

Health and Wellness in The Fire Service

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Why study firefighter health?

“When we hit the fire ground,
your risk factors become my risk.”

~ Firefighter Steve Mast

Robust Portrait of Firefighter Health



Captures the “Culture” of Health and Wellness in a National Study Using Sophisticated Qualitative Research Methods



Comprehensive assessment of Firefighter Health Using Epidemiological Research Methods



Purpose of AHA Study



- Develop baseline understanding of thoughts, opinions, attitudes, beliefs
- Understand key misconceptions
- Understand mechanisms of motivation
- Examine differences in regions/type of department
- Identify key themes for intervention

Overview of AHA Study





Purpose of FIRE Study



- Examines Risk Factors for Cardiovascular Disease and Cancer
- A Longitudinal (over 1 year) Cohort Study
- Both Career and Volunteer Departments
- Random Selection (increases generalizability)
- Both Self-Report and Measured Assessment



Overview of FIRE Study

- Missouri Valley Region
- N=714, > 90% Response Rate
- Department level data
 - Semi-structured Interview
- Individual Level
 - Objective Health Measures
 - Comprehensive Self Report Measure



Self Report Questionnaire

- (1) General health and attitudes toward body weight
- (2) Health history (personal & family)
- (3) Mental health
- (4) Nutrition
- (5) Physical activity
- (6) Substance use
- (7) Fire service beliefs & attitudes
- (8) Injury



Blood Pressure



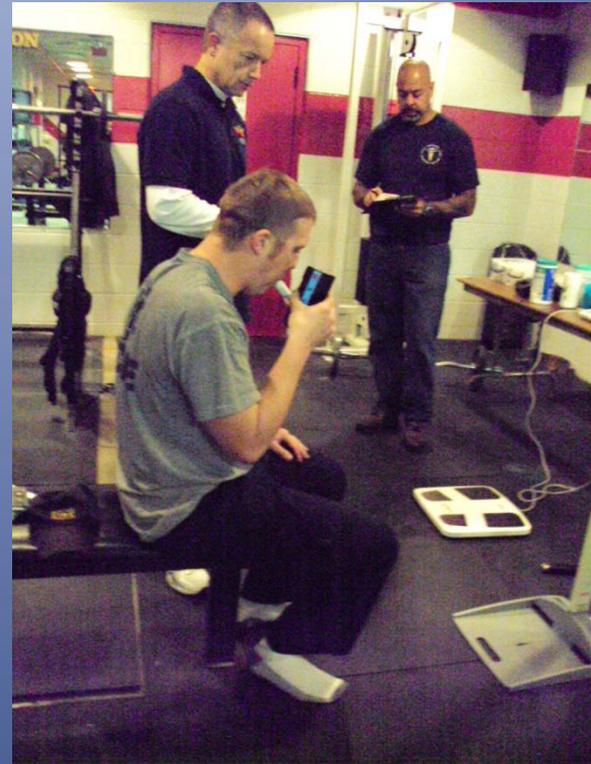
Cholesterol



Height, Weight Body Composition



CO (Smoking)



Flexibility



Strength



MO Valley Region, IAFC



Career Departments



Colorado

Boulder FD

Buckley AFB FD

Red, White & Blue Fire District

USAF Academy FD

Kansas

Chanute FD

Great Bend FD

Kansas City Kansas FD

Olathe FD

Missouri

University City FD

Nebraska

Norfolk FD

Wyoming

Rock Springs FD

Volunteer Departments

Colorado

Holyoke FPD

Fruita FD

Kansas

Tonganoxie City FD

Yates Center FD

Missouri

Linneus FPD

College of the Ozarks FD

Intercity FD

Cooper County FD

Nebraska

Petersburg FD

North Dakota

Jamestown Rural FD

Oakes VFD

South Dakota

Madison VFD

Yankton VFD



Lots of Together Time



Baseline demographic and clinical characteristics of career and volunteer firefighters in the FIRE study

Variable	Career (N=500)	Volunteer (N=214)
Age (years)	38.0(9.9)	39.7(12.0)
Gender (% male)	95.6	93.0
Race (% white)	86.2	97.2
Years in the Fire Service (years)	13.4(9.4)	10.9(10.3)
Education (% HS or greater)	92.4	92.5

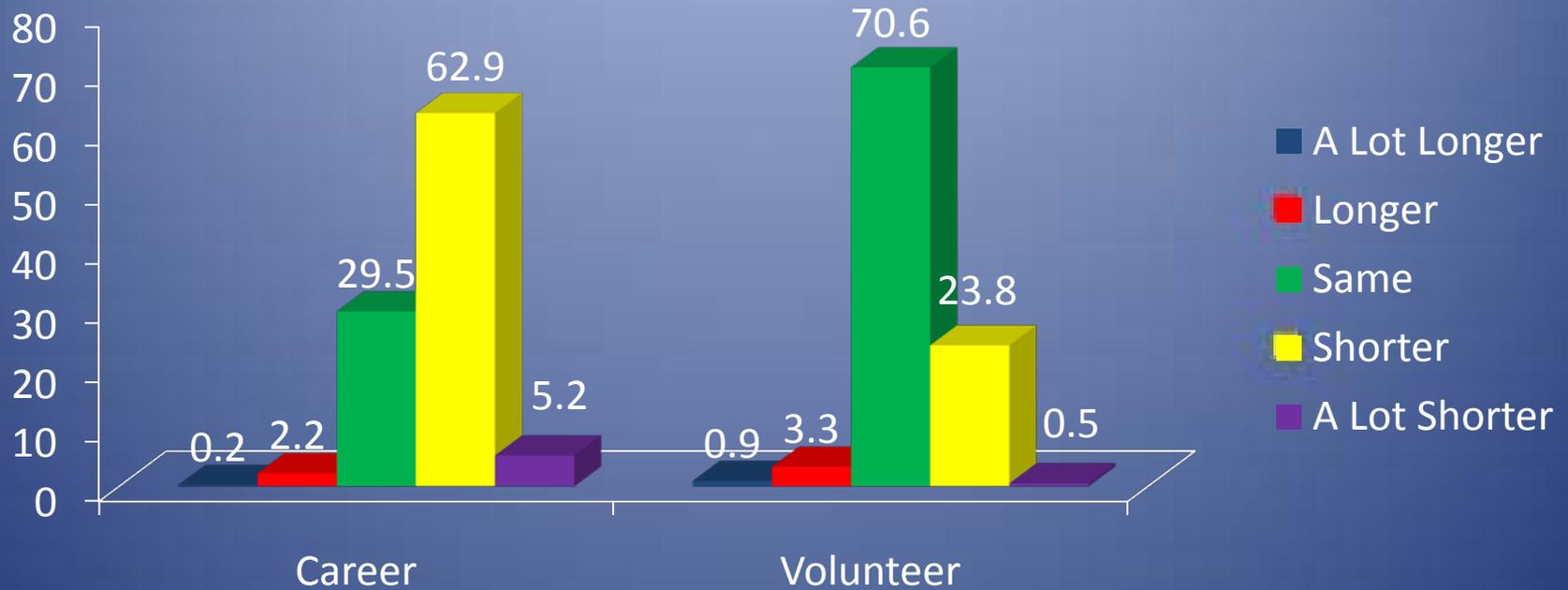
Firefighters Like Being Firefighters



Health Beliefs of Firefighters



Lifespan Compared to General Population



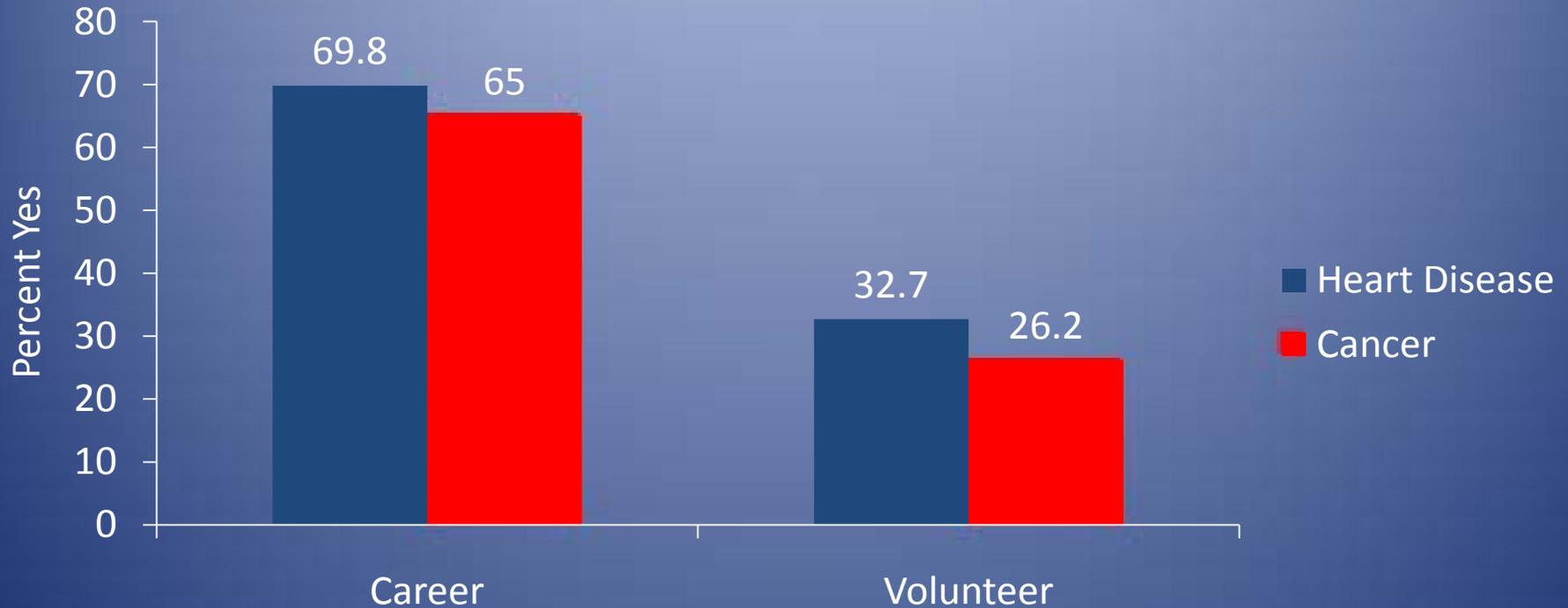
Actual Cohort Mortality of Firefighters

Insufficient Data to Make Definitive Statement

2001 article in *American Journal of Industrial Medicine*

- Firefighters in Philadelphia (n = 7,789)
- Similar mortality to US White Males for all causes
- Increased mortality from cancers of the colon and kidney, non-Hodgkin's lymphoma and multiple myeloma

Do Firefighters Have Higher Rates of Heart Disease and Cancer?



Safety Beliefs and Practices

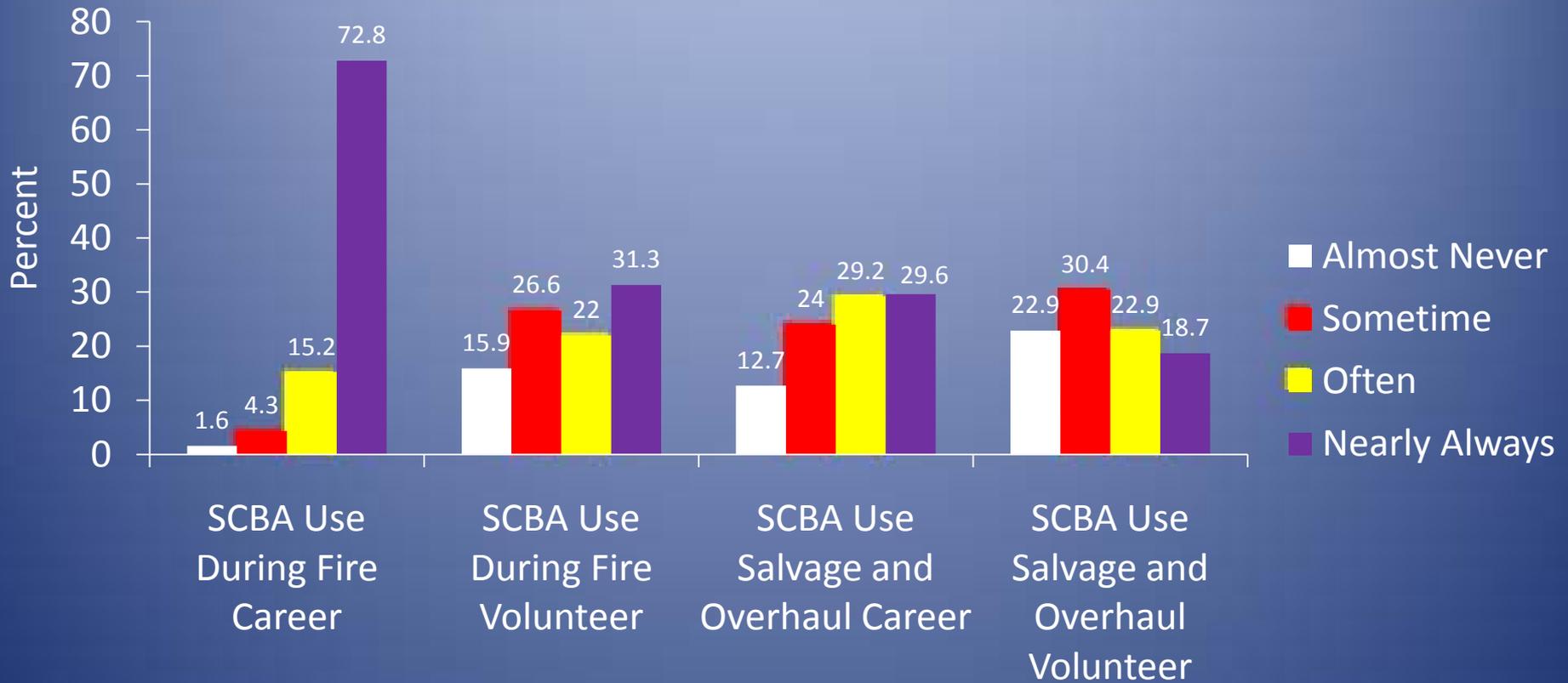


Firefighter Life Safety
STARTS WITH YOU

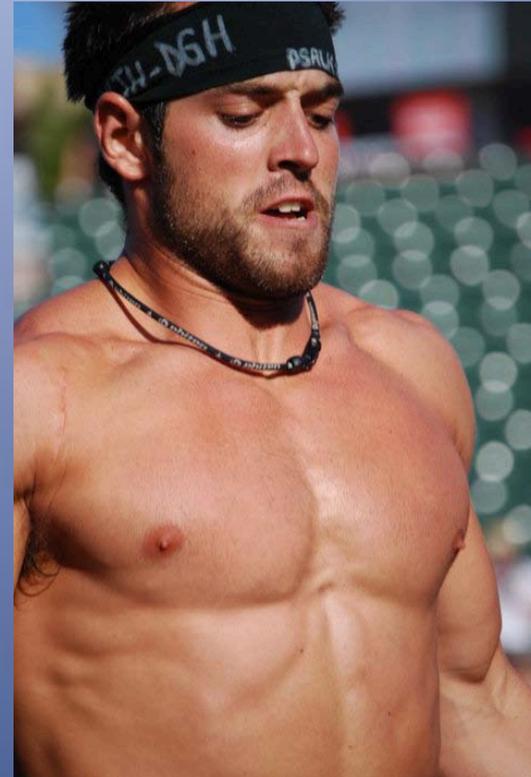
Have the Courage to be Safe
SO EVERYONE GOES HOME
www.EveryoneGoesHome.com



SCBA Use



Body Composition of Firefighters



Definition of Obesity

“Overweight and obesity are both labels for ranges of weight that are greater than what is generally considered healthy for a given height. The terms also identify ranges of weight that have been shown to increase the likelihood of certain diseases and other health problems” (CDC)

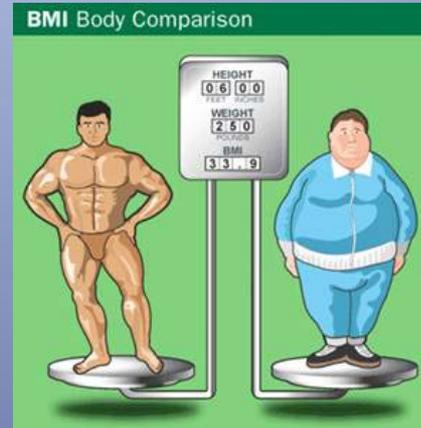
“Obesity is defined as excess adipose tissue” (TOS-NAASO)



Definition of Obesity

BMI (kg/m²)

- Overweight = $BMI \geq 25$ and < 30
- Class I = $BMI \geq 30$ and < 35
- Class II = $BMI > 35$ and < 40
- Class III = $BMI \geq 40$



Body Fat Percentage

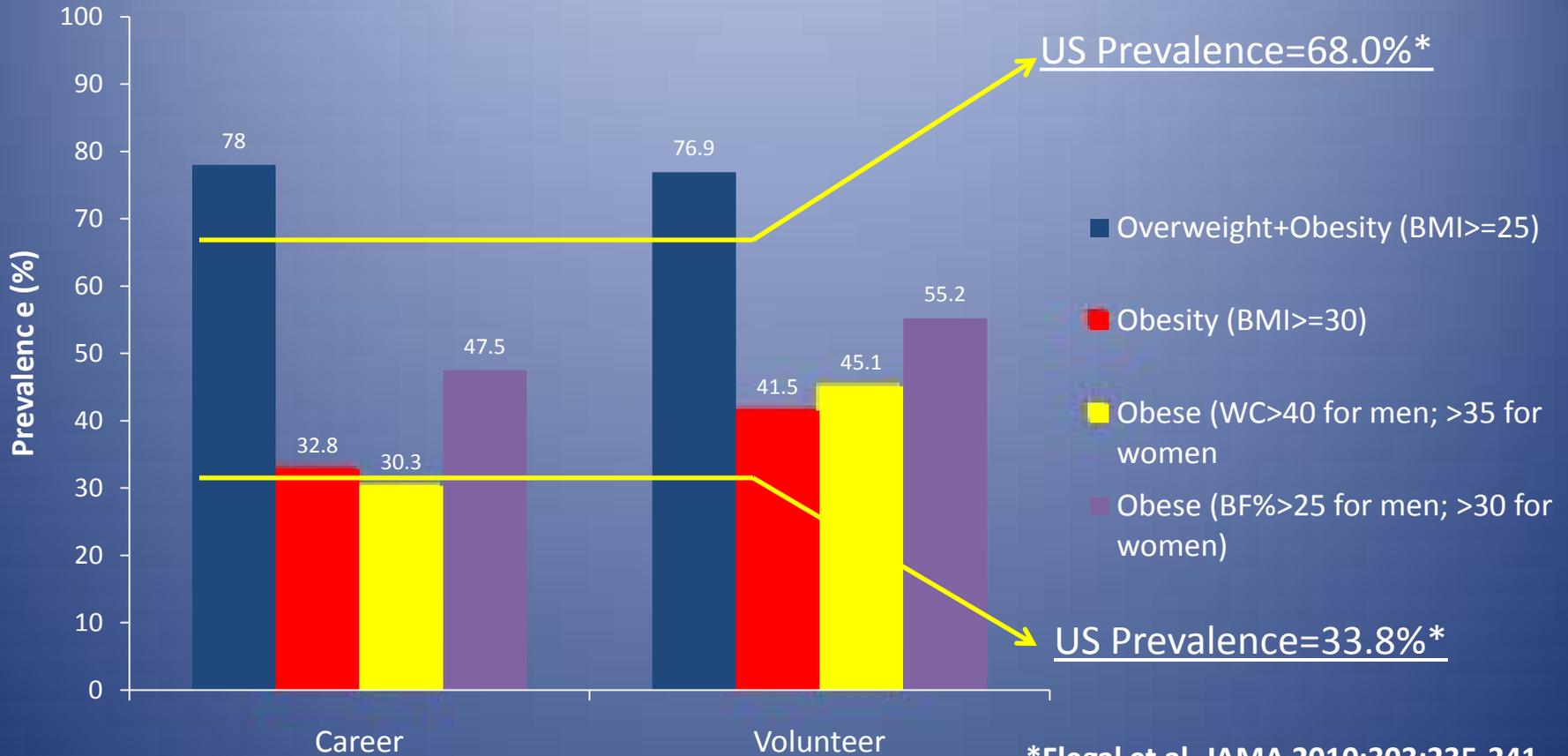
- Men, $BF\% > 25$; Women, $BF\% > 30$

Waist Circumference

- Men $WC > 40$ inches; Women $WC > 35$ inches

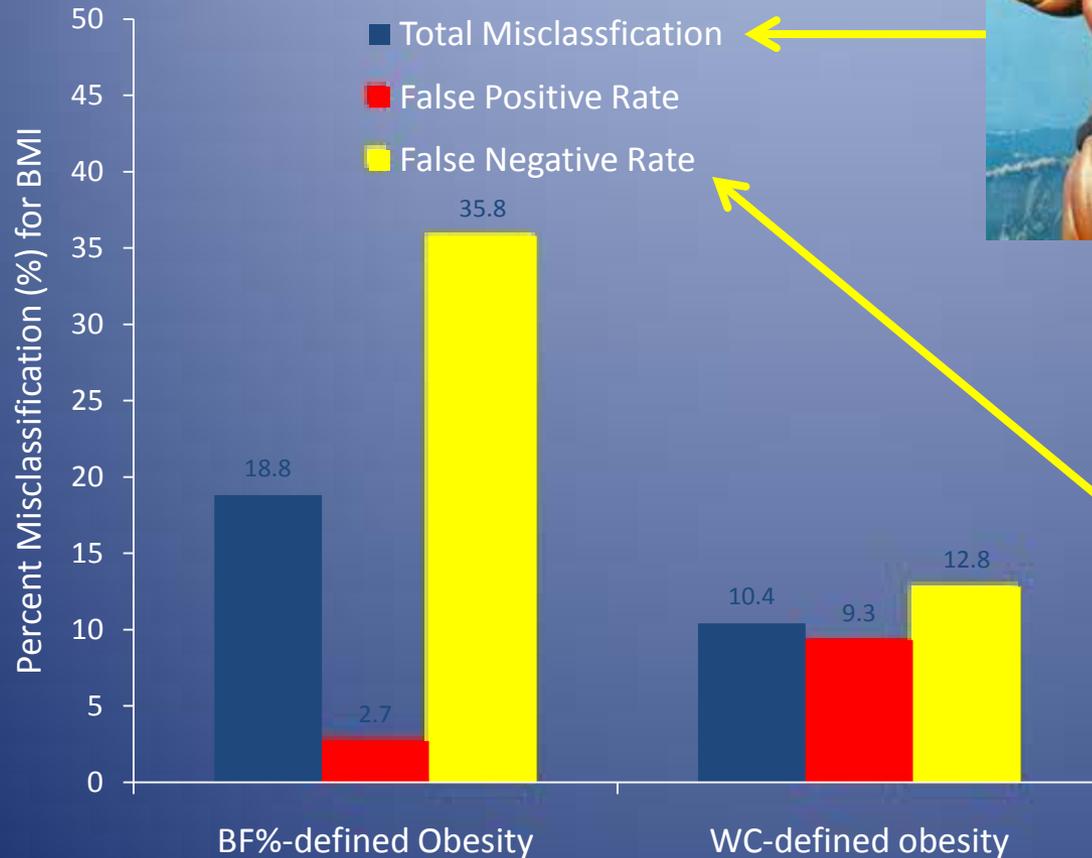


Prevalence of Overweight and Obesity

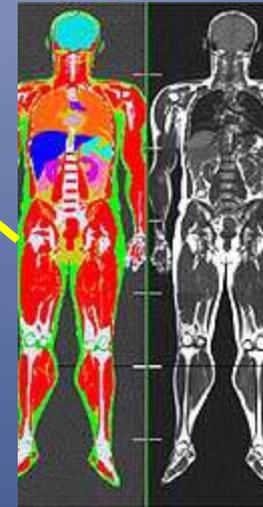


*Flegal et al. JAMA 2010;303:235-241

Accuracy of BMI Obesity Classification in Career Firefighters



“High BMI, Low Body Fat” – BMI says they are obese, but body fat or WC says they are not



“Skinny Fat” – BMI says they are normal, but body fat or WC says they are obese

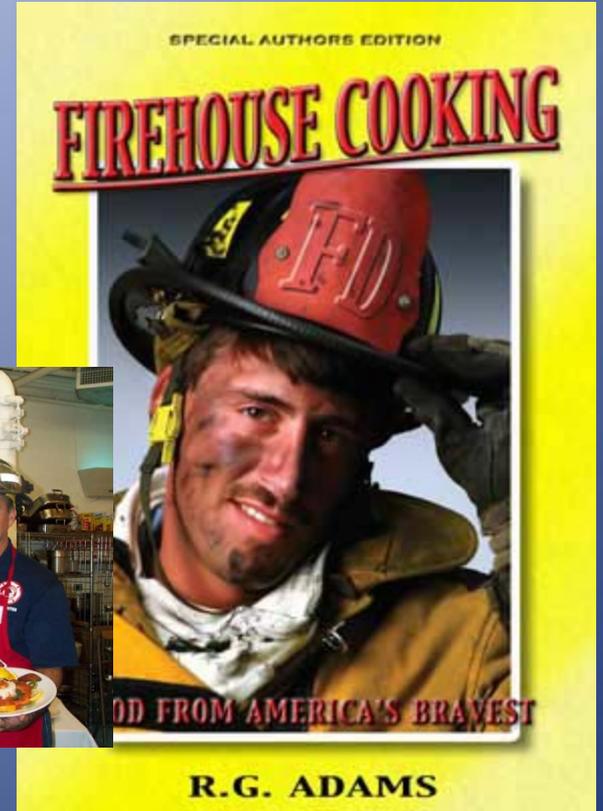
Why does body composition matter?

- Overweight, CVD, and low fitness are documented problems among firefighters
- Obesity and low fitness associated with higher risk of CVD and injury in other occupational groups
- High levels of fitness are associated with better health and job performance in firefighters and among workers in general

Food in the Firehouse



FOUNDED



Meals as Bonding



“...just eating with them on those days I put on some weight and it’s very difficult to do that because part of the fire service family is built around that kitchen table. That’s where it takes place. That’s where real problems are solved.”

“Yeah, at some stations, just everybody just brings their own food in... You know, they have problems in their groups and they don’t seem to cook up as much...just like guys that don’t get along together.”

Portion Sizes

Best Potato Soup - Feeds 6-8 people or 4-6 firefighters

- 4 Cups potatoes, diced but unpeeled
- 1/4 LB butter
- 2 Cups finely diced yellow onions
- 1/2 Cup flour 1 Quart warm water
- 1/4 Cup chicken bouillon
- 1 Cup potato flakes
- 4 Cups half and half
- 1/2 tsp. Tabasco sauce
- Salt, Pepper, Garlic powder and Dried Basil to taste

Sauté onions in melted butter for 10 minutes in large kettle.

Add flour to onions and butter and cook for 5 minutes, stirring until flour is absorbed.

In a separate container combine, water, chicken bouillon, potato flakes, and seasonings.

Stir until no lumps remain.

Add to onion mixture, 1 cup at a time.

Add half and half, stirring until smooth and lightly thickened.

Reduce heat and simmer for 15 minutes.

In a separate pan, the potatoes should be covered with water and brought to a boil, and simmered for 20 minutes.

Drain potatoes and add to soup to complete. If too thick for taste, milk may be added to thin down.

Serve with chopped green onions and cheese ! sprinkled on top.

Cook time approx. 40 minutes

Portion Sizes

“...a thimble full or a bucket full, it costs ten bucks”

“It was almost like we were loading up because you didn't know whether you're going to eat later on in the day, you know. You know, what if. And sometimes we have to get up in the middle of a meal and go and people are munching on something as they're walking to the fire truck to get on to go on some emergency.”



Making Changes



“They exert a little peer pressure on each other if somebody is grabbing the Twinkies and they won't say, "Oh, don't eat that." They'll just tease the snot out of them until he puts it back, doughboy. A lot of peer pressure. They were giving me crap the other day, "Well, you worked out three or four days a week. How come you're sitting on a gut?" "Because I eat seven days a week.”

Physical Fitness and Exercise



“Research has demonstrated the need for high levels of aerobic fitness, muscular endurance, muscular strength, muscular power, flexibility, and body composition in order to perform safely and effectively in the fire service.”

*The Fire Service Joint Labor
Management Wellness-Fitness
Initiative, 3rd Edition*

Low Fitness in the Fire Service



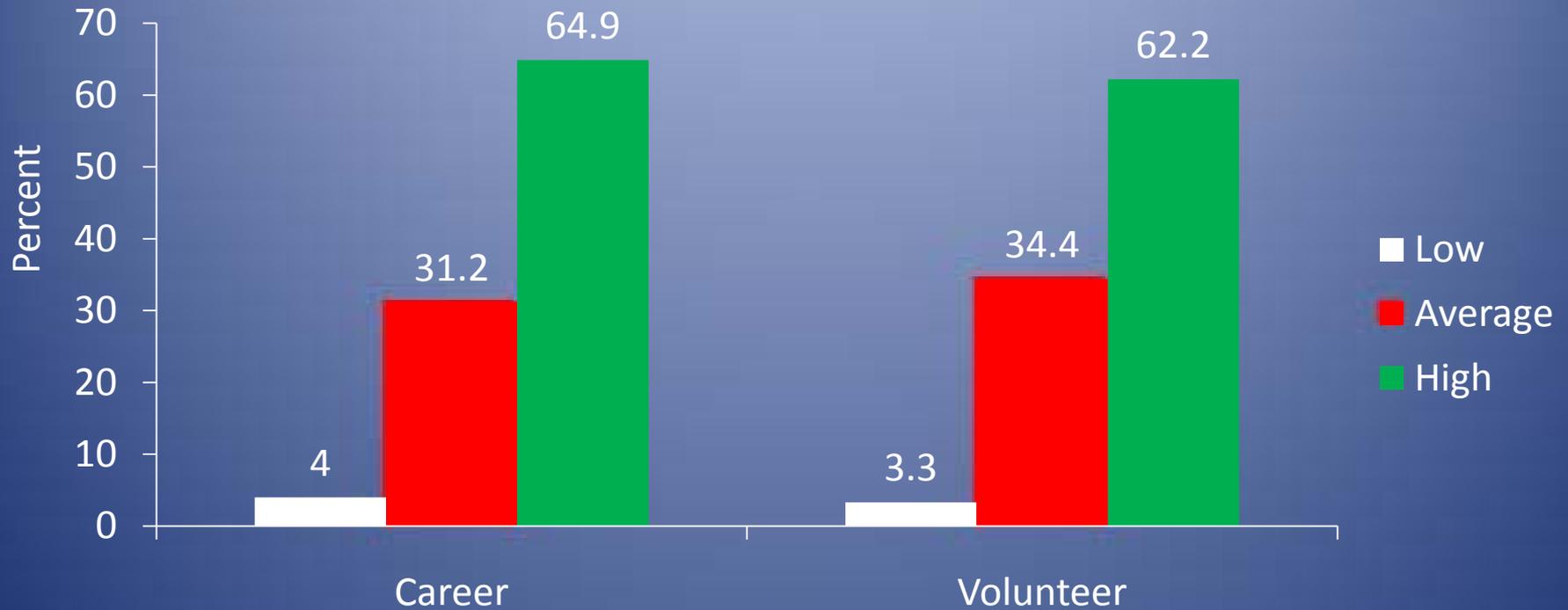
*Carnethon et al. JAMA 2005;294:2981-2988

- Estimates based on VO_2 max categories from Cooper Clinic

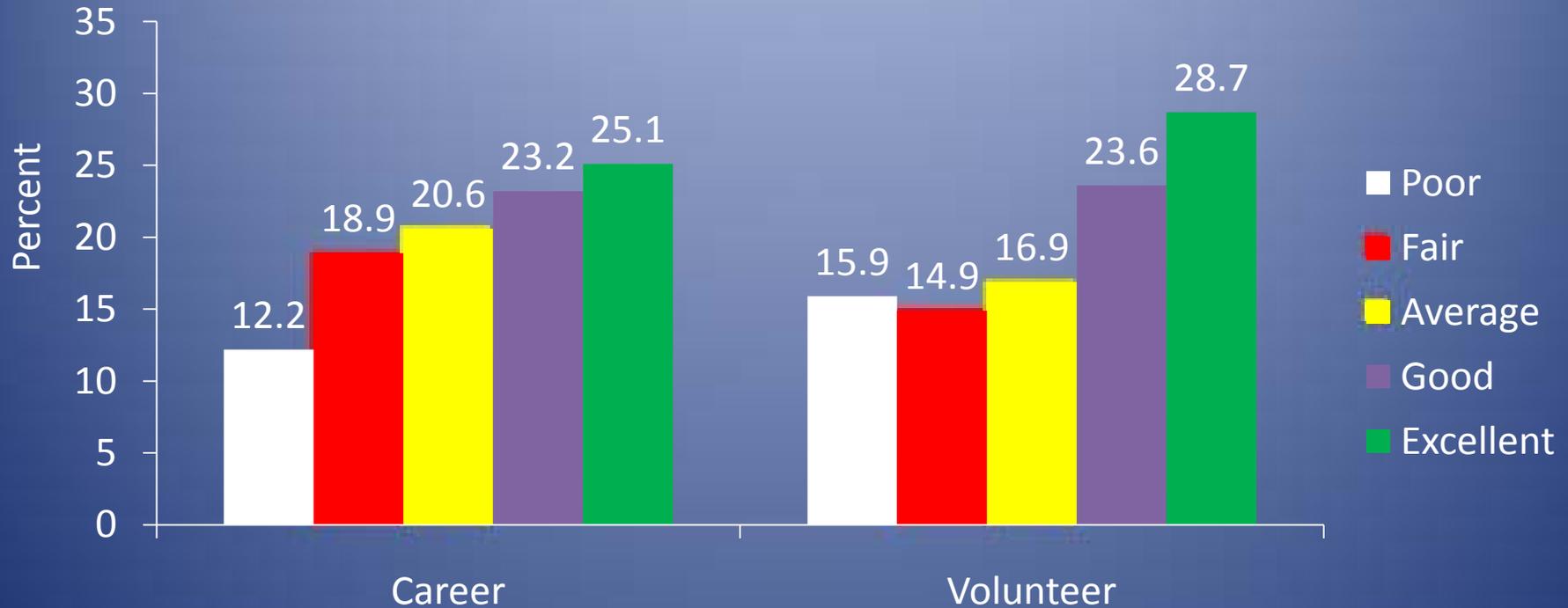
- US Adult estimate used Cooper norms, but unclear whether they refer only to those in the “very poor” category only or combined “very poor” and “poor”

- Regardless, fitness levels among firefighters are lower than expected given their status as “industrial athletes”

Torso Strength Level



Sit and Reach Flexibility



Why does low fitness matter?

- Low fitness associated with higher risk of CVD and injury in other occupational groups
- High levels of fitness are associated with better health and job performance in firefighters and among workers in general
- Low fit firefighters in our sample were more likely to be overweight or obese and have worse CV profiles than more fit firefighters

Physical Training/Activity

- Factors that facilitate regular PT:
 - ✓ Support from leadership
 - ✓ Funding and adequate space for equipment
 - ✓ Time allocated for PT during the duty day
 - ✓ Information or training on methods of PT (Peer Fitness Trainers)
 - ✓ One committed person or leader can make a difference

Physical Training/Activity

- Factors that facilitate regular PT:
 - ✓ Making PT part of the department culture and providing the expectation that it part of being a firefighter
 - ✓ Working out in a group (e.g., crews working out together)
 - ✓ Competition and participation in events like the Combat Challenge

Physical Training/Activity

- Factors that facilitate regular PT :

“The chief goes over and works out at time, so we see him – we know he’s going over there. He’s setting an example also, himself, but doing that.”

“Our fitness committee has done an outstanding job and the chief gets the money for them. And XXXX just did a lot of work getting all the stations outfitted with supplemental stuff...”

“...but every station I’ve been at there’s always one guy who always comes out and works out. Eventually, everybody kind of joins in.”

Physical Training/Activity

- **Factors that facilitate regular PT :**

“So, it – it kind of goes hand in hand if – if, for the officers that are doing it, chances are that everybody’s doing it, so it is not an issue.”

“We’ve got state of the art gyms in every house. Their days are structured so that basically they can set their schedule based on what they have to accomplish that day and we encourage them to build in physical training into their daily schedule...We also allow guys to come in off duty. They don’t have to have a gym membership.”

Physical Training/Activity

- **Barriers to regular PT:**

- ✓ **Heavy call volume**
- ✓ **Lack of support from leadership or other administration**
- ✓ **No time set aside during duty day for PT**
- ✓ **Inadequate space and/or equipment (e.g., gym set up in bay or poorly ventilated room)**
- ✓ **Chiefs and other officers not setting example**

Physical Training/Activity

- Barriers to regular PT:
 - ✓ Concerns about public perception
 - ✓ Concerns about not recovering from a hard workout when getting called out for an emergency
 - ✓ Risk management limits on types of PT and concerns about injury



Physical Training/Activity

- Barriers to regular PT:

“...That’s the big stumbling block is – is having the money...”

“The leadership....Like I said, you’ve seen our chiefs...They’re all overweight. They’re all overweight.”

“...and I had a chief that was stuck with this, that you couldn’t play organized sports...and it was like, it killed the camaraderie...”

“...we used to have basketball goals in the old fire stations and we had some injuries over there. And because of that they said ‘No more basketball’.”

Physical Training/Activity

- Barriers to regular PT:

“We got some flack over that in the paper...each station has the same equipment...I mean it’s good stuff, and it – that’s why we caught so much heat about it because it cost some money.”

“They do provide a dungeon.”

“I think it is a good idea (fitness evaluations), but again, it goes back to, you know, what about those of us who run the busier units that aren’t necessarily guaranteed time to work out.”

Work Related Injuries Among Firefighters

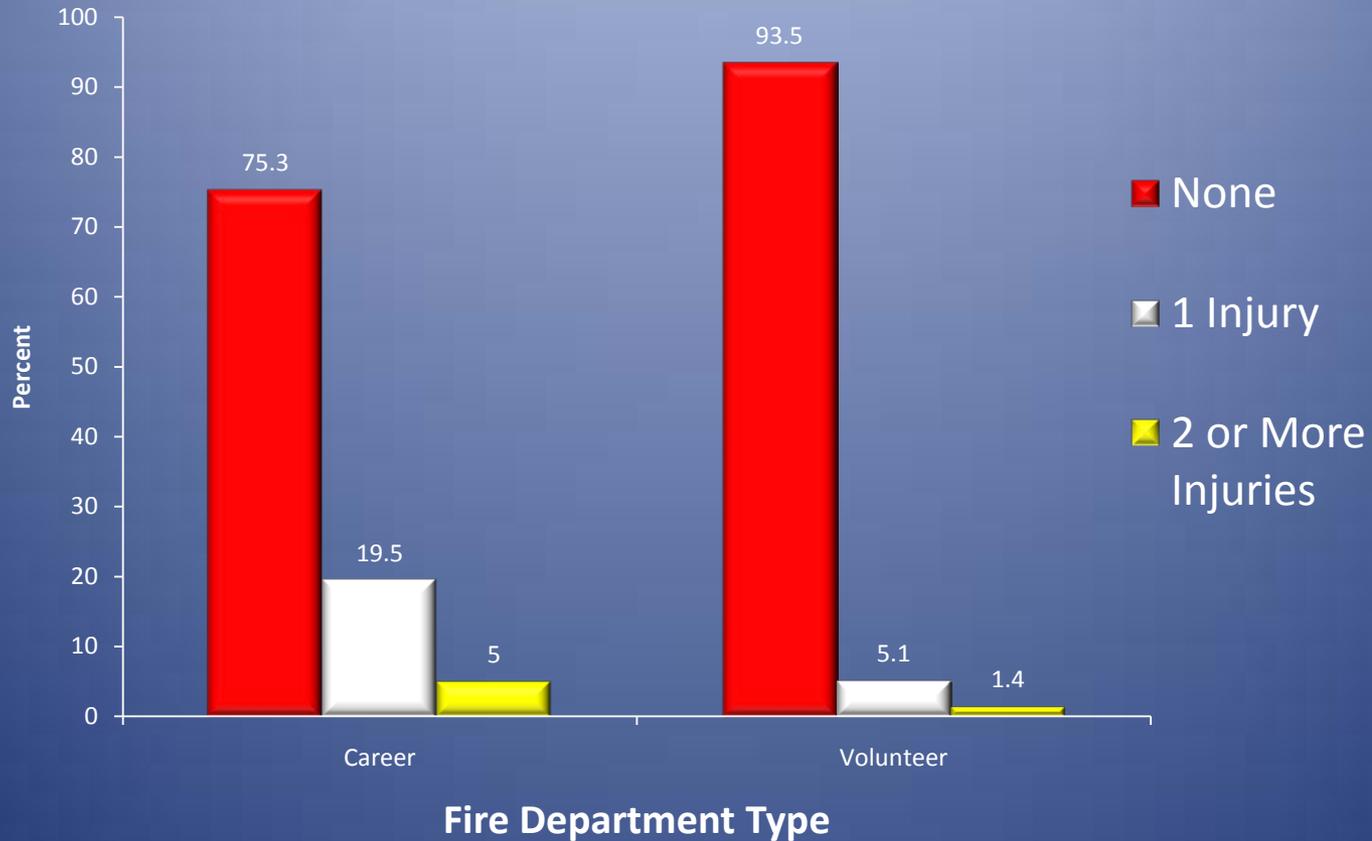


Definition of “Injury”

Anything for which you have completed an accident report for the department, reported to workers compensation, or received medical care (by a physician or other medical professional).



Percent of Firefighters Injured Previous Year



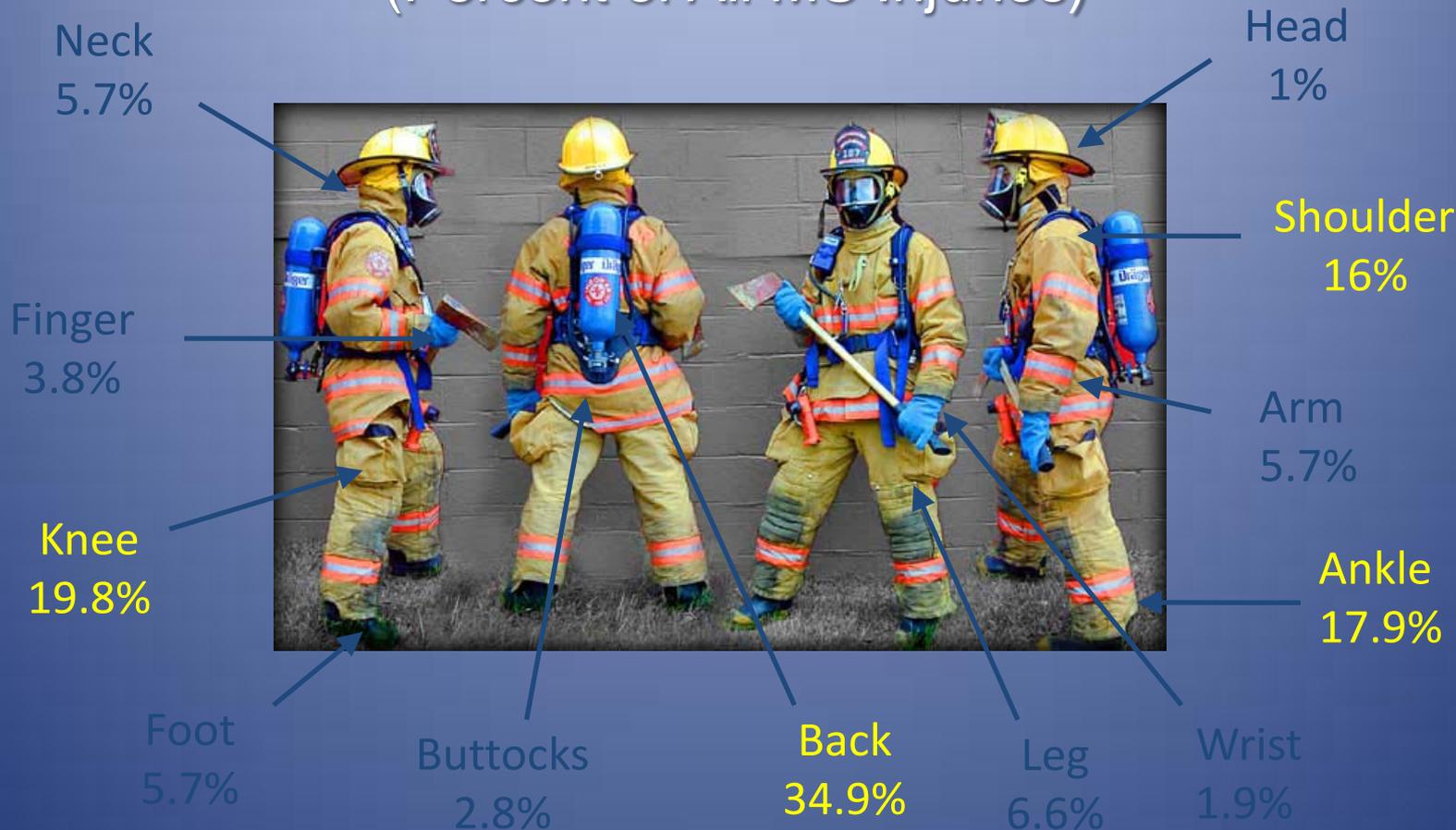
	Career Firefighter (% of injuries)		Volunteer Firefighter (% of injuries)	
	Injury 1 (N = 95)	Injury 2 (N = 16)	Injury 1 (N = 11)	Injury 2 (N = 3)
Type of Injury[†]				
Superficial Injury/ Open Wound	16.8	31.3	36.4	0
Fractures	2.1	0	9.1	0
Dislocations, Sprains, Strains	97.9	81.3	63.6	33
Amputations	0	0	0	0
Concussions, Internal Injuries	6.3	6.3	0	0
Eye Injury	2.1	0	0	0
Fire/Chemical Burn, Scalds, Frostbite	6.3	0	9.1	0
Acute Poisoning and Infections	0	0	0	0
Respiratory Injury	0	0	0	0
Thermal Stress/Heat Exhaustion	1.1	6.3	18.2	33
Heart Attack or Stroke	0	0	0	0
Other	4.2	6.3	0	0

•Most injuries were sprains and strains

•Referred to as “Musculoskeletal Injuries”

Location of Musculoskeletal Injuries

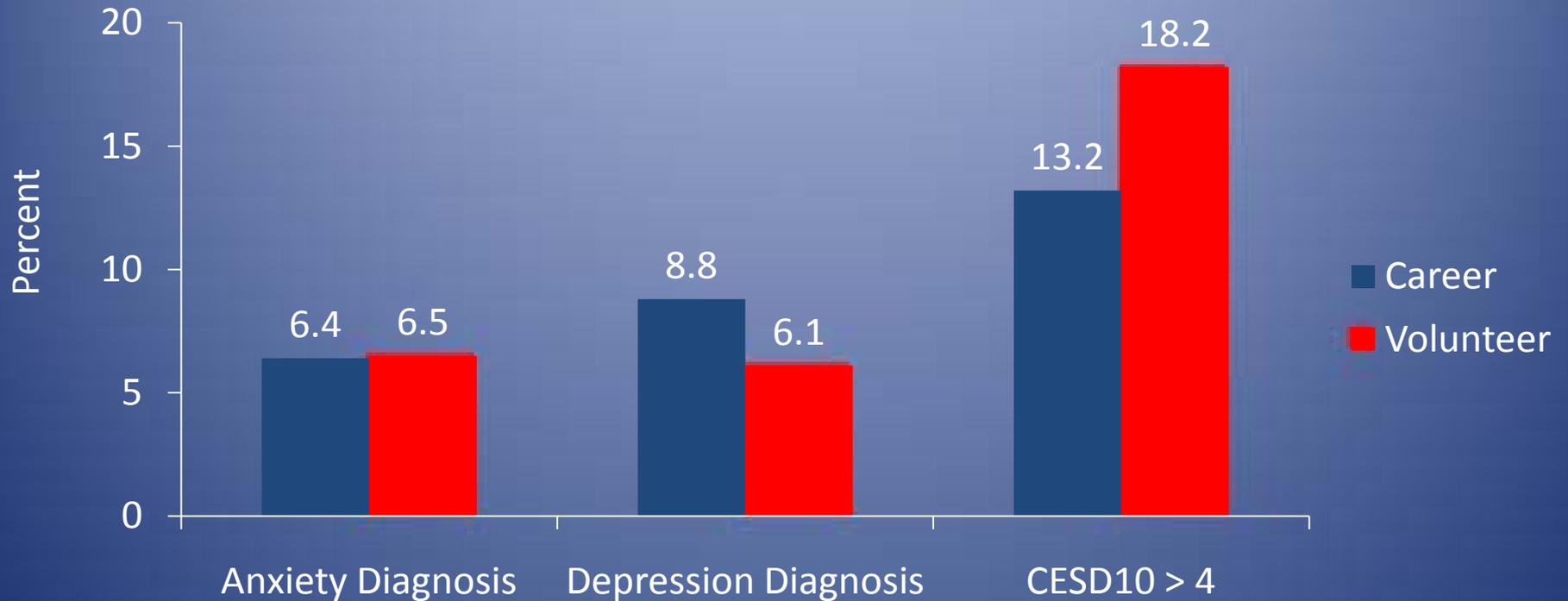
(Percent of All MS Injuries)



Mental Health and the Fire Service



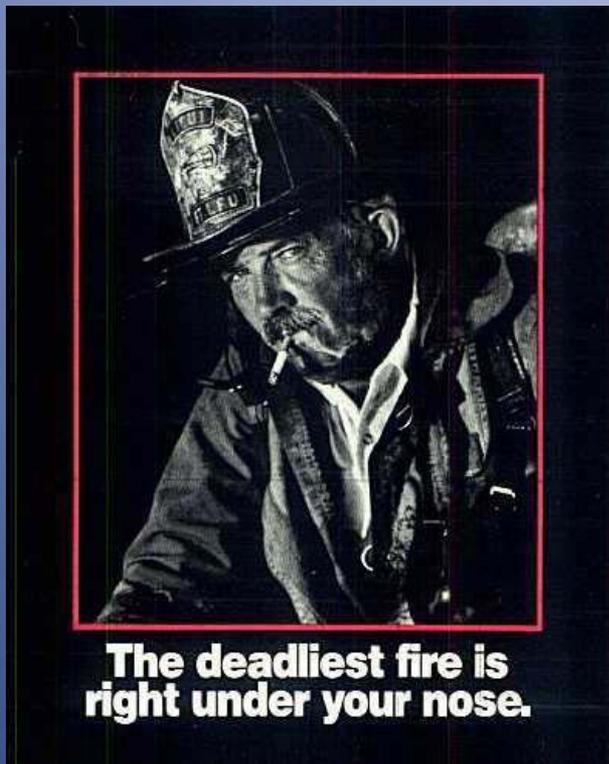
Mood Problems Reported by Firefighters



Impact of Depression on Career Firefighters

Health/Career Outcome	Depressed Firefighters are...	P-value
CAGE Alcohol Screener	2.5 times more likely to have ETOH problem	.001
Epworth Sleep Scale – Off Duty	2.9 times more likely to have sleep problem at home	< .001
Epworth Sleep Scale – On Duty	1.8 times more likely to have sleep problem at work	.052
Self-Rated Health	2.3 times more likely to report “fair” or “poor” health	.044
Work-Related Injury	2.6 times more likely to report 1 or more work related injuries	.001
Morale	3.2 times more likely to report low morale	<.001
Morale of Crew	3.2 times more like to report low morale of crew	<.001

Tobacco Use in the Fire Service



Prevalence of Smoking

- Most guessed that less than 5% of firefighters in their department smoked cigarettes (AHA Study).

Past 30 Day Smoking

Career Firefighters[†]

Fire Study

13.2%

Past 30 Day Smoking

Volunteer Firefighters[†]

Fire Study

16.8%

Past 30 Day Smoking

US Adults[‡]

(unadjusted)

20.6%

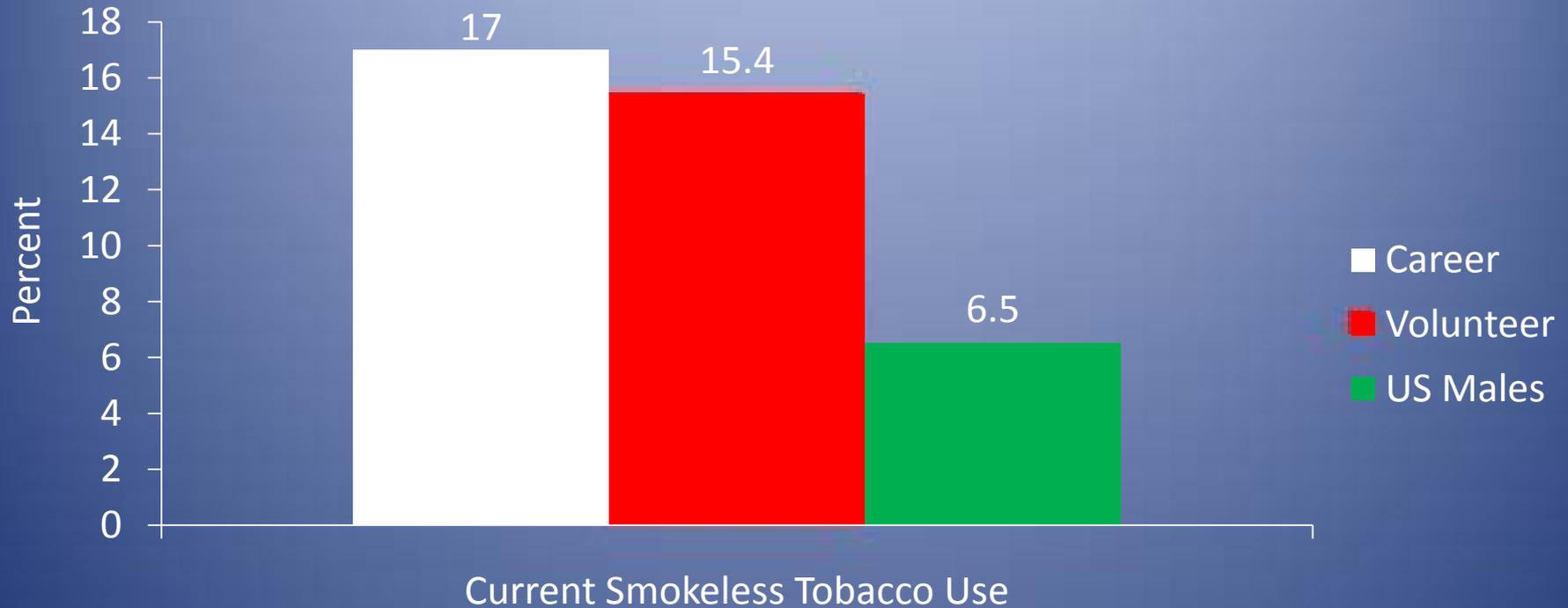
[†] Smoking defined as smoked 100 cigarettes in lifetime and smoked in past 30 days

[‡] Smoking defined as smoked 100 cigarettes in lifetime and, at the time of the interview, smoked at least some days. MMWR, November 13, 2009 / 58(44);1227-1232

Reasons for Decline

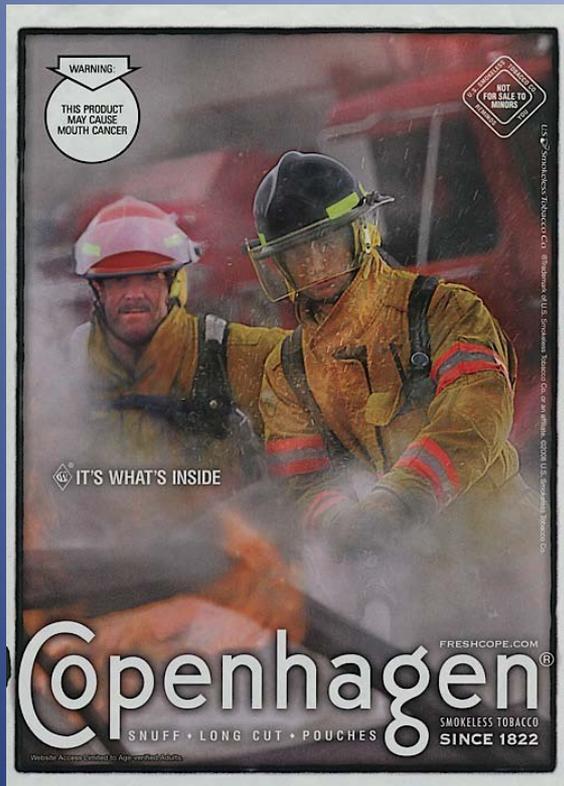
- Parallels National Trends (although faster decline)
- Education and Experience
- Smoking Bans and Contracts
- Peer Pressure (Firefighters don't smoke)
- Cost
- Fewer Recruits Smoke

Smokeless Tobacco Use Past 30 Days



Adult Male Rate from: Substance Abuse and Mental Health Services Administration (2007). *Results from the 2007 National Survey on Drug Use and Health*. Rockville (MD): Substance Abuse and Mental Health Services Administration, Office of Applied Studies.

High Use Not By Accident



New Polaris Ranger 6X6 from the US Smokeless Tobacco Grant. Picture left to right is Bob Williams of US Smokeless Tobacco, James Demers of The Demers Group, James Graham of US Smokeless Tobacco, Director Rep. Daniel Eaton, Chief XXXX President John Manning and Director Harry Boynton.

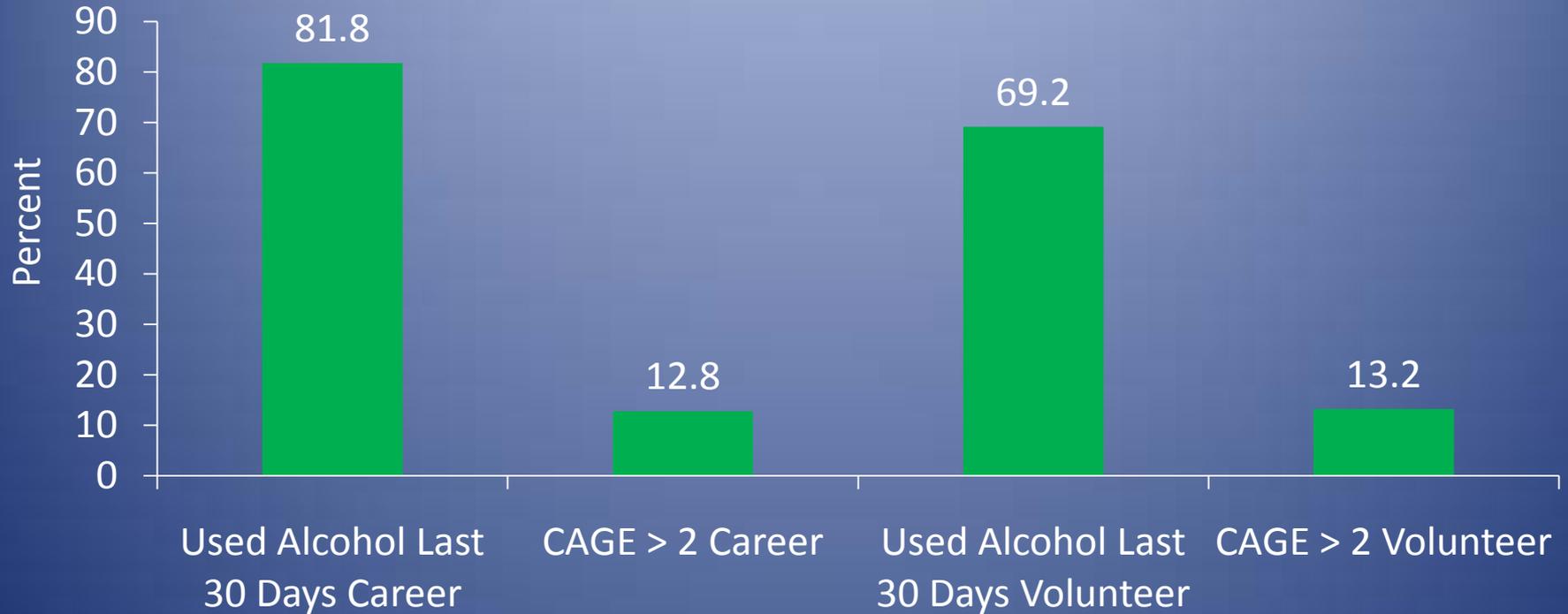
Smokeless Tobacco and Fire Service Culture

“I see a lot less smoking now but I do see a lot of dipping and chewing.” Chief in the Central US

“Most of us chew.” Volunteer Firefighter in the East

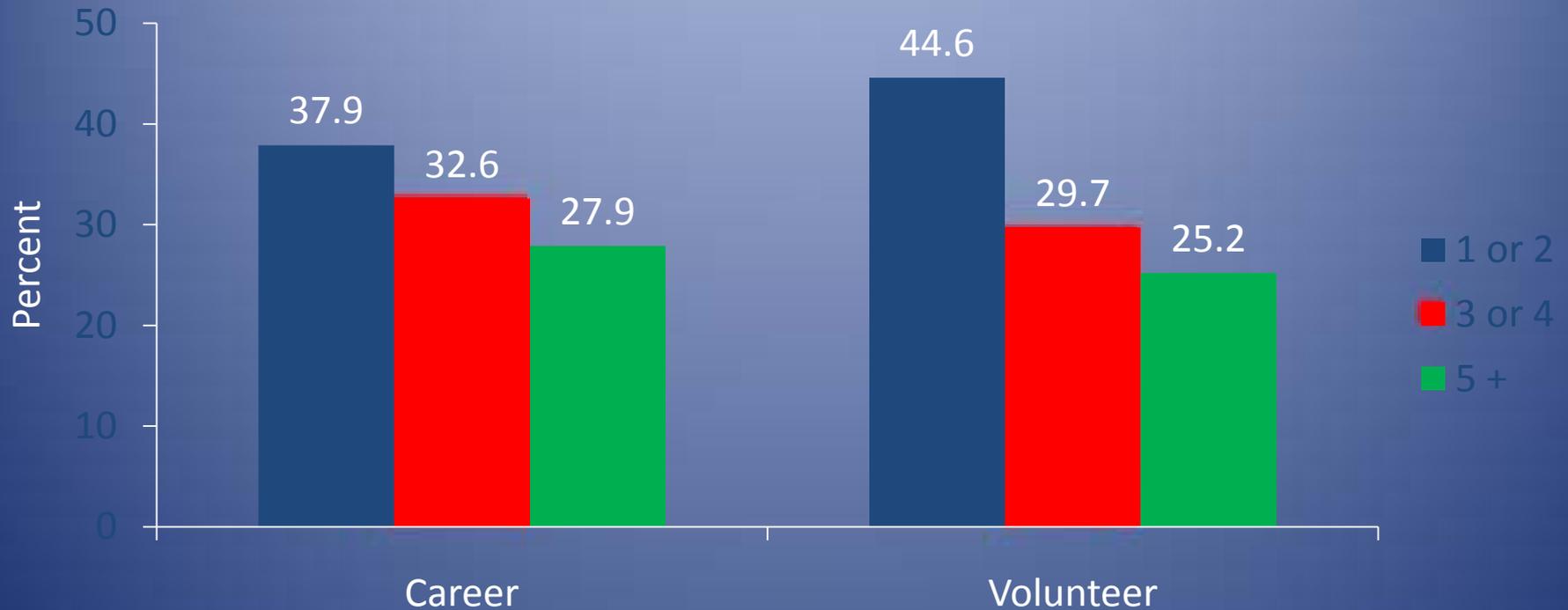
“I hate to say this, it sounds so cliché to say culture, but it’s the culture you know? I think of you come into a culture where people are using smokeless tobacco, your much more likely to use it.” Chief in the West

Alcohol Use

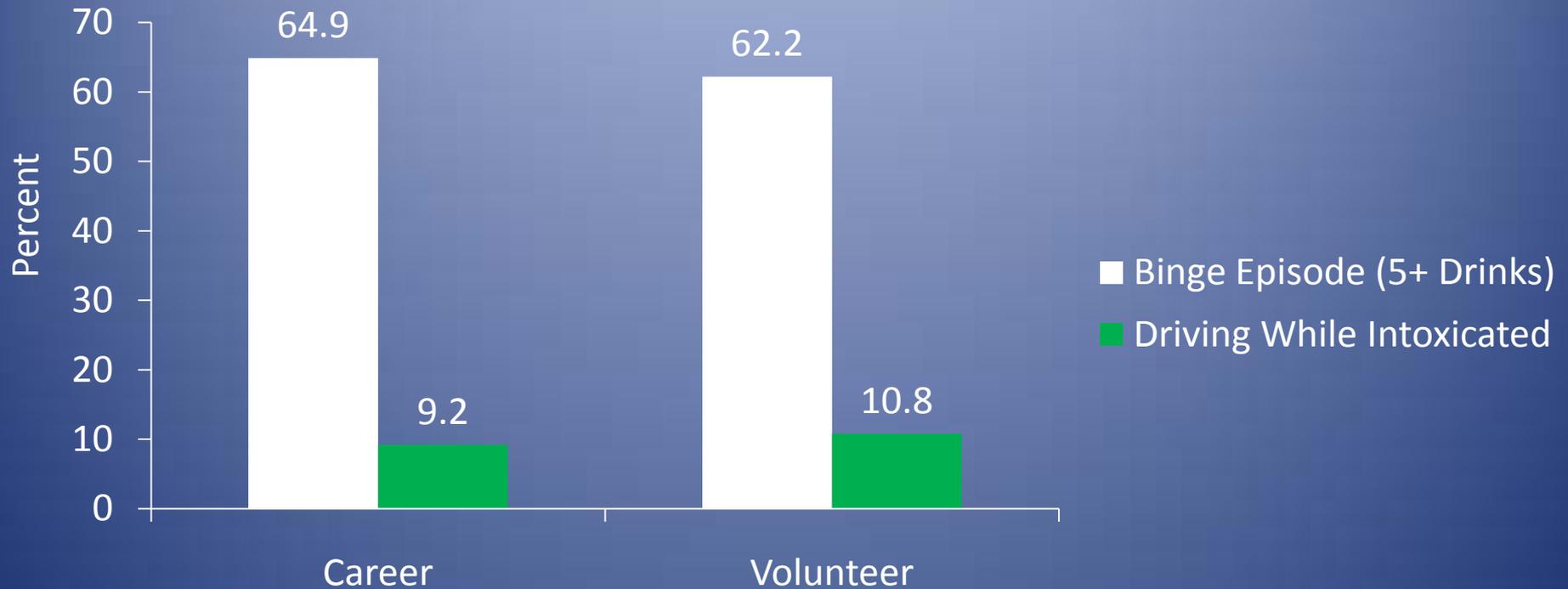


Alcohol Intake (Among Drinkers)

“On days you drank, how many drinks did you drink on average.”



Problem Drinking Among Drinkers



Recognition of A Drinking Culture

- “I think that if you go to most fire departments, even a police department, we drink.” Chief from West
- “Police and fire are some of the top drinkers.” Firefighter from East
- “We call it [alcohol] stress management.” Firefighter from the East
- “Our use [of alcohol]? Here? I would say it is heavy.” Chief from West

Questions?

