Project Abstract Components for
Outcome Assessment

Project description:

The purpose of this study was to examine farm vehicle and non-farm vehicle characteristics, as well as farm and public road environmental characteristics in order to better understand the interplay of these factors and how they contribute to farm vehicle public road crashes.

Target Population:

Drivers of farm vehicles on public roads

# Participants/Subjects/Observations:

385 North Carolina Farm Operators Who Drive Farm Vehicles on Public Roads

Specific Aims/Objectives:

Understand driver, vehicle and environmental (public road and farm) characteristics that are associated with increased farm vehicle public road crash risk.

Methods:

A case-control design was used to compare farms reporting a farm vehicle public road crash with farms that had not experienced a crash. A case was defined in this study as a North Carolina resident farm operator or owner/operator, who met the following criteria: drives farm vehicles on public roads; is 18 years of age or older; and either he/she or the farm help had experienced a farm vehicle public road crash between 1992 and 2003. Controls met the same screening criteria, except that neither the farmer respondent nor the farm help had experienced a farm vehicle crash between 1992 and 2003. This study used the farm as the unit of sampling and analysis rather than individual farm vehicle drivers. A USDA-sponsored agricultural program database provided a list of North Carolina resident farm operators and owner/operators with unique phone numbers (n = 46,910) from which a SAS program for random selection without replacement and random ordering generated 20,000 telephone numbers for sequential calling. A total of 14,800 phone numbers were called. Of those 14,800 calls, 24 percent were unable to be screened for the following reasons. Approximately 1.4 percent of calls were to individuals who refused to be screened. Approximately 22 percent of calls were placed
to numbers that were either out of service (n = 1,807), no longer where a farmer lives (n = 683), or could not be contacted (n = 807). Approximately 76 percent of the total 14,800 numbers called (i.e., 11,299 numbers) were to households that allowed successful screening. Approximately 26 percent (n = 3,902) of households successfully screened met inclusion eligibility criteria. The eligibility criteria were: North Carolina resident farm operators or owner/operators; 18 years of age or older; actively farming; and, reporting driving farm vehicles on public roads at the time of the study. Informed consent was obtained from all respondents following protocols approved by the NCSU IRB.

Eligible individuals were asked to participate in a 20 minute telephone survey, which included a question as to whether he/she or his/her farm help had experienced a farm vehicle public road crash between 1992 and 2003. A total of 236 interviews (i.e., with 208 no-crash respondents and 28 crash case respondents) were completed in part one of the telephone interviews. The 208 became the no crash control cases. From that point on, eligible individuals were screened and asked to complete the interview only if they or their farm help had experienced a farm vehicle public road crash between 1992 and 2003. A total of 188 crash case surveys were completed in the second phase of sampling. Combined with the 28 crash cases identified in the first phase of interviewing, a total of 216 crash cases were available for data analysis. Altogether, a sample of 216 farm vehicle public road crash cases and 208 no-crash controls resulted in a 1:1 case-control ratio. No eligible individuals asked to complete the survey refused. Survey contained measures of driver, farm vehicle, farm enterprise, and public road environment characteristics.

Results:

The posited combination of driver, vehicle and environmental characteristics significantly increased farm vehicle public road crash group membership. In addition, several posited risk factors suggest instead a “preventive” impact on farm vehicle public road crash risk.

Farms reporting non-family and non-English speaking farm vehicle drivers and younger farm vehicle drivers were at increased farm vehicle public road crash group membership risk. Farms reporting older drivers and a higher farm vehicle crash risk perception were less likely crash group members. Farms reporting a history of farm injury were also at increased risk for farm vehicle crash group membership.

Farms reporting increased non-farm vehicle public road use were at increased risk for farm vehicle public road crash group membership. Farms reporting more perceived public road use conflict were also at increased risk for farm vehicle public road crash group membership.
Conclusions:

Past farm vehicle public road crash preventive actions have focused primarily on the farm vehicle driver and the farm vehicle rather than taking a combined driver, vehicle and public road environmental approach. Future farm vehicle public road crash reduction interventions should consider a combined approach that may require changes to the public road infrastructure if the primarily driver and vehicle focused crash preventive actions alone prove ineffective against increasing public road use competition and public road driving conflict, as suggested by these findings.

Public road crashes are complex social phenomena. A combination of driver, vehicle and environmental characteristics were associated with farm vehicle public road crash group membership. Most increased the risk of public road crashes, while several played a protective role by decreasing farm vehicle public road crash group membership.

In summary, the data from this study suggest a combination of driver, vehicle and public road and farm environmental characteristics contribute to increased farm vehicle public road crash risk. Thus, a multifaceted approach to farm vehicle public road safety that goes beyond the farmer and farm vehicle is warranted. Urban expansion will continue to place increased numbers of urban drivers not familiar with rural roads and farm vehicles in traditional agricultural regions. Agriculture remains an important industry in North Carolina, so further research and intervention about how farmers and non-farmers can share public roads is warranted.

Products:


Future Directions:
Analysis of data for journal articles

Additional Grants:
NIOSH Costs of Tractor Operator Injuries from Overturns and Highway Collisions

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