

Review of International Best-Practices for Improving  
Child Passenger Safety  
and  
Evaluation of Saskatchewan's Program

Executive Summary

Submission to the Acquired Brain Injury Partnership Project  
Ministry of Health and Saskatchewan Government Insurance

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# HIGHLIGHTS

## 1. How does the Saskatchewan model compare to international best-practices?

- The Saskatchewan model for child passenger safety is primarily education focused.
- The Saskatchewan model is uniquely focused on certifying Child Passenger Safety Technicians to deliver education to the parents and caregivers of young children.
- Some distribution of free or discounted child safety seats is available through community grants and First Nations and Inuit Health (FNIH).
- International evidence focuses on short-term interventions rather than long-term programming. Consequently, comparisons to, and conclusions with regard to the Saskatchewan model, are difficult.
- Education coupled with another component (e.g. enforcement, distribution) is more effective than education alone.

## 2. Does the Saskatchewan model increase usage of child passenger restraints?

- National proportions of unrestrained children seen to decline from 12.9% in 1997 to 5.4% in 2006 to 4.2% in 2010.
- The proportion of Saskatchewan child passengers unrestrained according to the 2010 survey was 8.7%.
- The proportion of children 0-4 years and 5-8 years with motor vehicle crash-related injury who were improperly restrained decreased between 1988 and 2011 (TAIS data).
- The Saskatchewan model is associated with a decrease in number of children not restrained, who are the target audience of this project.

## 3. Does the Saskatchewan model increase PROPER usage of child passenger restraints?

- According to Transport Canada, the rate of correct use of child passenger safety seats in Saskatchewan has continuously declined since the 1997; however, the definition for correct use has also changed over the years.
- Observers in Saskatchewan in the 2010 Transport Canada roadside survey may have been more critical with regard to what constitutes correct use.
- Low proportions of proper use among 5-9 year olds may be related to the lack of a booster seat law in Saskatchewan.
- TAIS data indicate a decrease in improper use over time among children injured or killed in a motor vehicle crash.
- The majority of respondents of a Parking Lot Inspection in rural Saskatchewan had not attended a child passenger safety clinic; issues found with child seat use included Universal Anchorage System (UAS) routing, tightness of UAS/seat belts; insufficiently snug harnesses, location of chest clips; anchoring tether straps for forward-facing seats.
- Saskatchewan Prevention Institute Child Passenger Safety Clinic post-clinic telephone survey conducted in 2004 found that clients perceived an increase of knowledge from an average score of 6.03 out of 10 at pre-clinic to 8.58 at post-clinic; with 62% reporting a change in how they installed their child safety seat post-clinic and 43% in how they secured their child.
- Two student-lead client pre-post evaluations in 2006 and 2007 found that Saskatchewan participants reported a high self-perceived knowledge of child passenger safety following their clinic experience, yet actual knowledge remained low for some

specific elements such as knowing if the seat was installed sufficiently tight.

- Current client post-evaluation found that participants attending for rear-facing seats had higher knowledge of how to install the safety seat and how to secure the child properly than those clients with forward-facing seats; only 60% of clients with rear-facing seats knew when to move a child from rear-facing to forward-facing.
4. Do the demographics of caregivers involved in Saskatchewan interventions match the demographics of the Saskatchewan population? Are there segments of the population being missed?
- The Saskatchewan Child Passenger Safety program targets the parents and caregivers of children ages 0-4 years.
  - The majority of respondents of the Child Passenger Safety Clinic Client Survey were well-educated with high income; primarily Caucasian with 4% Aboriginal, and 3.5% of the sample were recent immigrants.
  - The segments of the population that may be missed by the Child Passenger Safety Program include lower socioeconomic families and Aboriginal families.
  - New Immigrant families appear to be availing themselves of this resource, although this needs to be confirmed.
5. Is there a match between the caregivers targeted by the Saskatchewan model, and the parents/guardians of the children injured in motor vehicle collisions? If not, what other method could be used to target these parents/ guardians?
- Drivers involved in motor vehicle crashes where a child passenger is injured are women ages 16-44 years; men 16-44 years.
  - No information on other demographics or socioeconomic information is available concerning the parents or guardians of children injured in motor vehicle crashes.
  - The systematic review of the literature did not reveal specific methods for targeting segments of the populations at higher risk.

- Potential methods for targeting the Child Passenger Safety Program are: Closer association with hospitals and Public Health units for all new parents; Partner with Aboriginal-serving and Immigrant-serving organizations (e.g. Friendship Centres); Partner with an existing aligned NGO (e.g. SK Abilities Council) for the distribution of child safety seats to lower socioeconomic populations.

6. What is the cost-effectiveness of the Saskatchewan model?

- Total Child Passenger Safety program costs are calculated to be \$231,210 annually.
- The program period saw 17 to 41 fewer deaths, 375 fewer hospitalizations, 164 fewer emergency room visits, and 784 fewer ambulance attended child passenger injuries than the pre-program period.
- Total direct costs decreased by a range of \$4.3M to \$8.2M within the pre-program period; and by a range of \$4.6M to \$8.6M during the program period.
- A range of cost reductions from \$25.2M to \$45.1M were calculated for the direct costs for child passenger injury and mortality medical care, comparing the program period to the pre-program period.
- The inclusion of indirect costs of child passenger injury and mortality would see significantly increased savings and return on investment.
- A return on investment ranging from \$12 to \$16 of costs avoided for every \$1 invested in child passenger safety was found, with the caveat that the Child Passenger Safety program is not the only factor involved in increased child passenger safety in Saskatchewan.
- Although it is not possible to determine if the Child Passenger Safety program is a cost-saving measure, there is strong evidence supporting its contribution to child passenger safety in Saskatchewan.

## Recommendations

### Education

- Use social media to the fullest. Credible information can be disseminated via social media: YouTube channel, Facebook, Twitter and LinkedIn. The Saskatchewan Prevention Institute has accounts with all four of these social media platforms. Current videos posted on YouTube focus on fetal alcohol syndrome and smoking/second hand smoke prevention.  
<http://www.youtube.com/user/PreventionInstitute1>  
<http://www.facebook.com/SaskatchewanPreventionInstitute>  
<http://twitter.com/#!/SkPrevention>  
<http://ca.linkedin.com/pub/communication-department/33/276/594>
- Enlist the support of ‘Mommy Bloggers’. Young female drivers were seen to be involved in single vehicle crashes where a child was injured. The influence of Mommy Bloggers should not be underestimated in their ability to influence behaviour among their peers. This is a credible audience for spreading child passenger safety messages and being part of the solution.
- Develop web-based/DVD instructional videos, e.g. Step 1, 2, 3 on how to install a car seat; how to adjust the straps securing your child, etc.
- Increase police education. The Child Safety Link located in the Maritimes has Child Passenger Safety Information and Resources for Enforcement Personnel, such as laminated resource cards detailing the child passenger laws and safety recommendations  
<http://professional.childsafetylink.ca/child-passenger-safety/enforcement>
- Review the upcoming Child Passenger Safety Tool Box for its potential to support or enhance Child Passenger Safety Technician training. Currently in development by Dr. Beth Bruce as part of AUTO 21, this online toolbox will be targeted to professionals working in child passenger safety.

### Equipment Incentive/Distribution

- Formalize distribution programs. Limited distribution currently takes place through the use of community grants and work with FNIH. A provincially co-ordinated program targeted at low socioeconomic families, Aboriginal and recent Immigrant families for the distribution of discounted or free child safety seats, should be considered.
- Utilize child seats that will serve the passenger safety needs of the child over several years, e.g. convertible (rear to forward-facing), or combination (forward-facing to booster seats), or 3-in-1 seats.
- Partner with the Saskatchewan Abilities Council, who has an established Special Needs Equipment Loan Program, including retail items. Depots are currently located in Prince Albert, Regina, Saskatoon (central warehouse), Swift Current and Yorkton.  
<http://www.abilitiescouncil.sk.ca/index.cfm>
- Partner with Aboriginal organizations such as Friendship Centres. A full list of Aboriginal organizations in Saskatchewan is available at <http://www.fnmr.gov.sk.ca/community/directory/>.
- Partner with Immigrant organizations providing services to new immigrants to Saskatchewan, e.g.

#### In Regina –

Regina Open Door Society Inc.  
<http://rods.sk.ca/index.php?p=Home>  
Regina Immigrant Women Centre  
<http://www.iwsregina.org/>

#### In Saskatoon –

Global Gathering Place  
<http://www.globalgatheringplace.com/>  
International Women of Saskatoon  
<http://www.internationalwomenofsaskatoon.org/>  
Saskatchewan Intercultural Association Inc.  
<http://saskintercultural.org/>  
Saskatoon Open Door Society  
<http://www.sods.sk.ca/>

#### Other Locations –

Moose Jaw Multicultural Council

<http://www.mjmcinc.ca/>

YWCA Prince Albert Settlement Services

<http://ywcaprincealbert.ca/ProgramsandServices/RefugeesImmigrantsandNewcomers.aspx>

#### **Enforcement / Enactment**

- Increase enforcement and child passenger safety blitzes. Re-establish partnerships with the RCMP and municipal police forces to increase the profile of child passenger safety and the enforcement of child passenger safety seat use.
- Support the enactment of legislation of booster seat use for children ages 5 to 9 years of age. Political lobbying is required to support a provincial politician. Other provinces have typically passed this law with little adversity when backed by a legislative champion.





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# INTRODUCTION

## Overview

Motor vehicle crashes are the leading cause of death and injury among Canadian children younger than 14 years of age (Snowdon et al., 2008). According to Transport Canada, 3,500 children are injured and 61 children are killed each year in motor vehicle crashes (Safe Kids Canada, 2011). The Canadian Paediatric Society and the American Academy of Paediatrics recommend appropriate child safety seat use to reduce injury risk (Canadian Paediatric Society, 2008; Durbin, 2011). Despite significant increases in child safety seat use over the past 25 years, many children are still not properly restrained. Appropriate use of child safety seats has been shown to reduce the risk of death and serious injury by roughly 70 percent (Kahane, 1986), however, it has been estimated that as many as one-third of Canadian children are not properly restrained (Transport Canada, 2006; Yi Wen et al., 2010).

According to the Saskatchewan Comprehensive Injury Surveillance Report, 1995-2005 (2008), injury is the leading cause of death among children ages 0 to 9 years in Saskatchewan, excluding perinatal illness and congenital issues. Motor vehicle crashes are the leading cause of injury resulting in these childhood deaths. It is also the second leading cause of hospitalization among children in Saskatchewan, accounting for 18.2 percent. Among ages 0 to 4 years specifically, motor vehicle crashes tie with fire and flame-related injury as the second leading cause of death after falls (Saskatchewan Comprehensive Injury Surveillance Report, 1995-2005 2008).

Furthermore, in 2004 Saskatchewan had the third highest per capita injury-associated health care costs in Canada (SMARTRISK, 2009). These unintentional injuries, including those resulting from motor vehicle crashes, totalled \$629 million. Injuries claimed the lives of 399 people living in Saskatchewan, left 192 people with permanent disability, and a further 2,348

people with permanent partial disability. Of these, transport related incidents were the leading cause of death per capita (12.9 per 100,000) and were responsible for 13 percent of injury hospitalizations, nine percent of all emergency department visits, and 13 percent of permanent disability, costing the health care system approximately \$147 million.

To address the continuing high social and economic costs associated with transportation injuries, Road Safety Vision 2010 was approved to carry on the work of Canada's inaugural national road safety vision – "to have the safest roads in the world" (Transport Canada, 2001).

The targets of the Road Safety Vision include:

1. Reducing the number of road users killed and seriously injured during the 2008-2010 period by 30 percent as compared to the 1996-2001 figures (Transport Canada, 2009)
2. Achieving a 95 percent seat belt wearing rate and proper child occupant restraint use among occupants of light duty vehicles (Transport Canada, 2011)
3. Passengers younger than sixteen years of age restrained according to their size or development, either in a vehicle seat belt or child passenger restraint system (Canadian Council of Motor Transport Administrators, 2010).

Taking a new approach, the Road Safety Vision 2015 includes the four strategic objectives: raising public awareness and commitment to road safety; improving communication, cooperation and collaboration among all stakeholders; enhancing enforcement; and improving road safety information in support of research and evaluation (CCMTA, 2011).

## The Saskatchewan Model

The model for addressing child passenger safety within Saskatchewan consists primarily of education – the education of parents and caregivers through the training of certified Child Passenger Safety Technicians, child passenger

safety clinics, and the distribution of resources – supplemented with some distribution of car seats to particular high risk populations through community grants, and the enforcement of child restraint laws.

Critical partners in child passenger safety within Saskatchewan include Saskatchewan Government Insurance (SGI), the Ministry of Health Acquired Brain Injury (ABI) Partnership Project, the Saskatchewan Prevention Institute, St. John Ambulance, and community-based partners such as emergency services. Each organization plays a key role in child passenger safety, such as funding, expertise, personnel, and resources (Table 1). Both the Saskatchewan Safety Council and the Transportation Centre at the University of Saskatchewan have also played key roles in the past.

The Community Liaison position was located at the Saskatchewan Safety Council from July 2000 to March 2009, at which time it transitioned to the Saskatchewan Prevention Institute as the Child Traffic Safety Coordinator. While housed at the Safety Council, the Community Liaison position addressed child passenger safety by:

- Chairing the *Provincial Interagency Committee on Child Passenger Safety*.
- Offering local contacts guidance to plan clinics.
- Maintaining a database of the clinics held, Instructor/Technician involved, number of seats checked and volunteers that assisted.
- Maintaining a technical knowledge of child restraints and serving as a provincial resource on child passenger safety:
  - Assisting with the training of Child Passenger Safety Technicians.
  - Making service available to perform car seat checks at the Saskatchewan Safety Council, as weather permits.
  - Responding to phone inquiries regarding Child Passenger Safety in Saskatchewan.
- Maintaining a relationship with the Saskatchewan Prevention Institute on their initiatives to:
  - Develop a network of trained child restraint community resource people.

- Distribute information on new initiatives to the child passenger network in Saskatchewan.
- Maintaining a relationship with St. John Ambulance on the ongoing progress of the National Child Restraint Program to:
  - Accommodate the requests for technician and instructor training courses.
- Providing communication to Child Passenger Safety Technicians through the Saskatchewan Prevention Institute's Child Passenger Safety Connection.

The CARE (Children Are Restrained Every Ride) program was also offered by the Saskatchewan Safety Council for three years, ending in February of 2009 (Saskatchewan Safety Council, 2009). This program allowed caregivers to rent a seat for two weeks for a \$20 fee. Over the three year period, approximately 100 loans were made (Lemon, 2009).

Today, the Child Passenger Safety Program within Saskatchewan consists of the Child Traffic Safety Coordinator funded through SGI, and the Child Injury Prevention Program Coordinator funded by the ABI Partnership Project. SGI provides child passenger safety materials for public clinics; promotes public clinics via radio announcements and newspaper advertisements; develops and distributes resources; and funds the program.

The Saskatchewan Prevention Institute began its focus on Child Passenger Safety Training in 1990, later receiving funding from the ABI Partnership Project to continue its work in child injury prevention in 1997 (Saskatchewan Prevention Institute, 2005). Use of the new National Child Passenger Safety Technician Training program was established in 2003. The Saskatchewan Prevention Institute encompasses child passenger safety, bicycle safety, and general injury prevention.

The Saskatchewan Prevention Institute organizes the Technician training sessions; produces continuing education materials such as e-mail updates (formerly newsletters) and annual Technician training updates; develops and distributes resources; and organizes public clinics. Child passenger safety information handouts and

loaner videos currently available through the Saskatchewan Prevention Institute include: *Universal Anchorage System* Fact Sheet; *Does Your Child Need to use a Booster Seat?* Information Card; *Air Bags* Fact Sheet; *Pregnant*

*Women and Seat Belts* Information Card; *What Car Seat Should a Child Use?* Fact Sheet; Transport Canada *Car Time 1, 2, 3, 4* VHS; and Safe Kid Canada's *Kids That Click* DVD.

Table 1 – Saskatchewan Child Passenger Safety Program

Critical Partners	Key Roles
Saskatchewan Government Insurance	<ul style="list-style-type: none"> <li>• Funding for program: staffing and grants</li> <li>• Expertise</li> <li>• Personnel support for training events</li> <li>• Support at community events</li> <li>• Development and distribution of resources</li> <li>• Providing materials and promotion of the clinics through radio, newspaper advertisement (proper promotion requires at least 2 week notification)</li> </ul>
Ministry of Health – Acquired Brain Injury Partnership Project	<ul style="list-style-type: none"> <li>• Funding for community grants</li> <li>• Funding for four education and prevention coordinators (1 provincial, 3 regional)</li> <li>• Funding for child injury prevention coordinator</li> <li>• Involvement in evaluation processes</li> </ul>
Saskatchewan Prevention Institute	<ul style="list-style-type: none"> <li>• Organization of Technician trainings, including personnel</li> <li>• Continuing education (e.g. Newsletter, Annual Updates)</li> <li>• Development and distribution of resources</li> <li>• Organization of clinics</li> <li>• Record keeping (database, clinics, requirements for re-certification)</li> <li>• Community support</li> <li>• Administers Interagency Network</li> </ul>
St. John Ambulance	<ul style="list-style-type: none"> <li>• Provides Technician certification</li> </ul>
Community-based Partners – police services, ambulance services, health regions, tribal councils, and others	<ul style="list-style-type: none"> <li>• Personnel support</li> <li>• Hosting clinics throughout the province</li> <li>• Providing indoor space for clinics during winter</li> </ul>
Saskatchewan Safety Council (onset – 2009)	<ul style="list-style-type: none"> <li>• Technician database</li> <li>• Community-based work, e.g. clinics</li> <li>• Community Liaison position (2000 – 2009)</li> <li>• CARE (Children Are Restrained Every Ride) (2006 – 2009)</li> </ul>
Transportation Centre – University of Saskatchewan (onset – 2011)	<ul style="list-style-type: none"> <li>• Expertise</li> <li>• Personnel support for training events</li> </ul>

Staff at the Saskatoon Prevention Institute is also trained in car seating for special needs children, and has hosted two training sessions by Dr. Marilyn Bull from the Riley Hospital for Children, Indianapolis, Indiana. The Saskatchewan Prevention Institute is currently working with the Department of paediatric Orthopaedics for loaner seats while children are

in casts following surgery. These loaner seats are currently available via the Saskatchewan Cerebral Palsy Association in Saskatoon and the Wascana Rehabilitation Centre in Regina.

First Nations and Inuit Health (FNIH) Branch of Health Canada is currently partnering with the Saskatchewan Prevention Institute to offer child passenger safety Technician mentoring and

updating for several First Nations communities. Child passenger car seats are also provided to each of these Technicians to take back to their communities.

The Child Passenger Safety Technician training is currently offered as a three-day in-person training course by the Saskatchewan Prevention Institute and SGI, with both classroom learning and practical training. A written exam is administered at the end of the training period, and Technicians are required to inspect at least ten child seats each year in order to retain their certifications.

There are currently 170 certified Technicians, including instructors, who support communities in reducing child safety seat misuse by educating parents and caregivers about the best evidence for appropriate child safety seat use. This service may be in the form of a booked appointment, a drop-in clinic, or contact by telephone.

Community-based and other critical partners combine efforts to host drive-through infant and child car seat clinics. Over the past five years, 11,289 child safety seats have been checked (Table 2).

Table 2 – Child Passenger Safety Clinic Information, 2007-2011

<b>Year</b>	<b># Seats Checked</b>	<b># Clinics</b>	<b># Communities Hosting Clinics</b>
2007	3,053	125	73
2008	2,214	101	62
2009	2,440	115	59
2010	2,423	86	61
2011	1,159	105	59

There has been one recent telephone survey by the Saskatoon Prevention Institute, and two student-lead evaluations of Child Passenger Safety Clinics looking at the change in knowledge of the clinic clients. The Saskatchewan Prevention Institute conducted a post-clinic telephone survey in 2004 to measure the perceived usefulness and change in knowledge and behaviour one year after attending a car seat clinic (Saskatchewan Prevention Institute, 2004). A total of 150 participants reported an average self-satisfaction score of 4.7 out of 5; a perceived increase of knowledge from an average score of 6.03 out of 10 at pre-clinic to 8.58 post-clinic; and with 62 percent changing how they installed their child safety seat post-clinic and 43 percent changing how they secured their child post-clinic.

Wallace (2006) evaluated clinics held by the Saskatoon Public Health Services, while Trinder (2007) evaluated child passenger safety clinics encompassing all of Saskatchewan. Both studies employed a pre-post survey design, although

Tinder allowed respondents to answer “I do not know” on the true/false knowledge questions, which had not been available on Wallace’s survey. Both studies found that participants self-reported a high perceived knowledge of child passenger safety following their clinic experience, yet actual knowledge remained low for some specific elements such as knowing if the seat is installed sufficiently tight.

Beyond child passenger safety education, the ABI Partnership Project and SGI provide community grants for traffic safety and general injury prevention programming. The community grants program was established by the SGI and Saskatchewan Health in 1997 (Saskatchewan Prevention Institute, 2005). These grants have enabled community groups to address safety issues primarily concerning: impaired driving, ATV/motorcycle safety, bicycle/skateboard/inline skating safety, child passenger restraint, and the prevention of falls among seniors. Funding through community grants has spanned both urban and rural communities,

including First Nations and Aboriginal organizations. Currently, a minimum of \$75,000 is available each year for community grants.

An example of a community-based child passenger safety program is *Kids in Safety Seats* (KISS). KISS is a distribution program for economically challenged families as well as a short-term loaner program that runs in the Swift Current, Moose Jaw and North Battleford areas.

Finally, enforcement of child restraint laws, which do not currently include a booster seat law in Saskatchewan, is an integral part of any child passenger safety program.

In 2010, the ABI Partnership Project, Ministry of Health and SGI issued a Request for Proposals for a review of international best-practices for improving Child Passenger Safety, and an evaluation of the Saskatchewan Program. The purpose of this evaluation is to:

1. Examine how the Saskatchewan model compares to best-practices being used across the world.
2. Examine the effectiveness of the various elements of the Saskatchewan model.
3. Examine the match between the injury problem and the Saskatchewan model.

The results of this evaluation will be used to provide guidance for improving the Saskatchewan model, and through these improvements, reducing the number and severity of child passenger injuries in Saskatchewan.

### **Purpose of this Report**

This report is the evaluation of the Saskatchewan Child Passenger Safety Program, addressing the following six evaluation questions:

1. How does the Saskatchewan model compare to international best-practices?
2. Does the Saskatchewan model increase usage of child passenger restraints?
3. Does the Saskatchewan model increase PROPER usage of child passenger restraints (to be assessed with both increased

knowledge of proper usage AND improved behaviour)?

4. Do the demographics of caregivers involved in Saskatchewan interventions match the demographics of the Saskatchewan population? Are there segments of the population being missed?
5. Is there a match between the caregivers targeted by the Saskatchewan model, and the parents/guardians of the children injured in motor vehicle collisions? If not, what other method (from the international best-practice review) could be used to target these parents/guardians?
6. What is the cost-effectiveness of the Saskatchewan model?
  - a. Are the interventions cost-saving measures?
  - b. Is there a return on investment of the interventions being used to improve child passenger safety?

To answer these questions, seven discrete projects were undertaken:

1. Systematic Review of International Best-Practices for Improving Child Passenger Safety
2. Saskatchewan Child Passenger Roadside Survey
3. Saskatchewan Child Passenger Parking Lot Inspection
4. Saskatchewan Child Passenger Safety Clinic Client Survey
5. Saskatchewan Child Passenger Safety Technician Survey
6. Secondary Data Analysis of the Saskatchewan Traffic Accident information System (TAIS) data
7. Saskatchewan Child Passenger Safety Economic Analysis

These projects are described in Chapters I through VII. Answers to the evaluation questions are provided in the Discussion section, along with recommendations presenting options for the future of the Child Passenger Safety program in Saskatchewan.

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# DISCUSSION & RECOMMENDATIONS

## Introduction

The purpose of this evaluation is to examine how the Saskatchewan model for supporting child passenger safety compares to currently accepted best-practices; determine the effectiveness of the various elements of the Saskatchewan model; and describe the match between the burden of child passenger injury and mortality and the Saskatchewan model.

In this section, the following six questions are answered based upon two years' work and data collection (see Chapters I to VII):

1. How does the Saskatchewan model compare to international best-practices?
2. Does the Saskatchewan model increase usage of child passenger restraints?
3. Does the Saskatchewan model increase PROPER usage of child passenger restraints (to be assessed with both increased knowledge of proper usage AND improved behaviour)?
4. Do the demographics of caregivers involved in Saskatchewan interventions match the demographics of the Saskatchewan population? Are there segments of the population being missed?
5. Is there a match between the caregivers targeted by the Saskatchewan model, and the parents/guardians of the children

injured in motor vehicle collisions? If not, what other method (from the international best-practice review) could be used to target these parents/guardians?

6. What is the cost-effectiveness of the Saskatchewan model?
  - a. Are the interventions cost-saving measures?
  - b. Is there a return on investment of the interventions being used to improve child passenger safety?

Recommendations for Saskatchewan are offered based on this work, towards the enhancement of child passenger safety.

Further, the American Academy of Pediatrics Policy Statement on Child Passenger Safety is appended in Appendix 8.1; a review of the literature pertaining to the cost-effectiveness of child passenger safety systems is presented in Appendix 8.2; and a review of what works for child passenger safety seat distribution is summarized, and resources for developing a distribution program are included in Appendix 8.3.

## 1. How does the Saskatchewan model compare to international best-practices?

The Saskatchewan model for child passenger safety is based primarily upon the education of the parents and caregivers of young children. This education is provided by certified Child Passenger Safety Technicians via appointment, drop-in clinics, and telephone; along with resources (printed/video) available from the Saskatchewan Prevention Institute. Secondary to education, some distribution of free or discounted seats is offered through community grants provided by the ABI Partnership Project and SGI, and work by First Nations and Inuit Health (FNIH) in conjunction with the Saskatchewan Prevention Institute and SGI.

The systematic review of the literature found that the available evidence focuses on specific interventions with short-term outcomes, rather than larger, long-term programming. For example, the ability of a home safety visit targeted to families attending a Head Start preschool to increase booster seat use from baseline to 3-months post visit.

No evidence was found evaluating the use of certified Child Passenger Safety Technicians in delivering education, or the evaluation of Technician training. In order to address this gap, a survey of the certified Saskatchewan Child Passenger Safety Technicians was included as part of this program evaluation to ascertain if the current Child Passenger Safety Technician education and training in Saskatchewan is sufficient preparation and support for these individuals to perform their preventative work in the community effectively and efficiently (Chapter V).

The systematic review confirmed that education alone is not effective in enhancing child passenger safety. A multifaceted approach that includes education coupled with other interventions was demonstrated most likely to be effective in promoting child passenger safety. This approach emphasizes a systems

approach to improving road safety and questions an over-reliance on education.

Specifically, strong evidence was found supporting the effectiveness of child passenger safety education when coupled with either incentive/distribution programs or enforcement campaigns.

A similar systematic review evaluating education-only interventions for child passenger safety reached similar conclusions. Zaza et al. (2001) found strong evidence for safety seat legislation and distribution coupled with education programs, sufficient evidence for community-wide information coupled with enhanced education campaigns, and economic incentives coupled with education programs. Insufficient evidence was found for education-only programs.

### Key Point Summary

- The Saskatchewan model for child passenger safety is primarily education focused.
- The Saskatchewan model is uniquely focused on certifying Child Passenger Safety Technicians to deliver education to the parents and caregivers of young children.
- Some distribution of free or discounted child safety seats is available through community grants and FNIH.
- International evidence focuses on short-term interventions rather than long-term programming. Consequently, comparisons to, and conclusions with regard to the Saskatchewan program, are difficult.
- Education coupled with another component (e.g. enforcement, distribution) is more effective than education alone.

## 2. Does the Saskatchewan model increase usage of child passenger restraints?

Child passenger restraint use has been measured in the Transport Canada roadside surveys in 1997 (Transport Canada, 1998), 2006 (Snowdon et al., 2006) and most recently in 2010 (Snowdon et al., 2010). Of these three surveys, only the 2010 survey reported the proportion of Saskatchewan child passengers to be unrestrained, at 8.7 percent. Overall, the national proportions of unrestrained children have decreased since 1997:

- 1997: 12.9%
- 2006: 5.4%
- 2010: 4.2%

According to SGI TAIS data, among children sustaining mild or moderate injury in a motor vehicle crash, the proportion of improper restraint use, which includes non-use, was observed to decrease between 1988 and 2010 for both age groups – 0 to 4 years and 5 to 9 years. Furthermore, the use of rear-facing seats was seen to increase in recent years among the 0 to 4 year olds, along with an increase in the use of booster seats among the 5 to 9 year olds.

Therefore, the Saskatchewan model is associated with a decrease in number of children not restrained, who are the target audience of this project.

### Key Point Summary

- National proportions of unrestrained children seen to decline from 12.9% in 1997 to 5.4% in 2006 to 4.2% in 2010.
- The proportion of Saskatchewan child passengers unrestrained according to the 2010 survey was 8.7%.
- The proportion of children 0-4 years and 5-8 years with motor vehicle crash-related injury who were improperly restrained decreased between 1988 and 2011 (TAIS data).
- The Saskatchewan model is associated with a decrease in number of children not restrained, who are the target audience of this project.

### 3. Does the Saskatchewan model increase PROPER usage of child passenger restraints?

#### Behaviour

The rate of correct use of child passenger safety seats in Saskatchewan has continuously declined since the 1997 Transport Canada survey was conducted (Table 8.1). At that time, proper use of proper restraints was estimated to be 81.2 percent for all age groups in Saskatchewan (Transport Canada, 1998). Since then, the definitions of both 'proper use' and 'appropriate restraint' have changed, and the provincial rate has decreased significantly to a weighted estimate of 59.7 percent in 2006 (Snowdon et al., 2006). Currently, the rate is estimated to be 53.5 percent among all age groups in Saskatchewan (Snowdon et al., 2010).

Table 8.1: Transport Canada roadside surveys of overall correct child passenger restraint use for 1997 (Transport Canada, 1998), 2006 (Snowdon et al., 2006), and 2010 (Snowdon et al., 2010) in Western Canada: SK, MB, AB and BC:

Province	1997	2006	2010
SK	81.2%	69.7%	53.5%
MB	81.3%	55.0%	57.2%
AB	77.2%	64.0%	71.2%
BC	80.6%	56.3%	68.2%

It is important to recognize that although the Transport Canada roadside surveys typically use students trained to estimate child age and to identify use of the right seat for that child, and the correct use of that seat, in Saskatchewan, the 2010 survey was conducted by certified Child Passenger Safety Technicians. This came about as the Transport Canada study had difficulty in finding a local coordinator in Saskatchewan, thus providing the BC Injury Research and Prevention Unit the opportunity to partner with Transport Canada in conducting this work in conjunction with this program evaluation.

Working with contacts at the Saskatchewan Prevention Institute and SGI, technicians and trained SGI summer students undertook the roadside data collection. The lower rates of correct child passenger restraint use observed in Saskatchewan during the 2010 survey may in part be due to a more critical eye than was used in the other provinces.

Another key point affecting the measurement of correct child passenger restraint use in Saskatchewan is the absence of a booster seat law in this province. Although legally correct, the use of seat belts is generally no longer deemed appropriate use among children over 40lbs until they have attained one of the following:

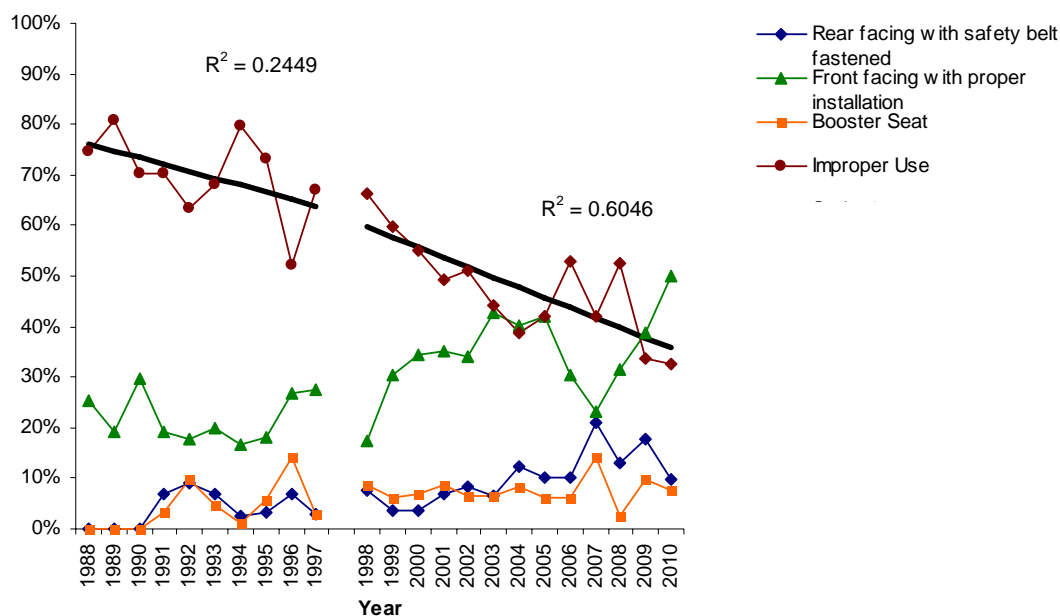
- 80lbs in weight
- 4'9" in height
- 9 years of age

British Columbia adopted its booster seat legislation in 2008, while Saskatchewan, Manitoba and Alberta continue to have no provincial law.

The SGI TAIS data for the period 1988 to 2010, where proper use is determined by the attending police officer at the crash site, demonstrates a decrease in inappropriate restraint use among children injured or killed in a motor vehicle crash. While there is an overall decrease in improper use, minor and moderate injury to 0 to 4 year olds demonstrates a higher rate of decline during the program period, visualized by a shift in slope in Figure 8.1. However, small numbers limit the ability to support this positive trend through statistical analysis.

A limitation of the TAIS data is that it only captures children who were injured in a crash. As restraint use is intended to prevent injury, it is more likely that proper use was seen among children who were in a motor vehicle crash who did not sustain an injury.

Figure 8.1: Proportion of minor and moderate motor vehicle crash-related injuries by year and type of child passenger restraint used, ages 0-4 years, SK, TAIS 1988-2010.



## Knowledge

The Parking Lot Inspection conducted for this evaluation (Chapter III) only recruited a small sample of 17 drivers with child passengers in rural Saskatchewan. The majority of participants had not attended a child passenger safety clinic. None of these participants were able to identify all of the criteria for moving a child from a rear-facing infant seat to a forward-facing seat. Less than half of the drivers with forward-facing seats (5 of 11) had correctly anchored the tether strap for their forward-facing child seat.

Among the participants with rear-facing seats, the Universal Anchorage System (UAS) routing was an issue as well as the tightness of UAS or seat belts used to install the seat. Fewer than half (3 of 8) of the infants had their harnesses sufficiently snug, and 5 did not have the chest clip in the correct location.

Among the 11 participants with forward-facing seats, almost all were correctly routed with the UAS or seat belts, but not all were sufficiently tight. All harnesses were fastened although one

was not properly positioned over the shoulders. Most of the harnesses were not sufficiently snug and more than half of the chest clips were not in the correct position. Fewer than half (5 of 11) of the tether straps were correctly anchored to the vehicle.

There has been one recent telephone survey by the Saskatoon Prevention Institute, and two student-lead evaluations of Child Passenger Safety Clinics looking at the change in knowledge of the clinic clients. The Saskatchewan Prevention Institute (2004) conducted a post-clinic telephone survey in 2004 to measure the perceived usefulness and change in knowledge and behaviour one year after attending a car seat clinic (Saskatchewan Prevention Institute, 2004). A total of 150 participants reported a perceived increase in knowledge from an average score of 6.03 out of 10 at pre-clinic to 8.58 at post-clinic; with 62 percent reporting post-clinic that they had changed how they install their child safety seat in the vehicle and 43 percent how they secure their child in the seat.

Wallace (2006) evaluated clinics held by the Saskatoon Public Health Services, while Trinder (2007) evaluated child passenger safety clinics encompassing all of Saskatchewan. Both studies employed a pre-post survey design, although Trinder allowed respondents to answer “I do not know” on the true/false knowledge questions, which had not been available on Wallace’s survey. Both studies found that participants reported a high self-perceived knowledge of child passenger safety following their clinic experience, yet actual knowledge remained low for some specific elements such as knowing if the seat was installed sufficiently tight.

The Child Passenger Safety Clinic Client Survey conducted for this evaluation (Chapter IV) found that this had been the first clinic experience for three-quarters of participants. Seventy-seven percent of participants attending for rear-facing seats self-rated their child passenger safety knowledge at 8 out of 10 or higher. This proportion dropped to 61 percent for participants attending for forward-facing seats, and 54 percent for those with booster seats.

Basic installation and harnessing knowledge was higher among respondents attending for a rear-facing seat than for a forward-facing seat. Knowledge regarding how to determine if a seat was installed tightly enough was higher among respondents attending for a rear-facing seat (72%) than forward-facing seats (59%). Knowledge regarding which harness slot to use was higher for rear-facing seats (80%) than forward-facing seats (49%). Fewer than 70 percent of respondents knew how to test whether the harness straps were tight enough for both seat types. Knowledge regarding the placement of the chest clip was high for both rear-facing and forward-facing seats.

Sixty percent of respondents knew when to move a child from a rear-facing seat to a forward-facing seat; while 67 percent knew when to move a child from a booster seat to the seat belt.

## Key Point Summary

- According to Transport Canada, the rate of correct use of child passenger safety seats in Saskatchewan has continuously declined since the 1997; however, the definition for correct use has also changed over the years.
- Observers in Saskatchewan in the 2010 Transport Canada roadside survey may have been more critical with regard to what constitutes correct use.
- Low proportions of proper use among 5-9 year olds may be related to the lack of a booster seat law in Saskatchewan.
- TAIS data indicates a decrease in improper use over time among children injured or killed in a motor vehicle crash.
- The majority of respondents of a Parking Lot Inspection in rural Saskatchewan had not attended a child passenger safety clinic; issues found with child seat use included UAS routing, tightness of UAS/seat belts; insufficiently snug harnesses, location of chest clips; anchoring tether straps for forward-facing seats.
- Saskatchewan Prevention Institute Child Passenger Safety Clinic post-clinic telephone survey conducted in 2004 found that clients perceived an increase of knowledge from an average score of 6.03 out of 10 at pre-clinic to 8.58 at post-clinic; with 62% reporting a change in how they installed their child safety seat post-clinic and 43% in how they secured their child.
- Two student-lead client pre-post evaluations in 2006 and 2007 found that Saskatchewan participants reported a high self-perceived knowledge of child passenger safety following their clinic experience, yet actual knowledge remained low for some specific elements such as knowing if the seat was installed sufficiently tight.
- Current client post evaluation found that participants attending for rear-facing seats had higher knowledge of how to install the safety seat and how to secure the child properly than those clients with forward-facing seats; only 60% of clients with rear-facing seats knew when to move a child from rear-facing to forward-facing.

#### 4. Do the demographics of caregivers involved in Saskatchewan interventions match the demographics of the Saskatchewan population? Are there segments of the population being missed?

The Saskatchewan Child Passenger Safety program targets the parents and caregivers of children between the ages of 0 and 4 years.

FNIH is currently partnering with the Saskatchewan Prevention Institute to provide child passenger safety Technician mentoring and updating in First Nations communities. Two child passenger car seats are also provided to each of these Technicians to take back to their communities.

According to the 2006 Census data for Saskatchewan (Statistics Canada, 2007):

- There were approximately 57,500 children between the ages of 0 and 4 years old; and 61,070 children ages 5 to 9 years.
- 94.0% of the population spoke English only in the home, 4.0% French, and 4.9% spoke an “other” language.
- 14.9% of the population were Aboriginal, and 5.0% were immigrants.
- 16.8% of the immigrant population arrived in Saskatchewan after the year 2000.
- 17.1% of residents aged 15 to 54 years had a University education, with a further 14.6% with a College education.
- 16.7% of Census Families were lone-parent families
- The median annual income of all “couple household with children” was \$76,494; and of lone-parent families was \$29,547

From the Child Passenger Clinic Client Survey (Chapter IV), respondents of the survey were:

- Mothers (85.0%); fathers (8.6%); and others including aunt, foster parents and Program Supervisor for clients.
- 94.3% were in married or common-law relationships
- Between 30-39 years of age (53.6%) and 20-29 years (35.7%).
- Caucasian (92.1%) and self-identified Aboriginal (4.3%), with the remainder Asian, Ukrainian or Multiple.

- Recent Immigrants since 2001 accounted for 3.5 percent.
- English was spoken in the home among 97.9% with the remainder speaking German, Hindi and Cree.
- Highly educated, with 79.4% with Apprentice, Trades, College or University
- High income levels, with 75.7% with an annual income of \$60,000 or more.

Table 8.2: Comparison of 2006 Census population in Saskatchewan with the participants of the Child Passenger Safety Clinic Client Survey.

2006 Census	Clinic Client Survey
94.0% English	97.9% English
14.9% Aboriginal	4.3% Aboriginal
5.0% Immigrant	3.5% Immigrant
31.7% High Education	79.4% High Education
16.7% Single Parents	5.7% Single Parents

Comparing the survey demographics with the 2006 Census for Saskatchewan (Table 8.2), it appears that the lower socioeconomic status population, consisting of lower education levels, lower income and single parents, may not be accessing the services of the Child Passenger Safety Clinics to the same degree as their wealthier, more educated married counterparts. Further, although the Aboriginal community makes up 14.9 percent of the population, only four percent of the Child Passenger Safety Clinic Client survey self-identified as Aboriginal. Recent immigrants may also be a vulnerable population with regard to child passenger safety, however the proportion of the Saskatchewan population (5.0%) and of the proportion completing the survey (3.5%) are very similar.



## Key Point Summary

- The Saskatchewan Child Passenger Safety program targets the parents and caregivers of children ages 0-4 years.
- The majority of respondents of the Child Passenger Safety Clinic Client Survey were well-educated with high income; primarily Caucasian with 4% Aboriginal, and 3.5% of the sample were recent immigrants.
- The segments of the population that may be missed by the Child Passenger Safety Program include lower socioeconomic families and Aboriginal families.
- New Immigrant families appear to be availing themselves of this resource, although this needs to be confirmed.

## 5. Is there a match between the caregivers targeted by the Saskatchewan model, and the parents/guardians of the children injured in motor vehicle collisions? If not, what other method (from the international best-practice review) could be used to target these parents/ guardians?

The SGI TAIS data analysis (Chapter VI) revealed that the drivers involved in crashes resulting in child passenger injury or death are predominantly females aged 25 to 44 years; while the drivers of single vehicle crashes causing child passenger injury or death are predominantly younger females. No other demographic or socioeconomic information pertaining to these drivers is available.

Contributing factors to single vehicle crashes causing child passenger injury or death include speed, inattentive driving, and impaired driving. Looking at single vehicle crashes only, female drivers aged 25 to 44 years are predominantly involved in speed-related crashes causing child passenger injury or death. Younger male drivers aged 16 to 34 years and females aged 16 to 44 are predominantly involved in inattentive-related crashes; and young male drivers aged 16 to 24 years are predominantly involved in impaired-related crashes causing child passenger injury or death.

Regarding the roadways where child passengers are injured in conjunction with these three contributing factors, the highest proportion of single vehicle speed-related crashes causing child passenger injury or death occurred on rural roads. The highest proportion of impaired-related crashes causing child passenger injury or death occurred on rural/urban highways; and the highest proportion of inattentive-related crashes causing child passenger injury or death occurred on rural/urban highways.

The Systematic Review of the Literature (Chapter I) did not reveal any specific target populations for child passenger safety programming, nor methods for targeting specific populations, where the particular risk factors revealed in Saskatchewan were specifically associated with child passenger injury and death.

There are several potential methods that can be used for targeting the Child Passenger Safety Program to the parents and guardians of young children in Saskatchewan. To reach new parents, a closer association could be established with hospitals and Public Health units. To reach the Aboriginal or immigrant population, partnering with one or more Aboriginal-serving and Immigrant-serving organizations such as Friendship Centres will support the adaptation of the Child Passenger Safety Program in culturally appropriate and language-specific manners.

For the distribution of discounted or free safety seats to low socioeconomic families, a partnership could be established with an existing aligned NGO, such as the Saskatchewan Abilities Council. This could entail conducting an environmental scan to determine where current loaner programs are operating, and how to combine resources to fill-in the currently disparate coverage in Saskatchewan.

### Key Point Summary

- Drivers involved in motor vehicle crashes where a child passenger is injured are women ages 16-44 years; men 16-44 years.
- No information on other demographics or socioeconomic information is available concerning the parents or guardians of children injured in motor vehicle crashes.
- The systematic review of the literature did not reveal specific methods for targeting segments of the populations at higher risk.
- Potential methods for targeting the Child Passenger Safety Program are: Closer association with hospitals and Public Health units for all new parents; Partner with Aboriginal and Immigrant-serving organizations (e.g. Friendship Centres); Partner with an existing aligned NGO (e.g. SK Abilities Council) for the distribution of child safety seats to lower socioeconomic populations.

## 6. What is the cost-effectiveness of the Saskatchewan model?

### **Are the interventions cost-saving measures? Is there a return on investment of the interventions being used to improve child passenger safety?**

The program costs of the Saskatchewan child passenger safety model include costs to SGI, the Saskatchewan Prevention Institute, and to the Ministry of Health/ABI Partnership. Costs to SGI include staffing costs including program coordination, advertising, materials and supplies, and Insurance Brokers Association of Saskatchewan sponsorship. Program co-ordination is shared between the Saskatchewan Prevention Institute and the Ministry of Health/ABI Partnership, and these costs were taken over by SGI in 2008. Costs to the Ministry of Health/ABI Partnership also include community grants. Total program costs are calculated to be \$231,210 annually.

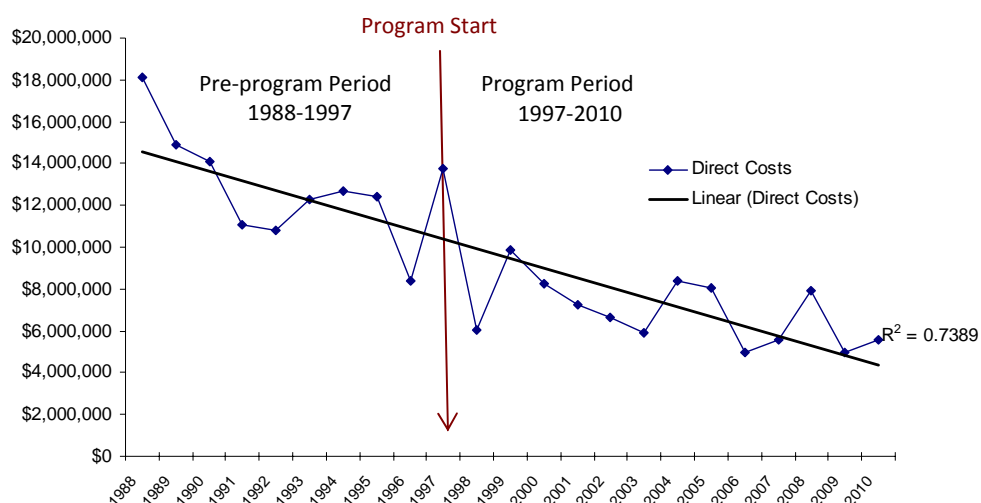
Comparing the 13 years of data during the program period to the previous 10-year pre-program (Table 8.2), there were 17 to 41 fewer deaths (according to TAIS vs. Vital Statistics mortality data), 375 fewer hospitalizations, an estimated 164 fewer emergency room visits, and an estimated 784 fewer ambulance attended child passenger injuries.

Within the pre-program period from 1988 to 1997, total direct costs decreased by a range of \$4.3M to \$8.2M (using the TAIS vs. Vital Statistics mortality data). These amounts average to \$484,000 to \$633,000 of costs avoided per year. Comparatively, during the program period from 1997 to 2010, these total direct costs avoided increased to a range of \$4.6M to \$8.6M, averaging \$508,000 to \$658,000 per year.

Comparing the program period to the pre-program period overall, the total direct costs of medical care for child passenger injury and mortality decreased by \$39.2M when using the TAIS mortality data. This increased to \$45.1M in total direct costs avoided using the Vital Statistics mortality data.

Taking a more conservative approach to calculating the direct costs by excluding estimates for emergency room and ambulance care, costs avoided of \$25.2M (TAIS mortality data) and \$36.0M (Vital Statistics mortality data) are still achieved.

Figure 8.2: Total direct costs, TAIS data 1988 – 2010.



An important consideration in the calculations of this economic burden of child passenger injury is that there are no indirect and intangible costs included, such as the monetary value of a child's life. For adults, one way to estimate the value of a life is to calculate potential income during their lifetime period. For example, for the families of victims of 9/11, compensation to families was primarily based upon likely future earnings and estimating the market price of lost services (Zelizer, 2007). However, in this human capital method of valuation, a child's future earnings are discounted because the child is not currently productive and the value of his or her future earnings has not been established. Conversely, considering the sentimental value of children has led to an increase in the economic value of a lost child. This controversial debate: devaluing a child's life versus profiting from a child's life has left this issue unresolved. Thus, indirect costs are not typically included for children. If indirect costs were included, the cost savings and return on investment would increase significantly.

A true return on investment for the Saskatchewan Child Passenger Safety Program can not be calculated as there are a multitude of other factors that may be contributing to the declining costs in child passenger injury and mortality. These other factors include resources invested in improvements to roads, vehicle improvements, promoting improved driver behaviour, legislation and increased enforcement, improvements to health care, and other programming that may contribute to improving child passenger safety.

Assuming that the Child Passenger Safety program was the major contributing factor in the reduction of child passenger injury and death, the return on investment is in the range of \$12 to \$16 of costs avoided for every dollar invested in prevention. The true return on investment for every dollar invested in the Child Passenger Safety program lies somewhere below this range.

What is known about the effectiveness of child passenger safety initiatives is that the use of restraint systems is the single most effective means of reducing fatal and nonfatal injuries in motor vehicle crashes, and that child safety seat laws are the most effective intervention to increase child safety seat use (Zaza et al., 2001). The Saskatchewan Seat Belt Regulations have required that children less than 18 kilograms be restrained in an appropriate child restraint system at least since 1983 (Govt. of Saskatchewan, 1997).

It is also known that improvements in behaviour become more difficult to achieve the higher the baseline of this behaviour in the population (Shults et al., 2004). The continued downward trend of child passenger injuries and deaths from 1988 to 2010 – more than 20 years after child passenger safety legislation – as well as the continued decrease to total direct costs of child passenger injury, suggests that legislation alone is not responsible for this continued improvement. Further, evidence from the Systematic Review (Chapter 1) supports the need for coupling differing types of interventions, such as legislation and enforcement reinforced with education and/or distribution (Zaza et al. 2001).

An example of this is presented by Ekman et al. (2001), looking at the long-term effects of legislation and local promotion of child restraint use in Sweden. Study communities who implemented an organized safety-promotion program showed greater improvement in child passenger restraint use following the child passenger safety legislation than the rest of Sweden.

Please see Appendix 8.2 for a brief review of the literature regarding the cost-effectiveness of other initiatives that have addressed child passenger safety.

Ultimately, it is not possible to determine if the Child Passenger Safety program is a cost-saving measure, however there is strong evidence supporting its contribution to child passenger safety in Saskatchewan.

## Key Point Summary

- Total Child Passenger Safety program costs are calculated to be \$231,210 annually.
- The program period saw 17 to 41 fewer deaths, 375 fewer hospitalizations, 164 fewer emergency room visits, and 784 fewer ambulance attended child passenger injuries than the pre-program period.
- Total direct costs decreased by a range of \$4.3M to \$8.2M within the pre-program period; and by a range of \$4.6M to \$8.6M during the program period.
- A range of cost reductions from \$25.2M to \$45.1M were calculated for the direct costs for child passenger injury and mortality medical care, comparing the program period to the pre-program period.
- The inclusion of indirect costs of child passenger injury and mortality would see significantly increased savings and return on investment.
- A return on investment ranging from \$12 to \$16 of costs avoided for every \$1 invested in child passenger safety was found, with the caveat that the Child Passenger Safety program is not the only factor involved in increased child passenger safety in Saskatchewan.
- Although it is not possible to determine if the Child Passenger Safety program is a cost-saving measure, there is strong evidence supporting its contribution to child passenger safety in Saskatchewan.

## Recommendations

The Saskatchewan Child Passenger Safety Program is a valuable program with a trained cadre of well over 100 passionate volunteers. Through the Child Passenger Safety Clinics, Technicians work with parents and caregivers of young children, educating them on the importance of child passenger safety and providing practical instruction for the installation of safety seats and their use. This model is also supplemented with limited distribution of free or discounted child safety seats available through community grants and a partnership with FNIH. Overall, child passenger safety seats are being used in Saskatchewan, and are protecting children from motor vehicle crash injuries. An exception to this is the low usage of booster seats among 5 to 9 year olds.

Among those children who are injured in motor vehicle crashes, improper child passenger restraint is decreasing. Some segments of the target demographic warrant focused efforts in order to be reached, and include low socioeconomic families, Aboriginal and Immigrant families.

This program has demonstrated savings in direct medical costs due to reduced numbers of child passenger injuries and deaths, and a return on investment ranging from \$9 to \$15 of costs avoided for every \$1 invested in prevention.

The current Saskatchewan Child Passenger Safety model focuses on technician training, parent and caregiver education with limited car seat distribution through the community grants program as well as through First Nations and Inuit Health.

Recommendations for enhancing child passenger safety promotion through:

### Education

- Use social media to the fullest. Credible information can be disseminated via social media: YouTube channel, Facebook, Twitter and LinkedIn. The Saskatchewan Prevention Institute has accounts with all four of these social media platforms. Current videos posted on YouTube focus on fetal alcohol syndrome and smoking/second hand smoke prevention.  
<http://www.youtube.com/user/PreventionInstitute1>  
<http://www.facebook.com/SaskatchewanPreventionInstitute>  
<http://twitter.com/#!/SkPrevention>  
<http://ca.linkedin.com/pub/communication-department/33/276/594>
- Enlist the support of 'Mommy Bloggers'. Young female drivers were seen to be involved in single vehicle crashes where a child was injured. The influence of Mommy Bloggers should not be underestimated in their ability to influence behaviour among their peers. This is a credible audience for spreading child passenger safety messages and being part of the solution.
- Develop web-based/DVD instructional videos, e.g. Step 1, 2, 3 on how to install a car seat; how to adjust the straps securing your child, etc.
- Increase police education. The Child Safety Link located in the Maritimes has Child Passenger Safety Information and Resources for Enforcement Personnel, such as laminated resource cards detailing the child passenger laws and safety recommendations  
<http://professional.childsafetylink.ca/child-passenger-safety/enforcement>
- Review the upcoming Child Passenger Safety Tool Box for its potential to support or enhance Child Passenger Safety Technician training. Currently in development by Dr. Beth Bruce as part of AUTO 21, this online toolbox will be targeted to professionals working in child passenger safety.

### **Equipment Incentive/Distribution**

- Formalize distribution programs. Limited distribution currently takes place through the use of community grants and work with FNIH. A provincially co-ordinated program targeted at low socioeconomic families, Aboriginal and recent Immigrant families for the distribution of discounted or free child safety seats, should be considered. See Appendix 8.3 for a review of what works for child passenger safety seat distribution is summarized, and resources for developing a distribution program.
- Utilize child seats that will serve the passenger safety needs of the child over several years, e.g. convertible (rear to forward-facing), or combination (forward-facing to booster seats), or 3-in-1 seats.
- Partner with the Saskatchewan Abilities Council, who has an established Special Needs Equipment Loan Program, including retail items. Depots are currently located in Prince Albert, Regina, Saskatoon (central warehouse), Swift Current and Yorkton.  
<http://www.abilitiescouncil.sk.ca/index.cfm>
- Partner with Aboriginal organizations such as Friendship Centres. A full list of Aboriginal organizations in Saskatchewan is available at <http://www.fnmr.gov.sk.ca/community/directory/>.
- Partner with Immigrant organizations providing services to new immigrants to Saskatchewan, e.g.

#### In Regina –

Regina Open Door Society Inc.

<http://rods.sk.ca/index.php?p=Home>

Regina Immigrant Women Centre

<http://www.iwsregina.org/>

#### In Saskatoon –

Global Gathering Place

<http://www.globalgatheringplace.com/>

International Women of Saskatoon

<http://www.internationalwomenofsaskatoon.org/>

Saskatchewan Intercultural Association Inc.

<http://saskintercultural.org/>

Saskatoon Open Door Society

<http://www.sods.sk.ca/>

### Other Locations –

Moose Jaw Multicultural Council

<http://www.mjmcinc.ca/>

YWCA Prince Albert Settlement Services

<http://ywcaprincealbert.ca/ProgramsandServices/RefugeesImmigrantsandNewcomers.aspx>

### **Enforcement / Enactment**

- Increase enforcement and child passenger safety blitzes. Re-establish partnerships with the RCMP and municipal police forces to increase the profile of child passenger safety and the enforcement of child passenger safety seat use.
- Support the enactment of legislation of booster seat use for children ages 5 to 9 years of age. Political lobbying is required to support a provincial politician. Other provinces have typically passed this law with little adversity when backed by a legislative champion.

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## Appendices

## Appendix 8.1

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Policy Statement—Child Passenger Safety

<http://pediatrics.aappublications.org/content/early/2011/03/21/peds.2011-0213>

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**Policy Statement—Child Passenger Safety**  
COMMITTEE ON INJURY, VIOLENCE, AND POISON PREVENTION  
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# Policy Statement—Child Passenger Safety

## abstract

FREE

Child passenger safety has dramatically evolved over the past decade; however, motor vehicle crashes continue to be the leading cause of death of children 4 years and older. This policy statement provides 4 evidence-based recommendations for best practices in the choice of a child restraint system to optimize safety in passenger vehicles for children from birth through adolescence: (1) rear-facing car safety seats for most infants up to 2 years of age; (2) forward-facing car safety seats for most children through 4 years of age; (3) belt-positioning booster seats for most children through 8 years of age; and (4) lap-and-shoulder seat belts for all who have outgrown booster seats. In addition, a fifth evidence-based recommendation is for all children younger than 13 years to ride in the rear seats of vehicles. It is important to note that every transition is associated with some decrease in protection; therefore, parents should be encouraged to delay these transitions for as long as possible. These recommendations are presented in the form of an algorithm that is intended to facilitate implementation of the recommendations by pediatricians to their patients and families and should cover most situations that pediatricians will encounter in practice. The American Academy of Pediatrics urges all pediatricians to know and promote these recommendations as part of child passenger safety anticipatory guidance at every health-supervision visit. *Pediatrics* 2011;127:788–793

Improved vehicle crashworthiness and greater use of child restraint systems have significantly affected the safety of children in automobiles. Major shifts in child restraint use, particularly the use of booster seats among older children, have occurred in response to public education programs and enhancements to child restraint laws in nearly every state.<sup>1–3</sup> In addition, there has been a substantial increase in scientific evidence on which to base recommendations for best practices in child passenger safety. Current estimates of child restraint effectiveness indicate that child safety seats reduce the risk of injury by 71% to 82%<sup>4,5</sup> and reduce the risk of death by 28% when compared with those for children of similar ages in seat belts.<sup>6</sup> Booster seats reduce the risk of nonfatal injury among 4- to 8-year-olds by 45% compared with seat belts.<sup>7</sup> Despite this progress, approximately 1500 children younger than 16 years die in motor vehicle crashes each year in the United States, nearly half of whom were completely unrestrained.<sup>8</sup>

The American Academy of Pediatrics (AAP) strongly supports optimal safety for children and adolescents of all ages during all forms of travel.

COMMITTEE ON INJURY, VIOLENCE, AND POISON PREVENTION

### KEY WORDS

child passenger safety, motor vehicle crash, child restraint system

### ABBREVIATIONS

AAP—American Academy of Pediatrics

CSS—car safety seat

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This policy statement provides 5 evidence-based recommendations for best practices to optimize safety in pas-

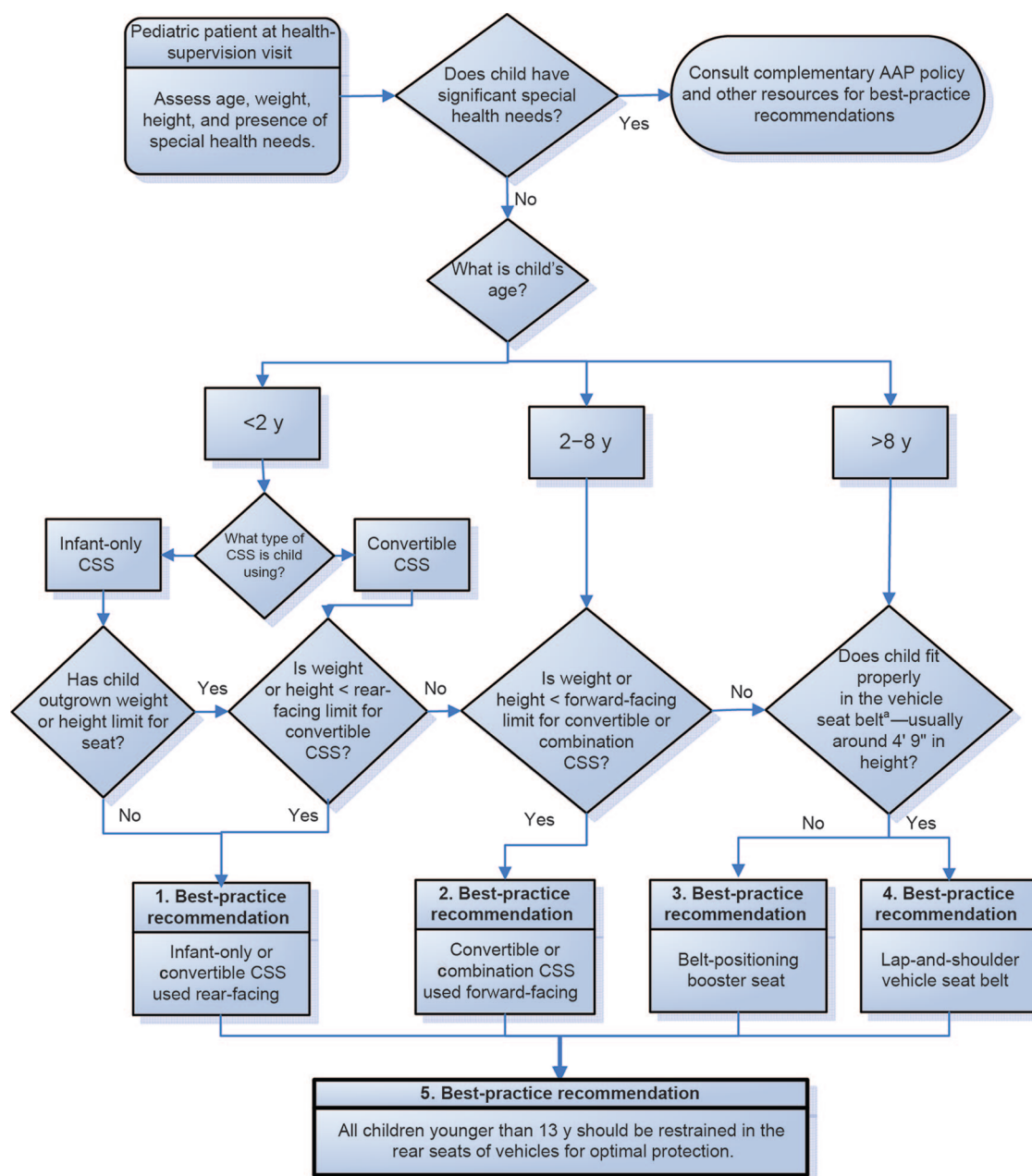
senger vehicles for all children, from birth through adolescence (a summary of recommendations is listed in Table 1):

1. All infants and toddlers should ride in a rear-facing car safety seat (CSS) until they are 2 years of age

**TABLE 1** Summary of Best-Practice Recommendations

Best-Practice Recommendation	Complementary Information
<div> <b>1. Best-practice recommendation</b>            Infant-only or convertible CSS used rear-facing         </div> <p>All infants and toddlers should ride in a rear-facing car safety seat (CSS) until they are 2 y of age or until they reach the highest weight or height allowed by the manufacturer of their CSS.</p>	<p>Infant-only seats usually have a handle for carrying and can be snapped in and out of a base that is installed in the vehicle. They can only be used rear-facing. Convertible CSSs can be used either forward- or rear-facing and typically have higher rear-facing weight and height limits than infant-only seats.</p> <p>When children using infant-only seats reach the highest weight for their seat, they should continue to ride rear-facing in a convertible seat for as long as possible. Most currently available convertible seats can be used rear-facing to at least 35 lb.</p> <p>Combination CSSs are seats that can be used forward-facing with a harness system and then, when the child exceeds the height or weight limit for the harness, as a booster seat with the harness removed.</p>
<div> <b>2. Best-practice recommendation</b>            Convertible or combination CSS used forward-facing         </div> <p>All children 2 y or older, or those younger than 2 y who have outgrown the rear-facing weight or height limit for their CSS, should use a forward-facing CSS with a harness for as long as possible, up to the highest weight or height allowed by the manufacturer of their CSS.</p>	<p>Several models of convertible and combination CSSs can accommodate children up to 65 or 80 lb when used forward-facing. The lowest maximum weight limit for currently available forward-facing CSSs is 40 lb.</p>
<div> <b>3. Best-practice recommendation</b>            Belt-positioning booster seat         </div> <p>All children whose weight or height is above the forward-facing limit for their CSS should use a belt-positioning booster seat until the vehicle lap-and-shoulder seat belt fits properly, typically when they have reached 4 feet 9 inches in height and are between 8 and 12 y of age.</p>	<p>There is a safety advantage for young children to remain in CSSs with a harness for as long as possible before transitioning to booster seats.</p>
<div> <b>4. Best-practice recommendation</b>            Lap-and-shoulder vehicle seat belt         </div> <p>When children are old enough and large enough to use the vehicle seat belt alone, they should always use lap-and-shoulder seat belts for optimal protection.</p>	<p>Booster seats function by positioning the child so that both the lap and shoulder portions of the vehicle seat belt fit properly; the lap portion of the belt should fit low across the hips and pelvis, and the shoulder portion should fit across the middle of the shoulder and chest. They come in both high-back (a seat back that extends up beyond the child's head) and backless models.</p> <p>The lap portion of the belt should fit low across the hips and pelvis, and the shoulder portion should fit across the middle of the shoulder and chest when the child sits with his or her back against the vehicle seat back. If they do not, then the child is likely too small to use the vehicle seat belt alone and should continue to use a belt-positioning booster seat.</p>
<div> <b>5. Best-practice recommendation</b>            All children younger than 13 y should be restrained in the rear seats of vehicles for optimal protection.         </div> <p>All children younger than 13 y should be restrained in the rear seats of vehicles for optimal protection.</p>	<p>CSSs should be installed tightly either with the vehicle seat belt or with the LATCH system, if available. LATCH is a system of attaching a CSS to the vehicle that does not use the seat belt. It was designed to ease installation of the CSS. Whether parents use LATCH or the seat belt, they should always ensure a tight installation of the CSS into the vehicle.</p>

LATCH indicates lower anchors and tethers for children.



**FIGURE 1**

Algorithm to guide the implementation of best-practice recommendations for optimal child passenger safety (see Table 1 for a summary of recommendations and Table 2 for definitions and explanations).

- or until they reach the highest weight or height allowed by the manufacturer of their CSS.
2. All children 2 years or older, or those younger than 2 years who have outgrown the rear-facing weight or height limit for their CSS, should use a forward-facing CSS with a harness for as long as possible, up to the highest weight or height allowed by the manufacturer of their CSS.
3. All children whose weight or height is above the forward-facing limit for their CSS should use a belt-positioning booster seat until the vehicle lap-and-shoulder seat belt fits properly, typically when they have reached 4 feet 9 inches in height and are between 8 and 12 years of age.
4. When children are old enough and large enough to use the vehicle seat belt alone, they should always use lap-and-shoulder seat belts for optimal protection.
5. All children younger than 13 years should be restrained in the rear

**TABLE 2** Explanations of Decision Points and Additional Resources

	<p>Children with certain temporary or permanent physical and behavioral conditions such as altered muscle tone, decreased neurologic control, skeletal abnormalities, or airway compromise may preclude the use of regular CSSs and may require the use of regular CSSs may require specialized restraint systems.</p>
	<p>The AAP has issued a policy statement that provides specific guidance on best-practice recommendations for children with special health care needs (<a href="http://www.pediatrics.org/cgi/content/full/pediatrics%3B104/4/988">www.pediatrics.org/cgi/content/full/pediatrics%3B104/4/988</a>). To locate a child passenger safety technician in your area with special training in special health needs, go to <a href="http://cert.safekids.org">http://cert.safekids.org</a>.</p>
	<p>Infants younger than 2 y have relatively large heads and several structural features of their neck and spine that place them at particularly high risk of head and spine injuries in motor vehicle crashes. Rear-facing CSSs provide optimal support to the head and spine in the event of a crash, and evidence indicates that this benefit extends to children up to 2 y of age or longer.</p> <p>Children who are 2 y of age or older and small for age may need to be evaluated like children younger than 2 y. Consult a child passenger safety technician with enhanced training in special needs or other resources for assistance.</p>
	<p>The AAP annually updates information on child restraint systems currently available in the United States (<a href="http://aap.org/family/carseatguide.htm">http://aap.org/family/carseatguide.htm</a>). More recent products have higher weight limits and should be used when possible. In general, children should remain in a child restraint system until they outgrow the weight or height limits for its intended use.</p> <p>Most children 2 to 8 y of age are not large enough to fit properly in the vehicle seat belt and will require a CSS or booster seat for optimal restraint. A belt-positioning booster seat positions a child so that the lap and shoulder portions of the seat belt fit properly: the lap portion low across the hips and pelvis and the shoulder portion across the middle of the shoulder and chest.</p> <p>Most children shorter than 4 feet 9 inches in height will not fit properly in vehicle lap-and-shoulder seat belts.</p> <p>These 3 questions are an evaluation to determine whether a child is ready to be restrained by the vehicle seat belt without a booster seat. If the answer is “no” to any of these questions, the child should use a booster seat:</p> <ul style="list-style-type: none"> <li>Is the child tall enough to sit against the vehicle seat back with his or her knees bent at the edge of the vehicle seat without slouching and stay in this position comfortably throughout the trip?</li> <li>Does the shoulder belt lie across the middle of the chest and shoulder, not against the neck or face?</li> <li>Is the lap belt low and snug across the upper thighs, not the abdomen?</li> </ul>

seats of vehicles for optimal protection.

It should be noted that the recommendation that all children younger than 2 years be restrained in an infant-only or convertible CSS used rear-facing represents a significant change from previous AAP policy and is based on new data from the United States<sup>9</sup> as well as extensive experi-

ence in Sweden.<sup>10,11</sup> It is important to note that most currently available CSSs have weight limits for rear-facing use that can accommodate the new recommendations.<sup>12</sup>

Certain considerations contained in this policy statement are relevant to commercial airline travel as well and are noted in the accompanying technical report.<sup>13</sup> Other AAP policy statements pro-

vide specific recommendations to optimize safety for preterm and low birth weight infants,<sup>14</sup> children in school buses,<sup>15</sup> and children using other forms of travel and recreational vehicles.<sup>16–18</sup> In addition, complementary AAP policy statements provide recommendations for teenaged drivers<sup>19</sup> and the safe transport of newborn infants<sup>20</sup> and children with special health care needs.<sup>21,22</sup>



Pediatricians play a critical role in promoting child passenger safety. To facilitate their widespread implementation in practice, evidence-based recommendations for optimal protection of children of all ages in passenger vehicles are presented in the form of an algorithm (Fig 1) with an accompanying table of explanations and definitions (Table 2). A summary of the evidence in support of these recommendations is provided in the accompanying technical report.<sup>13</sup> Because pediatricians are a trusted source of information to parents, every pediatrician must maintain a basic level of knowledge of these best-practice recommendations and promote and document them at every health-supervision visit. Prevention of motor vehicle crash injury is unique in health-supervision topics, because it is the only topic recommended at every health-supervision visit by *Bright Futures*.<sup>23</sup> Pediatricians can also use this information to promote child passenger safety public education, legislation, and regulation at local, state, and national levels through a variety of advocacy activities, including ensuring that their state's child passenger safety law is in better alignment with

the best-practice recommendations promoted in this policy statement.

Because motor vehicle safety for children is multifaceted and will continue to evolve, all pediatricians should familiarize themselves with additional resources to address unique situations for their patients that may not be covered by the algorithm and to maintain current knowledge. In particular, many communities have child passenger safety technicians who have completed a standardized National Highway Traffic Safety Administration (NHTSA) course and who can provide hands-on advice and guidance to families. In most communities, child passenger safety technicians work at formal inspection stations; a list of these stations is available at [www.seat-check.org](http://www.seat-check.org). If your community does not have an inspection station, you can find a child passenger safety technician in your area on the National Child Passenger Safety Certification Web site (<http://cert.safekids.org>) or the NHTSA child safety seat inspection station locator ([www.nhtsa.dot.gov/cps/cpsfitting/index.cfm](http://www.nhtsa.dot.gov/cps/cpsfitting/index.cfm)). Car seat checkup events are updated at [www.safekidsweb.org/events/events.asp](http://www.safekidsweb.org/events/events.asp). In addition, additional resources for pediatricians and families can be found at

[www.aap.org](http://www.aap.org) or [www.healthychildren.org](http://www.healthychildren.org).

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## Appendix 8.2

### Review of the literature pertaining to the cost-effectiveness of child passenger safety systems

There are no recent Canadian data on the costs of unintentional child injury, but a recent evaluation in the United States (US) has shown that the medical costs and losses in productivity as a result of all injuries among 0 to 14 year olds are in the range of \$50 billion (Doll, 2007). A survey conducted in the late 1990s on the costs of childhood unintentional injuries and the cost-effectiveness of interventions to prevent them showed that approximately 15 percent of medical spending resulted from an injury (Doll, 2007). The same study found that seven child injury safety measures including child safety seats had similar cost-effectiveness ratios to other well accepted strategies to prevent childhood illness. The implementation of this strategy with regards to booster seat legislation is not yet widespread in Canada.

According to the evidence, booster seat use and booster seat laws for children aged 4 to 7 years has a cost avoidance of \$1,845 per seat, a return investment of 9.4:1 for booster seat use (Table 8.2.1), while further evidence demonstrates that booster seat laws offer a return investment of 8.6 to 1 (Miller, Zaloshnja & Hendrie, 2006). In addition, Zaloshnja et al. (2007) found that child safety seats were more effective than lap-shoulder belts in preventing injury and death among children. Further, a cost-effective analysis by Goldstein et al. (2008) on a child restraint system disbursement/education program in 15 states in the US found that the program could reduce medical costs by \$1 million, parental work loss by \$94,000, and future productivity costs by \$2.7 million annually. The cost-effectiveness of the program was reportedly similar to the federal vaccines for children program (Goldstein et al., 2008). Importantly, this study finds Medicaid reimbursement for disbursement and education to be a cost-effective means of reducing injuries and considers such efforts an

important potential strategy for addressing injury disparities among low-income children.

While interventions can aid in the prevention of injuries, they also need to be cost-effective since resources are limited (Gyllensvärd, 2010). Available evidence strongly indicates that cost-effective strategies for the prevention of child occupant injury can save not only lives but direct health care costs as well (Table 8.2.1).

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Table 8.2.1: Summary evidence re the cost-effectiveness of child safety seats related interventions.

Author/ design	Population/ Study Time Period	Intervention/ Comparison	Analysis/Outcome	Reported Findings	Summary
Lindqvist & Lindholm (2001)	Motala, Sweden 1983-1989 Pre-intervention: October 1, 1983 – September 30, 1984 Post intervention: January 1, 1989 – December 31, 1989	Intervention: Safe Communities approach focussed on two risk populations (Children/ teenagers and elderly) and three risk environments (traffic safety, sports/ recreation and workplace). Formed self regulatory local action groups containing a facilitator and representatives from local organizations that managed injuries. Both passive and active interventions were introduced.  Comparison: Mjölby in Östergötland.	Cost-benefit analysis  Information about the place of injury, course of events, type and severity of injury and patients suggestions about possible preventive measures were inquired from all patients contacting health care units in the area. Also hospital discharge data from all hospitals were collected.	13% decrease in injured people in experiment group while a 2% increase of injured people in control group.  20 million decrease in injury cost. Intervention cost-effective.	Intervention is cost-effective
Miller, Zaloshnja & Hendrie (2006)	USA- Children age 4-7 years olds in USA	Cost-outcome analyses of booster seat use and of booster seat laws for children aged 4 to 7 years.	Net cost per quality adjusted life year saved, benefit cost ratio and net savings per seat. Seat cost of booster seats were estimated using Web and retailer data in USA. Costs of passing and enforcing a legal mandate were estimated as a percentage of the costs of seat use in	Booster seat use & booster seat laws for children 4-7 years has a cost avoidance of \$1,845 per seat, a return investment of 9.4 to 1 for booster seat use while further evidence shows that booster seat use laws offer a return investment of 8.6 to 1.	Both use of booster seats and booster seat laws are cost effective
Zaloshnja, Miller & Hendrie, (2007)	Toddlers who were sitting in rear vehicle seats based on US data on a nationally representative sample. 1998 – 2004	Intervention: Child safety seat Comparison: seat belt	Presence of any injury after a crash.	The adjusted odds of injury were 81.8% lower for toddlers in child seats than belted toddlers.	Intervention is cost-effective
Goldstein, Winston, Kallan, Branas & Schwartz (2008)	New York, New jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, North Carolina, District of Columbia, Ohio, Michigan, Indiana, Illinois, California, Nevada, Arizona 1999-2003	Intervention: universal Medicaid-based disbursement and education program. Comparison: Vaccines for children programme.	Cost-effective analysis  Cost per life saved, death, serious injury and minor injury averted, medical parental work loss and future productivity loss costs averted.	The program could have a cost avoidance of over \$1 million per 100,000 children.  Data similar to published vaccination cost-effectiveness data.	Intervention is cost-effective

## Appendix 8.3

### Review of what works for child passenger safety seat distribution

The US National Highway Traffic Safety Administration (NHTSA) has engaged in programming to increase the use of child passenger safety seats in order to reduce the burden of child passenger injury and mortality. The National Child Safety Seat Distribution Program provided seats to low income families and to children with special needs. Seats were disseminated via non-profit organizations. An evaluation of this program produced the following results (NHTSA, 1999):

- Over half of the distribution sites were medical-related.
- Less than half of sites had staff trained in child passenger safety before engaging in distribution.
- 80% of sites had staff trained in child passenger safety once seats were available for distribution.
- 95% of sites assessed needs of recipients prior to providing a seat.
- 91% of sites trained recipients in seat use.
- Distribution at medical-related sites (hospitals, Public Health) were found to be most likely to have trained staff and child passenger programming in place; and were most likely to have contact with qualified recipients.
- Distribution at non-medical sites was successful if they were able to identify low income families, committed to staff training, and provided recipient training.

#### Reference

National Highway Traffic Safety Administration (NHTSA) (1999). Child Safety Seat Distribution: What Works? *Ann Emerg Med* September 34:403-404.

#### Child Safety Link Car Seat Distribution Program

As part of the support for changes to car seat and booster seat regulations, Child Safety Link received a one-time allocation of funds from the Nova Scotia Department of Health and Wellness to provide car seats to people who needed them.

A survey of Family Resource Centres was conducted to determine if there was a need for child safety seat distribution, and if these resource centers would be willing to partner with Child Safety Link. An advertisement to family resource centres, a grant application form and a program guide were developed in total \$800 grants were provided to each centre that applied.

The target audience for the seats is defined in the program manual.

Costs incurred for this car seat distribution in addition to the grants provided included:

- Staff time to conduct the survey; produce and distribute electronic documents; receive, review and process applications; produce a legal agreement for signatures by resource centers; answer questions from resource centers; support from the accounting department to distribute cheques; and compiling the summary reports when the program wraps up.
- The cost of print materials and the “Kids that Click” DVDs (Safe Kids Canada <http://www.safekidscanada.ca/OrderCentre/tabid/157/CategoryID/14/List/1/Level/a/productid/8/Language/en-CA/Default.aspx>) to go to each recipient of a car seat.

(Personal communication, Kim Mundle, Car Seat Safety Specialist, Child Safety Link, IWK Health Centre)

The Car Seat Grants Program Guide and manual are available at

<http://professional.childsafetylink.ca/child-passenger-safety/grants>

### **Ride Safe Child Passenger Safety Program**

The Ride Safe Child Passenger Safety Program, developed by the , US Department of Health and Human Services, Indian Health Service, aims to increase the use of child passenger safety seats within the Indigenous population of the US. This program for Tribal Communities targets the families of children aged 3 to 5 years attending Head Start programs. It includes child passenger safety training for Head Start staff, child passenger education for parents and caregivers, distribution of child safety seats, home visits to reinforce education and child seat use, data collection and the promotion of community awareness around reducing the burden of child passenger injury by using safety seats.

The full Ride Safe Program Manual is available at <http://www.ihs.gov/MedicalPrograms/InjuryPrevention/index.cfm?module=toolbox&option=ride>