



# HOW DRIVER BEHAVIOR DIFFERS IN CANADA AND US?

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# OUTLINE

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▪ Age-weighted prevalence comparison;

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▪ Adverse weather effect

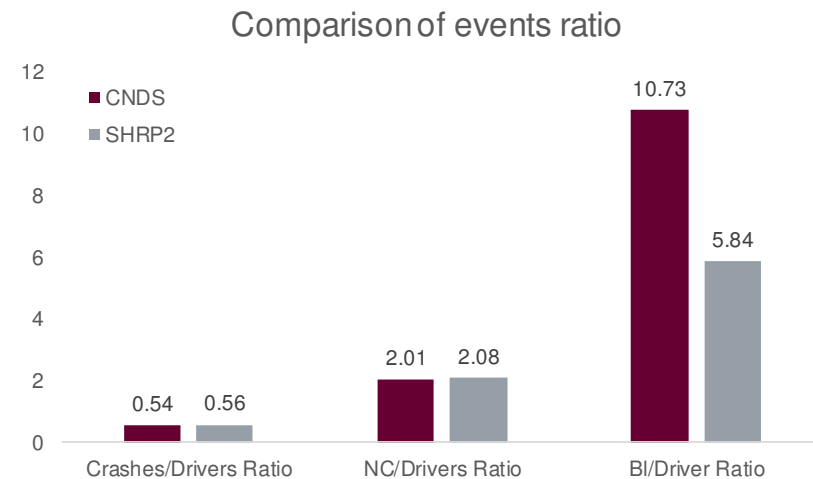
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▪ Odds Ratio

# DATA OVERVIEW

- Data description

	CNDS	SHRP2
# of Drivers	149	3,286
# of Crashes	<b>81</b>	<b>1,856</b>
Crashes/Drivers Ratio	<b>0.54</b>	<b>0.56</b>
# of Near-Crash	300	6,819
NC/Drivers Ratio	2.01	2.08
# BL	1,599	19,179
BI/Driver Ratio	10.73	5.84

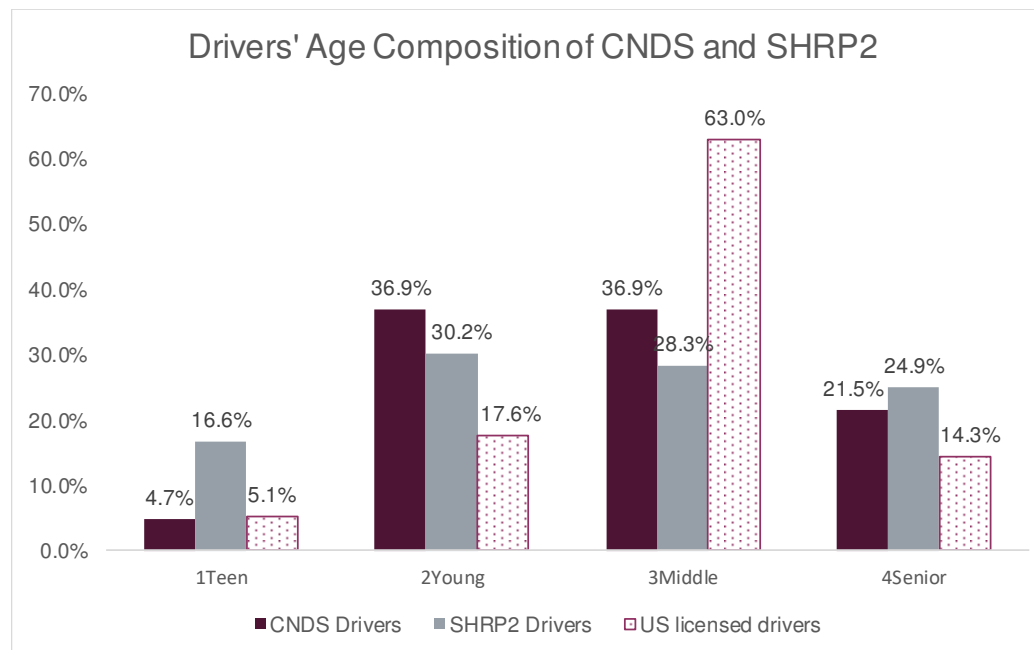


! The average crashes per driver is about the same for both countries although the number of baselines per driver is much greater in Canada.

# AGE COMPOSITION

## ■ Drivers' age distribution

- ! Both countries **over-sampled "Young" and "Senior" drivers**, and SHRP2 **over-sampled "Teen" drivers** also. **"Middle-age" drivers were under-sampled** in both Canada and SHRP2.
- ! Canada has **higher proportion of "Young" and "Middle-age" drivers**, while **lower in "Teen" drivers**.
- ! Canada only include age 18 and plus, while SHRP2 includes age 16 and 17 drivers as well



Note1: Age group: Teen(16-19); Young (20-29); Middle (30-64); Senior (65+)

Note 2: Source of US licensed drivers: <https://www.fhwa.dot.gov/ohim/onh00/bar7.htm>

# AGE-ADJUSTMENT METHODOLOGY

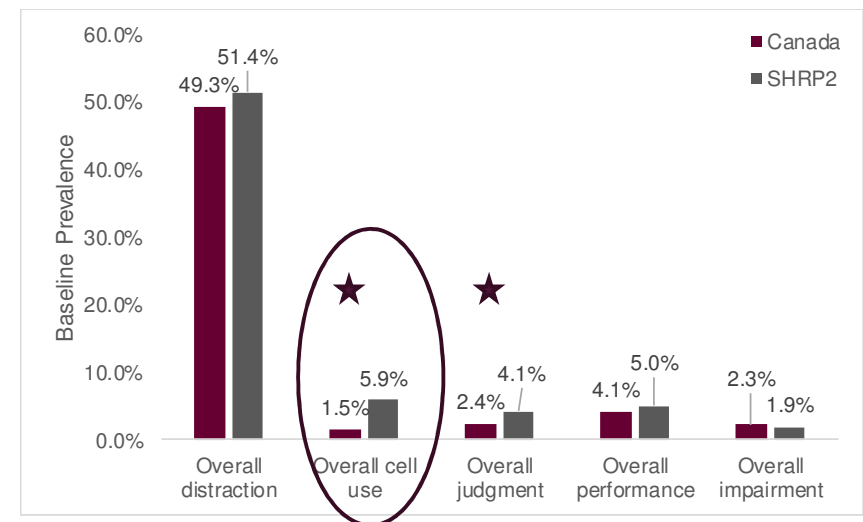
- Baseline prevalence
  - To measure the exposure under the normal, non-crash driving condition.
- Age-adjustment method
  - Age is an important factor. Young drivers have a much higher risk of crash and higher prevalence of secondary task engagement.
  - The age composition of Canada and SHRP2's participants are very different with SHRP2 oversample teenage and senior driver population.
  - In order to make valid comparisons, an age-adjusted method based on US licensed drivers was employed to control the differences among the age distributions of participants.

$$BP_{adj} = \sum_{i=1}^4 \frac{Task_i}{N_i} \times w_i^{US}$$

*i: Age group number*

# OVERALL BASELINE PREVALENCE

- Drivers in Canada engaged in observable distraction make up 49.3%, which is smaller than SHRP2 of 51.4%. An age-adjustment method has been applied to make the result more compatible.
- Canada has a much lower cell use prevalence (1.5% of baselines) than SHRP2 of 5.9%.
- The judgment error prevalence in Canada is relatively lower (2.4%) than SHRP2 (4.1%).
- In general, drivers in Canada engaged in distractions and other factors less often than in SHRP2



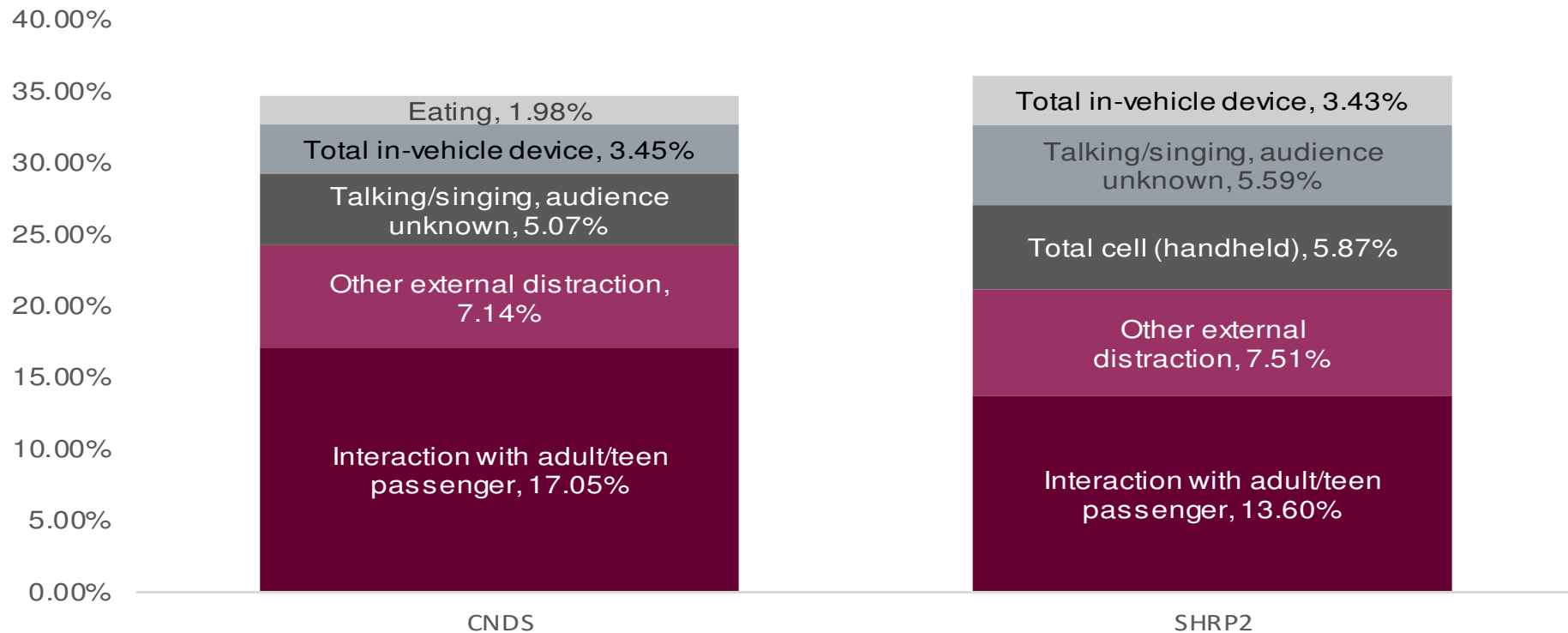
**Judgment error:** Aggressive driving; speeding; illegal/unsafe passing; following too closely; intentional signal/stop sign/yield sign violation; etc.

**Performance error:** inexperience, fail to signal; driving too slowly; unintentional signal/stop sign/yield sign violation; improper turn; wrong side of road; etc.

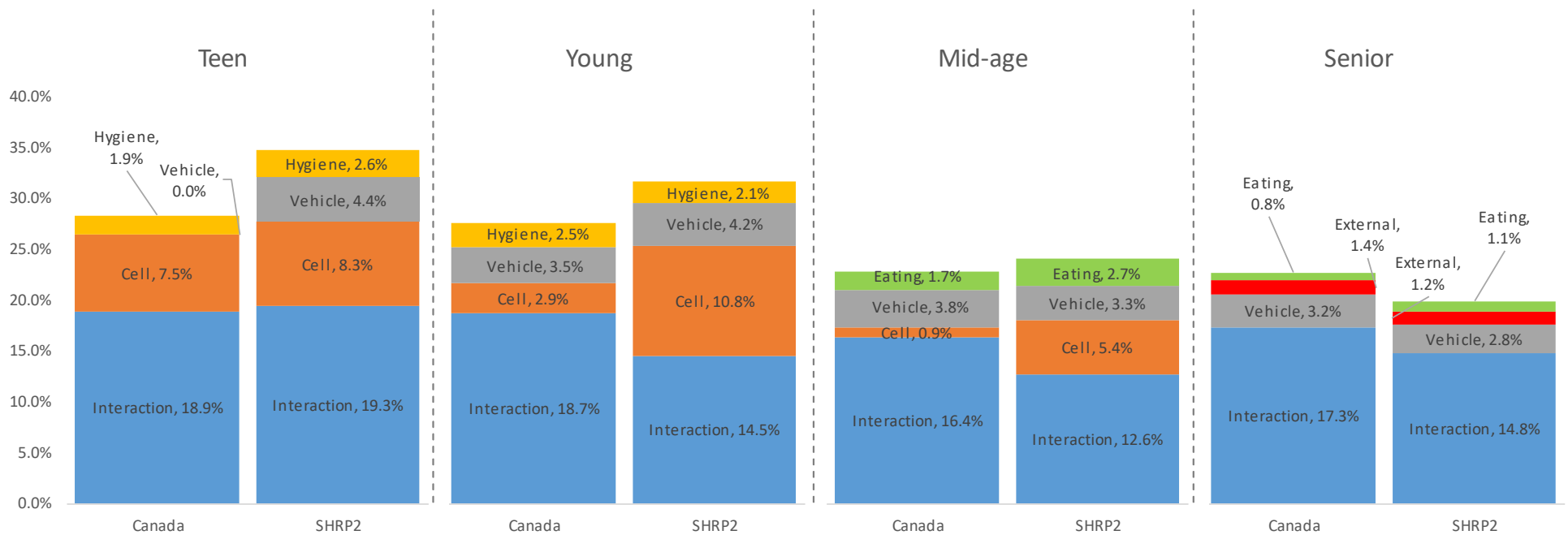
**Impairment error:** Drowsiness/fatigue; emotion; drug/alcohol; etc.

# PREVALENCE OF SUB-DISTRACTION CATEGORY (CA VS US)

## Top 5 sub-distractions in CNDS and SHRP2



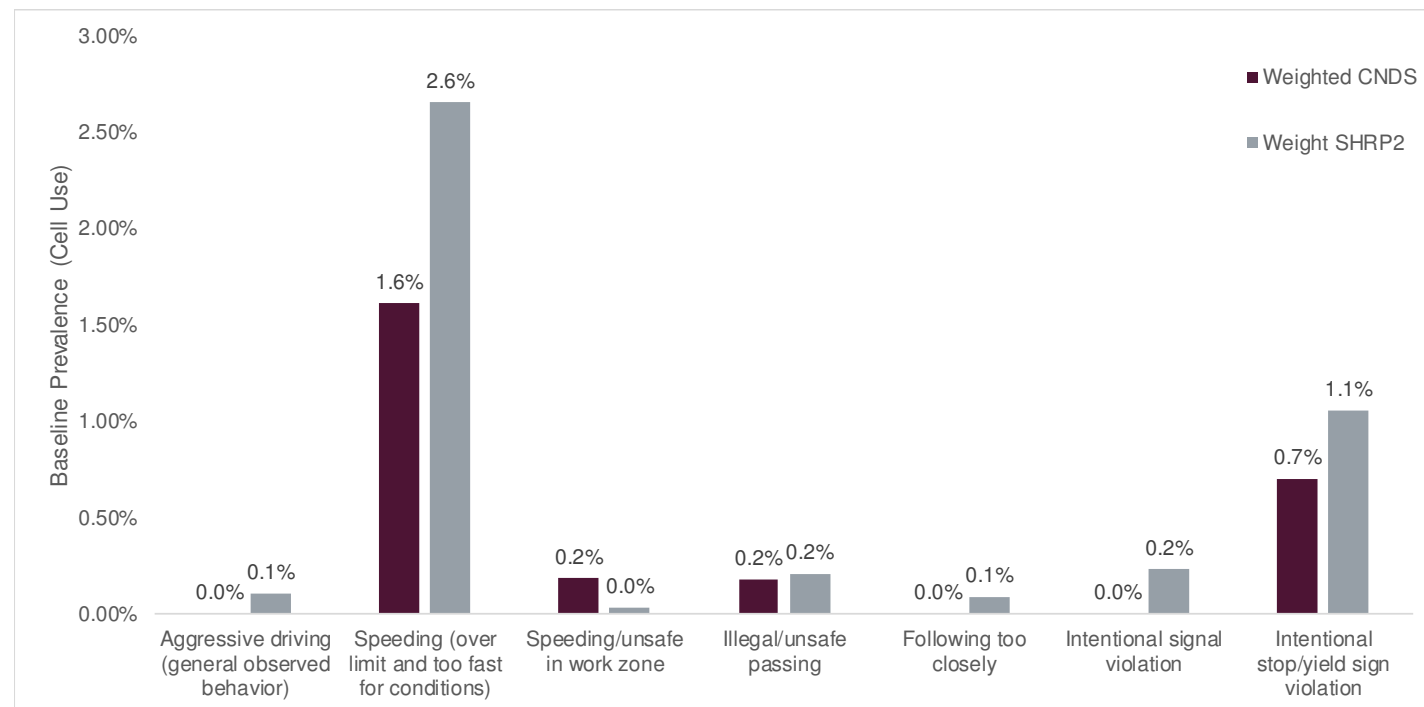
# PREVALENCE OF SUB-DISTRACTION CATEGORY (US VS CA)





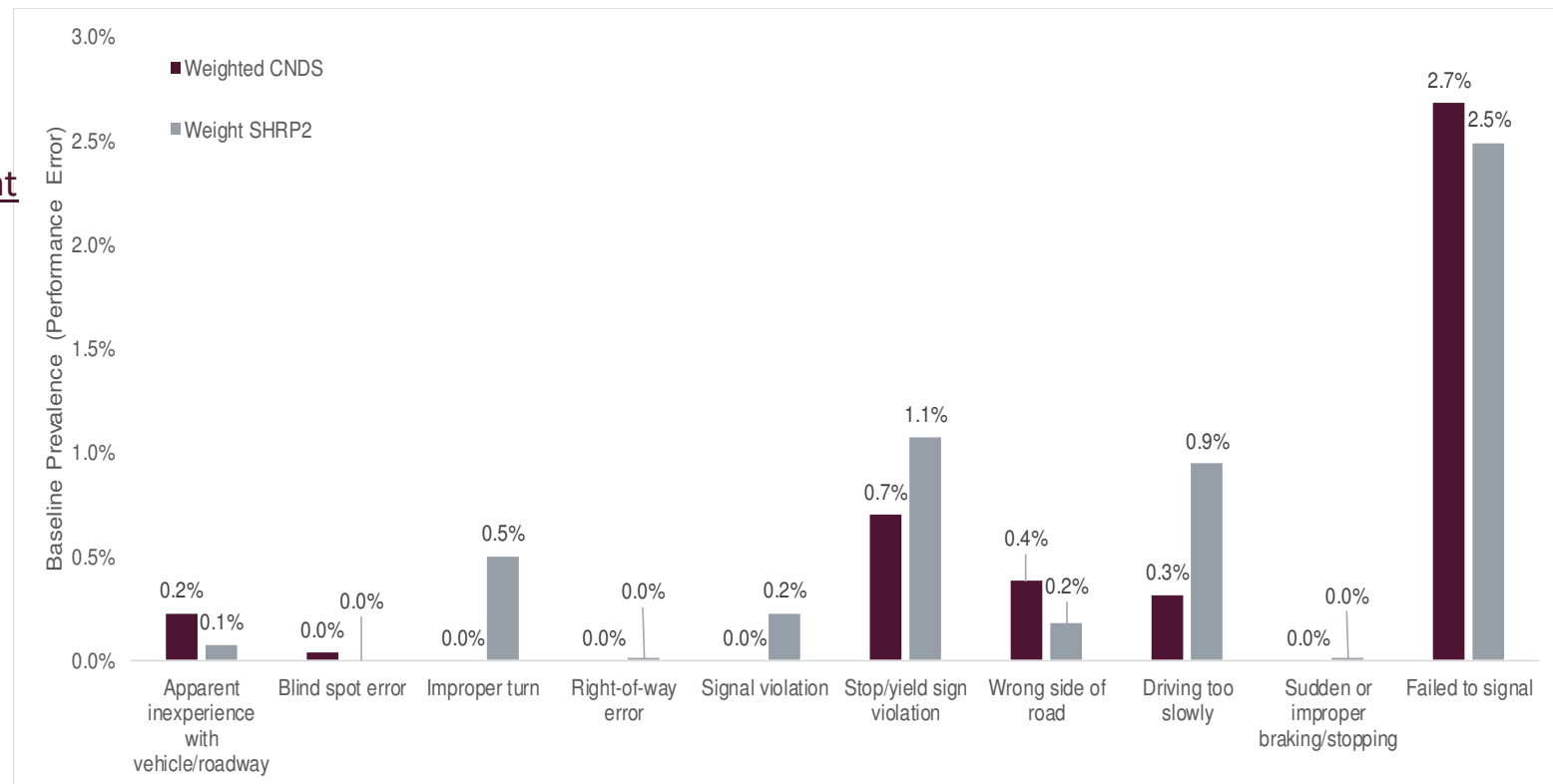
# RESULTS

- **Judgment error**
- “Speeding” and “Intentional stop/yield sign violation” are the two major judgment error sub-categories.
- Overall, most judgment error baseline prevalence is lower in Canada, especially in “Speeding”. However, the “Speeding/unsafe in the work zone” is greater in Canada.



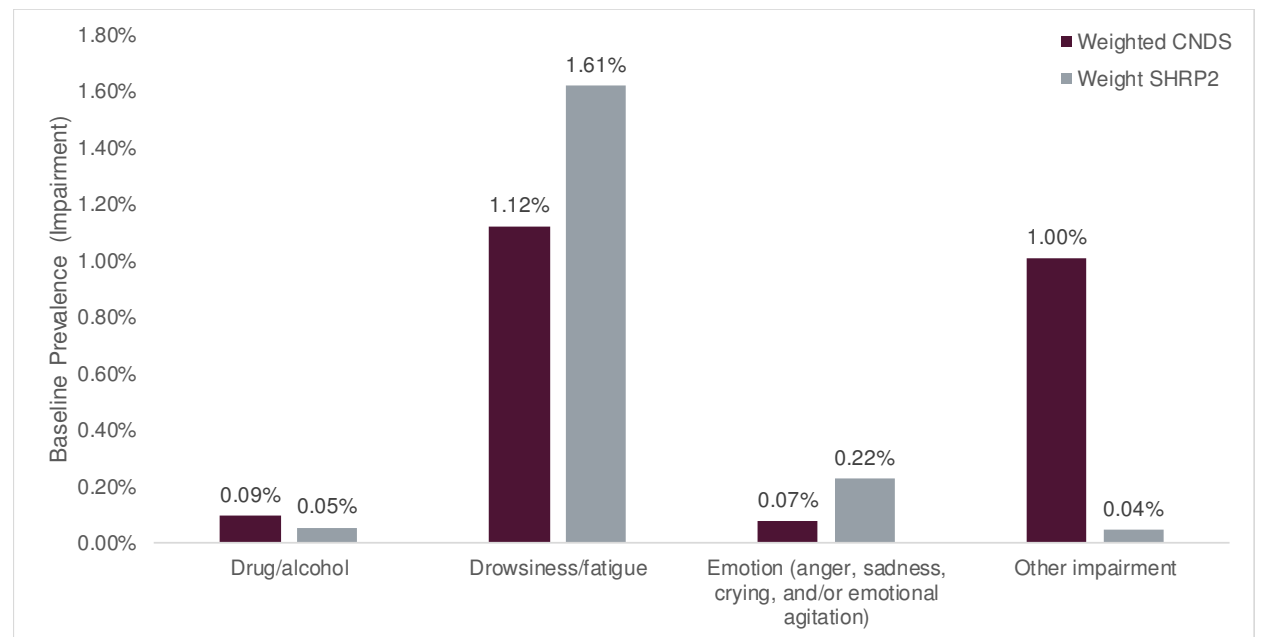
# RESULTS

- Performance error
- “Failed to signal” is the largest component in performance error.



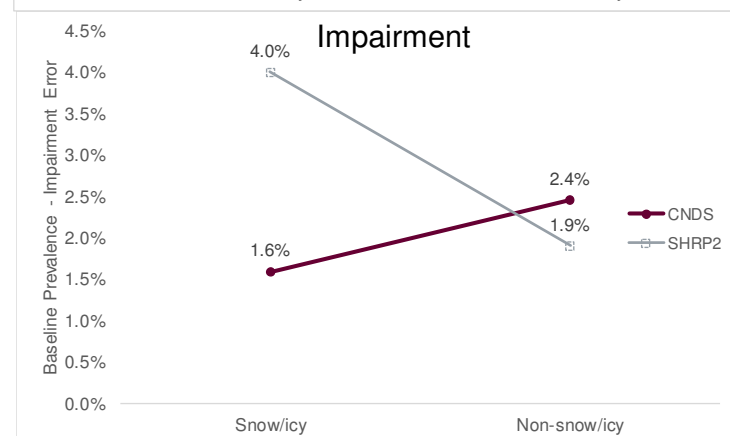
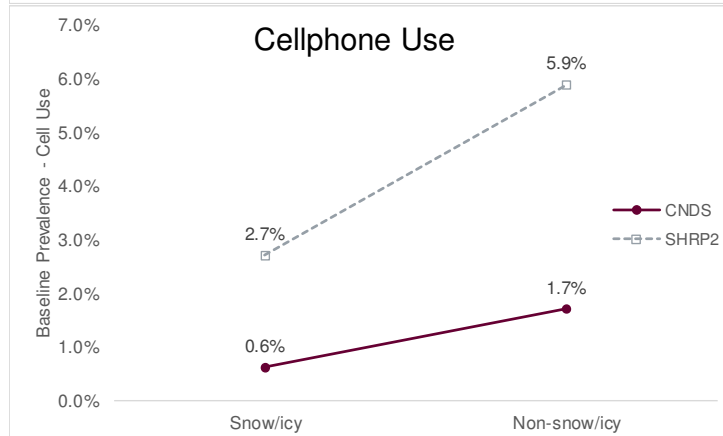
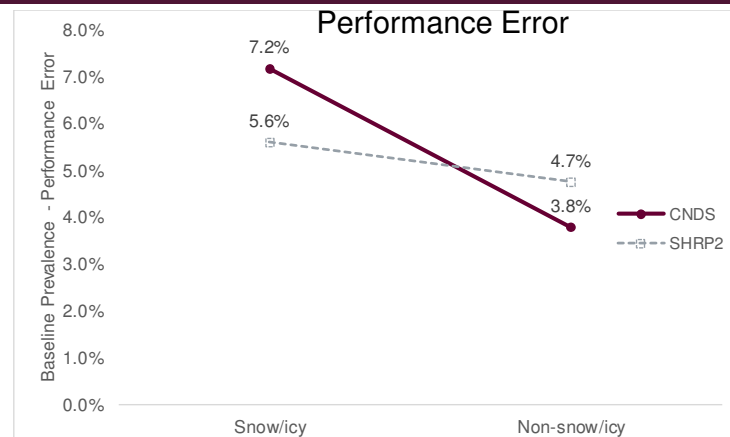
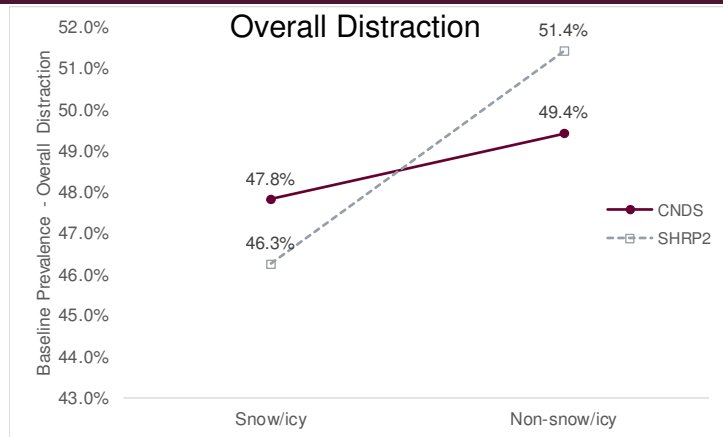
# RESULTS

- **Impairment**
- **“Drowsiness/fatigue” is the largest component in impairment, and SHRP2 has a slightly more fatigue driving than Canada.**
- **“Drug/alcohol” is low in both countries.**



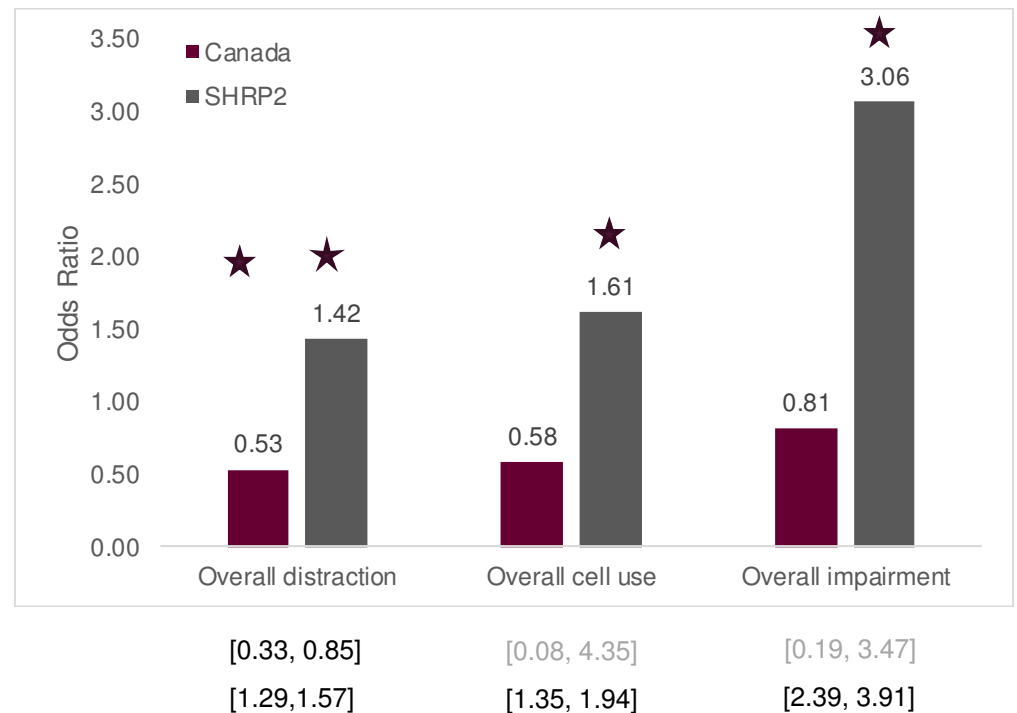
Note: 14 other impairments in Canada, including 13 “HEADPHONEIMPAIRMENT” and 1 “UNKNOWNIMPAIRMENT”

# BASELINE PREVALENCE BY WEATHER CONDITION



## OVERALL ODDS RATIO

- The odds ratio of all the categories are smaller in Canada than in SHRP2 with the exception of the judgment error.
- In general, the drivers in Canada are less risky than in SHRP2.



## SUMMARY

- In general, the drivers in Canada are less risky and have lower exposure in terms of the secondary task distractions, total cell use, performance error, and impairment than in SHRP2
- “Interaction with adult/teen passenger” and “Other external distraction” are dominant distractions for both countries.
- Snow/Icy weather condition affects driver behavior
- **How cellphone use behavior vary by**
  - **SHRP2 sites with different cellphone laws?**



Thank you!