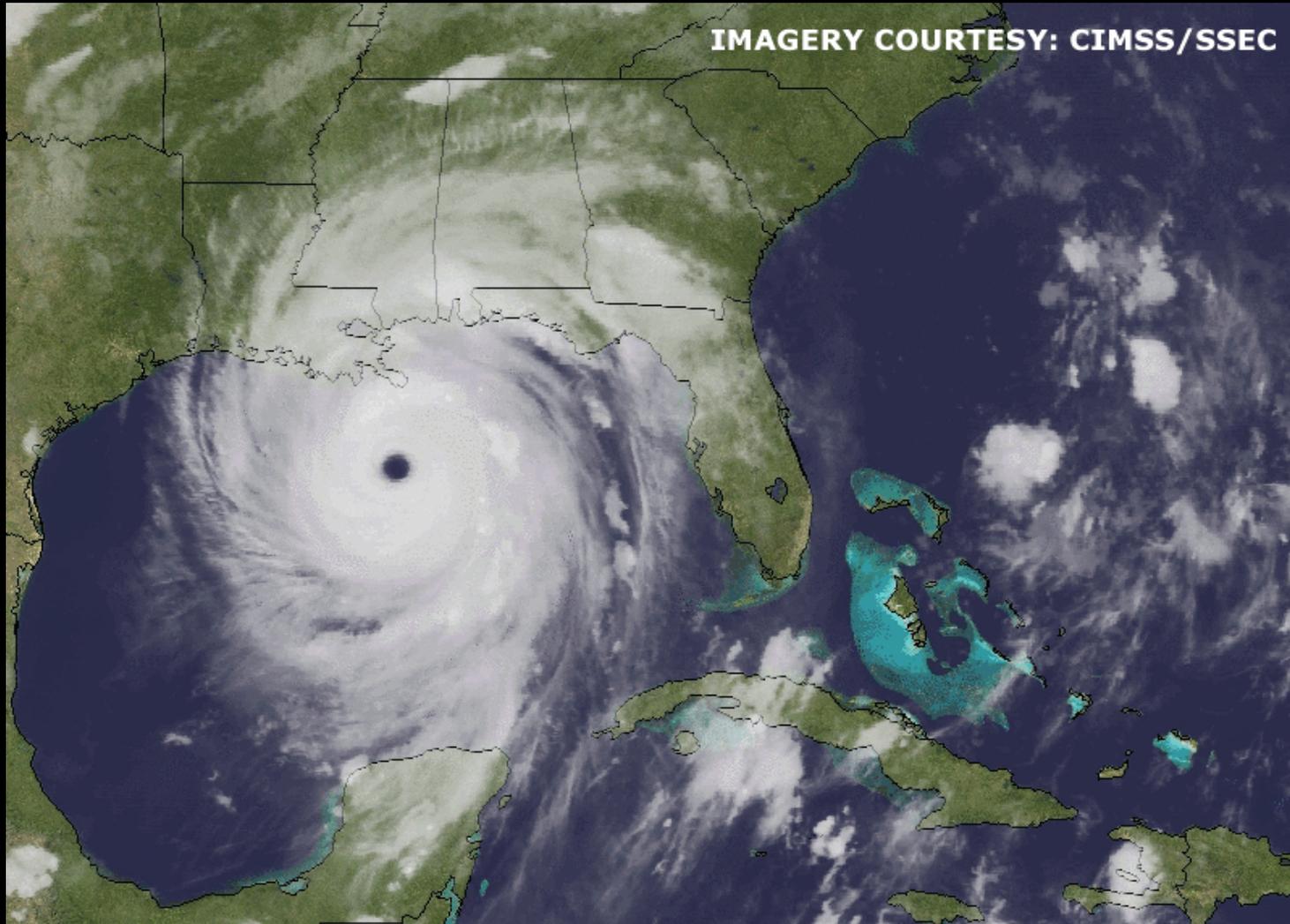




Katrina Exposures and Health Effects: Preliminary Analysis of Coast Guard Responders

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United States Coast Guard



IMAGERY COURTESY: CIMSS/SSEC

29 AUG 2005 - G-12 IMG - 01:15:00UTC



GO AWAY

~~IVAN~~ 6

DENNIS

KATRINA









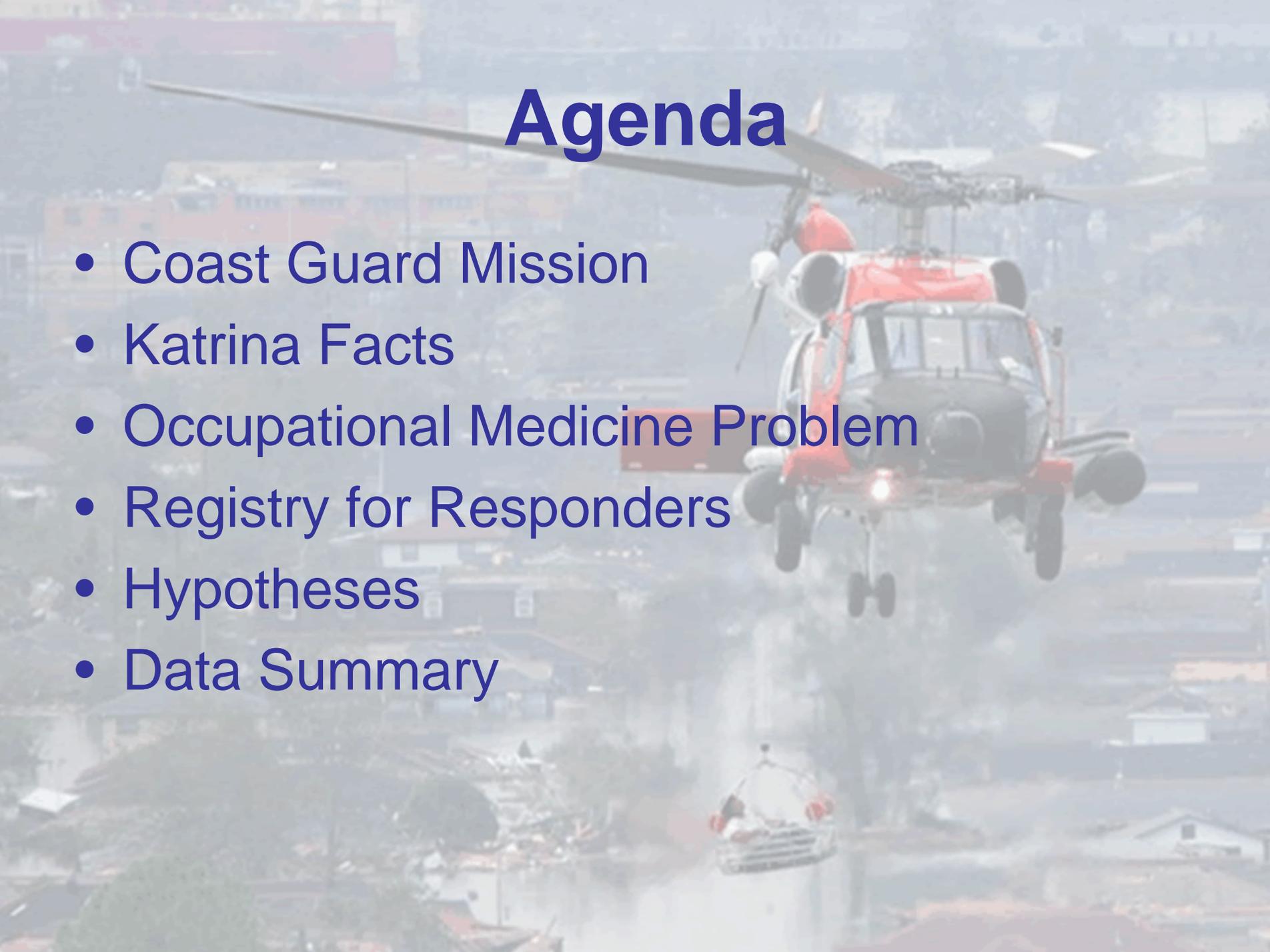








Agenda

A red Coast Guard helicopter is shown in flight, carrying a stretcher with a patient. The helicopter is flying over a residential area with houses and trees. The background is slightly blurred, emphasizing the helicopter and its mission.

- Coast Guard Mission
- Katrina Facts
- Occupational Medicine Problem
- Registry for Responders
- Hypotheses
- Data Summary

US Coast Guard's Mission

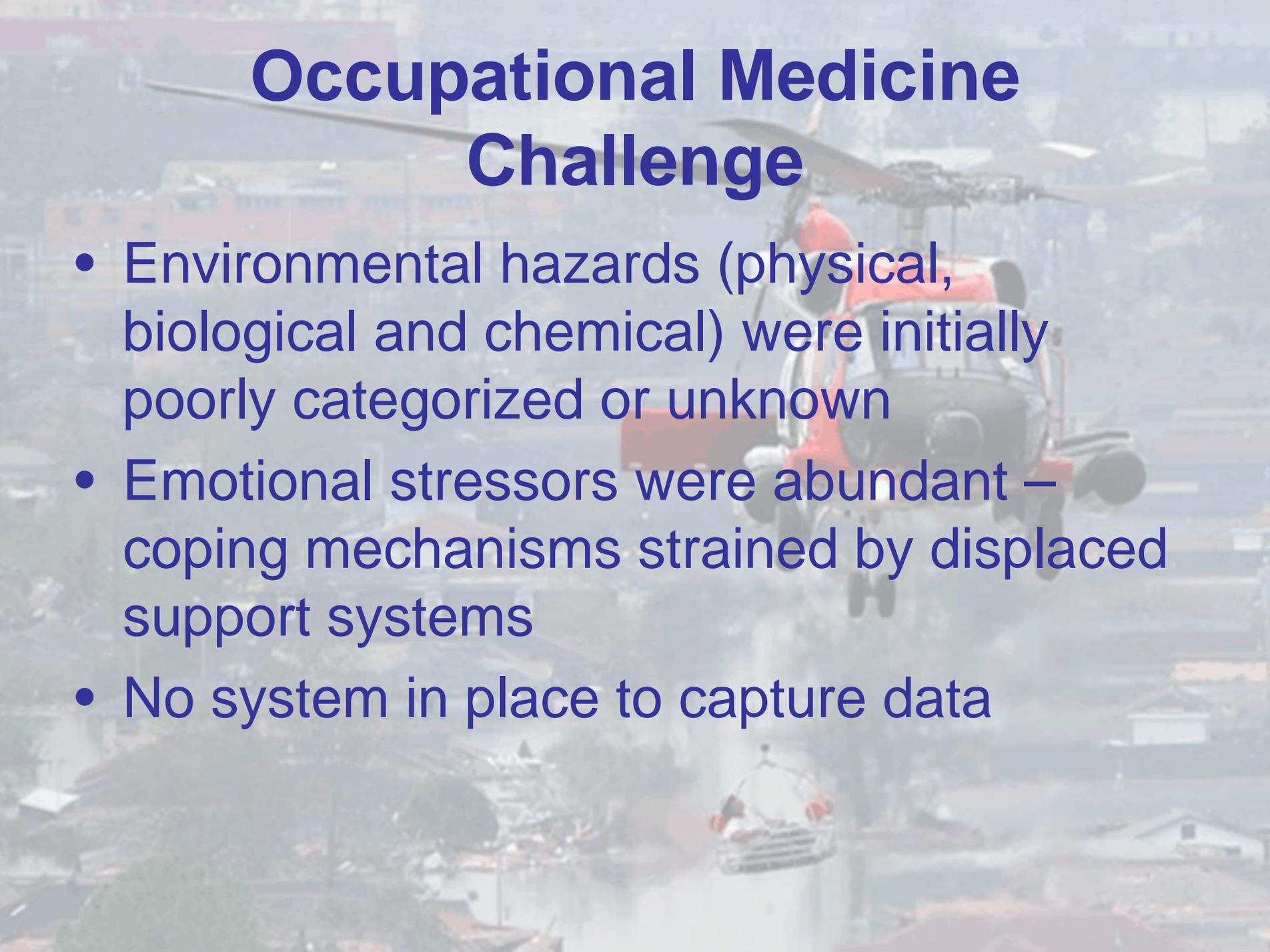
A US Coast Guard helicopter is shown in flight, viewed from a low angle. The helicopter is red and white, with a red stripe on the side. It is flying over a residential area with houses and trees visible in the background. The helicopter's rotors are blurred, indicating it is in motion. The overall scene is slightly hazy, suggesting a misty or overcast day.

- Protect the Public, the Environment and US Economic and Security interests
- 5 Primary roles:
 - Homeland Security
 - Law Enforcement
 - Search and Rescue
 - Marine Environmental Pollution Response
 - Aids to Navigation (ATONs)

Katrina Facts

- Persons saved 33,597
 - by helo 12,535
 - by boat/ground 21,062
- Sorties flown 1,817
- Total flight time 4,291 h
- Pollution cases investigated 4,245
- Oil spilled 9 million gallons
- Wrecks 2,960
- ATON discrepancies 1,815

Occupational Medicine Challenge

A red and white helicopter is the central focus, flying over a city. The helicopter is viewed from a slightly elevated rear-quarter perspective. The city below is a dense urban area with various buildings and streets. In the lower part of the frame, another smaller helicopter is visible, flying towards the viewer. The overall scene is somewhat hazy, suggesting a high-altitude or atmospheric perspective.

- Environmental hazards (physical, biological and chemical) were initially poorly categorized or unknown
- Emotional stressors were abundant – coping mechanisms strained by displaced support systems
- No system in place to capture data

Registry for Responders



- Provide a registry for acute or potential chronic health issues
- Risk management tool
 - Mechanism for self-documentation
 - Mechanism for access to needed/desired care
 - Variable analysis
- Elucidate environmental exposures and health effects of responders

Significant Event / Acute Exposure Tracking

• Last Name • First Name Middle Ini. • Social Security Number Today's date: time:

• Home Unit: OPFAC Unit Name

• Name of unit assigned to during response:

• Name of Operation/Event:

• Site / Locations:

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> Mobile | <input type="checkbox"/> STA NOLA | <input type="checkbox"/> Pascagoula | <input type="checkbox"/> IST Zephyr Field |
| <input type="checkbox"/> Gulfport | <input type="checkbox"/> AIRSTA NOLA | <input type="checkbox"/> NSA / Algiers Point | <input type="checkbox"/> CBD NOLA |
| <input type="checkbox"/> Alexandria | <input type="checkbox"/> COMMSTA NOLA | <input type="checkbox"/> Biloxi | <input type="checkbox"/> STA Dauphin Island |
| <input type="checkbox"/> Grand Isle | <input type="checkbox"/> Venice | <input type="checkbox"/> CGC <input type="text"/> | <input type="checkbox"/> IST Stennis |
| <input type="checkbox"/> FOB/JFO Baton Rouge | <input type="checkbox"/> Other Locations <input type="text"/> | | |

• Mission(s) Performed:

- | | | | |
|---|---|--|-------------------------------------|
| <input type="checkbox"/> SAR - Air | <input type="checkbox"/> HAZMAT / Oil Site Assess | <input type="checkbox"/> Administrative | <input type="checkbox"/> LE |
| <input type="checkbox"/> SAR - Boat | <input type="checkbox"/> Fire Fighting | <input type="checkbox"/> ICS Support / Command Post | <input type="checkbox"/> Med/Dental |
| <input type="checkbox"/> SAR - Ground | <input type="checkbox"/> Building Clean Up/Decon | <input type="checkbox"/> Worklife | <input type="checkbox"/> SEH |
| <input type="checkbox"/> Rescue Swimmer | <input type="checkbox"/> Body Recovery | <input type="checkbox"/> Other Activity <input type="text"/> | |

• Exposure:

	<u>Arrival Date(mm/dd/yyyy)</u>	<u>Departure Date (mm/dd/yyyy)</u>	<u>Hours/day exposed</u>	<u>Days Exposed</u>
Exposure duration:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Exposure Classification

• **Flood Water (FW)** Submersion Ingestion (by swallowing) Inhalation (Prop wash/air boat)
 No known exposure

• **Infectious Agents or Biological Agents (IA)** Deceased body Animal Carcass Bloodborne Pathogen
 Human waste No known exposure

• **Chemicals (CH)** Ingestion / swallowing Contact with eye Contact by hands
 Contact by splash Contact by submersion Inhalation of vapors
 Other No known chemical exposure

Exposure Classification

• **Flood Water (FW)**

- | | | |
|--|--|--|
| <input type="checkbox"/> Submersion | <input type="checkbox"/> Ingestion (by swallowing) | <input type="checkbox"/> Inhalation (Prop wash/air boat) |
| <input type="checkbox"/> No known exposure | | |

• **Infectious Agents or Biological Agents (IA)**

- | | | |
|--|--|--|
| <input type="checkbox"/> Deceased body | <input type="checkbox"/> Animal Carcass | <input type="checkbox"/> Bloodborne Pathogen |
| <input type="checkbox"/> Human waste | <input type="checkbox"/> No known exposure | |

• **Chemicals (CH)**

- | | | |
|---|---|---|
| <input type="checkbox"/> Ingestion / swallowing | <input type="checkbox"/> Contact with eye | <input type="checkbox"/> Contact by hands |
| <input type="checkbox"/> Contact by splash | <input type="checkbox"/> Contact by submersion | <input type="checkbox"/> Inhalation of vapors |
| <input type="checkbox"/> Other <input type="text"/> | <input type="checkbox"/> No known chemical Exp. | |

• **Heat Stress (HS)**

- | | | |
|---|---|--|
| <input type="checkbox"/> Rash | <input type="checkbox"/> Cramp / Nausea | <input type="checkbox"/> Confusion |
| <input type="checkbox"/> Profuse sweating | <input type="checkbox"/> Dry, hot skin | <input type="checkbox"/> No known exposure |

• **Carbon Monoxide (CO)**

- | | |
|-----------------------------------|--|
| <input type="checkbox"/> Exposure | <input type="checkbox"/> No known exposure |
|-----------------------------------|--|

• **Sun Burn (SB)**

- | | | |
|-------------------------------|-----------------------------------|---------------------------------|
| <input type="checkbox"/> Mild | <input type="checkbox"/> Moderate | <input type="checkbox"/> Severe |
| <input type="checkbox"/> None | | |

• **Animal / Vector (AV)**

- | | | |
|---|---|--|
| <input type="checkbox"/> Dog bite/scratch | <input type="checkbox"/> Cat bite/scratch | <input type="checkbox"/> Rodent bite/contact |
| <input type="checkbox"/> Mosquito bites | <input type="checkbox"/> Spider bite | <input type="checkbox"/> Snake bite |
| <input type="checkbox"/> Fire ant bite | <input type="checkbox"/> Other A/V <input type="text"/> | <input type="checkbox"/> No known exposure |

• **Mold Exposure (ME)**

- | | | |
|--|--|--------------------------------------|
| <input type="checkbox"/> Mild Respiratory Symptoms | <input type="checkbox"/> Severe Respiratory Symptoms | <input type="checkbox"/> No symptoms |
|--|--|--------------------------------------|

Injuries:

• **Slips, Trips, Falls (STF)**

- | | | |
|--|-----------------------------------|------------------------------------|
| <input type="checkbox"/> Twist, strain, sprain | <input type="checkbox"/> Fracture | <input type="checkbox"/> No Injury |
|--|-----------------------------------|------------------------------------|

• **Penetrating Injury (PI)**

- | | | |
|-----------------------------------|-------------------------------------|---|
| <input type="checkbox"/> Abrasion | <input type="checkbox"/> Laceration | <input type="checkbox"/> Puncture Wound |
| <input type="checkbox"/> None | | |

• Have you sought medical attention or received treatment for any of the above exposures?

- | | | | | | |
|-----------------------------|-------|--|--|---|---|
| <input type="checkbox"/> No | Yes = | <input type="checkbox"/> Flood Water (FW) | <input type="checkbox"/> Infectious Agents or Biological Agents (IA) | <input type="checkbox"/> Chemicals (CH) | <input type="checkbox"/> Heat Stress (HS) |
| | | <input type="checkbox"/> Carbon Monoxide (CO) | <input type="checkbox"/> Sun Burn (SB) | <input type="checkbox"/> Animal / Vector (AV) | <input type="checkbox"/> Mold Exposure (ME) |
| | | <input type="checkbox"/> Slips, Trips, Falls (STF) | <input type="checkbox"/> Penetrating Injury (PI) | | |

• Description of work performed:

Health Effects: (Check all that apply)

- | | | | |
|---|---|--|--|
| <input type="checkbox"/> Diarrhea | <input type="checkbox"/> Skin Rash | <input type="checkbox"/> Joint Pain | <input type="checkbox"/> Skin Lacerations |
| <input type="checkbox"/> Depression | <input type="checkbox"/> Nausea | <input type="checkbox"/> Infected Skin | <input type="checkbox"/> Confusion |
| <input type="checkbox"/> Sinus Infections | <input type="checkbox"/> Vomiting | <input type="checkbox"/> Cramps | <input type="checkbox"/> Muscle Strain |
| <input type="checkbox"/> Skin Puncture | <input type="checkbox"/> Difficulty Concentrating | <input type="checkbox"/> Loss of Appetite | <input type="checkbox"/> Excessive Weight Loss |
| <input type="checkbox"/> Dehydration | <input type="checkbox"/> Other <input type="text"/> | <input type="checkbox"/> No known health effects | |

- Symptoms while deployed? Yes No • Symptoms observed post deployment Yes No

Other Symptoms observed: (If any)

PPE: (Personal Protective equipment used - Check box if used)

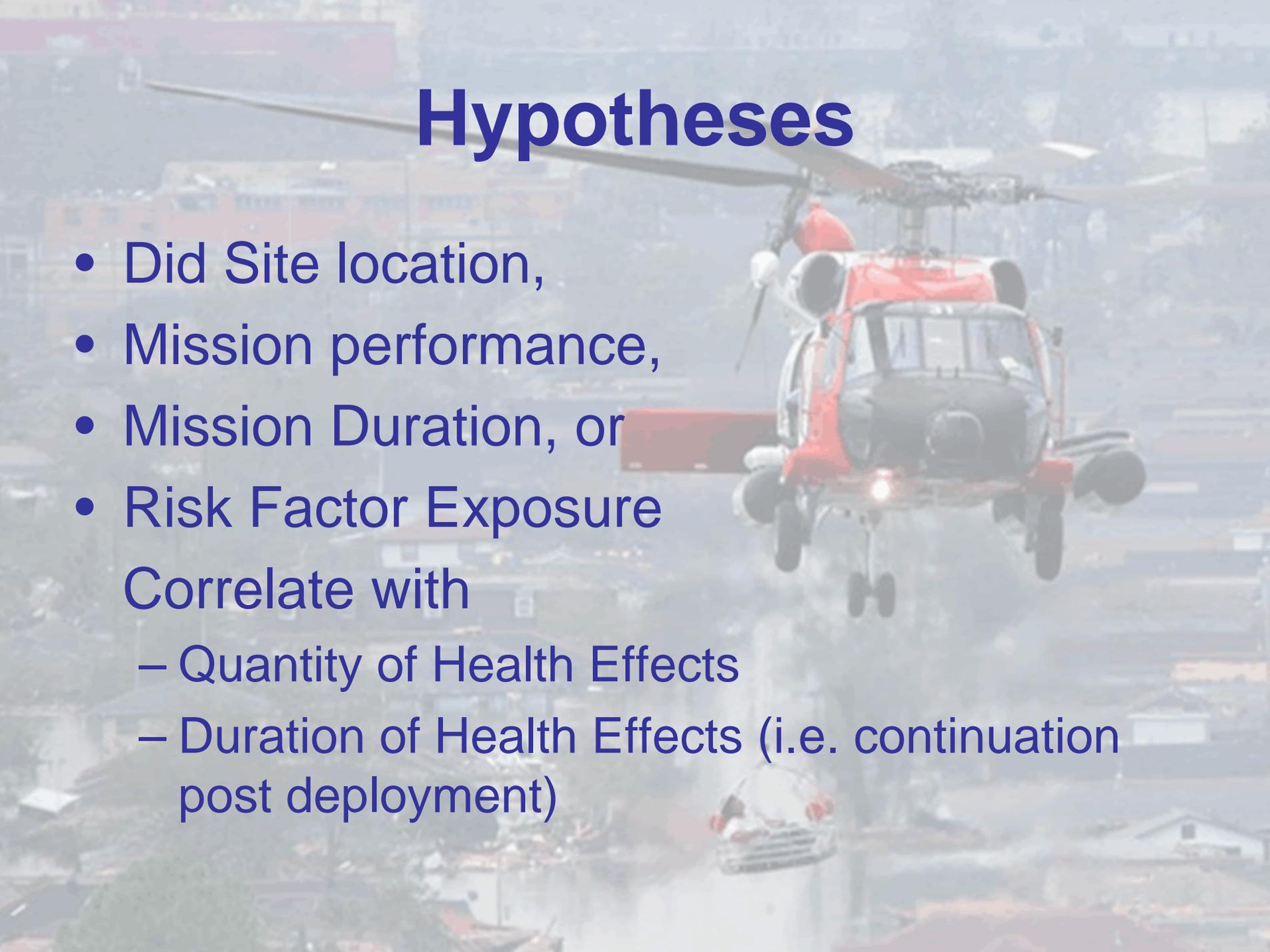
- | | | | |
|---|---|--|--|
| <input type="checkbox"/> Waders | <input type="checkbox"/> Hand Sanitizer | <input type="checkbox"/> PFD | <input type="checkbox"/> Boonie Hat |
| <input type="checkbox"/> Nitrile/Latex Gloves | <input type="checkbox"/> Safety Glasses | <input type="checkbox"/> Tyvek Suits | <input type="checkbox"/> Decon Stations |
| <input type="checkbox"/> Leather Work Gloves | <input type="checkbox"/> Camelbak | <input type="checkbox"/> Sunscreen | <input type="checkbox"/> PVC Pipe or other approved device to handle power lines |
| <input type="checkbox"/> Respirator | <input type="checkbox"/> Safety Boots | <input type="checkbox"/> Repellant | <input type="checkbox"/> Hearing Protection |
| <input type="checkbox"/> Other <input type="text"/> | <input type="checkbox"/> None used | <input type="checkbox"/> None required | |

Other Factors:

- On Average, how many hours did you sleep per night? 1 to 3 3 to 5 5 to 7 8+
- Do you use tobacco? None Smoke Smokeless Tobacco
- you have a day off during your deployment? if so, what frequency?
- No days off 1 in 7 days 1 in 10 days 1 in 14 days Other

Post-Deployment Health Assessment:

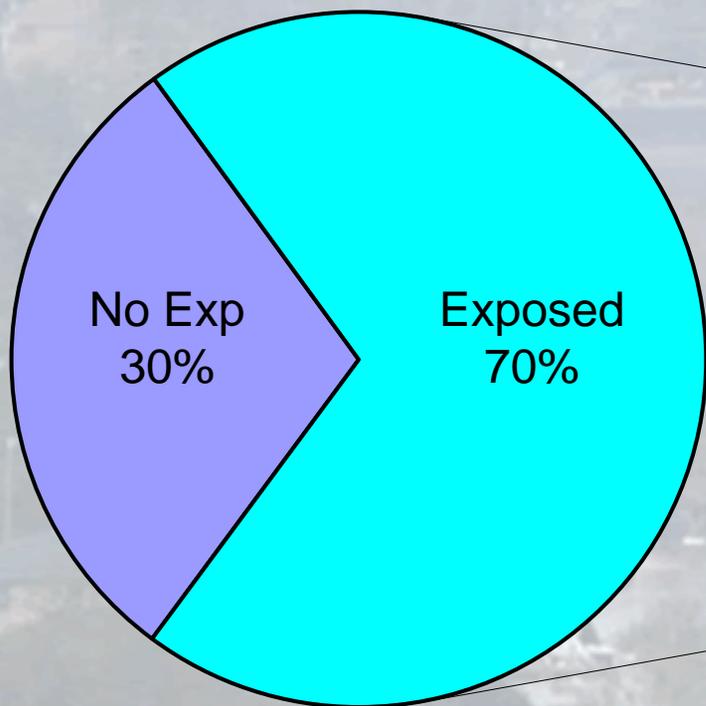
Hypotheses

A red and black helicopter is shown in flight, carrying a stretcher with a patient. The helicopter is flying over a city, and the background is a hazy, urban landscape. The helicopter is the central focus of the image, and its rotors are visible. The patient on the stretcher is lying flat, and the helicopter is positioned to transport them. The overall scene suggests a medical emergency or a rescue mission in an urban environment.

- Did Site location,
 - Mission performance,
 - Mission Duration, or
 - Risk Factor Exposure
- Correlate with
- Quantity of Health Effects
 - Duration of Health Effects (i.e. continuation post deployment)

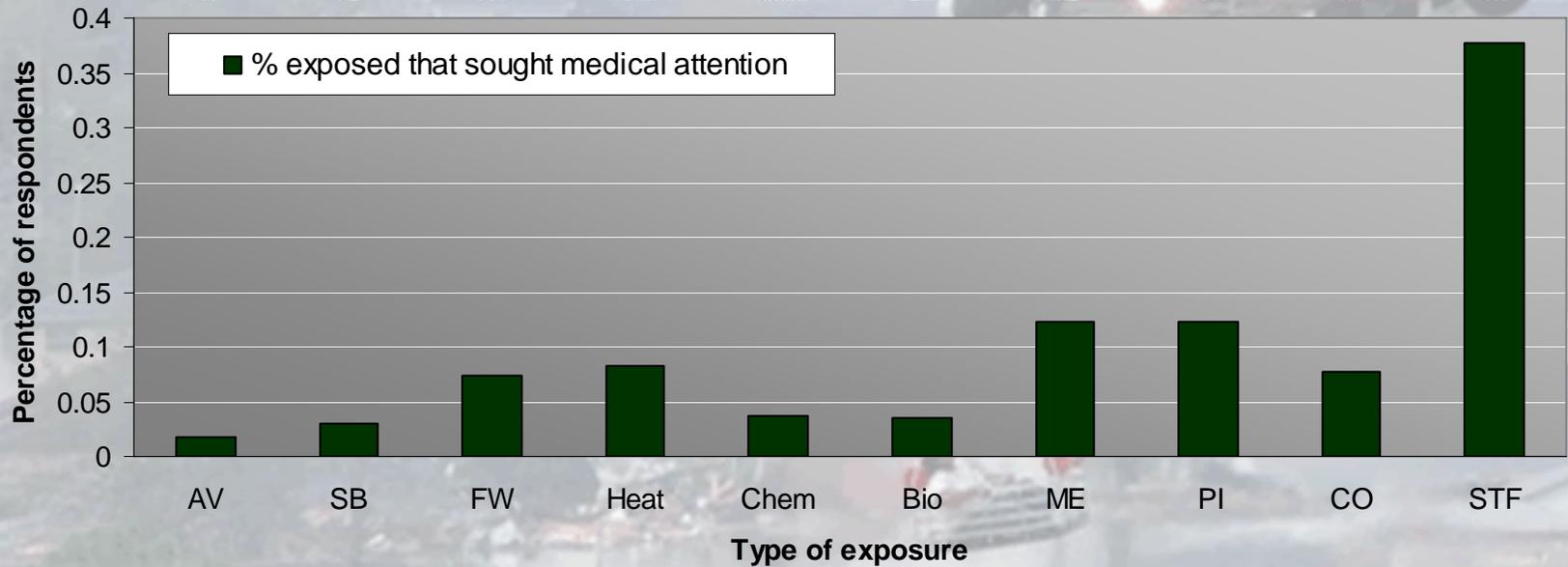
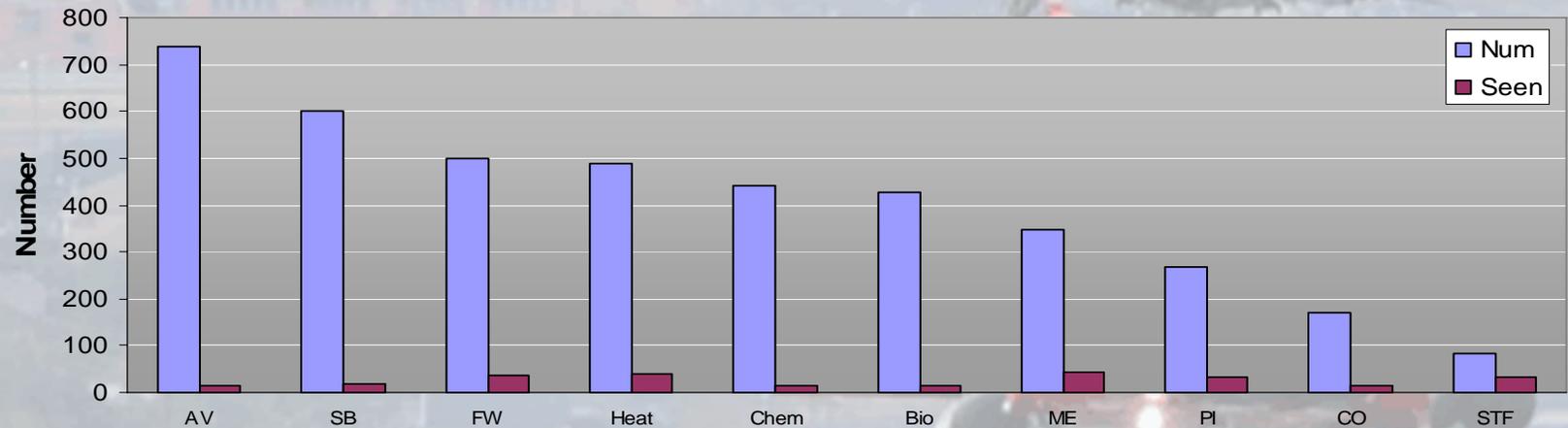
Distribution of Exposures

n=1583

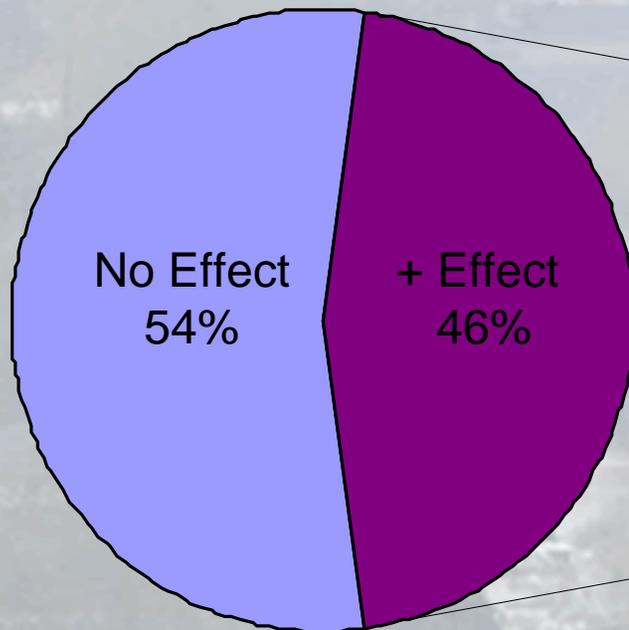


- No exposures
- STF
- CO
- Pen Injury
- Mld
- Bio
- Chem
- Heat
- Flood water
- Sunburn
- Animal vector

Exposures by Type

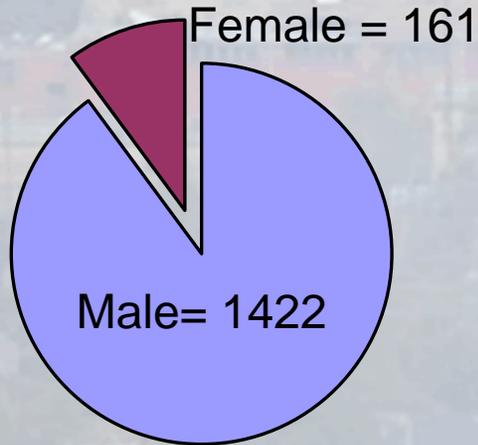


Distribution of Health Effects

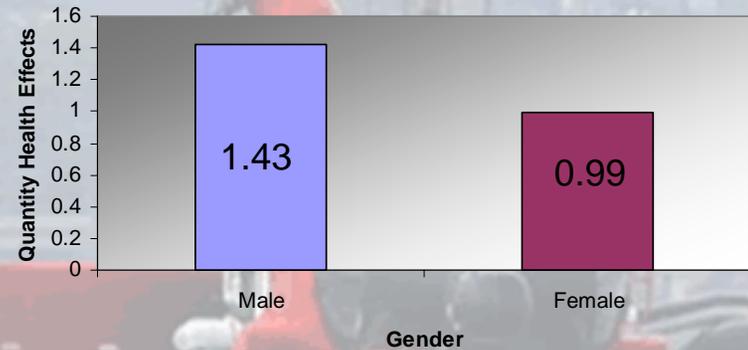


- No health effects
- WtLoss
- LossAppetite
- Dehydration
- Derm
- Psych
- ENT
- Musc
- GI
- Mold
- PenInj
- Other

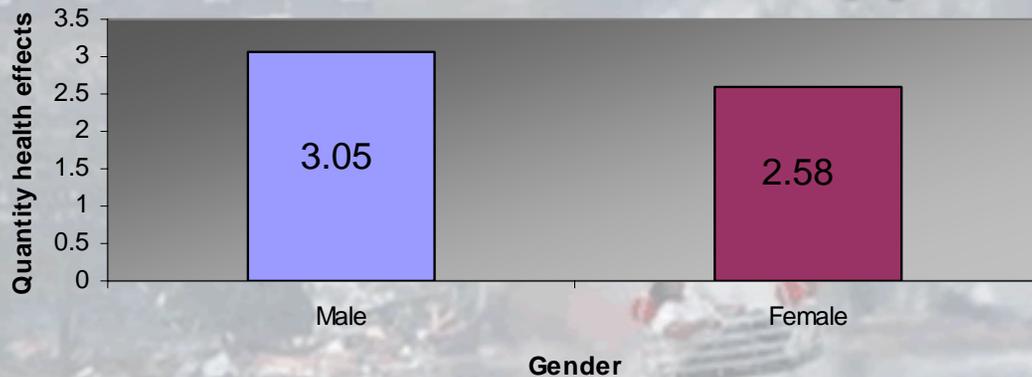
Gender and Health Effects



Avg Quantity of Health Effects by Gender

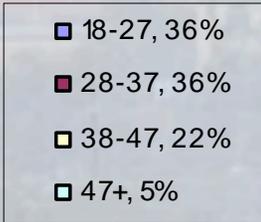
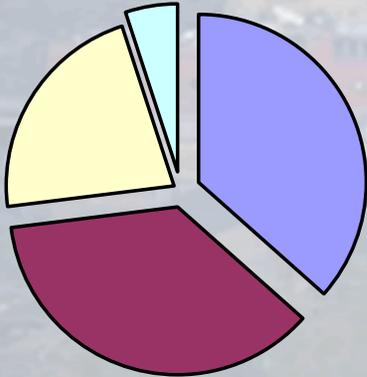


Average of Those Reporting Health Effects by Gender

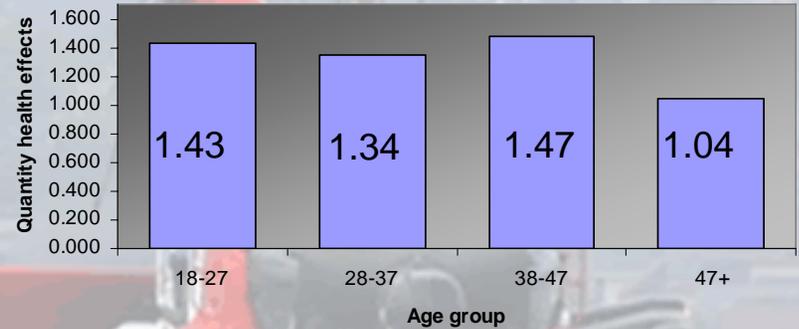


Health Effects by Age

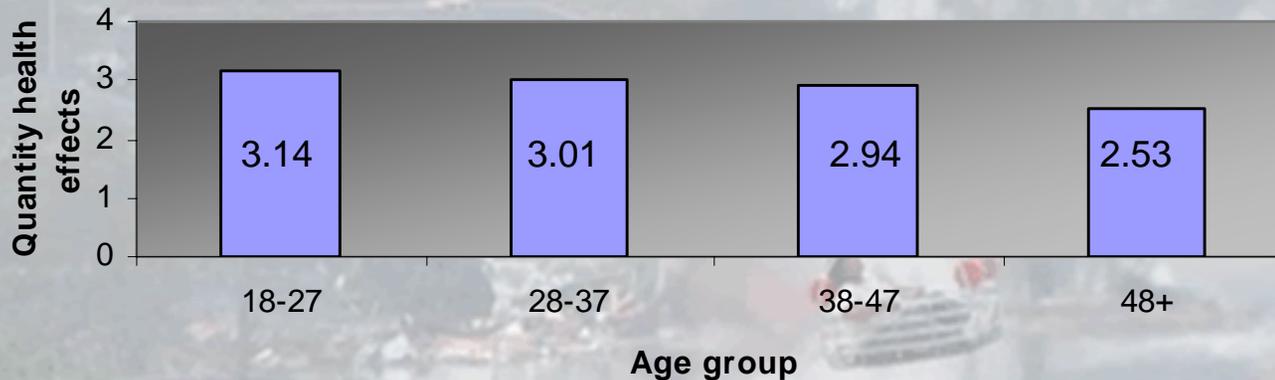
Age Diversity



Avg Quantity Health Effects by Age



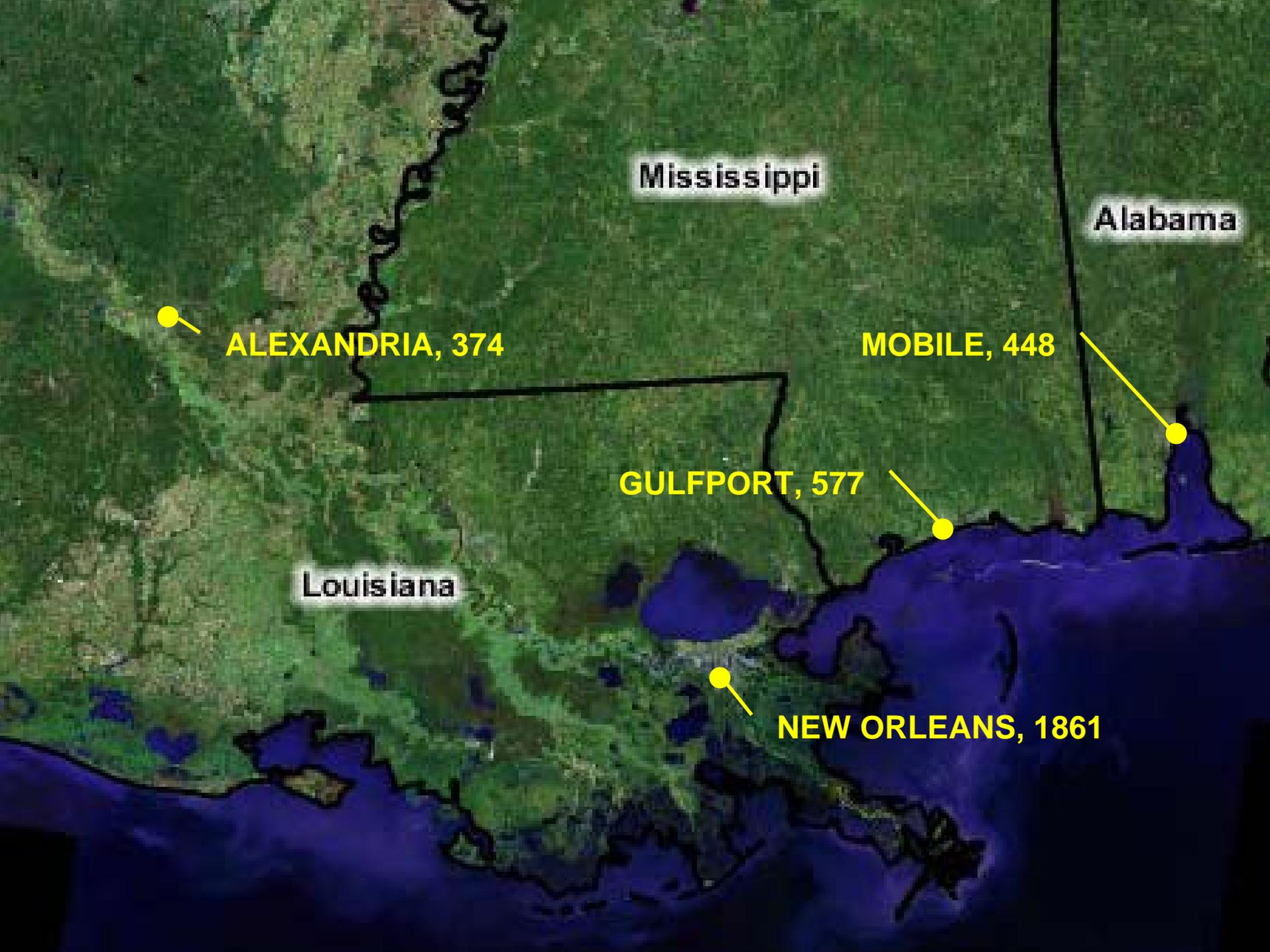
Average of Those Reporting Health Effects by Age



Sites

- 30K ft view
- 20K ft view
- 10K ft view
- Health Effects by Site (quantity)





Mississippi

Alabama

ALEXANDRIA, 374

MOBILE, 448

GULFPORT, 577

Louisiana

NEW ORLEANS, 1861



Mississippi

Alabama

Louisiana

MOBILE, 426

PASCAGOULA, 152

JFO BATON ROUGE, 196

STENNIS, 15

GULFPORT, 262

BILOXI, 148

DAUPHIN ISLE, 22

NEW ORLEANS, 1442

VENICE, 110

GRAND ISLE, 113



STA NEW ORLEANS, 416

ZEPHYR FIELD, 208

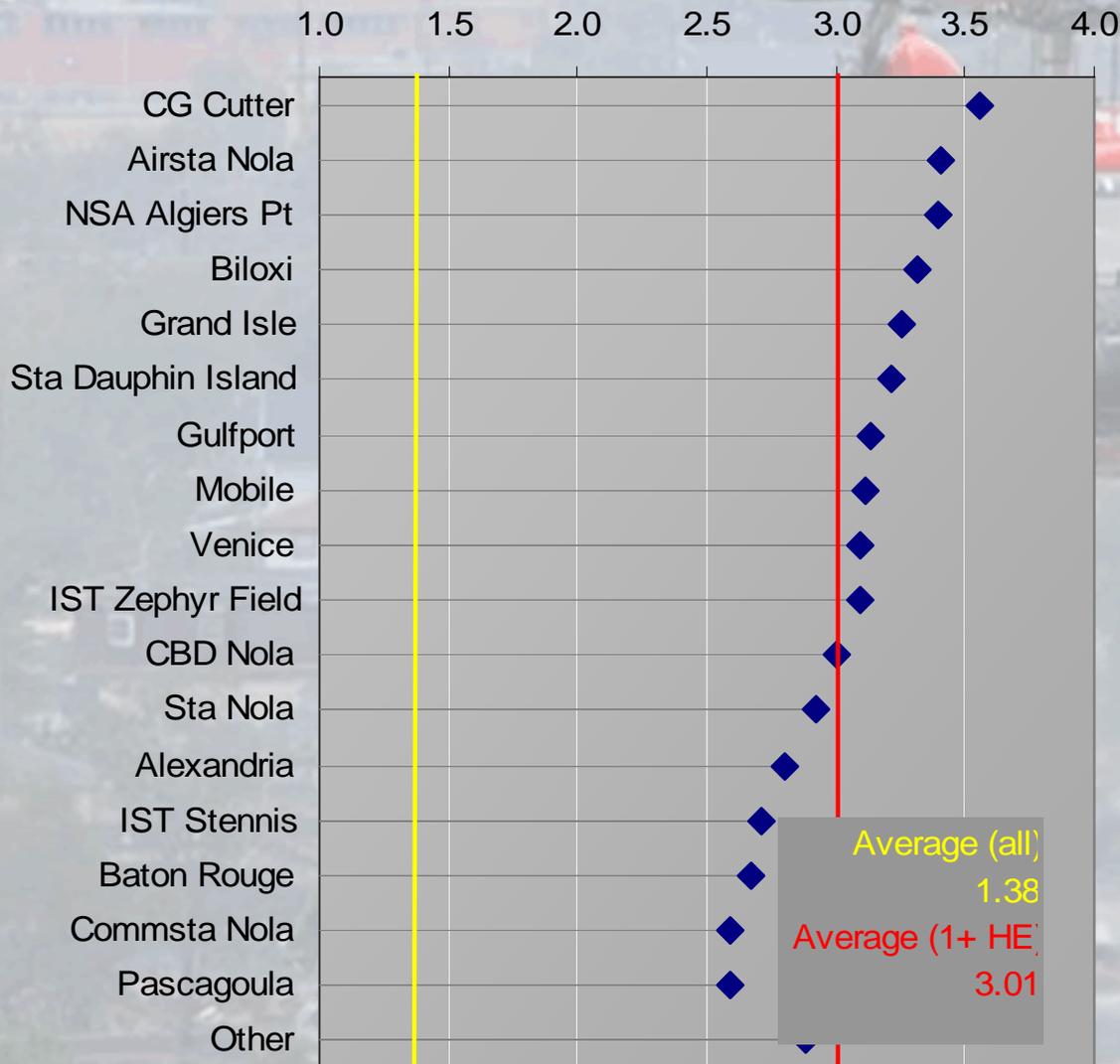
CBD, 105

NSA ALGIERS PT, 179

COMMSTA NEW ORLEANS, 84

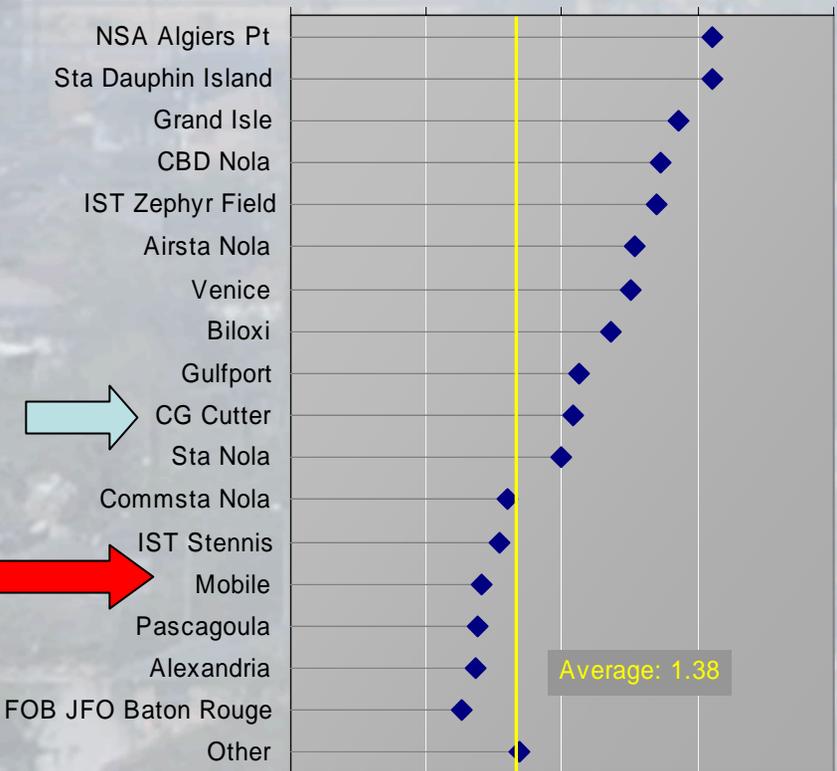
AIRSTA NEW ORLEANS, 450

Health Effects by Site

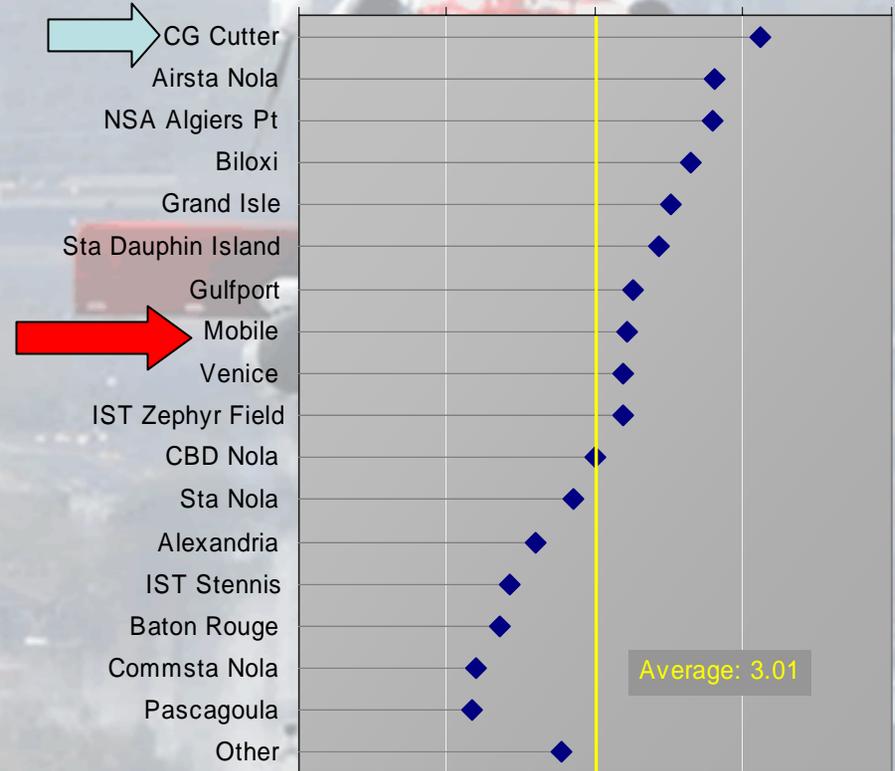


HE: Including & Excluding “0”

0.5 1 1.5 2 2.5

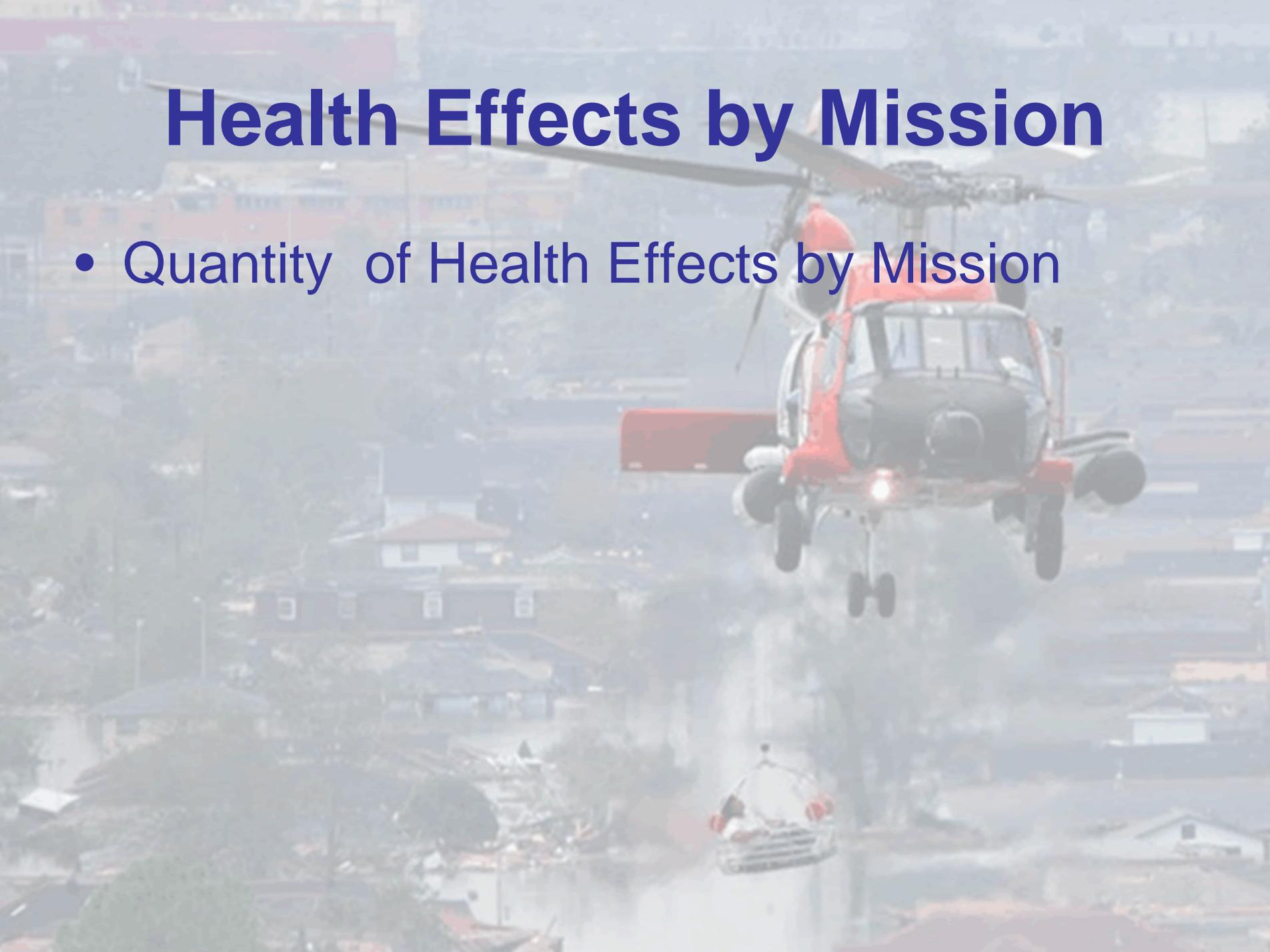


2.0 2.5 3.0 3.5 4.0

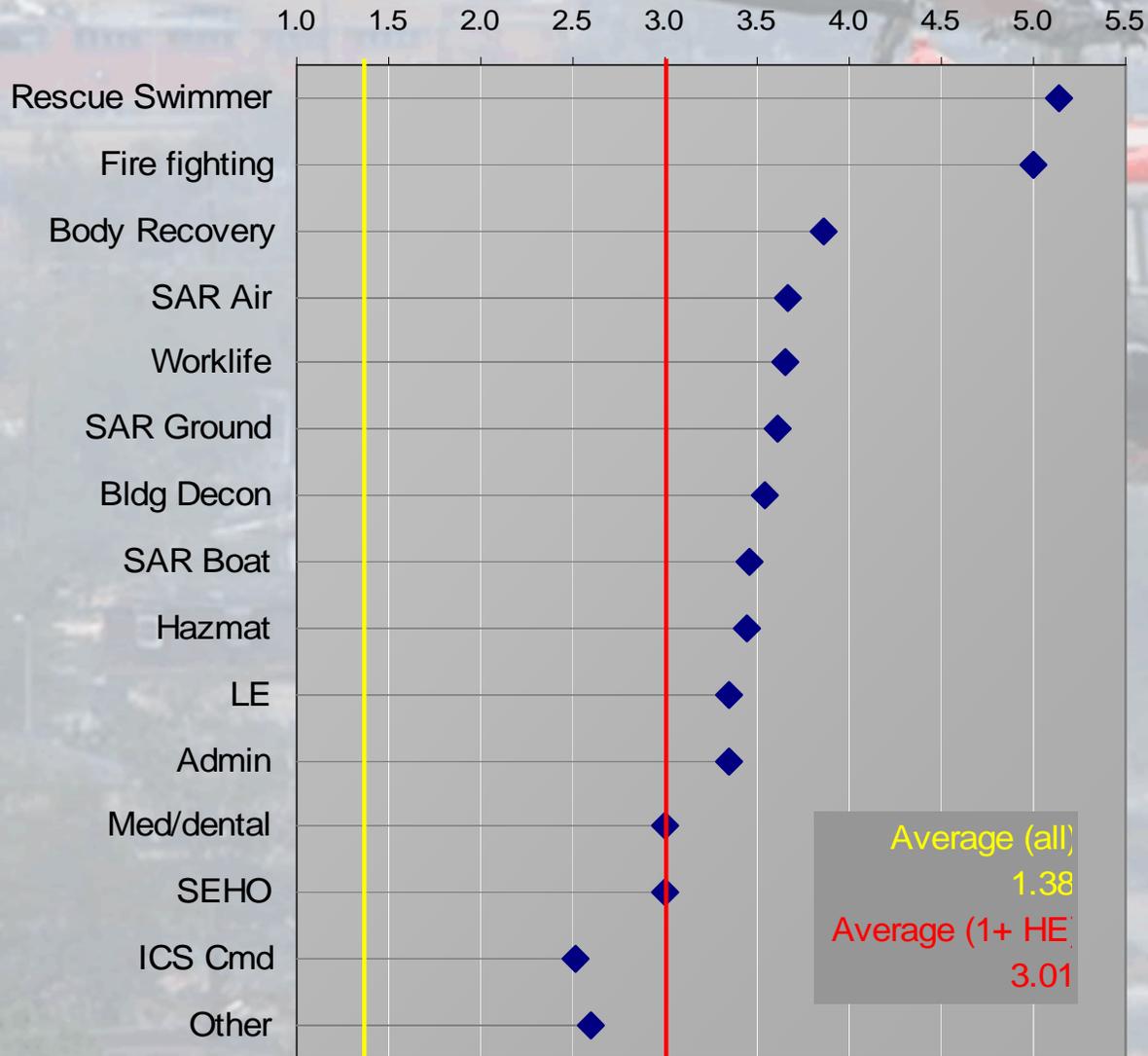


Health Effects by Mission

- Quantity of Health Effects by Mission



Health Effects by Mission



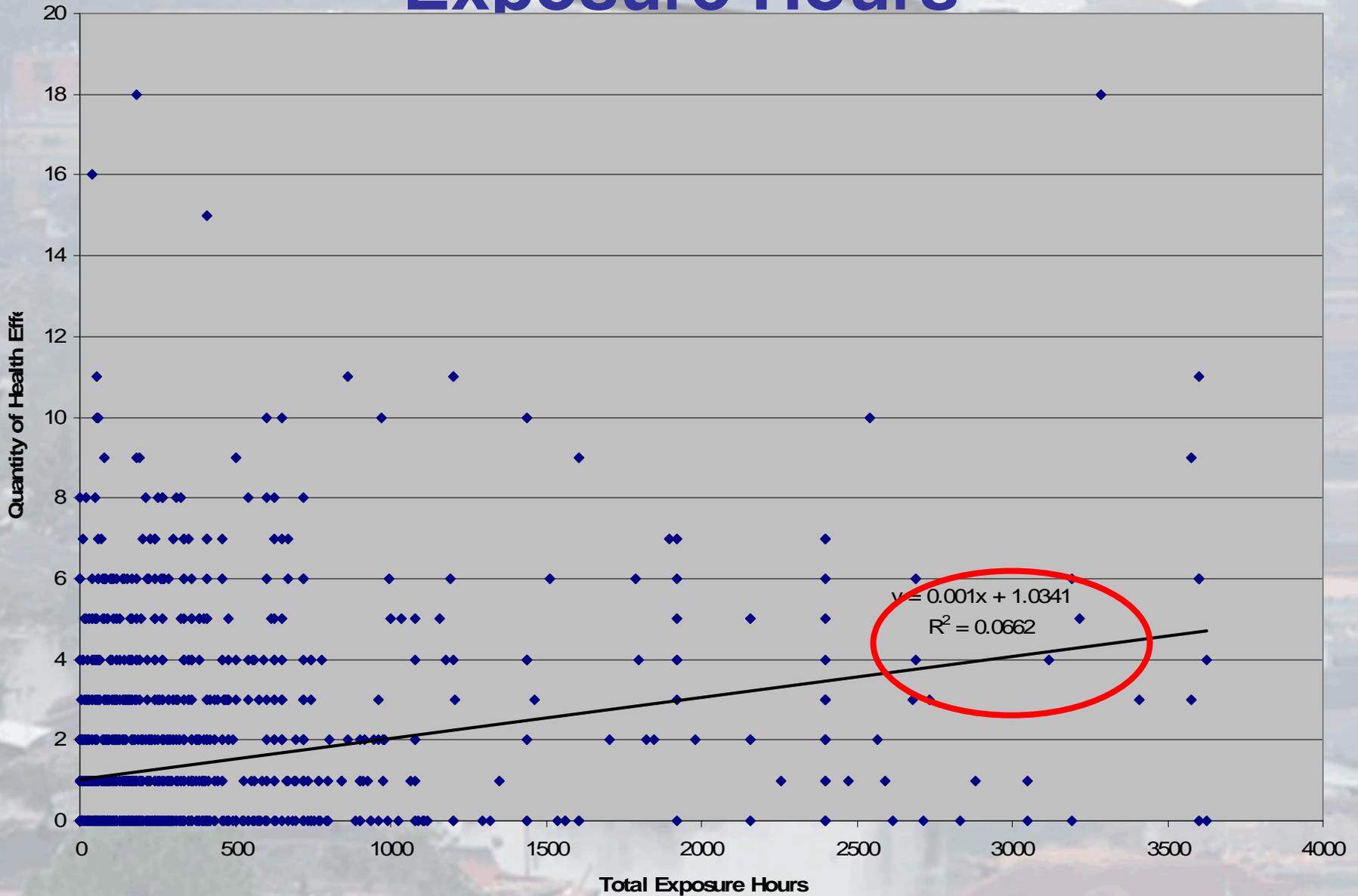
Average (all)
1.38
Average (1+ HE)
3.01

Time

- Linear Regression



Quantity Health Effects by Total Exposure Hours

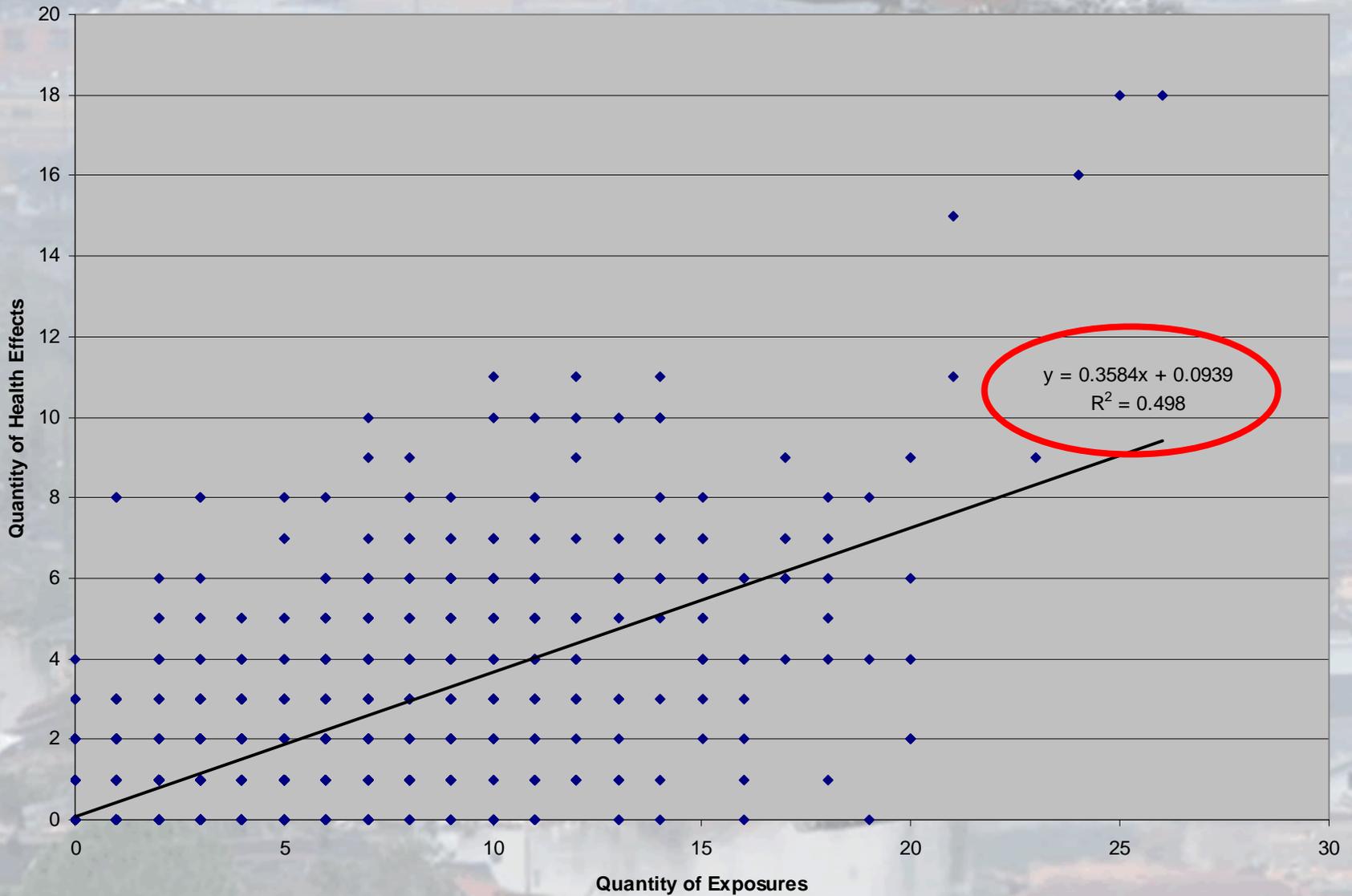


Health Effects by Exposure

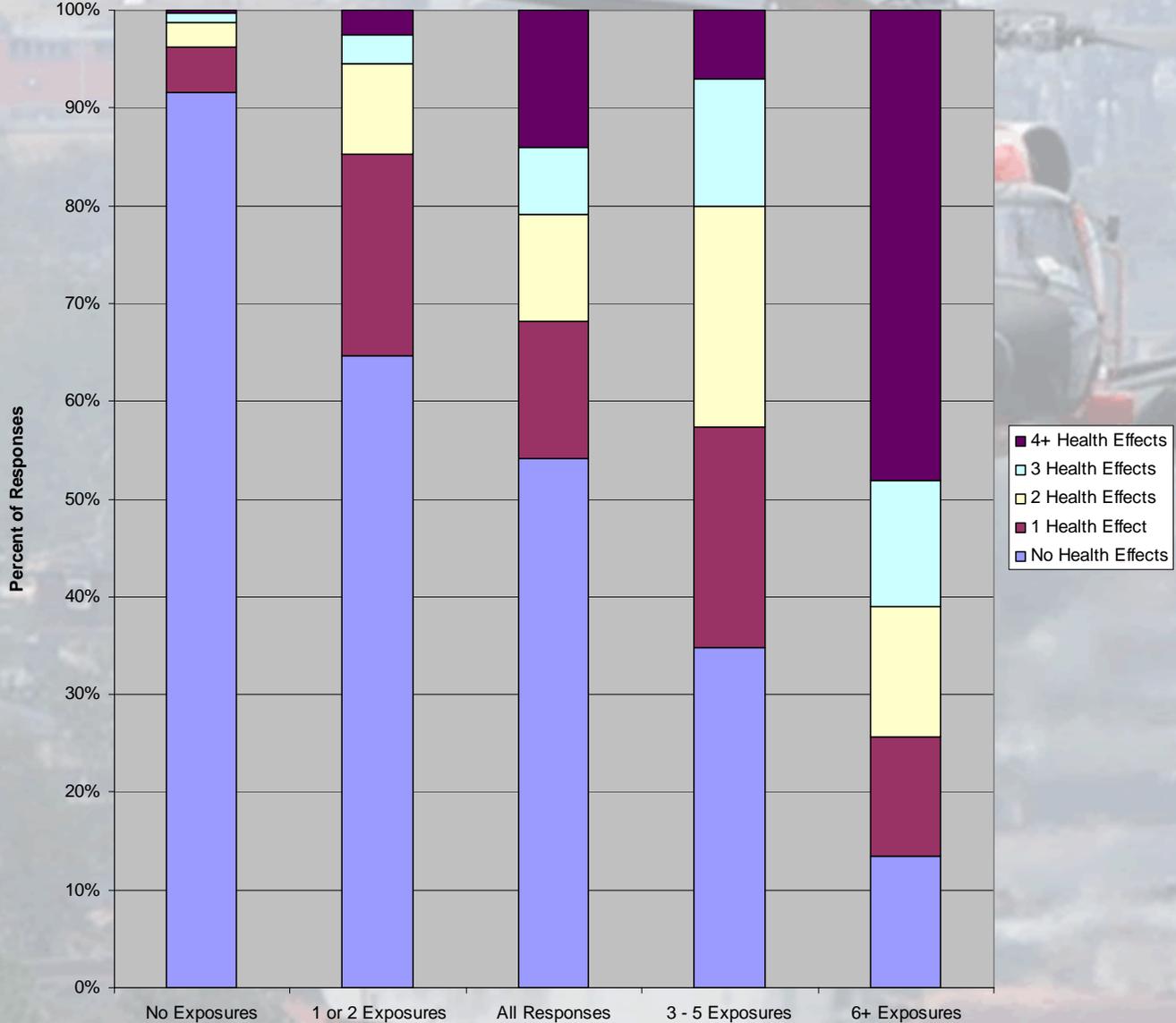
A red helicopter is shown in flight, carrying a stretcher with a patient. The helicopter is flying over a residential area with houses and trees. The background is slightly blurred, suggesting motion. The helicopter is the central focus of the image, with its rotors and landing gear visible. The patient on the stretcher is lying flat, and the stretcher is suspended from the helicopter. The overall scene is a medical emergency in progress.

- Linear Regression
- Quantity of Health Effects by Quantity of Exposures
- Post Deployment Health Effects by Exposure Quantity

Health Effects by Exposures

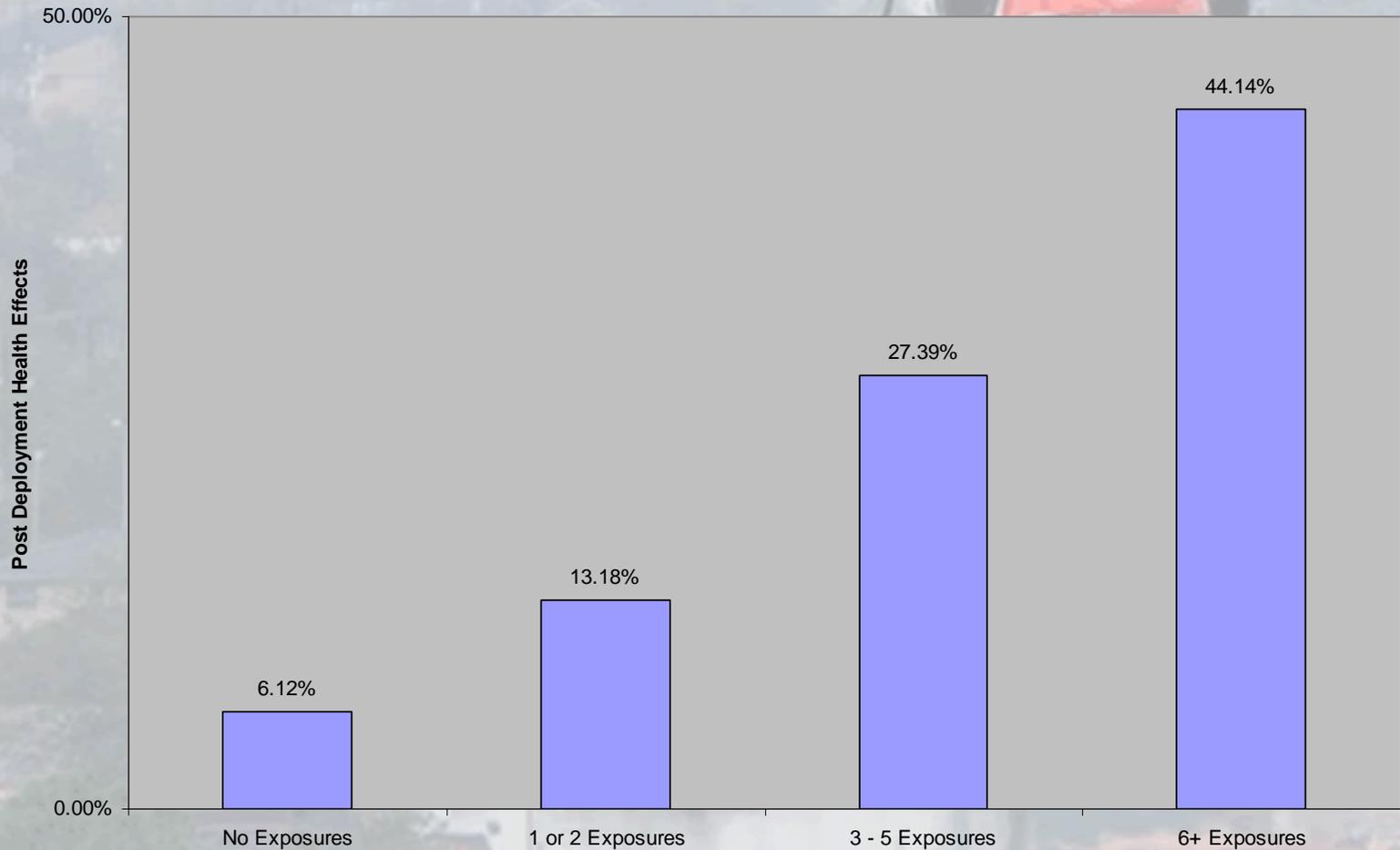


Health Effects by Exposures

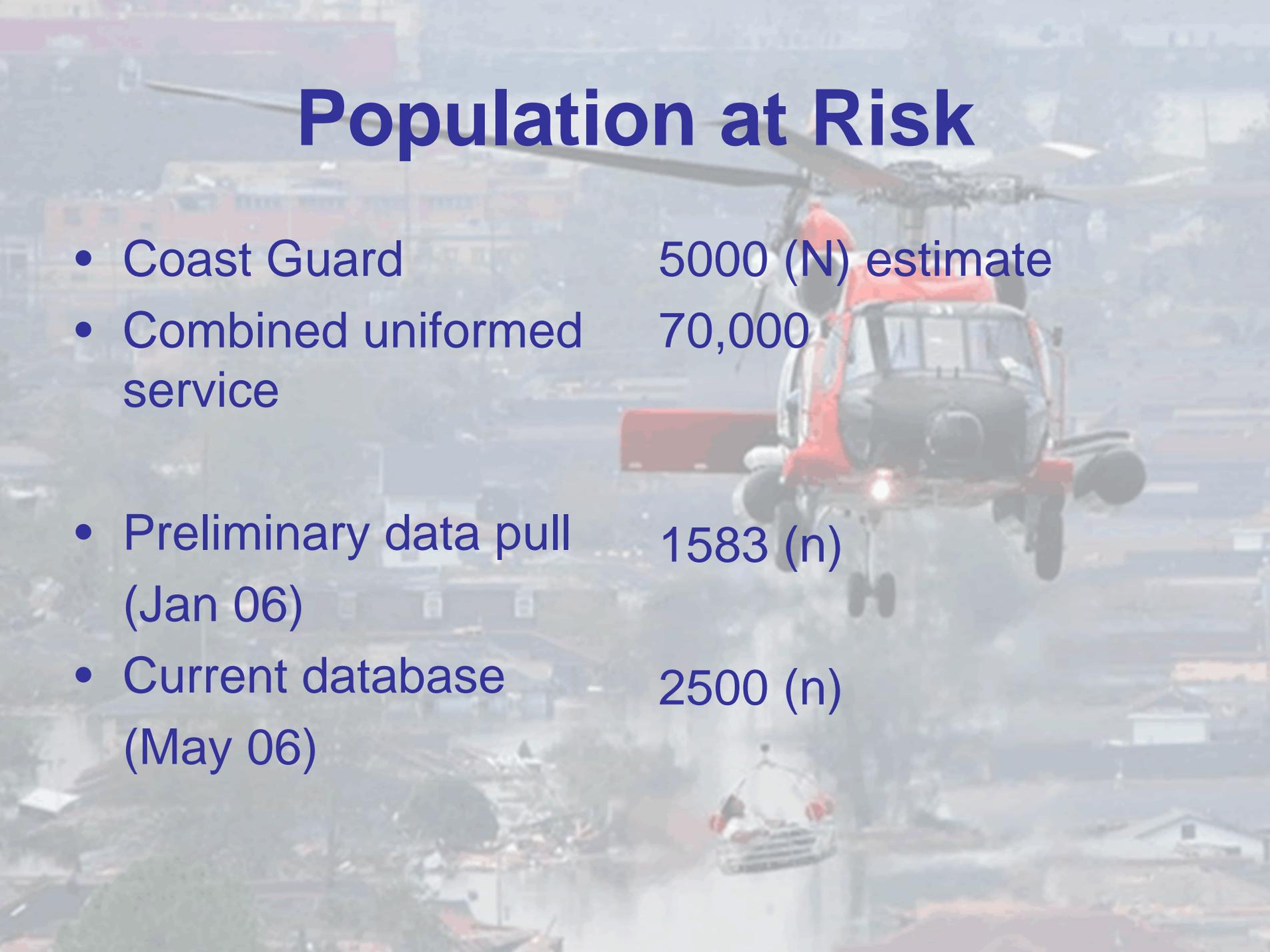


Measure of Severity by Continued Health Effects Post Deployment

Responses Reporting Post Deployment Health Effects by Reported Total Exposures



Population at Risk

A red helicopter is shown in flight, viewed from a low angle. It is carrying a stretcher with a person on it. The background is a residential neighborhood with many houses and trees, slightly blurred. The helicopter's rotors are visible, and it appears to be in the process of a rescue or transport.

- Coast Guard 5000 (N) estimate
- Combined uniformed service 70,000
- Preliminary data pull 1583 (n)
(Jan 06)
- Current database 2500 (n)
(May 06)

Magnitude of HE/Exposure

- Exposures for all respondents Mean = 3.6 exposures
- If exposure ≥ 1 Mean = 5.13 exposures
- If health effect ≥ 1 Mean = 6.16 exposures
- If health effect ≥ 1 HE continued post deployment = 44%

Questions

