Health Disparities among Police Officers

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Some may say they are addicted to the adrenaline and excitement,
the challenges of wearing a uniform.
I am addicted to the service I am able to provide to the community.
I see this as a noble thing and an honorable cause.
Some would say there is no job worth sacrificing your life for.
But we in this profession strap that notion on every day we come to work
and know that the next shift could be the last.

Anonymous, NIOSH Science Blog

Sources of Stress in Police Work

In their report "Stress in America", the American Psychological Association found that nearly two-thirds of Americans cite their job as a top source of stress (http://www.stressinamerica.org). Nearly 70% of Americans experience physical (i.e. fatigue, changes in sleep) and non-physical (i.e. feeling overwhelmed) symptoms attributed to stress, yet only one-third report doing a good job managing their stress (http://www.stressinamerica.org). Numerous scientific studies have found associations between work stress and poor health outcomes, including psychological disorders like depression and anxiety (D'Souza, Strazdins, Lim, Broom & Rodgers, 2003; Griffin, Greiner, Stansfeld & Marmot, 2007), and physical disorders like poor sleep quality (Knudsen, et al., 2007) and cardiovascular disease (CVD) (Chandola et al., 2008).

Policing has long been considered to be one of the most stressful occupations in the U.S. (Gershon, Lin & Li, 2002; Marmar et al., 2006). Like other occupations, the day-to-day duties may be planned and at times mundane: reporting to their supervisor, completing paperwork, balancing deadlines, and struggling with insufficient manpower and pay. Add to this the surges of physical and psychological pressure that come with responding to a fatal traffic accident, speeding through a neighborhood in search of a criminal, or witnessing a fellow officer being

gunned down, and the not so "day-to-day" duties like working a night shift and then staying over to sit in the courthouse waiting to testify.

Inherent police stressors, i.e. activities that involve threats to the officer's physical or psychological well-being, have the highest potential for psychological trauma, including post-traumatic stress disorder (PTSD) (Violanti & Aron, 1993; Marmar et al., 2006). These events bring about unpredictable and stressful bursts of intense and strenuous physical activity, placing high demand on the cardiovascular system (Kales, Tsismenakis, Zhang & Soteriades, 2009). Inherent stressors can also affect sleep quality and overall physical health, thus, increasing the likelihood of physical injury to the officer, other officers or the public. Organizational stressors involve duties that affect most workers: lack of supervisor and coworker support, job insecurity, and insufficient pay (Violanti & Aron, 1993). In prior research, officers have rated these organizational characteristics as more stressful than inherent events (Taylor & Bennel, 2006). Officers must also contend with shift work, extended work hours, and off-duty court time. Shift work, i.e. working a non-day shift or rotating shifts, requires a constant rearrangement of the officer's sleep and awake times leading to poorer sleep quality, fatigue and CVD risk factors (Puttonen, Härmä & Hublin, 2010). These types of work schedules also result in lost opportunities to be with family and friends at night and on the weekends.

Police officers acknowledge the potential health risks associated with this occupation. Over one-third (38%) of police officers believe employment as a police officer, particularly the stress associated with being a police officer, increased their risk of CVD (Franke, Collins & Hinz, 1998). In a separate study, female officers felt that either being a police officer (68%) or a *female* police officer (42%) contributed to their chronic disease risk (Yoo & Franke, 2011).

In a 2008 Science Blog, police officers were asked to identify the key stressors in policing, (http://blogs.cdc.gov/niosh-science-blog/2008/06/police/). Responses to the National Institute for Occupational Safety and Health (NIOSH) Science Blog included

The cumulative effect of career stress:

> "I am now over 45 years old and am seeing some of the symptomatic results of the stress involved in this job in myself. It's an accumulation. Doesn't go away or subside. It just is."

Examples of stressors experienced during their career:

> "As the years have progressed, I have seen co-workers quit, get fired for doing stupid things, get arrested for doing criminal things, kill themselves, kill the ones they supposedly love, and get killed in the line of duty. I have seen officers killed in accidents and I have seen officers murdered while performing their jobs."

The physical and psychological effects of the job:

> "As for me *[sic]* atfer 20+ years of civil service I have high blood pressure/ hypertension, (controlled with meds), *[sic]* unk(nown) stress disorder (controlled by will power, diet, exercise and rest), cervical disc herniation (neck) and *[sic]* numeruos failed relationships."

And the daily struggle with stress:

> "I manage stress throughout the day well and can respond to the needs of the job when on duty. But, it catches up to me later when I am off. Stress manifests in me as poor sleep, night terrors (nightmares), and what I think is a combination of PTSD symptoms and depression."

Indicators of Health

Prior scientific research seems to support these testimonies. Vena, Violanti, Marshall, and Fiedler (1986) found that white male police officers died on average seven years earlier than the general U.S. white male population (Arias, 2010). Subsequent studies have identified specific risk factors and conditions for the, at the time, unexpected finding. Many of these risk factors are associated with CVD. Police officers have some of the poorest CVD health profiles of any occupation, including higher overall CVD risk factor levels (Franke, Ramey & Shelley, 2002; Hartley, Burchfiel, Fekedulegn, Andrew & Violanti, 2011; Ramey, Downing & Franke, 2009; Ramey, Perkhounkova, Downing & Culp, 2011; Wright, Barbosa-Leiker & Hoekstra, 2011) and overt CVD (Franke et al., 2002; Ramey et al., 2009). CVD accounts for 22% of on-duty events for police officers (Kales et al., 2009).

Improvements in health and specifically traditional CVD risk factors are a large component of the U.S. Healthy People 2020 initiative. In the 2020 recommendations, nine of the twelve Leading Health Indicators can be tied directly to CVD, including improvements in smoking cessation; oral health; nutrition, physical activity, and obesity; clinical preventive services; decreased substance abuse; environmental quality; mental health; access to health care; and social determinants including the workplace (http://www.healthypeople.gov/2020/LHI/default.aspx).

A key focus of Healthy People 2020 is on health disparities. A health disparity is defined as a "particular type of health difference that is closely linked to social, economic, and/or environmental disadvantage" (http://www.healthypeople.gov/2020/about/DisparitiesAbout.aspx). Health disparities are generally thought of as existing in differing groups, such as racial/ethnic groups, between men and women, within social classes or mental health status. However, health disparities may also exist between occupational groups. In policing, the combination of shift work, the potential to be placed in life-and-death situations and organizational pressures may contribute to disparities in health.

In a recent paper, demographic, lifestyle and cardiovascular risk factor characteristics were compared between police officers from a large epidemiologic study with U.S. employed adult participants in other large epidemiologic population-based studies (Hartley, Burchfiel, Fekedulegn, Andrew & Violanti, 2011). The goal was to determine whether police officers have a more adverse cardiovascular profile than other employed adults. Several differences were found and will be discussed. The comparisons are in Table 1. Data for the police officers came from the Buffalo Cardio-metabolic Occupational Police Stress (BCOPS) Study. BCOPS is a cross-sectional study exploring the association between work-related stress and subclinical CVD. Between 2004 and 2009, 464 police officers from the Buffalo, New York Police Department participated in the study, which included a series of questionnaires, collection of salivary cortisol and blood samples, and ultrasounds of the carotid and brachial arteries.

INSERT TABLE 1 HERE

Comparisons of Police with Other Employed Groups

Shift Work, Second Jobs and Overtime

Policing is a 24-hour occupation; shift work and overtime are necessities to ensure public safety. Using payroll records to calculate shift type over the past 15 years of their career, Ma et al. (2011) found that only 53% of the police officers in the BCOPS Study worked a day shift. The remaining was split between afternoon shift (26.2%) and night shift (20.6%). By comparison 84% of the U.S. workforce worked day shift with only 5.6% working evening and 3.1% working night shift (McMenamin, 2007). Night shift work can have considerable consequences on health and safety. Shift work has been associated with obesity, metabolic syndrome (MetSyn), diabetes, CVD, and mood and anxiety disorders, most likely as a result of circadian rhythm disruption (Hartenbaum & Zee, 2011).

Some officers may prefer to work the afternoon or night shift because it allows them to work a second job or spend time with family. About 36% of the officers in the BCOPS Study reported working a second job and averaged about 7½ hours per week at that second job (Ma et al., 2011). Nearly all state and local police agencies (93%) allow officers to have outside employment, yet the majority (75%) of those agencies sets limits on the number of hours and types of establishments where the officer can work (Reaves, 2012).

Policing requires the officer to be flexible in their work schedule and often results in mandated overtime. According to the Bureau of Justice Statistics (BJS), nearly all police agencies (95%) allow officers to work overtime and over 75% do not set limits on the number of overtime hours (Reaves, 2012). In the BCOPS Study, police officers averaged over three hours of overtime per week (Ma et al., 2011). Reasons for overtime include starting the shift early, staying late or working an extra shift to ensure adequate manpower, court time, public events that require additional police presence, or completing paperwork. The combination of night shift

work, overtime and the requirements of second job could potentially increase the health effects found for shift work alone.

Hours of Sleep

The National Sleep Foundation recommends that adults sleep between 7-9 hours each night (http://www.sleepfoundation.org/article/how-sleep-works/how-much-sleep-do-we-really-need). Short sleep duration has been associated with CVD risk factors, including hypertension, glucose intolerance and MetSyn, and increased risk for CVD and diabetes (Mullington, Haack, Toth, Serrador & Meier-Ewert, 2009). It may not be surprising that police officers, who are exposed to irregular working hours, required overtime, and traumatic events, on average do not get adequate sleep. In the BCOPS Study, 32% of officers reported sleeping less than six hours in a 24-hour period (Slaven, et al., 2011). This is four times higher than employed workers completing the National Health Interview Survey (Luckhaupt, Tak & Calvert, 2010). Among police officers, sleep loss has been associated with higher levels of perceived stress in men and among those with higher ranks and greater workloads (Charles et al., 2011). Sleep loss can also be a consequence of shift work. Chronic sleep loss can lead to excessive fatigue and impaired alertness. Arnedt et al. (2005) suggested that such sleepiness creates impairment comparable to that of 0.04-0.05% blood alcohol content. These outcomes can have immediate consequences for police officers as the nature of their job requires them to function in a hypervigilant state.

Cigarette Smoking

Cigarette smoking is a well-known modifiable risk factor for CVD, cancer and respiratory disease (Arnett et al., 1998). The percentage of police officers who currently smoke

cigarettes was 16.7% (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011). This is slightly higher than employed participants of the Multi-Ethnic Study of Atherosclerosis (MESA) Study (13.6%) (Fujishiro et al., 2011); the prevalence is much lower than that for all employed workers (30%) and protective service workers (36.6%) who participated in a national study of health (Bang & Kim, 2001), and that reported for Milwaukee police officers (32.1%) (Ramey, Downing & Knoblauch, 2008).

There are sex differences associated with smoking and health outcomes. Current daily smoking is a stronger risk factor in women than men, and these sex differences are greater in women under the age of 45 (Njølstad, Arnesen & Lund-Larsen, 1996). One theory behind the difference is that smoking produces an antiestrogenic effect which results in women losing their 'natural' protection against CVD (Bolego, Poli & Paoletti, 2002). Estrogen production in premenopausal women is considered to be protective against CVD. In the BCOPS Study, women officers were twice as likely to be current smokers as men (27.3% vs. 13.2%) (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011). Women officers were also more likely to be former smokers than men (30.3% vs. 20.1%) (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011).

Depressive Symptoms

As discussed above, policing in general is considered to be highly stressful (Gershon et al., 2002). Job strain, low decision authority and low social support at work have been significantly associated with major depressive disorder (Blackmore et al., 2007). Prior studies have found an association between depressive symptoms and MetSyn (Pyykkönen et al., 2011).

MetSyn is a clustering of risk factors associated with CVD and type 2 diabetes, and will be discussed in more detail below.

In the BCOPS Study, the prevalence of depression was found to be around 12% (Hartley, Knox, et al., 2012; Slaven et al., 2011). This prevalence was nearly twice as high compared to the general population (6.8%; Reeves, et al., 2011). This somewhat surprising finding may be attributed to a few key differences. First, age is a significant risk factor for depression. According to the National Institutes of Mental Health, adults 30-44 years of age are 120% more likely and adults 45-59 are 100% more likely to experience depression during their lifetime than those over the age of 60 (http://www.nimh.nih.gov/statistics/1MDD_ADULT.shtml). Over 90% of the BCOPS Study participants fall into these working age categories (Hartley, Knox, et al., 2012). Workers in this age category may experience caregiver stress due to providing child care and/or elder care in addition to their responsibilities as a police officer. Younger officers with fewer years of service are more likely to work a non-day shift which may add additional stress (Ma et al., 2011).

Second, the comparison study sample was not restricted to employed adults (BCOPS Study included only police officers), included a higher percentage of women (50.6% vs. 27.4%), and possibly included a higher percentage of persons who have chronic medical conditions and those who are unemployed. Depression is known to be higher among women, those with chronic medical conditions, and those who are unemployed (Marcotte, Wilcox-Gok & Redmon, 1999; Egede, 2007). In the BCOPS Study, 10% of male and 16% of female officers had depression (Hartley, Knox, et al., 2012). In the comparison study, the prevalence of depression was 5% for men and 8% for women (Reeves, et al., 2011). Given that the comparison study group had nearly twice as many women, this contrast is noteworthy.

Finally, the self-reported questionnaires used in each study were different. The BCOPS Study used the Center for Epidemiologic Studies-Depression Scale (Hartley, Knox, et al., 2012) and the National Health and Nutrition Examination Survey used the Patient Health Questionnaire-9 (Reeves, et al., 2011). Both are widely used in epidemiologic research but comparisons between the two should be made with caution.

Metabolic Syndrome (MetSyn)

MetSyn is a clustering of risk factors that increase the risk of developing CVD and diabetes (Grundy et al., 2005). These five risk factors are abdominal obesity, hypertension, elevated triglycerides, low levels of HDL-C and glucose intolerance. A person is considered to have MetSyn if they have three or more of these risk factors. Davila (2010) reported that the prevalence of MetSyn was 20.6% among U.S. workers and 26.1% among protective service workers (including police officers). In the BCOPS Study, the prevalence of MetSyn was 26.7% and was nearly four-fold higher for male officers compared to women officers (33.0% for men, 8.8% for women) (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011). The next sections describe differences in the individual MetSyn components.

Overweight and Obesity

Obesity is associated with other CVD risk factors, such as hypertension, glucose intolerance and dyslipidemia, and obesity has been associated with CVD independent of other risk factors (Poirier et al., 2006). Overweight is defined as a body mass index (BMI) between 25 and 29.9 kg/m^2; obesity is defined as BMI of 30 kg/m^2 or higher (Poirier et al., 2006). Over 80% of the police officers in the BCOPS Study are considered overweight or obese (Hartley,

Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011). The percent of officers who were overweight (41.5%) was similar to the general employed population (40%; Fujishiro et al., 2011) but levels of obesity were higher for police officers (40.5%) than the employed group (32.1%) (Fujishiro et al., 2011). Ramey, Downing and Knoblauch (2008) reported that 47% of Milwaukee police officers self-reported being overweight and 25% self-reported being obese.

The obesity component of MetSyn uses abdominal obesity, as measured by waist circumference, instead of BMI. Waist circumference has been found to be a better predictor of CVD and metabolic risk factors, including glucose and LDL cholesterol levels and blood pressure, than BMI (Zhu et al., 2002). In the BCOPS Study, the prevalence of abdominal obesity (waist circumference of ≥ 102 cm or 40 inches in men, ≥ 88 cm or 34.5 inches in women) was 33.3% with men having a much higher prevalence than women: 38.9% vs. 17.7% (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011). Using data from Ervin's study of U.S. adults (2009), the prevalence of abdominal obesity, defined in the same manner as the BCOPS Study, was 49% overall and much higher for women than men: 57.3% vs. 41.5%. Despite the lower prevalence for police officers and specifically for women officers, the odds of having abdominal obesity significantly increased with increased police stress in female officers only (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011). This means that the more police stress the officer reported, the more likely she was to have elevated waist circumference levels.

Blood Lipid Levels

The risk of CVD increases with increasing levels of total serum cholesterol, low-density lipoprotein cholesterol (LDL-C) and triglycerides, and with decreasing levels of high-density lipoprotein cholesterol (HDL-C)

(http://www.heart.org/HEARTORG/Conditions/Cholesterol/AboutCholesterol/About-Cholesterol_UCM_001220_Article.jsp). Diet, physical activity and cigarette smoking have all been shown to affect lipid levels (http://www.heart.org/HEARTORG/Conditions/Cholesterol/PreventionTreatmentofHighCholesterol/Prevention-and-Treatment-of-High-Cholesterol_UCM_001215_Article.jsp). Total cholesterol levels above 240 mg/dL more than double an individual's risk of coronary heart disease (http://www.heart.org/HEARTORG/Conditions/Cholesterol/AboutCholesterol/What-Your-Cholesterol-Levels-Mean_UCM_305562_Article.jsp). High cholesterol in combination with high blood pressure or diabetes further increases that risk (http://www.heart.org/HEARTORG/Conditions/Cholesterol/WhyCholesterolMatters/Why-Cholesterol-Matters_UCM_001212_Article.jsp).

In the BCOPS Study, the mean serum total cholesterol levels were 200.8 mg/dL (Hartley, Shankar, et al., 2011) in line with the American Heart Association guidelines (200 mg/dL), and 7 points above the mean for the employed MESA Study participants (Fujishiro et al., 2011). Ramey and colleagues (2008) using self-reported high blood cholesterol (i.e. hypercholesterolemia) found a similar prevalence of high cholesterol between Milwaukee police officers and the general Wisconsin population (28.5% for police, 28.1% for general population). The percent of BCOPS Study officers with low levels of HDL-C (< 40 mg/dL men, < 50 mg/dL women, or taking fibrates or nicotinic acid) was 42.6% and nearly double that of the NHANES participants (22.3%); while the percent of officers with elevated triglycerides (≥ 150 mg/dL or taking fibrates or nicotinic acid) was slightly higher than the NHANES Study participants (31.5% vs. 29.4%) (Ervin, 2009; Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011).

As reported above, the prevalence of MetSyn and the individual components were lower for women officers compared to men. The prevalence of elevated triglycerides was four-fold higher and the prevalence of reduced HDL-cholesterol was nearly twice as high for men than women: elevated triglycerides, 39.6% vs. 8.8%, reduced HDL-cholesterol, 48.3% vs. 26.5% (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011). However, among female officers, as their reported police stress levels increased so did the odds of having high triglycerides and low HDL-cholesterol; no associations were found for male officers (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011).

Hypertension (High Blood Pressure)

Nearly one-third of U.S. adults have hypertension (systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg), and less than half of those have their hypertension under control (Gillespie, Kuklina, Briss, Blair & Hong, 2011). The higher the blood pressure the higher the risk of having a heart attack, stroke, heart failure or kidney disease (http://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.pdf). The risk of CHD in those with hypertension increases by 5-10% with every additional CVD risk factor (i.e. dyslipidemia, cigarette smoking, diabetes) (http://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.pdf).

Several characteristics of policing are also known risk factors for hypertension: irregular physical exertion, poor diet, shift work, noise exposure, PTSD and high job demand/low job control (Kales et al., 2009). Over one-quarter (27.4%) of Milwaukee police officers reported being told by their physician that they have hypertension compared to only 17.6% of Wisconsin residents (Ramey et al., 2008). Using a combination of objective (i.e. standardized blood pressures measurements of ≥130 mmHg systolic or ≥85 mm Hg diastolic) and subjective (i.e.

self-reported physician diagnosed hypertension, self-reported antihypertensive medication use) measures, 39.5% of the BCOPS Study officers had hypertension compared to 30.1% of U.S. adults (Ervin, 2009). This definition of hypertension follows the guidelines for the hypertension component of MetSyn (discussed above) and may include those who are prehypertensive (http://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.pdf). Individuals with prehypertension are at even greater risk for developing hypertension than normotensives and can be good candidates for lifestyle modifications.

Glucose Intolerance

The last component of MetSyn is glucose intolerance. Glucose intolerance includes individuals who have a fasting glucose level of ≥ 100 mg/dL and those who are taking hypoglycemic (glucose lowering) medications. Up to 70% of individuals with elevated fasting glucose levels will go on to develop diabetes (Nathan et al., 2007). Levitzky et al. (2008) found that the odds of having incident coronary heart disease was 70% higher for women with fasting glucose levels between 100-125 mg/dL compared to those women with values below 100. According to the American Heart Association, adults with diabetes are between two and four times more likely to have CVD or a stroke than those without diabetes (http://www.heart.org/HEARTORG/Conditions/Diabetes/WhyDiabetesMatters/Cardiovascular-Disease-Diabetes_UCM_313865_Article.jsp).

In the BCOPS Study, less than one-quarter of officers (23.6%) had glucose intolerance (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011) compared to 32.4% of U.S. adults (Ervin, 2009). The lower prevalence of glucose intolerance is similar to the lower reported prevalence of diabetes previously published for police officers: 2.1% in the BCOPS Study

(Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011), 3.1% among the Milwaukee, Wisconsin Police Department (Ramey et al., 2008), and 1.5% among officers from nine Midwestern states (Franke et al., 2002).

Police subgroups at greater risk

State and local law enforcement agencies target specific demographic groups during recruitment. In 2008, over 50% of officers reported that their agencies had special recruitment efforts. Of these, 56% targeted women, 59% racial/ethnicity minorities and 51% military veterans (Reaves, 2012). Interestingly, these groups are often considered health disparate groups. Throughout this chapter, levels of CVD risk factors for police officers in general have been discussed. But within policing, these groups of officers may be at greater risk for adverse physical and psychological health than other police officers.

Gender

In 2007, women accounted for less than 15% of all police officers in the United States with variation by type and size of police agency (Langton, 2010). Approximately 15% of officers in the larger local police departments were women, compared to 13% in large sheriff's offices, 6% in small local police departments and state police agencies, and 4% in small sheriffs' offices (Langton, 2010). In the U.S., about 54% of workers age 20 and older are male (U.S. BLS, 2008). It has been shown that female police officers experience additional sources of stress beyond the traditional stressors associated with policing, some of which have been attributed to working in a male-dominated occupation. These include sexual harassment and discrimination, breaking from

traditional domestic roles, and balancing work and family responsibilities (*See Chapter on women police officers*).

Ethnicity

Increased racial/ethnic representation in policing has also been a target for recruitment. Approximately 34% of officers in federal agencies, 25% in local police departments and 19% of sheriffs' offices in the US were non-white officers (Burch, 2012; Reaves, 2010; Reaves, 2012). Blacks comprised the largest minority representation in local police departments (12%) and sheriffs' offices (9%); Hispanics are the largest minority in federal agencies (20%) (Burch, 2012; Reaves, 2010; Reaves, 2012). The police agency representing the BCOPS Study is a large urban city which may provide opportunity for more diverse representation. Over three-quarters (77%) of the study population were white with 20% black and 2% Hispanic (Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011). Data from the U.S. Bureau for Labor is comparable. Blacks represent 11% of the US workforce; however, BLS asks about Hispanic/Latino ethnicity separately from race (U.S. BLS, 2008). Fourteen percent of the US workforce regardless of race was of Hispanic/Latino ethnicity (U.S. BLS, 2008).

Military Experience

In 2011, 10.4 million veterans or 7.5% of U.S. civilian employed adults were military veterans (U.S. BLS, 2012). Veterans of World War II (December 1941 – December 1946), the Korean War (July 1950 – January 1955) and the Vietnam War (August 1964 – April 1975) represent the largest percentage of veterans (31.6%), followed Gulf War I veterans (August 1990 – August 2001; 22.1%), and Gulf War II veterans (September 2001 – present; 16.4%). Nearly

one-third of veterans are from other service periods (29.9%) (U.S. BLS, 2012). Women account for fewer than 10% of these 10.4 million veterans (U.S. BLS, 2012). Data on the percentage of police officers who are military veterans is difficult to find. In 2011, 14.5% of veterans worked in service-related occupations, including policing, and 21.7% worked in government industry, which would also include policing (U.S. BLS, 2012). In the BCOPS Study, approximately 26% of participants had prior military experience; the majority served in the Gulf War I or II eras (Hartley, Burchfiel, et al., 2012).

Conclusions

In this chapter, key studies on police officer health, including work with the Buffalo Cardio-metabolic Occupational Police Stress (BCOPS) Study, were compared with results from studies of other U.S. employed adults. Police officers have higher levels of traditional CVD risk factors, including more current smokers, higher levels of obesity, hypertension and dyslipidemia, than other U.S. employed adults. Officers also have higher prevalence of the non-traditional risk factors like depression, sleep insufficiency and shift work. Specific groups of officers who may be more adversely affected by these stressors including women and ethnic minorities who are underrepresented in policing, and military veterans who may be at greater risk for psychological disorders including post-traumatic stress disorder and depression, were also identified.

Both the scientific literature and accounts from police officers themselves describe the stressors associated with being an officer. These include the routine organizational stressors common to other workers, along with unique stressors like shift work and exposure to dangerous and potentially life-threatening situations. Officers recognize the potential health effects associated with these stressors. Prior research has demonstrated associations between these

stressors and poor health outcomes using cross-sectional studies, which limit the ability to determine if the exposure led to the outcome. Future studies of police officers should use a prospective study design so that the association and the potential biologic mechanisms responsible for these health disparities can be better understood.

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Table 1. Health disparities of BCOPS Study participants compared with the general U.S. employed population.*

Characteristics	BCOPS			General Employed Population Estimate		
	Characteristic	Study Population		Characteristic	Study Population	
	% or Mean	Mean Age	% Women	% or Mean	Mean Age	% Women
Demographics and Workplace						
Men	73.8[a]	41.5	-	57.6[b]	43.1	-
Women	26.2[a]	41.5	-	42.4[b]	43.1	-
White	76.7[a]	41.5	26.2	81.4[b]	43.1	42.4
Black	20.3[a]	41.5	26.2	11.2[b]	43.1	42.4
Hispanic**	1.8[a]	41.5	26.2	14.3[b]	43.1	42.4
Day Shift	53.1[c]	41.2	28.6	84.0[d]	40.5	48.2
Afternoon Shift	26.3[c]	41.2	28.6	5.6[d]	40.5	48.2
Night Shift	20.6[c]	41.2	28.6	3.1[d]	40.5	48.2
Military Veteran	26.0[e]			7.5[f]		
Lifestyle Behaviors						
Current Smokers	16.7[a]	41.5	26.2	13.6[g]	56.4	46.9
Sleep < 6 hours/24 hour period	32.0[h]	40.7	27.4	8.0[i]	41.5	50.1
Psychosocial						
Depression	12.0[h]	40.7	27.4	6.8[j]	48.3	50.6
Cardio-Metabolic Risk Factors						
Overweight (BMI 25-29.9 kg/m^2)	41.5[a]	41.5	26.2	40.0[g]	56.4	46.9
Obese (BMI ≥ 30 kg/m^2)	40.5[a]	41.5	26.2	32.1[g]	56.4	46.9
Total Cholesterol, mg/dL	200.8[k]	41.1	25.9	193.2[g]	56.4	46.9
Systolic Blood Pressure, mm Hg	120.9[k]	41.1	25.9	121.6[g]	56.4	46.9
Metabolic Syndrome	26.7[a]	41.5	26.2	20.6[l]	41.0	46.5
Abdominal Obesity	33.3[a]	41.5	26.2	49.0[m]	39.5	47.6
Reduced HDL-Cholesterol	42.6[a]	41.5	26.2	22.3[m]	39.5	47.6
Elevated Triglycerides	31.5[a]	41.5	26.2	29.4[m]	39.5	47.6
Hypertension	39.5[a]	41.5	26.2	30.1[m]	39.5	47.6
Glucose Intolerance	23.6[a]	41.5	26.2	32.4[m]	39.5	47.6

Data Sources. a: Hartley, Burchfiel, Fekedulegn, Andrew, Knox, et al., 2011; b: U.S. Bureau of Labor Statistics, 2008; c: Ma et al., 2011; d: McMenamin, 2007; e: Hartley, Burchfiel et al., 2012; f: U.S. Bureau of Labor Statistics, 2012; g: Fujishiro et al., 2011; h: Slaven et al., 2011; i: Luckhaupt, Tak & Calvert, 2010; j: Reeves, et al., 2011; k: Hartley, Shankar, et al., 2011; l: Davila et al., 2010; m: Ervin, 2009

* The study populations for depression and the individual metabolic syndrome components were not restricted to employed status.
** Hispanic race or ethnicity. In BCOPS, Hispanic was collected as "Race". In BLS, Hispanic was collected as "Ethnicity". A person could then list "Race" as "White" and also list "Ethnicity" as "Hispanic". As a result, the BLS percentages will not sum to 100 like those for BCOPS.

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