Maternal and Fetal Injury: Understanding and Tracking the Hidden Epidemic in New Zealand

SAVIR & Safe States Alliance, 2011 - IOWA

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ACKNOWLEDGMENTS

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- Chris Lewis  
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- Simon Ross & Laura Neilson  
  *NZ Ministry of Health*

- Brandon de Graaf  
  *IPRU, University of Otago*
Driver, no restraint 22 MPH
# Rates and Frequency of U.S. Fetal & Infant MV Crashes, Injuries, & Deaths

<table>
<thead>
<tr>
<th>Level of Motor Vehicle Incidents and Injury</th>
<th>Estimated Annual Number of Fetal Cases Extrapolated to U.S.</th>
<th>Infant Comparison (data source)</th>
<th>Fetal to Infant Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Police reported Maternal MV crashes:</td>
<td>120,778 (3/100 pregnancies, ‘95-’99)¹</td>
<td>24,000 (1995-1999 NASS)</td>
<td>5.0</td>
</tr>
<tr>
<td>C. Maternal MV occupant ED visits:</td>
<td>34,599 (0.9/100 pregnancies, ‘99-’02)²</td>
<td>6,547 (2005 WISQARS)</td>
<td>5.3</td>
</tr>
<tr>
<td>D. Maternal MV occupant hospital discharges:</td>
<td>4,000 (1/1000 pregnancies, ‘97)³</td>
<td>400 (1995-1999 NASS)</td>
<td>10</td>
</tr>
<tr>
<td>E. MV occupant deaths</td>
<td>~400 to 700 (17.5 per 100,000 births, fetal death certificates, ‘95-’97)⁴</td>
<td>87 (2004 WISQARS)</td>
<td>8.1</td>
</tr>
</tbody>
</table>

Sources:
TOP 10* CAR OWNERSHIP RATES, 2006


*(plus China & India)
MVT OCCUPANT DEATH RATE FOR YOUNG WOMEN (AGES 15-34): 2001 TO 2005

New Zealand: 8.3 per 100,000 persons
US: 6.5 per 100,000 persons

Sources: IPRU NIQS Stats Query and CDC WISQARS, April, 2009
MV TRAFFIC HOSPITALIZATION RATE FOR YOUNG WOMEN (AGES 15-34)

New Zealand ('03-'07) - 88.5

US ('06) - 69.8

Sources: IPRU NIQS Stats Query and AHRQ HCUP NIS (excludes deaths)
COMPARATIVE BIRTH RATES: 2008

New Zealand: 13.6 per 100,000 persons
US: 14.2 per 100,000 persons

Source: CIA World Fact Book
US FERTILITY RATE, BY AGE & AGE SPECIFIC HOSPITALIZED CRASH INJURY, 2006*

2006 Births = 4,265,555

Sources: Fertility data - CDC, NVSS Table “MAGER”, 2006
NZ FERTILITY RATE, BY AGE & HOSPITALIZED CRASH INJURY: 2003 TO 2007*

Age of Women

2006 Births = 60,327
Median Age of Child Bearing = 30.3 Years

Injury data - IPRU, University of Otago (*financial years 2003 to 2007)
MAORI FERTILITY RATE (2006), BY AGE & HOSPITALIZED CRASH INJURY: NZ, 2003 TO 2007*

Injury data – Brandon de Graaf, IPRU, University of Otago (*financial years 2003 to 2007)

2006 Births = 13,813
Median Age of Child Bearing = 25.9 Years
FERTILITY VERSUS CRASH INJURY RATES

Age of Women

Relative Rate
WHO IS AT RISK?
“WHAT GETS MEASURED GETS DONE”

James Marks MD, MPH
(Commentary on Safe Motherhood)
OUT OF SIGHT OUT OF MIND?
ICD-10 CLASSIFICATION

- **P00.5** = Newborn (suspected to be) affected by maternal *injury*
External cause codes should be used only if the underlying condition is classifiable to the injury and poisoning chapters (WHO).

Since maternal trauma is NOT in the injury chapters

no external cause codes are assigned to these cases!
FETAL AND NEONATAL DEATH CERTIFICATE

Medical Certificate of Causes of Fetal and Neonatal Death

This certificate should be completed for stillbirths and for liveborn infants dying within 28 days of birth, and given to the funeral director or other person in charge of the body without delay.

Certification status

Tick one: ☐ Stillbirth (a dead fetus that weighed 400 g or more when issued from its mother or issued from its mother after the 20th week of pregnancy) ☐ A liveborn infant dying within 28 days of birth

NOTE: a midwife may certify a certificate in respect of a stillbirth if there was no medical practitioner in attendance.

Infant

Name of infant (if given)

Infant’s NHI number (if available)

Sex

☐ Female ☐ Male ☐ Indeterminate

Ethnic group(s)

☐ New Zealand European ☐ Maori ☐ Samoan ☐ Cook Island Maori ☐ Tongan

☐ Niuean ☐ Chinese ☐ Indian

Mark the space or spaces that apply

☐ other (such as DUTCH, JAPANESE, TOKELAUAN). Please state:
### Causes of Death

<table>
<thead>
<tr>
<th>Description</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Main disease or condition in fetus or infant</td>
<td>Fetal death of unspecified cause</td>
</tr>
<tr>
<td>(b) Other diseases or conditions in fetus or infant</td>
<td></td>
</tr>
<tr>
<td>(c) Main maternal disease or condition affecting fetus or infant</td>
<td>Maternal injury affecting fetus or newborn</td>
</tr>
<tr>
<td>(d) Other maternal diseases or conditions affecting fetus or infant</td>
<td></td>
</tr>
<tr>
<td>(e) Other relevant circumstances</td>
<td>MVA injury</td>
</tr>
</tbody>
</table>
FETAL AND NEONATAL DEATHS CODED AS FOETUS & NEWBORN AFFECTED BY MATERNAL INJURY, NZ: 1997-2007

N=41
(37 Fetal
4 Neonatal)

Source: Simon Ross and Laura Neilson, Information Analysts Information Directorate, NZ Ministry of Health
FETAL AND NEONATAL MATERNAL INJURY DEATHS
BY GESTATIONAL AGE, NZ: 1997-2007

Source: Simon Ross and Laura Neilson, Information Analysts
Information Directorate, NZ Ministry of Health,
Maori made up 14.7% of 2001 population but 27% of the fetal deaths due to maternal injury.
MECHANISM OF FETAL & NEONATAL DEATHS CODED AS FETUS & NEWBORN AFFECTED BY MATERNAL INJURY, NZ: 1997-2007

N=41

- MVA: 51%
- Not Specified: 32%
- Fall: 10%
- Assault: 5%
- Other: 2%

Source: Simon Ross and Laura Neilson, Information Analysts Information Directorate, Mortality Collection, Ministry of Health
FETAL AND NEONATAL MATERNAL INJURY DEATHS COMPARED TO INFANT MV DEATHS, NZ: 1997-2007

Fetal/Neonate (all injury) N=41*
Fetal/Neonate MVA N=21*
Infant MV N=22**

Source: Simon Ross and Laura Neilson, Information Analysts Information Directorate, NZ Ministry of Health, and **Brandon de Graf, IPRU Stats Query
Fetal and Neonatal Maternal Injury MVA Deaths by Gestational Age, NZ: 1997-2006

Fetal/Neonate MVA  N=21*

Source: *Simon Ross and Laura Neilson, Information Analysts Information Directorate, NZ Ministry of Health
SUMMARY

- Critical gaps in reporting and surveillance of pregnancy related injury hide the problem
- Injury and motor vehicle injury is a surprisingly common occurrence during pregnancy
- About the same number of fetal deaths due to motor vehicle crashes occur in NZ as infant MV deaths but the overall risk in NZ is lower than the US probably due to different patterns of age at crash and maternal age at birth.
OUT OF SIGHT OUT OF MIND?

CDC Childhood Injury Report:
Patterns of Unintentional Injuries among 0-19 Year Olds in the United States, 2000-2006

National Action Plan for Child Injury Prevention
50 Experts - 35 Organizations
Understanding and Tracking the Hidden Epidemic in New Zealand

MATERNAL AND FETAL INJURY

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FILLING THE PREVENTION GAP

4. Decrease crash risk if you do drive

- Drive during daylight hours and good weather
- Consider public transportation (buses, trains, commuter rails)
- Ride with good drivers
- Don't ride with impaired drivers
- Plan routes you are familiar with good roadways
- Make sure the vehicle is in good safety condition
5. Reduce travel during pregnancy

- Arrange for people to visit you
- Shop in larger quantities to reduce trips
- Shop online
- Ask someone else to make the trip
- Postpone trips until after pregnancy
- Download flicks rather than go to movies
- Telecommute to work if possible
- Home nursing visits rather than trips to the doctor
- Fly rather than take long car trips
FILLING THE PREVENTION GAP

1. Develop, evaluate and implement improved vehicle crash protection systems for pregnant women and fetuses
2. Pass primary seatbelt laws
3. Develop effective programs to improve proper seatbelt use during pregnancy