# A Comparison of Road Traffic Mortality and Morbidity rates (2000-2015) and Road Safety Policies in Quebec and Ontario

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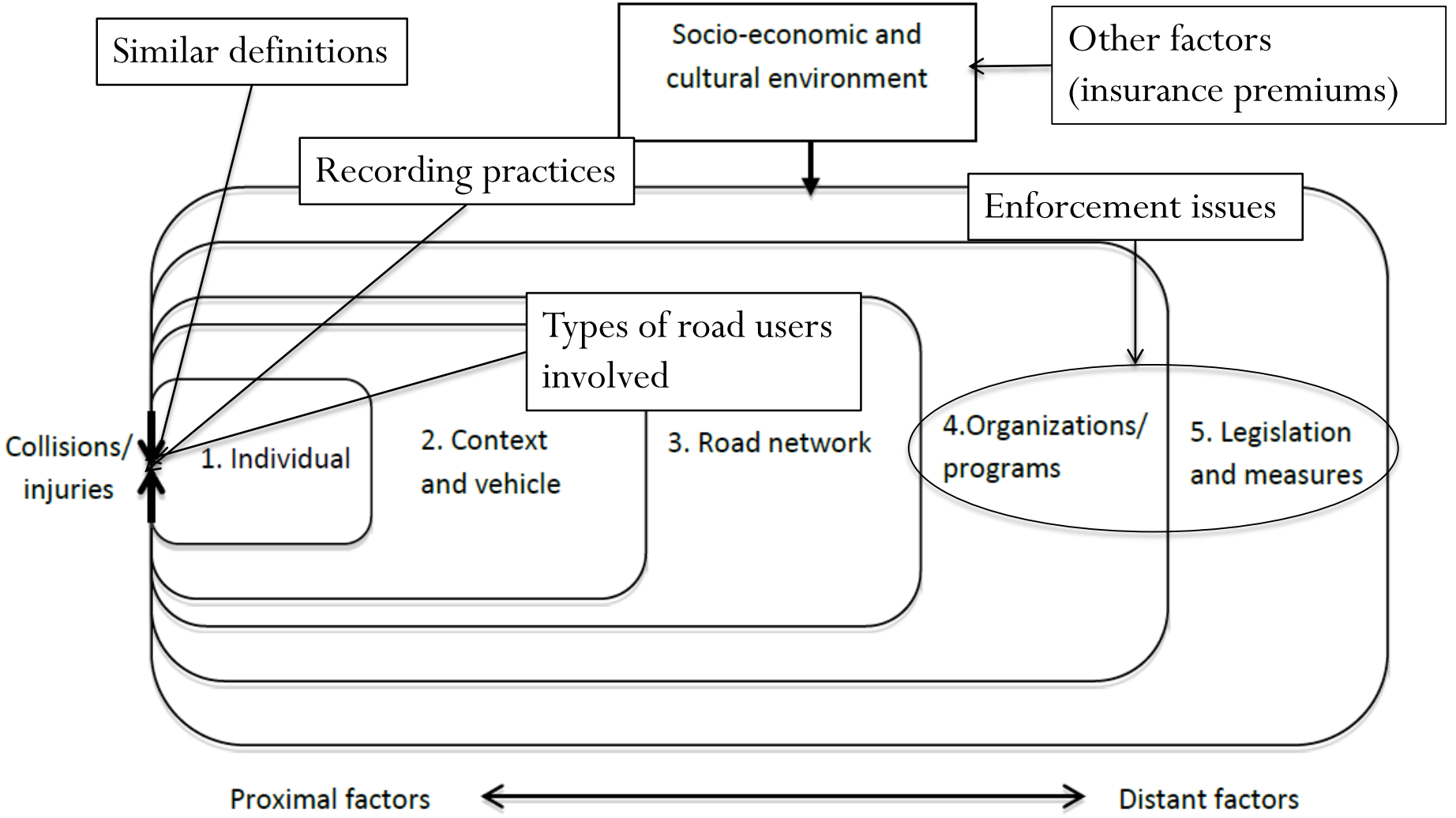
# Introduction

- Decreases of 54% and 59% were respectively recorded in traffic-related mortality and morbidity rates between 2000 and 2013 in Quebec.
- Mortality and morbidity rates are still lower in Ontario.
- Ontario has the best road toll in North America.
- Identify "factors" likely to explain the traffic safety gap between Quebec and Ontario.
- Offer a framework to conduct comparative analysis

# Theoretical Framework: Systemic Perspective



# Main Objectives

- Compare measurement methods for mortality and morbidity rates due to road traffic accidents:
  - Definitions for different categories of accidents
  - Methods for counting accidents
  - Accident recording practices by police officers
  - Compare similar categories of accidents (data analysis)
- Identify traffic safety measures likely to explain the traffic safety gap
- Identify evidence-based traffic safety measures likely to improve road safety in Quebec

# Methodology

- Four main parts:

1. Critical analysis of data and indicators of road accidents with injuries
   - Demographic and statistical analysis / interviews with police officers
2. Comparative analysis of mortality and morbidity rates for various categories of injuries and road users
   - Statistical analysis based on aggregate and individual data
3. Comparative analysis of road safety measures in each province: documents and interviews
   - Qualitative and thematic analysis
4. Identification of effective evidence-based measures in relation to previous findings
   - Provincial evaluations and systematic reviews

# Data

- Individual data on people killed or injured, drivers and road accidents with injuries collected by SAAQ and MTO for the years 2000 to 2013 (2015 for Quebec).
  - Quebec: 392 fatalities and 1725 major injuries in 2013
  - Ontario: 518 fatalities and 2490 major injuries in 2013

- Population estimates for Quebec and Ontario (from Statistics Canada)
  - Quebec : 8 155 505 as of July 1st 2013
  - Ontario : 13 556 229 as of July 1st 2013

- Licensed Drivers for Quebec and Ontario (SAAQ and MTO) for the years 2000 to 2013 (2015 for Quebec).
  - Quebec: 5 241 846 in 2013
  - Ontario: 9 592 489 in 2013

# Results

# Critical analysis of data : Severity of Injury in Quebec and Ontario

| Sévérité des blessures/Severity of injury | Québec | Ontario |
|---|---|---|
| Mortelle/Fatal | Décès immédiat ou survenant dans les **huit*** jours suivant l'accident (***since 2007, 30 days)** | Death occurring immediateley or within 30 days of the motor vehicle collision |
| Grave (Qc) / Major (Ont) | Blessure nécessitant l'hospitalisation, incluant celle nécessitant que la personne demeure sous observation à l'hôpital | Person admitted to hospital |
| Légère | Blessure ne requérant pas l'hospitalisation ni la mise sous observation de la victime, même si elle exige des traitements chez un médecin ou dans un centre hospitalier. | - |
| Minor | - | Person went to hospital and was treated in the emergency room but was not admitted |
| Minimal | - | Person dit not go to hospital when leaving the scene of the collision. Includes minor abrasions, bruises and complaints of pain. |
| Sans blessure apparente/None | La personne ne montre pas ou ne se plaint pas de blessures physiques | Uninjured person. |

# Critical analysis of data and indicators : Severity of injury in Quebec and Ontario (continued)

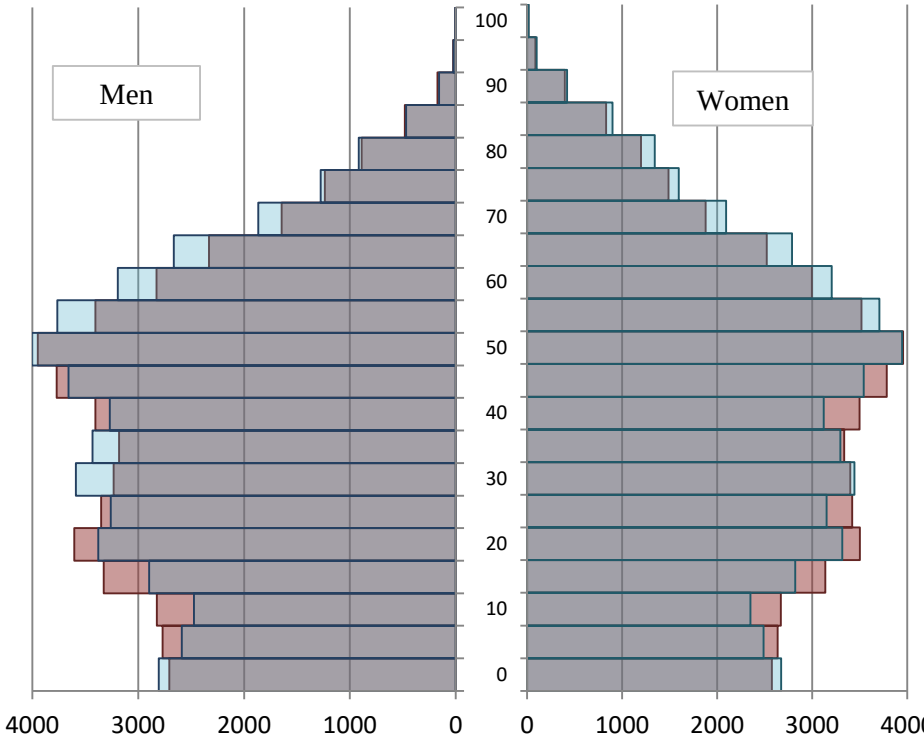
- Valid comparisons for fatalities and severe morbidity (major injuries) only

- Interviews with police officers: different application of victim registration procedures by organizations

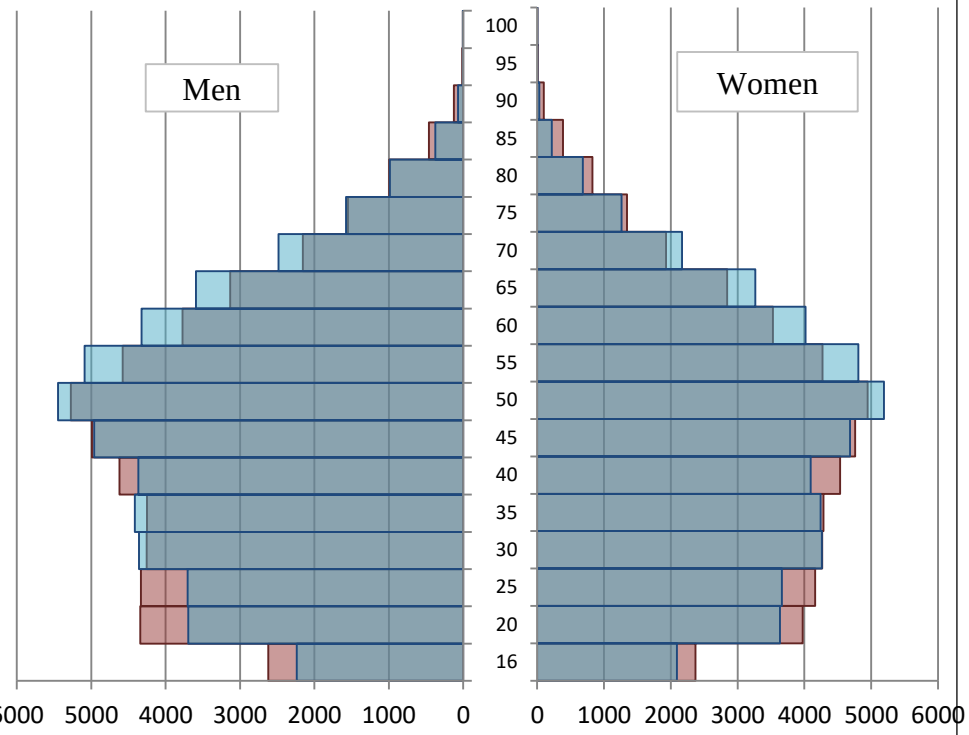
# Critical analysis of data and indicators:

## Population Estimates and Licensed Drivers, Age Pyramids (in relative numbers), 2013

### Populations




### Licensed Drivers



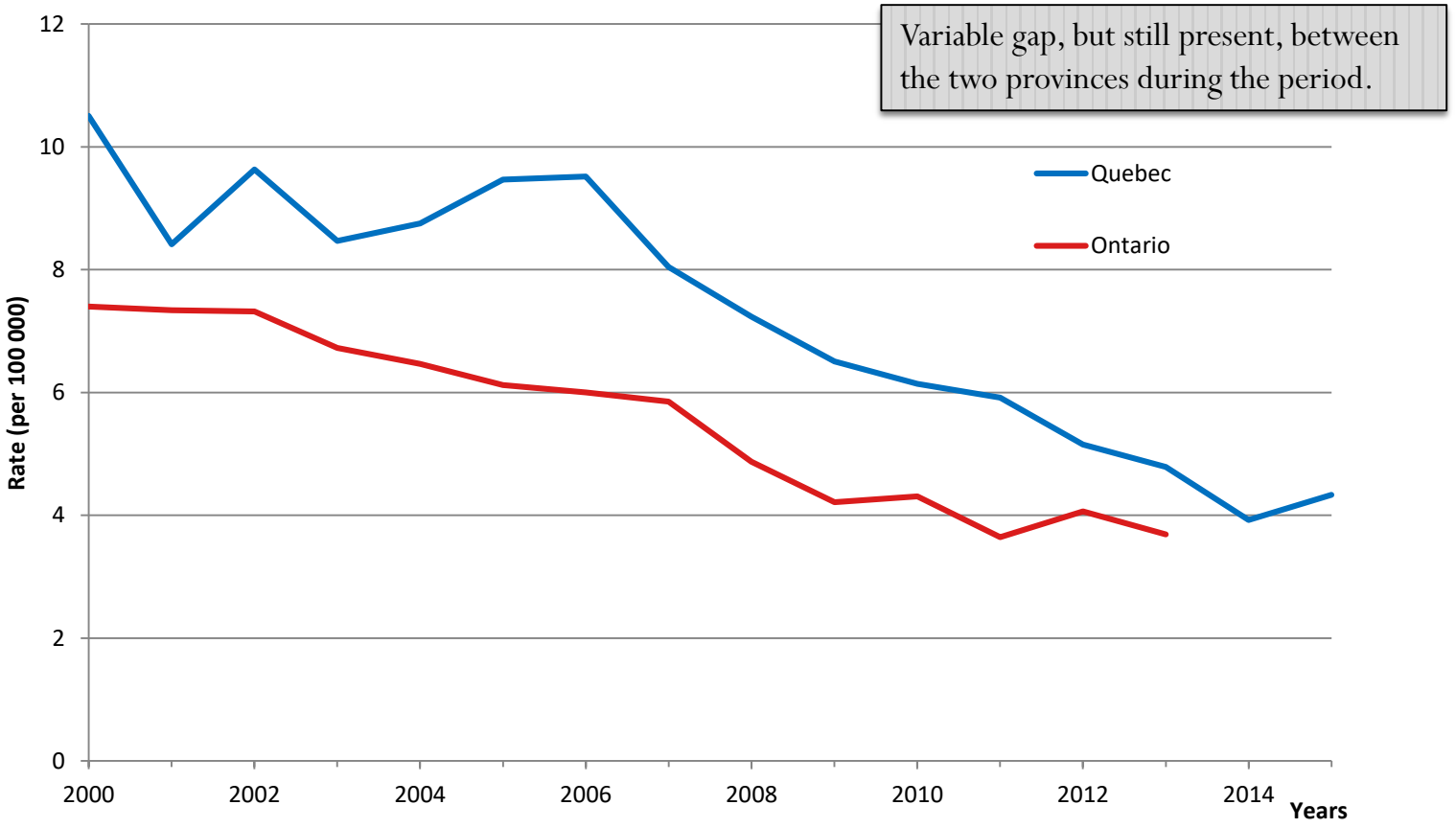





— Québec — Ontario

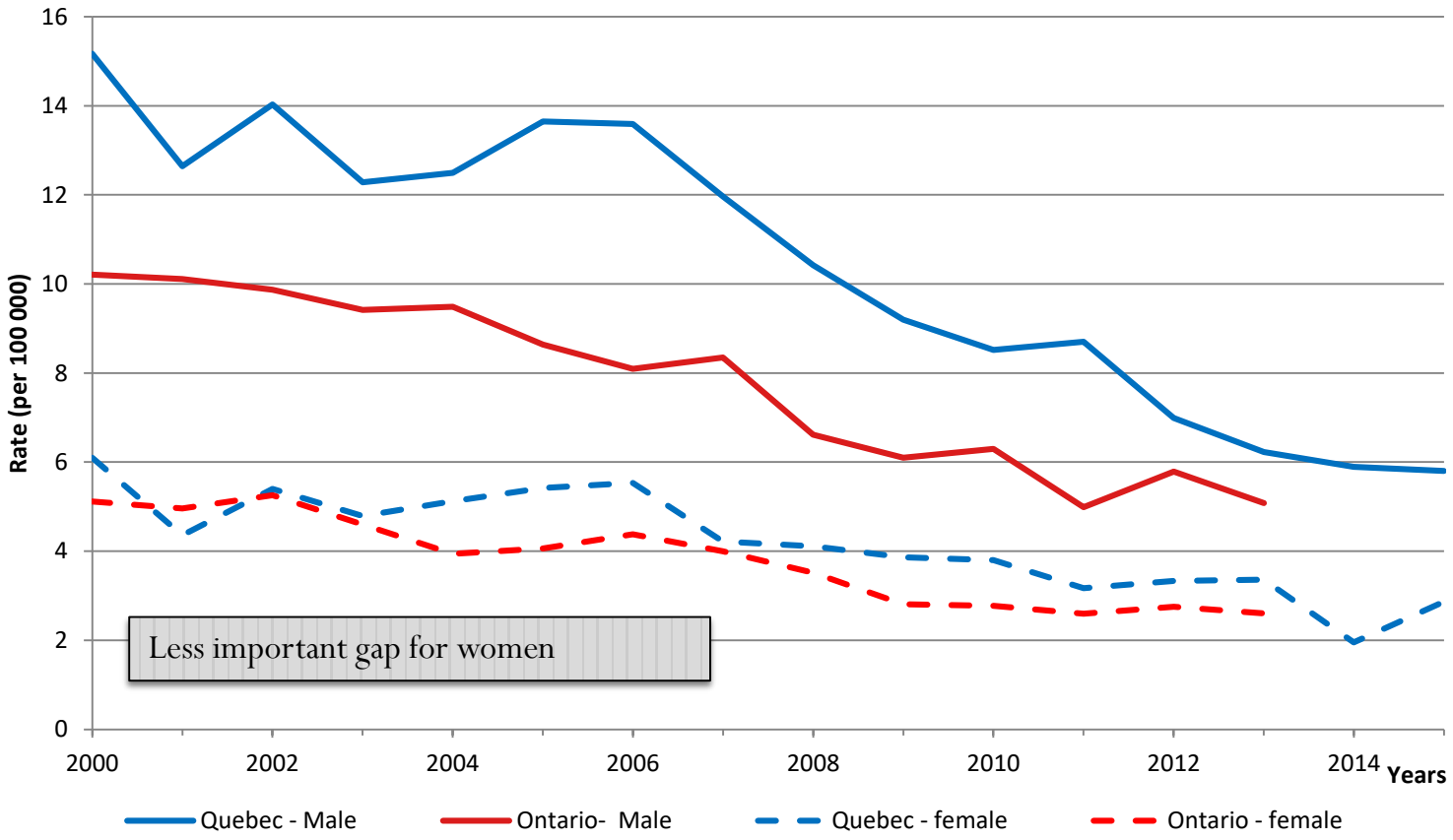
# Comparative Analysis of Mortality (Both Sexes)

**Age-Standardized Mortality Rate (both sexes), Quebec and Ontario, 2000 to 2015**



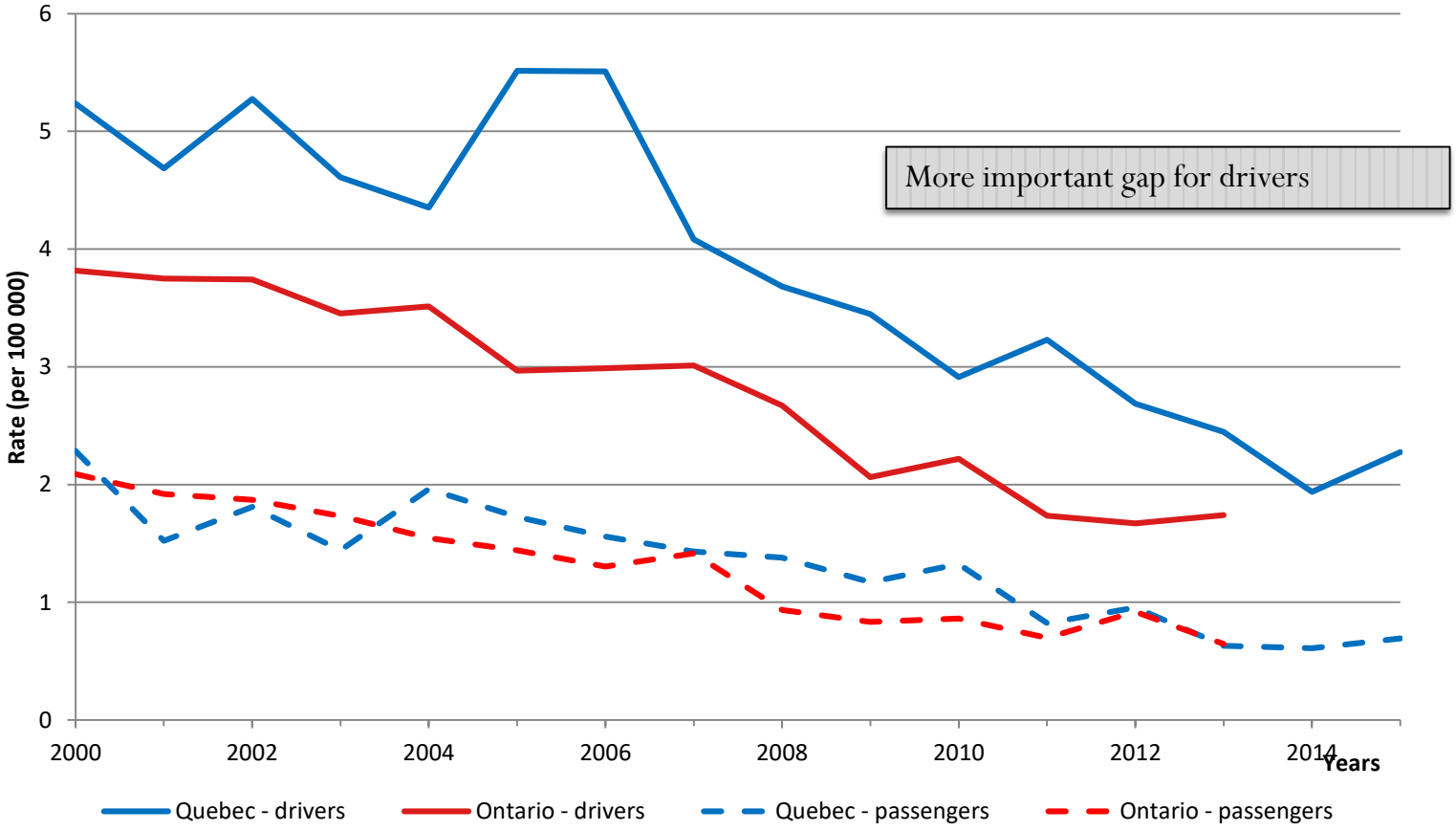
# Comparative Analysis of Mortality by Sex

## Age-standardized Mortality Rate by Sex, Quebec et Ontario, 2000 to 2015



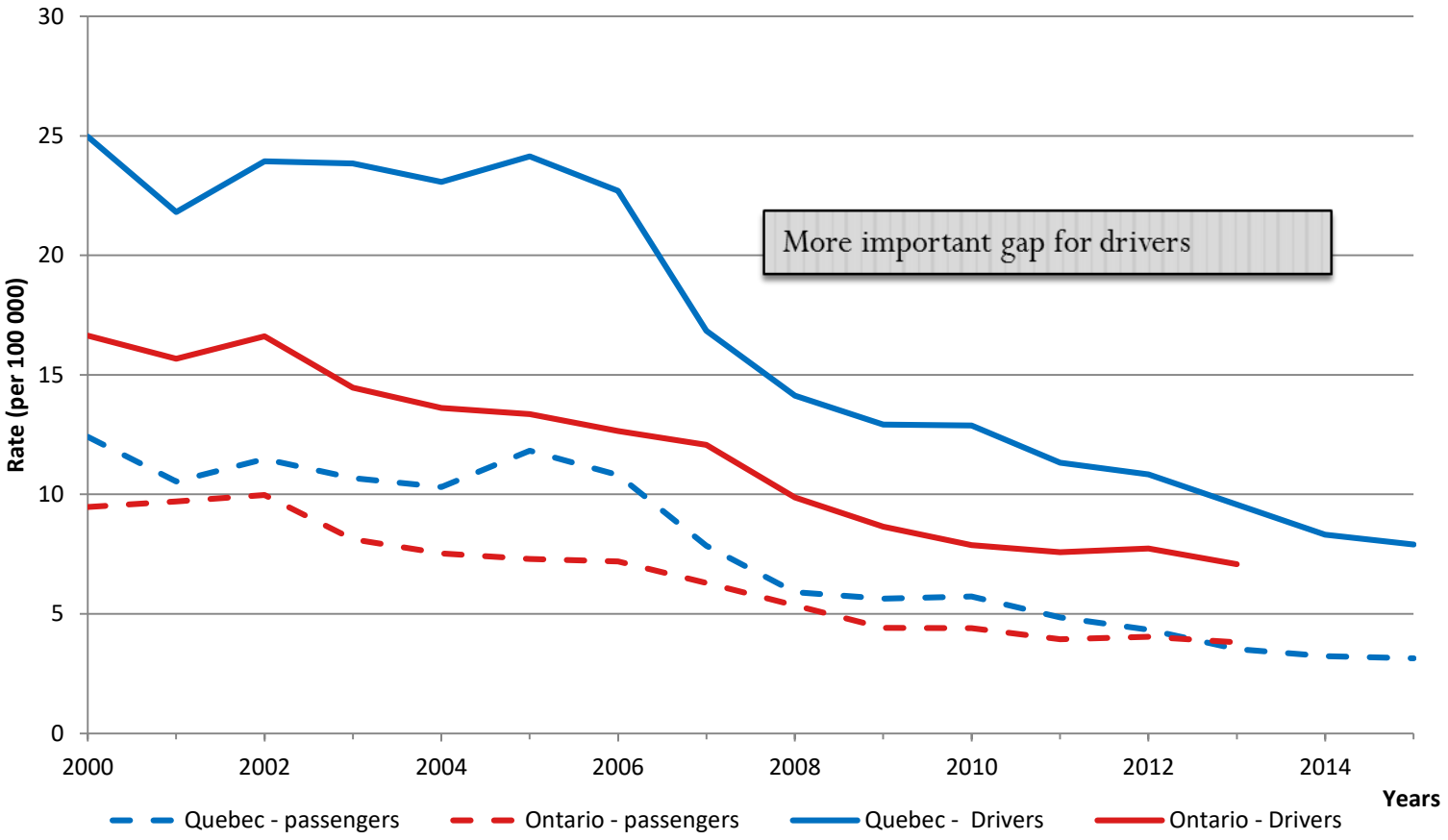
# Comparative Analysis of Mortality by Category of Involved Person: Drivers and Passengers

**Age-Standardized Mortality Rate by Category of Involved Person (drivers and passengers), Quebec et Ontario, 2000 to 2015**

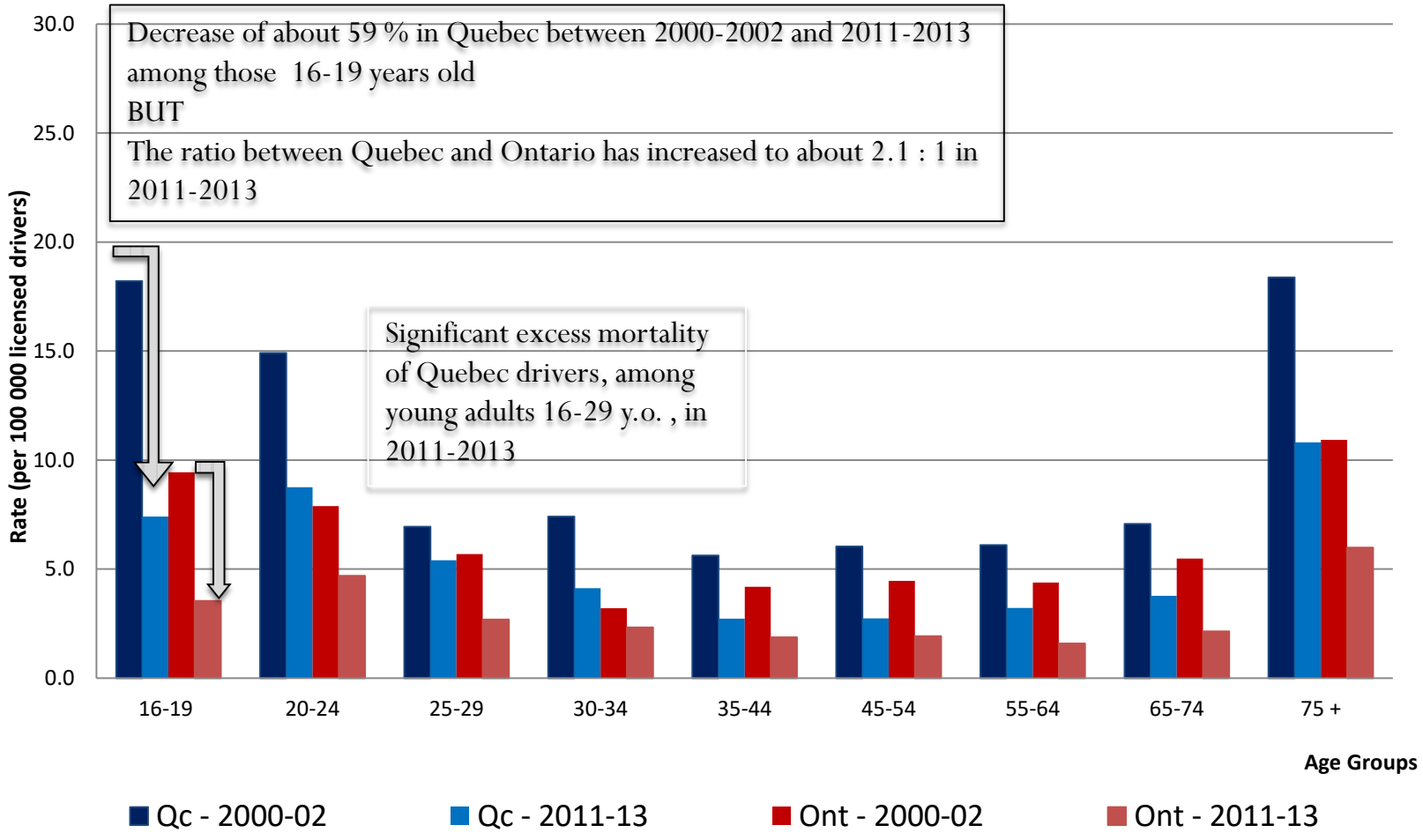


# Comparative Analysis of Major injuries by Category of Persons Involved : Drivers and Passengers

**Age-Standardized Major Morbidity Rate by Category of Involved Person (drivers and passengers), Quebec et Ontario, 2000 to 2015**



# Mortality Rate (per licensed drivers) by Age Group for Drivers, Quebec and Ontario, 2000-2002 et 2011-2013 (*Both sexes*)

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# Reduction in the Number of Persons Killed in Quebec : A Target for Drivers

If mortality rates of Quebec drivers had been the same as those of Ontario drivers in 2013 ...

| Sex | Observed fatalities | Expected Fatalities | Reduction |
|---|---|---|---|
| Men | 144 | 93 | 51 |
| Women | 57 | 35 | 22 |
| Total | 201 | 128 | 73 |

A reduction of 73 deaths among drivers would have been observed in Quebec in 2013

# Comparative Analysis of Traffic Safety Measures

# Approach for Comparing Measures

- Five Policies
  1. Drinking and driving
  2. Speeding
  3. Young Drivers
  4. Drowsiness
  5. Old Drivers

- Identification of measures for each policy

# Approach for Comparing Policies (continued)

- For each measure :
  1. Does it exist in Quebec and Ontario?
  2. What is the nature of the measure?
  3. Is it an effective measure based on provincial assessments and systematic reviews?
  4. Is the measure likely to explain the traffic safety gap between Quebec and Ontario?

- Triangulating results makes it possible to determine whether a measure is responsible for the traffic safety gap

# Results: Comparison of Measures

**Table. Comparisons of traffic safety measures introduced in Quebec and Ontario**

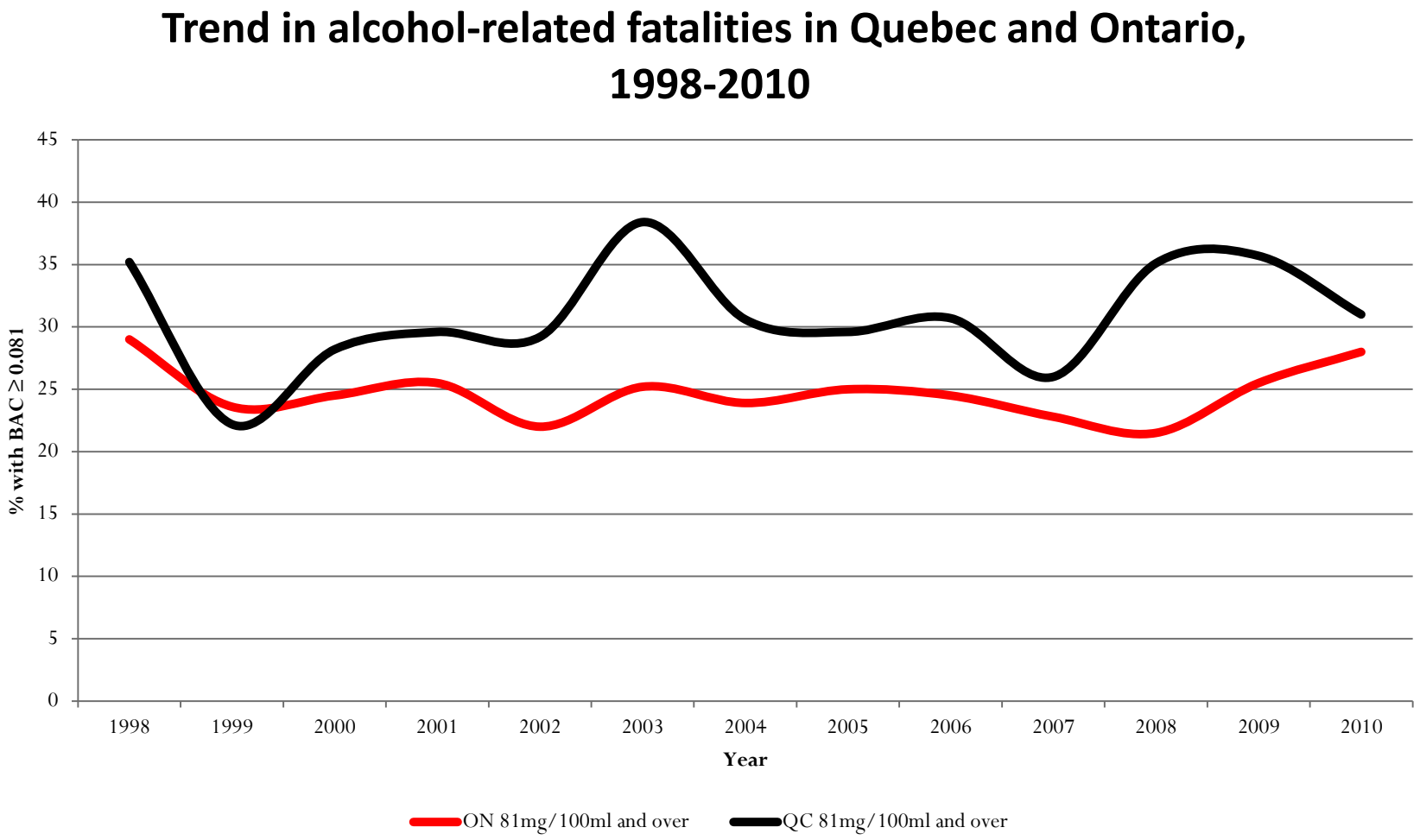
| Categories of measures | Measure present? | | Assessment? | | Systematic review |
|---|---|---|---|---|---|
| | Quebec | Ontario | Quebec | Ontario | |
| **Measures against drinking-and-driving** | | | | | |
| ***Laws and enforcement programmes (social environment)*** | | | | | |
| 0.08% BAC limit (Criminal code) | Y | Y | Y/E | Y/E | Y/E |
| 0.05% BAC limit (administrative measure) | N | Y | DNA | Y/E | Y/E |
| Mass media campaigns | Y | Y | Y | N | Y/E |
| Sobriety checkpoints | Y | Y | N | N | Y/E |
| ***Measures against the driver*** | | | | | |
| Driver license suspension | Y | Y | N | Y/E | Y/E |
| Treatment and awareness programmes | Y | Y | Y/E | Y/E | Y/E |
| ***Alternatives to drinking-and-driving*** | | | | | |
| Taxi services | Y | Y | N | N | Y/M |
| ***Measures limiting alcohol availability and accessibility*** | | | | | |
| Taxes | Y | Y | N | Y/E | Y/E |
| Training for waiters and bar/restaurant owners | N | Y | DNA | Y/E | Y/E |
| State monopoly | Y | Y | N | N | Y/E |
| Limited hour sales | Y | Y | Y/E | N | Y/E |
| Limited sale points | Y | Y | N | N | Y/E |
| Increased legal age to purchase alcohol | Y | Y | N | Y | Y/E |
| ***Measures targeting the vehicle*** | | | | | |
| Alcohol interlock programme | Y | Y | Y/M | N | Y/E |
| Vehicle impoundment | Y | Y | N | N | N |

# Results: Comparison of Measures, continued

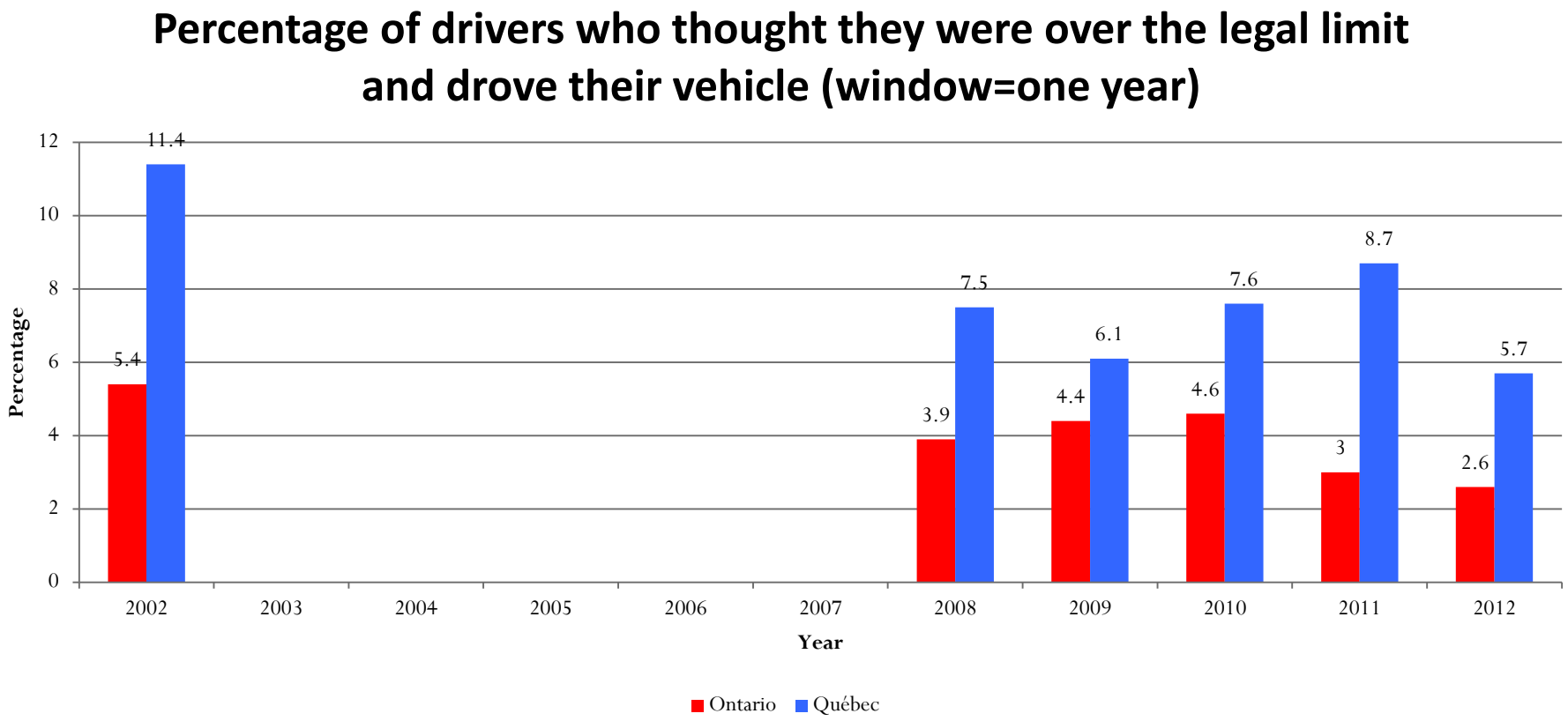
| **Measures for young drivers** | | | | | |
|---|---|---|---|---|---|
| ***Measures targeting the driver*** | | | | | |
| Driving courses | Y | Y | Y/A | Y/A | Y/A |
| Graduated licensing programme | Y | Y | Y/E | Y/E | Y/E |
| Zero tolerance for alcohol | Y | Y | Y/E | Y/I | Y/E |
| ***Contextual measures (incorporated to GDLP)*** | | | | | |
| Limited number of young passengers | N | Y | DNA | N | Y/E |
| Prohibition of driving on highways | N | Y | DNA | N | Y/M |
| Curfews | N | Y | DNA | N | Y/E |
| Supervised driving | Y | Y | N | N | Y/M |

**Legend:**
Yes (Y) or No (N): Indicates if the measure is implemented in the province and if it has been evaluated.
A: Adverse – indicates that the measure produced adverse effects such as an increase in the accident risk or level.
E: Effective – indicates that the measure resulted in a decrease of accident risk or level.
M: Mixed – indicated that the measure produced mixed effects on traffic safety indicators.
DNA: Does not apply

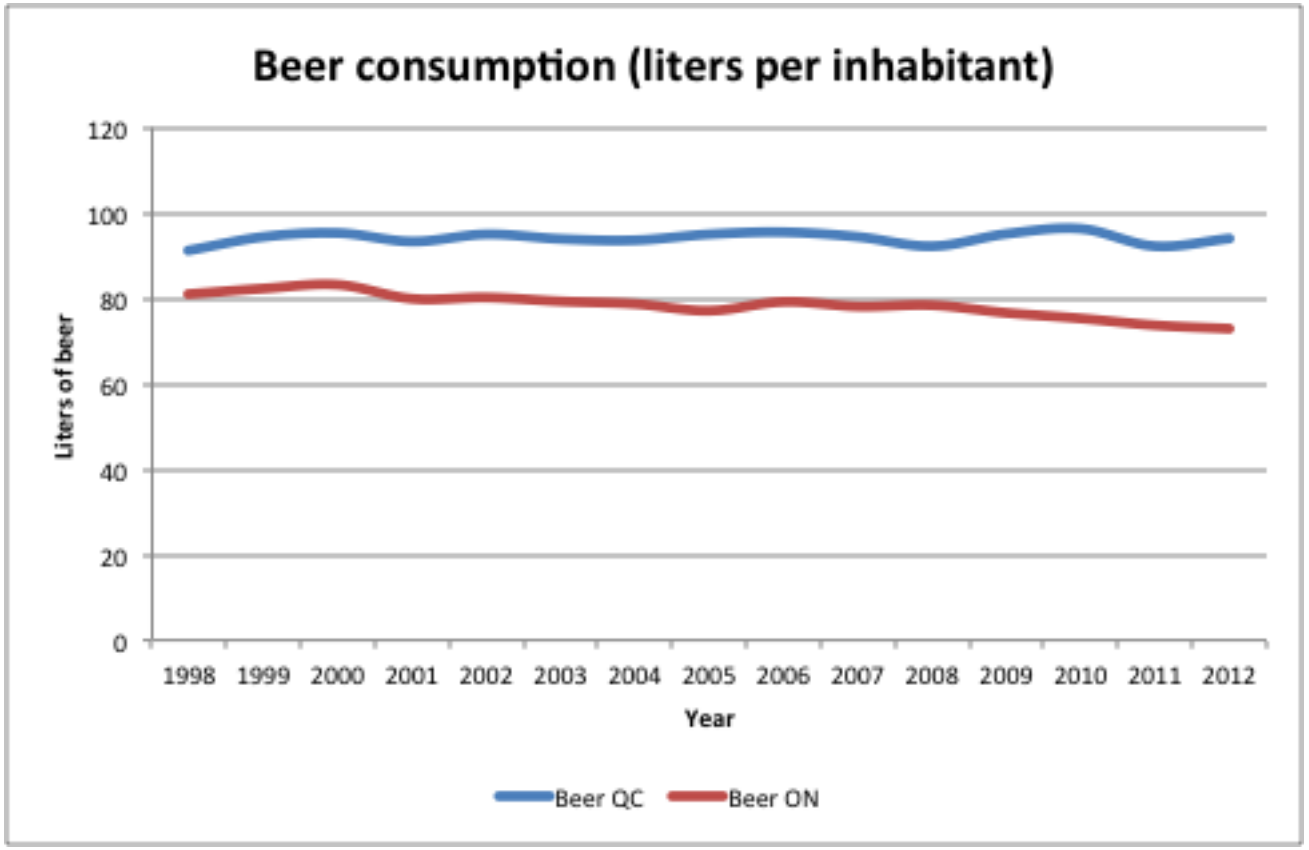
# Results : Percent of Fatally-injured Drivers with a Positive BAC



# Results: Trends in Drinking-and-Driving



# Results: Beer Consumption (Statistics Canada)



# Conclusion

The traffic safety gap between Quebec and Ontario is attributable to several factors and it is difficult to identify all of them precisely

Based on our approach, two sets of measures could be suggested:

1. Measures againt drunk driving
   - Lowering the TA to 0.05 grams /100ml
   - Limit sales outlets
   - Raising legal age
   - Limit hours of sale of alcohol
2. Gradual Access to driver's license
   - Supervise driving at night (midnight to 5 am )
   - Limit the number of passengers without a regular license

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RÉSEAU DE RECHERCHE EN SÉCURITÉ ROUTIÈRE

Ontario MINISTRY OF TRANSPORTATION

# Supplementary Materiel

# Dissemination of Results

- **Paper, report and thesis**
- BOURBEAU, Robert, BELLAVANCE, François et BLAIS, Étienne (2016). **Comparaisons des bilans routiers du Québec et de l'Ontario**, Rapport de recherche, FRQSC, SAAQ, FRQS, 31 janvier 2016.
- BLAIS, Étienne, BOURBEAU, Robert, BELLAVANCE, François et CLÉROUX-PERRAULT, Marie-Pier (2015). Évaluation par l'approche comparative Comparaison des bilans routiers du Québec et de l'Ontario, dans: Laurent Carnis, Gilles Blanchard, eds., **Évaluation des politiques de sécurité routière**, L'Harmattan.
- CLÉROUX-PERREAULT, Marie-Pier. **Analyse comparative de la mortalité et de la morbidité par accident de la route au Québec et en Ontario, 2000-2010**. Mémoire de maîtrise, Département de démographie, Université de Montréal. (in progress).

- **Medias:**
  - **La Presse +:** ***Le Québec tient la route, l'Ontario fait mieux***. 29 juillet 2016 (Robert Bourbeau)
  - **Entrevue à RDI** le 30 juillet 2016 (Étienne Blais).

- **Presentations in Conferences:**
  - **Activité de transfert des connaissances, Programme de recherche en sécurité routière (FRQSC – SAAQ – FRQS), Québec,** 23 septembre 2016
  - **Congrès sur l'évaluation des politiques de sécurité routière: méthodes, outils et limites**, 9 juin 2015, Paris.
  - **Colloque de l'Association des démographes du Québec (ADQ)**, Ottawa, juin 2015.
  - **Rencontre annuelle du Réseau de recherche en sécurité routière**, Québec, 2 mai 2014.

# La Presse plus du 29 juillet 2016

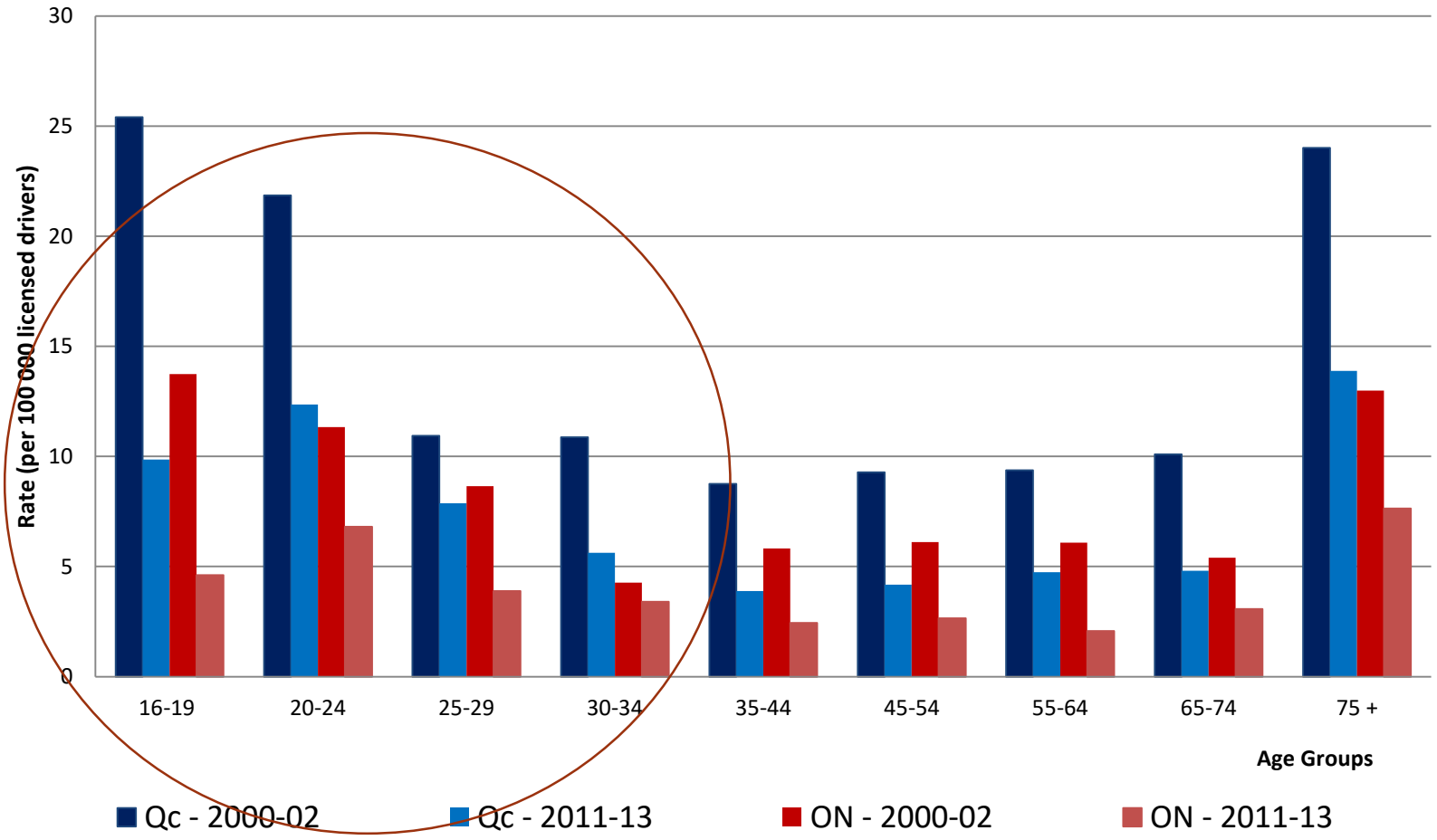
Éric-Pierre Champagne La Presse

- 
- BILAN ROUTIER
- **Le Québec tient la route, l'Ontario fait encore mieux**
- **« Quebec keeps up the road, Ontario is doing even better »**
- UN MEILLEUR BILAN ROUTIER POUR L'ONTARIO

# Young drivers: a coroner suggests a curfew from midnight to 5:00 AM


Speed up… it's almost midnight

# Mortality Rate (per licensed drivers) by Age Group for Male Drivers, Quebec and Ontario, 2000-2002 et 2008-2010



# Mortality Rate (per licensed drivers) by Age Group for Female Drivers, Quebec and Ontario, 2000-2002 et 2011-2013