Using Ambulance Service Data for Road Trauma Surveillance

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Road Traffic Crash Injury Surveillance

- Incidence
- Type
- Severity
- Geographic location

- Emerging problems
- Risk factors

- Road Traffic Safety Programs
- Legislation and Policies Changes

Data Gaps in BC

Police	• ~ 20 -30% crashes • Lack injury details
Coroner	• Fatal injury only
Hospital	• Require admission only • Lack crash details
Trauma Registry	• Hospital admission > 48 hr • Not all trauma centres are included
Emergency Department	• No uniform information system • No province wide data collection

Ambulance data

- Province wide
- Place and time
- Types of road users
- Safety equipment
- Injury level
- Electronic Data

Advantage of using Ambulance data

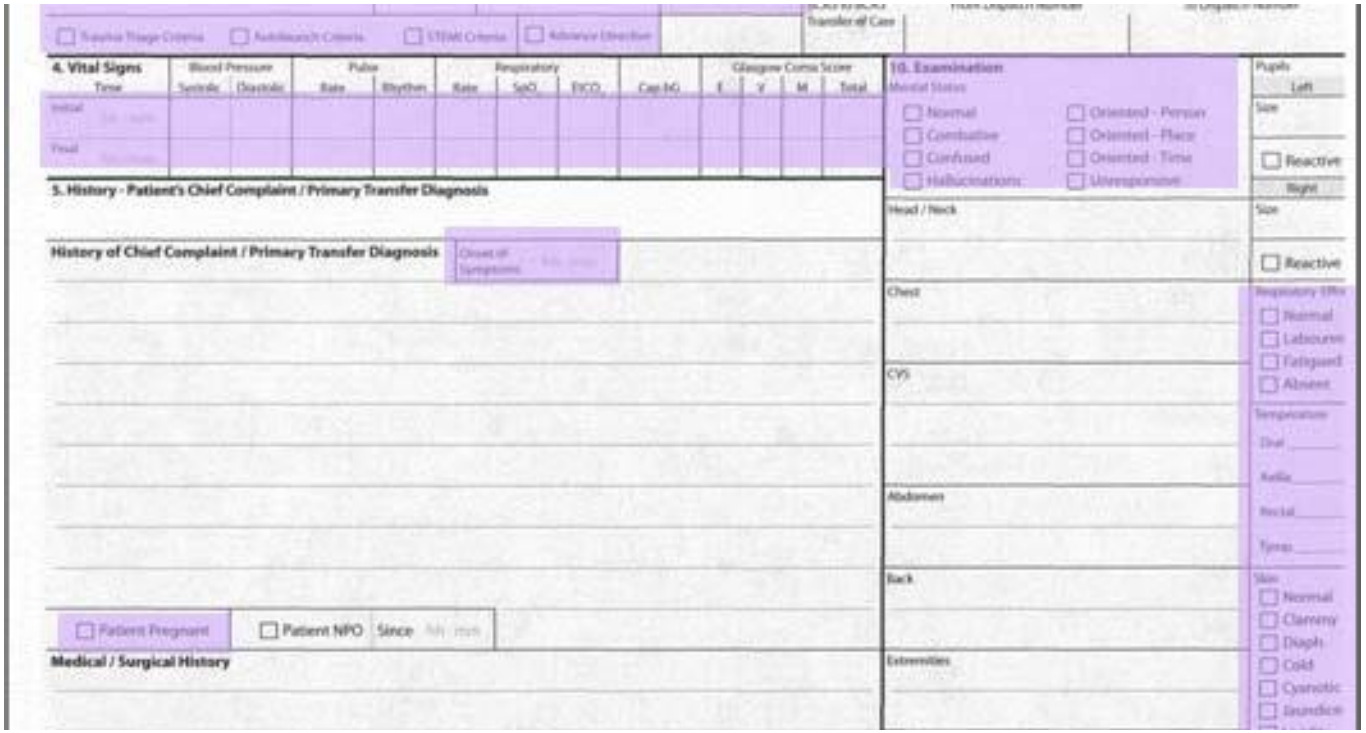
More inclusive

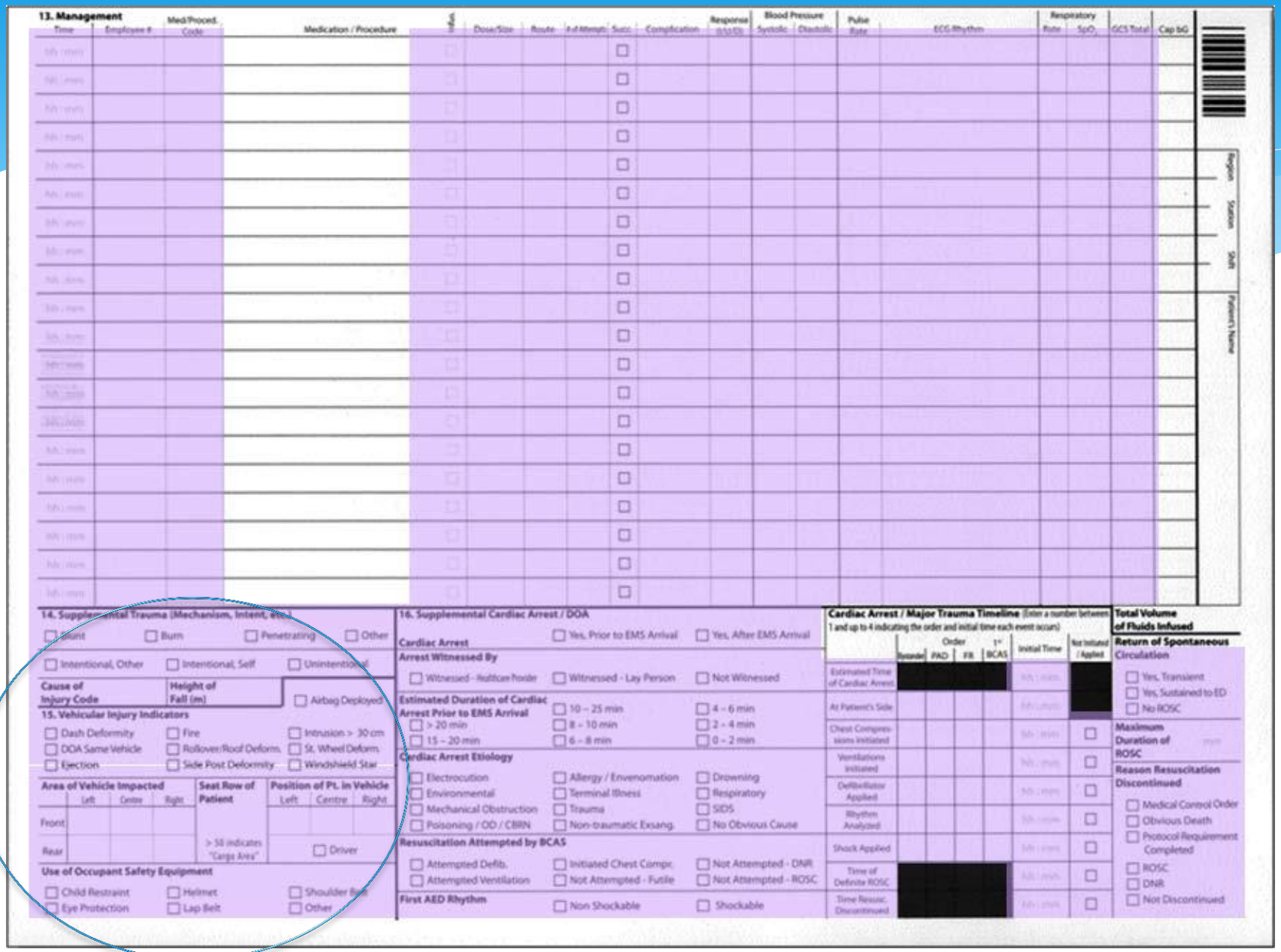
- Most injury crashes are attended by ambulance
- Most crash survivors are brought to hospital by ambulance
- BC has a single ambulance service system

Crash information

- Provide more information on crash information compared to hospital admission and trauma registry data

BC Ambulance form – Patient Care Record




13. Management
Time
Employee #
Med/Proced. Code
Medication / Procedure
Dose/Size
Route
# of Attempts
Succ
Complication
Response
Blood Pressure
Systolic
Diastolic
Pulse
Rate
ECG Rhythm
Respiratory
Rate
SpO2
GCS Total
Cap bG
Region
Station
Shift
Patient's Name
14. Supplemental Trauma (Mechanism, Intent, etc.)
Burn
Penetrating
Other
Intentional, Other
Intentional, Self
Unintentional
Cause of Injury Code
Height of Fall (m)
Airbag Deployed
15. Vehicular Injury Indicators
Dash Deformity
Fire
Intrusion > 30 cm
DOA Same Vehicle
Rollover/Roof Deform.
St. Wheel Deform.
Ejection
Side Post Deformity
Windshield Star
Area of Vehicle Impacted
Left
Centre
Right
Front
Rear
Seat Row of Patient
> 50 indicates "Cargo Area"
Position of Pt. in Vehicle
Left
Centre
Right
Driver
Use of Occupant Safety Equipment
Child Restraint
Helmet
Shoulder Belt
Eye Protection
Lap Belt
Other
16. Supplemental Cardiac Arrest / DOA
Cardiac Arrest
Yes, Prior to EMS Arrival
Yes, After EMS Arrival
Arrest Witnessed By
Witnessed - Rollcan Provider
Witnessed - Lay Person
Not Witnessed
Estimated Duration of Cardiac Arrest Prior to EMS Arrival
> 20 min
15 – 20 min
10 – 25 min
8 – 10 min
6 – 8 min
4 – 6 min
2 – 4 min
0 – 2 min
Cardiac Arrest Etiology
Electrocution
Environmental
Mechanical Obstruction
Poisoning / OD / CBRN
Allergy / Envenomation
Terminal Illness
Trauma
Non-traumatic Exsang.
Drowning
Respiratory
SIDS
No Obvious Cause
Resuscitation Attempted by BCAS
Attempted Defib.
Attempted Ventilation
Initiated Chest Compr.
Not Attempted - Futile
Not Attempted - DNR
Not Attempted - ROSC
First AED Rhythm
Non Shockable
Shockable
Cardiac Arrest / Major Trauma Timeline (Enter a number between 1 and up to 4 indicating the order and initial time each event occurs)
Order
Bystander
PAD
FR
1st BCAS
Initial Time
Not Initiated / Applied
Estimated Time of Cardiac Arrest
At Patient's Side
Chest Compressions Initiated
Ventilations Initiated
Defibrillator Applied
Rhythm Analyzed
Shock Applied
Time of Definite ROSC
Time Resusc. Discontinued
Total Volume of Fluids Infused
Return of Spontaneous Circulation
Yes, Transient
Yes, Sustained to ED
No ROSC
Maximum Duration of ROSC
Reason Resuscitation Discontinued
Medical Control Order
Obvious Death
Protocol Requirement Completed
ROSC
DNR
Not Discontinued

Objectives

1. Utility of ambulance data
2. Road traffic injuries from the ambulance perspective
3. Compared with police reported crashes

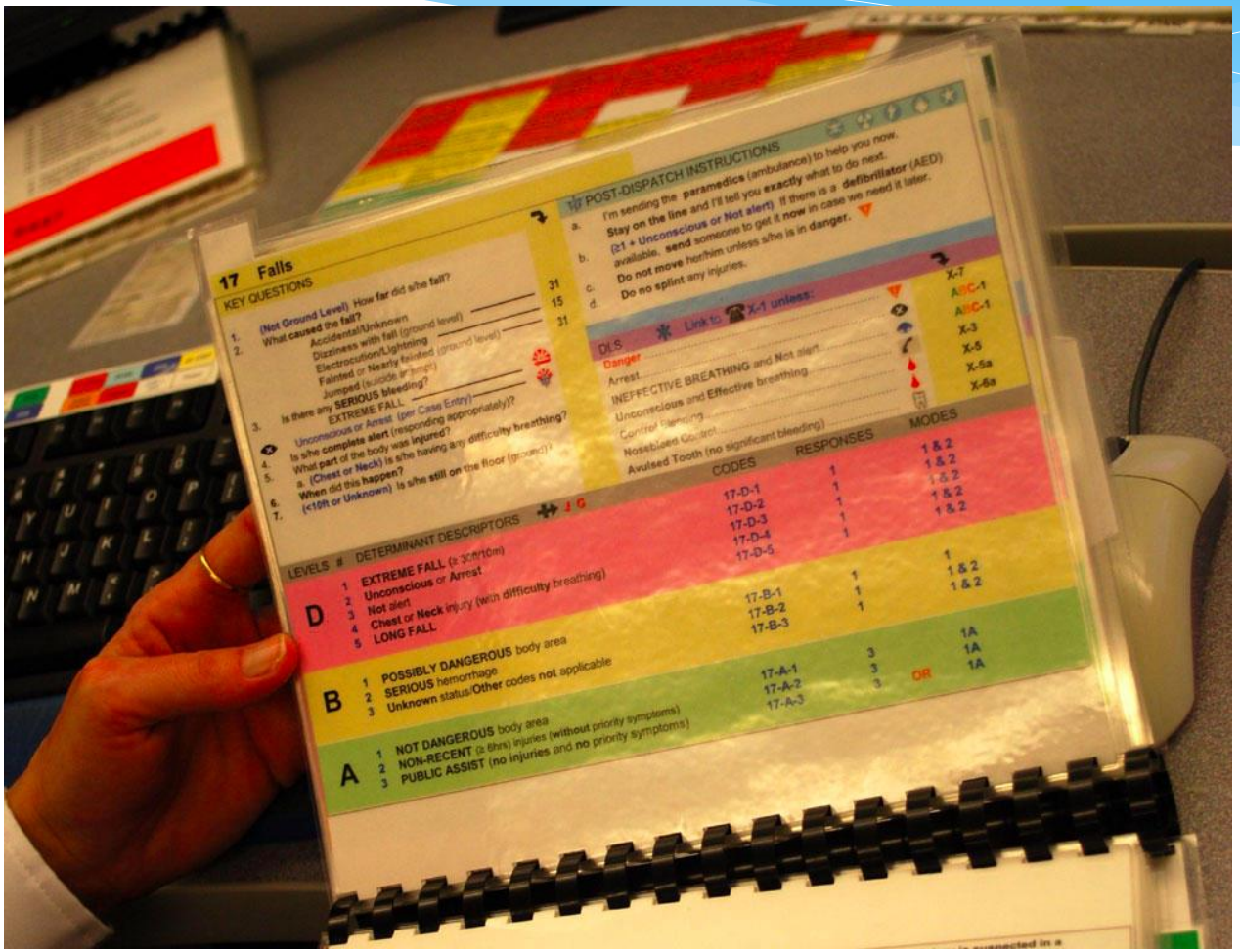
Methods

1. Validity testing of using Card 29 to identify traffic injuries

1. Examine completeness of essential data fields (using BCAS data from 2009 to 2012)

1. Compared with police reports (TAS 2009 to 2012)

Advanced Medical Priority Dispatch System™



Methods

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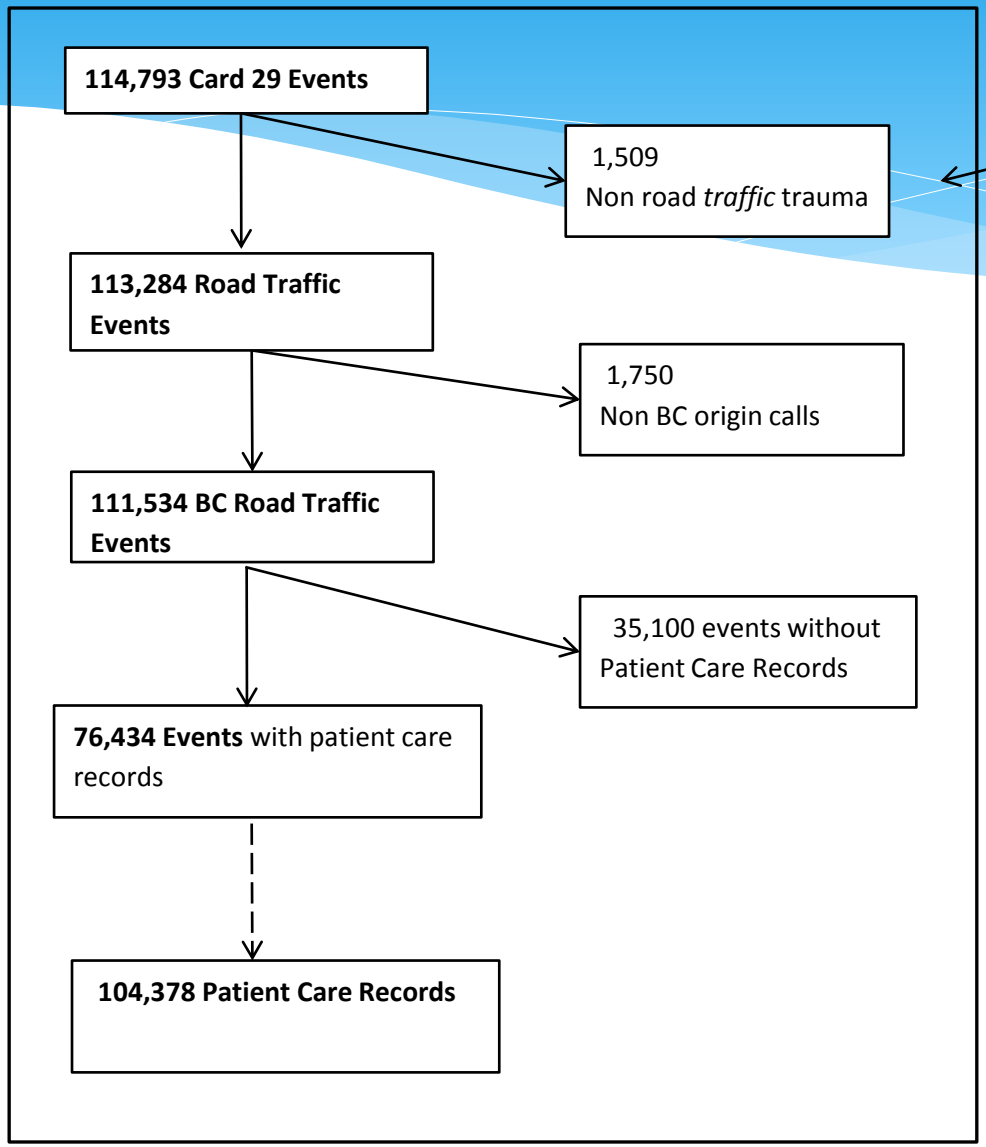
1. Compared with police reports (TAS 2009 to 2012)

	PCR road trauma	PCR not Road trauma	Total
AMPDS Card 29 (test positive)	True + 41	False + 1	42
Other AMPDS (test negative)	False – 4	True – 678	682
	45	679	724

Prevalence of road trauma event per dispatch calls (95% CI)	6.2 (4.6 – 8.3)
Sensitivity (95% CI)	0.911 (0.779 – 0.971)
Specificity (95% CI)	0.999 (0.990 – 0.100)

Card 29 – Events – 2009 to 2012



Incidences of train, plane or boating

Completeness Of Records

Events (N=76,434)	% filled
Call location city	100
Call location (geocodes)	96.5
Incident location type (highway, farm, etc)	73.7
Other service (fire, police, etc)	65.4
AMDPS subcode (e.g. involving cyclists)	100

Completeness Of Records

Patient Care Records (N=104,378)	% filled
Age	88.2
Gender	89.3
Road user type	19.5 – 27.2
Mechanism of injury	20.1
Reason for transport destination	73.1
Vital sign	**% filled**
Initial GCS	87.1
Final GCS	64.5
Initial Systolic pressure	77.3
Initial pulse rate	86.8
Respiratory effort	99.9
Initial respiratory rate	72.3

Ambulance vs Police

2009 - 2012

Ambulance	# Records	Police	# Records
Road Traffic Events	111,534	Reported crashes	130,212
Events without PCR	35,100	PDO crashes	71,772
Events with PCR	76,434	Injury crashes	57,746
Fatal crashes	Nil	Fatal crashes	1,163
Number of PCRs	104,347	Injured person	79,102
Patient died at scene	270	Fatality	1,300

PDO = property damage only; PCR = patient care record

Conclusion

- Valuable source of road trauma data
- More detailed injury information
- Types of motor vehicle crashes differ from those of police reports
- Ambulance attend primarily injury crashes

Recommendations

* Linking ambulance and police data
* Mandatory fields – road users and Injury level
* Linking ambulance data with hospital discharge data

Thank You

Thanks BC Ambulance Service for providing the data and their assistance in describing the data.