Osteopathic Association

- Multistage random sampling design
  - 112 geographic primary sampling units (PSUs)
  - Random stratified sample of physicians within PSUs, by 15 specialty areas
  - Saw patients during randomly assigned 1-week reporting period
  - Response rate over both years was 56.3%

- Face-to-face interaction between physician and U.S. Census Bureau interviewer

- Data weighted by inverse of selection probability
  - Nonresponse adjustment
  - National estimates done based on weighting

- Surveys approved annually by NCHS Ethics Review Board
Analyses

• Chi-square
  – Significance at $p < 0.05$

• Logistic regression
  – Included significant variables from chi-square analysis
  – 95% confidence intervals

• SAS-callable SUDAAN 9.0
  For multistage, complex sampling designs
Dependent Variables

• Training in identification and diagnosis of Centers for Disease Control and Prevention (CDC) category A (weaponizable) diseases:
  – Smallpox
  – Anthrax
  – Plague
  – Botulism
  – Tularemia
  – Hemorrhagic fevers

• Training for other exposures:
  – Chemical
  – Radiological
Independent Variables

Physician characteristics

- Age
  - 30-39 years
  - 15-year bands for age 40–85 years

- Degree
  - Allopathic (MD)
  - Osteopathic (DO)

- Specialty group
  - Family medicine
  - Other primary care
  - Medical
  - Surgical

Practice characteristics

- Region
  - Northeast
  - South
  - Midwest
  - West

- Metropolitan statistical area
  - Urban
  - Rural

- Managed care contracts
  - None
  - One or more
Figure 1. Percentage of Physicians Trained for Terrorism-Related Exposures

NOTE: No significant differences by medical degree, urban-rural, or geographic region.
SOURCE: National Ambulatory Medical Care Survey, 2003-2004
Training for Exposures, by Specialty (Compared with Surgeons), Adjusted for Age and Managed Care Contracts

• Family physicians more likely to be trained in any exposure
  – Odds ratio (OR) 2.05 (95% CI 1.51-2.78)
  – More likely to be trained in all eight individual exposures

• Other primary care physicians more likely to be trained in any exposure
  – OR 1.95 (95% CI 1.47-2.60)
  – More likely to be trained in all eight individual exposures

• Medical specialists more likely to be trained any exposure
  – OR 1.37 (95% CI 1.02-1.84)
  – More likely to be trained for anthrax, smallpox and plague
Figure 2a: Percentage of Physicians Trained for Terrorism-Related Exposures, by Specialty Group

Anthrax (p<0.01)  Smallpox (p<0.01)  Chemical (p<0.01)  Botulism (p<0.01)

SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2003-2004
Figure 2b: Percentage of Physicians Trained for Terrorism-Related Exposures, by Specialty Group

SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2003-2004
Training for Exposures, by Age (Compared with Age 30-39 Years), Adjusted for Specialty and Managed Care Contracts

• Physicians aged 55-69 years less likely to be trained for
  – Smallpox
    • OR 0.70 (95% CI 0.49-0.99)
  – Chemical exposures
    • OR 0.67 (95% CI 0.46-0.96)
  – Anthrax
    • OR 0.66 (95% CI 0.46-0.95)

• No differences for other exposures or age groups
Figure 3a: Percentage of Physicians Trained for Terrorism-Related Exposures, by Age in Years

SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2003-2004
Figure 3b: Percentage of Physicians Trained for Terrorism-Related Exposures, by Age in Years

NOTE: NSD is no significant difference.
SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2003-2004
Training for Exposures, by Managed Care Involvement, Adjusted for Age and Specialty

• Physicians with one or more managed care contracts more likely to be trained in any exposure than those without contracts
  – OR 1.78 (95% CI 1.26-2.52)

• More likely to be trained in these individual exposures:
  – Chemical
  – Smallpox
  – Anthrax
  – Plague
  – Radiological
Figure 4a: Percentage of Physicians Trained for Terrorism-Related Exposures, by Number of Managed Care Contracts

- Anthrax (p<0.01): 40.0%
- Smallpox (p<0.01): 39.8%
- Chemical (p<0.01): 31.4%
- Botulism (NSD): 26.7%

NOTE: NSD is no significant difference.
SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2003-2004
**Figure 4b:** Percentage of Physicians Trained for Terrorism-Related Exposures, by Number of Managed Care Contracts

[Bar chart showing the percentage of physicians trained for different infectious diseases, such as Radiological, Plague, Hemorrhagic Fever, and Tularemia. The chart compares those with no training (blue) and one or more trainings (green).]

NOTE: NSD is no significant difference.

SOURCE: CDC/NCHS, National Ambulatory Medical Care Survey, 2003-2004
Discussion

• Most office-based physicians are not trained for weaponizable biological, chemical and radiological exposures.
  – Best: 38% for anthrax
  – Worst: 22% for tularemia

• Some improvement for family physicians since 2001
  – About 50% of family physicians had received training in any exposure in our study (2003-2004).
  – Only 18% of members of American Academy of Family Physicians had received bioterrorism training by October 2001 (Chen et al, 2002).
Specialty

• Primary care and medical specialists more likely than surgeons to be trained for terrorism-related exposures

• About one-quarter of surgeons trained for chemical exposures in our study

• Consistent with other recent literature
  – About one-third of trauma surgeons prepared to manage hazardous materials exposures (Ciraulo et al., 2004)
Age

- Middle-aged physicians less likely to be trained than young physicians
- Oldest physicians comparable to youngest
- No explanation in literature for differences by age of physician
Managed Care

- Physicians involved in managed care more likely to be trained than those not involved.

- Continuing education seen by some as a means of positively influencing practice behavior and meeting organizational goals (Piatt, 1996).

- No literature found on value of terrorism preparedness training to managed care organizations specifically.
Strengths and Limitations

Strengths
• Nationally representative sample
• First to address physician training comprehensively since September 11, 2001

Limitations
• Self-reported yes-or-no nature of questions
• No assessment of training quality
• Relatively small sample size in some strata (e.g., osteopathic physicians)
Conclusions

• Naturally occurring weaponizable agents rare
  – Smallpox eradicated worldwide
  – CDC reports for 2004
    • No anthrax
    • 3 cases of plague
    • 133 cases of botulism
    • 134 cases of tularemia

• But concern remains about terrorist attacks and natural exposures
  – Low probability
  – Devastating impact

• Terrorism response training is transferable to management of
  – Epidemics (SARS, pandemic flu)
  – Chemical mishaps (chlorine release in Cary, North Carolina, October 2006)
  – Radiological emergencies (nuclear power plants)