

NO SMOKING AREA.” THE NEED OF A SMOKING CONTROL
REGULATION FOR THE PUERTO RICO FIRE DEPARTMENT

EXECUTIVE ANALYSIS FIRE SERVICE OPERATIONS IN
EMERGENCY MANAGEMENT

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ABSTRACT

The problem was that the Puerto Rican Firefighters (PRFF) smokes cigarettes during working hours. The purpose was to report the percent of firefighters (FFs) smoking during working hours, describe the dangers of the smoking habit to prove the necessity of a smoking control plan to, eventually, develop a non-smoking policy (NSP) during working hours.

A descriptive research was employed to (a) find the percent of FFs smoking during working hours, (b) mention the reasons why FFs continue smoking, (c) describe dangers of the smoking habit that affects the FFs efficiency, (d) show the percent of FFs ready to attend a smoking cessation program (SCP), and (e) find how FFs would feel about a NSP.

The procedures used were literature review, a survey among FFs, interviews with experts on the cigarette smoking dangers, and with a smoking firefighter.

The survey revealed that 14.9 % of PRFF have a smoking habit (Figure 1). About 11.9% FFs (Figure 2) smoke less than one box of cigarettes per day and 6.4% smoke more than one. Among the smoking firefighters, 14.3 % were interested in attending a SCP (Table 4). Coinciding with experts, the “stress” was the first reason for continuing smoking (Figure 3), and 82.8% said that smoking FFs had more risk to develop lung cancer and other respiratory diseases than the non-smoker (Table 1). The need of a SCP at work was supported by 74.5% of them (Table 2). A total of 40.8% FFs revealed that they had been affected by smoke inhalation during the fire responses (Table 3).

The selection of the appropriate SCP was recommended, including a health evaluation for FFs. The study of the legal implications (National Fire Academy {NFA}, 2001a) for a smoking policy in the Fire Department (FD), was strongly recommended (EAFSOEM SM-10-3-36).

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List of Abbreviations

CHD	Coronary heart disease
EFOP	Executive Fire Officers Program
FD	Fire department
FF	Firefighter
FFs	Firefighters, firefighter's
IAFF	International Association of Fire Fighters
NFA	National Fire Academy
NFPA	National Fire Protection Association
NSP	No-smoking policy
PR	Puerto Rico
PRFD	Puerto Rico Fire Department
PRFF	Puerto Rican fire fighters
SCP	Smoking cessation program
SPP	Smoking prohibition policy

Introduction

The Puerto Rico Fire Department (PRFD) does not have a smoking control plan and the FFs smoke during working hours. The cigarette smoke, fire smoke, chemicals and other toxic materials are inhaled before, during, and after a fire or emergency response, resulting in a reduction in the FFs efficiency, and increasing the possibility to develop respiratory illnesses, stress, heart attacks, cancer or death.

The purpose of this applied research project is to report the percent of FFs smoking during working hours, and describe the dangers of the smoking habit in order to prove the necessity of a smoking control plan, and eventually, achieving regulation prohibiting the fire fighters to smoke during working hours.

A descriptive research method is employed to present the smoking habit as a problem, and a mayor risk to the FFs health.

The research questions were the following:

1. What percent of PRFF smoke during work?
2. What are the most common excuses for the FFs to continue smoking?
3. Which dangers of the smoking habit problem affect the FFs efficiency?
4. Are the PRFF ready to attend a smoking control program at work?
5. How do FFs feel about a NSP during working hours?

Background and Significance

Puerto Rico (PR) is a Caribbean Island between the Caribbean and the North Atlantic Ocean, east of the Dominican Republic. The Government is a *Commonwealth* Associate with the United States. The total area is 9,104-sq. km, slightly less than three times the size of Rhode Island (ABC Country Book of Puerto Rico, 1996). Puerto Rico has a population of 3,808,610 inhabitants (Census, 2000), and all of them are US citizens.

The predictability hazard (NFA 2001b) of a hurricane affecting Puerto Rico (Appendix C) is certain based on the past experiences of several mayor storms (Hurricanes...Puerto Rico, 2003), like Hurricane Georges 1998, Hurricane Hortense in 1996 and Hurricane Hugo in 1989 (Appendix D). Flooding, is another risk that is possible during the Hurricane season, extended from June 1, to November 30 each year. The frequent tropical depressions and heavy rains cause the probability of an occurrence of flooding (Appendix C) during the hurricane season. Other “surprises” of our tropical weather can bring heavy rains causing floods during other seasons of the year.

The PRFD is an all-paid FD with 1,800 FF positions, and all of them are not always ready for emergency response. About seven hundred of them are out of service for various reasons combined including sick leave, vacation leave, special non-paid licenses military license, and reasonable accommodations. Now we are talking about 1,100 active FFs available to protect a 3,808,610 population. This represents about 275 FFs per shift responding to fires, and other emergencies around the Island. The health and efficiency of this available 1,100 FF on duty has never been evaluated.

The results of the research showed that 14.9 % of the PRFF smokes at working hours. This represents approximately 250 FFs that have their health on risk.

Since 1993, the PRFD started to comply with the Law #40 which regulates the smoking practice (Consideraciones Importantes, 2001) at specific public, and private places. Firefighters continued smoking outside the fire stations, but with no designated smoking areas. There were no smoking regulations for working hours, and FFs smoked in official vehicles, official events, and training breaks, or emergency response. At this time I don't know how many PRFF are in good health in order to respond efficiently to a fire, rescue, or a high magnitude emergency caused by a terrorist attack. This is a good question for future research. But, at this moment, the necessity to protect the health conditions of the remaining 1,100 FF on service is a must. At this moment, when the USA and the Homeland Security Agency are giving funds to prepare FFs for terrorist attacks with any biological, nuclear, incendiary or explosive arm, we must take care of the FFs health, because being "always ready" means being ready in "all forms".

On March 7, 2003 the Puerto Rico United Firefighters Syndicate, Local 2277, signed an agreement with the Puerto Rico Fire Department Administration, and includes health and safety regulations (Convenio Colectivo, 2003). Smoking cessation programs were not included in those regulations.

The proposed smoking control plan can be of great importance for the aesthetics and perceived quality at the PRFD (NFA, 1998a {EDSM, 10-25}). Actually, the citizens see the FFs as role models. Non-smokers, and healthy FFs will look "great" giving advice to our children to never start smoking, in order to prevent fires, and maintain their good health.

This project supports the U.S. Fire Administration operational objective to reduce the loss of life from fire of firefighters; age group 14 years old and bellow and 65 years old and above (NFA, 2002a). We must protect the health of the heroes that protects our lives.

Literature Review

A cigarette is a small roll of finely cut tobacco wrapped in thin paper for smoking and usually having a filter tip (Guralnik & Neufeldt, 1994). The World Health Organization (Grannis F., & Teel, 2003) defines the cigarette as a “*euphemism*” of a cleverly crafted product that delivers just the right amount of nicotine to keep its user addicted for life before killing the person. Investigations of Grannis and Teel (2003) reveals that there are currently almost fifty million smokers in the United States, and another fifty million are ex-smokers, (p. 2).

The National Cancer Institute (1999) describes the tobacco use, particularly cigarette smoking, as the “single most preventable cause of death in the United States.” Quitting smoking, can significantly reduce a person’s risk of developing heart and lung diseases, and cause adverse health effects on unborn children, (p.1). These studies indicate that tobacco smoke contains thousands of chemical agents, including 60 substances that are known to cause cancer (carcinogens), and explains how, during smoking, nicotine is absorbed quickly into the bloodstream and travels to the brain, causing an addictive effect, (p.2). The National Cancer Institute reported studies from the Surgeon General revealing that “cigarettes and other forms of tobacco are addicting, and the aspects that determine tobacco addiction are similar to those that determine heroin and cocaine addiction” (p.2).

In the article “*Why Firefighters Die,*” Charles E. Truthan said that “we need positive action to save our brother and sister FF lives” (p.1). In his article, Truthan (2003) said that some FFs health risks come from what he called the “*Macho Firefighter Syndrome,*” describing the FF who does not take a break after two bottles of air, or 20 minutes on the ladder, (p.1). This is the “super hero” that dies from 100% preventable causes. Truthan said, that all FF are at an

increased risk for developing cancers of all causes. For FFs who smoke, there is an exponential increase in risk for all cancers, (p.3).

The cigarette smoke irritates the lungs, and impairs their self-cleaning ability, so smokers are at greater risk of developing some work-related lung diseases than non-smokers develop (American Academy of Family Physicians, 2000). In the article “*Occupational Respiratory Disease*” the Academy mentions some of the many substances found in the workplace that can cause breathing problems to FFs and other workers, (pp. 1-4):

- a. Smoke from burning organic materials. Smoke can contain a variety of dusts, gases and vapors, depending on what is burning, and FFs are at that special risk.
- b. Dusts from such things as wood, cotton, coal, asbestos, *silica* and talc; dust from cereals, grain, coffee, pesticides, drug or enzyme powders, metals and fiberglass.
- c. Fumes such as from metals that are heated and cooled quickly. This process results in fine, solid particles being carried in the air.
- d. Gases such as *formaldehyde*, ammonia, chlorine, sulfur dioxide, ozone and nitrogen oxides. These gases can be found in jobs where chemical reactions occur, and in jobs with high heat operations, such as welding, brazing smelting, over drying, and furnace work.

Each year, tobacco smoking accounts for around 26,000 deaths from coronary heart disease (CHD) in the United Kingdom (Smoking...and Circulation, 2002). In this article, CHD was well described as “conditions caused by an interrupted or diminished blood flow through the coronary arteries to the heart muscle” (p.1). This happens commonly by the build up of fatty

deposits (arteriosclerosis), or the formation of a blood clot (thrombosis) in the arteries. When the blood supply is cut off completely, a *myocardial* infarction, or heart attack occurs. The heart muscle may become permanently damaged by this complete, and prolonged interruption of the blood supply to it. Cigarette smoking, raises blood cholesterol, and high blood pressure. These are the most firmly established non-hereditary risk factors leading to CHD. Smoking is the “most identified of the known modifiable risk factors for CHD.” A cigarette smoker has two to three times the risk of having a heart attack than a non-smoker. If both of the other main risk factors are present, then the chances of having a heart attack can be increased eight times, (p.2). This article (Smoking, the Heart and Circulation, 2003) describes many aspects of the effects of cigarette smoking in the human body, (p.2):

- a. Smoking tends to increase blood cholesterol levels. The ratio of high-density lipoprotein cholesterol (the “good” cholesterol) to low-density lipoprotein cholesterol (the “bad” cholesterol) tends to be lower in smokers compared to non-smokers.
- b. Carbon monoxide attaches itself to *hemoglobin* (the oxygen-carrying pigment in red blood cells) much more easily than oxygen does. This reduces the amount of oxygen available to the tissues. All these factors make smokers more at risk of developing various forms of *arteriosclerosis* disease.
- c. As the arteriosclerosis process progresses, blood flows less easily through rigid and narrowed arteries and the blood is more likely to form a *thrombosis* (clot). This sudden blockage of an artery may lead to a fatal heart attack, a stroke or gangrene of the leg.

- d. Smokers are more likely to develop a cerebral thrombosis (stroke) than non-smokers are. About 11% of all stroke deaths are estimated to be smoking related, with the overall relative risk of stroke in cigarette smokers and passive smokers being about 1.5 times that of non-smokers.

In a recent study of risk factors for CHD among FFs in Cincinnati (American Journal of Industrial Medicine, {abstract}, 1996), a total of 806 FFs were followed for an average of 6.4 years since 1984. In that study, age, cigarette smoking, diastolic blood pressure, and family history were identified as independent predictors of CHD, (p.1). The authors concluded that fire fighting does not appear to be an occupation associated with an increased incidence of CHD; instead, the CHD events in that population appears to be governed by traditional, modifiable risk factors” (p.1).

Another danger from cigarette smoking is *cancer*. The *American Cancer Society Surveillance Research* (2003) defines cancer as a group of diseases characterized by uncontrolled growth and spread of abnormal cells, resulting in death if it is not controlled, (p.1). That Society confirms that cancer is caused by external factors (tobacco, chemicals, radiation, and infectious organism) and internal factors (inherited mutations, hormones, immune conditions, and mutations that occur from metabolism). Causal factors may act together, or in sequence to promote carcinogens, (p.1).

The American Cancer Society estimates that in the year 2003 more than 180,000 deaths are expected to be caused by tobacco use, (p.1). Male smokers have a 20 fold relative risk of developing lung cancer compared with male nonsmokers. This means that they are about 20 times more likely to develop lung cancer than nonsmokers are. All cancers caused by cigarette smoking could be prevented completely, (p.1).

On June 27, 2000, President William J. Clinton wrote an Executive Memorandum directing all Federal Departments and Agencies to encourage their employees to stop, or never start, smoking. The Memorandum reads as follows:

Today, the Surgeon General is releasing updated guidelines, compiled by top public and private sector experts, to help more people overcome their tobacco addiction and to give health care professionals an important tool to help their patients quit using tobacco products. Tobacco addiction and related health disorders pose one of the greatest public health threats facing our Nation today. Over 400,000 Americans die every year from tobacco related diseases-more than AIDS, illegal drugs, alcohol, fires, car accidents, murders and suicides combined. While more than 25 percent of U.S. adults smoke studies show that 70 percent of them would like to quit. To build on the new guidelines and progress, we have already made to help federal personnel stop smoking, today I am issuing an Executive Memorandum directing all Federal Departments and Agencies to: encourage their employees to stop, or never start, smoking; provide information on proven smoking cessation treatments and practices; and describe assistance they can provide to help their personnel quit smoking. I am also directing the agencies to review their current tobacco cessation programs using the updated guidelines, and to report on their effectiveness and opportunities for enhancement to the Director of the Office of Personnel Management. Finally, I urge Congress to enact my budget proposal to ensure that every state Medicaid program covers both prescription and non-prescription smoking cessation drugs-helping millions

of low income Americans gain access to medical treatments that would help them break their addiction to tobacco. WILLIAM J. CLINTON.

The National Fire Protection Association (NFPA) Code 1500, 1997, requires providing a program on the health effects associated with the use of tobacco products. The FD “shall provide a smoking/tobacco use cessation program” (NFPA 1997a). If a FF has a category A condition specified in Chapter 3 of the 1582 standard, he/she shall not be certified for the medical requirements. The NFPA Standard 1582 indicates that a category "A" medical condition shall include the following: active hemoptysis, emphysema, current pneumonia, pulmonary hypertension, active tuberculosis, and infectious diseases of the lungs or pleural space, (p. 3-6.1). Some of these conditions can be caused by cigarette smoking. Category “A” heart condition mentioned (NFPA 1997b) was the following: angina pectoris, current heart failure, acute pericarditis, endocarditic, or myocarditis among other heart illnesses (pp. 3-7.1.1). Evidence of the PRFF heart and pulmonary conditions is not available. At this time, the PRFD doesn’t have an effective health and safety program integrating the mandatory screening of any of the above conditions. As you can evaluate in the literature review, some category A and B conditions can be caused by cigarette smoking (Smoking...and Circulation, 2002).

Captain Thomas Gaylord (1999), an NFA Executive Fire Officer Program student, wrote a research project titled “*Initiating a Departmental Wellness Program,*” for the Morris Township FD. Gaylord (1999) recommended in his research project that it was necessary for FDs to develop no-tobacco use policies. Gaylord said, that the International Association of Firefighters (IAFF) states that new candidates should be tobacco-free on appointment and should remain that way through their career, (p.31). The NFPA 1500 (NFPA 1997a) requires the development for non-tobacco use policies for current members and new recruits, and that each

FD should assist any member that uses tobacco in finding a cessation program to help he/she quit, (pp.1500-22).

To evaluate the possible external causes of FF fatalities on the line of duty, Rita Fahy & Paul LeBlanc (2003) published an article titled “*On Duty Deaths: FFs Fatalities 2002*”. In this article, published on the *NFPA Journal 2003* (Vol. 97, No. 4, pp. 56-61), Fahy & LeBlanc (2003) reports that among the 97 on-duty FFs deaths that occurred in the United States in the year 2002, 46 were on the fire ground. Among these 46 deaths, 13 were related to heart attacks and 10 were related to asphyxiation. Eight out of 19 deaths related to fire responses are due to heart attacks. During training activities, two FFs suffered fatal heart attacks, 2 suffered strokes, 2 died from smoke inhalation, and a FF died of a heat stroke. Seven FFs died as the result of heart attacks, while engaging in normal administrative, or station activities; one FF suffered a fatal heart attack while cleaning up after a tornado. Five FFs died on non-fire emergency activities, and all of them from fatal heart attacks at the scenes of medical calls or motor vehicle crashes. A FF suffered a heart attack while directing traffic and another was asphyxiated while attempting to rescue someone from an underground tank. In this Journal, Fahy and LeBlanc, concluded that, again in 2002, heart attacks were the leading cause of on-duty FFs deaths, and they continue to find that most victims for whom medical documentation was available had pre-existing health problems. Fahy and Le Blanc (pp. 53-61) also expressed that adopting and adhering to a comprehensive safety program, can reduce the frequency of these fatalities and other fire ground and training deaths.

A characteristic from the addiction to cigarettes is that a person who tries to quit smoking, returns to doing it. This behavior is similar to heroin addiction (Datos sobre...Nicotina, 2001).

New York FFs can tell you about quitting smoking and returning to doing it. A survey after the September 11, 2001 terrorist attacks, reveals that 23 percent of FFs who had kicked cigarettes, picked them up again (Greene, 2002). The reasons to start smoking were the despair, disappointment, sadness, helplessness, and exhaustion (Greene, 2002). In this report from Gina Greene, from CNN news, she said that those emotions motivated a FF to pick up his first cigarette in 13 years on September 11, 2001. New York City FF Bill Donahue said: “the last thing I cared about was myself or my health and cigarettes were something to comfort me at the time.” Then, he started to smoke three packs a day, and discover that he had a problem, affecting him and his seven children, (p.1). Dr. David Prezant, FDNY’s Deputy Chief Medical Officer, recruited smoking cessation expert Matthew Bas to put the program in place for FFs, (p.2).

To make matters worse, 29 percent of FFs who already smoked started smoking more to deal with the stress and grief following the terrorist attacks (Grant, 2002).

At December 30, 2002, FFs and citizens in Houston (Houston FD, 2002) “lined up” inside the Houston Fire Station 6, to sign a giant card pledging to quit smoking, (p.1). Fire Chief Chris Connealy said members of the Houston Health Department, the National Association of Hispanic Firefighters, and the State and local chapters of the Black Association of Firefighters were part of a team to launch a campaign to help FFs eliminate cigarette smoking. “Cigarettes are the number one cause of house fires so you bet we want people to stop smoking,” said Chief Connelly. He also mentions that the FD can set an example and serve as a role model for the people of Houston, (p.1).

Firefighters as role models were mentioned in the article “*Role Models/Heroes: Lest We Forget,*” written by Alice Robinson from *La Guardia Live Wire News*. Robinson (2003) mentioned that, after September 11, 2001, old *paradigms* about role models changed (p.1). As

terrorism “darkened the world and rained ashes and debris on its victims, the definitions of heroes and role models were re-evaluated,” Robinson said. She also describes the role models and our heroes as the “chivalrous men and women that, without fear, ran into the burning building and exerted superhuman energies to save people from a fate that they themselves were only partially aware of.” Also, she described as role model heroes, the defiant travelers of Flight 93, who valiantly “struggled to avert further calamity” (p.1). Courageous, unselfish, fearless, unshrinking, dauntless, purposeful, exemplary, gallant, resolute, and spunky are some of the words we can use to describe these awesome men and women, said Robinson, (p.2). May we all aspire to be like them, (p.2)?

Firefighters as community role models are used actually, in the Companion Program under “*Fire Watch*” (Fire Watch, 2003), matching specially trained FFs who serve as long-term role models for child and adolescent fire setters.

Smoking policies and/or prohibitions are already established in FDs.

Burlington, MAFD requires that “no employee hired on or after July 1, 1990, will engage in smoking cigarettes, cigars, pipes, or any other tobacco either on or off duty (Burlington, FD, 1990).

A national campaign to reduce smoking among FFs was smoldering in Edmonds, Seattle FD. Chief Thomas Tomberg has asked Edmonds FFs Local 1828 to endorse his proposed policy (Brooks, 2001), which would require all future FD employees, including clerical workers, to pledge in writing that they would never smoke or chew tobacco. “Existing employees would not be asked to sign,” said Chief Tomberg, (p.1). Kelly Fox, President of the Washington State Council of Firefighters, said that the International Association of Fire Chiefs, several years ago,

adopted a fitness and wellness initiative for FFs; that includes encouraging FFs to quit smoking (Brooks, 2002, p.2).

A smoking ban was introduced at West Yorkshire FS, UK in 2002. This smoking ban will be extended to 50 fire stations in West Yorkshire and the district fire safety offices (West Yorkshire, 2002). Assistant Chief Fire Officer Allan Hughes said that they “originally didn’t opt for a total ban because they wanted to give people time to adjust,” and they intend to offer all the support through their occupational health staff.

The International Association of Fire Fighters (IAFF, 2002) launches a SCP supporting its members in ten cities across the United States, and encouraging FFs and all tobacco users to quit smoking tobacco on World No Tobacco Day observed on May 3, 2002. The FDs will also host “*Go Tobacco-Free with Your Fire Department*” program during which use of all tobacco products will be prohibited in firehouses, (p.1).

Starting July 15, 2002, a no tobacco policy took place for on-duty FFs (Bryant, 2002) in Myrtle Beach Fire Stations. The rule comes, as health and fitness become more of a priority in FDs across the country, especially along the Grand Strand where a Surfside Beach FF collapsed while fighting a blaze in January 2002 and died, (p.1). Bryant also mentioned that FDs in Florida, Virginia and Boston have similar policies. Also, since 1988, Boston has refused to hire smokers as FFs but “grandfathered” in older FFs who smoke. *The Augusta Chronicle* (New Law Bans, 2002) published on July 16, 2002, said that Myrtle Beach FFs were no longer allowed to step outside for a smoke break. While on duty, all FFs must be smoke-free. All tobacco use, including smokeless tobacco, was banned inside and outside stations and city vehicles, (p.1).

Diverse bans and regulations about smoking in the fire services are very strict. The City of San Rafael and the San Rafael FFs' Association (San Rafael, 2002) signed a memorandum of understanding. In that memorandum, they agreed, that "an applicant for a non-promotional safety position in the FD shall be disqualified from employment if he/she has smoked tobacco within one (1) year preceding the date of filing an application for such employment and through the probationary period of one year," (p.7.5).

Information about the first FF fired for smoking in Massachusetts was found on an article published on www.freerepublic.com. This article (First Massachusetts Firefighter...2002), mentions that John S. Marrero, 25 years old, was fired from the Department on September 2002, after he was smoking when a trooper arrested him on July 22, 2002, for driving erratically. He was not only smoking cigarettes, but he also faces criminal charges of possession of crack cocaine and oxycotin. Firefighter Marrero pleaded innocent, saying "he was driving a borrowed car when he was arrested and did not know there were drugs in the vehicle."

In Springfield, the no-smoking law calls for the firing of any FF or police hired after January 1, 1988, who was caught smoking tobacco products on or off duty.

The only law that is on effect that the PRFF must comply with, is Law #40, from August 3, 1993 (Consideraciones, 2001). Law #40 prohibits smoking in determinate public and private places, and imposes fines from \$250 to \$500 for its violators.

Procedures

This research project had the purpose to report the percent of fire fighters smoking during working hours and describe the dangers of smoking habits, in order to prove the necessity of a smoking control plan and, eventually, a regulation prohibiting the FFs to smoke during working hours.

A descriptive research was used to break down and report information to (a) find the percent of FFs smoking during working hours, (b) mention the most common excuses for FFs to continue smoking, (c) describe the dangers of the smoking habits that affects the FF efficiency, (d) show the percent of FFs ready to attend a smoking control program and, (e) find how FF would feel about a smoking prohibition policy working hours.

The first procedure was literature review. The literature review is necessary to summarize critical findings of others that have published documents related to the research problem and clearly describes how such information influenced the author's research effort (NFA, 2002a).

A survey to know the cigarette-smoking problem among FFs was successfully conducted. The table for determining needed size of a randomly chosen sample (NFA 1998a), was used to assure 95% confidence level in the survey. Because a 20 percent non-response rate was expected (pp. 3-41), 500 surveys were distributed. The feedback instrument (Appendix B) included a cover letter (Appendix A) with information about the research, the purpose and dateline. A total of 377 responses were received back between the 14 days of the "date line."

Three persons specialized in no-smoking programs affiliated to the American Lung Association and the American Heart Association was contacted for their opinion. These persons were:

1. Mrs. Lucy E. Figueroa Oliveras, Associated Director
Puerto Rican Lung Association
2. Mrs. Cristina Rodriguez, Special Assistant
American Heart Association, Puerto Rican Chapter
3. Mrs. Madeline Vega, Coordinator, Tobacco Control Program
Puerto Rico Department of Health

The experts were asked to talk about their mission, programs, and their efforts to help people quit smoking, including the opinion and suggestions about this research.

Firefighter Angel L. Berríos a 33 year old FF, who has smoked since he was 16 years old, was also interviewed.

Definition of Terms

Aesthetic	An underlying principle, a set of principles, or a view often manifested by outward appearances or style of behavior. Appearance, fits, finishes. External or physical aspect; presence: a commanding appearance.
Addiction	Compulsive physiological need for a habit-forming substance.
Anaplastic	Of or characterized by cells that have become less differentiated.
Arteriosclerosis	A chronic disease in which thickening, hardening, and loss of elasticity of the arterial walls result in impaired blood circulation.
Bloodstream	The flow of blood through the circulatory system of an organism.
Cancer	Any of various malignant <i>neoplasms</i> characterized by the proliferation of <i>anaplastic</i> cells that tend to invade surrounding tissue and transmitted or transferred by or as if by <i>metastasis</i> to new body sites.
Commonwealth	The official designation of Puerto Rico in its special status under the U.S. government. A group of people united by common interests.
Emphysema	An abnormal swelling of body tissues caused by the accumulation of air; esp., such a swelling of the lung tissue, due to the permanent loss of elasticity, or the destruction, of the alveoli which seriously impairs respiration.

Endocarditic	Inflammation of the thin endothelial membrane lining the cavities of the heart called the endocardium.
Euphemism	The use of a word or phrase that is less expressive or direct but considered less distasteful, less offensive, etc., than another.
Hemoglobin	The red coloring mater of the red blood corpuscles of vertebrates, a protein yielding heme and globin on hydrolysis: it carries oxygen from the lungs to the tissues, and carbon dioxide from the tissues to the lungs.
Formaldehyde	A colorless, gaseous compound used for manufacturing resins, fertilizers, dyes, embalming fluids, and (in aqueous solution) as a preservative and disinfectant.
Hemoptysis	The spitting of coughing up of blood: usually caused by bleeding of the lungs or bronchi.
Hypertension	Any abnormal high blood pressure.
Lungs	Either of the two “sponge like” respiratory organs in the thorax of vertebrates, that oxygenate the blood and remove carbon dioxide from it.
Lymph	A clear, watery, sometimes faintly yellowish fluid derived from body tissues that contains white blood cells and circulates throughout the lymphatic system, returning to the venous bloodstream through the thoracic duct.
Lymphatic system	The interconnected system of spaces and vessels between body tissues and organs by which lymph circulates throughout the body.

Metastasis	Transmission of pathogenic microorganisms or cancerous cells from an original site to one or more sites elsewhere in the body, usually by way of the blood vessels or <i>lymphatics</i> .
Myocardium	The muscular tissue of the heart.
Myocarditis	Inflammation of the myocardium
Neoplasm	An abnormal new growth of tissue in animals or plants: a tumor.
Nicotine	The first name for the tobacco plant given by Jean Nicot (1530-1600), Ambassador of Lisbon, who first introduced tobacco into France (1560). A poisonous, water-soluble alkaloid, C ₁₀ H ₁₄ N ₂ , found in tobacco leaves was used, ordinarily in an aqueous solution of its sulfate, as an insecticide.
Pericarditis	Inflammation of the pericardium.
Pericardium	The thin, closed, membranous sac surrounding the heart and the roots of the great blood vessels and containing a clear serous liquid.
Pleural	The thin serous membrane that covers a lung and lines the chest cavity in mammals
Silica	Silicon: A nonmetallic chemical element occurring in several forms, found always in combination, and more abundant in nature than any other element except oxygen, with which it combines to form silica: used in the manufacture of transistors, solar cells, rectifiers, silicones, ceramics, etc.
Syndrome	A number of symptoms occurring together and characterizing a specific disease or condition.
Tobacco	Any of a genus (<i>Nicotiana</i>) of chiefly tropical American plants of the nightshade family, with hairy, sticky foliage and long-tubed, white,

yellow, greenish or purple flowers. The leaves of certain of these plants, prepared for smoking, chewing or snuffing. Products prepared from these leaves are cigars, cigarettes, snuff, etc.

Thrombosis The formation presence of a fibrinous clot (thrombus) formed in a blood vessel or in a chamber of the heart.

Results

Puerto Rican FFs, smoking during working hours, represents 14.9% of the participants in the survey (Figure 1). Eighty three percent (83%) of the FFs said that they are non-smokers. Only eight FFs didn't answer this question, representing 2.1%.

Eleven percent of FFs said that they smoke less than one box daily (Figure 2), and 6.4% said that they smoke one or two boxes.

The stress was presented by 7.2% FFs, as the most common reason (or excuse) to continue smoking, followed by the smoking habit with 5.8% (Figure 3).

Eighty two percent (82%) of the FFs think that smoking FFs are in more risk of cancer, lung, and other respiratory diseases than the non-smokers due to the overexposure to cigarette smoke, fire smoke, and toxins when responding to emergencies, (Table 1).

From the 14.9% smoker FFs, 14.3% are ready to attend a SCP. From the 377 FFs responding the survey, 40.8% had been affected by smoke inhalation in fires, (Table 3).

Firefighters who smoke are in exponential increase for all cancers (Truthan, 2003), and coronary heart diseases (Smoking, the Heart and Circulation, 2002). The National Cancer Institute (1999) described the cigarette smoking as the single most preventable cause of death in the United States of America.

These findings in the literature review confirms that all the dangers of the smoking habit affects the FFs efficiency, and a cigarette smoking cessation program must be introduced in the PRFD.

Interviews

The three experts interviewed received information about the NFA, Executive Fire Officer Program (EFOP). Also, they were oriented about the title, problem, and the purpose of this research. The survey's results were discussed with them. The questions given were:

1. What is the official name your organization?
2. What kind of organization (private, non- –lucrative, federal, local, or voluntary)?
3. What is the mission of the organization that you represent?
4. What kind of smoking control programs do you have in Puerto Rico?
5. Are your programs cost-free?
6. How does the smoking habit affect the FFs efficiency? What is the most common reason for FFs to continue smoking?
7. How can your organization help the FD with this project?

The questions asked to FF Angel Berríos were the following:

1. How many years of service do you have in the FD?
2. What is your age?
3. When did you start smoking?
4. It is true that you suffered severe burns when a car already extinguished exploded after you open the trunk for inspection?

5. Where you smoking cigarettes when this happened?
6. Do you think that smoking cigarettes during working hours is dangerous?
7. How do you feel about a smoking prohibition regulation during working hours?
8. What is the reason for you to continuing smoking?

Answers from the Experts Interviewed

Mrs. Lucy Figueroa-Oliveras

(Personal Communication: September 18, 2003)

Mrs. Figueroa-Oliveras, Associate Director of the Puerto Rico Lung Association said that the Association is a private non-lucrative institution with the mission to prevent pulmonary diseases and promote respiratory health through all their services. This Association offers free smoking cessation programs orientations and a SCP. If the smoker decides to start the program the cost is \$70.00 per person including ten sessions and follow up during a year. This special program uses no-medication procedures and the smokers must leave the habit by themselves receiving help from the program givers. Mrs. Figueroa-Oliveras said that smoking habits affect severely the FFs efficiency. Fire and emergency situations generate a lot of stress.. She said that, since the cigarette smoke reduces the oxygen, the smoking FF would be tired to extinguish fires, being agile, and save lives. She agreed with our research results saying that “*stress*” is the common reason for FFs to continue smoking, and recommended a psychotherapeutic program to help FFs in lowering stress. Studies by the Puerto Rican Lung Association confirm that nicotine activates the brain enzymes that give a relaxing sensation. This Association can help the PRFD by giving orientations about smoking cessation programs, and educational *brochures* at low cost, said Mrs. Figueroa.

Answers from the Experts Interviewed

Mrs. Cristina Rodriguez

(Personal Communication: September 17, 2003)

Mrs. Cristina Rodríguez said that the American Heart Association, Puerto Rican Chapter, is a private non-lucrative organization receiving federal funds with the mission to reduce the fatalities or incapacity caused by heart and vascular-cerebral illnesses. “This organization does not have smoking cessation programs, but we do have copyright free handouts that can be reproduced for your conferences,” expressed Mrs. Rodríguez. The most useful handout for the firefighters is “*How Can I Quit Smoking,*” said Mrs. Rodríguez. She also expressed that the stress and the strong addiction caused by the nicotine, are the reasons for firefighters to continue smoking. “A smoking cessation program is favorable for the firefighters because the smoking habit represents a double damage to their health and their heart,” said Mrs. Rodríguez.

Answers from the Experts Interviewed

Mrs. Madeline Vega

(Personal Communication: September 18, 2003)

Mrs. Madeline Vega said that the Department of Health of PR is a governmental agency that has a Tobacco Control Program as one of their services to the community and to the health professionals. This Agency receives state and federal funds. Their mission is to bring services and training to prepare health professionals to put into effect tobacco-cessation programs in their 8 community regions, covering the whole Island of PR. These two-day courses are free, said Mrs. Vega, and we can give training to FFs. Mrs. Vega was surprised, but very happy, when I

told her all the regulations, and smoking cessation programs already in effect at many FDs in our American Nation. She mentioned that some states and regions are giving their employee, 5 years to quit smoking in order to transform their working environment in smoke-free places. She said that to quit smoking is not easy. “The smoking habit is like the drug habit in some people and the idea to make smoking cessation programs in the PRFD is necessary,” said Mrs. Vega. In this interview, she also expressed that they can plan a special two–days program to help FFs in planning the smoking cessation programs for the fire districts.

Answers from the FF Interviewed

Fire Fighter Angel Berríos-Rodríguez

(Personal Communication: September 5, 2003)

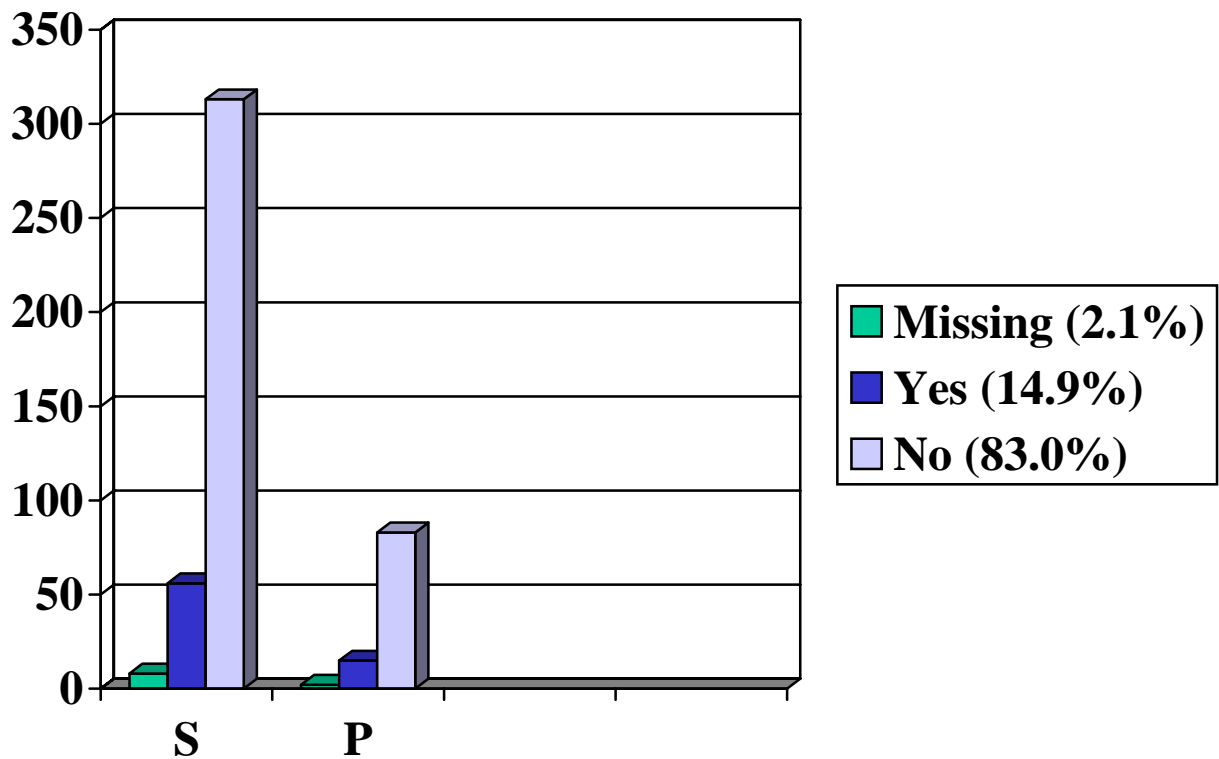
Firefighter Angel Berríos-Rodríguez has 12 years of service in the PRFD. He started working in a fire station in 1999 and in 1995 he asked for a transfer to the new marine unit. A few years later (1997), he asks to return to the fire station. In the year 1998, he was severely burned when a car fire re-initiated when FF Berríos was opening the trunk. He stayed at the hospital for six months and was out of service for at least one year. Some people said that he was smoking when this happens, but at the interview, he said that he never smoke during emergencies.

Firefighter Berríos- Rodríguez smokes cigarettes since he was 16 years old. He accepts his smoking habit and wants to participate in a SCP. Berríos-Rodríguez said that he suffered first, second and third degree burns in a car fire, caused by an accident. “The car was already extinguished, but it exploded when I opened the trunk, causing me severe burns and a six month hospitalization,” he said. Berríos-Rodríguez said that the double exposure to the smoke is more

dangerous for him. Berríos-Rodríguez said, that we must prohibit FFs to smoke at working hours, because it is “very dangerous to our health and safety.” On the other hand, “it is unfair to prohibit smoking during non-working hours to a FF that already have many years smoking, like me,” he said. “I continue smoking because my habit is very strong and difficult to quit, and I will put all my effort to quit smoking during working hours,” expressed FF Angel Berríos-Rodríguez.

Figure 1

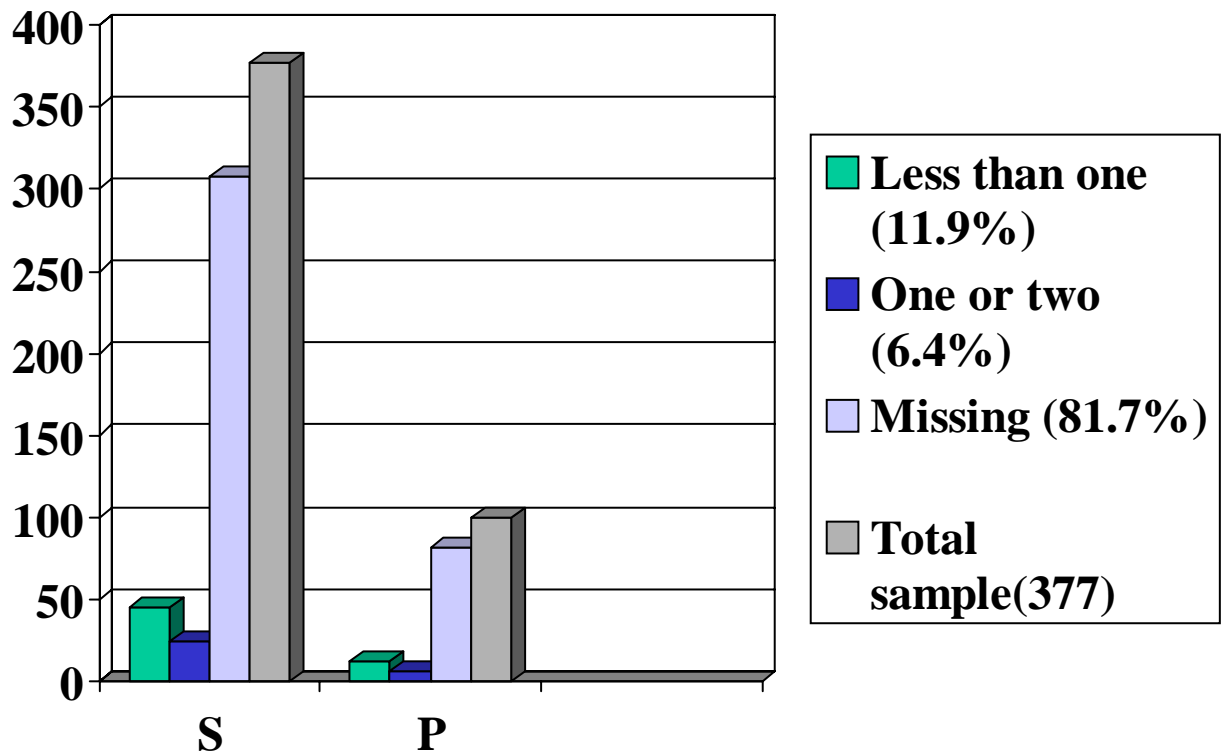
Figure 1. Do you have a cigarette smoking habit?



Note: (N=1800/S=347. P=percent. S=sample). Some FFs answered that they don't have a cigarette smoking habit, but wrote that they smoke less than one box per day (See Figure 2).

Figure 2

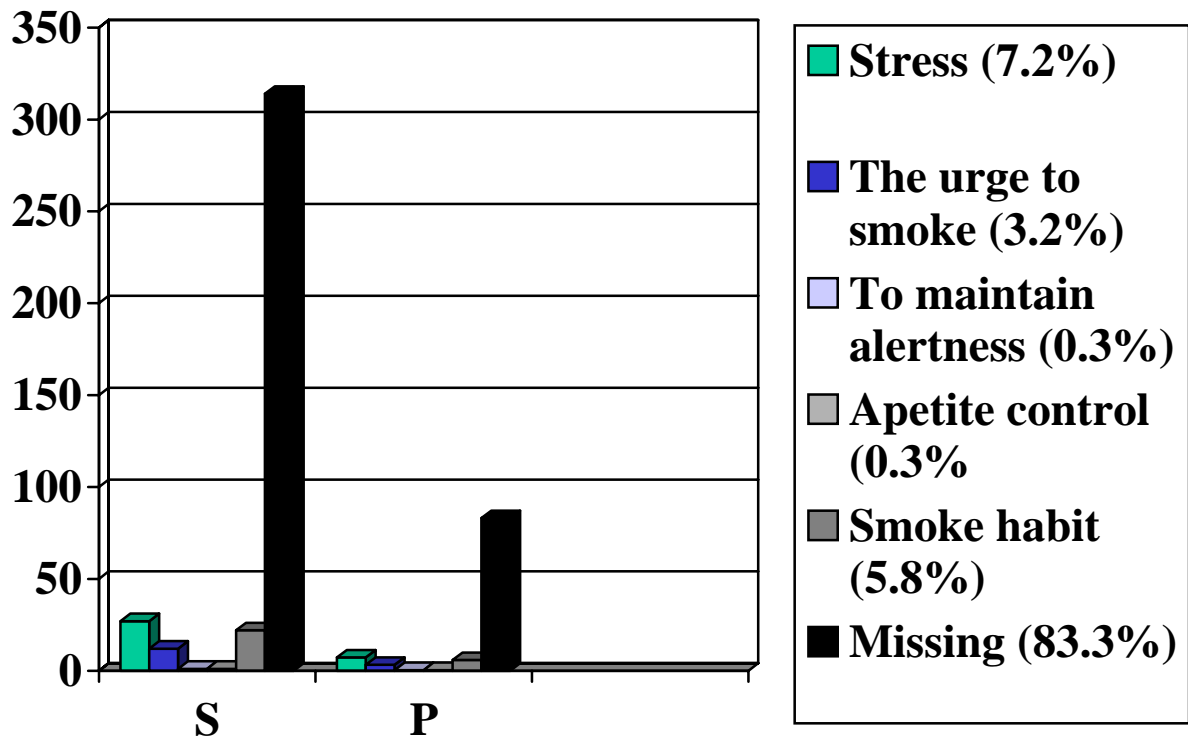
Figure 2. How many boxes of cigarettes do you smoke daily?



Note: (N=1800/S=377. P=percent. S=sample). Apparently, 3.4% smokers consider that they don't have a habit. You can see the difference by comparing 14.9% (Figure 1) having a smoking habit. Notice now that 11.9% (Figure 2) said that they smoke less than one box per day and 6.4% says that they smoke one or two. This represents 3.4% more smokers.

Figure 3

Figure 3. What are your reasons for smoking cigarettes?



Note: ($N=1800/S=347$. $P=percent$. $S=sample$.)

Table 1

Table 1

Do FFs that smoke have more risk of cancer, lung, and other respiratory diseases than the non-smokers due to the overexposure to cigarette smoke, fire smoke, and toxics when responding to emergencies?

Answers	<i>N</i>	<i>P</i>
Yes	312	82.8%
No	45	11.9%
Missing	20	5.3%
Total <i>S</i> & <i>P</i>	377	100%

Note: (f=frequency, P=percent, N=1800/S=377). The 11.9% FFs that answered “No” to this question confirms that they need education about the dangers of cigarette smoking. The 21% that answered “no” in Table 2 can also be used to prove this necessity.

Table 2

Table 2

Do you think that the smoking habits during working hours can reduce the FFs efficiency, when responding to emergencies? (This proves the need of a smoking cessation program at work.)

Answers	<i>f</i>	<i>P</i>
Yes	281	74.5%
No	79	21.0%
Missing	17	4.5%
Total <i>S & P</i>	377	100%

Note: (f=frequency. P=percent. N=1800/S=377).

Table 3

Table 3

Have you ever been affected by smoke or toxic inhalation during emergencies?

Answer	<i>f</i>	<i>P</i>
Yes	154	40.8%
No	206	54.6%
Missing	17	4.5%
Total <i>S</i> & <i>P</i>	377	100%

Note: (f=frequency. P=percent. N=1800/S=377)

Table 4

Table 4

Would you like to attend a free smoking-cessation clinic?

Answers	f	P
Yes	54	14.3%
No	123	32.6%
Missing	200	53.1%
<hr/>		
Total <i>S & P</i>	377	100%

Note: (f=frequency. P=percent. N=1800/S=377).

Discussion

The FF is an honorable and respectable emergency worker. After September 11, 2001 the FF profession is seen by millions of people more dangerous as it has always been. The question about the possibility of a terrorist attack with thousands of victims was answered. The FFs were also targets in those attacks and it was confirmed that they must be ready for the worst. They must have good health by staying away from external risk factors, in order to be “always ready” and give the best of themselves. Some health limitations or medical conditions (NFPA 1997,b), would preclude a person from performing as a fire fighter in training or emergency operational environment by presenting a significant risk to the safety and health of the person or others (p.1582-4).

Actually PRFF are not allowed to smoke inside of the fire stations, offices, or dormitories, but they smoke outside the fire station, or in front of the entrance door when they are on duty. They can also smoke during training breaks, and while driving official vehicles. PRFF need this SCP to protect their health, and give better services to our community.

It was good to know that only 14.9 percent of the PRFF smoke cigarettes (Figure 1). More percent was expected. This can facilitate an introduction of a tobacco cessation program in the FD. The stress was presented by 7.2% of smoking FFs, as their first reason to continue smoking. This coincided with the Puerto Rican Lung Association Specialist, Mrs. Lucy Figueroa, who agreed with the survey results that *stress* is the most common reason for smokers to continue the habit. Stress as the cause to continue smoking compares, also, with the article written by Ross Grant (Grant, 2002) who indicates that to deal with stress and grief following the terrorist attacks, 29 percent of the smokers in the NYFD, admitted that they smoked more cigarettes, (p.1). Also, 23 percent of the ex-smokers said that they had started again, according to

data collected by the department's medical office, (p.1). In this article, Dr. David J. Prezant, the New York Fire Department's deputy medical officer, said, "fire fighting is one of the most stressful jobs in America."

The second cause for FF to continue smoking (Figure 3) was the nicotine addiction. This coincides with the World Health Organization (Grannis, F., & Teel, 2003), that defines the cigarette as a *euphemism* of a cleverly crafted product that delivers just the right amount of nicotine to keep its user addicted for life before killing the person.

The recent studies of risk factors for CHD among FFs in Cincinnati (American Journal of Industrial Medicine, 1996), concludes that "fire fighting does not appear to be an occupation associated with an increased incidence of CHD; instead, CHD events in that population appears to be governed by traditional, modifiable risk factors" (p.1). Smoking cigarettes is a modifiable risk factor.

Eighty two percent of the PRFF think that the smoking FFs are in more risk of cancer, lung, and other respiratory diseases than the non-smokers, because they are in overexposure by a combination of cigarette smoke, fire smoke, and toxic gases, liquids, etc., when responding to emergencies, (Table 1). This risk is, explained in the article "Why Firefighters Die" (Truthan, 2003), where Truthan said that some FFs take a lot of risks to their health including the cigarette smoking. Truthan expressed that "all FFs are at an increased risk for developing cancers of all causes, and for those who smoke, there's an exponential increase at risk, (p.3). Cigarette smoking (American Academy of Family Physicians, (2000) irritates the lungs and impairs the self-cleaning ability, and smokers are at a greater risk of developing some work-related lung diseases than are non-smokers. In the article *Occupational Respiratory Disease*, the American Academy of Family Physicians, mentions the substances found in the workplace that can cause

breathing problems to FFs and other workers. Among these substances, we can find dust, fumes, smoke, gases, vapors and mists, (p.1). Despite all accumulated knowledge on the subject of diseases caused by tobacco products (Grannis, F. & Steel, S., 2003), a shockingly high percentage of smokers continue to believe that their cigarettes will not cause them harm, (p.2).

The experts of the lung, health and cancer associations in PR are very interested in this program, and they agreed that this is going to improve the FFs health and efficiency.

Definitely, the literature review opened the door to prove that this kind of program is giving good results in other fire departments around the United States of America.

For our Fire Department Chief, Lieutenant Agustín Cartagena, this kind of smoking cessation program is new. Not one of our 97 fire stations has a smoking cessation program and/or regulation.

This is the first survey about smoking habits in our Department. Three FFs questioned me about what the administration was going to do with FFs that smokes, and if it is legal or against our Constitutional rights to prohibit smoking during working hours. Those questions reminded me that the legal implications of this program must be studied. I have the purpose to prove the necessity of a smoking control plan but I don't have the power or authority to put the smoking policy at working hours into effect (NFA, 2001a). Definitely, we must learn from what others have done or failed to do in this area first (SM 10-36). The Union representatives can work together, including the proposed SCP in their next agreement with the PRFD.

An important part of our community that will benefit from this program is our children, because among them, are the future FFs. Our commitment as roll models for our children, will result in a more healthy and responsible FF in the future and a smoke-free FD.

Recommendations

We don't know how many PRFF are in good health in order to respond efficiently to a fire, rescue or high magnitude emergency. A mandatory health evaluation, for all PRFF, must be done to comply with the NFPA 1582: Medical Requirements for Firefighters. The designation of a health specialist is also needed.

The handouts titled *How Can I Quit Smoking?* were delivered to all smoking, and non-smoking FFs. On October 12, 2003, a smoking FF told me that he was following the advice from that "handout." He said that, it was the first time that he has been three days without smoking, following the steps about *how to quit smoking*. As recommended by the Puerto Rico Lung Association representative, I sent a letter, asking the names of the FFs who voluntarily wanted to take the "first step" assisting to a free conference about the Association's SCP. Four FFs responded to the letter, by signing an application for the orientation.

The following recommendations are necessary to start a smoking control program during working hours.

1. Know and prove your problem, and the FFs opinion about the program. Make a survey about the smoking problem in your department.
2. The legal aspect referent to the smoking policy during working hours must be clearly studied. Evaluate other findings, and work done in this area.
3. Look for all the information related to a SCP. Study the aspects of other established programs, and deliver the one that goes better with your department's necessities. Ask the experts.

4. Selection of the program givers. The selection of well prepared voluntary health providers and FFs with a paramedic license is recommended. Ex-smokers can help by giving their experiences.
5. Tell the FFs about what you are planning to do. Remember to write a memorandum to all the employees, signed by the Chief-of course-explaining the purpose of the program. If you are the Chief, please continue!
6. An orientation to smokers and non-smokers about the cigarette smoking danger to their health is recommended. Education must be the first step to prepare the smoking FF to quit smoking step by step. Education to non-smokers is necessary in order to prepare them in giving help to their smoking co-workers.
7. The orientation must include a review of the NFPA 1500, and NFPA 1582 requirements.
8. Brochures and handouts from health organizations are suggested to be delivered to all employees. The handout “How Can I Quit Smoking” from the American Heart Association is suggested as the first information given to all employees.
9. An orientation from experts about cigarette smoking effects is recommended. Ex-smokers can participate, giving their experiences.
10. After all the education is given, try to designate a special day to quit smoking selecting a nice slogan like “Quick Quit Day, Healthy Firefighters Day” or something, friendly and motivational.
11. Remember that cigarette smokers, and other tobacco product users, are not criminals. They are people like us that need help to leave the nicotine addiction. Our support, friendship, and understanding are needed.

12. Don't expect to have all the smokers in a SCP. Give them the option to assist to the program voluntarily. After all the efforts were given, we can start talking about a smoking policy during working hours.
13. Eventually, smoking prohibition on or off working hours and a no-smoking requirement for new recruiters can be done.
14. A special campaign to advice children to never smoke, and giving our example, can be delivered throughout our departments. Definitely, children will hear what our heroes say, because (in my personal opinion) firefighters are "our Nation's fire safety & protection heroes."

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Appendix A

**Puerto Rico Fire Department
Press and Public Relations Office**

July 10, 2003

All Firefighters

Miss Carmen G. Rodriguez Diaz
Special Assistant
Press and Public Relations Director

Smoking Habit Survey

Dear Firefighters:

A special research project about the smoking habit among FFs, has been made as part of the National Fire Academy Executive Fire Officer's Program, in which I am part of. With this letter, you'll find a survey related to the project.

The purpose is to report the percent of firefighters smoking during working hours, and describe the dangers to their health. This can prove the necessity of a smoking prohibition at working hours.

The instructions are the following:

Please read all the instructions.
You may write in pen or pencil.
The survey must be returned by July 24, 2003.
The results can be solicited by November 2003.
You don't have to write your name or district.
This survey is completely voluntary.

Thank you for your cooperation

Appendix B

**Puerto Rico Fire Department
Smoking Habit Survey**

1. Do you have a smoking habit? _____Yes _____No

Important: If you answered “yes” to question #1, please continue answering all the questions. If you answer “No” to question #1, go only to questions 4, 5, and 6.

2. How many boxes of cigarettes you smoke daily?

_____Less than one _____one or two _____two or more

3. Why do you smoke? (*please circle only one answer*)

- a. anxiety or stress
- b. smoking impulse
- c. to keep alert
- d. to control appetite
- e. smoking habit; I can't quit

4. Do you think that smoker FFs are in more risk to catch lung cancer, and other respiratory illnesses due to the overexposure to the cigarette smoke, combined with fire smoke?

_____Yes _____no

5. Do you agree that smoking during working hours can reduce the FFs efficiency when responding to emergencies? (This proves the need of a smoking cessation program).

_____Yes _____no

6. Have you been affected by smoke or toxic inhalation during emergencies?

_____Yes _____no

7. Would you like to attend a free smoking-cessation clinic?

_____Yes _____no

Thank you!

Appendix C

Risk Rating Table
Puerto Rico

Hazards	Probability of Occurrence			Vulnerability			Risk (probability x Vulnerability)
	Likely (3)	Possible (2)	Unlikely (1)	High (3)	Moderate (2)	Low (1)	Rating
Hurricane	3			3			9
Flooding	3			3			9
Haz Mat Transp.	2		3				6
Haz Mat Fixed Site		2			2		4
Aircraft Accident			1		2		2
Wild-land Fires	3				2		6
Major Structural Fires		2			2		4

Appendix D

Hurricanes in Puerto Rico in the Last 100 Years

Hurricane	Date	Fatalities	Damages
Saint Roque	August 17, 1893	4	20 millions
Saint Ciríaco	August 17, 1899	3,000	20 millions
Saint Felipe	August 13, 1928	300	50 millions
Saint Nicolás	September 11, 1931	2	No data
Saint Ciprián	September 27, 1932	225	30 millions
Santa Clara (Betsy)	August 12, 1956	11	25 millions
Hugo	September 18, 1989	5	300 millions
Luis	September 7, 1975	No data	No data
Marylin	September 16, 1995	No data	No data
Hortense	September 10, 1996	20	300 millions
Georges	Sept. 21, 1998	7	4,200 millions

Note: The center of Hurricane David, passed at 90 miles at the south of Puerto Rico on August 30, 1979. From "Huracanes Mayores que han Pasado por Puerto Rico". Retrieved September 10, 2003, from http://farmacisaalidas.com/huracanes_mayores.htm