



U.S. Department of Transportation
Federal Highway Administration

Office of Safety Research and Development

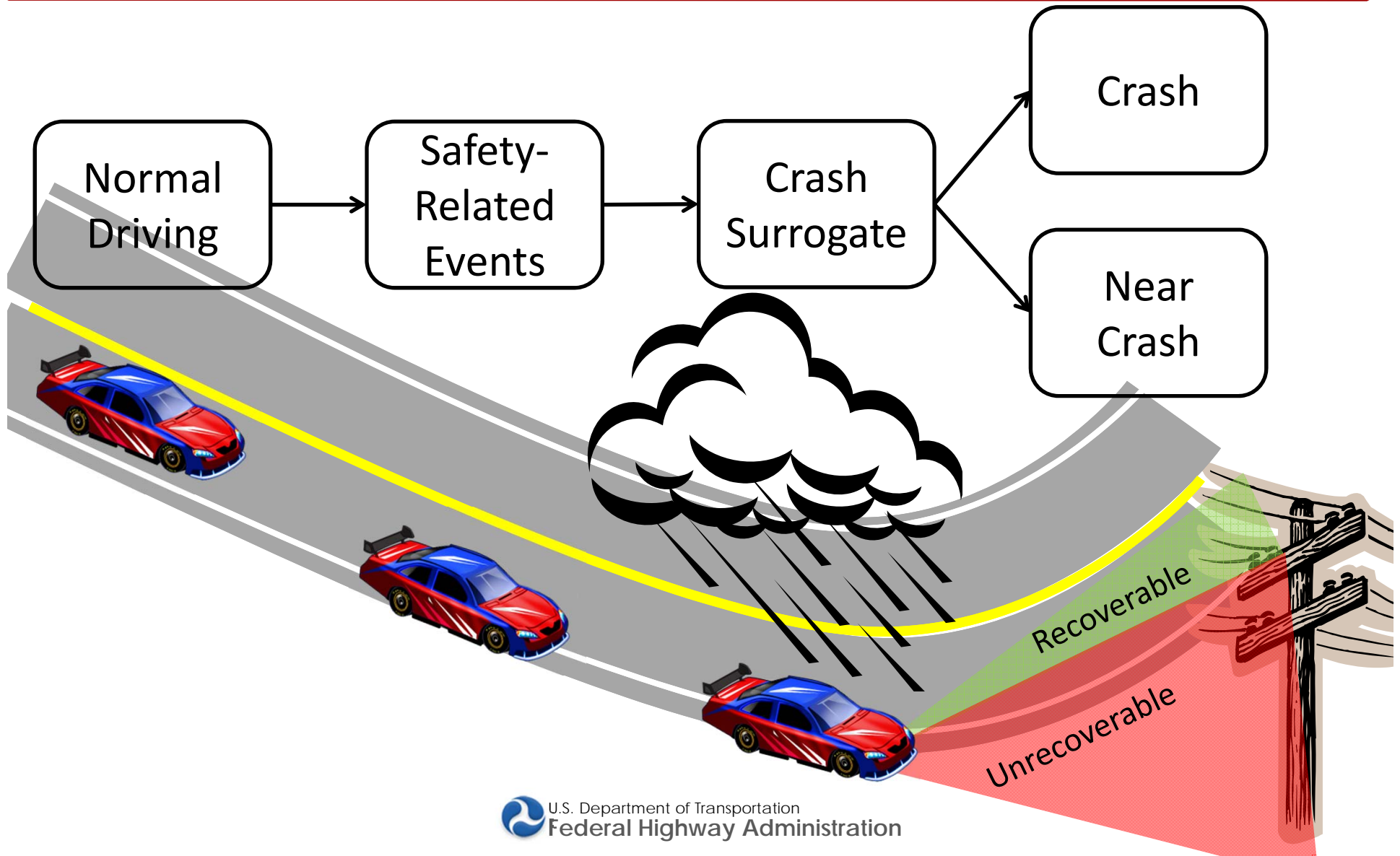
A Systemic Framework for Studying Traffic Crash Sequence Using Naturalistic Driving Study Data

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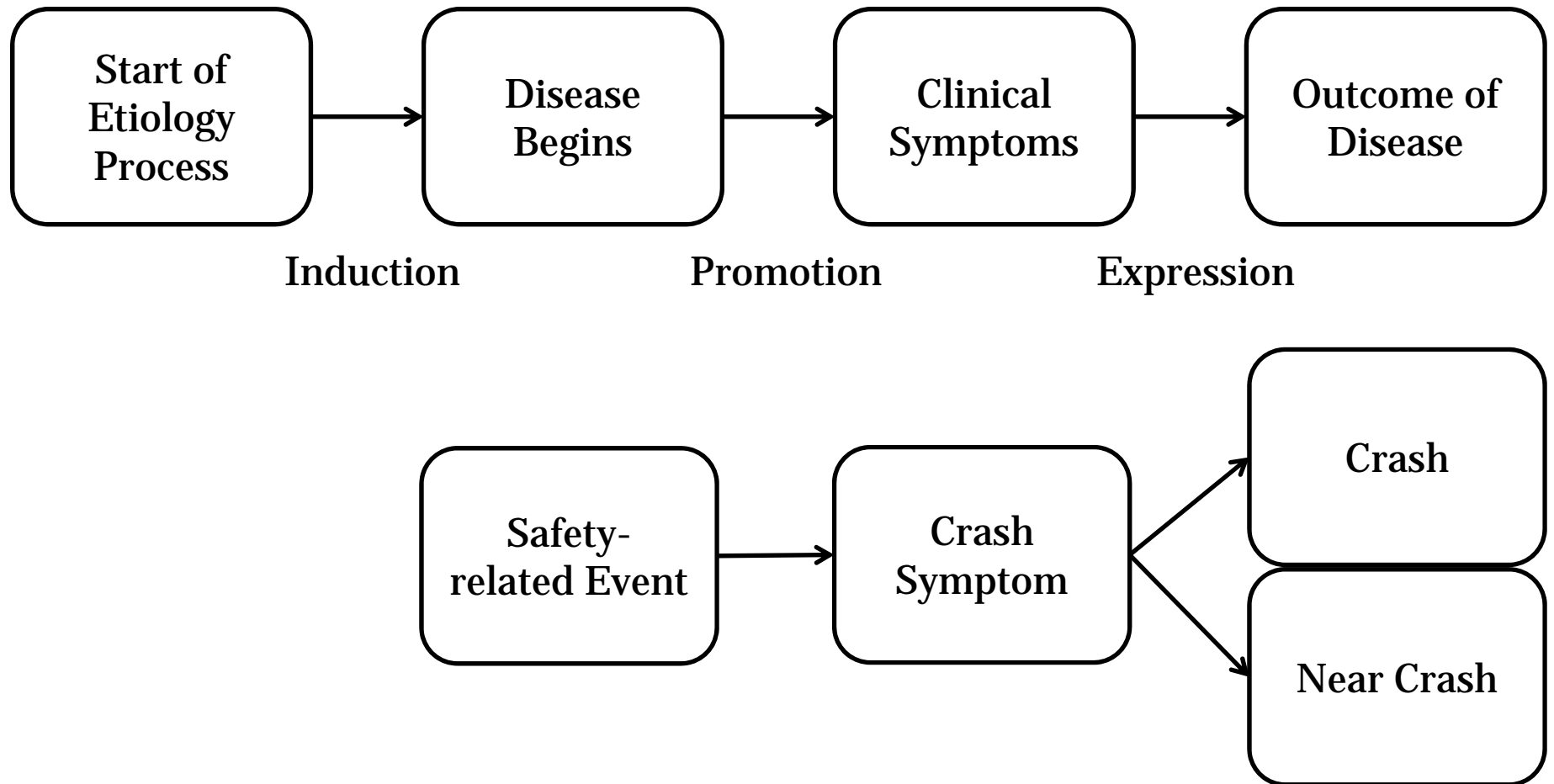
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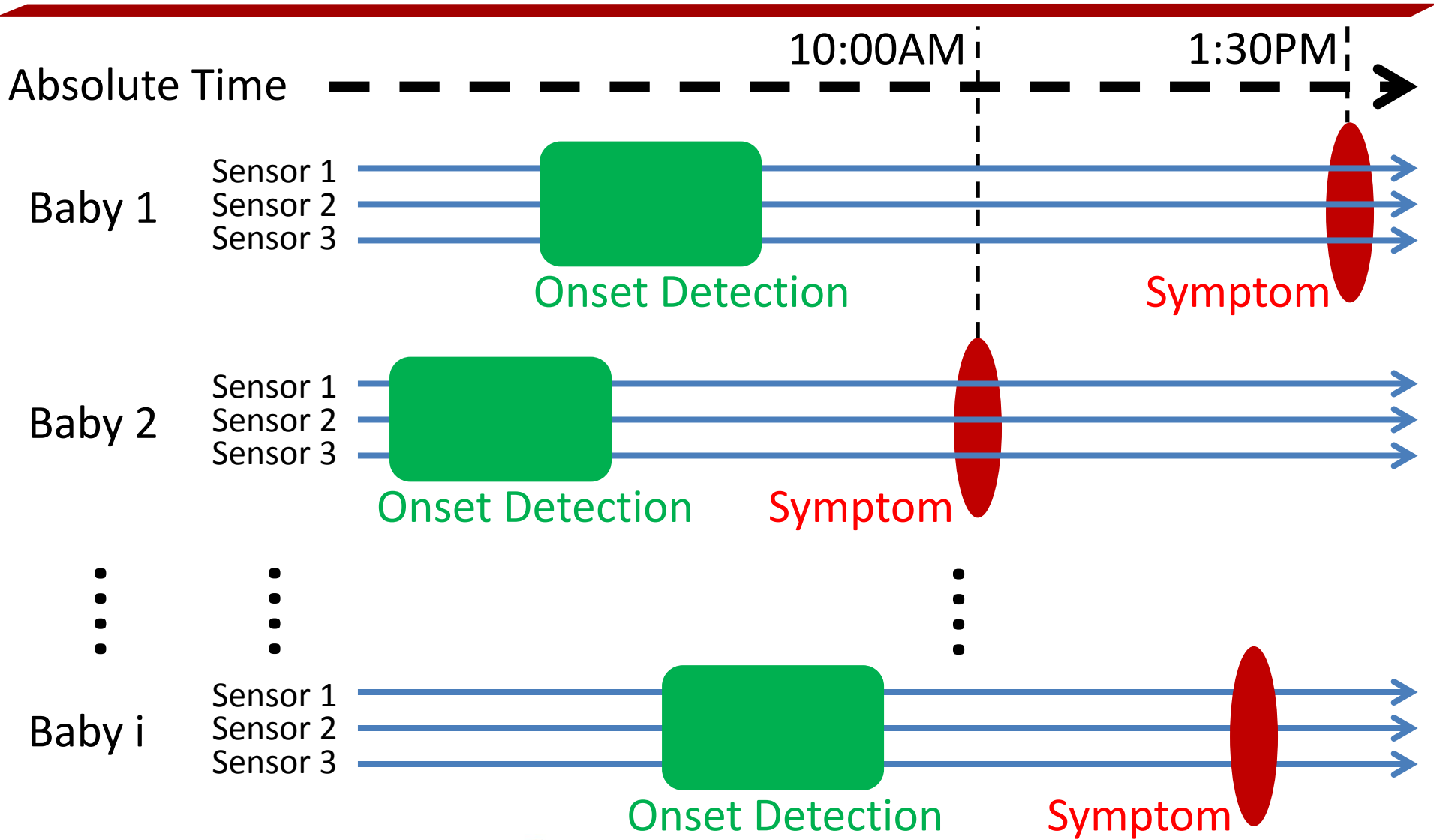
What are Crash Sequences?



Explore Paradigms from Epidemiology and Transposing Their Methods to the Study of Road Crashes



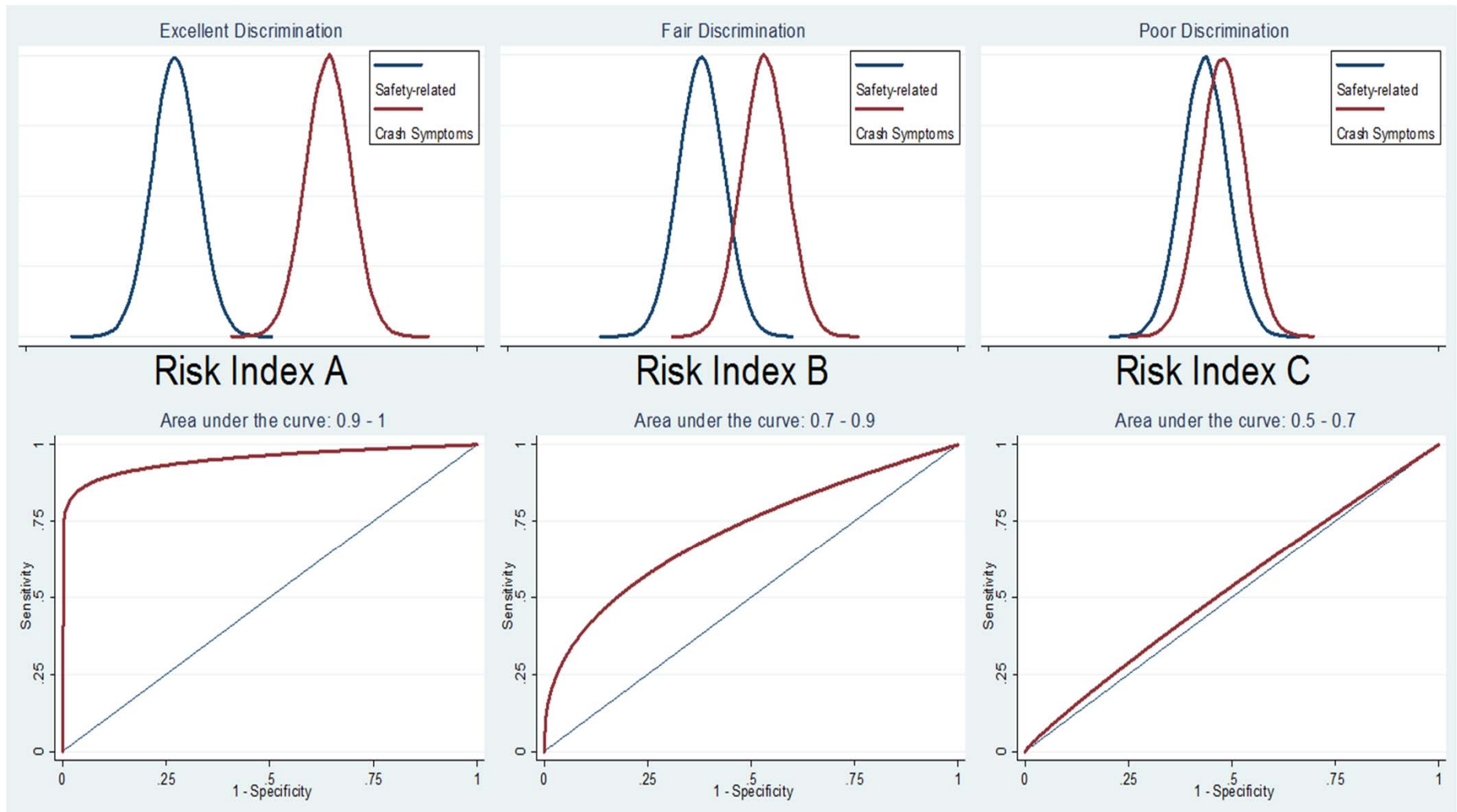
The Hospital for Sick Children Project (IBM)

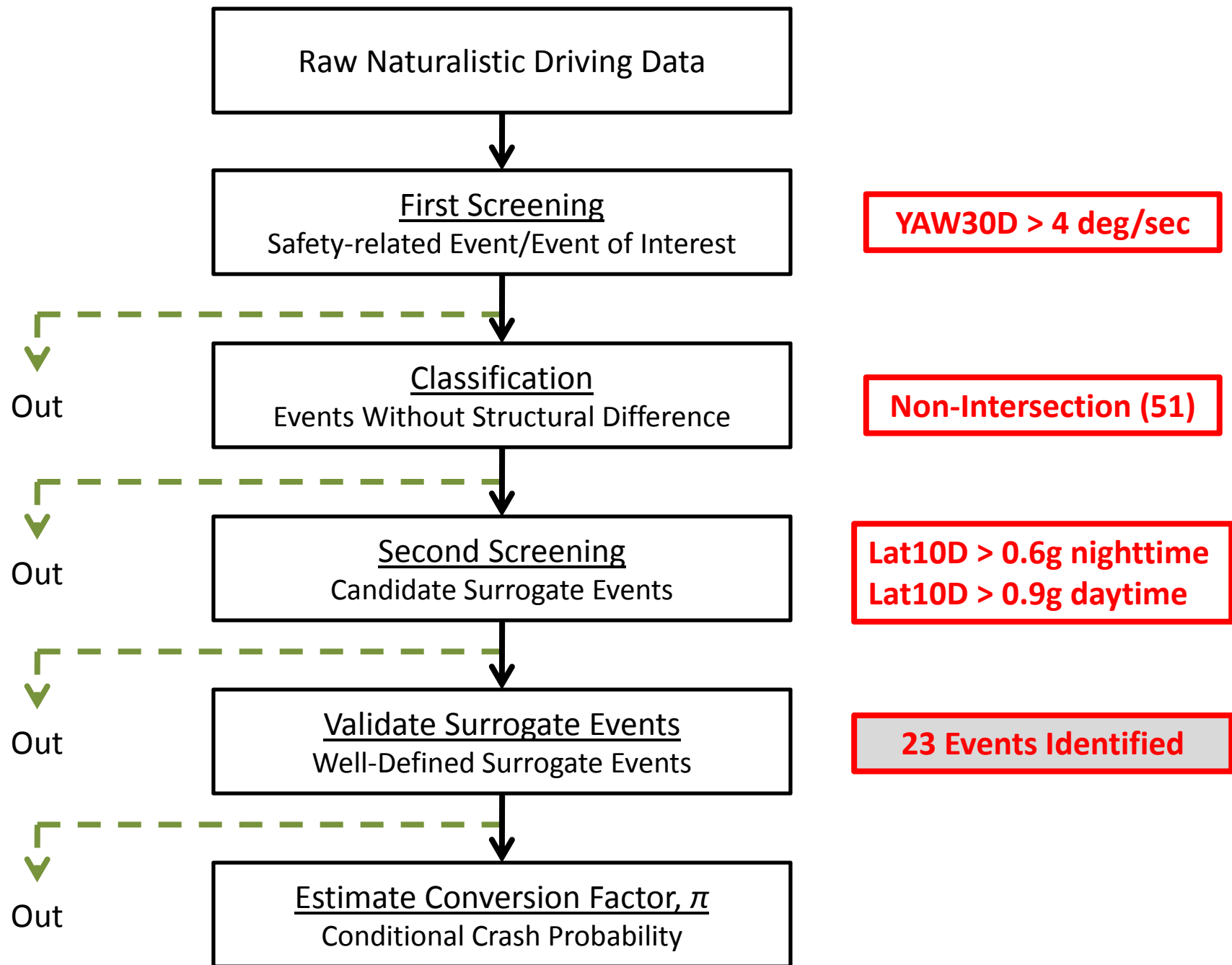


ANALYSIS DATASET

- VTTI 100-Car Data
- Single-vehicle run-off-road crashes
 - 63 identified events
 - 21 Crashes
 - 42 Near crashes
- Apply the structural framework to the dataset to identify “crash symptoms”

RECEIVER OPERATOR CHARACTERISTIC (ROC) CURVE

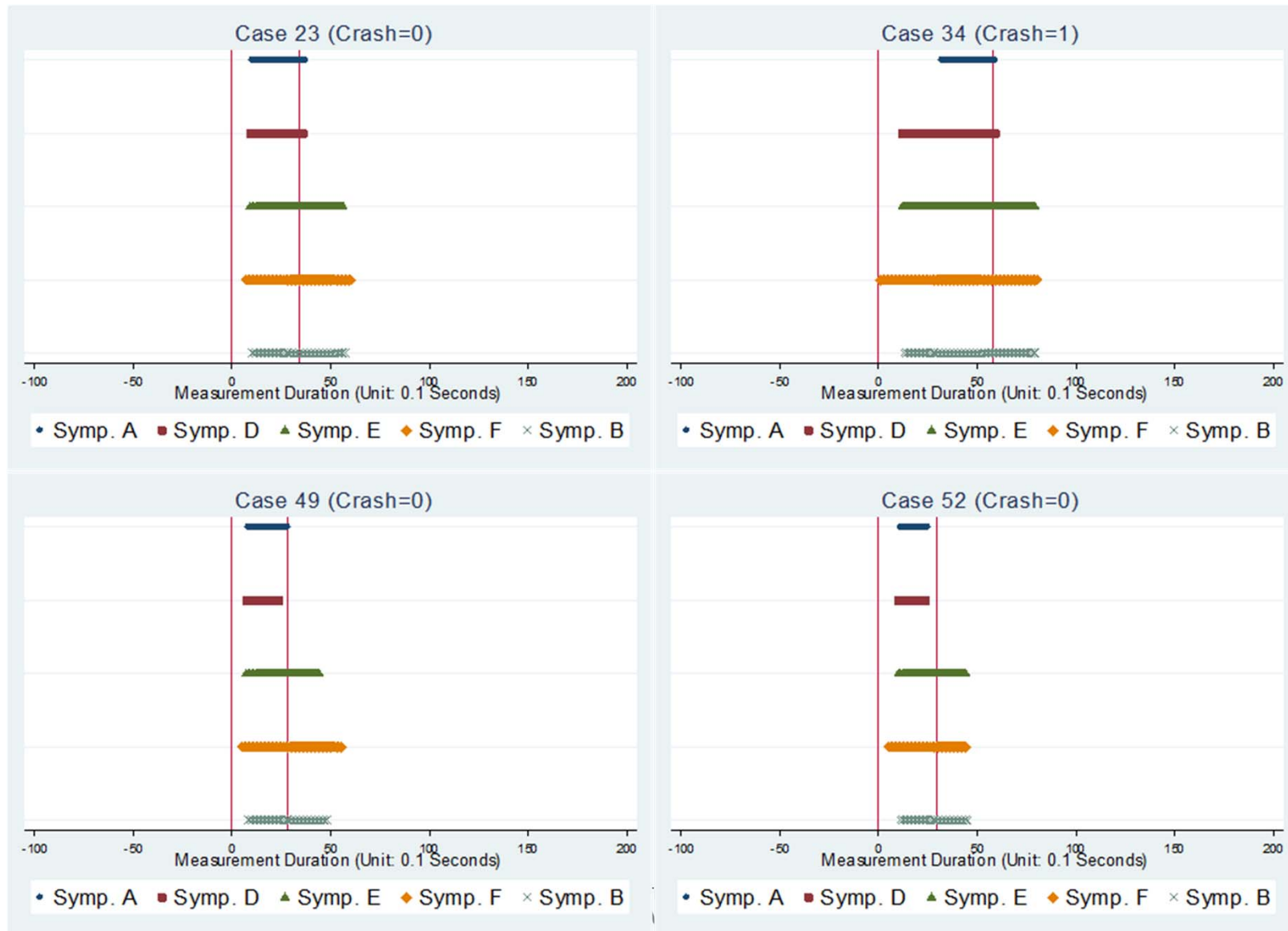




The Quantification of Crash Symptoms for All the Six Screening Measures

Crash Symptoms (Screening Measure at First Screening)	Conditions	Number of Quantification In terms of the 51 Events
Symptom A (Start with Lat10D)	<ul style="list-style-type: none"> Lat10D > 0.4g during event; Non-intersection related Lat30D > 0.7g if during nighttime Lat30D > 0.9g if during daytime 	22
Symptom B (Start with Lat30D)	<ul style="list-style-type: none"> Lat30D > 0.4g during event; Non-intersection related Lat30D > 0.8g if during nighttime Lat30D > 0.9g if during daytime 	22
Symptom C (Start with Lat01M)	No statistical relationship between crash symptoms and crash risk can be established.	NA
Symptom D (Start with Lat10M)	<ul style="list-style-type: none"> Lat10M > 0.3g during event; Non-intersection related Lat30D > 0.8g if during nighttime Lat30D < 0.9g & if during daytime 	20
Symptom E (Start with Lat30M)	<ul style="list-style-type: none"> Lat30M > 0.3g during event; Non-intersection related Lat10D > 0.7g if during nighttime Lat10D > 0.9g if during daytime 	20
Symptom F (Start with Yaw30D)	<ul style="list-style-type: none"> Yaw30D > 4 degree/sec during event; Non-intersection related Lat10D > 0.6g if during nighttime Lat10D > 0.9g if during daytime 	23

In Traffic Safety Field, NDS Data Provides a Similar Opportunity to Study the Progression of a Crash.



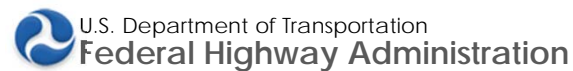
Summary

- NDS data provides an excellent opportunity to better understand the crash process.
- This study explores paradigms from other disciplines and transposes their methods to the study of road crashes.
- The results based on the algorithm developed are consistent with researchers' video review of event initiation and duration.

ACKNOWLEDGEMENT



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THANK YOU

