Methods Overview of the Commercial Driver Individual Differences Study

Richard Hanowski, Ph.D.
Director, Center for Truck & Bus Safety
Virginia Tech Transportation Institute
Blacksburg, USA

4th International Conference and Exhibition on Occupational Health & Safety
Toronto, Canada
August 24-25, 2015

Acknowledgements

- Study is funded by the U.S. Department of Transportation's Federal Motor Carrier Safety Administration (FMCSA)
- Theresa Hallquist is FMCSA's project manager
- Study is ongoing, but permission granted to discuss study methods
- Co-authors of the paper, and leads on the study, are my VTTI colleagues:
  - **Jeff Hickman, Ph.D.**
  - **Erin Mabry, Ph.D**

CDIDS Overview

- Identify and prioritize CMV driver individual differences with respect to crash risk from 21,000 drivers
- Risk factors will include:
  - Medical factors
  - Personal factors
  - Situational factors
- Extreme groups based on risk outputs will be assessed
  - 3,000 cases and controls

VirginiaTech TRANSPORTATION INSTITUTE

CDIDS Primary Objectives

- Determine whether individual driver factors increase CMV crash risk
- Examine relationships between fleet characteristics and driver health and performance
- Identify and prioritize factors that contribute to risky driving behavior and CMV crashes
- Longitudinally track drivers for crash events

649-F Medical Certification

General Information

- Driver Information
- Health History
- Medications

Testing

- Height
- Weight
- Vision
- Hearing
- Blood Pressure/Pulse Rate
- Laboratory and Other Test Findings

Physical Examination

- General Appearance
- Eyes
- Ears
- Mouth and Throat
- Heart
- Lungs and Chest (not including breast examination)
- Abdomen and Viscera
- Vascular System
- Genitor-urinary System
- Extremities
- Spine and Other Musculoskeletal
- Neurological

Questionnaires

- Approved by OMB
- Initial questionnaire
  - Demographic
  - Prior crash/violation history
  - Training and compensation
  - Medical history
  - Sleep behaviors
  - Lifestyle behaviors
  - Life experiences
  - Risky driving index
- Fleet Characteristics
  - Carrier type
  - Size
  - Number of drivers
  - Health benefits
  - Policies
- Follow-up questionnaire
  - Life experiences
  - Job satisfaction
  - Sleep history

Participant Recruitment

- Point of initial contact at driver orientation
- Drivers are new to JBH, but not entry-level drivers

Group	Mean Age	Age Distribution	Gender	Self-Employed
National Sample (ATA, 2010)	43.1 years old	21 to 29: 10.1% 30 to 44: 41.8% 45 to 64: 44.5% > 65: 3.7%	4.6 % Female 95.4% Male	21% of drivers
Drivers Attending JBH's Driver Orientation	44.3 years old	21 to 29: 7.2% 30 to 44: 41.5% 45 to 64: 48.8% >65: 2.5%	3.9% Female 96.1% Male	19.9% of drivers

Recruitment Sites



Methods

- Fleet personnel introduce study
- Potential participants watch video
- Immediate cash payment or mail to VTTI ($20)
- VTTI receives driver 649-F medical exam
- Monitor drivers monthly for up to 3 years via carrier crash records and MCMIS
- Monthly follow-up with case and control drivers ($10)
  - 1 to 4 ratio

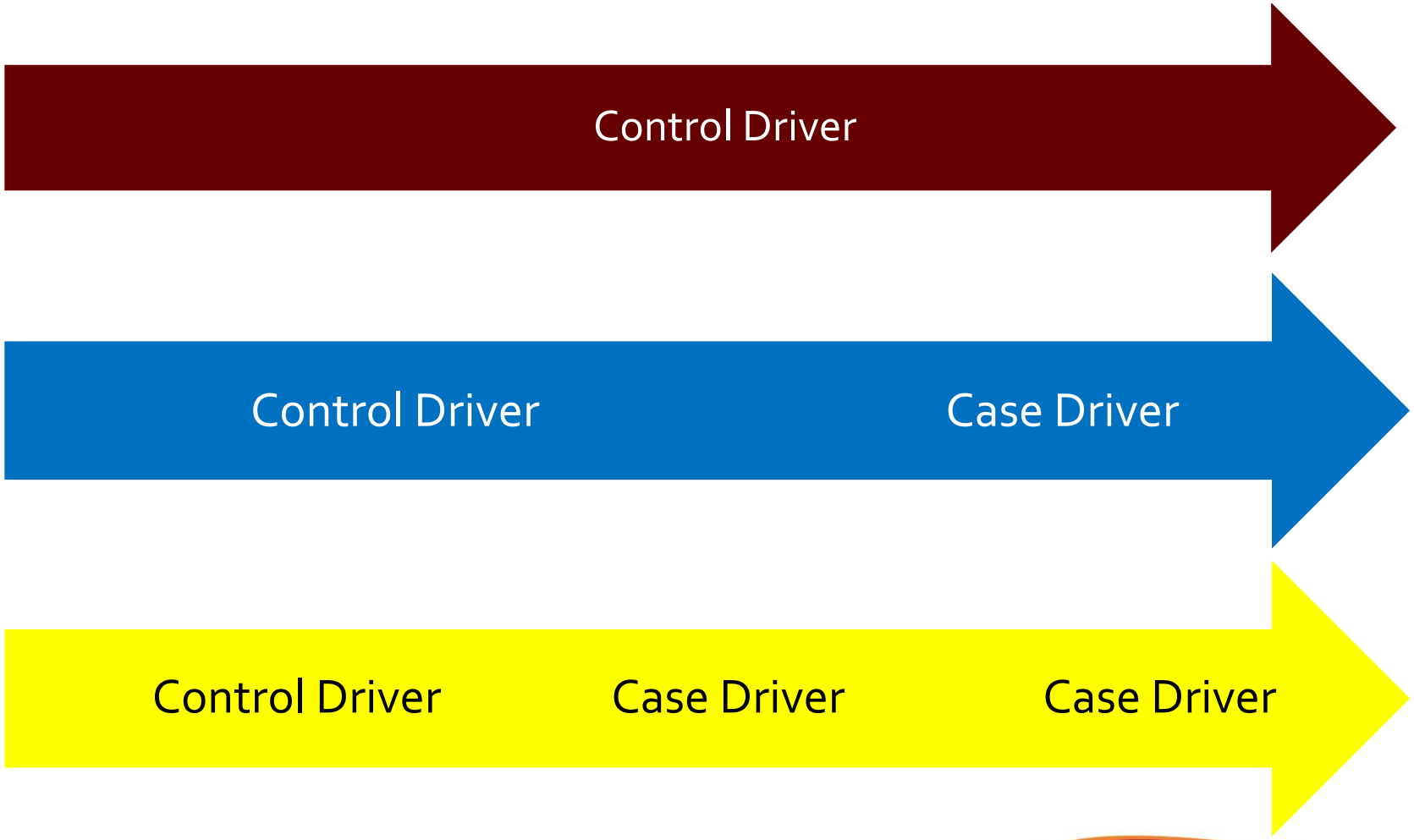
Definition of a Case Driver

Crash Severity	2009 Frequency
Preventable DOT Crashes	514
Non-Preventable DOT Crashes	975
Preventable Non-DOT Crashes	6,627 (total)
Non-road	4,289
Injuries	16
On-road	2,322
Non-Preventable Non-DOT Crashes	7,034

Source: Hickman et al. *Onboard Safety Systems Effectiveness Evaluation Final Report*, 2009

- Preventable DOT crashes
- Preventable non-DOT injury crashes
- Preventable non-DOT on-road crashes

Follow-Up Approach



VirginiaTech
TRANSPORTATION
INSTITUTE

Response Rates

- As of July 30, 2015

	Atlanta	East Brunswick	Chicago	Los Angeles	Dallas	Louisville	Columbus	Total
Participant drivers*	2,881	822	1,867	766	2,229	688	243	**9,496**
Total Drivers	3,795	2,160	3,485	1,479	3,009	1,027	N/A	**14,955**
Response Rate	76%	38%	54%	52%	74%	67%	N/A	**63%**

*Drivers who have completed Driver Survey and are eligible for Follow-up

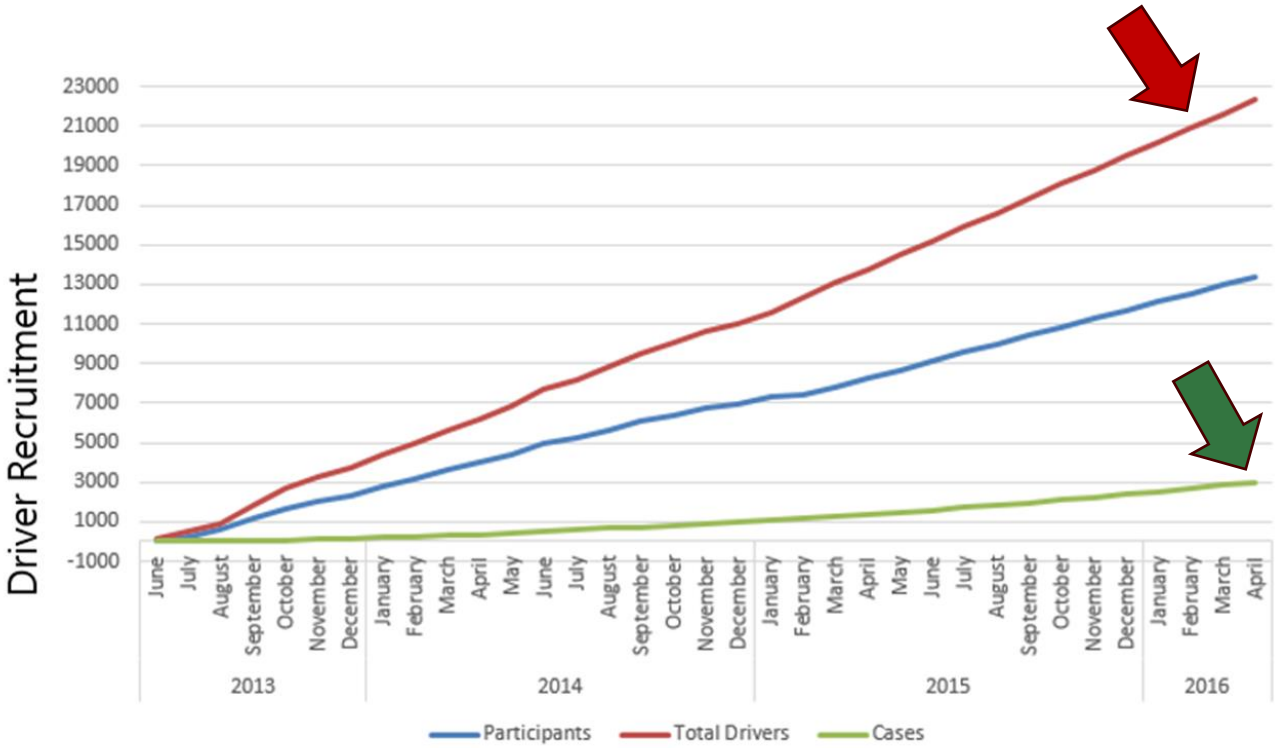
- 1375 case events identified (as of May 2015)
  - 151 case drivers and 508 controls have completed follow-up data collection

Next Steps

- Continue recruiting drivers
  - 400 to 700 drivers each month
  - ~65% complete Driver Survey
- Continue monitoring safety data
  - Carrier data
  - MCMIS
- Continue follow-up with case and control drivers
  - 150-250 drivers contacted monthly

Next Steps

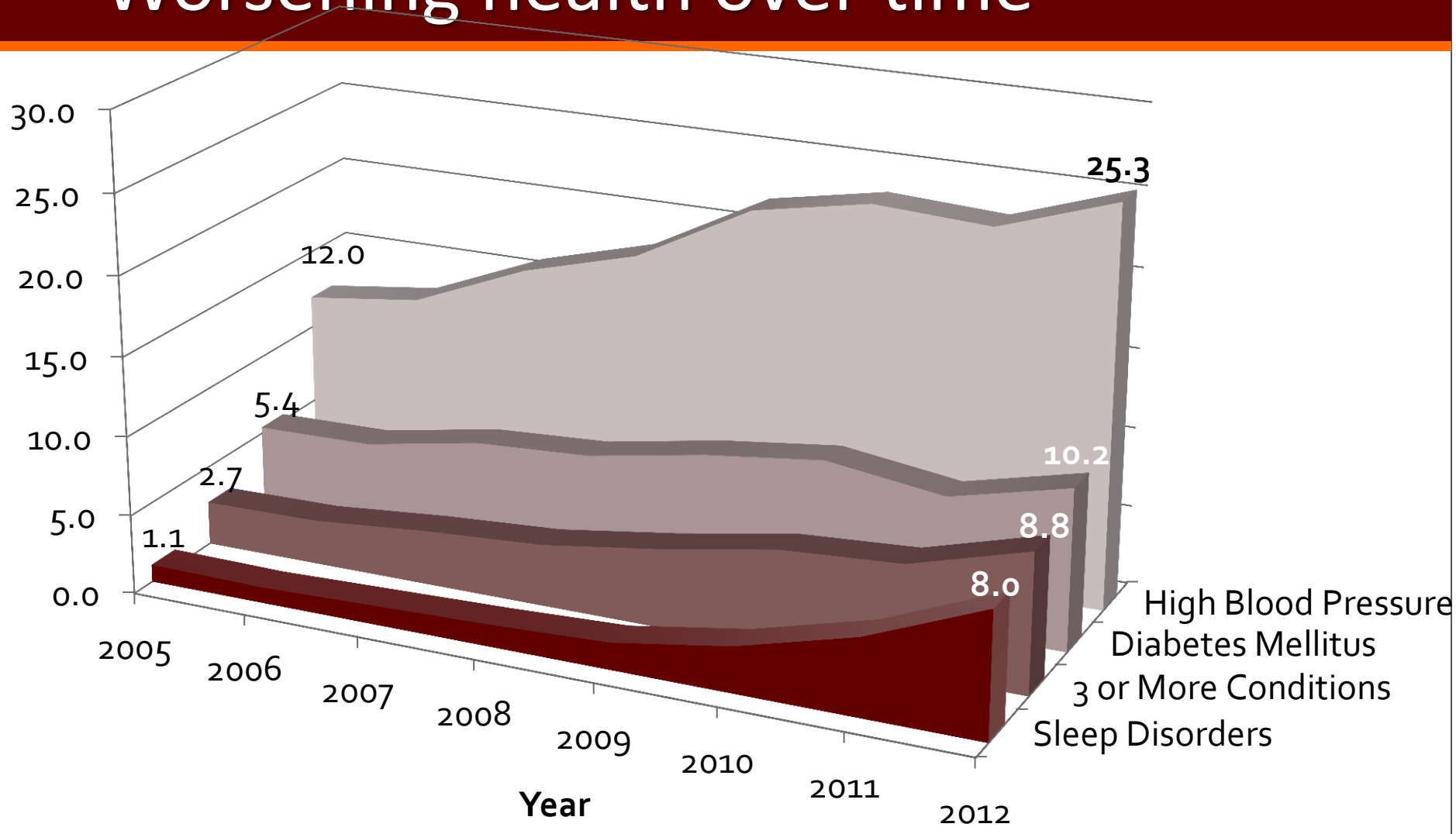
- 21,000 drivers anticipated February 2016
- 3,000 cases anticipated April 2016
- Study Completion: January 2017



Total Drivers, Participant, and Case Tracking and Extrapolation

VirginiaTech TRANSPORTATION INSTITUTE

Worsening health over time



Thiese M.S., Moffitt G., Hanowski R.J., Kales S.N., Porter R.J., Hegmann K.T. (2015). Commercial Driver Medical Exams: Prevalence of Obesity, Co-morbidities and Certification Outcomes. *Journal of Occupational and Environmental Medicine*

New Opportunities?

- Large data sets exist that can be mined to investigate new research questions
  - Important, but insufficient
- Some have estimated that the life expectancy of drivers may be 15 years less than the average US male (*Washington Trucking Associations*)
- Longitudinal study is needed to follow a large cohort of truck drivers through their driving career and into (and past) retirement to better understand the implications of the profession on health and wellness and to develop countermeasures to improve their condition

Questions

