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Radar Health and Safety
Complete Epidemiology Report

Dr. G.A. Wells
Clinical Epidemiology Unit
Ottawa Civic Hospital
University of Ottawa

TECHNICAL REPORT
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Submitted by:
Dr. G.A. Wells
Ottawa Civic Hospital

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EXECUTIVE SUMMARY

The Police Radar Health Study, a joint initiative of the Canadian Police Research Centre with the Canadian Association of Chiefs of Police, the Canadian Police Association, and the Solicitor General of Canada commenced in March 1993. Initial funding was put in place in March 1994. The study, all 54,000 surveys, were mailed out in July 1996 to active and retired police officers of the five largest police departments in Canada, (Metro Toronto, Montreal, the Ontario Provincial Police, the Sûréte du Quebec and the Royal Canadian Mounted Police). The study was supported by the local police associations/brotherhood.

The study showed that, for the most types of cancers, there was no higher risk among police officers than among the general population. In fact, the incidence of testicular cancer, the concern that prompted the study is 20 percent lower among police officers.

The study did reveal that melanoma, the more serious kind of skin cancer, is apparently about eight times higher among police officers than the general public. The result is of great concern to the researchers. This high incidence of melanoma may be the result of a poorly-worded survey question which, when asking the types of cancer suffered by the respondent, listed melanoma as the only type of skin cancer and offered no other choices. Researchers are going back out to the RCMP active and pensioned police officers to ask the question more clearly (the RCMP part of the survey had the same standard incidence ratio as the other police departments). The researchers believe this should determine for the whole population, whether this concern of higher melanoma incidence is actual fact or a result of a poorly-worded question.

There was also an indication of a slight increase in the incidence of urinary tract cancers, but the researchers think that result is probably a statistical aberration. It has been suggested that police offers may wish to discuss with their doctors the taking of a urine sample at their yearly physical examination.

It has been recommended that police officers, whether on duty of off duty should follow the following steps to protect themselves from melanoma due to sun exposure:

1. Wear long sleeves, long pants, a peaked cap and sunglasses when in the sun.
2. Apply sunblock with a high UV protection factor (SPF15 or greater) at least 30 minutes before going out in the sun, and re-apply repeatedly during sun exposure.
3. Check your skin regularly for any moles or other marks which appear to be changing, getting darker, growing or becoming ragged around the edges.
4. Report any moles or marks which concern you to your doctor; melanoma is usually treatable if caught early.
5. At your regular check-up make sure that your doctor checks your skin thoroughly.

SOMMAIRE

L'etude sur le lien entre la santé des policiers et le fait d'avoir effectué du radar routier, une initiative du Centre canadien de recherches policieres, de l'Association canadienne des chefs de police, de l'Association canadienne des policiers et du Solliciteur general du Canada, a débuté en mars 1993. Le financement initial commençait en mars 1994. En juillet 1996, on a posté 54 000 sondages à des policiers actifs et à la retraite des cinq plus grands services de police au Canada (communautes urbaines de Toronto et de Montreal, Police provinciale de l'Ontario, Sûreté du Quebec et Gendarmerie royale du Canada). Les associations locales de police ont donné leur appui à l'etude.

Les resultats montrent que pour la majorité des cancers, les policiers ne présentent pas plus de risques que la population en general. En effet, l'incidence du cancer des testicules, à l'origine de l'etude, est de 20 % inferieure chez les policiers.

L'etude a bel et bien révélé que le melanome, le cancer de la peau le plus grave, semble Qtre huit fois plus élevé chez les policiers que la population en general, ce qui inquiete grandement les chercheurs. Un tel résultat peut être dû à la mauvaise formulation des questions, du moins pour ce qui est des types de cancer dont souffrait le repondant, parce qu'on y donnait comme seul choix de réponse le melanome. Les chercheurs sont à reposer clairement la question aux policiers actifs et à la retraite de la GRC (l'incidence chez les sujets de la GRC était la même que celle chez d'autres services de police). Ils estiment que cela devrait permettre de savoir pour l'ensemble des policiers si l'incidence élevée du melanome est réelle ou si elle résulte d'une question mal posée.

Selon les resultats du sondage, il semble y avoir une légère augmentation du cancer des voies urinaires, mais les chercheurs estiment qu'il s'agit probablement d'une erreur de statistiques. On suggère aux policiers de demander à leur medecin de prélever un echantillon d'urine lors de leur examen physique annuel.

On recommande aux policiers, qu'ils soient de service ou non, de prendre les mesures suivantes pour se protéger du melanome dû à l'exposition au soleil :

1. Porter des manches longues, des pantalons longs, une casquette et des lunettes de soleil.
2. Appliquer un écran solaire ayant un facteur de protection contre les rayons ultra-violets (SPF15 ou plus) au moins 30 minutes avant de sortir au soleil et en remettre à plusieurs reprises.
3. Examiner sa peau régulièrement pour y déceler des grains de beauté ou d'autres marques qui semblent changer, se foncer, grossir ou qui sont poilus sur les bords.
4. Signaler au medecin toute marque ou grain de beauté irregulier; le melanome est généralement traitable s'il est diagnostique tot.
5. S'assurer que le medecin examine bien la peau lors de l'examen medical regulier.

POLICE RADAR HEALTH STUDY
REPORT

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G. A. Wells

PREPARED BY: Clinical Epidemiology Unit
Ottawa Civic Hospital
University of Ottawa
Ottawa, Ontario

FUNDED BY: Solicitor General Canada
Solliciteur Général Canada

Canadian Police Association
L'Association Canadienne des Policièrs

Canadian Police Research Centre
Centre canadien de recherches policières

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1. INTRODUCTION

Recently an increased awareness and concern has developed regarding the use of and exposure to common sources of man-made non-ionizing radiation (NIR). Exposure to low levels of NIR is part of everyday life. Some of these sources include radio frequencies such as AM or FM radiowaves, microwaves and electric heaters. Other sources of NIR are found in the workplace. Employment in the communications, security, medical, military, power and transportation fields to name a few may provide additional exposure to NIR.

Scientific research on the exposure to NIR has produced a plethora of opinions on the potential adverse effects from exposure to this type of radiation. In particular, law enforcement journals have reported anecdotal cases of cancer that have occurred in a small number of police officers who have operated radar units for the purpose of traffic control. Davis and Mostofi' who studied clusters of cancers in police officers exposed to hand held radar, recommended that a full epidemiologic study be carried out.

2. BACKGROUND

2.1 Non-ionizing Radiation

Non-ionizing radiation (NIR) has lower frequencies (from 0 Hertz (Hz) to 3000 Gigahertz (GHz)) and longer wavelengths (from 3 x 10^{8} to 3 x 10^{-10} meters) than ionizing radiation. It is these two types of radiation that form the electromagnetic radiation spectrum. Other than our ability to see light (visible) and feel heat (infrared), humans are unable to detect most other forms of NIR.

Electromagnetic radiation is grouped in ascending order by wave frequency with the lowest being power lines and the highest ultraviolet light (Table 1)[2,3]. Radar (RAdio Detecting And Ranging) works by transmitting electromagnetic waves that are pulsed from the antenna and when these waves encounter a solid object they are reflected back and received by the unit. The pulsing of the signal means that the transmitted waves have

greater amplitude than those received back. Radar units use microwaves (1 to 300 GHz) and belong to the radio waves part of the electromagnetic frequency spectrum. They are referred to as long wave, low frequency, low energy microwave and radio frequency emissions.

TABLE 1: Frequency Bands of Non-ionizing Radiation

	FREQUENCY	WAVELENGTH	DESCRIPTION	EXAMPLES OF USES
RADIO WAVES	0-300 Hz	> 10^6 m	Extremely Low Frequency (ELF)	Electric Power
	0.3 - 30 kHz	> 10^4 m	Very Low Frequency (VLF)	Voice, Audio-Frequencies
	30-300kHz	> 10^3 m	Low Frequency (LF)	Military Communications
	0.3 - 3 MHz	> 10^2 m	Medium Frequency (MF)	AM Radio, Communications, Industrial RF equip.
	3-30MHz	>10m	High Frequency (HF)	CB radios, diathermy, international Communications
	30 - 300 MHz	>1m	Very High Frequency (VHF)	Police, etc radios, radar, VHF- TV
MICRO WAVES	0.3 - 3 GHz	> 10^{-1} m	Ultra High Frequency (UHF)	Police, etc. Radios, UHF-TV, microwave oven,
	3-30GHz	> 10^{-2} m	Super High Frequency (SHF)	Police Radars, satellite communication
	30-300 GHz	> 10^{-3} m	Extremely High Frequency (EHF)	Satellite communication, radar, microwave relay
	0.3 - 400 THz	> 10^{-3} m	**Infrared Light (IR)**	**Terrestrial and solar spectrum**
	400 - 800 THz	**800 - 400 nm**	**Visible Light**	
	800 - 3000 THz	400-1000nm...	**Ultraviolet Light (UV)**	

Source: Adapted from **Hankin**[2] and **Yost**[3]

2.2 Radar Units

Since the mid 1950's police departments across Canada have used radar units for traffic control. The units are manufactured by a small number of manufacturers in Canada and the United States (U.S.). The original models were operated from outside the police car with the radar unit mounted on a tripod by the side of the road while the police officer worked in a concealed area away from the radar antenna. A second police officer was then radioed a description of the offender in order to issue the speeding ticket. As

technology changed these radar units were replaced by units that could be operated in the police car and required only one police officer to enforce the speed limit. In general there are two types of radar units, those that are mounted in or on the vehicle and those that are hand held (radar guns). Prior to 1983, radar units regardless of type were x-band and emitted 10.525 GHz. In 1983 k-band units (24.150 GHz), which emit a higher frequency wave, came into use. Testing in Canada[4] and the U.S.[5] has shown that under normal operating conditions police officers in their vehicle are exposed to levels between 0.02 and 0.05 mW/cm² which is well below the safety limit of 5.0 mW/c²m . Investigations into hotspots[6], which may produce elevated levels, also indicate levels within safety limits with measured exposure levels less than 1 .0 mW/cm². More recently the newest technologies that are becoming available are photo-radar and laser radar. Updates on the latter are being reported in the law enforcement press as it does not emit NIR.

2.3 Canadian Police Community

Police across Canada fall under several jurisdictions at the federal, provincial and municipal levels. The Royal Canadian Mounted Police (RCMP) is responsible for law enforcement on all tiers. Their mandate is to protect all federal jurisdictions, they are also the provincial police for all provinces except Quebec and Ontario, and they perform municipal policing duties in many towns across Canada except for in the two provinces noted above. Ontario and Quebec are served by their own provincial police forces, the Ontario Provincial Police (OPP) and Sureté du Quebec (SQ) respectively. Like the RCMP, these two forces also provide services to many towns in their respective provinces. Many municipalities across Canada maintain their own police forces, the largest being. Metropolitan Toronto Police (MTP) and the Montreal Urban Community (SPCUM). These five forces are the largest in Canada. In total there are approximately 329 police forces[7] with over 58,800 active police off icers[8].

3. LITERATURE REVIEW

3.1 Guidelines

Recommendations from governments on exposure levels historically have been set by consensus and are not enforceable[3,9]. These limits have been proposed for frequencies ranging from 10 kHz to 300 GHz. Discrepancies in limits set on exposure levels exist between North America" and Eastem Europe", with the North American limits allowing

up to a five hundred fold higher exposure than the Eastern European standard. Russian standards are based on an exposure that produces any biological effect whereas the American standard is established with a safety factor of 10 below where harmful biological effects may be measured. In 1982 American National Standards Institute (ANSI) limited the exposure of workers exposed to radiofrequency and microwave (RF/MW) emissions (1.5 to 100 GHz) to a power density of 5 mW/cm² over a six minute time period for the radio frequency protection guide[12]. ANSI revised their standard in 1988 and raised it to 10 mW/cm2for frequencies above 3 GHz[13]. Many countries, including Canada, have based their recommendations on the original ANSI standards. Studies use a measure of the effects of radar exposure on a body of tissue called the specific absorption rate (SAR) in watts per kilogram of body mass (w/kg). SARs cannot be directly measured in humans but can be calculated since it is proportional to power density of the NIR which can be measured. Guidelines always indicate an average. over the entire body as the absorption of the energy varies according to body position, and properties of the body exposed to the RF/MWenergy. Guidelines that have been established limit the whole body exposure to 0.4 w/kg. Stuchly states that the Canadian population, for the most part, are not exposed to the levels of the limits currently recommended in Canada and except for specific industrial exposures, such as industrial heaters, most occupational exposures are below the proposed limits[9].

3.2 Biological Effects of Microwave and Radiofrequency Waves

Studies on exposure to radiofrequency and microwaves (RF/MW) have identified two reactions: thermal and nonthermal. There appears to be consensus that the absorption of electromagnetic energy can cause thermal effects in living organisms[14]. Thermal changes have consistently been identified at SARsat or above 1.0 W/kg. Unlike exposure to direct heat sources there is no cutaneous perception of the heating of the tissues[15]. Research into thermal effects have been conducted in animal models and depending on the SARs adverse effects range from increased body temperature[16,17] to changes in a number of systems including the neuroendocrine system[18,19], immune system[20,21,22], nervous system[23], blood-brain barrier[24], hematopoietic system[25]; and behavioural changes[26,27].

Two areas that may have a greater immediate impact on human exposure are the thermal effect on the testes and on the eyes[36,28]. The testes have a normal temperature a few degrees below body temperature, approximately 33-35° Celsius. Increasing testicular temperature to that of the body may cause sterility, and the killing of mature sperm[36,29,30,31].

The ability to warm tissue without deleterious effects has been turned into treatment such as diathermy and hyperthermia in the medical field[32].

Nonthermal effects, those not explained by the warming of tissues, have not been universally accepted[14,32,33,34,35]. Low level thermal and nonthermal effects are observed at SAR levels below 1 .0 W/kg. The most significant findings linked to nonthermal effects of NIR exposure are those identified as neuroendocrinological and immunological in nature and are associated with the pulsed wave. The hypothesized relationship between exposure to NIR and the development of cancer has not had unanimous support. The major dilemma in this area of research is the vast discordance in the published studies and the fact that many of the effects that are proposed to be related to exposure to NIR have not been replicated. This type of problem would lead one to question the validity of the evidence found[36].

Laboratory studies both in vitro[37] and in vivo[38,39] have produced the vast majority of findings. Although most of these studies have measured the effects of exposure to an electromagnetic field frequency of 2.45GHz, which is different to those used in police radar, the specific absorption rate for the whole body exposure is a common marker throughout.

3.3 Effects on Humans

Many studies reporting on the outcomes from exposures to NIR are carried out among various occupational groups with long-term exposure, notably radar workers. The research has included gonadic function, where differences in libido and alterations in spermatogenesis were found[40], and Goldini found hematological changes in the peripheral blood of workers exposed to chronic low-level microwaves[41]. Other studies did not uncover a difference between the exposed workers and controls. These studies investigated the health status of workers[42], effects on the central nervous system[43] Robinette et al examined health effects in a Navy cohort[44] and these findings agreed with those reported in the U.S. embassy staff in Moscow by Lilienfeld[45].

Survey methodology has been used by Czerski et al in health surveillance of exposed workers, and although these surveys were far reaching, only an unusually high incidence in functional disturbances such as neurotic syndrome, disturbances in the digestive tract and cardio-circulatory abnormalities were found[46,47]. Appleton et al investigated eye damage from microwave radiation in the military and as with the other studies no

differences were found[48].. Michaelson, in his review of the literature, has found that there is no definite evidence that confirms that exposure to radiofrequency levels less than 4 W/kg has caused any increased mortality or morbidity in humans[25].

Research into adverse health effects from exposure to electromagnetic fields has focused on childhood cancers[49,50,51,52,53,54] and on adult brain cancers and leukemias[55,56,57]. There is little concurrence in these findings as to the effects of electromagnetic fields on the incidence of cancer.

Anecdotal reports of the adverse effects from exposure to radar abound in less academic journals[58,59,60,61,62], some of which are widely available to police officers. Other questionable reports such as the Zapping of America to mention just one, are questionable in their pronouncements. This type of publicity and the lack of clear guidelines from the scientific community have led to the rationale for this study.

3.4 Risk Factors for Testicular Cancer

Testicular cancer is the most common neoplasm in men aged 15 to 35 and affects approximately 3 in 100,000 men of all ages annually in the U.S. In Canada the age-standardized rates show a high incidence in young men, but do not portray the bimodal distribution reported elsewhere (Table 2)[64]. Although the incidence has doubled in the last 60 years, advances in diagnostic techniques, treatment and management have improved survival rates from 10% in the 1970s to 90% in the 1990s[65].

TABLE 2. Age-Standardized, Age-Specific Rates for Testicular Cancer (per 100,000)

Age-Standardized	4.6
Crude	4.7
0 - 24	2.2
25 - 34	10.1
35 - 44	8.0
45 - 54	3.3
55 - 64	2.4
65 - 74	1.4
75 - 84	1.8
85 +	2.4

Source: Cancer in Canada 1990

In order to identify young men at increased risk, research has been geared to recognizing potential risk factors that should be identified and considered for early detection. Unfortunately, there is little concordance in the findings and many of those in agreement are reporting high point estimates with wide 95% confidence intervals. Discussion sections in some of the articles also reveal the possibility of bias influencing their findings. There is strong agreement that cryptorchidism is a risk factor for testicular cancer (OR 2.5 to 17.12)[65,66,67,68,69,70,71,72]. Medical risk factors that may be potentially associated with this disease are inguinal hernia[66,67,68], mumps and mumps orchitis[69,70,71,72], testicular atrophy", and in utero exposure to DES[66,68,71,72]. Coldman et al[67], and Haughey and colleague propose that testicular trauma may well be associated with the diagnosis of cancer. This trauma could be inflicted by activities such as bicycling, motorcycling, horseback riding and operating a truck or tractor. Others speculate that it is not the injury to the reproductive organs that increases the risk, but that it functions as. a stimulus to seek medical attention[67,73]. Elevated testicular temperature has also been implicated as a risk factor. Indicators for this increased temperature have been the taking of hot baths and the wearing of jockey shorts versus boxers"*'*.

Demographic variables were also examined and have brought forth an abundance of opinions. The main focus of these are residence (rural or urban), education, socioeconomic status and occupation. Although some of the associations are weak, the following hypotheses have been suggested. An increased risk of testicular tumours among rural residents has been proposed[74,75,76,77,78] but is also refuted by Coldman et al[67], Ducatman et al[79]and Clemmesen[80].Social factors that have been investigated include high social class which has been reported by Swerdlow et al[81]and Pearce et al[82] among others. The impact of a higher education has also been described[69,81,83] along with a variety of occupations which are believed to have an effect on the risk of developing testicular cancer. Unfortunately there are a profusion of jobs that may or may not be associated with neoplasms. This high number certainly creates confusion as to whether an association actually exists or whether an element of chance has played a part in the reporting of such associations. Often what one researcher has found significant has been refuted in the next publication. White collar employment[67,74,75,82,83,84] for example managers, administrators, health professionals, has been implicated as a moderately elevated risk factor, but so has blue collar employment such as mechanics, naval aircraft repairmen, leather workers, labourers and sailors[79,82,83,85,86] Also farmers, and oil and natural gas workers[87,88,89] have not been exempt from this scrutiny. In New Zealand, Pearce and colleagues[82] have found an increased odds ratio for men working in the

security field which includes the armed forces and police (OR 2.74).

3.5 RCMP Historical Cohort Study

A companion study involving the RCMP highway patrol has been undertaken. For this initiative, a historical cohort design was used in which a group in the RCMP were identified at some point in the past and analysis of their subsequent morbidity experience during the observation period analyzed. The study design was conceptually longitudinal with a time interval extending from the past to the present and, in addition, it is possible to set up the cohort retrospectively and continue it forward prospectively, adding current data to the assembled cohort. The purpose of this research study was to determine the profile of exposure and cancer outcomes in members of the RCMP. Details on the methodology and results of this study are provided in Appendix A.

4. METHODOLOGY

4.1 General Design

Exposure to NIRs from radar units is almost exclusively restricted to people employed in policing. The specific objectives of this study are:

1) To determine the prevalence of testicular cancer in Canadian police officers by surveying the members from the police forces across Canada.

2) To determine prevalences of any other cancers such as leukemia, brain, melanoma of the eye or skin, thyroid and bone among police.

3) To describe the distribution of radar use by police in Canada.

The design used in this study is cross-sectional with the main intent of determining the prevalence of testicular and other cancers among living members of the five largest police forces in Canada. Each participating police force has provided a mailing list of all active and pensioned members of their force. This level of cooperation has permitted the study to be a census of these 5 forces.

4.2 Target Population

The population of interest for this study is all Canadians who have worked as a police officer since the introduction of radar for the purpose of traffic control. As mentioned above, traffic radar has been used in Canada for approximately 40 years. Therefore this population includes all currently employed police officers, all those who have retired from a police force, all those who have died but had served as a police officer, and all who are no longer employed with a police force but do not receive a pension from a police force. Unfortunately there is no single overall system available to enable us to access lists of all persons who have worked as a police officer since the mid 1950's.

There is also no accurate method to trace the deceased police officers since occupation has not consistently been recorded on death certificates over the last 30 years. It is unlikely that the study would have been able to trace their exposure to radar units unless this information was contained in their employment records and that these records were made available to this study. There is also no way to trace former police officers who left a police force without a pension.

The target population of interest for this survey are the alive (active and pensioned) police officers.

4.3 Study Population

The study population includes all alive police officers, approximately 36,000 active and 17,200 pensioned police officers, in the five largest police forces in Canada. These forces, the RCMP, OPP, SQ, MTP and SPCUM account for 61% of all active police officers in Canada and cover the spectrum of law enforcement duties performed. Through the efforts of the CPA and the CPRC, each force provided a set of personalized mailing labels used to mail the questionnaire directly to all their active and pensioned police officers. Force specific letters were used in the mailing whereby the head of each force and the union leader signed original letter that was used with its members . (Appendix B).

Information was gathered to identify similarities and differences between the study population and the wider police community. All of our findings and conclusions will reflect the study population.

4.4 Instrument Development

The questionnaire for this study was developed and pretested in the pilot study. To ensure ease of completion, the questions were primarily closed form but open ended questions were included to allow for latitude in, response when it was considered necessary. The questionnaire used self-coded responses wherever possible. This ensured that a minimum amount of coding was required, and it facilitated data entry.

One version of the questionnaire (Appendix B) was translated and used. Members who are currently employed by the forces were instructed to skip the questions regarding an additional time frame for "after leaving the force", which was appended to the activities or injuries deemed to be potential risk factors for testicular cancer.

The questionnaire.was composed of three sections: work experience; health including cancer diagnosis(es) and risk factors; and demographics. The purpose of the work experience section was to collect all pertinent data necessary to calculate the exposure algorithm. Three time periods were allowed for and the participants were instructed to list as many time periods as possible, specifically start and end dates. This allowed for reconstruction of the timeline of their police career. The same strategy was used for periods of duty during which radar was used. In this case, the members were given up to five time periods to complete. A filter question was used to allow all members who had never performed radar duties to skip to the health section. All those who had performed radar duties completed questions ascertaining the amount of training received prior to radar assignment and period(s) of work that included radar duties. Since many of the work assignments included radar exposure but were not exclusively radar work the members were also asked to estimate the number of years, as well as the average number of days per week and hours per day of radar duty. Questions about the type of radar unit they used most often (mounted versus hand held) were also included in this section. The last question included in the work experience section was where the radar unit was kept when active but not pointed at a vehicle. This was to provide an indication of risky behaviour that might be associated with the use and placement of radar units.

The health section was designed to collect information on cancer diagnosis, specifically testicular cancer. A filter question at the beginning of this section inquired about whether the member had ever been told by their physician that they had cancer. All respondents who answered positively to this question continued by completing information on the type of cancer diagnosed, date of diagnosis, whether it had spread, and if so to which site and

the corresponding date of diagnosis. Specific cancers listed in this section included leukemia, brain, melanoma of the eye or skin, thyroid, salivary gland and bone as they have been associated with exposure to various frequencies of the electromagnetic spectrum. Space was also left for free response to other cancers not included in the list. All those who responded negatively skipped the questions relating to cancer diagnosis and continued with the instructions for the risk factors potentially associated with testicular cancer. If the member was female, she was instructed to go to the next section.

Other components in this section focused on the putative risk factors for testicular cancer such as undescended testis, bicycling, horseback riding and severe trauma. Time periods were defined for the latter three risk factors and included "prior to joining the force" and "during police service"; the pensioners also were asked about "after leaving the force". A positive response to testicular trauma led to the additional question of whether the member sought medical care.

The last section included the demographic questions, specifically date of birth, gender, marital status, progeny and rank.

4.5 Data Management

Questionnaires were returned by Canada Post in business reply envelopes addressed to the Clinical Epidemiology Unit (CEU) at the Ottawa Civic Hospital. Envelopes containing the questionnaires were open. The questionnaires were scanned for completeness and whether any special notes were included that required immediate action. Batch numbers were assigned as a proxy for exact date of receipt. Coding decisions (Appendix B) had been made a priori in the pilot study and were adhered to for this study. Questionnaires were prepared for data entry. The questionnaires were entered directly into the SAS database that was designed to appear identical to the questionnaire format.

4.6 Estimating Exposure

As with many occupational studies, exposure is the most difficult component to measure. Crude estimates can often be extracted, but these may apply only to groups of employees and cannot be individualized to personal exposure. This problem is especially true if the

exposure is deemed to be harmless as is the case with police radar units used to measure vehicular speed. Manufacturers and government agencies have conducted tests to determine the exact emissions from radar units, but it is often difficult to apply these findings to actual exposure in workers as their behaviour with these units varies on an individualbasis.

Since it is impossible to physically and accurately measure occupational exposure toNIR in a retrospective fashion, estimates of the exposure toNIR from the use of radar units was performed by using the algorithm of general exposure developed from information collected in the pilot study. The variables used in the algorithm include the number of years, hours per day and days per week assigned to highway patrol (as this is where radar unit use occurs).

Levels of exposure were classified as low (below the 25th percentile of exposure), moderately low (between the 25th and less than the 50th percentile), moderate (between the 50th and less than the 75th percentile), moderately high (between the 75th and less than the 90th percentile) and high (at or above the 90th percentile). This. is the same approach to classification used by Theriault et al[90] once exposure levels were measured among electric workers.

4.7 Outcome Measures

The primary outcome of interest is whether the police officer has been told that s/he has been diagnosed with cancer, specifically testicular neoplasms in the male officers. Secondary outcomes for this study are cancers that may also be associated with exposure to various frequencies of the electromagnetic spectrum. These cancers include leukemia, brain, melanoma of the eye or skin, thyroid and bone. Date of diagnosis and information on the potential spread of cancer including the site and date was ascertained for each participant. Proposed risk factors for testicular cancer (undescended testis, bicycling, horseback riding and severe trauma) were only collected from male police officers. Other data that were gathered included membership in a police service, employment status and sociodemographic information such as date of birth, gender, marital status and progeny.

4.0 Analysis

Descriptive analyses were performed on all the variables to address the study objectives. Frequency distributions were computed for all nominal and ordinal variables while univariate procedures were used for continuous variables providing medians and ranges. The outcome of cancer was defined as all invasive cancers. Non-invasive skin cancers were reported only in the standardized incidence ratio tables. The prevalence of testicular cancer in the male cohort was calculated. The prevalence of all other types of cancer was investigated in both genders.

The estimated exposure for each participant, who has used radar, was calculated using the algorithm developed in the pilot study. These subjects were classified into the appropriate exposure level.

The epidemiological measures that were considered for this cross-sectional study for prevalence comparisons are prevalence ratios and prevalence differences (comparing persons in a given exposure level with persons in the reference category of lowest or no exposure). Internal comparisons (exposure levels) were considered.

5. RESULTS

Detailed results overall and by each police force are provided in Appendix C and D.

5.1 Response Rates

Data from 25,777 questionnaires were entered into the study database. Taking into consideration the inventory of forms at the end of the study, a total 50,1 19 questionnaires were distributed. Assuming this number equals the number of forms mailed to the various

association members, an overall response rate of 51.4% was obtained. Details of the return rates are given in Table 5.1. The rate varied by police force from a low of 38.9% for the MTP to 59.0% for the RCMP. Retumed questionnaires that were not entered indicated that some were sent to deceased members (spouse and children receiving pension benefits) and some members received more then one questionnaire (either the member belonged to more than one of the forces at different times or the mailing inadvertently included two questionnaires).

Table 5.1: Questionnaire Return Rates

Police Force	Number Distributed	Number Entered	Response Rate	Number Returned N/A	Number Returned Refused
MTP	7,129	2779	38.9%	24	6
OPP	6,625	3,772	56.9%	23	1
RCMP	**21,540**	12,714	59.0%	212	47
SPCUM	8,025	3,328	41.5%	22	5
SQ	6,800	3,187	46.9%	2	5
ALL	50,119	25,777	51.4%	283	64

5.2 Demographics

Detailed information on the demographics of the respondents is given in Appendix C (TablesC.I.I, C.2.1, C.3.1, C.4.1, C.5.1 and C.6.1) and Appendix D (Figures D.I, D.2, D.3 and D.4). In particular, the average age was 47 years, 92% were male, 85% were married (including common law) and 78% had children.

Of the respondents, 93% were non-commissioned officers, 66% were currently working in a police force and the average number of working years in the police forces was 20 years. Further details of work histories are given in Appendix C (Tables C.1.2, C.2.2, C.3.2, C.4.2, C.5.2 and C.6.2) and Appendix D (Figures D.5 and D.6).

5.3 Cancer

A total of 1,141 primary invasive cancers were reported by 1,073 members (4.2% of the respondents). Of these, 1,014 were male, 57 were female and in two cases gender was not indicated. Detailed information by police force of these cancers is provided in Appendix C (Tables C.1.6, C.l.7, C.2.6, C.2.7, C.3.6, C.3.7, C.4.6, C.4.7, C.5.6 ,C.5.7 ,C.6.6 and C.6.7). A summary of the distribution of these cancers by gender and site is given in Table 5.2. In particular, the most common cancer reported by both genders is melanoma. (This must be interpreted with caution as it may include non-invasive cancer (skin cancer).

The prevalence of cancer for selected sites for males in the police forces surveyed is summarized in Table 5.3. Bone tissue and skin (13.4 per 1000) and genital organs (12.7 per 1000) had the highest prevalence rates.

Table 5.2: **Distribution of Primary Invasive Cancer Sites: All Departments**

Number of police officers with invasive cancer = **Male 1014 (4.3%), Female 57(2.9%), Overall 1073 (4.2%)**

	Male		Female		Overall	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Blood & Lymph Tissues	**95**	**8.6**	**7**	**19.4**	**102**	**8.9**
Blood	35	3.2	1	2.8	36	3.2
Lymphoma & Non-Hodgkin's	30	2.7	3	8.3	33	2.9
Hodgkin's Disease	27	2.1	2	5.6	25	2.2
Other	7	0.6	1	2.8	8	0.7
Bone Tissue & Skin	**320**	**29.0**	**12**	**33.3**	**333**	**29.2**
Bone (unspecified)	12	1.1	0	0.0	12	1.1
Sarcoma	8	0.7	0	0.0	8	0.7
Melanoma	300	27.2	12	33.3	313	27.4
Brain	**13**	**1.2**	**0**	**0.0**	**13**	**1.1**
Eye	**6**	**0.5**	**0**	**0.0**	**6**	**0.5**
Digestive Organs	**129**	**11.7**	**0**	**0.0**	**130**	**11.4**
Colo-rectal	110	10.0	0	0.0	111	9.7
Stomach	9	8.2	0	0.0	9	0.8
Other	10	0.9	0	0.0	10	0.9
Genital Organs	**203**	**27.5**	**4**	**11.1**	**308**	**27.0**
Prostate	235	21.3	--	--	236	20.7
Testicular	67	6.1	--	--	67	5.9
Male other	1	0.1	--	--	1	0.1
Female other	--	--	4	11.1	4	0.4
Head & Neck	**40**	**3.6**	**0**	**0.0**	**40**	**3.5**
Salivary Gland	12	1.1	0	0.0	12	1.1
Other	28	2.5	0	0.0	28	2.5
Respiratory	**43**	**3.9**	**0**	**0.0**	**43**	**3.8**
Lung	39	3.5	0	0.0	39	3.4
Larynx	4	0.4	0	0.0	4	0.4
Urinary Tract	**93**	**8.4**	**2**	**5.6**	**95**	**8.3**
Bladder	66	6.0	0	0.0	66	5.8
Kidney	26	2.4	0	0.0	26	2.3
Other urinary	1	0.1	2	5.6	3	0.3
Breast	**1**	**0.1**	**7**	**19.4**	**8**	**0.7**
Endocrine Glands	26	2.4	3	8.3	**29**	**2.5**
Thyroid	23	2.1	3	8.3	26	2.3
Other	3	0.3	0	0.0	3	0.3
Other & Unspecified	**33**	**3.0**	**1**	**2.8**	**34**	**3.0**
Total	1102	100.0	36	100.0	1141	100.0

Table 5.3: Prevalence of Cancer (Male) for Selected Sites

	Prevalence per 1000
Blood & Lymph Tissues	4.0
Digestive Organs	5.4
Bone Tissue & Skin	13.4
Genital Organs	12.7
Head & Neck	1.7
Respiratory	1.8
Urinary Tract	3.9
Endocrine	1.1
Testicular	2.8
Melanoma	12.6

5.4 Radar

Approximately 67% of the respondents indicated that radar was part of their job. A wide variation in performing radar duties across the police forces was found with 25% of the SPCUM and 92% of the OPP indicating radar use. The average number of years performing radar duties was 8.2 with an average of 3.1 days per week and 4.8 hours per day. Usually both hand held and mounted radar units were used (60%), with only 10% and 30% using only hand held and mounted respectively.

Using the percentiles of the distribution of total exposure years for the overall sample, levels of exposure were classified as low, moderately low, moderate, moderately high, and high. Using this classification system, Table 5.4 provides a summary of exposure by police force.

Table 5.4: Distribution of Respondents by the Exposure Algorithm

Police Force	Exposure Level					
	None	Low	Moderately Low	Moderate	Moderately High	High
MTP	41.3	22.8	17.2	10.6	4.9	3.2
OPP	9.01	16.51	19.5	24.2	18.2	12.6
RCMP	33.1	17.7	15.8	16.5	10.5	6.5
SPCUM	77.8	10.1	6.2	3.6	1/9	0.6
SQ	26.8	11.6	21.4	24.5	11.2	4.5
ALL	35.6	16.3	15.9	16.3	9.9	6.0

Using the placement of the unit when it was active but not pointed at a car, behaviours were classified as: most risky (next to body or front seat area of car); risky (mounted inside or kept inside car excluding the risky and least risky locations); least risky (on dash pointing forward or mounted on outside of windows); and not risky (kept on outside of car). Overall, 45% of the respondents indicated behaviours considered most risky, with 24%, 66% and 18% of behaviours considered risky, least risky and not risky respectively.

Further details on the radar use are provided in Appendix C (Tables C.1.3, C.1.4, C.1.5, C.2.3, C.2.4, C.2.5, C.3.3, C.3.4, C.3.5, C.4.3, C.4.4, C.4.5, C.5.3, C.5.4, C.5.5, C.6.3, C.6.4 and C.6.5) and Appendix D (Figures D.7, 0.8, D.9, D.IO, D.II, D.12, D.13, D.14 and 0.15).

5.5 Cancer and ,Radar

The distribution of primary invasive cancer by exposure level is provided in Table 5.5 by police force. In general, cancer occurred most often in members that were not exposed and no trend in cancer with increasing levels of exposure was found.

Table 5.5: Distribution of Primary Invasive Cancer by Exposure

(a)

Police Force	Exposure Level						
	None	Low	Moderately Low	Moderate	Moderately High	High	Overall
MTP	6.7	3.3	3.0	3.7	2.4	3.8	4.7
OPP	10.2	3.5	4.6	3.7	6.0	6.4	5.2
RCMP	8.5	3.0	2.8	1.7	2.3	2.8	4.5
SPCUM	3.7	1.2	3.1	1.8	1.7	0.0	3.3
SQ	5.5	2.5	0.8	1.7	0.6	0.7	2.4
ALL	6.7	2.9	2.8	2.3	3.0	3.7	4.2

(b)

Police Force	Exposure Level			
	Least Exposed	Moderately Exposed	Most Exposed	Overall
MTP	5.5	3.3	2.9	4.7
OPP	5.9	4.1	6.2	5.2
RCMP	6.6	2.2	2.5	4.5
SPCUM	3.4	2.6	1.3	3.3
SQ	4.6	1.3	0.6	2.4
ALL	5.5	2.5	3.3	4.2

In particular for testicular cancer, the distribution by exposure indicated no trend with levels of exposure: least exposed 0.34%; moderately exposed 0.15% and most exposed 0.29%. For the 6 levels of exposure the percents were: no exposure 0.33%; low 0.20%;moderately low 0.16%; moderate 0.15%; moderately high 0.29% and high 0.41%.

5.6 Risk Factors for Testicular Cancer:

Proposed risk factors for testicular cancer include undescended testis, testicular trauma and activities such as bicycling and horseback riding. Overall, 4.7% of the respondents indicated that they were bom with undescended testicle(s) and 11.4% indicated a severe injury or trauma to the testicles. Details of this information by force and associated activities are given in Appendix C (Tables C.I.8, C.I.9, C.2.8, C.2.9, C.3.8, C.3.9, C.4.8, C.4.9, C.5.8, C.5.9, C.6.8 and C.6.9, and Appendix D (Figures D.16, 0.17, 0.18, D.19, 0.20, D.21, 0.22 and D.23).

6.0 SUMMARY

With respect to the study objectives the following was found:

(1) Prevalence of testicular cancer was 2.8 per 1000.

(2) Prevalence of other cancers are given in Table 5.3. In particular, the most common cancer reported by both genders was melanoma with a prevalence of 12.6 per 1000. (This must be interpreted with caution as it may include non-invasive cancer (i.e. skin cancer)).

(3) Although a wide variation was found across the police forces, approximately 67% of the respondents indicated that radar was part of their job. The average number of years performing radar duties was 8.2 years. Usually both hand held and mounted radar units were used.

The distribution of primary invasive cancer by exposure level is provided in Table 5.5 by police force. In general, cancer occurred most often in members that were not exposed and no trend in cancer with increasing levels of exposure was found.

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APPENDIX A:

RCMP Historical Cohort Study

Appendix A - RCMP Historical Cohort Study

As indicated in this report, a study involving the RCMP highway patrol was carried out as a pilot to the larger five police force study. The purpose of this research study was to determine the profile of exposure and cancer outcomes in members of the Royal Canadian Mounted Police (RCMP) who have ever performed radar duties. The specific objectives of the study were:

1) To characterize exposure to radar units in the RCMP in order to develop a classification system.

2) To survey the study population to determine the occurrence and types of cancer.

3) To ascertain whether there is any association between exposure to radar units and the diagnosis of cancer in each of the cohorts.

Methodology

The design was a historical cohort study involving 4 cohorts. The target population was defined as all members of the RCMP who had been assigned to highway patrol from 1973 onward. Four cohorts of subjects were identified within this population and surveyed: pensioned members (n=1819), active members who had 30 or more consecutive days of sick leave (n=750), a sample of active members who had less than 30 consecutive days of sick leave (n=750) and the deceased members (n=146). For the purpose of this study results from the deceased cohort will not be discussed. The questionnaire ascertained police service, radar unit usage, diagnosis of cancer, risk factors for testicular cancer and socio-demographic information.

Each of these three objectives, as they relate to the RCMP study, are described below:

1) To characterize exposure to radar units in the RCMP in order to develop a classification system.

Members were provided with two opportunities to report their radar exposure. The first question asked about the time periods (up to five periods with start and end years) during which they were assigned to radar duty. The second asked the member for an estimate of the number of years, days per week and hours per day that they performed radar duties.

Information was also sought on the radar training they received as well as on the location where the unit was kept while it was active but not pointed at traffic.

An exposure algorithm was computed using the estimates described above. Based on Theriault's et al (Theriault G, Goldberg M, Miller AB et al. Cancer

risks associated with occupational exposure to magnetic fields among electric utility workers in Ontario and Quebec, Canada and France: 1970-1989. Am J Epidemiol 1994; 139:550-72) work in exposure to electromagnetic fields, exposure was classified into five levels of exposure (less than the 25th percentile, 25th percentile to less than the 50th percentile, 50th percentile to less than 75th percentile, 75th percentile to less than 90th percentile, and greater than or equal to the 90th percentile of exposure). For some of the analyses, the five levels were further collapsed into three levels of exposure (least, moderate and most exposed).

2) To survey the study population to determine the occurrence and types of cancer.

The outcome of cancer was determined from self report. Eachquestionnairewith a positive or don't know response to whether the member had ever been told by a physician that they had cancer was adjudicated on two separate occasions. Information on the site of the cancer and year of diagnosis was recorded. Data entry permitted multiple primaries to be reported.

Standardized incidence ratios (SIR) were also calculated to compare cancer incidence in all living members (using an algorithm which weighted the data from the three cohorts of alive members to represent all members who have ever been assigned to highway patrol) to the 1971 standard Canadian male population.

3) To ascertain whether there is any association between exposure to radar units and the diagnosis of cancer in each of the cohorts.

This aspect of the study involved a complex analysis plan which included descriptive analyses, both frequencies and univariate. Bivariate analyses of exposure and outcome with the performance chi-square procedures were initially used to examine the association between radar exposure and cancer. Logistic regression modeling was then applied to control for potential confounding and assess the proposed association.

Results

1) To characterize exposure to radar units in the RCMP in order to develop a classification system.

Only 76.1% of pensioned members reported having ever performed radar duties compared to over 98% in either of the other two living cohorts. Results from the calculation of the exposure algorithm identified that the median number of hours reported by the members with extended sick leave was 1.31

times more hours of lifetime exposure than the active cohort without extended leave and 2.78 times more hours of exposure than the pensioner cohort.

Table A.1: Exposure Algorithm Compared Between the Cohorts

	Pensioners	Active Members with Extended Sick Leave	Active Members without Extended Sick Leave
Least Exposed	54.5%	11.8%	15.4%
Moderately Exposed	32.6%	52.3%	56.2%
Most Exposed	13.0%	35.9%	28.4%
. Total N			521

(missing = 57 pensioners, 15 with sick leave, 18 without sick leave)

Regardless of the cohort membership as exposure increased to the highest levels, more members performed the 'riskiest behaviours with the radar unit.

2) To survey the study population to determine the occurrence and types of cancer.

Invasive cancers were reported by 7.4% of pensioners, 4.5% of active members with 30 or more consecutive days of sick leave and 1.5% of members without extended sick leave. Of the cancers diagnosed, testicular accounted for 5.2% of cancers reported by pensioners and 8.0% of cancers reported by the cohort of active members with extended sick leave. The most common primary cancer was melanoma (skin) accounting for 33.3% of cancers reported by the pensioners, 20% of cancers reported by members with extended sick leave and 50% of cancers among members without extended sick leave. The pensioner cohort had the bulk of cancer diagnoses (n=96), the active members with 30 or more days of sick leave reported 25 primary cancer sites and the active members without extended sick leave reported 6 cancer sites.

Table A.2: Distribution. of Primary Invasive Cancer Sites Among Pensioners

	Frequency	Percent of all Reported Cancer Sites
Blood & Lymph Tissues	**9**	**9.4**
Blood	2	2.1
Hodgkin's Disease	3	3.1
Lymphoma and Non-Hodgkin's	4	4.2
Bone Tissue & Skin	**35**	**36.5**
Bone (unspecified)	2	2.1
Sarcoma	1	1.0
Melanoma	32	33.3
Brain	**2**	**2.1**
Digestive Organs	**12**	**12.5**
Bowel	2	2.1
Colon	7	7.3
Esophagus	1	1.0
Rectum	1	1.0
Stomach	1	1.0
Genital Organs	**18**	**18.8**
Penis	1	1.0
Prostate	12	12.5
Testicular	5	5.2
Head & Neck	**2**	**2.1**
Lip	1	1.0
Throat	1	1.0
Respiratory System - Lung	**4**	**4.2**
Urinary Organs	**12**	**12.5**
Bladder	4	4.2
Kidney	7	7.3
Ureter	1	1.0
All Other & Unspecified	**2**	**2.1**
Adenocarcinoma of the Axilla	1	1.0
Unspecified Carcinoma	1	1.0
Total	**96**	**100**

Table A.3: Distribution of Primary Invasive Cancer Sites Among Active Members with Extended Sick Leave

	Frequency	Percent of all Reported Cancer Sites
Blood & Lymph Tissues	**6**	**24.0**
Blood	2	8.0
Myeloma	1	4.0
Hodgkin's Disease	2	8.0
Lymphoma and Non-Hodgkin's	1	4.0
Bone Tissue & Skin	**5**	**20.0**
Melanoma	5	20.0
Brain	**1**	**4.0**
Digestive Organs	**2**	**8.0**
Colon	2	8.0
Genital Organs	**4**	**16.0**
Prostate	2	8.0
Testicular	2	8.0
Head & Neck	**2**	**8.0**
Lip	1	4.0
Sinus	1	4.0
Urinary Organs	**3**	**12.0**
Kidney	3	12.0
All Other & Unspecified	**2**	**8.0**
Thyroid	1	4.0
Unspecified Carcinoma	1	4.0
Total	**25**	**100**

Table A.4: Distribution of Primary Invasive Cancer Sites Among Active Members without Extended Sick Leave

	Frequency	Percent of all Reported Cancer Sites
Bone Tissue & Skin	**3**	**50.0**
Melanoma	3	50.0
Genital Organs	**1**	**16.7**
Cervical (invasive)	1	16.7
Urinary Organs	**2**	**33.3**
Bladder	2	33.3
Total	**6**	**100**

Using SIR calculations to compare to the 1971 standard Canadian male population, members of the RCMP who had been assigned to highway patrol did not have an excess of cancers diagnosed for all cancer types or for testicular cancer. However, an excess risk of developing melanoma of the skin (SIR = 7.8) and urinary tract cancers (SIR = 2.0) were identified. An excess of non-melanoma skin cancers was also noted (SIR = 2.1). The low number of observed cases for brain tumours, cancer of the digestive organs and lung cancer may be due to the short duration from diagnosis to death for these types of cancer.

Table A.5: Standardized Incidence Ratios for the RCMP

	Observed	Expected	SIR (O/E)		95% Confidence Interval Lower	Upper
All Invasive Cancers	147.68	147.46	1.00		0.85	1.19
Blood & Lymph Tissues	13	21.01	0.62		0.33	1.06
Melanoma	53.84	6.87	7.84	*	5.82	10.35
Brain	3	5.83	0.51	*	0.11	0.79
Digestive Organs	14	33.19	0.42	*	0.23	0.71
Colorectal	12	18.52	0.65		0.34	1.13
Male Genital Organs	21	16.24	1.29		0.80	1.98
Prostate	14	8.70	1.61		0.88	2.70
Testicular	6	7.18	0.84		0.31	1.82
Respiratory System - Lung	3	28.14	0.11	*	0.02	0.31
Urinary Organs	27.56	13.93	1.98	*	1.32	2.87
Kidney	10	5.51	1.82		0.87	3.34
Non Melanoma Skin	53.84	25.53	2.11	*	1.56	2.78

* Statistically significant ($p<0.05$)

3) To ascertain whether there is any association between exposure to radar units and the diagnosis of cancer in each of the cohorts.

The results of the analyses performed to assess whether there is an association between exposure to radar units and the diagnosis of cancer revealed that as exposure increased the incidence of reported cancers decreased.

Conclusions

There is no conclusive evidence of adverse health effects from exposure to radar among these cohorts of RCMP members. The active members with extended sick leave were more exposed to radar units than any of the other cohorts. For all cohorts, as exposure increased cancer incidence decreased. There was no measured excess of all cancers or testicular cancer among the members of the RCMP. An excess risk of developing melanoma of the skin (SIR = 7.8) and urinary tract cancers (SIR = 2.0) was identified. The risk of developing non-melanoma skin cancers (SIR = 2.1) was also elevated.

APPENDIX B:

Covering Letters for Survey and Survey Questionnaire

Metropolitan Toronto Police

40 College Street, Toronto, Ontario, Canada. M5G 2J3
(416) 808-2222 FAX (416) 808-8202

David I. Boothby
Chief of Police

To Serve and Protect Protect
Working with the community

File Number: .....

Mr. Scott Newark
Executive Director
Canadian Police Association
141 Catherine Street, Suite 100
Ottawa, Ontario
K2P 1C8

Dear Mr. Newark:

The Metropolitan Toronto Police Service is in receipt of correspondence relative to a proposed study, on the link between the use of police radar and the development of cancer.

I endorse this study, and sincerely hope that the results from it would be beneficial to all police officers.

As Chief of Police, I am deeply concerned about health and safety issues that affect our members, and will ensure that recommended changes are implemented in order to protect members of the Metropolitan Toronto Police Service.

Sincerely,

David J. Boothby
Chief of Police

HHD:bh

c.c. Mr. Paul Walter, President, Metropolitan Toronto Police Association

METROPOLITAN
TORONTO
POLICE
ASSOCIATION

PAUL WALTER
President
JACK RITCHIE
Vice-President
DOUGLAS CORRIGAN
Secretary

DENNIS EWANIUK
Director, Education & Research Services
BOB BILLINGER
Director, Monitors & Information Services

AL OLSEN
Director Uniform Member Services
DON COURTS
Director Civilian Member Services

Dear Association Member:

You have probably seen some of the media coverage surrounding the question of whether there might be a link between using police radar and the development of cancer.

An investigation is being conducted to assess the degree of radar being performed and the types of cancer occurring in former and current police officers. Past and present members of the Metro Toronto Police along with the Ontario Provincial Police, Montreal Urban Community Police, Quebec Provincial Police and the RCMP are being surveyed.

Enclosed please find a brief questionnaire and a pre-addressed stamped envelope. Completing the questionnaire will only take a few minutes of your time, and the results from this study will be very useful to police services and associations across Canada. Whether you have used radar or not, it is important that you respond.

All information received will be kept completely confidential. No results will be released that could identify you personally.

This study is being undertaken by Dr. George A. Wells at the University of Ottawa's Clinical Epidemiology Unit at the Ottawa Civic Hospital in cooperation with the Canadian Police Research Centre, the Solicitor General's Office, the Canadian Police Association, and the Canadian Association of Chiefs of Police. Should you have any questions, please do not hesitate to call Judy Snider, Study Coordinator in Ottawa at (613) 7984555, extension 5182.

Thank you very much for your help and prompt reply.

Fraternally yours,

METROPOLITAN TORONTO POLICE ASSOCIATION

Per: Paul Walter

Paul Walter, President

Enclosure

180 Yorkland Blvd., North York, Ontario, Canada M2J 1R5 Telephone (416) 491-4301 Fax (416) 494-4948

Ontario Provincial Police

Ontario Provincial Police Association

Dear OPP Member:

You have probably seen some of the media coverage surrounding the question of whether there might be a link between using police radar and the development of cancer.

An investigation is being conducted to assess the degree of radar use by, and the types of cancer occurring in, former and current police officers. Past and present members of the OPP, along with the Metropolitan Toronto Police, Montreal Urban Community Police, Quebec Provincial Police and the RCMP are being surveyed.

Enclosed please find a brief questionnaire and a pre-addressed stamped envelope. Completing the questionnaire will only take a few minutes of your time, and the results from this study will be very useful to the Canadian police community. Whether you have used radar or not, it is extremely important that you respond. We, as the employer and the employee representatives, feel this study is critical for the health of our retired and current members.

All information received will be kept completely confidential. No results will be released that could identify you personally.

This study is being undertaken by Dr. George A. Wells at the University of Ottawa's Clinical Epidemiology Unit at the Ottawa Civic Hospital, in cooperation with the Canadian Police Research Centre, the Solicitor General's Office, the Canadian Police Association, and the Canadian Association of Chiefs of Police. Should you have any questions, please do not hesitate to call Judy Snider, Study Coordinator in Ottawa at (613) 798-5555, extension 5 182.

Thank you very much for your help and prompt reply.

Yours sincerely,

Thomas B. O'Grady
Commissioner

Brian Adkin
President

Enclosures

Royal Canadian Mounted Police | Gendarmerie royale du Canada

J.P.R. Murray
Commissioner Le Commissaire

TO ALL MEMBERS
A TOUS LES MEMBRES

You have probably seen some of the media coverage regarding the question of whether there might be a link between the use of traffic radar and the development of certain cancers.

An investigation is being undertaken to assess, on a scientific basis, whether there is any correlation between the use of traffic radar and/or the amount of its use and any occurrence of cancer in former and current Canadian police officers. Past and present members of the RCMP, along with the Metro Toronto Police, the Ontario Provincial Police, la Sûreté du Quebec and le Service de police de la communauté urbaine de Montreal, are being surveyed.

The study is being conducted by Dr. George Wells of the University of Ottawa's Clinical Epidemiology Unit at the Ottawa Civic Hospital, in cooperation with the Canadian Police Association, the federal Ministry of the Solicitor General, the Canadian Association of Chiefs

Vous avez peut-être vu certains articles dans les journaux sur la possibilité qu'il existe un lien entre le recours au radar de vitesse et l'apparition de certains cancers.

On a entrepris une evaluation scientifique afin de determiner s'il y a une correlation entre l'utilisation des radars de vitesse ou leur durée d'utilisation et certains cancers chez les policiers canadiens actifs ou à la retraite. On évalue actuellement la situation chez les membres actifs et à la retraite de la GRC, ainsi que chez les policiers du Metro Toronto Police, Ontario Provincial Police, de la Sûreté du Quebec et du Service de police de la communaute urbaine de Montreal.

L'étude est effectuée par le Dr George Wells de l'unité d'épidémiologie clinique de 1'Université d'Ottawa à l'Hôpital Civic d'Ottawa, en collaboration avec 1'Association canadienne des chefs de police, le ministère fédéral du Solliciteur general, 1'Association

. . . /2

1200 Vanier Parkway
Ottawa, Ontario
KIA OR2

1200, promenade Vanier
Ottawa (Ontario)
KIA OR2

of Police, and the Canadian Police Research Centre.

canadienne des chefs de police et le Centre canadien de recherches policières.

Enclosed please find a brief questionnaire and a pre-addressed and stamped envelope. Completing the questionnaire will only take a few minutes of your time and the results from this study will be very useful to police officers and police services across Canada. **Regardless of whether you have ever used traffic radar or not, it is important that you respond.**

Vous trouverez ci-joint un bref questionnaire et une enveloppe pré-adressée et deja affranchie. Vous pouvez repondre au questionnaire en quelques minutes et les résultats de cette etude seront très utiles aux policiers et aux services de police de l'ensemble du pays. **Importe que vous répondiez au questionnaire, cue vous ayez déjà utilisé un radar de vitesse ou non.**

All information received will be kept strictly confidential. No results will be released that could identify you personally. If you have any questions, please do not hesitate to 'contact the Study Coordinator, Judy Snider, in Ottawa at (613) 798-5555, extension 5182.

Les renseignements reçus seront strictement confidentiels. Aucun résultat pouvant vous identifier personnellement ne sera communique. N'hésitez pas à communiquer avec la coordonnatrice de l'étude, Judy Snider, au (613) 798-5555, poste 5182, à Ottawa, si vous avez des questions.

Thank you very much for your help and your prompt response to this important survey.

Nous vous remercions de votre aide et de repondre rapidement à cet important sondage.

J.P.R. Murray

Enclosure

piece jointe

Association de bienfaisance et de retraite
des policiers et policières de la Communauté urbaine de Montréal

Le 5 juillet 1996

Aux policiers et policieres retraités de 1'A.B.R.P.C.U.M.

Objet : **Étude du Centre canadien des recherches policières sur les risques de l'utilisation de radars pour la santé**

Cher membre,

Vous avez probablement deja vu des reportages qui examinent l'existence d'un lien entre l'utilisation du radar et le cancer chez les policiers et policieres.

Une etude, actuellement en cours, vise à determiner le genre de radar utilisé et les types de cancer qui se développent chez les policiers (ères) retraités. Le CCRP conduit également cette etude auprès d'autres corps policiers tels que Toronto Metro, la Sûreté du Quebec, la Police provinciale de 1'Ontario et la G.R.C.

Vous trouverez ci-joint, un questionnaire et une enveloppe de retour affranchie. Il ne vous faudra que quelques minutes pour repondre aux questions. Les résultats de cette étude seront très utiles aux services policiers du Canada; même si vous n'avez pas utilisé de radar, il est important d'y repondre. **Tous les renseignements seront gardés strictement confidentiels et les données publiées ne permettront pas de vous identifier.**

L'étude est menée par le docteur George A. Wells de l'unité d'épidémiologie clinique de l'université d'Ottawa, de l'hbpital Civic, en collaboration avec le Centre canadien de recherches policieres, le bureau du Solliciteur général, 1'Association canadienne des policiers et 1'Association canadienne des chefs de police. Pour de plus amples renseignements, n'hésitez pas à communiquer avec Judy Snider, coordonnatrice de l'étude à Ottawa au (613) 798-5555, poste 5182.

Nous vous remercions de votre collaboration et vous prions de recevoir, cher membre, l'expression de nos sentiments les meilleurs.

Le président,

Jacques Perron

p.j.

480, rue Gilford, bureau 200, Montréal (Québec) H2J 1N3
Téléphone: (5 14) 527-806 : Télécopieur (5 14) 522-7736

CPRC CANADIAN POLICE RESEARCH CENTRE

C C R P CENTRE CANADIEN DE RECHERCHES POLICIÈRES

Aux policiers et policieres, membres actifs du S.P.C.U.M.

OBJET: ***Étude du Centre canadien des recherches policières sur les risques de l'utilisation de radars pour la santé.***

Cher membre du S.P.C.U.M.,

Vous avez probablement deja vu des reportages qui discutent l'existence d'un lien entre l'utilisation du radar et le cancer chez les policiers(ères).

Une etude est actuellemeut en cours qui vise à determiner le genre de radar utilisé et les types de cancer qui se développent chez les anciens policiers et les membres actifs. Le CCRP conduit présentement cette etude auprès de d'autres corps policiers tels que Toronto Metro, la Sûreté du Quebec, la Police proviuciale de I'Ontario aiusi que la G.RC.

Vous trouverez ci-joint, uu questionnaire et une euveloppe pré-adressée affranchie. 11 ne vous faudra que quelques miuutes pour répondre aux questions et les résultats de l'étude seront très utiles aux services policiers du Canada. Même si vous n'avez pas utilisé de radar, il est important d'y répondre.

Tous les reuseignements seront gardés strictement confidentiels. Les données publiées ne permettront pas de vous identifier.

L'étude est menée par le docteur George A. Wells de l'unité d'épidémiologie clinique de l'Université d'Ottawa, de l'hôpital Civic, avec la collaboration du Centre cauadien de recherches policieres, le bureau du Solliciteur général, l'Association canadienne des pohciers et l'Association canadienne des chefs de police. Pour plus de reuseignemeuts, n'hesitez pas à communiquer avec Judy Snider, Coordiuatrice de l'étude, à Ottawa au (613) 798-5555, poste 5182.

Nous vous remercions de votre collaboration.

Veuillez agréer, Madame, Monsieur, l'expression de nos sentiments distiugués.

Jacques Duchesneau, Adm.A., AdeC
Directeur
Service de Police
Communauté urbaine de Montreal

Yves Prud'Homme
President
Fraternité des pohciers et policieres
Communauté urbaine de Montreal

P.J.

Telephone: (613) 993-3737 NRC/CPRC • Ottawa, Ontario K1A OR6 Fax: (613) 9561473

DIRECTION DES RESSOURCES HUMAINES ET
DES RELATIONS PROFESSIONNELLES
255, boul. Crémazie Est
9e étage
Montréal (Québec)
H2M 1L5

Votre dossier.....

Notre dossier.....

Le 25 janvier 1996

OBJET : Étude sur les effets du radar

Madame,
Monsieur,

À titre de membre ou de membre retraité de la Sûreté du Québec, vous avez probablement lu des reportages qui discutent d'un lien possible entre l'utilisation du radar et le cancer chez les policiers(ères).

Même si présentement, rien ne nous porte à croire qu'un tel lien existe, une étude est actuellement en cours qui vise à déterminer le degré d'exposition au radar utilisé et les types de cancer qui se développent chez les anciens policiers et les membres actifs. Les policiers(ères) actifs et anciens de la Sûreté du Québec ainsi que Toronto Métro, la Police provinciale de l'Ontario, la Communauté urbaine de Montréal et la Gendarmerie royale du Canada sont présentement à l'étude.

Vous trouverez ci-joint un questionnaire et une enveloppe pré-adressée et affranchie. Il ne vous faudra que quelques minutes pour répondre aux questions. Les résultats de l'étude seront très utiles aux services policiers du Canada. Même si vous n'avez pas utilisé de radar, il est important d'y répondre.

Tous les renseignements seront gardés strictement confidentiels. Les données publiées ne permettront pas de vous identifier.

.../

4G3-067 (95-09)

L'étude est menée par le Dr George A. Wells de l'Unité d'épidémiologie clinique de l'Université d'Ottawa, de l'Hôpital Civic, avec la collaboration du Centre canadien de recherches policières, le bureau du Solliciteur général, l'Association canadienne des policiers et l'Association canadienne des chefs de police.

Pour plus de renseignements, n'hésitez pas à communiquer avec Mme Judy Snider, coordonnatrice de l'étude à Ottawa, au :

(613) 798-5555, local 5182.

Nous vous remercions de votre collaboration et vous prions d'agréer, Madame, Monsieur, l'expression de nos sentiments les meilleurs.

Simon Bigras
Chef du Service de la santé
et de la sécurité du travail

Michel Oligny
Vice-président à l'aide
au personnel
Association des policiers
provinciaux du Québec

SB/MO/dd

p.j. (1)

0278547199-K1Y4E9-BR01

CLINICAL EPIDEMIOLOGY UNIT
OTTAWA CIVIC HOSPITAL - F6
1053 CARLING AVE
OTTAWA ON K1Y 9Z9

POLICE RADAR HEALTH STUDY

INSTRUCTIONS:

THIS QUESTIONNAIRE HAS 3 SECTIONS: SECTION 1 RELATES TO YOUR EXPERIENCE IN POLICE WORK, SECTION 2 INQUIRES ABOUT YOUR HEALTH AND ACTIVITIES, AND SECTION 3 PROVIDES US WITH BACKGROUND INFORMATION ABOUT POLICE AS A WORK FORCE. AS SOME QUESTIONS MAY NOT APPLY SPECIFICALLY TO YOU, PLEASE FOLLOW THE INSTRUCTIONS AND IF DIRECTED TO DO SO, SKIP THOSE QUESTIONS THAT DO NOT APPLY TO YOU. IF YOU ARE NOT ADVISED TO SKIP A SET OF QUESTIONS, EVEN IF YOU DO NOT THINK THAT THEY APPLY TO YOU, PLEASE ANSWER THEM TO THE BEST OF YOUR KNOWLEDGE. PLEASE CIRCLE THE NUMBER NEXT TO THE RESPONSE THAT BEST MATCHES YOUR ANSWER OR WRITE IN YOUR ANSWER WHERE YOU ARE ASKED TO SPECIFY IT.

CPC 95-E

Disponible en français

The purpose of this survey is to determine whether there is an occupational risk of cancer among certain police officers. Your assistance will be important to other police officers. Please help us by answering the following questions.

SECTION 1- POLICE WORK

1. Please specify the police 'force of which you are currently a member?

   Specify: _____

2. What is your current working status?

   1. Working as a police officer or member of the RCMP
   2. Retired from police work

3. Please indicate the period(s) during which you worked as member of a police force. If you have served for more than one period of time, please indicate as many time periods as necessary to best describe your time of service.

   Specify: From 19_____ to 19_____

   From 19_____ to 19_____

   From 19_____ to 19_____

   From 19_____ to 19_____

   From 19_____ to 19_____

4. Have you ever used radar as part of your job?

   1. Yes
   2. No → PLEASE GO TO SECTION 2

IF YOU DID ANY RADAR, PLEASE ANSWER THE FOLLOWING QUESTIONS

5. How long was your first training session before using radar in your work?

   1. Received no standard training
   2. Less than a day
   3. 1 - 3 days
   4. More than 3 days but less than a week
   5. A week or more

6. Please indicate the period(s) during which you performed radar duties. If you did radar as part of your police work for more than one period of time, please indicate as many time periods as necessary.

Specify: From 19_____ to 19_____.

From 19_____ to 19_____

From 19_____ to 19_____

From 19_____ to 19_____

From 19_____ to 19_____

7. For the entire time you did radar		
7.a Approximately how many years did you perform radar duties? Specify: _____ years	7.b Approximately how many days a week did you perform radar duties? **specify:** _____ days per week	7.c Approximately how many hours a day was the radar unlt turned on? **specify:** _____ hours per day

a. What types of radar units did you use on a "regular basis"?

1. Only hand held radar unlts
2. Only mounted radar units (including tripod units)
3. Both hand held and mounted radar units

→→ **If** you used both types, please indicate which typa of radar unit you used most often,

8a. Type of unit used most often:

1 . Hand held radar unit
2. Car mounted radar unit (including tripod units)

9. While the unit was **active,** where did you keep the radar unit when not pointed at a cat? **(Circle as many as apply)**

1. Next to body or in the front seat area (excluding dash)
2. Mounted inside or kept inside police car (excluding 1 above and dash)
3. On dash, pointed through the windshield or pointed ahead or mounted on the outside of windows
4. Unit kept on the outside of police car for example on tripod or trunk or lightbar or hood.

SECTION 2 - HEALTH AND ACTIVITIES

10. Has a doctor ever told you that you had cancer?

1. Yes
2. No **3 PLEASE GO TO QUESTION 11**
a. Don't know

IF YOU HAVE BEEN DIAGNOSED WITH CANCER, PLEASE ANSWER THE FOLLOWING QUESTIONS BY CIRCLING THE NUMBER BESIDE THE TYPE(S) OF CANCER YOU HAVE HAD.

10.a. What kind of cancer were you diagnosed with and when were you first told?		WHEN (YEAR)?
1.	Blood (leukemia)	19_____
2.	Bone	19_____
3.	Brain	19_____
4.	Eye	19_____
5.	Melanoma	19_____
6.	Salivary gland	19_____
7.	Testicular	19_____
a.	Thyroid	19_____
9.	Other (please specify)	
	_____	19_____
	_____	19_____

10.b. Where did the cancer SPREAD (if anywhere)?		WHEN (YEAR)?
0.	Did **Not** Spread	
1.	Blood (leukemia)	19_____
2.	Bone	19_____
3.	Brain	19_____
4.	Eye	19_____
5.	Melanoma	19_____
6.	Salivary gland	19_____
7.	Testicular	19_____
a.	Thyroid	19_____
9.	Other (please specify)	
	_____	19_____
	_____	19_____

IF YOU ARE FEMALE, PLEASE GO TO SECTION 3. IF YOU ARE MALE PLEASE CONTINUE AND ANSWER ALL THE QUESTIONS THAT FOLLOW.

11. Were you born with undescended testicle(s)?

1. Yes
2. No
a. Don't know

12. For each of the following time periods, please indicate how often you have bicycled.					
12.a.	Prior to joining the police force.	12.b.	During your police service	12.c.	If retired: After leaving the police force
1.	Often	1.	Often	1.	Often
2.	Once in a while	2.	Once in a while	2.	Once in a while
3.	Never	3.	Never	3.	Never

13. For each of the following time periods, excluding recruit training, please indicate how often you have riden a horse.					
13.a.	Prior to joining the police force	13.b.	During your police service	13.c.	If retired: After leaving the police force
1.	Often	1.	Often	1.	Often
2.	Once in a while	2.	Once in a while	2.	Once in a while
3.	Never	3.	Never	3.	Never

14. Have you ever had a severe injury or trauma to the testides?

1. Yes →
2. No
8. Don't know

14.a. If yes, when? (Circle as many as apply)	14.b Did you see a doctor?
1. Prior to joining the police force 2. During your police service 3. If retired: After leaving the police force	1. Yes 2. No

SECTION 3 - PERSONAL INFORMATION

15. What is your date of birth?

Specify: _____ / _____ / 19_____
day month year

16. Are you male or female?

1. Male
2. Female

17. What is your current marital status?

1. Never married
2. Married (including common law)
3. Separated or divorced
4. Widowed

18. Do you have any biological children?

1. Yes
2. No

19. What is the highest rank you have attained while working for a police force?

Specify: _____

Comments: _____

_____

Thank you for answering these questions. Please return the completed questionnaire in the enclosed pre-addressed stamped envelope to:

Clinical Epidemiology Unit,
Ottawa Civic Hospital F-6,1053 Carling Avenue, Ottawa, ON KIY 4E9

ÉTUDE SUR LA SANTÉ ET LE RADAR POUR LES MEMBRES DES FORCES POLICIÈRES

INSTRUCTIONS:

LE QUESTIONNAIRE COMPREND TROIS SECTIONS: LA SECTION 1 PORTE SUR VOTRE EXPÉRIENCE DE TRAVAIL EN TANT QUE POLICIERS(ÈRES), LA SECTION 2 TRAITE DE VOTRE SANTÉ ET DE VOS ACTIVITÉS ET LA SECTION 3 FOURNIT DES RENSEIGNEMENTS GÉNÉRAUX SUR LES POLICIERS(ÈRES) EN TANT QUE GROUPE DE TRAVAIL. CERTAINES QUESTIONS NE S'APPLIQUENT PEUT-ÊTRE PAS PRÉCISEMENT À VOUS. SUIVEZ LES INSTRUCTIONS ET SI ON VOUS DEMANDE DE LE FAIRE, SAUTEZ LES QUESTIONS QUI NE S'APPLIQUENT PAS À VOTRE CAS. SI ON VOUS DEMANDE DE RÉPONDRE À DES QUESTIONS QUI À VOTRE AVIS NE S'APPLIQUENT PAS À VOTRE CAS, VEUILLEZ QUAND MÊME Y RÉPONDRE DE VOTRE MIEUX. ENCERCLEZ LE NUMÉRO À CÔTÉ DE L'ÉNONCÉ QUI CORRESPOND LE MIEUX À VOTRE RÉPONSE OU ÉCRIVEZ VOTRE RÉPONSE À L'ENDROIT INDIQUÉ.

CPC 95-F

Available in English

33435

Le but du présent sondage est de determiner s'il existe un risque de cancer lié au travail pour les membres des forces de police. Votre collaboration sera précieuse et utile à d'autres policiers. Veuillez nous aider en répondant aux questions suivantes:

SECTION 1- TRAVAIL AU SEIN DE LA FORCE

1. Précisez de quelle force policière êtes-vous couramment membre?

   Précisez : _____

2. Quelle est votre status d' emploi actuel?

   1. Employ&(e) comme policier(ère) ou membre de la GRC
   2. Retraité(e) d'un emploi de policier

3. Veuillez indiquer la période durant laquelle vous avez travaillé comme membre d'une force. Si vous avez été policier(ière) pendant plus d'une période, veuillez indiquer autant de périodes que nécessaire pour décrire la durée de votre service.

   Précisez : De 19 _____ à 19_____

   De 19 _____ à 19_____

   De 19 _____ à 19_____

   De 19 _____ à 19_____

   De 19 _____ à 19 _____

4. Durant votre service, vous êtes-vous servi(e) d'un radar?

   1. Oui
   2. Non PRIÈRE DE PASSER A LA SECTION 2

SI VOUS AVEZ TRAIVAILLÉ AVEC UN RADAR, VEUILLEZ RÉPONDRE AUX QUESTIONS SUIVANTES

5. Quelle a été la durée de votre formation au travail avant d'avoir utilisé un radar?

   1. Aucune formation officielle
   2. Moins d'un jour
   3. 1 à 3 jours
   4. Plus de trois jours, mais moins d'une semaine
   5. Une semaine ou plus

6. Veuillez indiquer la période durant laquelle vous avez travaillé avec un radar. Si vous vous êtes servi(e) d'un radar pendant plus d'une période de service dans la force, veuillez indiquer autant de périodes que nécessaire.

Précisez : De 19_____ à 19_____

De19_____ à 19_____

De19_____ à 19_____

De19_____ à 19_____

De 19_____à19 _____

7. En-tenant compte de toutes les périodes pendant lesquelles vous avez travailé avec un radar :		
7.a Environ combien d'années avez-vous utilisé un radar? Précisez : _____années	7.b Environ combien de jours par semaine avez-vous utilisé un radar? Précisez : _____jours par semaine	7.c Environ combien d'heures par jour le radar était-il allumé? Précisez : _____heures par jour

6. Quels genres de radars utilisiez-vous habituellement?

1. Seulement des pistolets radars (pistoletscinémométriques)
2. Seulement des radars installés à bord de l'automobile (incluant sur un trépied)
3. Les deux genres

→→ Sl vous utilisiez les deux genres d'appareils, veuillez indiquer lequel vous utilisiez le plus souvent.
6.a. Genre de radar utilisé le plus fréquemment : 1. Pistolet radar 2. Radar installé à bord de l'automobile

9. Pendant que l'appareil était allumé, oh gardiez-vous le radar lorsqu'il n'était pas braqué sur une voiture? Encerclez ceux qul s'applIquent

1. Près du corps ou sur le siège avant (excluant le tableau de bord).
2. Fixé à l'intérieur ou garde à l'intérieur de l'auto patrouille (excluant item 1 et le tableau de bord).
3. Sur le tableau de bord, dirigé à travers le pare-brise ou fixé à l'extérieur du pare-brise.
4. Appareil à l'extérieur du véhicule; par exemple : sur un trépied ou le capot ou le toit ou les gyro-phares.

SECTION 2- SANTÉ ET ACTIVITÉS

10. Un médecin vous a-t-il deja dit que vous aviez un cancer?

1. Oui
2. Non → **PRIÈRE DE PASSER AQUESTION 11**
8. Ne sais pas

SI ON VOUS A DIT QUE VOUS ÉTIEZ ATTEINT D'UN CANCER, VEUILLEZ RÉPONDRE AUX QUESTIONS SUIVANTES EN ENCERCLANT LE NUMÉRO CORRESPONDANT AU(X) GENRE(S) DE CANCER DIAGNOSTIQUÉ(S).

10.a.	De quel genre de cancer vous a-t-on dit que vous étiez atteint et quand vous l'a-t-on annoncé pour la première fois?	QUAND (ANNÉE)?
1.	Sang (leucémie)	19_____
2.	Os	19_____
3.	Cerveau	19_____
4.	Oeil	19_____
5.	Mélanome	19_____
6.	Glandes salivaires	19_____
7.	Testicules	19_____
8.	Glande thyroïde	19_____
9.	Autre (précisez)	
	_____	19_____
	_____	19_____

10.b.	Où le cancer s'est-il **PROPAGÉ** (le cas échéant)?	QUAND (ANNÉE)?
0.	Ne s'est **pas** propagé	
1.	Sang (leucémie)	19_____
2.	Os	19_____
3.	Cerveau	19_____
4.	Oeil	19_____
5.	Mélanome	19_____
6.	Glandes salivaires	19_____
7.	Testicules	19_____
8.	Glande thyroïde	19_____
9.	Autre (précisez)	
	_____	19_____
	_____	19_____

SI VOUS ÊTES UNE **FEMME**, VEUILLEZ PASSER À LA **SECTION 3**. SI VOUS ÊTES UN **HOMME**, VEUILLEZ CONTINUER ET RÉPONDRE À TOUTES LES QUESTIONS QUI SUIVENT.

11. À la naissance, votre (vos) testicule(s) étai(en)t-elle(s) dans le scrotum?

2. Oui
1. Non
8. Ne sais pas

12.	Pour chacune des périodes suivantes, veuillez dire à quelle fréquence vous avez fait de la bicyclette?				
12.a	Avant de joindre les rangs de la force	12.b	Durant vos années de service policier	12.c	**SI retraité :** Après avoir quitté la force
1.	Souvent	1.	Souvent	1.	Souvent
2.	De temps en temps	2.	De temps en temps	2.	De temps en temps
3.	Jamais	3.	Jamais	3.	Jamais

13.	Pour chacune de ces périodes, **à l'exception** de la période de formation au recrutement, veuillez indiquer à quelle fréquence vous êtes montés à cheval.				
13.a	Avant de joindre les rangs de la force	13.b	Durant vos années de service policier	13.c	**SI retraité :** Après avoir quitté la force
1.	Souvent	1.	Souvent	1.	Souvent
2.	De temps en temps	2.	De temps en temps	2.	De temps en temps
3.	Jamais	3.	Jamais	3.	Jamais

14. Avez-vous jamais eu une blessure grave ou un traumatisme aux testicules?

1. Oui → 14.a. **Dans l'affirmative, quand? (Encerclez ceux qui s'appliquent.)**
   - **1.** Avant de joindre les rangs de la force
   - 2. Durant vos années de service policier
   - 3. SI retraité : Après avoir quitté la force

   14.b. **Avez vous consult6 un médecin?**
   - 1. Oui
   - 2. Non
2. Non
8. Ne sais pas

SECTION 3 - RENSEIGNEMENTS PERSONNELS

15. Quel est votre date de naissance?

Précisez : _____ / _____ / 19 _____
jour mois année

16. Êtes-vous :

1. Homme?
2. Femme?

17. Quel est votre état civil actuel?

1. Célibataire (jamais marié(e))
2. Marie(e) (ou conjoint de fait)
3. Séparé(e) ou divorce(e)
4. Veuf (veuve)

18. Avez-vous des enfants biologiques?

1. Oui
2. Non

19. Quel a été votre rang plus élevé dans la force?

Précisez : _____

Commentaires _____

_____

Nous vous remercions de votre collaboration. Veuillez retourner le questionnaire dûment rempli dans l'enveloppe ci-jointe affranchie et libellée à l'adresse suivante :

Unite d'épidémiologie clinique,
Hôpital Civic d'Ottawa F-6, 1053 avenue Carling, Ottawa, ON K1Y 4E9

APPENDIX C:

Frequency Distributions: Overall and for Each Police Force

Table C.I .1 : Demographics: All Departments

Median age (years)	46.7
Language (%)	
English	68.0
French	32.0
Gender (%)	
Male	92.4
Female	7.6
Marital status (%)	
Never Married	6.2
Married/Com. Law	84.8
Separated/Divorced	7.4
Widowed	1.6
Biological children (%)	
Yes	77.6
No	22.4
Rank (%)	
Non-commissioned	93.4
Commissioned	5.9
Other	0.6

Table C.12: Work Histories: All Departments

Work Status	
Working	66.0
Retired	34.0
Total years in police work	20.1
Ever radar (%)	
Yes	66.5
No	33.5
Days of radar training	
None	11.1
< 1 day	21.1
1-3 days	46.2
3<-<7 days	10.9
7+ days	10.7
Years of radar	8.2
Days per week of radar	3.1
Hours per day of radar	4.8

Table C.1.3: Distribution by the Exposure Algorithm: All Departments

	Percent	Cumulative Percent
No Exposure	35.6	
25th Percentile	16.3	51.6
> 25th and ≤ 50th Percentile	15.9	67.8
> 50th and ≤ 75th Percentile	16.3	84.1
> 75th and ≤ 90th Percentile	9.9	94.0
> 90th Percentile	6.0	100.0
(Missing = 1543)		

	Percent	Cumulative Percent
Least Exposed	51.9	
Moderately Exposed	32.2	84.1
Most Exposed	15.9	100.0
(Missing = 1543)		

Table C.1.4: Distribution Radar Unit Type: All Departments

	Percent	
Hand held	10.2	
Mounted	30.1	
Both	59.6	Hand Held = 24.0 Mounted = 76.0
(Missing = 8710)		

Table C.1.5: Distribution of Risky Behaviour With Radar Units: All Departments

	Percent
Most Risky (next to body in front seat of car)%	
Yes	44.5
No	55.5
Risky (mounted inside or kept inside car, not most risky or least risky)%	
Yes	24.0
No	76.0
Least Risky (on dash pointing forward)%	
Yes	66.4
No	33.6
Not Risky (kept on outside of car)%	
Yes	16.3
No	81.7
(Missing = 8866)	

Table C.1.6: Distribution of Primary Invasive Cancer Sites: All Departments

Number of police officers with cancer = 1364 (5.3%)
Number of police officers with invasive cancer = 1073 (4.2%)

	Frequency	Percent of all Reported Cancer Sites
Blood & Lymph Tissues	**102**	**6.9**
Blood	36	3.2
Lymphoma & Non-Hodgkin's	33	2.9
Hodgkin's Disease	25	2.2
Other	8	0.7
Bone Tissue & Skin	333	29.2
Bone (unspecified)	12	1.1
Sarcoma	8	0.7
Melanoma	313	27.4
Brain	**13**	1.1
Eye	6	0.5
Digestive Organs	**130**	**11.4**
Cole-rectal	111	9.7
Stomach	9	0.8
Other	10	0.9
Genital Organs	306	27.0
Prostate	238	20.7
Testicular	67	5.9
Male other	1	0.1
Female other	4	0.4
Head & Neck	40	3.5
Salivary Gland	12	1.1
Other	28	2.5
Respiratory	43	3.8
Lung	39	3.4
Larynx	4	0.4
Urinary Tract	**95**	8.3
Bladder	66	5.8
Kidney	26	2.3
Other urinary	3	0.3
Breast	6	0.7
Endocrine Glands	**29**	2.5
Thyroid	26	2.3
Other	3	0.3
Other & Unspecified	34	3.0
Total	1141	100.0

Table C.I.7: Distribution of Primary Non-invasive Cancer Sites: All Departments

	Frequency	Percent of all Reported Cancer Sites
Skin	324	92.0
Cervical	28	8.0
Total	352	100.0

Table C.1.8: Risk Factors for Testicular Cancer: All Departments

Undescended Testicles (%)	
Yes	4.7
No	65.4
Don't Know	29.8
Testicular Trauma (%)	
Yes	11.4
No	86.7
Don't Know	1.9
Saw a Doctor for Trauma (%)	
Yes	63.0
No	37.0
When Trauma Occurred (%)	
Prior to Service	
Yes	51.9
No	48.1
During Service	
Yes	56.9
No	43.1
After Service	
Yes	3.9
No	96.1

Table C.1.9: Risk Factors (Activities) for Testicular Cancer: All Departments

Bicycling Prior to Service (%)	
Often	48.0
Once in a while	48.9
Never	3.1
Bicycling During Service (%)	
Often	14.6
Once in a while	65.1
Never	20.3
Bicycling After Service (%)	
Often	13.4
Once in a while	44.9
Never	41.7
Riding Prior to Service (%)	
Often	6.3
Once in a while	45.7
Never	48.0
Riding During Service (%)	
Often	5.0
Once in a while	27.3
Never	67.7
Riding After Service (%)	
Often	1.2
Once in a while	9.6
Never	89.2

Table C.2.1: Demographics: Metropolitan Toronto Police

Median age (years)	47.0
Language (%)	
English	99.6
French	0.4
Gender (%)	
Male	92.1
Female	7.9
Mariial status (%)	
Never Married	5.2
Married/Corn. Law	85.2
Separated/Divorced	7.5
Widowed	2.1
Biological children (%)	
Yes	79.0
No	21.o
Rank (%)	
Non-commissioned	87.1
Commissioned	11.8
Other	1.2

Table C.2.2: Work Histories: Metropolitan Toronto Police

Work Status	
Working	60.2
Retired	39.8
Total years in police work	22.4
Ever radar (%)	
Yes	62.3
No	37.7
Days of radar training	
None	5.3
< 1 day	16.1
I-3 days	37.9
3<-<7 days	11.6
7+ days	29.2
Years of radar	6.0
Days per week of radar	2.9
Hours per day of radar	4.3

Table C.2.3: Distribution by the Exposure Algorithm: Metropolitan Toronto Police

	Percent	Cumulative Percent
No Exposure	41.3	
25th Percentile	22.8	64.1
> 25th and ≤ 50th Percentile	17.2	81.3
> 50th and ≤ 75th Percentile	10.6	92.0
> 75th and ≤ 90th Percentile	4.9	96.8
> 90th Percentile	3.2	100.0
(Missing = 241)		

	Percent	Cumulative Percent
Least Exposed	64.1	
Moderately Exposed	27.9	92.0
Most Exposed	8.0	100.0
(Missing = 241)		

Table C.2.4: Distribution Radar Unit Type: Metropolitan Toronto Police

	Percent	
Hand held	42.3	
Mounted	9.1	
Both	48.6	Hand Held = 51.6 Mounted = 48.4
(Missing = 1058)		

Table C.2.5: Distribution of Risky Behaviour With Radar Units: Metropolitan Toronto Police

	Percent
Most Risky (next to body in front seat of car)%	
Yes	70.9
No	29.1
Risky (mounted inside or kept inside car, not most risky or least risky)%	
Yes	21.6
No	78.2
Least Risky (on dash pointing forward)%	
Yes	43.1
No	56.9
Not Risky (kept on outside of car)%	
Yes	19.5
No	80.5
(Missing = 6866)	

Table C.2.6: Distribution of Primary Invasive Cancer Sites: Metropolitan Toronto Police

Number of police officers with cancer = 176 (6.4%)
Number of police officers with invasive cancer = 126 (4.6%)

	Frequency	Percent of all Reported Cancer Sites
Blood & Lymph Tissues	**14**	**9.7**
Blood	6	4.1
Lymphoma & Non-Hodgkin's	6	4.1
Other	2	1.4
Bone Tissue & Skin	**50**	34.4
Bone (unspecified)/Sarcoma	6	4.2
Melanoma	44	30.3
Brain	**0**	**0**
Eye	**0**	**0**
Digestive Organs	13	9.0
Colo-rectal	11	7.6
Stomach	2	1.4
Other	0	0
Genital Organs	40	27.6
Prostate	26	19.3
Testicular	12	6.3
Male other	0	0
Female other	0	0
Head & Neck	2	1.4
Respiratory	**5**	3.4
Urinary Tract	11	7.6
Bladder	**7**	4.8
Kidney	**4**	2.8
Other urinary	**0**	0
Breast	**2**	1.4
Endocrine Glands	6	4.1
Other & Unspecified	2	1.4
Total	145	100.0

Table C.2.7: Distribution of Primary Non-invasive Cancer Sites: Metropolitan Toronto Police

	Frequency	Percent of all Reported Cancer Sites
Skin	54	98.2
Cervical	1	1.8
Total	55	100.0

Table C.2.8: Risk Factors for Testicular Cancer: Metropolitan Toronto Police

Undescended Testicles (%)	
Yes	2.2
No	76.5
Don't Know	21.3
Testicular Trauma (%)	
Yes	12.9
No	85.3
Don't Know	1.9
Saw a Doctor for Trauma (%)	
Yes	65.4
No	34.6
When Trauma Occurred (%)	
Prior to Service	
Yes	50.9
No	49.1
During Service	
Yes	60.4
No	39.6
After Service	
Yes	2.8
No	97.2

Table C.2.9: Risk Factors (Activities) for Testicular Cancer: Metropolitan Toronto Police

Bicycling Prior to Service (%)	
Often	48.3
Once in a while	48.7
Never	3.0
Bicycling During Service (%)	
Often	12.1
Once in a while	60.4
Never	27.6
Bicycling After Service (%)	
Often	10.0
Once in a while	39.7
Never	50.3
Riding Prior to Service (%)	
Often	3.9
Once in a while	49.3
Never	46.8
Riding During Service (%)	
Often	4.0
Once in a while	20.7
Never	75.3
Riding After Service (%)	
Often	0.5
Once in a while	5.6
Never	94.0

Table C.3.1: Demographics: Ontario Provincial Police

Median age (years)	**48.1**
Language (%)	
English	**99.8**
French	**0.2**
Gender (%)	
Male	**90.4**
Female	9.6
.Mariial status (%)	
Never Married	6.7
Married/Corn. Law	86.1
Separated/Divorced	5.9
Widowed	1.2
Biological children (%)	
Yes	78.8
No	**21.2**
Rank (%)	
Noncommissbned	93.1
Commissioned	6.9
Other	**0.1**

Table C.3.2: Work Histories: Ontario Provincial Police

Work Status	
Working	64.8
Retired	35.2
Total years in police work	20.1
Ever radar (%)	
Yes	91.7
No	8.3
Days of radar training	
None	27.3
‹ 1 day	51.8
I-3 days	17.5
3<-<7 days	1.3
7t days	2.2
Years of radar	11.0
Days per week of radar	2.8
Hours per day of radar	5.3

Table C.3.3: Distribution by the Exposure Algorithm: Ontario Provincial Police

	Percent	Cumulative Percent
No Exposure	9.0	
25th Percentile	16.5	25.5
> 25th and ≤ 50th Percentile	19.5	45.0
> 50th and ≤ 75th Percentile	24.2	69.2
> 75th and ≤ 90th Percentile	18.2	87.4
> 90th Percentile	12.6	100.0
(Missing = 288)		

	Percent	Cumulative Percent
Least Exposed	25.5	
Moderately Exposed	43.7	69.2
Most Exposed	30.8	100.0
(Missing = 288)		

Table C.3.4: Distribution Radar Unit Type: Ontario Provincial Police

	Percent	
Hand held	2.0	
Mounted	23.3	
Both	74.7	Hand Held = 21 .0 Mounted = 79.0
(Missing = 323)		

Table C.3.5: **Distribution** of Risky Behaviour With Radar Units: Ontario Provincial Police

	Percent
Most Risky (next to body in front seat of car)%	
Yes	51.9
No	48.1
Risky (mounted inside or kept inside car, not most risky or least risky)%	
Yes	29.7
No	70.3
Least Risky (on dash pointing forward)%	
Yes	71.3
No	28.7
Not Risky (kept on outside of car)%	
Yes	19.6
No	80.4
(Missing = 8866)	

Table C.3.6: Distribution of Primary Invasive Cancer Sites: Ontario Provincial Police

Number of police officers with cancer = 259 (6.9%)
Number of police officers with invasive cancer = 205 (5.4%)

	Frequency	Percent of all Reported Cancer Sites
Blood & Lymph Tissues	**19**	**9.0**
Blood	4	1.9
Lymphoma & Non-Hodgkin's	6	2.8
Other	9	4.3
Bone Tissue & Skin	**83**	**39.2**
Bone (unspecified)/Sarcoma	2	0.9
Melanoma	81	38.2
Brain	**2**	**0.9**
Eye	**1**	**0.5**
Digestive Organs	**22**	**10.4**
Cola-rectal	20	9.4
Stomach	2	0.9
Other	0	0.0
Genital Organs	**44**	**20.8**
Prostate	29	13.7
Testicular	14	6.6
Male other	0	0.0
Female other	1	0.5
Head & Neck	6	3.6
Respiratory	6	2.6
Urinary Tract	13	6.1
Bladder	10	4.7
Kidney	3	1.4
Other urinary	0	0.0
Breast	0	0.0
Endocrine Glands	3	1.4
Other & Unspecified	11	5.2
Total	212	100.0

Table C.3.7: Distribution of Primary Non-invasive Cancer Sites: Ontario Provincial Police

	Frequency	Percent of all Repotted Cancer Sites
Skin	65	90.3
Cervical	7	9.7
Total	72	100.0

Table C.3.8: Risk Factors for Testicular Cancer: Ontario Provincial Police

Undescended Testicles (%)	
Yes	2.0
No	79.1
Don't Know	19.0
Testicular Trauma (%)	
Yes	12.5
No	85.2
Don't Know	2.3
Saw a Doctor for Trauma (%)	
Yes	60.0
No	40.0
When Trauma Occurred (%)	
Prior to Service	
Yes	62.9
No	37.1
During Service	
Yes	47.3
No	52.7
After Service	
Yes	1.4
No	98.6

Table C.3.9: Risk Factors (Activities) for Testicular Cancer: Ontario Provincial Police

Bicycling Prior to Service (%)	
Often	44.6
Once in a while	52.9
Never	2.8
Bicycling During Service (%)	
Often	11.6
Once in a while	64.9
Never	23.5
Bicycling After Service (%)	
Often	11.9
Once in a while	41.0
Never	47.1
Riding Prior to Service (%)	
Often	4.7
Once in a while	49.9
Never	45.4
Riding During Service (%)	
Often	1.0
Once in a while	19.2
Never	79.8
Riding After Service (%)	
Often	0.4
Once in a while	4.1
Never	95.5

Table C.4.1: Demographics: Royal Canadian Mounted Police

Median age (years)	45.2
Language (%)	
English	85.5
French	14.5
Gender (%)	
Male	92.2
Female	7.8
Mariial status (%)	
Never Married	5.8
Married/Corn. Law	86.3
Separated/Divorced	6.3
Widowed	1.6
Biological children (%)	
Yes	79.0
No	21.0
Rank (%)	
Non-commissioned	94.5
Commissioned	4.6
Other	0.9

Table C.4.2: Work Histories: Royal Canadian Mounted Police

Work Status	
Working	69.2
Retired	30.8
Total years in police work	19.1
Ever radar (%)	
Yes	69.0
No	31.0
Days of radar training	
None	5.7
< 1 day	15.8
1-3 days	65.3
3<-<7 days	8.3
7+ days	4.9
Years of radar	7.7
Days per week of radar	3.2
Hours per day of radar	4.8

Table C.4.3: Distribution by the Exposure Algorithm: Royal Canadian Mounted Police

	Percent	Cumulative Percent
No Exposure	33.1	
25th Percentile	17.7	50.8
> 25th and ≤ 50th Percentile	15.8	88.8
> 50th and ≤ 75th Percentile	16.5	83.0
> 75th and ≤ 90th Percentile	10.5	93.5
> 90th Percentile	6.5	100.0
(Missing = 788)		

	Percent	**Cumulative Percent**
Least Exposed	**50.9**	
Moderately Exposed	**32.2**	**83.0**
Most Exposed	**17.0**	**100.0**
(Missing = 788)		

Table C.4.4: Distribution Radar Unit Type: Royal Canadian Mounted Police

	Percent	
Hand held	8.2	
Mounted	30.5	
Both	61.3	Hand Held = 23.8 Mounted = 76.2
(Missing = 3966)		

Table C.4.5: Distribution of Risky Behavlour With Radar Units: Royal Canadian Mounted Police

	Percent
Most Risky (next to body in front seat of car)%	
Yes	42.6
No	57.4
Risky (mounted inside or kept inside car, not most risky or least risky)%	
Yes	22.9
No	77.1
Least Risky (on dash pointing forward)%	
Yes	68.4
No	31.6
Not Risky (kept on outside of car)%	
Yes	15.2
No	84.8
(Missing = 8866)	

Table C.4.6: Distribution of Primary Invasive Cancer Sites: Royal Canadian Mounted Police

Number of police officers with cancer = 711 (5.7%)
Number of police officers with invasive cancer = 559 (4.5%)

	Frequency	Percent of all Reported Cancer Sites
Blood & Lymph Tissues	45	7.5
Blood	16	2.7
Lymphoma & Non-Hodgkin's	14	2.3
Other	15	2.5
Bone Tissue & Skin	**168**	**28.1**
Bone (unspecified)/Sarcoma	7	1.1
Melanoma	161	26.9
Brain	**9**	**1.5**
Eye	**5**	0.8
Digestive Organs	**69**	**11.5**
Cole-rectal	57	9.5
Stomach	4	0.7
Other	8	1.3
Genital Organs	171	28.6
Prostate	140	23.4
Testicular	29	4.8
Male other	1	0.2
Female other	1	0.2
Head & Neck	**17**	2.8
Respiratory	22	3.7
Urinary Tract	54	9.0
Bladder	37	6.2
Kidney	14	2.3
Other urinary	3	0.5
Breast	**4**	0.7
Endocrine Glands	**15**	2.5
Other & Unspecified	**19**	3.2
Total	598	100.0

Table C.4.7: Distribution of Primary Non-invasive Cancer Sites: Royal Canadian Mounted Police

	Frequency	Percent of all Reported Cancer Sites
Skin	165	89.7
Cervical	19	10.3
Total	184	100.0

Table C.4.8: Risk Factors for Testicular Cancer: Royal Canadian Mounted Police

Undescended Testicles (%)	
Yes	3.3
No	72.7
Don't Know	24.0
Testicular Trauma (%)	
Yes	12.4
No	85.7
Don't Know	1.9
Saw a Doctor for Trauma (%)	
Yes	58.2
No	41.8
When Trauma Occurred (%)	
Prior to Service	
Yes	50.6
No	49.4
During Service	
Yes	60.3
No	39.7
After Service	
Yes	3.6
No	96.4

Table C.4.9: Risk Factors (Activities) for Testicular Cancer: Royal Canadian Mounted Police

Bicycling Prior to Service (%)	
Often	49.9
Once in a while	47.5
Never	2.6
Bicycling During Service (%)	
Often	15.9
Once in a while	64.9
Never	19.2
Bicycling After Service (%)	
Often	13.2
Once in a while	45.5
Never	41.2
Riding Prior to Service (%)	
Often	8.9
Once in awhile	49.3
Never	41.9
Riding During Service (%)	
Often	8.0
Once in a while	34.8
Never	57.2
Riding After Service (%)	
Often	2.1
Once in a while	15.5
Never	82.5

Table C.5.1: Demographics: Service de Police Communauté urbaine de Montréal

Median age (years)	50.9
Language (%)	
English	2.3
French	97.7
Gender (%)	
Male	92.4
Female	7.6
Marital status (%)	
Never Married	7.9
Married/Com. Law	79.3
Separated/Divorced	10.1
Widowed	2.6
Biological children (%)	
Yes	70.3
No	29.7
Rank (%)	
Non-commissioned	93.4
Commissioned	6.4
Other	0.2

Table C.5.2: Work Histories: Service de Police Communauté urbaine de Montreal

Work Status	
Working	53.8
Retired	46.2
Total years in police work	22.9
Ever radar (%)	
Yes	25.2
No	74.8
Days of radar training	
None	28.9
< 1 day	12.1
1-3 days	23.1
3<-<7 days	20.5
7+ days	17.5
Years of radar	4.2
Days per week of radar	3.1
Hours per day of radar	4.4

Table C.53: Distribution by the Exposure Algorithm: **Service de Police Communauté urbaine de** Montréal

	Percent	Cumulative Percent
No Exposure	77.8	
25th Percentile	10.1	87.9
> 25th and ≤ 50th Percentile	6.2	94.0
> 50th and ≤ 75th Percentile	3.6	97.6
> 75th and ≤ 90th Percentile	1.8	99.4
> 90th Percentile	0.6	100.0
(Missing = 128)		

	Percent	Cumulative Percent
Least Exposed	87.9	
Moderately Exposed	9.7	97.6
Most Exposed	2.4	100.0
(Missing = 128)		

Table C.5.4: Distribution Radar Unit Type: **Service de Police Communauté urbaine de** Montréal

	Percent	
Hand held	27.9	
Mounted	39.6	
Both	32.6	Hand Held = 47.5 Mounted = 52.5
(Missing = 2499)		

Table C.5.5: Distribution of Risky Behaviour With Radar Units: **Service de Police Communauté urbaine de Montréal**

	Percent
Most Risky (next to body in front seat of car)%	
Yes	36.7
No	63.3
Risky (mounted inside or kept inside car, not most risky or least risky)%	
Yes	18.5
No	81.5
Least Risky (on dash pointing forward)%	
Yes	39.2
No	60.8
Not Risky (kept on outside of car)%	
Yes	28.4
No	71.6
(Missing = 8866)	

Table C.5.6: Distribution of Primary Invasive Cancer Sites: Service de Police Communauté urbaine de **Montrél**

Number of police officers with cancer = 133 (4.0%)
Number of police officers with invasive cancer = 108 (3.3%)

	Frequency	Percent of all Reported Cancer Sites
Blood & Lymph Tissues	14	**12.3**
Blood	5	4.4
Lymphoma & Non-Hodgkin's	5	4.4
Other	4	3.5
Bone Tissue & Skin	**19**	**16.7**
Bone (unspecified)/Sarcoma	4	3.6
M e l a n o m a	15	13.2
Brain	**0**	**0**
Eye	**0**	**0**
Digestive Organs	**12**	**10.5**
Cola-rectal	10	8.8
Stomach	1	0.9
Other	1	0.9
Genital Organs	36	31.6
Prostate	30	28.3
Testicular	5	4.4
Male other	0	0
Female other	1	0.8
Head & Neck	7	6.1
Respiratory	7	6.1
Urinary Tract	**12**	**10.5**
Bladder	7	6.1
Kidney	5.	4.4
Other urinary	0	0
Breast	2	1.6
Endocrine Glands	3	2.6
Other & Unspecified	2	1.6
Total	114	100.0

Table C.5.7: Distribution of Primary Non-invasive Cancer Sites: **Service de Police** Communauté **urbaine de** Montréal

	Frequency	Percent of all Reported Cancer Sites
Skin	29	100.0
Cervical	0	0.0
Total	29	100.0

Table C.5.8: Risk Factors for Testicular Cancer: Service de Police Communauté urbaine de Montreal

Undescended Testicles (%)	
Yes	11.3
No	38.1
Don't Know	50.5
Testicular Trauma (%)	
Yes	8.6
No	89.6
Don't Know	1.8
Saw a Doctor for Trauma (%)	
Yes	77.8
No	22.2
When Trauma Occurred (%)	
Prior to Service	
Yes	40.4
No	59.6
During Service	
Yes	58.3
No	41.7
After Service	
Yes	9.8
No	90.2

Table C.5.9: Risk Factors (Activities) for Testicular Cancer: Service de Police Communauté urbaine de Montréal

Bicycling Prior to Service (%)	
Often	48.8
Once in a while	47.0
Never	4.4
Bicycling During Service (%)	
Often	15.4
Once in a while	85.6
Never	19.0
Bicycling After Service (%)	
Often	16.3
Once in a while	48.9
Never	34.8
Riding Prior to Service (%)	
Often	3.1
Once in a while	36.8
Never	60.0
Riding During Service (%)	
Often	3.0
Once in a while	22.2
Never	74.8
Riding After Service (%)	
Often	0.6
Once in a while	4.7
Never	94.7

Table C.6.1: Demographics: Sûreté du Québec Police

Median age (years)	45.2
Language (%)	
English	1.4
French	98.6
Gender (%)	
Male	95.8
Female	4.2
Mariial status (%)	
Never Married	6.1
Married/Com. Law	82.6
Separated/Divorced	10.6
Widowed	0.8
Biological children (%)	
Yes	76.9
No	23.1
Rank (%)	
Non-commissioned	95.5
Commissioned	4.4
Other	0.1

Table C.6.2: Work Histories: Sûreté du Québec Police

Work Status	
Working	72.0
Retired	28.0
Total years in police work	19.0
Ever radar (%)	
Yes	73.8
No	26.2
Days of radar training	
None	5.8
< 1 day	2.7
I-3 days	31.9
3<-<7 days	30.8
7+ days	28.9
Years of radar	8.5
Days per week of radar	3.3
Hours per day of radar	4.3

Table C.6.3: Distribution by the Exposure Algorithm: Sûreté du Québec Police

	Percent	Cumulative Percent
No Exposure	26.8	
25th Percentile	11.6	38.5
> 25th and ≤ 50th Percentile	21.4	59.9
> 50th and ≤ 75th Percentile	24.5	84.3
> 75th and ≤ 90th Percentile	11.2	95.5
> 90th Percentile	4.5	100.0
(Missing = 77)		

	Percent	Cumulative Percent
Least Exposed	38.5	
Moderately Exposed	45.9	84.3
Most Exposed	15.7	100.0
(Missing = 77)		

Table C.6.4: Distribution Radar Unit Type: **Sûreté** du Québec Police

	Percent	
Hand held	0.3	
Mounted	50.8	
Both	48.8	Hand Held = 6.4 Mounted = 93.6
(Missing = 840)		

Table C.6.5: Distribution of Risky Behaviour With Radar Units: **Sûreté** du Québec Police

	Percent
Most Risky (next to body in front seat of car)%	
Yes	23.7
No	76.3
Risky (mounted inside or kept inside car, not most risky or least risky)%	
Yes	23.3
No	76.7
Least Risky (on dash pointing forward)%	
Yes	78.3
No	21.7
Not Risky (kept on outside of car)%	
Yes	23.5
No	76.5
(Missing = 8866)	

Table C.6.6: Distribution of Primary Invasive Cancer Sites: Sûreté du Québec Police

Number of police officers with cancer = 85 (2.7%)
Number of police officers with invasive cancer = 75 (2.4%)

	Frequency	Percent of all Reported Cancer Sites
Blood & Lymph Tissues	**10**	**13.9**
Blood	5	6.9
Lymphoma & Non-Hodgkin's	2	2.6
Other	3	3.9
Bone Tissue & Skin	**13**	**16.7**
Bone (unspecified)/Sarcoma	1	1.3
Melanoma	12	15.4
Brain	**2**	**2.6**
Eye	**0**	**0**
Digestive Organs	**14**	**17.9**
Colo-rectal	13	16.7
Stomach	0	0
Other	1	1.3
Genital Organs	**17**	**21.8**
Prostate	9	11.5
Testicular	7	9.0
Male other	0	0
Female other	1	1.3
Head & Neck	**6**	**7.7**
Respiratory	**3**	**3.8**
Urinary Tract	**5**	**6.9**
Bladder	5	6.9
Kidney	0	0
Other urinary	0	0
Breast	**0**	**0**
Endocrine Glands	**2**	**2.6**
Other & Unspecified	**0**	**0**
Total	72	100.0

Table C.6.7: Distribution of Primary Non-invasive Cancer Sites: Sûreté du Québec Police

	Frequency	Percent of all Reported Cancer Sites
Skin	12	100.0
Cervical	0	0.0
Total	12	100.0

Table C.6.6: Risk Factors for Testicular Cancer: Sûreté du Québec Police

Undescended Testicles (%)	
Yes	9.1
No	39.7
Don't Know	51.2
Testicular Trauma (%)	
Yes	7.8
No	90.8
Don't Know	1.4
Saw a Doctor for Trauma (%)	
Yes	78.3
No	21.7
When Trauma Occurred (%)	
Prior to Service	
Yes	54.4
No	45.8
During Service	
Yes	47.3
No	52.7
After Service	
Yes	5.3
No	94.7

Table C.6.9: Risk Factors (Activities) for Testicular Cancer: **Sûreté** du **Québec** Police

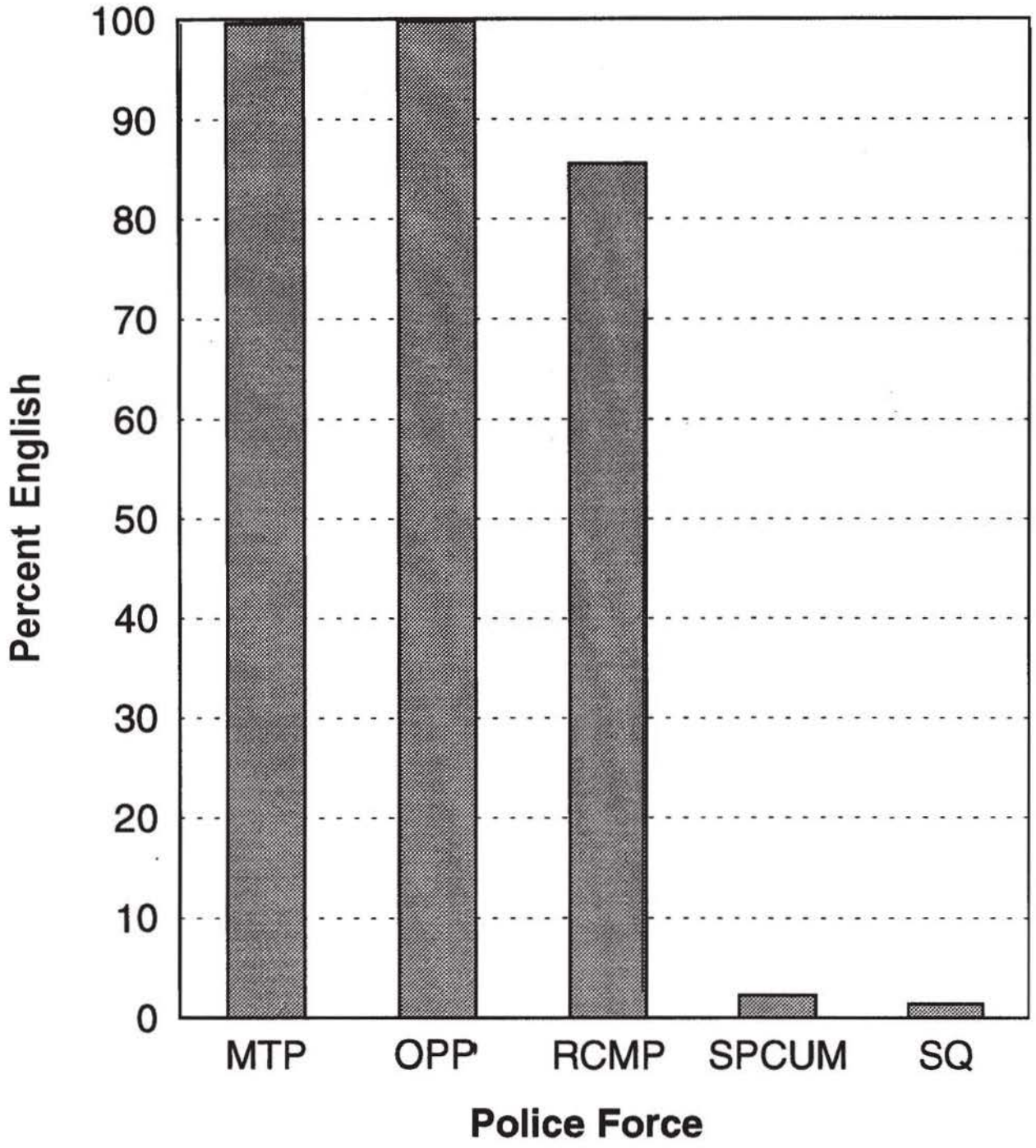
Bicycling Prior to Service (%)	
Often	43.6
Once in a while	52.3
Never	4.1
Bicycling During Service (%)	
Often	14.6
Once in a while	69.1
Never	16.3
Bicycling After Service (%)	
Often	16.1
Once in a while	47.2
Never	36.7
Riding Prior to Service (%)	
Often	3.0
Once in a while	32.9
Never	64.1
Riding During Service (%)	
Often	1.1
Once in a while	17.8
Never	81.1
Riding After Service (%)	
Often	0.7
Once in a while	4.9
Never	94.4

APPENDIX D:

Charts: Comparison of Departments

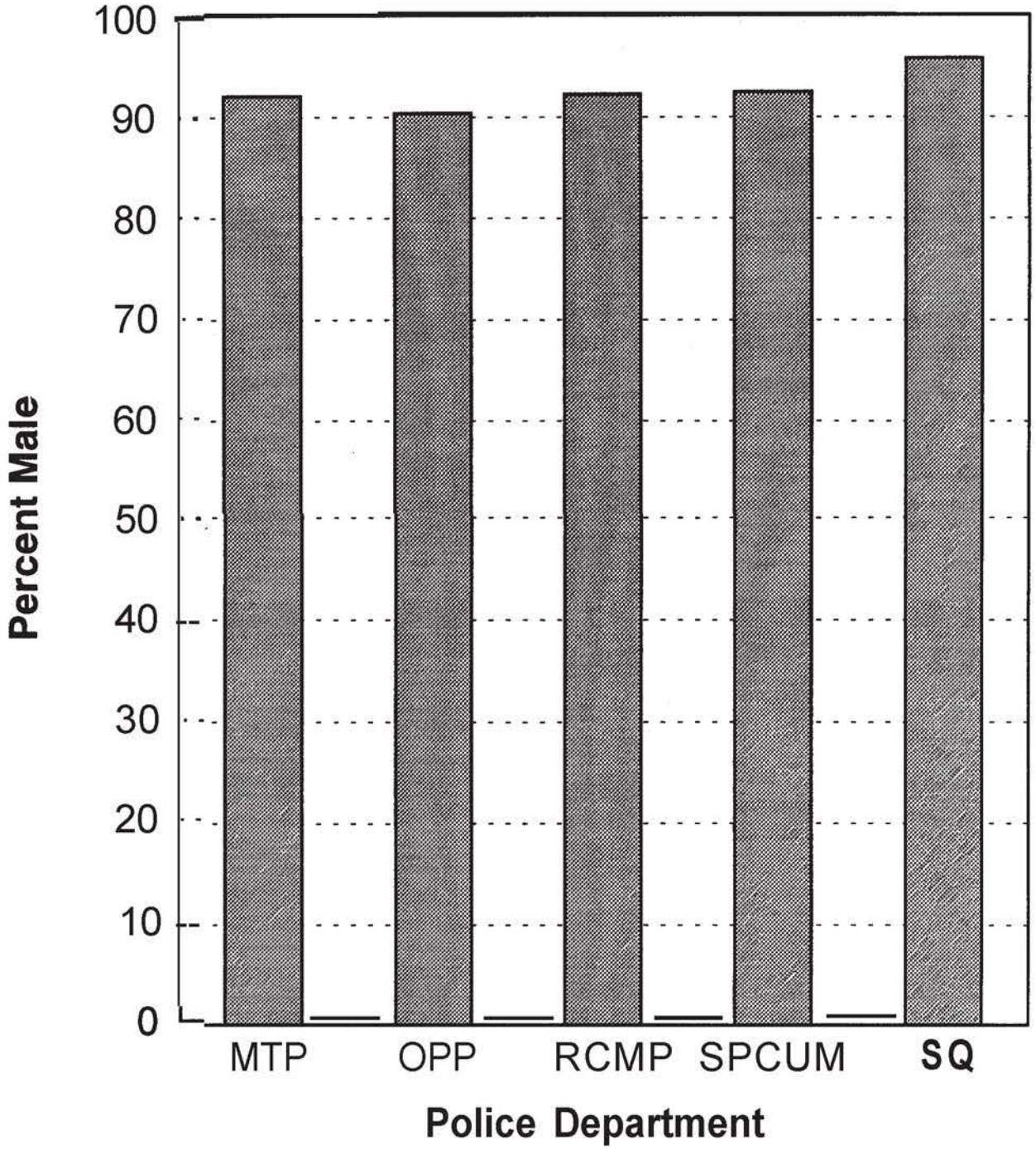
Police Radar Health Study

Figure D.1: Language of Returned Questionnaire



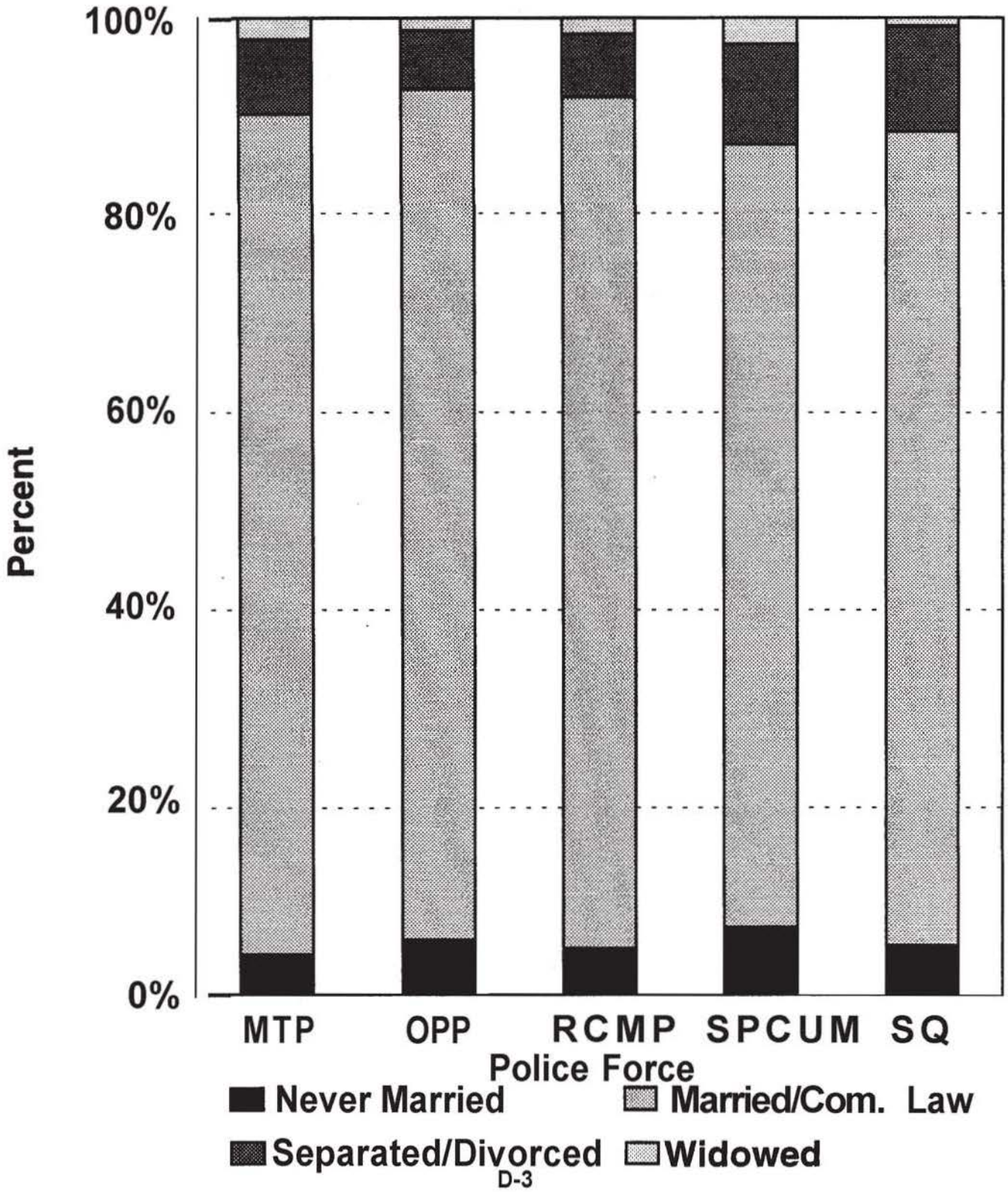
Police Radar Health Study

Figure D.2: Gender



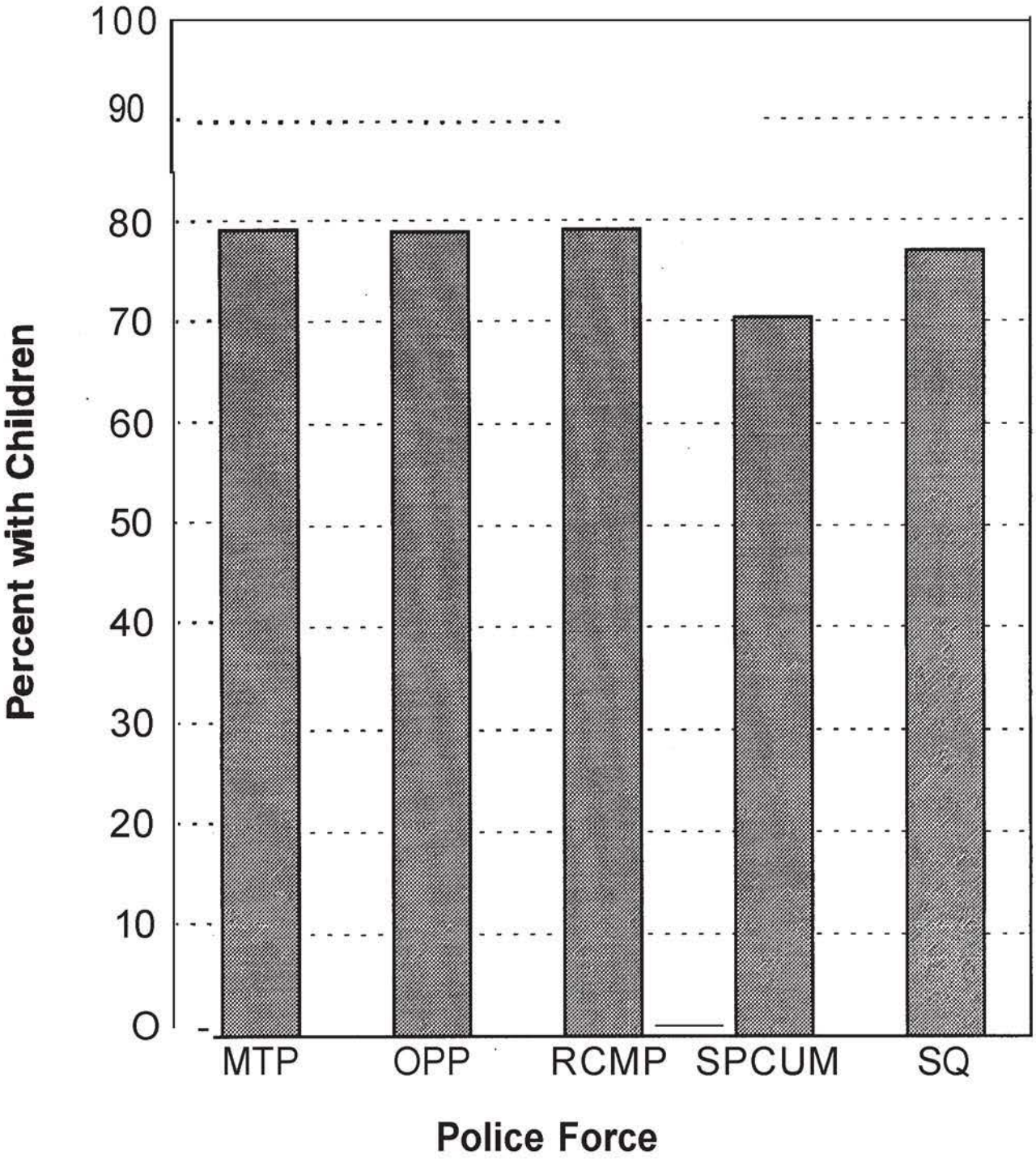
Police Radar Health Study

Figure D.3: Current Marital Status



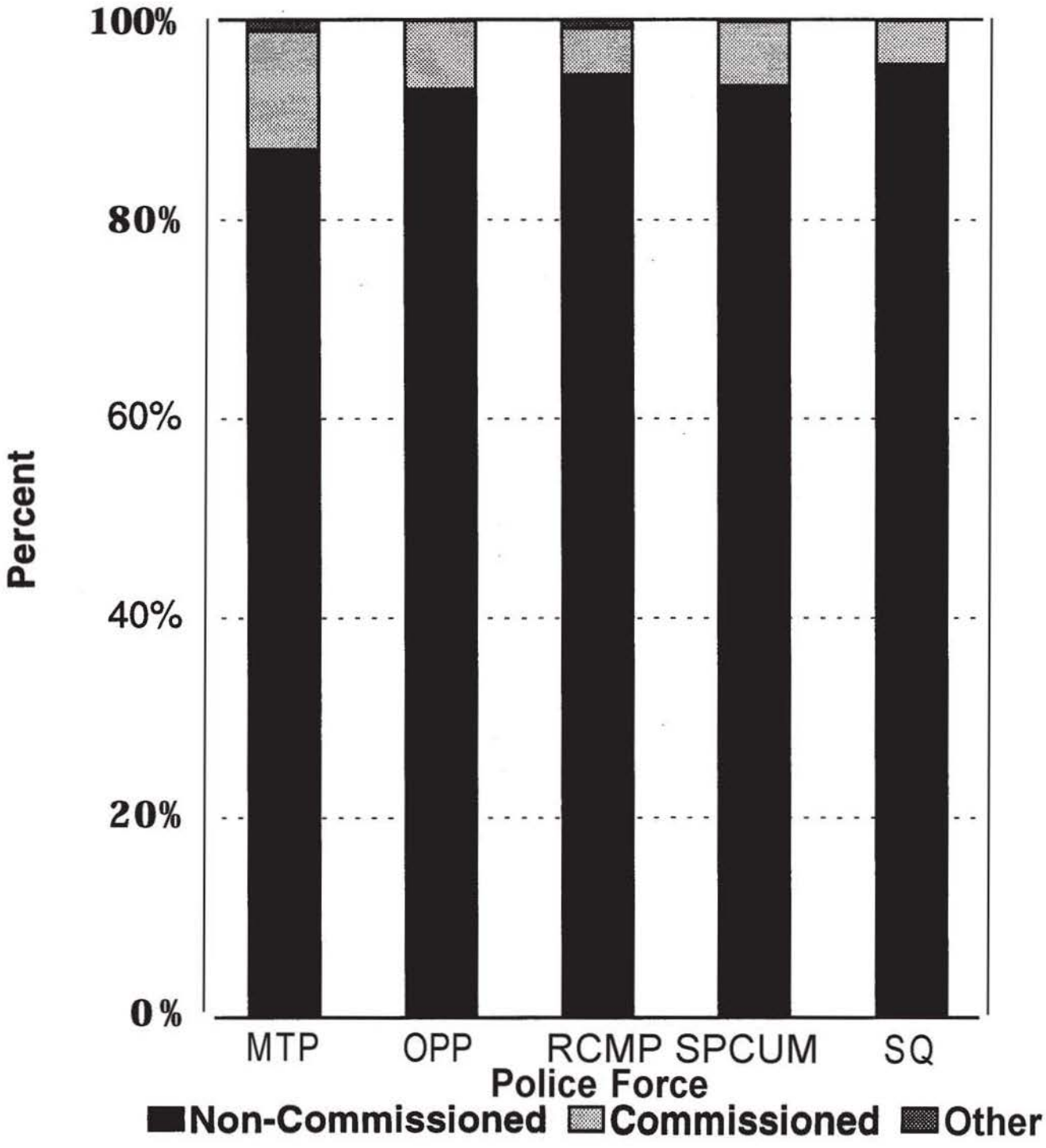
Police Radar Health Study

Figure D.4: Any Biological Children



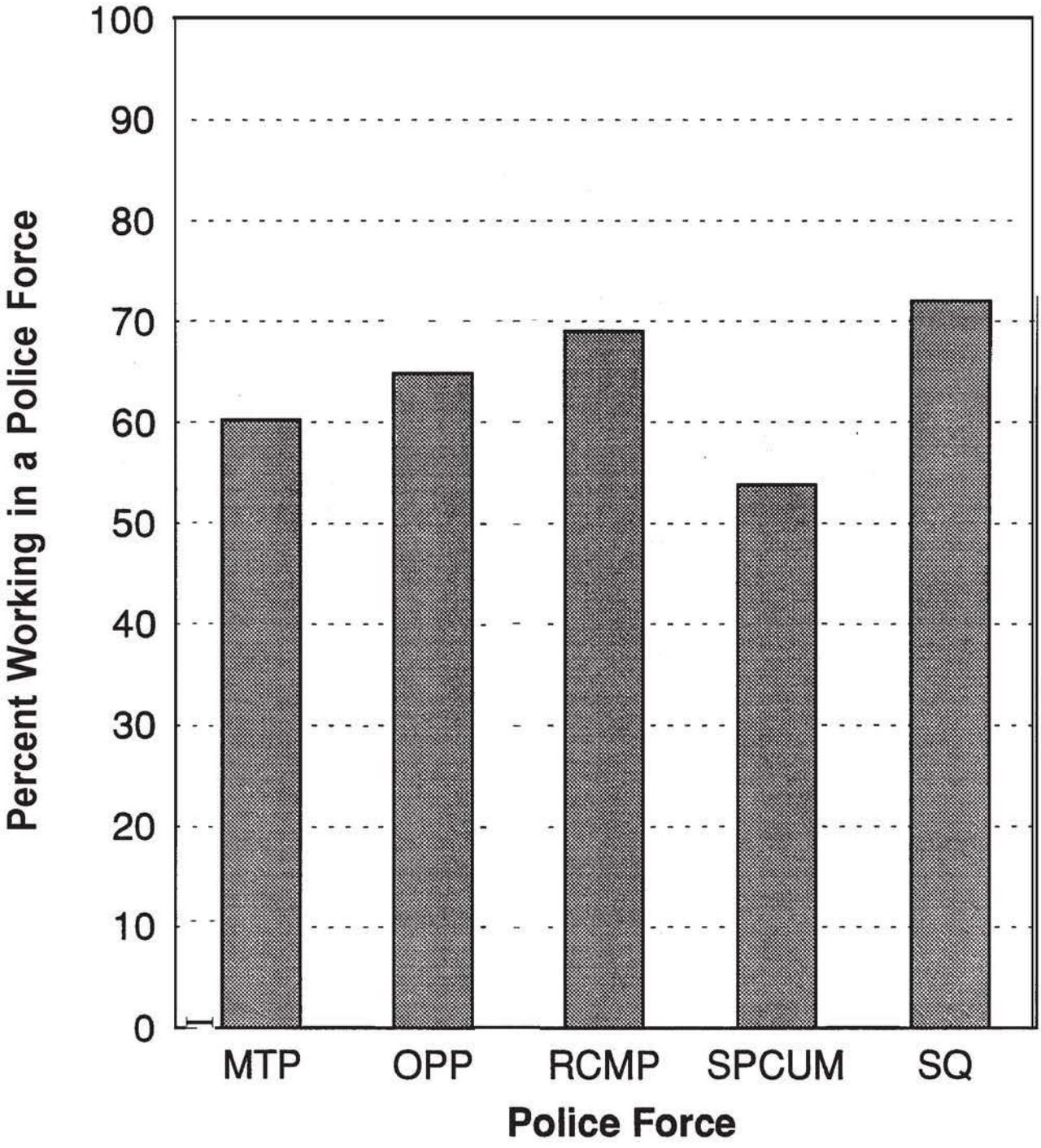
Police Radar Health Study

Figure D.5: Highest Rank Attained While Working for a Police Force



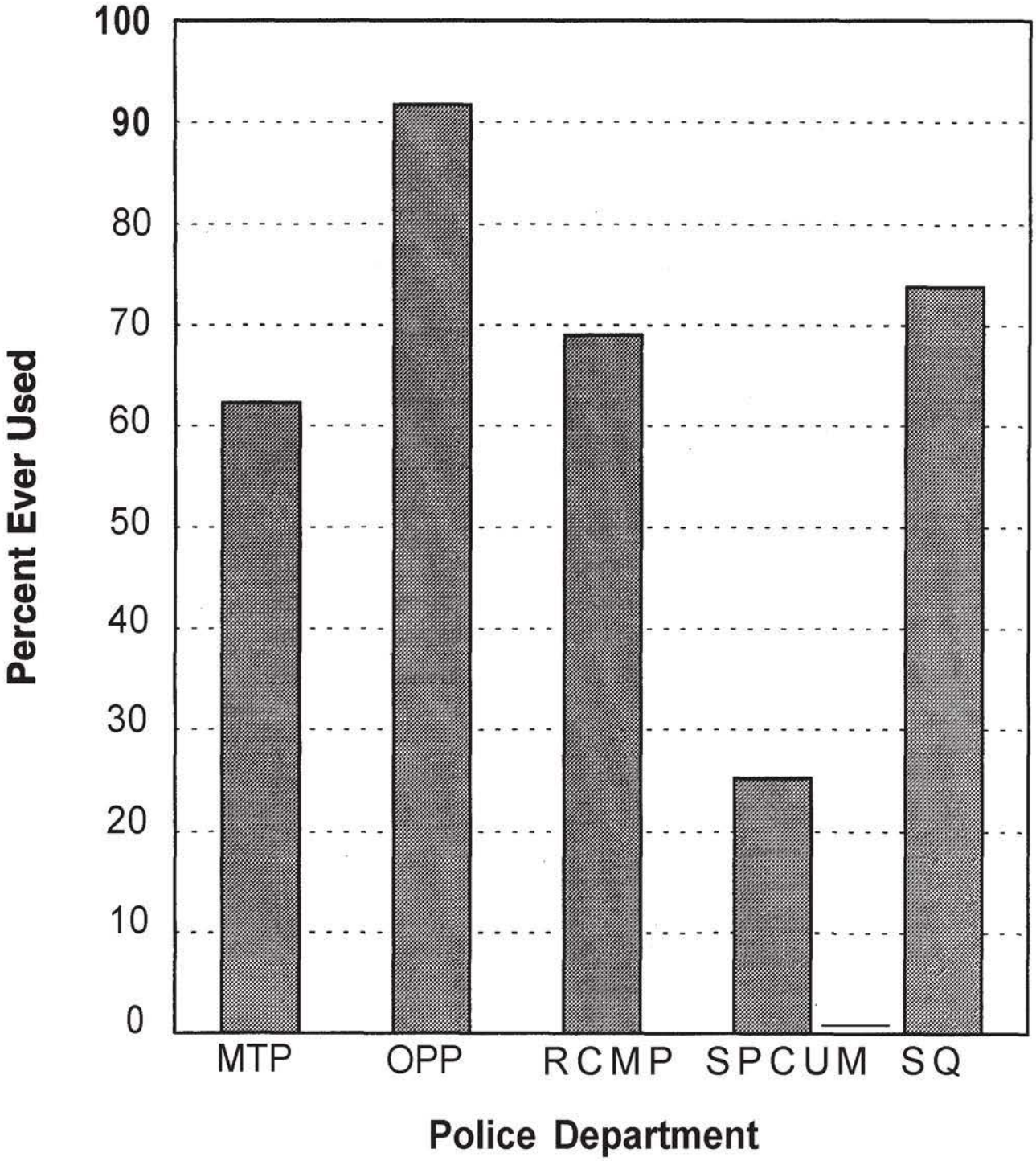
Police Radar Health Study

Figure D.6: Current Working Status



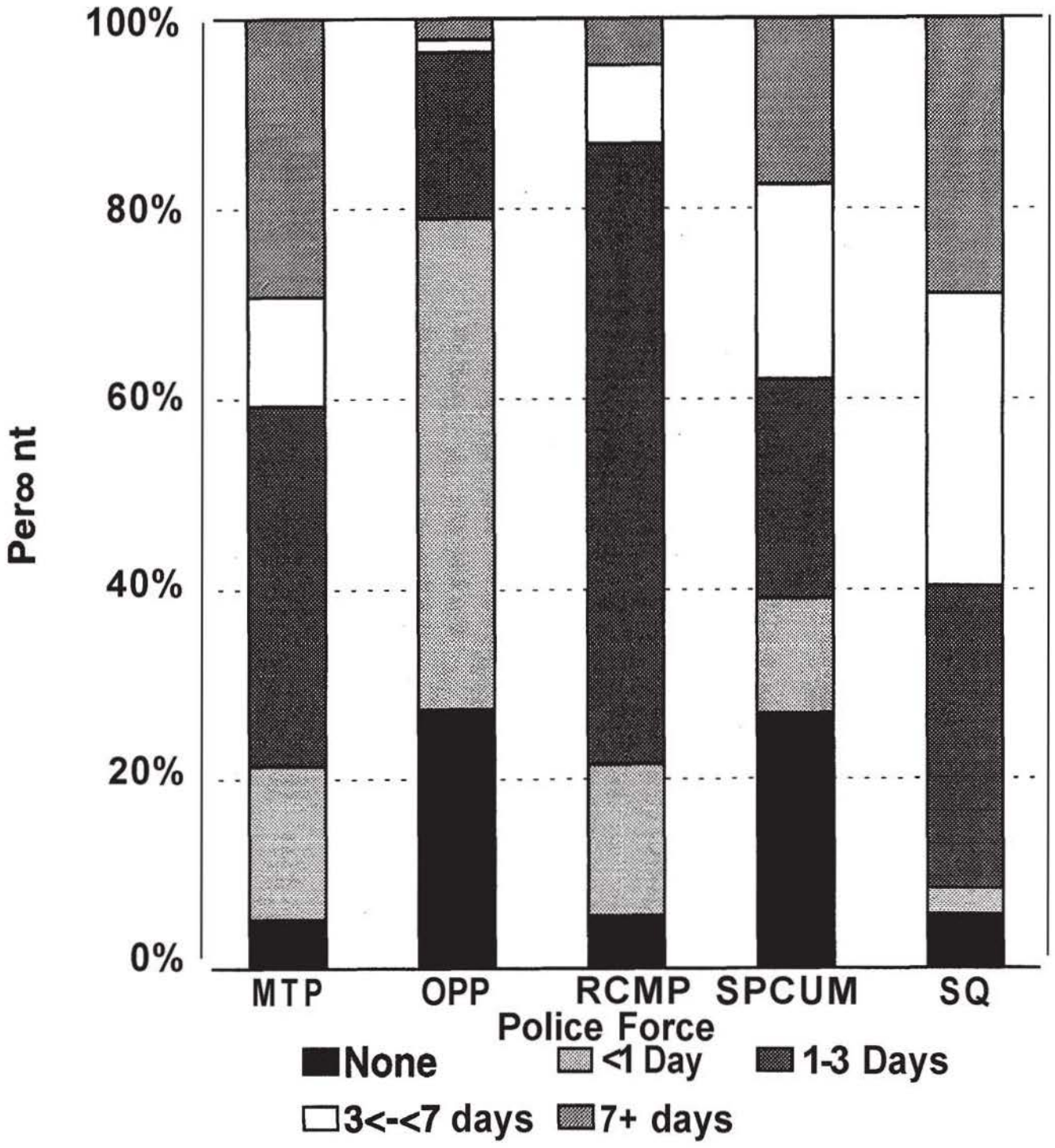
Police Radar Health Study

Figure D.7: Ever Used Radar as Part of Job



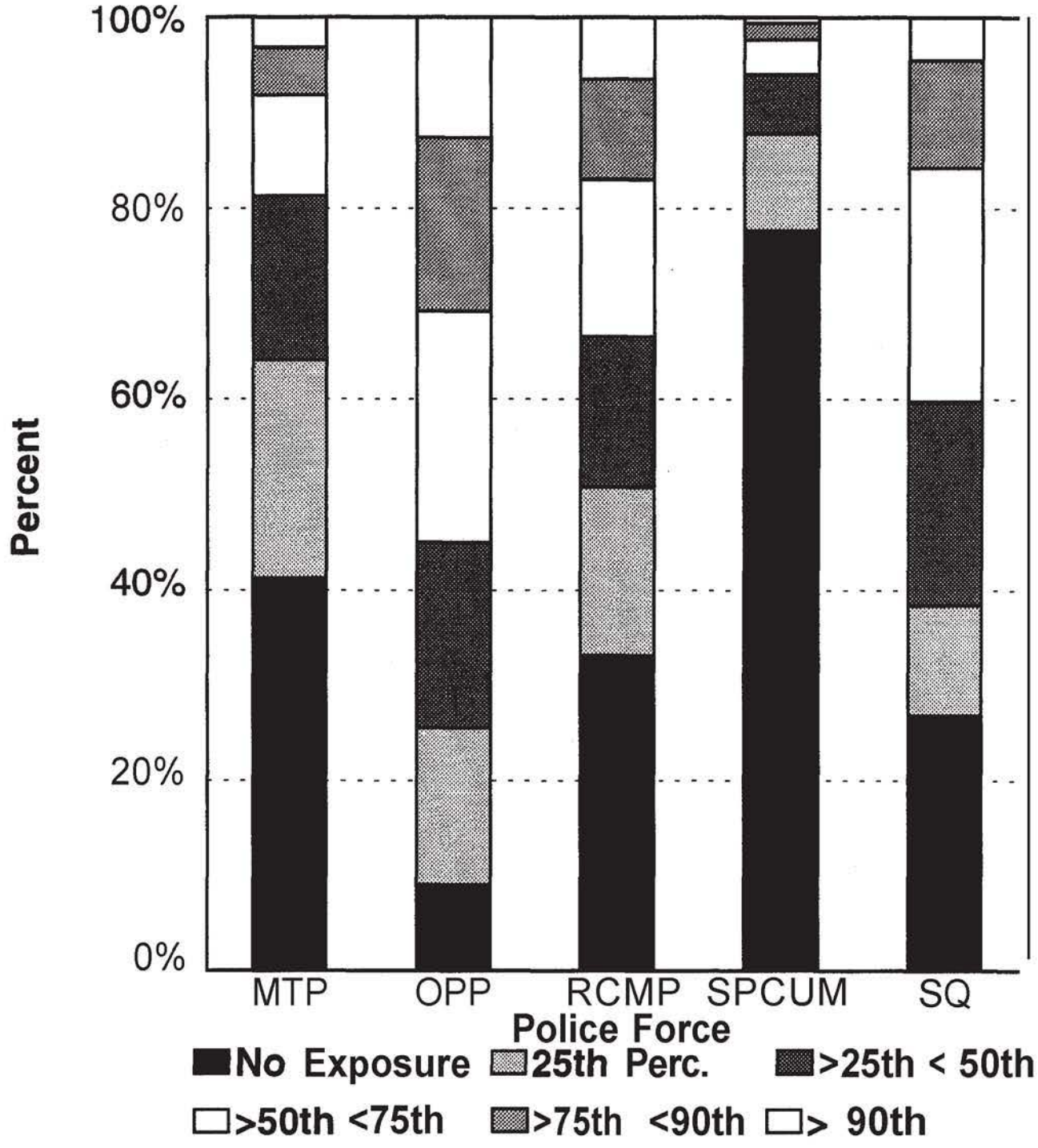
Police Radar Health Study

Figure D.8: First Training Session Before Using Radar



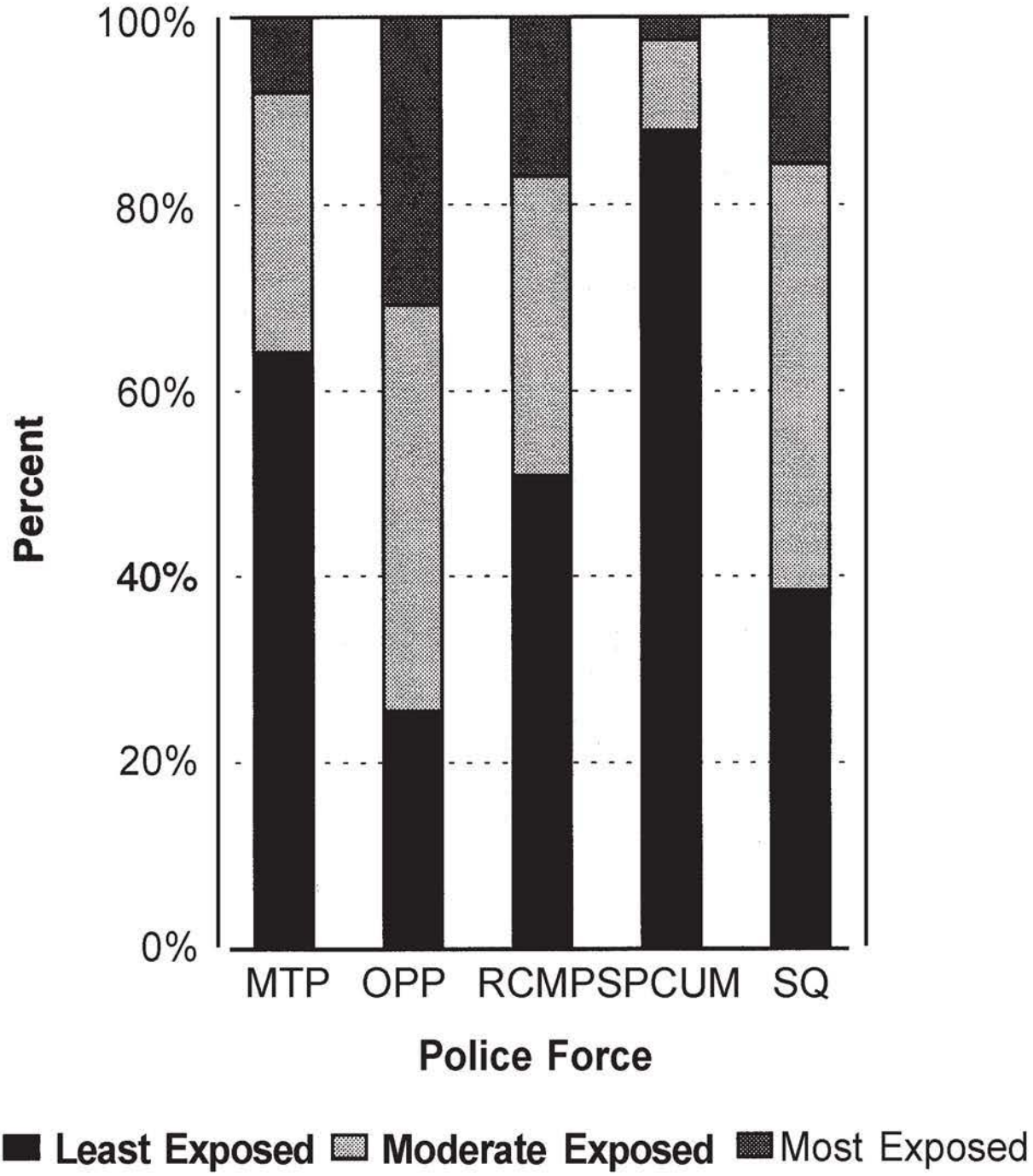
Police Radar Health Study

Figure D.9: Distribution by the Exposure Algorithm



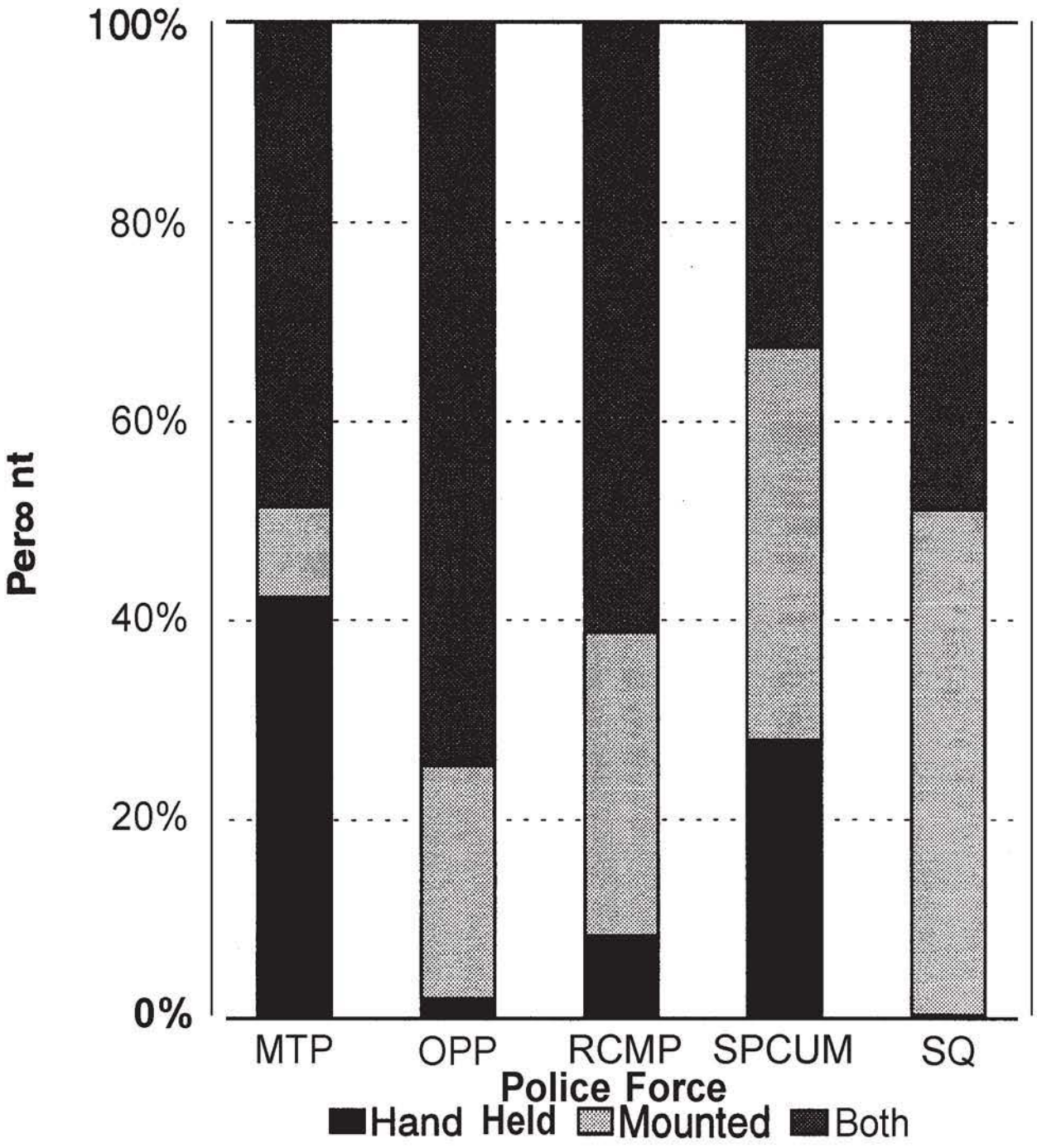
Police Radar Health Study

Figure D.IO: Distribution by the Exposure Algorithm (3 Levels)



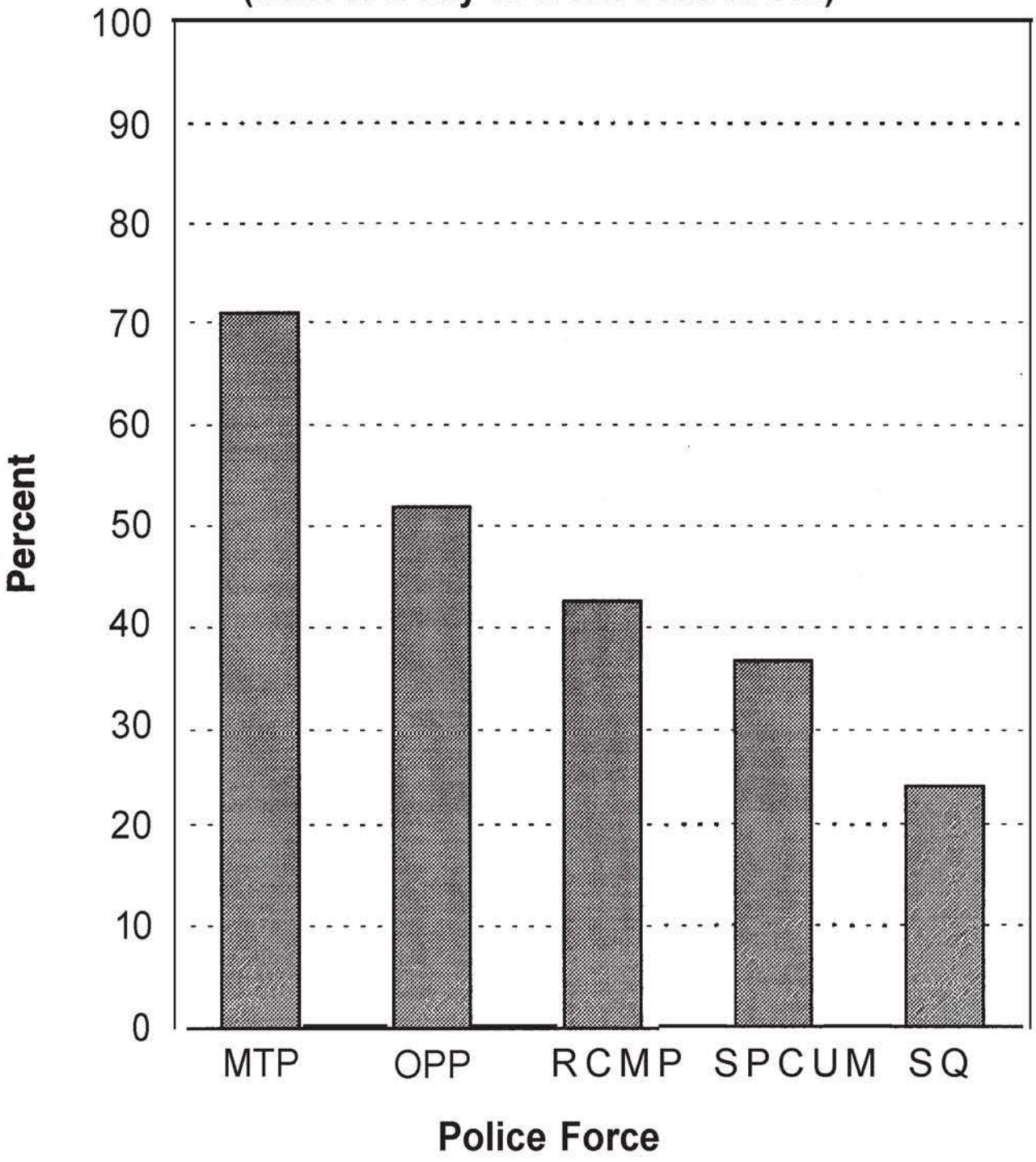
Police Radar Health Study

Figure D.II: Type of Radar Units Used on A Regular Basis



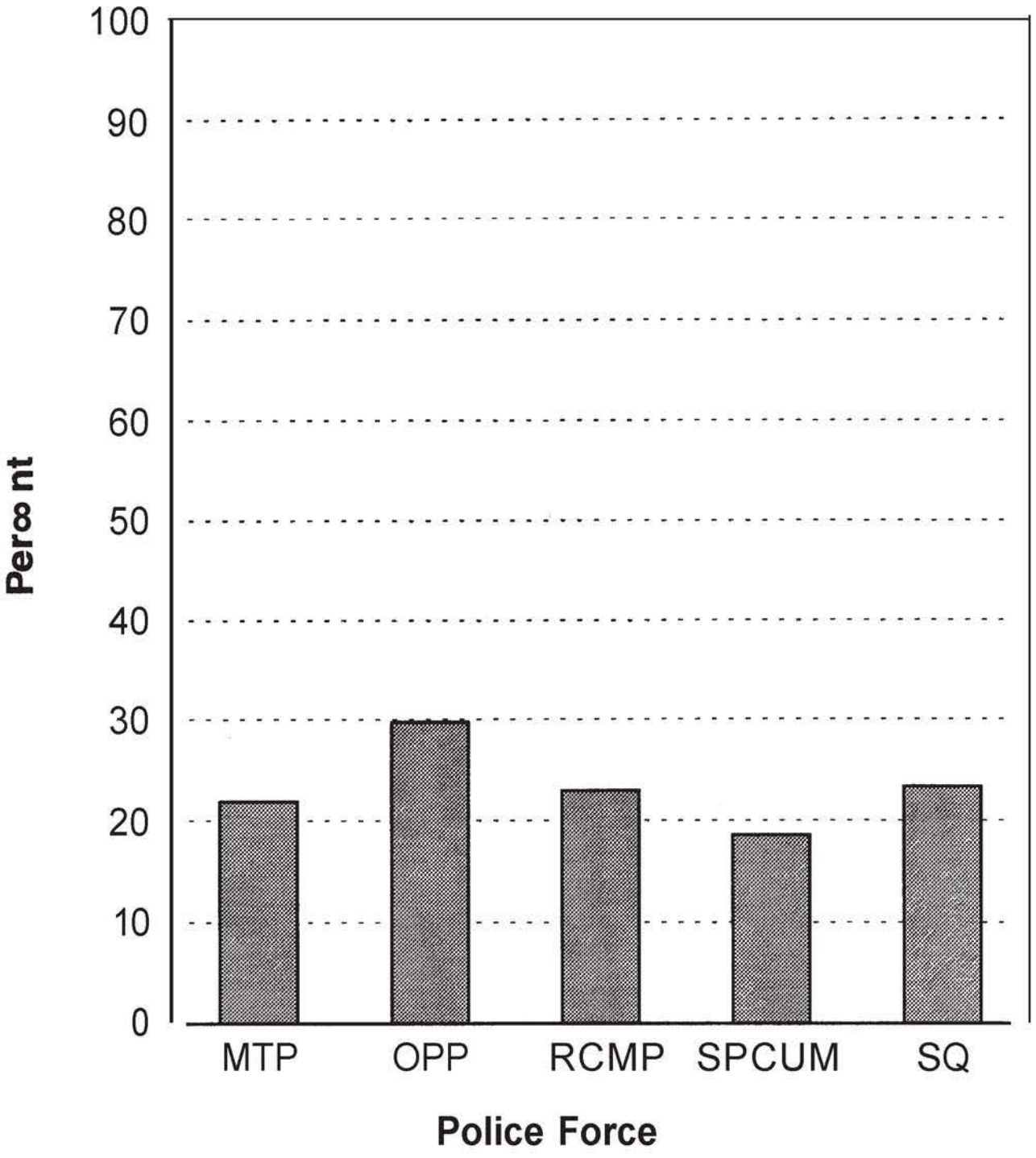
Police Radar Health Study

Figure D.12: Location of Radar Unit When Active and Not Pointed at a Car: Most Risky (next to body in front seat of car)



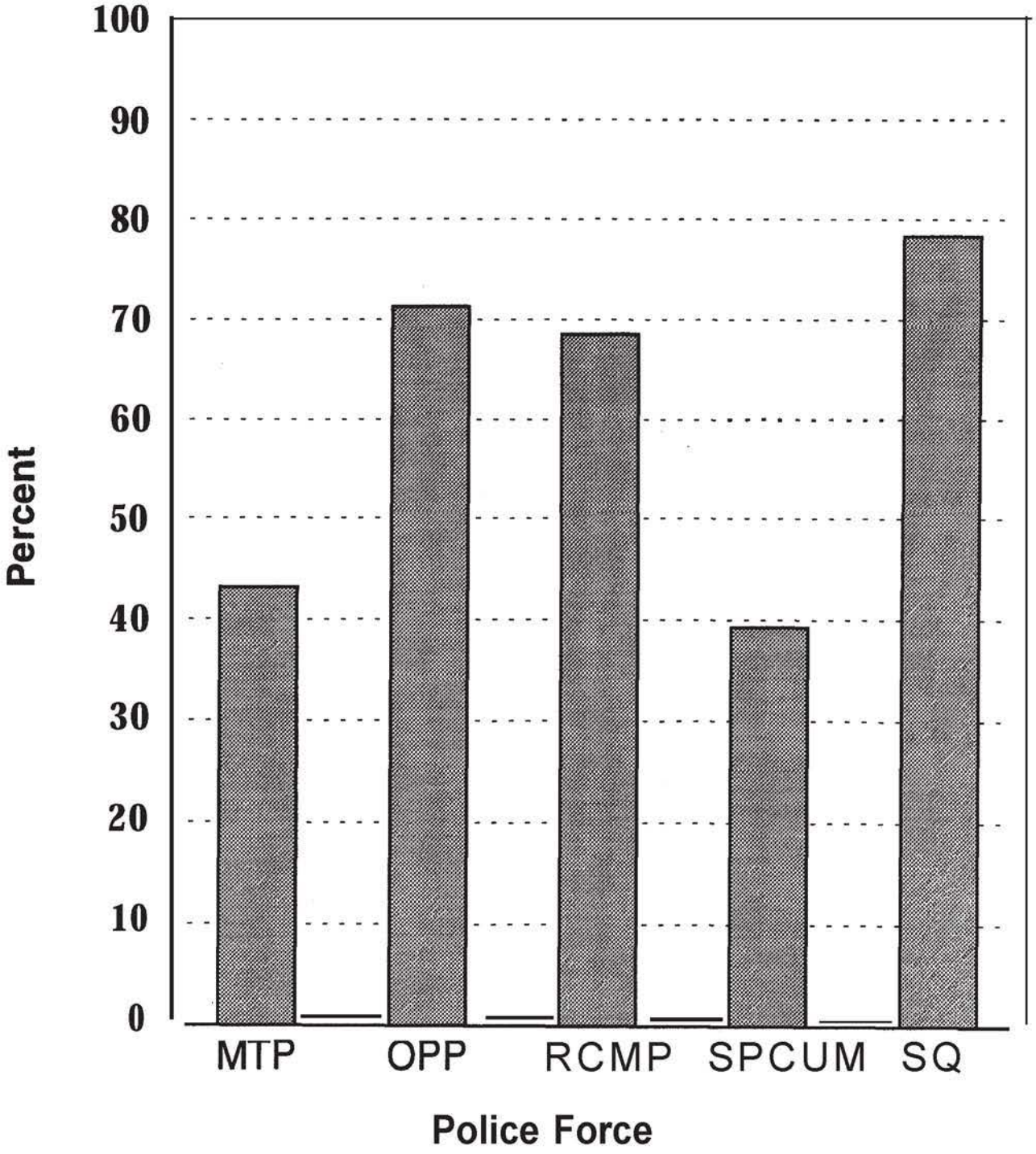
Police Radar Health Study

Figure D.13: Location of Radar Unit When Active and Not Pointed at a Car: Risky (mounted inside or kept inside car)



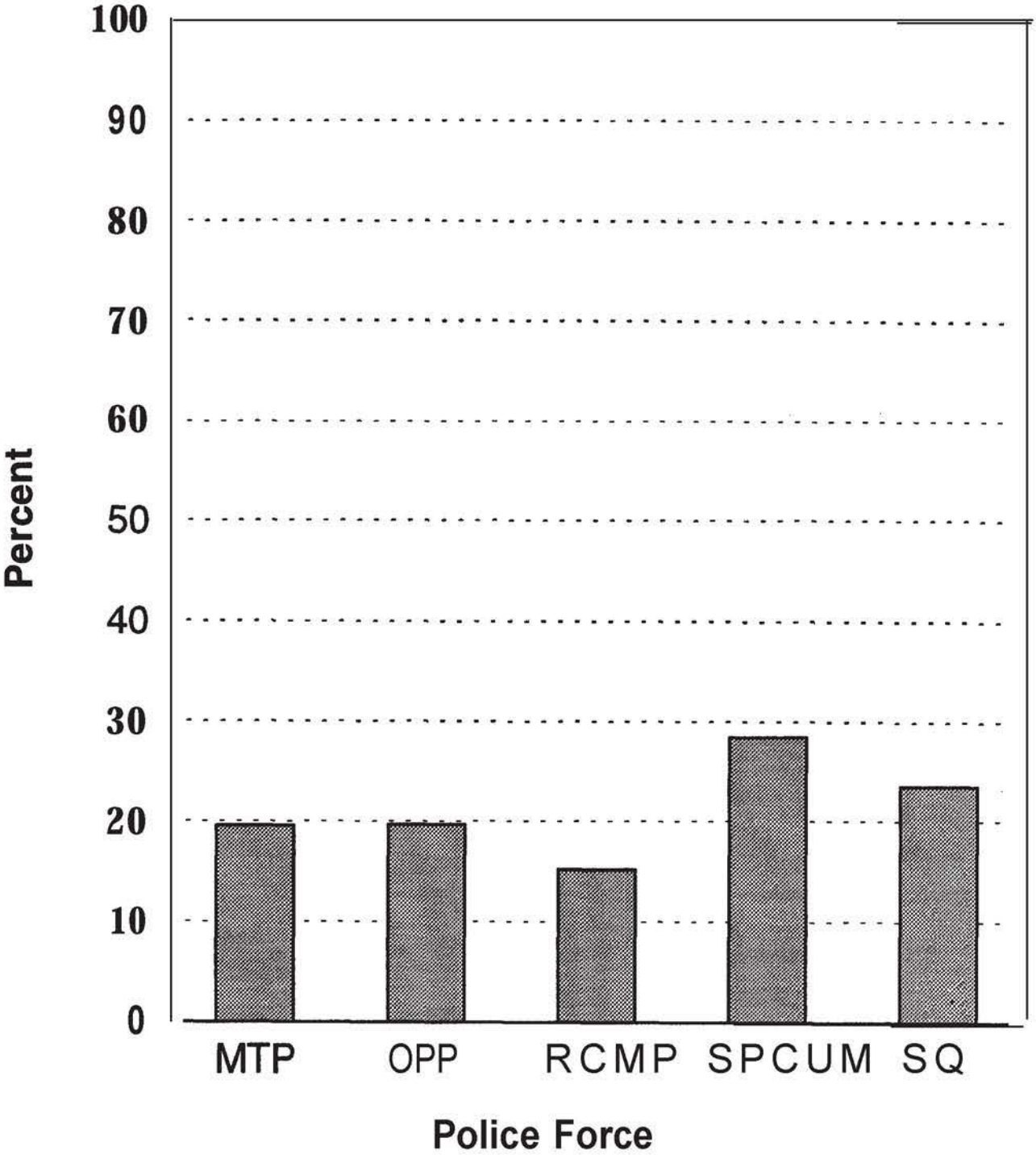
Police Radar Health Study

Figure D.14: Location of Radar Unit When Active and Not Pointed at a Car: Least Risky (on dash pointing forward)



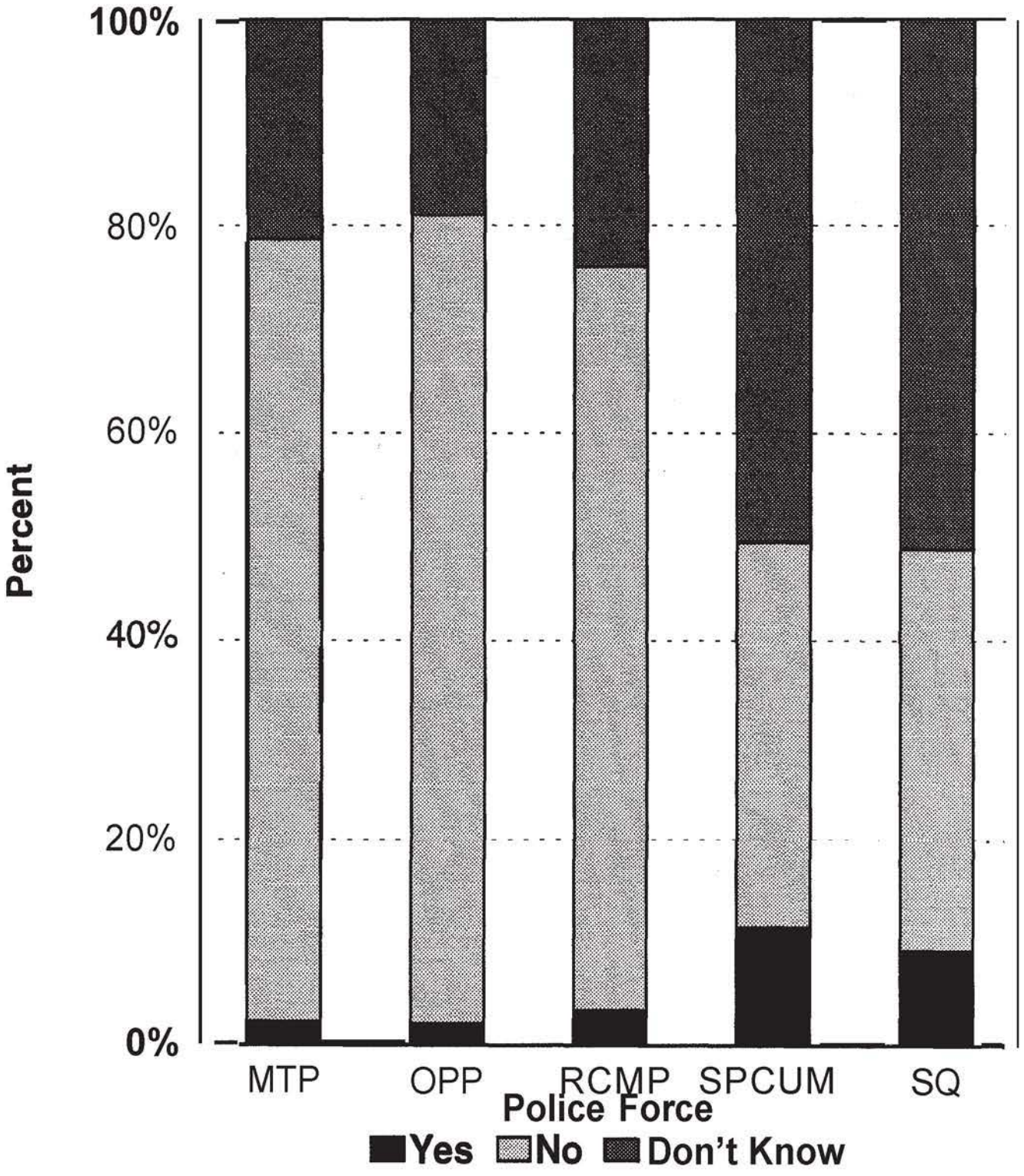
Police Radar Health Study

Figure D.15: Location of Radar Unit When Active and Not Pointed at a Car: Not Risky (kept on outside of car)



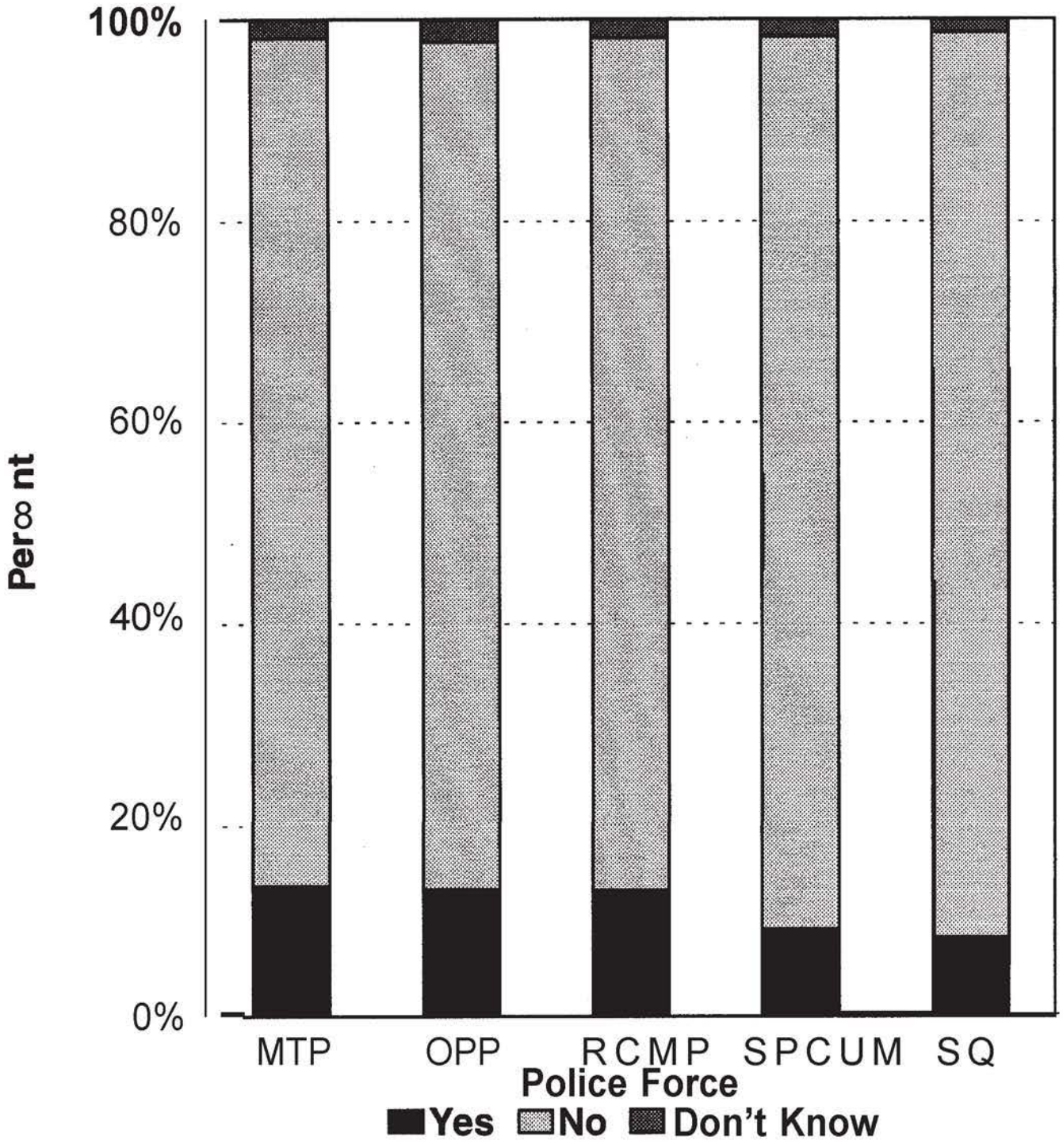
Police Radar Health Study

Figure D.16: Born with Undescended Testicles: Risk Factors for Testicular Cancer



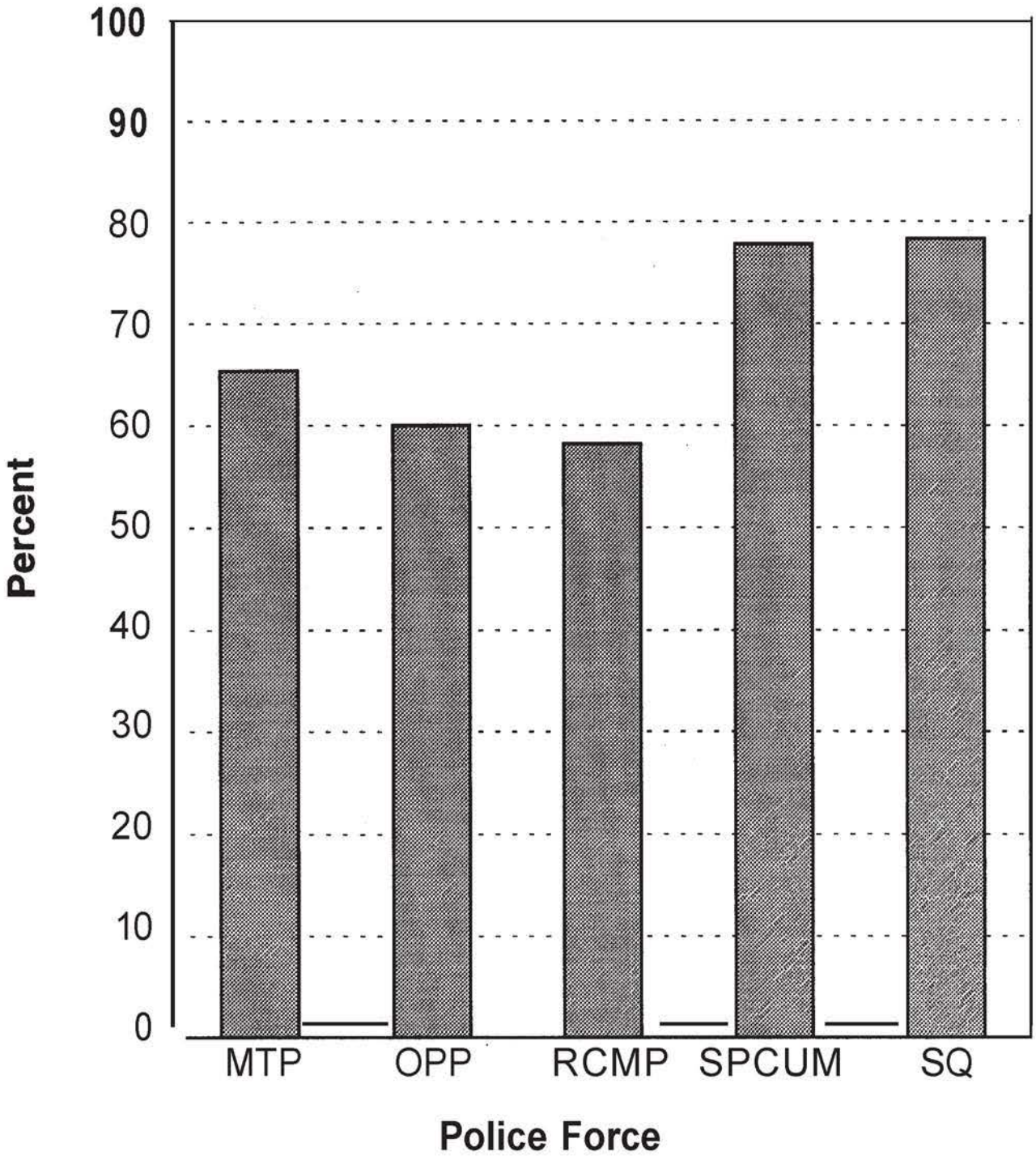
Police Radar Health Study

Figure D.17: Risk Factors for Testicular Cancer: Severe Injury or Trauma to the Testicles



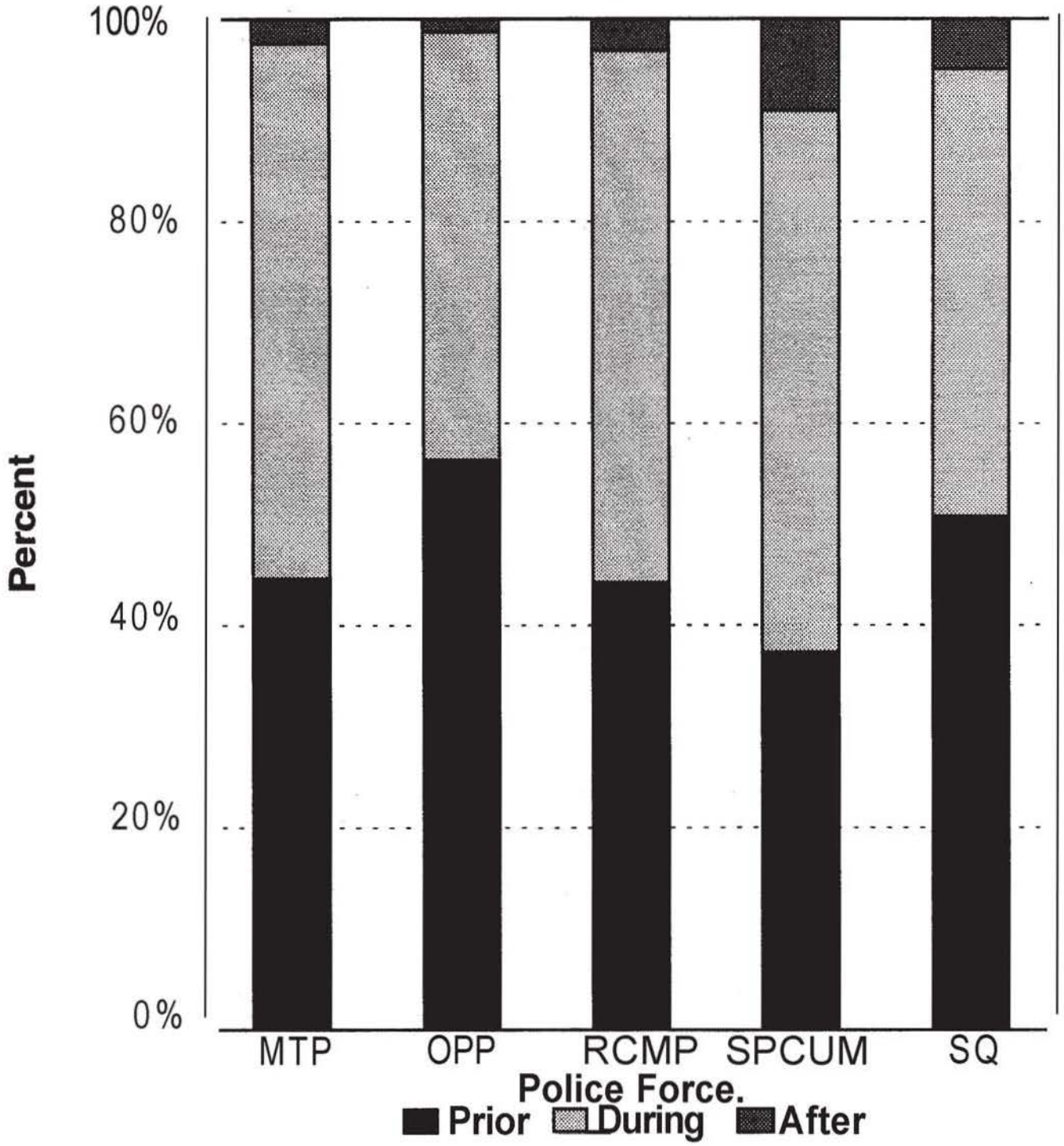
Police Radar Health Study

Figure D.18: Risk Factors for Testicular Cancer: Severe Injury or Trauma to the Testicles - Saw a Doctor



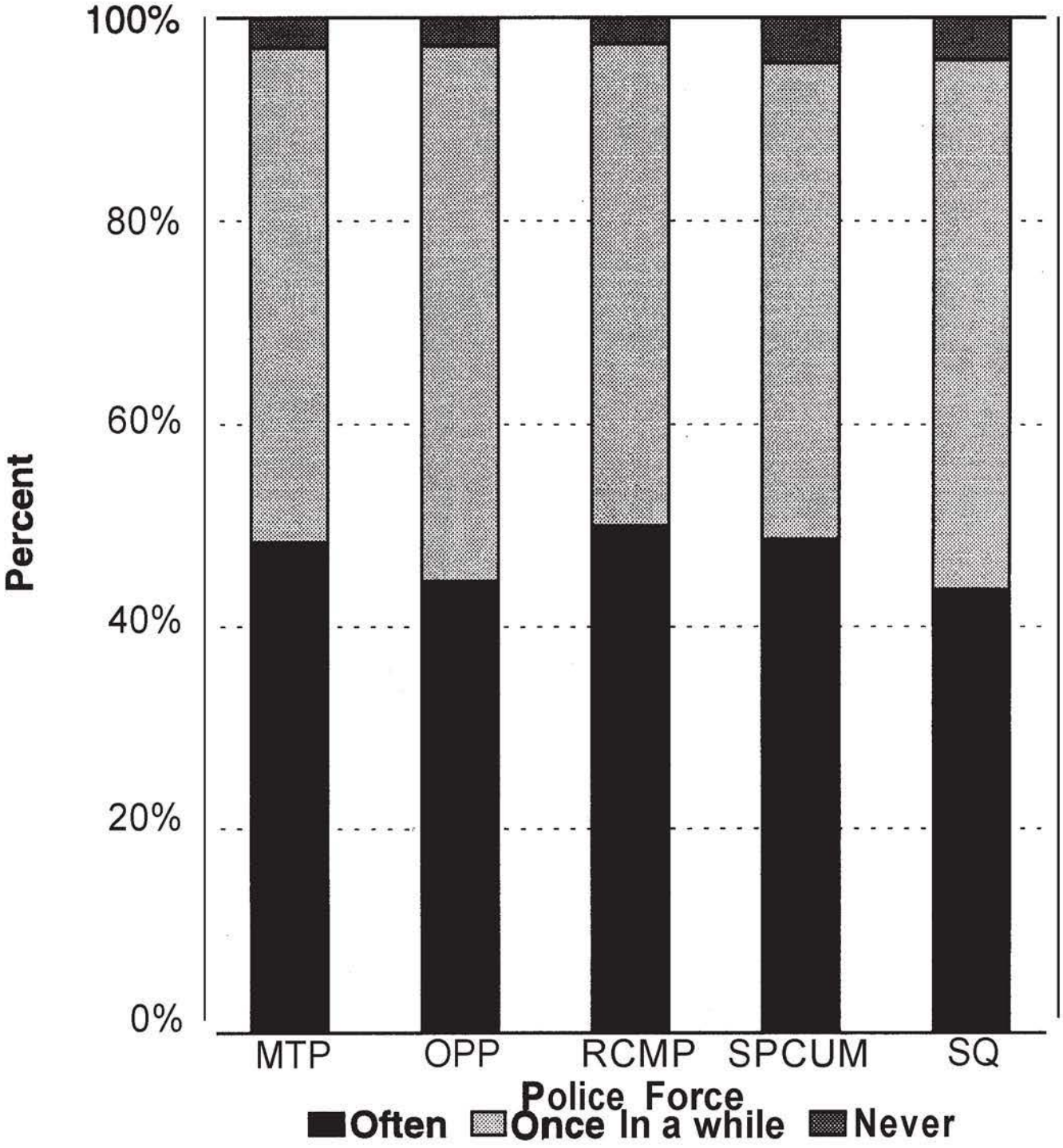
Police Radar Health Study

Figure D.19: Risk Factors for Testicular Cancer: When Severe Injury or Trauma to the Testicles Occurred: Prior to Joining the Police Force



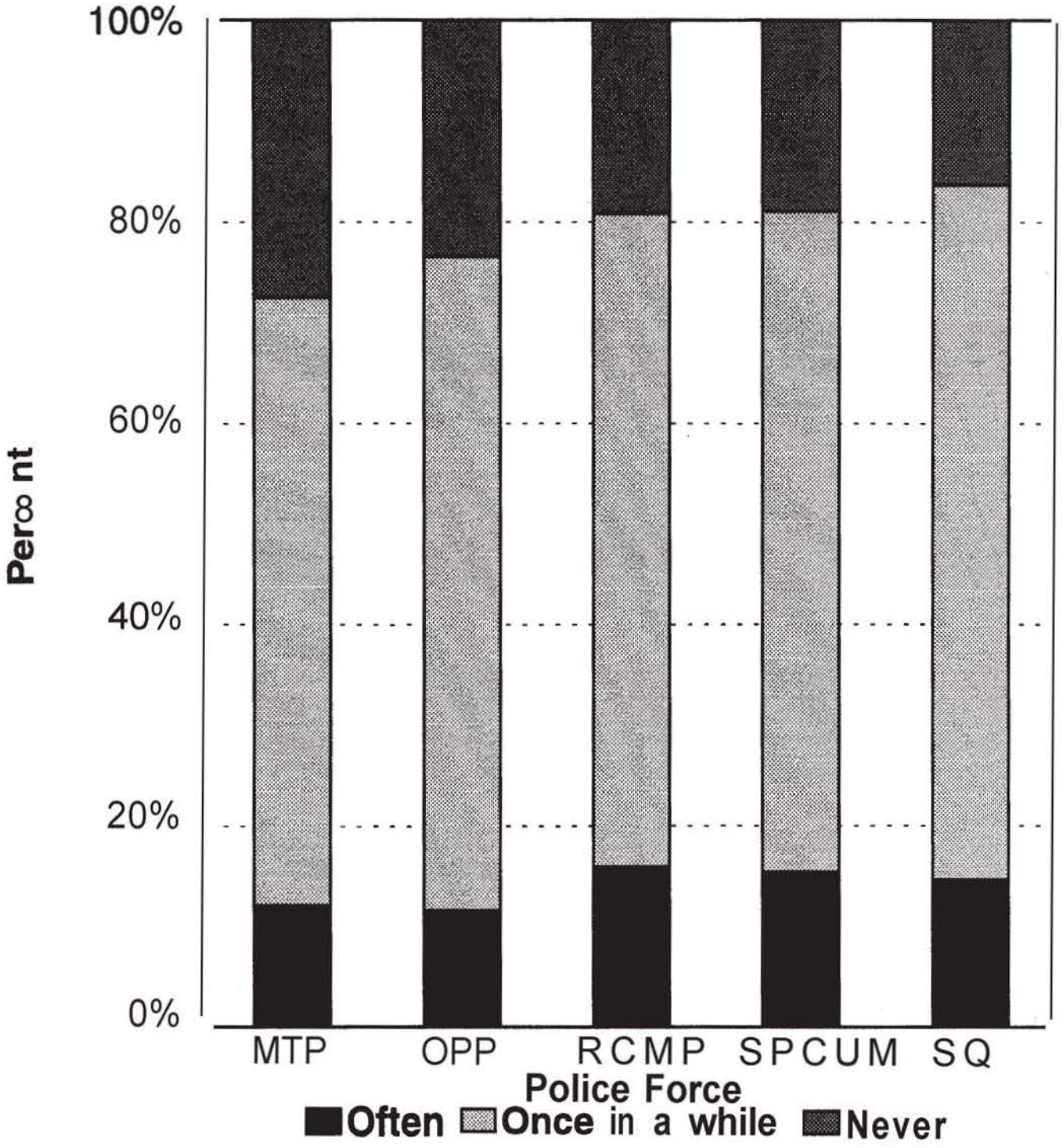
Police Radar Health Study

Figure D.20 Risk Factors (Activities) for Testicular Cancer: Bicycling Prior to Service



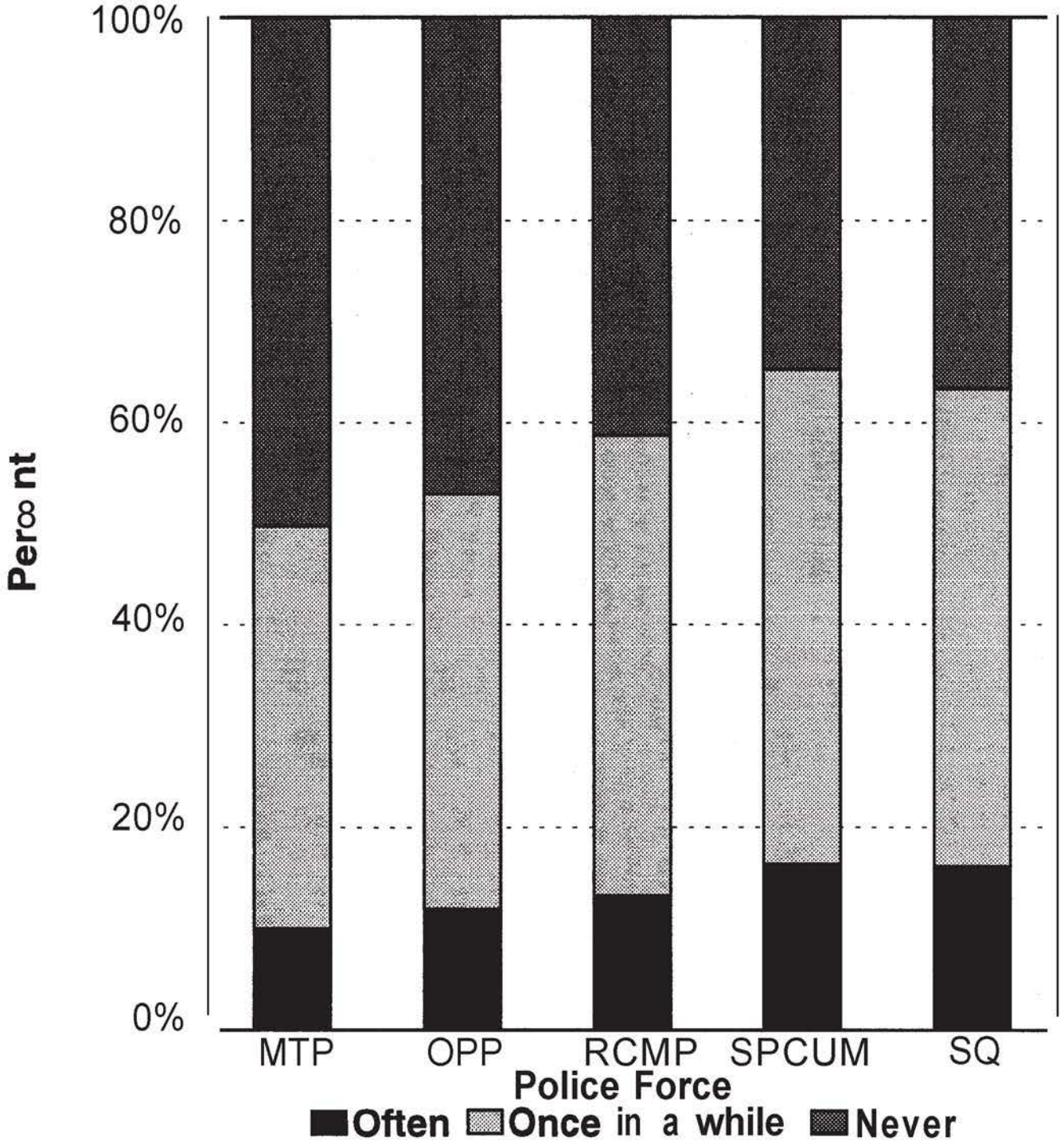
Police Radar Health Study

Figure D.21 Risk Factors (Activities) for Testicular Cancer: Bicycling During Service



Police Radar Health Study

Figure D.22 Risk Factors (Activities) for Testicular Cancer: Bicycling After Service



Police Radar Health Study

Figure D.23 Risk Factors (Activities) for Testicular Cancer: Riding Prior To Service

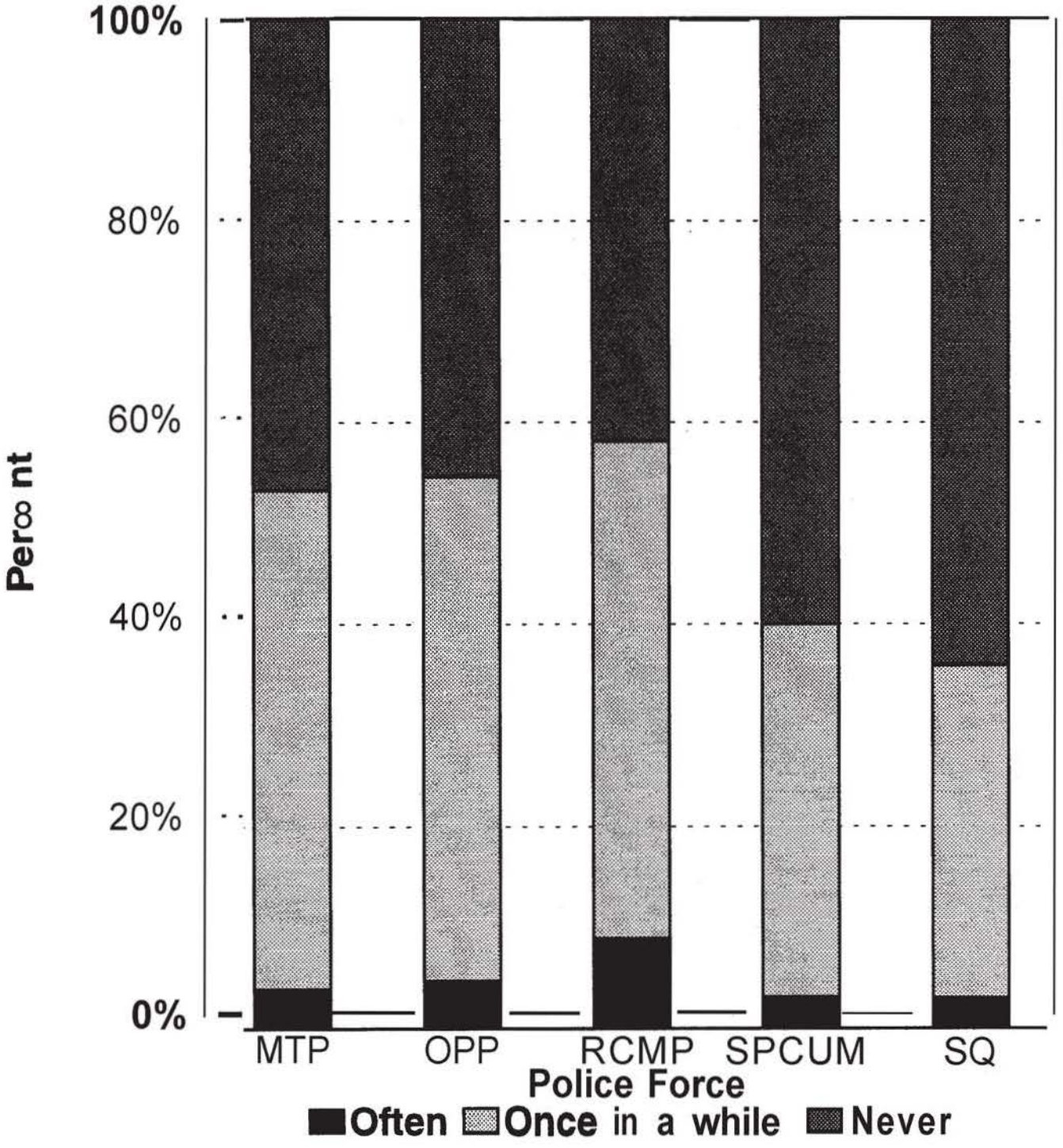


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Figure D.24 Risk Factors (Activities) for Testicular Cancer: Riding During Service

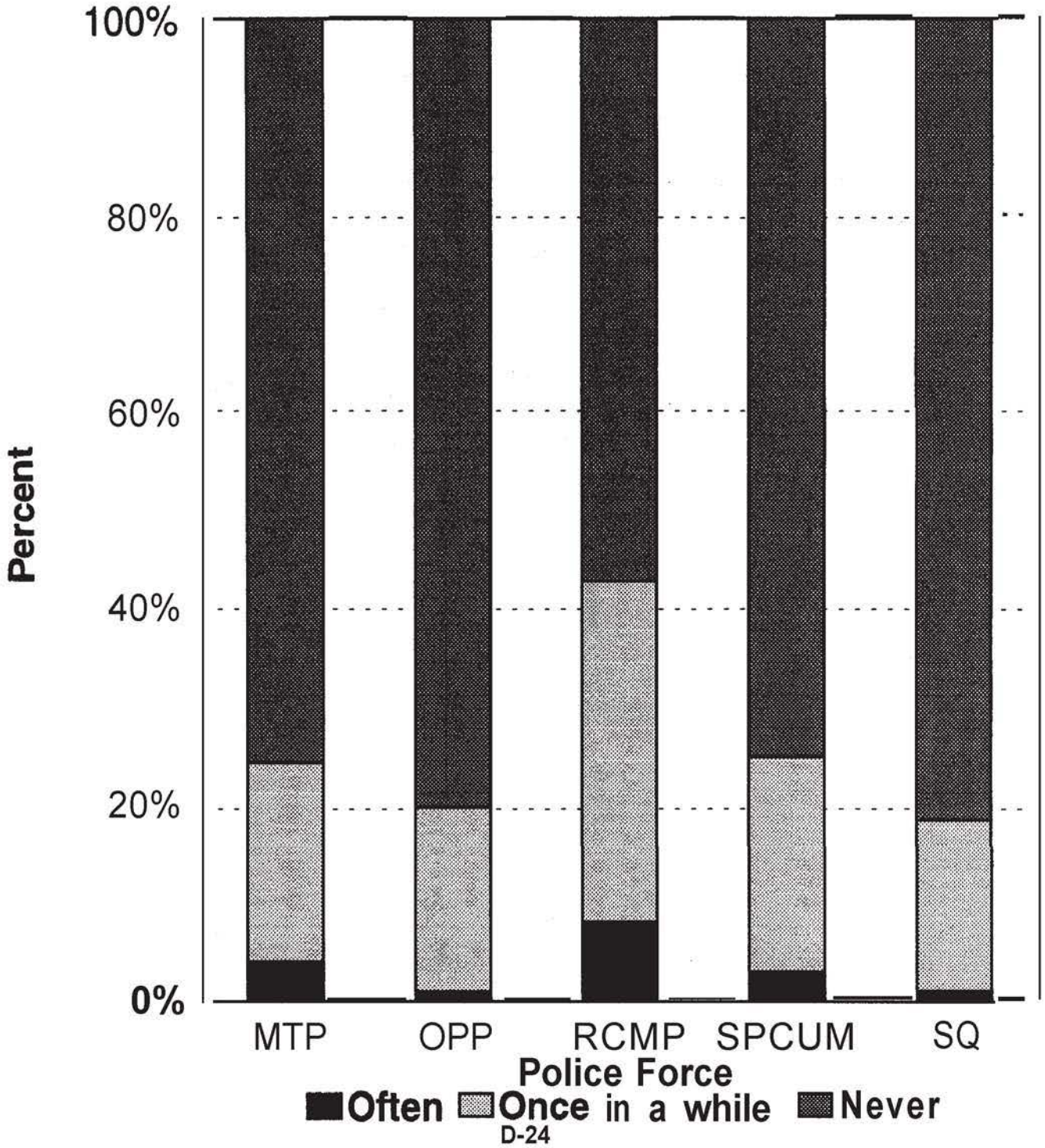

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Figure 0.25 Risk Factors (Activities) for Testicular Cancer: Riding After Service

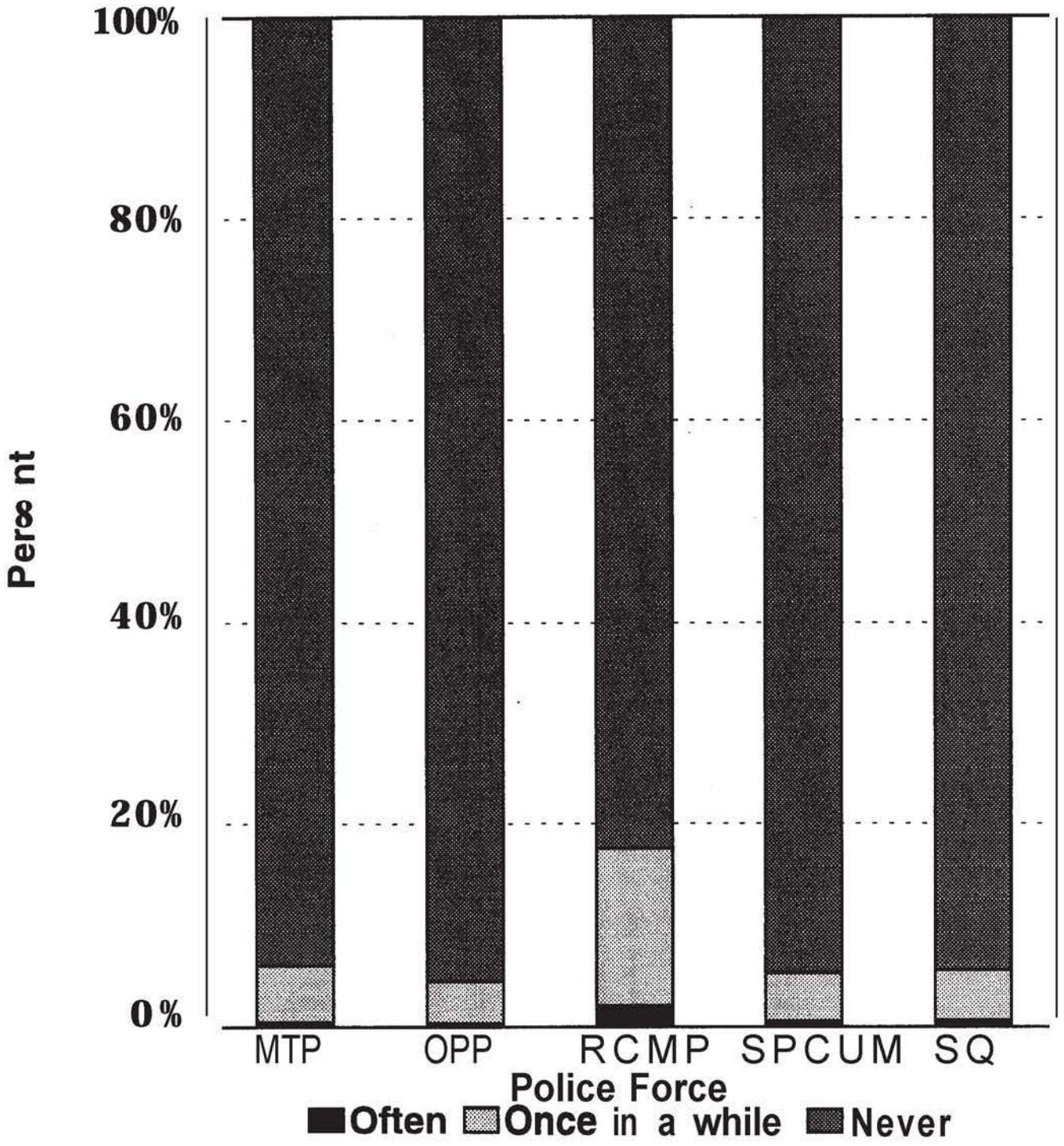

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Figure D.26: Risk Factors for Testicular Cancer: When Severe Injury or Trauma to the Testicles Occurred - Prior to Joining the Police Force

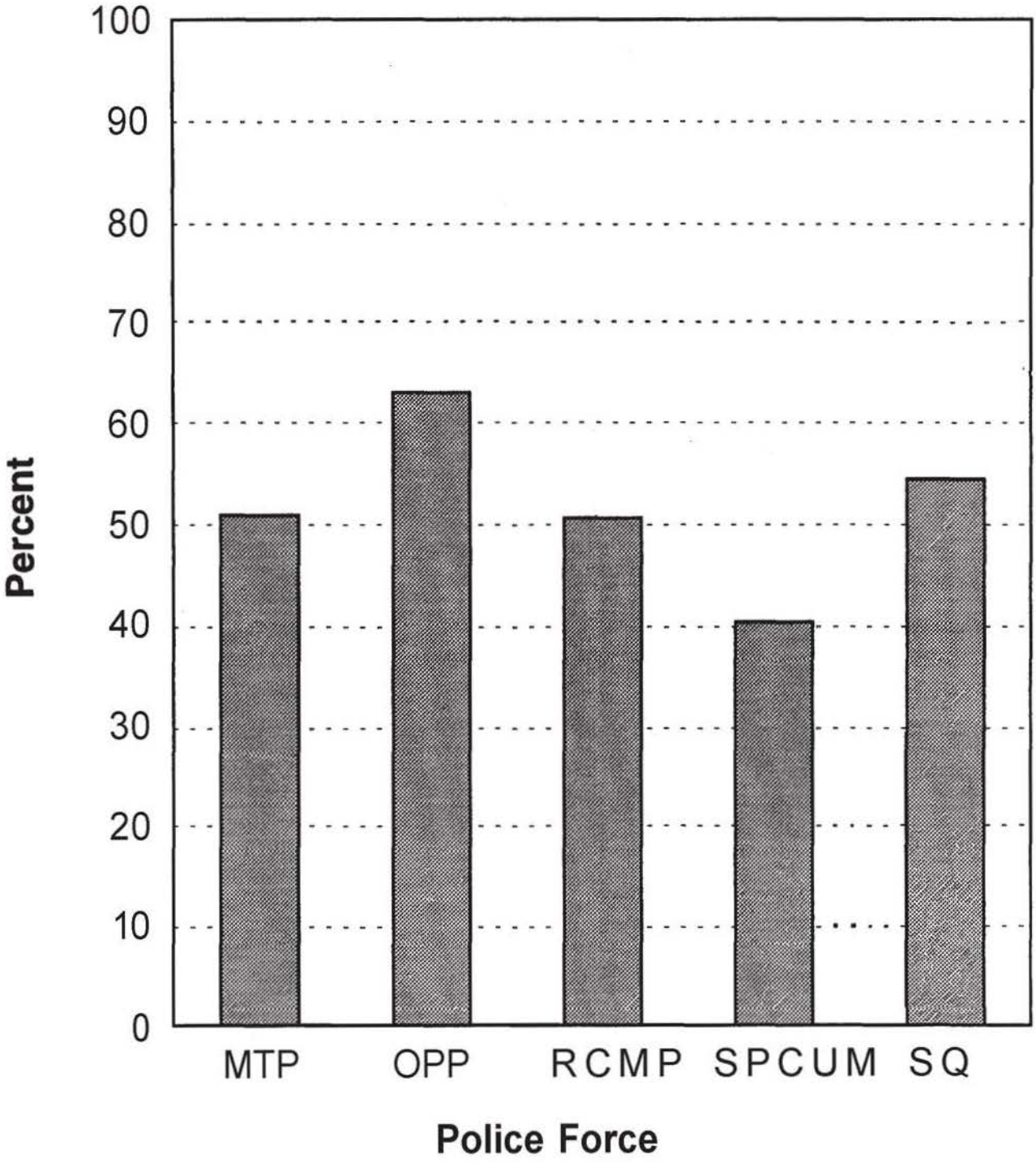

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Figure D.27: Risk Factors for Testicular Cancer: When Severe Injury or Trauma to the Testicles Occurred - During Police Service

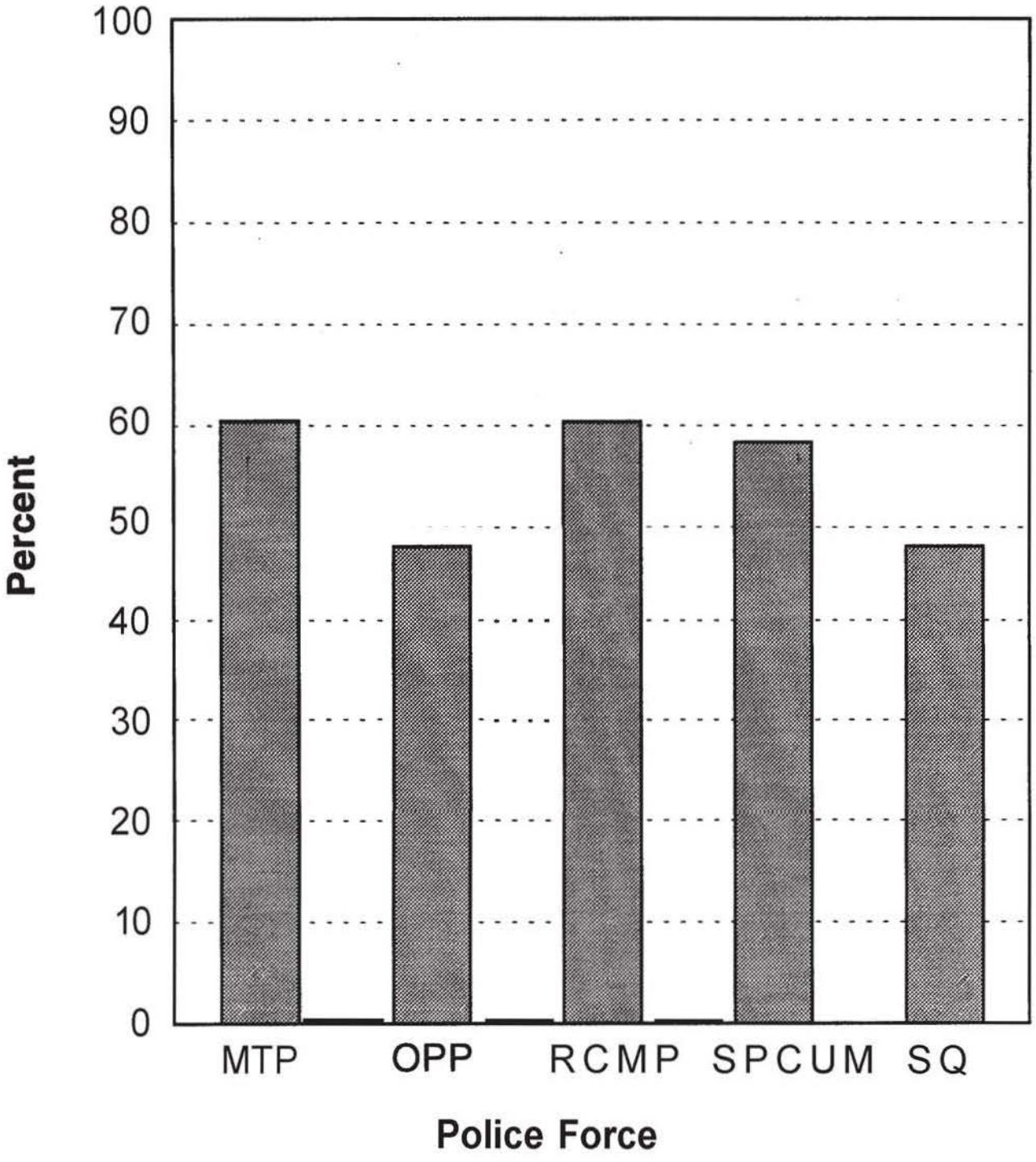

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Figure D.28: Risk Factors for Testicular Cancer: When Severe Injury or Trauma to the Testicles Occurred - After Leaving the Police Force