# Establishing Evidence-Based Injury Prevention Priorities: An Example Process

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# Public Health Approach to Injury Prevention

1. ***Surveillance*** to identify and prioritize problems
2. *Research* to identify modifiable risk factors and causes
3. *Intervention trials* to determine effectiveness
4. *Implementation* of programs and policies
5. ***Evaluation/monitoring*** of programs and policies to determine success

**Bold** = Current focus of USACHPPM Injury Prevention Program

# Public Health / Risk Management

***Public Health Approach***

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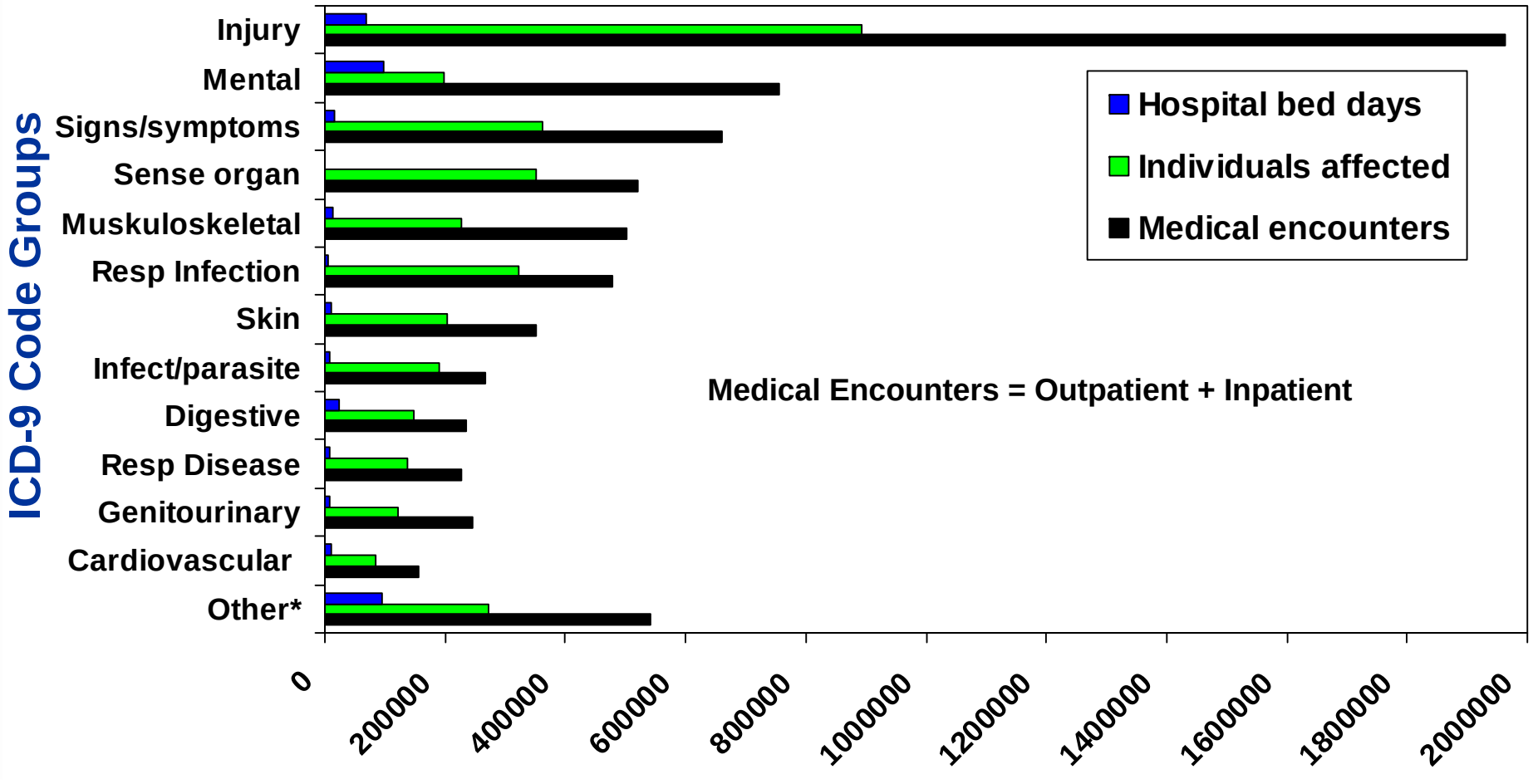
- *Research* to identify modifiable risk factors and causes
- *Intervention trials* to determine effectiveness
- *Implementation* of programs and policies
- ***Evaluation/monitoring*** of programs and policies to determine success or failure

***Risk Management Process***

- Identify hazards
- Assess hazards
- Develop Controls and Make Decisions
- Implement Controls
- Supervise and Evaluate

# Magnitude of the U.S. Military Injury Problem

## Injuries vs. All Other Medical Conditions, US Armed Forces, 2006



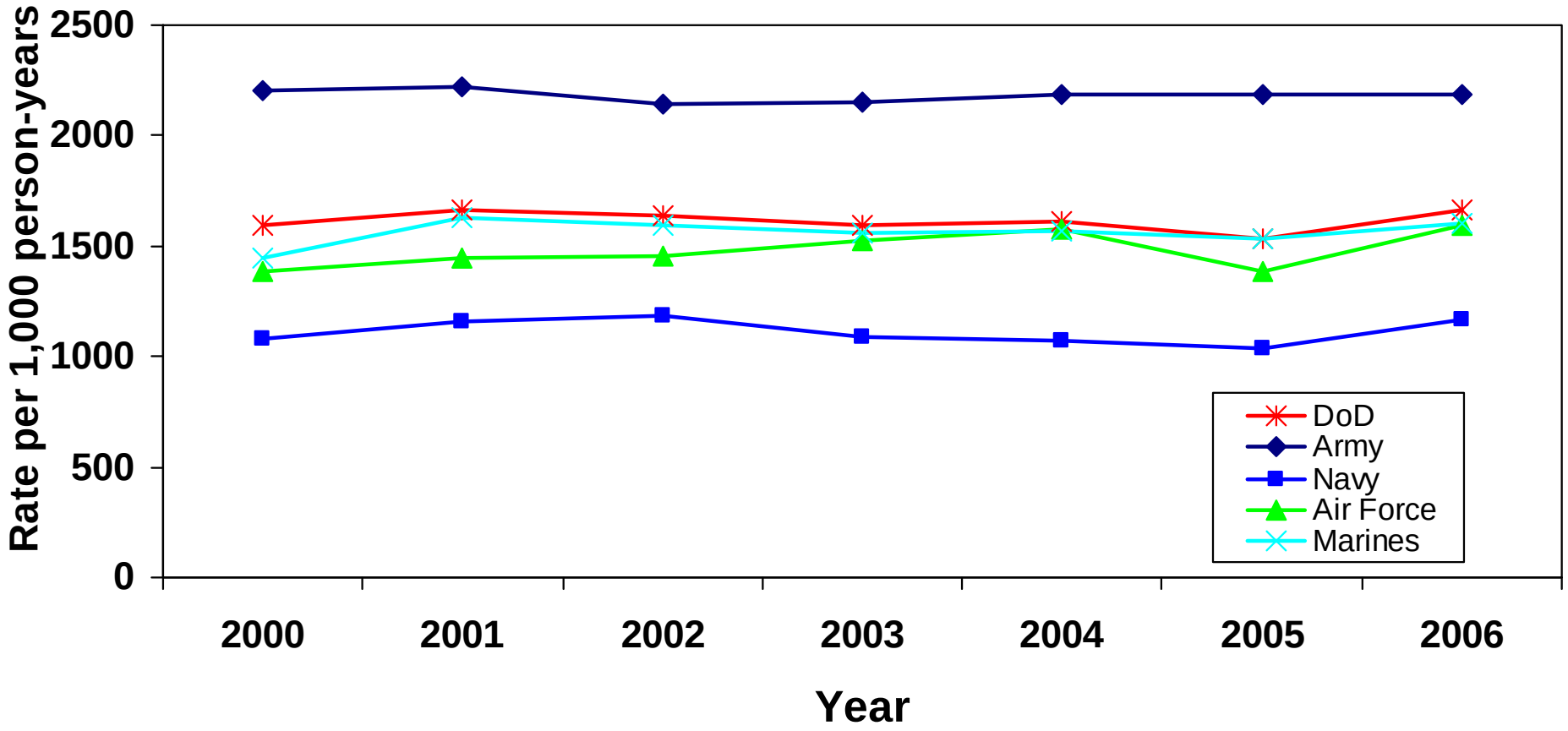

**Medical Encounters/ Individuals Affected**

*Includes all ICD-9 codes groups with less than 150,000 medical encounters

Source: Medical Surveillance Monthly Report, 12(3):17, Apr07

# Magnitude of the U.S. Military Injury Problem

## Active Duty Injury Visit Rates 2000-2006*




*Adjusted to remove deployed injury and deployed person-time

Source: Defense Medical Surveillance System, 2007

# Why prioritize?

"…policy development in public health at all levels of government is often *ad hoc*, responding to the **issue of the moment** rather than benefiting from a careful assessment of **existing knowledge**, establishment of **priorities based on data**, and allocation of resources according to an **objective assessment of the possibilities for greatest impact**".

- *The Future of Public Health*
Institute of Medicine Committee for the
Study of the Future of Public Health, 1988

# Purpose

To develop a systematic, objective process for setting injury prevention program and policy priorities.

Key features:

(1) *Data-driven:* Medical surveillance data used to define the magnitude and severity of injury problems

(2) *Evidence-based:* Subject matter experts (SMEs) provide knowledge of prevention

(3) *Systematic & objective:* Pre-defined criteria used to assign a 'score' to each injury issue

# Prioritization Process:

## USACHPPM Injury Prevention Program Example

# STEP 1: Assemble SMEs

Twelve injury experts gathered for a one-day meeting

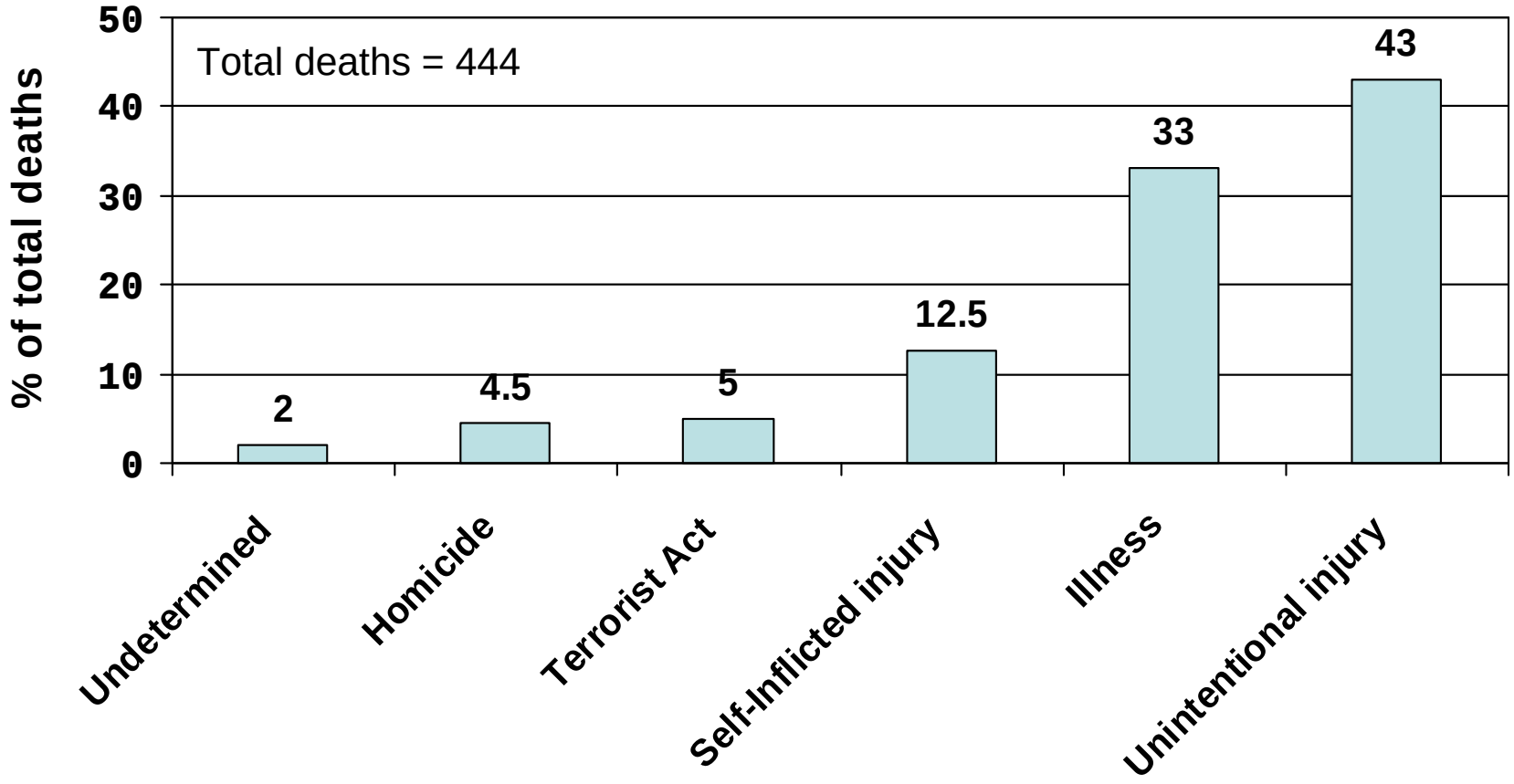
- Multi-disciplinary: clinicians, epidemiologists, safety professionals, academicians
- Military and civilian

Goal: To define injury prevention priorities for the USACHPPM Injury Prevention Program

# STEP 2: Review Data

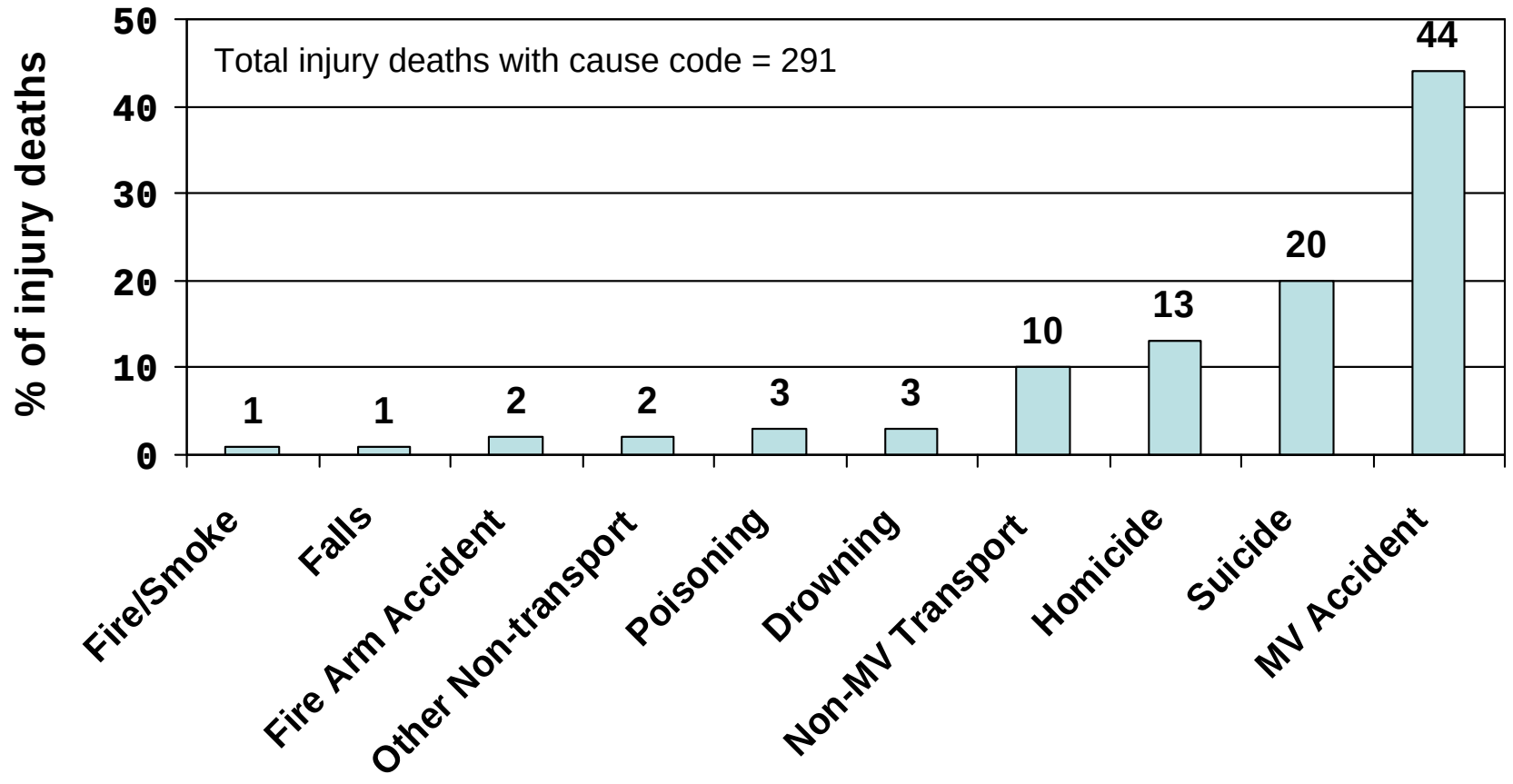
- Reviewed and discussed current U.S. Army injury surveillance and research data
- Following data are from 2001 & serve as an example of accessible medical surveillance data that can be used in process

# Deaths
## Active Duty Army, CY2001




Source: Defense Medical Surveillance System, 2002

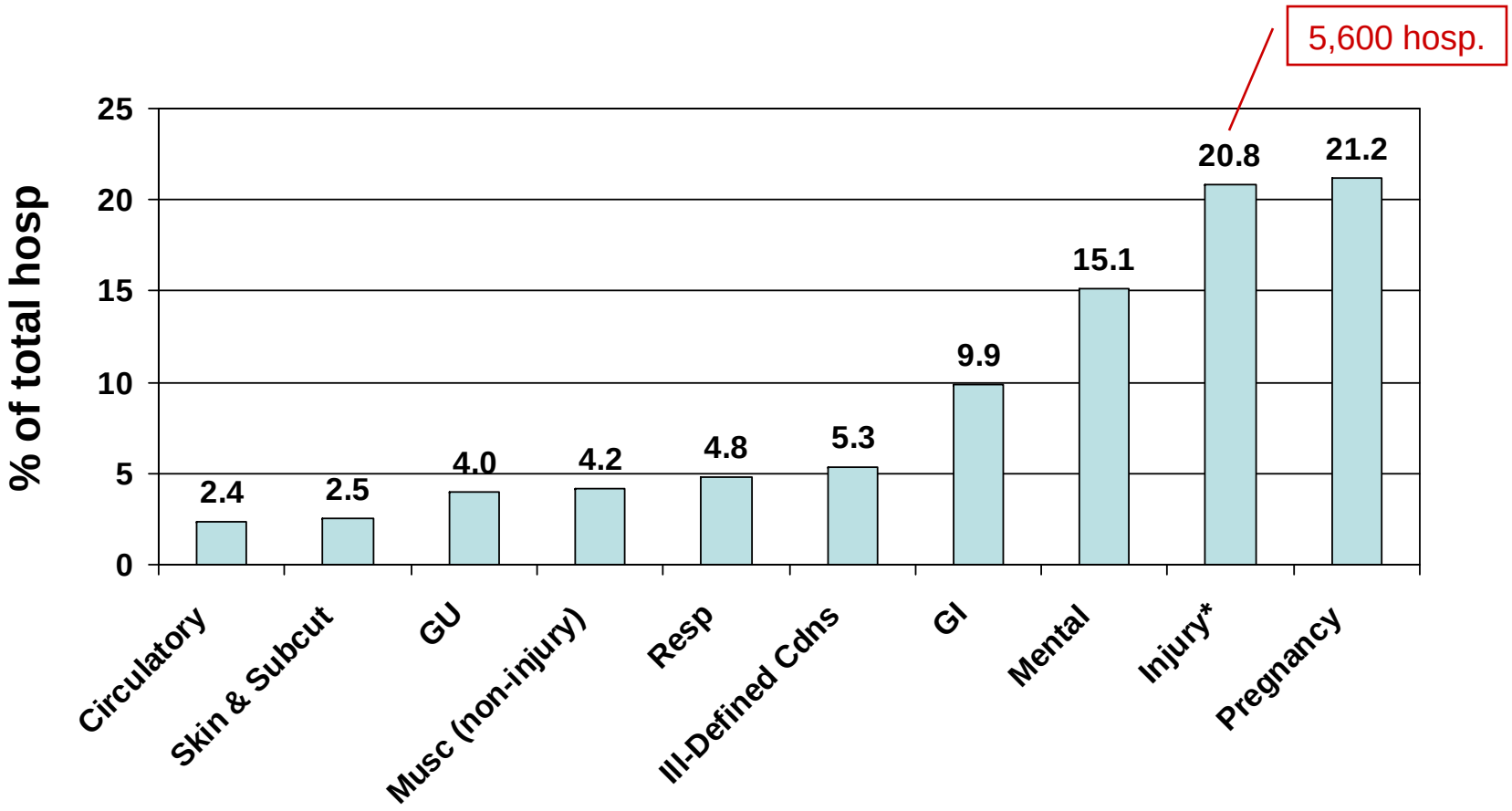
# Causes of Injury Deaths
## Active Duty Army, CY 2001




Source: Defense Medical Surveillance System, 2002

# Hospitalizations

## Top 10 ICD-9 Categories, Active Duty Army, CY2001

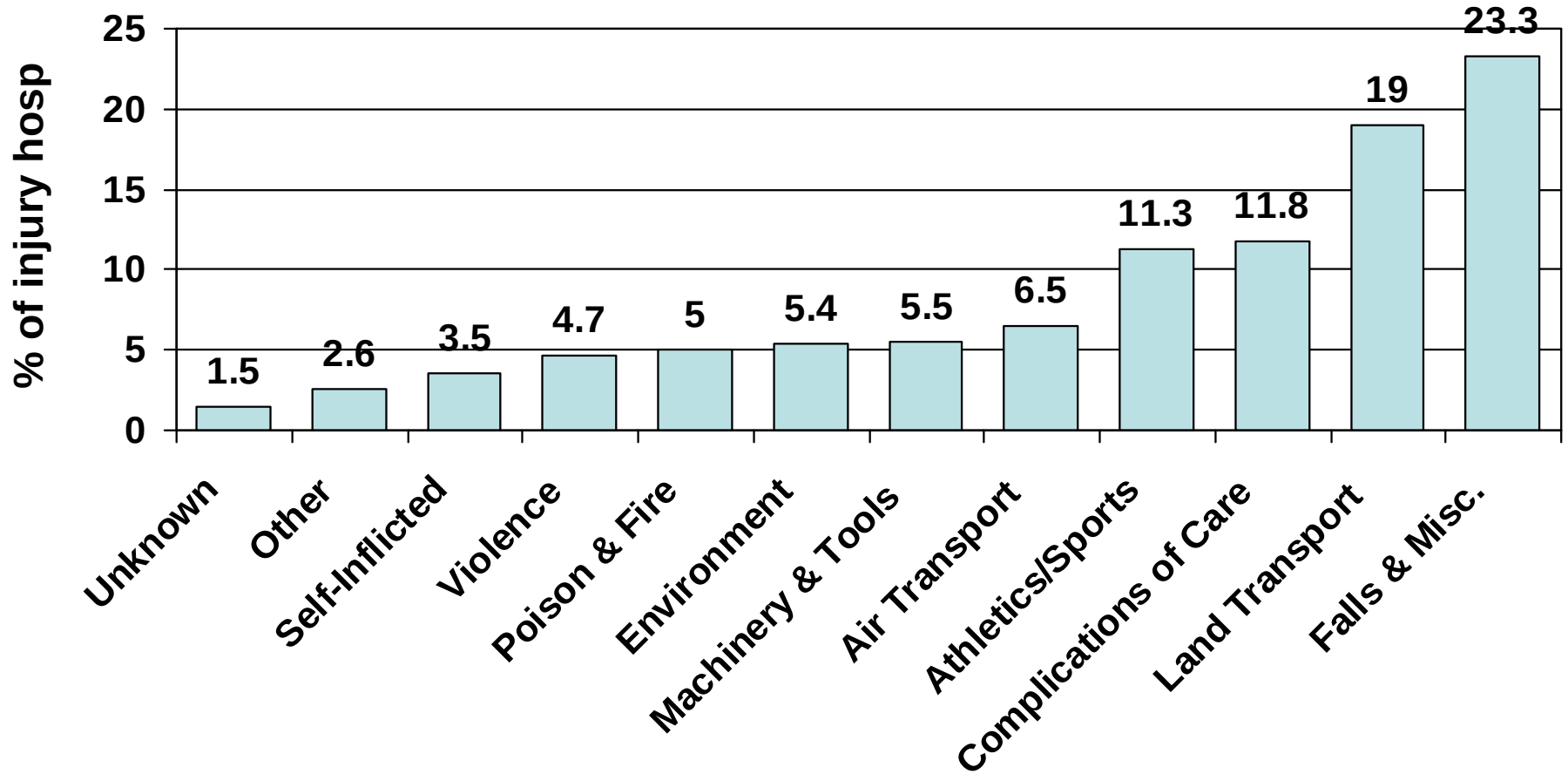



Source: Defense Medical Surveillance System, 2002

*Includes injuries classified in ICD9 710-739, Musculoskeletal Conditions

Total Army hospitalizations = 27,000

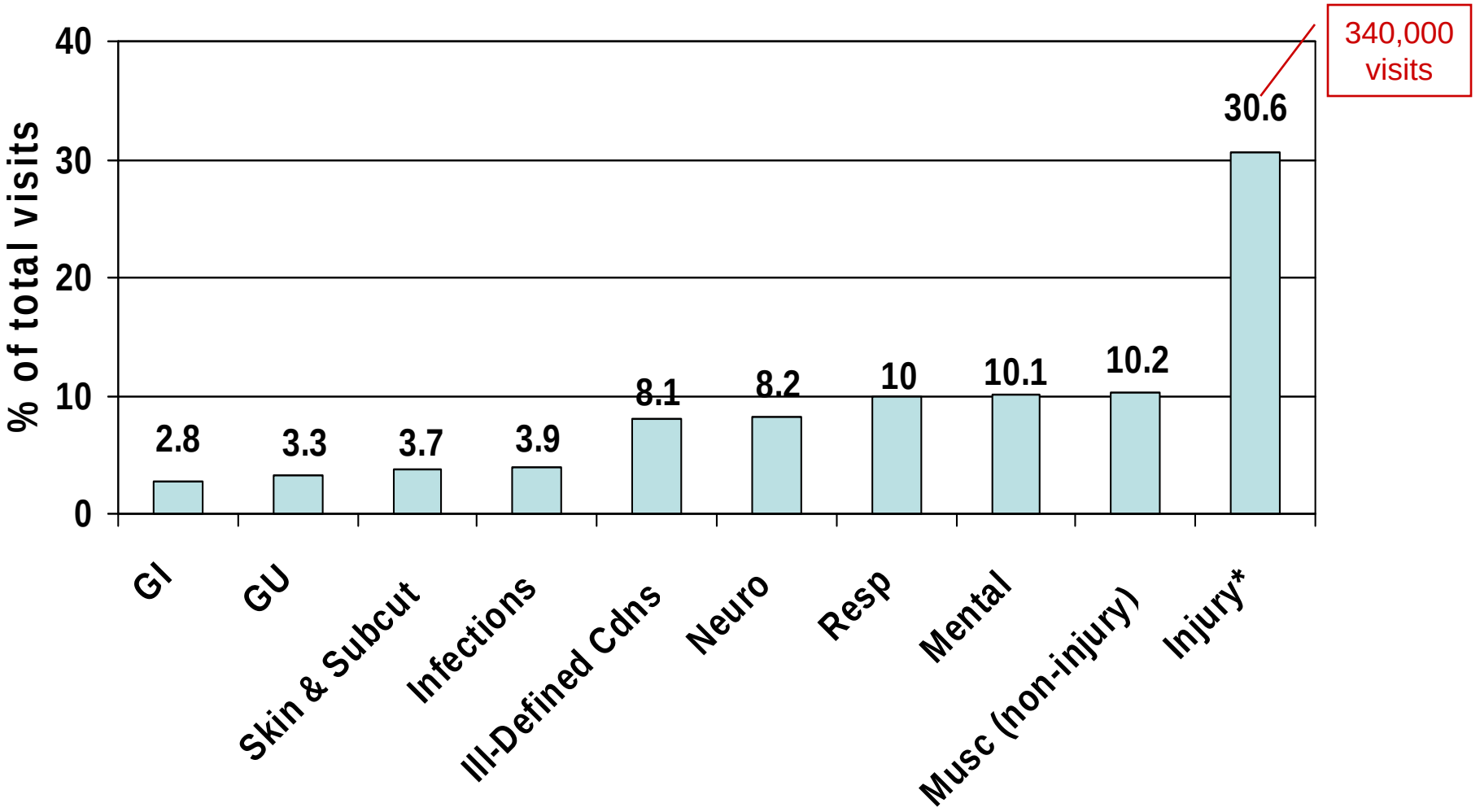
# Causes of Injury Hospitalizations
## Active Duty Army, CY 2001




Source: Defense Medical Surveillance System, 2002
Total injury hospitalizations with cause codes = 3,751

# Outpatient Visits

## Top 10 ICD-9 Categories, Active Duty Army, CY 2001



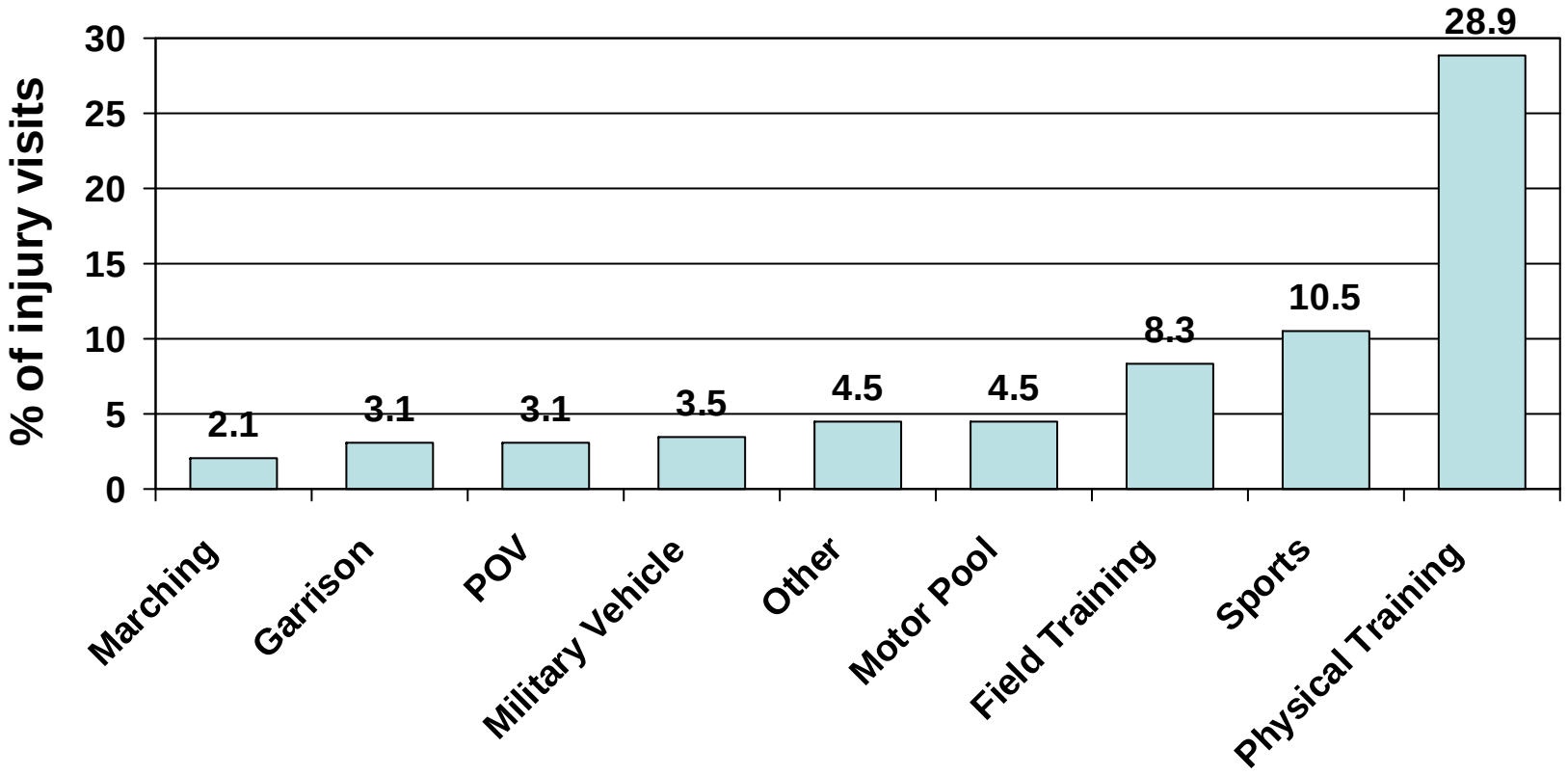

Source: Defense Medical Surveillance System, 2002

*Includes injuries classified in ICD9 710-739, Musculoskeletal Conditions

Total Army outpatient visits = 1.1 million

# Causes of Outpatient Injury Visits

## Active Duty Army, Fort Riley, Kansas




Source: USACHPPM Epidemiologic Consultation, 2002; N=768 Soldiers
Total injury visits (1Apr01-31Mar02) = 1065, unknown/cause not noted in medical record = 320 (30%)

# STEP 3: Revise Criteria

- Reviewed draft criteria
- Brainstormed additional relevant criteria
- Grouped criteria into five main categories
- Assigned scores for each main category

# Draft criteria
## for establishing program & policy priorities*

1. Consistent with mission
2. Magnitude of problem
3. High costs of problem
4. Size of population
5. Degree of public concern
6. Preventable problem
7. Modifiable risk factors
8. Proven prevention
9. Public health & health infrastructure
10. Evaluation capability
11. Benefits greater than costs
12. Adequacy of resources

*CDC, National Center for Injury Prevention and Control, 2001

# Criteria added

1. Cause(s) are identifiable
2. Prevention strategies can be designed
3. Authority to implement the program or policy
4. Program or policy will not undermine essential missions
5. Accountability & responsibility for implementation exists or can be established

# Grouped criteria

1. CONSISTENT WITH MISSION
2. IMPORTANCE OF PROBLEM to force health and readiness
3. PREVENTABILITY of problem
4. FEASIBILITY of program or policy
5. EVALUATION of program or policy

# Established scoring

10 pts. – IMPORTANCE

10 pts. – PREVENTABILITY

10 pts. – FEASIBILITY

5 pts. – EVALUATION

35 pts. – TOTAL

**USACHPPM Criteria for**
**Prioritizing Injury Programs & Policies**

**Purpose:** This scorecard is a tool that provides a systematic means of assessing and quantifying the state of prevention programs and policies for a specific injury problem. The criteria and scoring were developed by military and civilian injury researchers, medical providers, and safety experts. Comparing total scores obtained using this scorecard can assist with injury program and policy prioritization efforts.

**How to use this scorecard:** Complete a scorecard for each injury problem under consideration. First, provide a **preliminary rating** for each of the *Considerations* listed under each criterion. Then, using the preliminary ratings as a guide, assign a **final score** for each criterion. For criteria B, C, and D, assign a final score from 1-10 (1=lowest score, 10= highest score). For criterion E, assign a final score from 1-5 (1= lowest score, 5=highest score). Adding the final scores will provide a **total score**. A perfect score on all criteria would result in a total score of 35.

| Criterion | Preliminary rating | Final score |
|---|---|---|
| **A. PROGRAM OR POLICY IS CONSISTENT WITH MISSION** | [ ] YES<br>[ ] NO | If YES – Continue with scoring.<br>If NO – Stop here. |
| **B. IMPORTANCE OF PROBLEM TO FORCE HEALTH & READINESS**<br>*Considerations*: | | **(10 points; 1=low, 10=high)** |
| 1. Magnitude and severity of problem (consider its effect on personnel readiness) | 1. [ ] Low [ ] Medium [ ] High | |
| 2. Cost of the problem (consider training, property, and personnel costs) | 2. [ ] Low [ ] Medium [ ] High | |
| 3. Size and/or vulnerability of population at risk | 3. [ ] Low [ ] Medium [ ] High | |
| 4. Degree of concern (consider command concern, public concern, visibility of problem) | 4. [ ] Low [ ] Medium [ ] High | |
| **C. PREVENTABILITY OF PROBLEM (10 points)**<br>*Considerations*: | | **(10 points; 1=low, 10=high)** |
| 1. Cause(s) are identifiable. | 1. [ ] Low [ ] Medium [ ] High | |
| 2. Risk factors are modifiable. | 2. [ ] Low [ ] Medium [ ] High | |
| 3. Proven prevention strategies exist. | 3. [ ] Low [ ] Medium [ ] High | |
| 4. Prevention strategies can be designed. | 4. [ ] Low [ ] Medium [ ] High | |
| **D. FEASIBILITY OF PROGRAM OR POLICY (10 points)**<br>*Considerations*: | | **(10 points; 1=low, 10=high)** |
| 1. Existence of infrastructure to support implementation of the program or policy (consider medical staff & facilities, safety staff & resources, cadre availability). | 1. [ ] Low [ ] Medium [ ] High | |
| 2. Adequacy of funding to support implementation. | 2. [ ] Low [ ] Medium [ ] High | |
| 3. Authority to implement the program or policy is held or obtainable by the implementing organization(s). | 3. [ ] Low [ ] Medium [ ] High | |
| 4. Program or policy will not undermine essential missions. | 4. [ ] Low [ ] Medium [ ] High | |
| 5. Political and cultural acceptability of program or policy. | 5. [ ] Low [ ] Medium [ ] High | |
| 6. Accountability & responsibility for implementation exists or can be established. | 6. [ ] Low [ ] Medium [ ] High | |
| **E. EVALUATION OF PROGRAM OR POLICY (5 points)**<br>*Considerations*: | | **(5 points; 1=low, 5=high)** |
| 1. Ability to evaluate effects of program or policy exists (consider if a metric is possible). | 1. [ ] Low [ ] Medium [ ] High | |
| 2. Benefits of program or policy outweigh the costs of implementation. | 2. [ ] Low [ ] Medium [ ] High | |
| **TOTAL SCORE** | | |

# STEP 4: Apply Criteria

- Listed 25 military-relevant unintentional injury causes defined based standardized NATO injury cause codes.
- Work group members completed a worksheet for each injury issue.

## 25 Potential Causes of Injury Hospitalization*

1. Accidents** with own instruments of war
2. Athletics/sports
3. Complications of medical/surgical procedures
4. Cut/pierced by object
5. Drowning/submersion
6. Excessive cold
7. Excessive heat
8. Falls/jumps
9. Fighting
10. Guns, explosives, and related devices
11. Hanging/suffocation
12. Late effects of injury
13. Lifting/pushing/pulling
14. Machinery/tools
15. Marching/drilling
16. Military air transport accidents**
17. Military vehicle accidents**
18. Nonmilitary air transport accidents
19. Other environmental
20. Physical training (e.g., running, calisthenics)
21. Poisoning
22. Privately-owned motor vehicle accidents**
23. Twisting/turning/slipping
24. Unconventional weapons injury (chemical&biological weapons, terrorism)
25. Water transport

*Alphabetical list of standard NATO injury cause codes used in U.S. military medical surveillance systems.

**"Accidents" is consistent with terminology used in NATO Standardization Agreement (STANAG) No. 2050, March 1989.

# STEP 5: Evaluate/Interpret Results

- Work group compared ranking of injury issues using 3 methods
  1. Mean total score
  2. Harmonic mean total score
  3. Multi-Attribute Decision Making (MADM)

- Higher score = higher likelihood of successful implementation of related programs and policies

# Results - three methods

| Top 10 injury causes | Mean total score (rank) | Harmonic mean total score (rank) | Multi-Attribute Decision Making score (rank) |
|---|---|---|---|
| 1. Physical training | 25.7 (1) | 26.2 (1) | 78.6 (1) |
| 2. Privately owned motor vehicle accidents | 22.6 (2) | 25.0 (2) | 74.3 (2) |
| 3. Athletics/sports | 21.8 (3) | 22.3 (3) | 62.9 (6) |
| 4. Excessive heat | 21.1 (4) | 22.0 (4) | 68.6 (3) |
| 5. Military motor vehicle accidents | 21.0 (5) | 21.5 (5) | 67.1 (4) |
| 6. Falls/jumps | 20.5 (6) | 21.1 (6) | 60.0 (7) |
| 7. Marching/drilling | 20.3 (7) | 20.9 (7) | 64.3 (5) |
| 8. Lifting/pushing/pulling | 20.0 (8) | 20.7 (8) | 60.0 (7) |
| 9. Military air transport accidents | 20.0 (8) | 20.4 (9) | 57.1 (10) |
| 10. Excessive cold | 18.0 (10) | 18.8 (10) | 58.6 (9) |

# Discussion

- Regardless of ranking method,
  - Top 2 causes were physical training injuries and privately-owned motor vehicle crashes.
  - Top 10 causes were the same (ranks differed)
- When not responding to *ad hoc* requests for assistance, USACHPPM Injury Prevention Program focuses on the Top 10 injury issues defined by this process.
- Enables sustained progress toward reduction of injuries due to leading causes.

# Impact of Prioritization Results

- Standardized Army physical training evaluated & implemented
- Falls recognized as important problem for Services
- Process adopted by other DoD groups
  - Defense Safety Oversight Council
  - Defense Military Injury Prevention Priorities Work Group (OASD-HA)
  - Military Injury Epidemiology and Prevention Priorities Work Group (DSOC MTTF)

# Conclusions

- Systematic & objective process
  - Criteria determined by work group members upfront
  - Applied to all injury issues in same manner
  - Contained key factors that influence program & policy success
  - More comprehensive than, but in congruence with, criteria suggested by civilian scientists
- Data-driven
  - Importance of problem assessed using population-based *non-fatal* injury data
- Process could be adapted for use in other organizations and communities
  - Installation-level data from Armed Forces Health Surveillance Center

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