

# Coroner: for a vehicle inspection program for cars 10 years old and more

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Dr Martin Sanfaçon, MD, FRCPC  
Coroner

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## Coroner's report

### ■ September 16, 2012

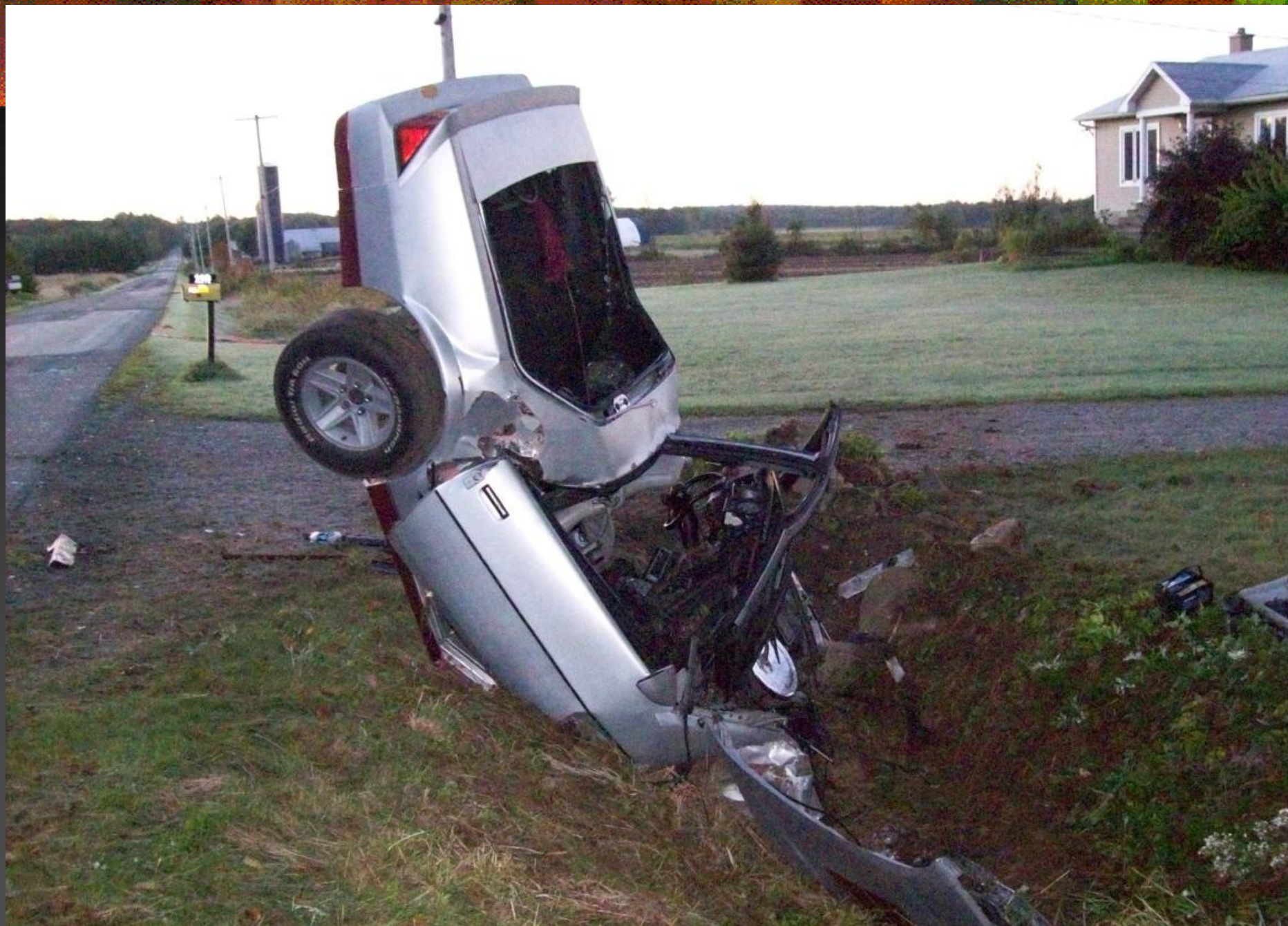
- 21 years-old man, driver, unbuckled, alcohol level 93 mg/dL, high speed, Chevrolet Camaro 1982, waste tires. Weak frame?
- 36 years-old man, front passenger, unbuckled







2012/09/16





## Coroner's report

### ■ Recommendation:

To the Société de l'assurance-automobile du Québec:

- create a mandatory mechanical vehicle inspection program for every 10 years old and more vehicle



## The facts

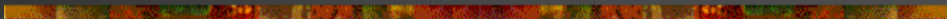
- **Alcohol, drugs and driving**
  - Advertising
  - Awareness campaigns
  - Breathalyzer of starting up
  - Police road-blocks
  - Chauffeur service organisms and companies

Nevertheless, the message “doesn’t pass...”



## The facts

### ■ Speed

- Speed is everywhere
  - Police tolerance
  - Male behavior
  - Laws and penalties more severe
- 

Persistence of speed on our roads...



## The facts

- **Seat belt**
  - **Mechanical measure of protection having showed its ability**
  - **Necessity of constant advertising to maintain the high rate of use**



## The facts

- **Motor vehicle population from Quebec:**
  - 26,7% of vehicles are more that 10 years old
  - 11,3% of these vehicles are held by young people
  - These vehicles are involved in
    - 32,2% of fatal accidents
    - 29,6% of serious accidents



## The facts

- 20 % more risk of being involved in a serious or fatal accident if you find yourself in a vehicle of more than 7 years;
- 40% if in a vehicle of more than 13 years.



## SAAQ statistics

### Police reports:

- In Quebec, police reports ask to the policemen to establish the two main causes having caused the accident, determining them in the order of importance.
- **No other nuance or detail**



## SAAQ statistics

**Consequence: according to the statistics of the Société de l'assurance-automobile du Québec (SAAQ):**

**« The mechanical failures are identified as main cause only in 2 % of fatal accidents involving vehicles ... »**

**Source: S.A.A.Q. 2007 and 2010**

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## SAAQ statistics

**In figure:**

- These 2 % represent an average of 10 deaths a year having for main cause a vehicle in poor condition.



## SAAQ statistics

### Interpretation of the Société de l'assurance-automobile du Québec (SAAQ):

**« Mechanical failures are identified as main cause only in 2 % of fatal accidents involving vehicles, what not seems sufficient for us to justify the institution of a mandatory vehicle inspection program »**

Source: S.A.A.Q. 2007 and 2010



## SAAQ statistics

**Nevertheless:**

**Ten deaths a year, it's as if the tragedy of Lac  
Mégantic arose on the roads of Quebec in every 5  
years...**

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# Studies

- **6 major studies:**
  - **2 studies with negative conclusions**
  - **4 studies with positive conclusions**



## Positive studies

### New Zealand, 2003

- Study realized in 1998 and 1999
- Case-control study
- 571 damaged vehicles and 588 control vehicles



## Positive studies

### New Zealand, 2003

#### Issues:

- Study the relation between periodic inspection and trimestrial verification of tires pressure versus injuries by car accident
- Study the relation between vehicle age and injuries by car accident



## Positive studies

### New Zealand, 2003

#### Conclusions of the study:

- More young people of less than 25 years in the injured group (34,2 versus 13,7 %)
- Lower prevalence of tires pressure check in the previous three months before an accident (73,8 versus 90,3 %)
- Fewer accidents if regular inspection realized

## Positive studies

### New Zealand, 2003

### Conclusions of the study:

Odds ratio of accident (after adjustment for other variables)  
if responses « Don't know » are not considered

| Certificate of inspection in rule          | RR   | Confidence interval |
|--|------|---------------------|
| Yes  | 1,00 |                     |
| No   | 2,67 | 1,46 – 4,86         |
| Tire pressure checked in the last 3 months |      |                     |
| Yes  | 1,00 |                     |
| No   | 1,32 | 0,73 – 2,39         |

## Positive studies

### New Zealand, 2003

### Conclusions of the study:

Odds ratio of accident (after adjustment for other variables)  
if responses « Don't know » are considered as « No »

| Certificate of inspection in rule          | RR   | Confidence interval |
|--|------|---------------------|
| Yes  | 1,00 |                     |
| No   | 3,08 | 1,87– 5,05          |
| Tire pressure checked in the last 3 months |      |                     |
| Yes  | 1,00 |                     |
| No   | 1,89 | 1,16 – 3,08         |

## Positive studies

### New Zealand, 2003

### Conclusions of the study:

Odds ratio of accident (after adjustment for other variables)  
according to the age of vehicle

| Age of vehicle | Non-adjusted RR   | Age and sex-adjusted only RR |
|----------------|-------------------|------------------------------|
| < 5 years      | 1,00              | 1,00                         |
| 5 – 10 years   | 2,00 [1,28-3,13]  | 1,66 [1,05-2,62]             |
| 10 – 15 years  | 2,27 [1,44-3,57]  | 1,81 [1,14-2,88]             |
| > 15 years     | 5,94 [3,47-10,16] | 4,80 [2,68-8,58]             |

## Positive studies

### New Zealand, 2003

### Conclusions of the study:

Odds ratio of accident (after adjustment for other variables)  
according to the age of vehicle

| Age of véhicule | Non-adjusted RR          | Multiple variables-adjusted RR |
|-----------------|--------------------------|--------------------------------|
| < 5 years       | 1,00                     | 1,00                           |
| 5 – 10 years    | <b>2,00</b> [1,28-3,13]  | 1,38 [0.72-2,64]               |
| 10 – 15 years   | <b>2,27</b> [1,44-3,57]  | 1,02 [0.52-2.01]               |
| > 15 years      | <b>5,94</b> [3,47-10,16] | <b>2,88</b> [1,20-6,91]        |



## Positive studies

### New Zealand, 2003

#### Several gaps and limitations:

- many datas obtained by auto-disclosure



## Positive studies

### USA, 2009

- Study realized from 2004 to 2007
- Ministry of Transports of Pennsylvania



## Positive studies

**USA, 2009**

### Issue:

- Validate the efficacy of the vehicle inspection program of Pennsylvania to reduce the accident rate, particularly fatal accidents



## Positive studies

**USA, 2009**

### Conclusions of the study:

- 1,1 deaths per fatal accident
- Mechanical defect responsible of 2% of fatal accidents
- More than half of the mechanical defects related to tires



## Positive studies

**USA, 2009**

### Conclusions of the study:

- 1,5 accident prevented by one billion traveled miles
- For Pennsylvania, it represents 115 to 169 accidents less, that is 127 in 187 deaths
- The rate is significant for vehicles from 3 to 9 years old (datas insufficient for the older vehicles)

# Vehicle mechanical inspection program in Quebec

## ■ Advantages

- **Decrease of the number of accidents**
  - Material costs
  - Human costs
- **Potential decrease of the costs of maintenance and repair**
- **Decrease of the costs of operation (tires, gas consumption)**



# Vehicle mechanical inspection program in Quebec

## ■ Désavantages

- Costs of the inspection
  - Probably between 25 et 100 \$
- Preservation on the roads of older vehicles

# Vehicle mechanical inspection program in Quebec

- **Shared role:**
  - **Policemen**
  - **Coroners**
  - **Interested organisms**
  - **Representatives in mechanical inspection in Quebec**



## Other exemples of amelioration

- **Some recommandations to prevent accidents:**
    - **Better lighting of trailers**
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## Other exemples of amelioration

- **Some recommandations to prevent accidents:**
  - **Better lighting of trailers**
  - **Bumper scattering better the kinetic energy during impacts**



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## Other exemples of amelioration

- **Some recommandations to prevent accidents:**
  - **Better lighting of trailers**
  - **Bumper scattering better the kinetic energy during impacts**
  - **Scanners of driving licence in the starting up**



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## Other exemples of amelioration

- **Some recommandations to prevent accidents:**
  - **Better lighting of trailers**
  - **Bumper scattering better the kinetic energy during impacts**
  - **Scanners of driving licence in the starting up**
  - **Better protection of the head during the side impacts**



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## Conclusion

- A car in good mechanic condition with security equipment in good order of work give the best protection to his occupants

Reports available  
in French AND in English  
[coroner.gouv.qc.ca](http://coroner.gouv.qc.ca)

Questions and comments  
Dr Martin Sanfaçon  
Coroner

[martinsanfacon@outlook.com](mailto:martinsanfacon@outlook.com)

*Thanks*

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## Negative studies

### Norway, 1992

Study realized from 1986 to 1988

203 856 vehicles in 3 groups:

1. Annual inspection
2. Inspection only in 1986
3. No inspection



## Negative studies

**Norway, 1992**

**Conclusion of the study:**

- The inspected vehicles present fewer imperfections of brakes, lighthouses and suspension in the year following the inspection
- No difference in the rate and the gravity of the accidents, based on the registers of four insurance companies



## Negative studies

### Norway, 1992

#### Several gaps and limitations:

- 1/3 of the vehicles that must be inspected were not
- 7,5 - 15 % of vehicles " no inspection " were inspected
- 6,5 - 9,7 % of vehicles " inspection in 1986 only " were inspected



## Negative studies

### Norway, 1992

#### Several gaps and limitations:

- No secondary consideration of profits in the costs of operation and maintenance / repair reduced
- Study carried out about 30 years ago

## Negative studies

### Norway, 2007

- Study realized between 1998 and 2002
- Mandatory inspection beginning at the 4<sup>th</sup> year
- 253 098 vehicles include in the study



## Negative studies

**Norway, 2007**

**Issues:**

- 1) Establish the link between the accidents happening the year before the first inspection and the mechanical defects identified**
- 2) Establish the accident rate before and after the first inspection**



## Negative studies

**Norway, 2007**

### Conclusions of the study:

- Each mechanical defect raise the risk of an accident by 3%
- The inspection of vehicles does not decrease the risk of accident



## Negative studies

### Norway, 2007

#### Several gaps and limitations:

- crossing of the public registers of inspection and private datas of an insurance company
- non-unimportant counts of non-declared accidents
- no control group



## Positive studies

### New Zealand, 1986

- Study realized at the beginning of the '80s
- Mandatory inspection beginning at the 6<sup>th</sup> year and each six months



## Positive studies

**New Zealand, 1986**

**Issue:**

**Accident rate at week 1 and 26 after inspection**

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## Positive studies

### New Zealand, 1986

#### Conclusion of the study:

- The rate of accident passes from 2,68 % to 3,35 % between the 1st and 26th week after the inspection, which gives a relative decrease of 25 %
- No difference according to the age of the vehicle



## Positive studies

### New Zealand, 1986

#### Several gaps and limitations:

- data coming from police registers
- low number of vehicles in the study
- low rate of events