Cops & Cars: Reducing Law Enforcement Officer Deaths in Motor Vehicle Crashes

Request for Office of Management and Budget Review and Approval
for Federally Sponsored Data Collection

Section B

Project Officer: Hope M. Tiesman, PhD
National Institute for Occupational Safety and Health
1095 Willowdale Rd. M/S 1811
Morgantown, WV 26505
htiesman@cdc.gov
304-285-6067
304-285-6235 (fax)

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B. Collections of Information Employing Statistical Methods

B1. Respondent Population and Selection of Respondents

Using the most recently available data from the Bureau of Justice Statistics, Iowa employed 5,424 sworn law enforcement personnel, ranking 33rd in the nation (Bureau of Justice Statistics, 2007). Of the 5,424 sworn Iowa officers, 58% (n=3,191) are employed in a local police department, 28% (n=1,516) in a sheriff's office, and 14% (n=717) are employed in other types of law enforcement agencies, such as airports, universities, and state parks (BJS, 2007).

Since reports from the Bureau of Justice Statistics, as mentioned above, are only released every four years, a more recent data source is needed to develop appropriate power and sample size calculations for this study. DiscoverPolicing.org is a publically available online record of all U.S. law enforcement agencies (2010). It is managed by the International Association of Chiefs of Police (IACP) and sponsored by the Bureau of Justice Assistance (BJA). According to this database, the number of Iowa LEOs has slightly decreased since the last Bureau of Justice statistics report that showed Iowa had 5,424 officers. According to this data source, there approximately 5,377 LEOs employed in approximately 400 law enforcement agencies throughout Iowa including county sheriff's departments and local (municipal) police departments. Law enforcement officers are also employed by other state agencies including the Department of Natural Resources, Iowa State Fire Marshall, state universities, department of parks and recreation, and the Cedar Rapids Airport. The state of Iowa also employs officers in the state patrol and as state capitol police officers.

This national database (discoverpolicing.org) was used to select the study sample. The database was first stratified into agency type (sheriff, local/municipal/city, state patrol) and the number of sworn officers in each agency (small = less than 10 officers, medium=10-99 officers, large=more than 100 officers). We removed from the database all officers employed at airport safety offices, county park agencies, state fire marshals, department of natural resource officers, and those employed at state university agencies. This left a final population size of 5,132 officers. A breakdown of the population under study by type of department and size is given in Table 1.

Table 1: Study Population by Type and Size of Department: Iowa

Department Type	Size	Number of Departments	Total Officers
Sheriff	Small	55	393
Sheriff	Medium	40	701
Sheriff	Large	3	386
Municipal	Small	227	714
Municipal	Medium	58	1,395
Municipal	Large	6	1,088
Iowa State Patrol	-	-	455
TOTAL			5,132

Table 2 summarizes the sampling strategy for this study. Agencies will be selected at random without replacement. The sample of participants will be distributed using proportional allocation, which will take into account the population size distribution. We will fix the number of departments selected within each strata (sheriff/municipal and small/medium/large). Since at this time, the exact number of officers in each department is unknown, it is impossible to know the exact number of participants. However, we can get an estimate of the number of participants by taking the average number of officers within each strata using data from the discoverpolicing.org database. If we multiply that average by the number of departments we plan on selecting and inviting into the study, we can arrive at estimated number of participants (Table 2).

Table 2: Sample Size Estimates Based on Average Number of Officers in Each Strata

Type	**Size**	**Average number officers**	**Number invited departments**	**Estimated # officers**	**Assuming 80% response rate**
Sheriff	Small	7	34	238	190
Sheriff	Medium	17	22	374	299
Sheriff	Large	128	2	256	204
TOTAL Sheriff			**58**	**868**	**693**
Municipal	Small	3	78	234	187
Municipal	Medium	24	22	528	422
Municipal	Large	181	3	543	434
TOTAL Municipal			**103**	**1305**	**1043**
State Patrol	-		1	455	364
Grand Total			**162**	**2,629**	**2,100**

For sheriff's departments, a total of 34 small departments, 22 medium departments, and 2 large departments will be selected. By extrapolating the mean number of officers for each department, an estimate of 238 officers in small departments, 374 officers in medium departments, and 256 officers in large departments will be included. For municipal departments, a total of 78 small departments, 22 medium departments, and 3 large departments will be selected. By extrapolating the mean number of officers, an estimate of 234 officers in small departments, 528 officers in medium departments, and 543 officers in large departments will be selected. All Iowa State Patrol officers will be selected (n=455). A total estimate of the number of participants will then be approximately 2,629 officers. Since not all officers within each agency may elect to participate in this study, we will also need to account for response rates. Assuming an 80% response rate across each strata, approximately 2,100 officers will provide data which will be analyzed.

Once the data has been downloaded and stratified, variables in the database will be verified by a research assistant using an online search engine (Google) to verify each agency's correct address, phone number, and current leadership. After the database had been corrected as needed, the random sample will be drawn. This study is not intended to estimate national population parameters.

B2. Procedures for the Collection of Information

Study packets will be mailed to each participating law enforcement agency, addressed to the pre-identified agency leader. Prior to this mailing, the agency leader will provide project officers with the number of sworn officers in his/her agency that will be participating. Each study packet will include an introduction letter, paper-and-pencil questionnaire, and self-addressed stamped envelope to return the completed questionnaire. Each study packet will be sealed in a larger envelope.

The letter, to be included as part of the questionnaire, has been written to provide them with the information required in an informed consent form, but we are requesting a waiver of written informed consent. The letter will emphasize that it is the choice of the law enforcement officer to participate and the confidentiality protections that will apply should they choose to participate. The letter informs them of the option to opt out of completing the survey. If they do not opt out, the letter confirms their willingness to participate by completing and retuning the enclosed survey. A returned survey will be deemed to be the subject's consent to participate.

Participation for individual officers will be voluntary with no incentives or reimbursement. During pilot testing, we found that on average, participants were able to complete the questionnaire in approximately 20 minutes. Each questionnaire will be coded according to the participating law enforcement agency. This alpha-numeric code will be mapped to each participating agency and **not** to the individual officer. No identifying information such as name, address, or badge number will be sought. Through this alpha-numeric code, we will monitor returns by specific agency and **not** by individual officer. It is hoped that this level of confidentiality will encourage high response rates and truthful responses.

Approximately six weeks after this initial mailing, the PI or Co-PI will contact the agency leadership and inform him/her of the number of non-responders. Each agency will then receive additional study packets for distribution to the non-responders. Since the number of responses will only be tracked at the agency level (to determine if there are non-responders), agency leadership will not know whether an individual LEO has returned the survey. Therefore, we will ask the agency leadership to remind all officers to return surveys and provide him/her with extra copies of questionnaires to distribute to self-identified non-responders. While this is a disadvantage to the follow-back of non-responders, tracking of specific responses could have a detrimental impact on response rates and the validity of survey responses.

B3. Methods to Maximize Response Rates and Deal with Nonresponse

Since recruitment will begin at the agency level, several steps will be taken to ensure high rates of recruitment at this stage. Firstly, a recruitment packet will be compiled and addressed to the current departmental leadership. This recruitment packet will include a study flyer, recruitment letter, and postage-paid return postcard. The letter outlines the tasks that will be asked of the departmental leadership if they agree to participate and asks them to return the provided postcard to confirm consent to participate in the research study. As part of this study, the department leadership will be tasked with the distribution of surveys as well as encouraging prompt and truthful responses. This recruitment packet will serve as the first method of contacting potential agencies.

The second method of contacting potential agencies will come in the form of a personal phone call approximately six to eight weeks after the mailing of the recruitment packet. One of the two primary investigators will call all non-responsive agencies. Date, time, and detail of all phone calls will be logged using an excel database. These calls will have three purposes:
(1) Answer any remaining questions and better explain survey methodology if needed,
(2) If the agency leadership has not yet returned the consent postcard, investigators will attempt to obtain verbal consent to participate, and
(3) To plan a face-to-face meeting with departmental leadership for the spring of 2011 if so desired.

If at the time of the phone call, the agency chooses not to participate in the research study, their agency name will be dropped from the study sample database and no further contact will be made.

The third and final method of recruiting potential agencies will be a face-to-face meeting with the department leadership in the spring of 2011. The two investigators will meet with various stakeholders, including participating law enforcement agencies. These meetings will be imperative in establishing trust and a sound working relationship with the departmental leadership. Investigators will meet with potential agencies who requested a face-to-face meeting before agreeing to participate. If an agency has not yet agreed to participate, investigators will again attempt to obtain verbal consent. If at this time the agency chooses not to participate in the research study, their agency name will be dropped from the study sample database and no further contact will be made.

Even though the agency leadership provides consent to include the agency in this study, participation for individual LEOs will be voluntary with no incentives for participation beyond self-motivation and no negative impacts for declining to participate. Therefore, we plan on taking the following steps to encourage participation and a high response rate in this research study, beyond that of intensive agency recruitment:

1. Stakeholders involved with this research project have indicated that this topic is of strong interest to law enforcement. They believe that with proper agency support, law enforcement officers will find this line of research salient and will be inclined to relay their personal experiences.

2. Extensive pilot-testing of both the questionnaire and data collection methods with current Iowa LEOs has facilitated this research. Such testing has elucidated what barriers may be present while doing survey research with this unique occupational cohort.

3. The questionnaire has been designed to be as non-burdensome as possible. This includes ordering the questions in a logical sequence and asking only those questions that are needed for analysis purposes.

Due to the nature of law enforcement work, LEOs can be very wary of disclosing private details about their personal lives and jobs using standard data collection techniques. The culture surrounding law enforcement makes surveying officers difficult (Westley, 1971). Therefore, to maximize response rates and minimize non-response bias among members of this occupation, no personal identifiers or ID numbers will be used in this study. This weakness in the design stage disallows for the tracking of non-responders and measurement of non-response bias. Since prior work has demonstrated that safety practices significantly differ between non-responders and responders, this possible differential bias will be addressed as a possible explanation for our findings in all publications, reports, and outcomes associated with this study (Kendrick et al., 2001). However, we believe that this design actually improves overall response rates by allowing LEOs to feel more comfortable responding to our survey.

By obtaining permission of each agency's chief or sheriff (ie-recruiting at the agency level), we hope to increase participation rates. Our recruitment documents asked the leadership at each selected agency to play a pivotal role in the survey administration by allowing each officer 15 minutes of paid time to complete the survey. We believe obtaining buy-in at the agency level will positively impact response rates. While a lower response rate will not significantly affect the study results, we will report both the overall agency response rate, as well as the individual response rate (inter-agency). As noted above, non-response bias will be listed as a limitation in all outputs associated with this study.

B4. Tests of Procedures or Methods to be Undertaken

The survey will be composed of six main sections: (1) demographics, (2) occupational characteristics, (3) motor-vehicle safety training, (4) motor-vehicle operations and safety policies, (5) officer safety practices and perceptions, and (6) prior occupational motor-vehicle crashes and events. Since no validated tool or questionnaire exists, we will develop a survey

using a combination of several national validated tools. We will model questions from sections one (demographics) and two (occupational characteristics) after the questionnaire used in the "Buffalo Police Health Study" (Violanti, 2000). This study examines the effect of policing and stress on adverse metabolic and subclinical cardiovascular outcomes and is a joint effort between NIOSH and the University at Buffalo (2000). The survey associated with this study includes a series of questionnaires which measure demographic, lifestyle, and psychological factors (Violanti 2000). We have modified questions from this survey for use in our study and population.

We will model sections four (motor-vehicle operations and safety policies) and five (officer safety practices and perceptions) on the survey used in the "The Driver Training Study" (POST, 2009). The California Commission on Peace Officer Standards and Training (POST) recently completed a comprehensive exploratory study of vehicle operations and driver training in the state of California. The purpose of this study was to identify the most effective vehicle operations training practices in order to replicate and implement them in California (POST, 2009). We have modified questions used in this study as needed for use in the current study population.

Finally, questions from the National Highway Traffic Safety Administration's (NHTSA) Motor Vehicle Occupant Safety Survey (MVOSS) will be used. The MVOSS is a biennial telephone survey of 8,000 randomly selected Americans, aged 16 years and older (NHTSA, 2008). Respondents are queried on attitudes, beliefs, and behaviors concerning occupant protection including seat belts, enforcement, and laws related to protecting motor vehicle occupants. We have modified the questions for use in this population. The MVOSS questions will be used in sections three, five, and six (prior occupational motor-vehicle crashes and events) where applicable.

This study will utilize the health belief model (HBM) as the conceptual framework for the study, specifically for questionnaire (see Table 3 below for question breakdown) and toolkit development. The HBM is a psychological model that attempts to explain and predict health behaviors by focusing on the attitudes and beliefs of individuals and has been applied to a broad range of health behaviors, including preventive behaviors like wearing a seatbelt (Glanz et al., 2002). The HBM includes four constructs: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Glanz et al., 2002). We will use the general form of the Structural Equation Model to measure the HBM constructs (Cummings et al., 1987).

The use of a conceptual framework to guide data collection allows for development of evidence-based messages which are clear, concise, and well-targeted. For example, if the study demonstrates low perceived susceptibility to injury in MVCs, the prevention message in the toolkit would be entirely different than if the study reveals a high level of perceived barriers to safety behaviors like seatbelt use. The study is not designed to test the HBM's ability to predict seatbelt use or other safety behaviors.

Table 3: HBM Constructs and Survey Question Alignment (Maiman et al., 1977)

Construct	Question #

Perceived Benefits	21 (scale = strongly agree 5 to strongly disagree 1) 29 (rank order = 1-5) 36 (scale = very likely 5 to very unlikely 1) 37 (scale = very important 5 to not at all important 1)
Perceived Barriers	38 (scale = very important 5 to not at all important 1) 40 (rank order = 1-5)
Perceived Susceptibility	21 (scale = strongly agree 5 to strongly disagree 1) 27 (scale = very likely 6 to very unlikely 1) 28 (scale = very dangerous 4 to not at all dangerous 1) 29 (rank order = 1-5) 36 (scale = very likely 5 to very unlikely 1) 37 (scale = very important 5 to not at all important 1 38 (scale = very important 5 to not at all important 1)
Perceived Severity	18 (rank order = 1) 27 (scale = very likely 6 to very unlikely 1) 28 (scale = very dangerous 4 to not at all dangerous 1) 36 (scale = very likely 5 to very unlikely 1) 37 (scale = very important 5 to not at all important 1)

Before use in the field, the questionnaire will go through several rounds of formal and informal pilot testing. This pilot testing will include internal and external peer review for reliability, validity, and comprehension. Internal peer review will include survey experts and content experts at NIOSH-DSR. Additionally, officers from the Davenport, Iowa Police Department tested the survey for content and comprehension. Based on this pilot-testing, the questionnaire was further refined as needed. Consequently, each question was scrutinized to confirm that it would provide useful information for analyses in terms of content.

B5. Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data

The following individuals will be involved in the design, collection and/or analysis of the data obtained in this study:

Hope M. Tiesman, MSPH, Ph.D. - Project Officer/Epidemiologist, Analysis and Field Evaluations Branch (AFEB), Division of Safety Research (DSR), NIOSH, Morgantown WV, 304-285-6067, htiesman@cdc.gov. Dr. Tiesman is the project officer and will be involved in the design, collection, and analysis of data.

Rebecca Heick, MPH, Ph.D –Assistant Professor, Walden University, School of Health Sciences, Davenport, Iowa, 309–738–2316, Rebecca.heick@walden.edu. Dr. Heick is the co-project officer (contractor) and will be involved in the design, collection, and analysis of the data.

Scott Hendricks, MPH. – Statistician, AFEB, DSR, NIOSH, Morgantown WV, 304-285-6000, sah5@cdc.gov. Mr. Hendricks will be involved in the design and analysis of the data.

Lunette Utter – Data Collection Specialist, AFEB, DSR, NIOSH, Morgantown WV, 304-285-6001, lku1@cdc.gov. Ms. Utter will be involved in the agency recruitment and collection of the data.

References

Bureau of Justice Statistics. (June, 2007). Census of State and Local Law Enforcement Agencies, 2004. NCJ 212749.

California Commission on Peace Officer Standards and Training (POST). (February 2009). POST Driver Training Study: Volume One.

Cummings KM, Jette AM, Rosenstock IM. (1987). Construct Validation of the Health Belief Model. Health Education & Behavior, 6:394-405.

Discoverpolicing.org. http://discoverpolicing.org/. Accessed on July 6, 2010.

Glanz K, Rimer BK, & Lewis FM. (2002). Health Behavior and Health Education: Theory, Research and Practice. San Francisco: Wiley & Sons

Kendrick D, Hapgood R, Marsh P. (2001). Do Safety Practices Differ Between Responders and Non-Responders to a Safety Questionnaire? Injury Prevention, 7:100-103.

Maiman LA, Becker MH, Kirscht JP, Haefner DP, Drachman RH. (1977). Scales for Measuring Health Belief Model Dimensions: A Test of Predictive Value, Internal Consistency, and Relationship Among Beliefs. Health Education & Behavior, 5:215-230.

National Highway Traffic Safety Administration (NHTSA). (August 2008). 2007 Motor Vehicle Occupant Safety Survey: Volume 1 Methodology Report. DOT HS 810 974.

Westley W. (1971). Violence and the police: A sociological study of law, custom, and morality. Boston, MA : The MIT press.

Violanti J. (2000). The Buffalo Police Health Baseline Study. Epidemiology, 11(4):S57.