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## **Research Report**

# **Review on Child Restraint Legislation Practices around the World**



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**M.I.R.O.S**

MALAYSIAN INSTITUTE OF ROAD SAFETY RESEARCH

ASEAN ROAD SAFETY CENTRE

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## Abstract

Child restraint system (CRS) is essential to protect infants and young children from injury in road crash. It has been proven that a correctly installed child safety seats can reduce the risk of fatality by 70% and 54% for infants and young children at the age of 1 – 4 years old. In 2013, the World Health Organization reported that 96 countries have enacted child restraint law. Unfortunately, there are only three out of 11 countries in South East Asia region that have implemented such a law. Despite implementing frontal and rear seatbelt laws, Malaysia is still yet to establish its child restraint law.

Low usage on CRS on passenger vehicle can be one of the major contributing factors to the high fatality rate. The usage of CRS is very low where it was reported that only 9.5% out of observed 537 children were using CRS in Kajang, Malaysia. To increase the usage ratio of CRS among Malaysians, it is essential to establish child restraint law to make it mandatory for all children to be restrained on CRS while they are travelling on motor vehicle. Prior adopting any established child restraint law from other countries, it is wise to conduct a thorough and holistic review of these child restraint laws to ensure that the suggested legal framework can be applied with effective and efficient outcomes. The objective of this study is to determine the specification, usage criterion and exemption criterion of CRS in the new legal framework. This study also intended to provide an insight into the effective execution of the child restraint law through studying the practices from success stories of other countries.

The CRS usage criterion includes age, weight and height of children required in using an appropriate CRS, type of vehicle and situations exempted from using CRS. Among all, the legal system regarding CRS in Europe countries, United States, Australia, New Zealand and Japan are selected in this discussion section. The child restraint specification, criteria of CRS usage and the exemption criteria of these countries are highlighted and presented.

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CRS safety standard is developed to outline the requirement of crash criteria and design specifications of CRS. United Nations (UN) standard ECE Regulation No. 44 and No. 129 are well-known safety standards for CRS. More than 50 countries worldwide including all European Union countries, Japan, the Russian Federation and South Africa have transposed and adopted this safety standard into their national legislation since 2013. According to this safety standard, CRS is designed to diminish the risk to injury to the wearer, in the event of a collision or of abrupt deceleration of the vehicle, by limiting the mobility of the wearer's body. A similar definition of CRS was also found in the Australian standard. Dynamic loading test in the frontal, side and rear impact are required before a CRS can obtain approval under this safety standard. All manufactured CRS must be conformed to the safety standard in European Union countries and Australia. Thus, Malaysian authority needs to implement stringent condition on the safety level of CRS in accordance to the well-established safety standard from the European Union.

Introduction of UN ECE R129 also intended to reduce installation option of CRS to ISOFIX only which can lower the risk of the CRS being incorrectly fitted in the car. It was reported that the misuse issue was identified among 80% of examined CRS usage in Israel and Australia. Incorrect and inappropriate installation of CRS may reduce or nullify the safety benefits of CRS. ISOFIX and similar system such as LATCH (Lower Anchors and Tethers for Children) used in the United States are designed to reduce serious installation errors in using vehicle seatbelts to secure CRS. From this perspective, Malaysian authority must be aware of the issue of misuse or inappropriate installation of CRS after the implementation of child restraint law. Besides providing constructive information related to correct used of CRS, the authority should also promote the usage of ISOFIX installation method and progressively fully implement the requirement as prescribed in UN ECE R129.

In regards to usage criterion of CRS in child restraint law, the combination of age, height and weight has been chosen as the criterion in the law system of reviewed countries. Weight and height have always been related to the main criterion to be used while choosing the right CRS. Nonetheless, surveys of CRS usage in various countries have shown that many parents are lacking knowledge in selecting correct CRS for their children. Instead, using the age of child may be a more preferable way in advocacy and regulation because parents always know their child's age. It can help to reduce the error

rate in installation of CRS in motor vehicles. In term of exemption criteria, most countries considered the limitation of some situation and have allowed some exception for not using CRS.

To ensure the effective implementation of child restraint law, it is essential to be conducted along with advocacy and appropriate education to the public for the optimum result to be seen. It is very important to convey the correct message to the public regarding the importance of using CRS and also how to install a CRS correctly. It is to minimize the issue of misuse and inappropriate installation of CRS. In the effort in promoting the usage of CRS, the related authority shall take strict and effective enforcement in ensuring the compliance of the enacted child restraint law by the public to avoid failure in executing the child restraint law nationwide by the public.



## 1. Introduction

A Child Restraint System (CRS) is essential to protect infants and young children from injury in the wake of a car crash. It has been proven that a correctly installed child safety seat can reduce the risk of fatality by 70% and 54% for infants and young children at the age of 1 – 4, according to reports from the National Highway Transport Administration (1997). Realizing the importance of child restraint system in reducing injury severity in children, some countries have implemented national child restraint laws to mandate the use of child safety seat. In 2013, the World Health Organization (WHO) (2013) reported that 96 countries have enacted child restraint laws. Unfortunately, only three out of 11 countries in the South-East Asia region have implemented such a law. Despite having implemented the frontal and rear seatbelt laws, Malaysia is still to establish its child restraint regulation.

Road traffic injury involving children is a major concern in Malaysia. From 2007 to 2009, 1232 children (less than 14 years) were killed in traffic accidents as indicated in a MIROS report (Mohamed, Voon, Hashim, & Othman, 2011). In the same report, it was stated that child fatalities in road crashes accounted for 15.5% of the total road fatalities in the year of 2009, where most of these fatal crashes involved children travelling in passenger vehicles.

Low usage of CRS in passenger vehicles may be one of the contributing factors to the high fatality rate. The usage of CRS is very low where it was observed that only 9.5% out of 537 children were using CRS in Kajang, Malaysia (Ariffin, Soid, Borhan, & Sukardi, 2014). Thus, the current situation calls for mandatory legislation on the usage of CRS for children travelling on land transport vehicles to be introduced. Such a move will also boost the usage of this safety device in Malaysia. Although it is more time-efficient to adopt a well-established child restraint regulation from other countries, a thorough and holistic review of such laws is necessary to ensure that the suggested legal framework can be applied in Malaysia with effective and efficient outcomes.

## 1.1 Objectives

The main objective of this study is to determine the legal framework for implementing a child restraint law in Malaysia. The specific objectives of this study are as follows:

- i. To determine the definition of child restraint in a legislative context
- ii. To determine the implementation criterion of a child restraint law in Malaysia
- iii. To determine the exclusion criterion in using child restraint in Malaysia

## 2. Research Methodology

As stated in the previous section, to date, 96 countries have enacted national child restraint laws to mandate the use of CRS when ferrying a child in a vehicle. Among the 96 countries with child restraint laws, 17 countries are classified as 'good' in implementing the law as reported by WHO. They include Canada, Finland and France. The implementation framework of these 17 countries was set as the main reference to compare with the framework in other countries. In addition, countries with well-established CRS specifications and legislation including Australia, Japan and the United States were taken as the main reference when determining the legal framework for Malaysia. This research project perused all of the restraint laws accessible from the internet or library. Child restraints laws that could not be retrieved were excluded from the study. Collected legal documents of the child restraints law were studied thoroughly to identify the implementation and exclusion criteria of child restraint usage. These criteria included but were not limited to the following scopes:

- i. Type of vehicle
- ii. Type of child restraint system
- iii. Child restraint system specification
- iv. Age/height/weight of children required to use child restraint
- v. Exemption

Based on the identified criteria, the implementation status of each country with child restraint law was summarized and evaluated which could act as a benchmark for establishing a child restraint law in Malaysia.

### 3. Results and Discussion

From the 96 countries with child restraint laws being enacted, the child restraint laws in 70 countries were found available on the official website of the respective countries. Nonetheless, this study did not intend to present all of the child restraint laws. Instead, the laws of selected countries shall be discussed thoroughly in this section; most notably, the legal system regarding CRS in European countries, the United States, Australia, New Zealand and Japan. These selected countries were well-established in terms of their safety standards and legal system regarding child restraint. The child restraint specifications, criteria of CRS usage and the exemption criteria in these countries shall be highlighted and presented here.

#### 3.1 Child Restraint Safety Standard

CRS safety standard is developed to outline the requirements of crash criteria and CRS design specifications. These safety standards are normally included in the law to ensure the compliance of CRS manufacturers in accordance to the required specifications. The United Nations standard ECE Regulation No. 44 and No. 129 are well-known safety standards for CRS. More than 50 countries worldwide including all European Union countries, Japan, Russia and South Africa have transposed and adopted this safety standard into their national legislation since 2013 (UNECE, 2015).

A Child Restraint System (CRS) is defined as “an arrangement of components which may comprise the combination of straps or flexible components with a securing buckle, adjusting devices, attachments and in some cases a supplementary chair and/or an impact shield, capable of being anchored to a power-driven vehicle. It is so designed as to diminish the risk to injury to the wearer, in the event of a collision or of abrupt deceleration of the vehicle, by limiting the mobility of the wearer’s body” in accordance to UN ECE R44/03 (United Nations, 2014). The specific components of CRS are described

in detail in the definition. Similar to the definition of CRS as defined in UN ECE R44/03 is the definition of CRS in Australia/New Zealand Standard which reads; Child Restraint System for use in motor vehicles (AS/NZS 1754:2013) has emphasized the function of CRS in minimizing or reducing the risk of injury to the restraint children in the event of vehicle impact (Australian Standard, 2013). Nonetheless, the definition used in Japan and United States safety standards is simpler and less detailed where CRS is defined as a device designed for use in a motor vehicle to restraint or position children weighing 30 kg or less. These definitions are good references to be included in the Malaysian Safety Standard for CRS.

To meet the safety requirements of UN ECE R44/03, the fully assembled CRS must undergo corrosion test, overturning test and dynamic test. Tests for the individual components are also specified in the safety standard where buckle, adjusting device, retractor, straps, lock off devices and ISOFIX attachment are put through dedicated testing. For the dynamic loading test, all CRS are required to perform frontal and rear impact test at the speed of 50 km/h and 30 km/h, respectively. The side impact test is not a requirement in UN ECE R44/03. The test is included in European Union safety standard when UN ECE R129 was introduced where the required impact speed is 24 km/h. The dynamic loading test in frontal, rear and side direction is also the requirement of Australian standard, AS/NZS 1754:2013. However, the requirement of Japan and United States safety standards is less stringent and the frontal impact test is the only required test in the dynamic loading test. To ensure the performance of CRS is optimum in all frontal, side and rear impact directions, the adoption of safety standard in Malaysia shall refer to the European Union or Australia safety standard.

Introduction of UN ECE R129 was also intended to reduce installation option of CRS to only ISOFIX which can lower the risk of the CRS being incorrectly fitted in the car. ISOFIX is a system to connect CRS to vehicles with two anchorages in the vehicle and two corresponding attachments on the CRS. These low anchorages are meant to limit the pitch rotation of CRS in the event of a vehicle crash. Using vehicle seatbelts as an option to install the CRS on vehicle seat may result in misuse and inappropriate installation of CRS. In a study in Israel, it was reported that misuse was identified among 80% of examined CRS usage (Levi, Hamenachem, Gilad, & Klein, 2013). This problem was also found in Australia where 79% of the inspected CRS had at least one misuse or

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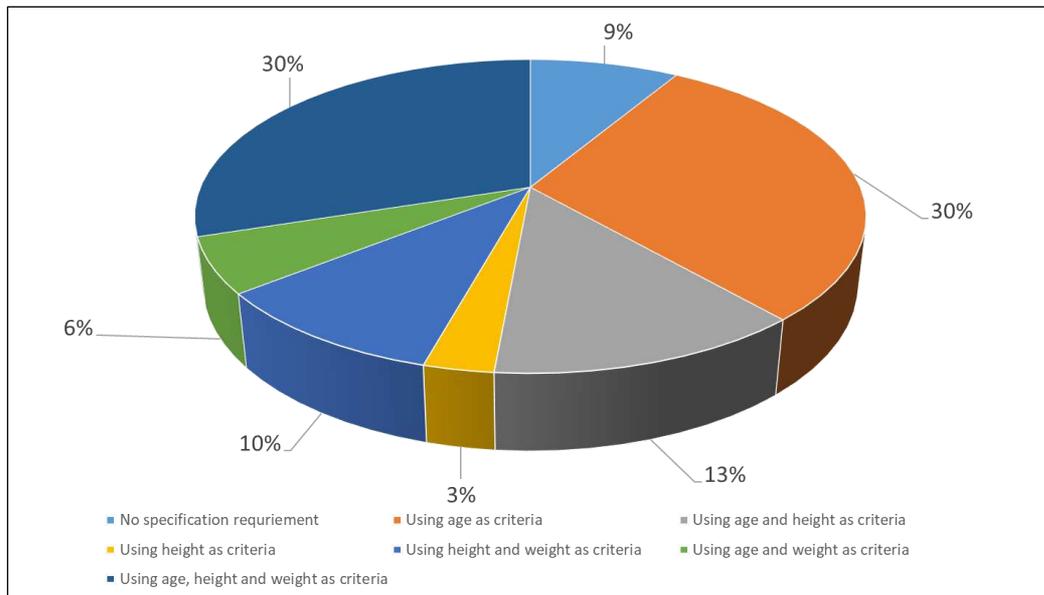
inappropriate use issue (Koppel, Charlton, & Rudin-Brown, 2013). Incorrect and inappropriate installation of CRS may reduce or nullify the safety benefits of CRS (Paine & Vertsonis, 2001). After the implementation of child restraint law, the use rate of CRS in Australia exceeded 99% (Brown, Hatfield, Du, Finch, & Bilston, 2010) but the misuse of CRS reduced the effectiveness of this mandatory legislation. Numerous studies have attempted to evaluate the impact of CRS legislation in Japan on motor vehicle occupant fatalities and injuries. Iwase (2003) studied the impact between the period of Jan 1991 to Dec 2002, approximately 32 months after the implementation of the child restraint law. However, the results produced no statistically significant evidence in the reduction of child casualties in motor vehicle accidents. The author highlighted issues including incorrect use of CRS, no strict requirements and penalties as the factors associated with the ineffectiveness of CRS legislation.

ISOFIX and similar systems such as LATCH (Lower Anchors and Tethers for Children) used in the United States are designed to reduce serious installation errors while using vehicle seatbelts to secure CRS. The implementation of UN ECE R129 was aimed to promote the concept of universal compatibility between vehicle and CRS where the installation method of all CRS, in compliance with UN ECE R129, was the same. The secretariat of UNECE has decided to progressively replace the old CRS with the new CRS which shall comply with UN ECE R129 in the near future (UNECE, 2015). In Australia, the authority has required all vehicle manufacturers to include ISOFIX low anchorages and corresponding top tether in new vehicle models from 1 November 2013. In other words, the trend in CRS installation is moving toward the type of attachment; which is independent of vehicle seatbelt and universal to all types of vehicles. Thus, the implementation of ISOFIX-compatible CRS has to be included in the new legislative framework of Malaysia's child restraint law.

### 3.2 Child Restraint Usage Criterion

In the child restraint law, criterions including age, height and weight are commonly used to determine the persons who must use CRS. Nonetheless, some countries have never introduced any specific criterion when implementing compulsory usage of CRS. The distribution of usage according to these criterions is shown in Figure 1. From the

collected data, one-third of the countries used all three of the criteria for CRS usage. On the other hand, another one third of the countries specified age as the only criterion. Further, 10% of the countries did not specify any criterion in their child restraint law, despite mandating the use of CRS.



**Figure 1** Child restraint usage criterion for the studied CRS law

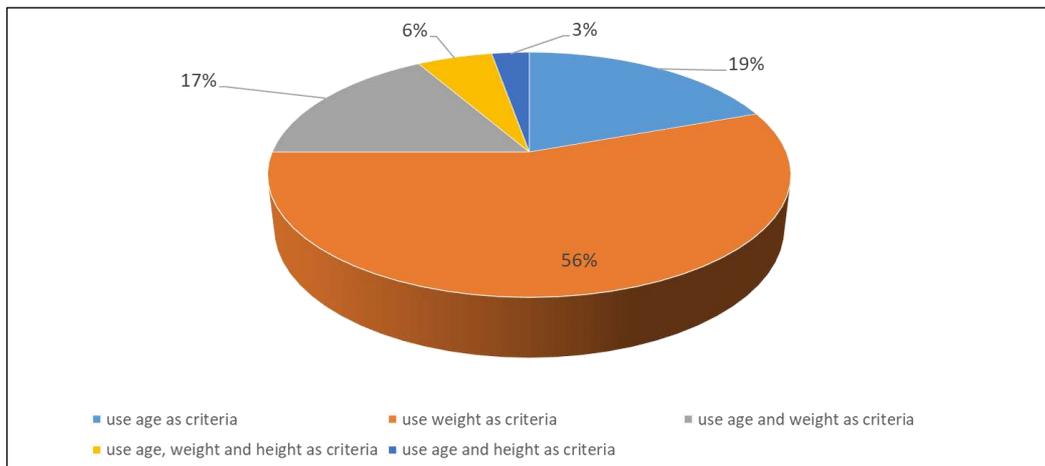
From the total 70 countries, 28 countries did not further specify the type of CRS for different child categories. These countries only used age, height or weight to determine which category of children shall use CRS, but with no specification of CRS stated in their law. 11 of these 28 countries only required children at the ages 2 – 5 to use CRS. For countries without further specification on CRS type, seven (7) countries required all children below 1.50 m to use CRS.

Without a clear specification on CRS in the law, it may not be possible to gain the full advantage of CRS in protecting children in vehicle crashes. Although CRS was compulsory in these countries, without more detail implementation specification, caregivers may end up using the wrong type of CRS for a child. Using CRS without proper testing and specification not only reduces the efficiency of the CRS, but may also increase the injury

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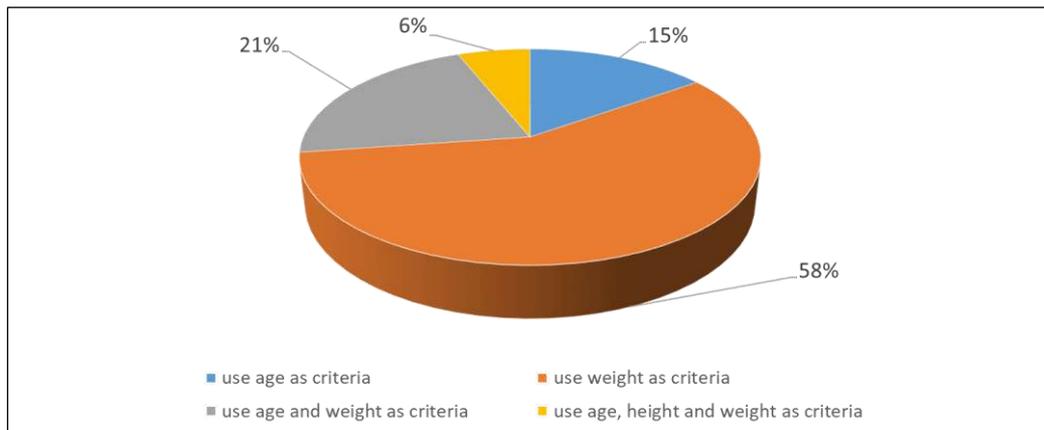
severity to children. Therefore, while preparing the CRS law the relevant authorities in Malaysia shall not adopt any CRS law without detailed specification.

Most advanced countries including the United States, European countries, Australia and Japan have specified the criteria for using rear-facing CRS, front facing CRS and booster seat in their child restraint law. Age, height and weight were the common specifications for these types of CRS. For rear-facing CRS, the most common weight range was more than 10 kg and less than 13 kg. On the other hand, the most common height range was less than 0.75 m. Rear-facing CRS is dedicated for an infant below 1 year old and is specified in the child restraint law. The distribution of the rearward-facing CRS for 35 countries is presented in Figure 2.



**Figure 2** The distribution for rearward facing CRS for 35 countries with further specification

Further, 33 countries have included the specification of forward facing CRS in their child restraint law. Weight was the most commonly used criteria in which the law only allowed children weighing between 9 – 18 kg to use this type of CRS. A child must at least reach the height of 0.75 m but not taller than 1.11 m as stated in the child restraint laws. For countries using age as the criterion, the children must be between 1 – 4 years for the usage of forward facing CRS to be legitimate. The distribution of the forward facing criterion is presented in Figure 3.



**Figure 3** The distribution of forward facing CRS criterion for 33 countries with this specification in their law

On the other hand, booster seats were usually compulsory for children between 5 – 12 years old as stipulated in 7 countries. Out of 70 countries, only 32 countries had underlined the need for booster seats for children. The most common criterion was weight, where children between 15-36 kg were compelled to use booster seat CRS. For countries using height as the criteria, three different height ranges were used; children below 1.35 m, below 1.45 m; and below 1.50 m, respectively. This can be understood as the common height for children aged 12 was between 1.35 m and 1.50 m.

In addition, disallowing children to occupy the front seat is the best practice in child restraint law as promoted in the Global Status Report 2015. Out of 70 countries, 54 countries did not allow children to sit in front. The most common criteria for this specific ruling included age, where children below 12 years were disallowed to be in the front seat; with or without CRS. For this specific ruling, none of the countries used weight as the criteria to disallow children from occupying the front seats.

### 3.2.1 Case Studies on Child Restraint Usage Criterion

A few in-depth case studies were conducted to further understand the details of implementation of such criterions. The practice in European countries, Australia and Japan were analyzed and summarized in these in-depth case studies.

In the European Union, Directive 2003/20/EC of the European Parliament and the Council mandated the use of CRS in vehicles effective May 5, 2006 (European Parliament, 2003). The choice of CRS type is according to the weight of the child. As per the directive, CRS is categorized into five main groups which corresponded with weight. The classification of CRS is tabulated in Table 1. The usage of CRS is required when a child is ferried on vehicles type M1, N1, N2 and N3. The content of the directive is based on the UN ECE R44. After the introduction of UN ECE R129, Directive 91/671/EEC was issued to include UN ECE R129 into the national child restraint law for all EU member states. Instead of weight, the appropriate CRS was chosen according to the body size of the child. Under this new regulation, child below 15 months or less than 83 cm should use rearward-facing CRS.

**Table 1** Classification of CRS in accordance to Directive 2003/20/EC

No.	Group	Weight
1	Group 0	Up to 10 kg
2	Group 0+	Up to 13 kg
3	Group 1	9 to 18 kg
4	Group 2	15 to 25 kg
5	Group 3	22 to 36 kg

In general, for the European Union countries, using a rear facing child seat in the front seat of a vehicle is prohibited if the airbag has not been deactivated. Children under 3 years must not be in a moving vehicle without an appropriate car seat. All CRS used must conform to UN ECE 44/04 or UN ECE R129. The CRS should be adapted to the children's size and weight. Height-based car seats are known as 'i-Size' seats, where these types of seats must be rear-facing until the child is over 15 months. On the other hand, front-facing CRS can be used for children over 15 months. If all other restraints are being used by other children, the child aged 3 years old or older may ride in the back seat with a

seat belt. Nonetheless, the child restraint laws in European Union countries are slightly different between each other. Children in the UK must use a CRS until they are 12 years old or 135 cm tall, whichever comes first. In Germany, the law requires children up to 12 years and less than 1.5 m tall to ride in an approved CRS. In Spain, children up to 12, measuring less than 135 cm must be seated in a CRS adapted to their size and weight, while children measuring more than 135 cm may use an adult seatbelt. Under French law, children up to 10 must travel in an approved child seat or restraint, adapted to their age and size. There were some differences in terms of classification of a child's age for each type of CRS. However, the main CRS usage criteria were mainly based on the child's weight or body size.

For Australia, the national laws required children under 6 months to be restrained in an approved rearward-facing CRS. Children from 6 months to under 4 years must be restrained by an approved rear-facing or front-facing CRS, where the type of restraint will depend on the child's size. At the age of 4 – 7, children must be restrained in either an approved forward-facing CRS with an in-built harness or an approved booster seat. The children may use an adult safety belt or booster seat at the age of 7 – 16 years old. Also, children must not share the same seating position as another passenger (7 – 16 years old). Age is an important criterion for Australia's child restraint law in determining the type of CRS to be used. In 2010, the Australian standard introduced the use of age-appropriate restraints for children up to 7 years, in all states and territories, except the Northern Territory, which was implemented in 2013. The implementation was announced state-wide through public education campaigns including radio advertising, billboards, press, as well as flyers and posters distributed to early childhood educator, maternal health nurses, kindergarten and primary schools (Koppel et al., 2013). An amendment on the requirement on ISOFIX anchorage was later integrated into the mandatory AS/NZS 1754 safety standard in the 2013 version. The revised version of the ISOFIX system also included a compulsory top-tether strap as an extra security measure, which should be attached to the car's anchorage point. The standard applies to new vehicles manufactured from November 2012, and from 1 November 2013 for all other new vehicles of existing models. The legal requirement also stated that ISOFIX-compatible child restraint from overseas was illegal since the design had not been approved for use. Similar to Australia, the New Zealand Transport Agency also approved new amendments to the child safety seat regulations starting 1 November 2013. As the

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amendment was announced in June 2013, parents were given four months to purchase appropriate child restraints according to the law. The amendment was based on the country's Land Transport (Road User) Rule 2004, requiring child passengers up to 7 years to be restrained in an appropriate child restraint. Previous law required child passengers up to 5 years to use an appropriate child restraint.

In Japan, the revised law on child seat was passed under the Road Traffic Law Article 17-3 – 4 of April 2000. The law requires children under 6 to use safety seats while the vehicle is in motion. However, infants younger than 1 year and those who weigh less than 20-22lbs are covered by different restraint guidelines. Infants in Japan (0-1-year-old) are required to be placed rear-facing until they reach at least 1 year old and weigh at least 9 kg. In the United States, child restraint law is different between states. Body weight, height and age of the children are the main criterions in the requirement for CRS usage. For example, in Washington, all children below 8 years and 4 feet 9 inches (144.78 cm) must use CRS. However, in New Jersey, children below 2 years and weigh 30 lbs must be seated in rear-facing CRS while children below 4 years must be seated on an appropriate CRS. The National Highway Traffic Safety Administration (NHTSA) has revised its child restraint guidelines to be categorized by age rather than by type of child seat in order to follow the latest scientific and medical research and the development of new child restraint technologies. NHTSA has also recommended all children under 13 years to ride in the back seat and stressed that children in rear-facing CRS must never be seated in front of an active passenger airbag.

### 3.2.2 Summary

The child restraint law in the countries stated above used a combination of age, height and weight as the criteria for CRS usage in their legal system. Weight and height have always been related to the main criterions for choosing the right CRS. Nonetheless, surveys of CRS use in various countries have shown that many parents lack the knowledge in selecting the correct CRS for their children (Apsler, Formica, Rosenthal, & Robinson, 2003). The information given to parents is normally in terms of the child's weight and height, but such details may be difficult for parents to remember or they do not know the exact weight of their child (Edwards, Anderson, & Hutchinson). Using the

age of the child may be more appropriate in CRS advocacy and regulation because parents would always know their child's age. A study found that according to the Australian CRS safety standard, the transition age of CRS at 6 months and 4 years only lead to 10% of all children under the age of 8 using CRS unsuited to their weight. Corresponding error rates of using CRS for the European and United States Standards are 6% and 16%, respectively. Thus, it is recommended that the child's exact age be promoted as the transition criteria in using different types of CRS rather than using the child's weight or height. This is to reduce errors in selecting CRS by parents.

### 3.3 Child Restraint Exemption Criterion

The use of CRS is exempted in certain situations. While drafting the child restraint law, the practical condition is taken into consideration to minimize the impact of social cost. This study has looked at the exemption criterions in some countries, that shall be highlighted in this section.

In this study, 25 countries were found to have included exemption criteria in their child restraint law. It can be concluded that there are four types of exemption criteria, namely situational, public transport, old vehicles and exemption in installing third CRS due to insufficient space.

The situational type of exemption criteria mainly exists to deal with emergency situations including sending a child to the hospital for immediate treatment. In such cases, the condition of unexpected, necessary and only travel over a short distance must be fulfilled. The authority in these countries would give the benefit of the doubt to the drivers transporting children without using child restraint. However, only 9 out of 25 countries have considered emergency events as the CRS exemption criteria. Examples of countries using these exemption criteria are Belgium, Netherland, Canada, the United States and the United Kingdom.

In certain countries, public transport including taxi, school bus and rented car is given the leniency for not using CRS. The exemption criteria exist due to the practical problem that the driver of the public transport vehicle may not be able to prepare appropriate

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and suitable CRS to the child passengers. Thus, these types of public transport are exempted from complying with the law. A total of 23 out of 25 countries excluded public transport in their child restraint law.

Lastly, some countries allow for old vehicles, manufactured before a certain date, to be exempted from the child restraint law. This is because the old vehicles were not designed for CRS use and most of them did not come with rear passenger seatbelts. Therefore, the driver of such a vehicle would not be penalized if the children travelling on board did not use CRS. Nonetheless, only 11 countries allowed old vehicles to be exempt from CRS law.

### 3.3.1 Case Studies of Exemption Criterion

Several in-depth case studies were conducted to understand the implementation of the exemption criteria in specific countries. The detailed information of exemption criteria for the United Kingdom, Canada and Australia shall be presented in this sub-section.

In the United Kingdom, the exemption criterion is applied to children travelling in taxis. Children under 3 years old may travel without a CRS or seat belt but only in the rear seats. On the other hand, children over 3 years must wear an adult seat belt in either the front seat or rear seat without CRS. The exemption criterion is further extended to minibuses or coaches where the operators are not required to provide CRS to children onboard. In a minibus or coach, children can travel without a CRS or seat belt, if such a device is unavailable. Specifically, children who are 3 years and above must use a CRS if it is available on a minibus or uses an adult seat belt if a child seat is not fitted or unsuitable. In the event of unexpected and necessary short distance travel, children aged 3 years and above can use an adult seat belt instead of CRS. However, this exemption does not apply to child below 3. The exemption criterion in the United Kingdom also considered the limited space of a passenger vehicle. If there is no room for fitting a third CRS in the rear seat, children under 3 years must travel in the front seat with appropriate CRS. Nonetheless, children aged 3 and above can sit in the back using a seatbelt. In some circumstances, a vehicle may be manufactured without the rear seatbelt, hence making the installation of CRS impossible. For vehicles without rear

seatbelt, children aged 3 years and above are allowed to travel in the rear seat without using CRS. However, the same exemption does not apply to children under 3 years and they cannot travel in the vehicle without the rear seatbelt.

In New South Wales, Australia, children aged 1 and below can be exempted from using CRS while travelling on a taxi or small bus. However, children ranging from 1 – 7 years may use the combination of booster seat and seat belt or adult seatbelt while travelling on the taxi or small bus. Children aged 1 – 7 can be exempted from using CRS and occupy any seat, except the front seat if the vehicle was manufactured before January 1971 with written advice.

In Alberta, Canada, the use of CRS is exempted if the motor vehicles were not designed or equipped with seat belt by their manufacturer; motor vehicles being driven in reverse; motor vehicles used in the course of making deliveries or picking up items, driven at a speed of not exceeding 40 km/h; or driven in a parade authorized by a municipality. Taxis, emergency vehicles and motor vehicles that are rented or leased for periods of not exceeding 14 consecutive days at a time are also exempted from using CRS.

### 3.3.2 Summary

In short, while travelling on vehicles such as the taxi, coach, minibus or emergency vehicle, the use of CRS is not mandatory. Instead, the children on board must be restrained with adult seatbelt in the rear seat and cannot share the same seat with another passenger. Also, in some situations where the journey is unexpected, necessary and within a short distance, children are allowed to travel on board without CRS. Where there is no room for a third CRS to be fitted, children are allowed to occupy the front passenger seat using a CRS; with the front passenger airbag deactivated. Lastly, for vehicles assembled without seatbelts, children are allowed to travel onboard without the CRS. However, it is necessary to obtain approval from the authority before doing so.

## 4. Conclusion and Recommendations

It is well proven that CRS is a device to reduce injury severity in children in the event of a vehicle impact or abrupt deceleration. Various studies have shown that implementation of mandatory child restraint law can effectively boost the usage of CRS. However, such a law has to be implemented along with advocacy and appropriate education to the public for the optimum result to be seen. It is very important to convey the correct message to the public regarding the importance of CRS and also how to install it correctly. This will also minimize the issue of misuse and inappropriate installation of CRS. The failure of increasing rear seatbelt wearing rate through mandatory legislation must be avoided through strict and effective implementation of the enacted child restraint law. After a given buffer period, all vehicle owners in Malaysia must comply with both the child restraint and rear seatbelt laws. The following are some recommendations to ensure effective implementation of the child restraint law:

**a) To Conduct a Further Study on Height and Weight of Malaysian Children in Relation to Their Age**

Previous studies have shown that using age as a criterion in choosing an appropriate CRS can reduce the error rate of parents. However, to match the height and weight of Malaysian children in accordance with the safety standard, a thorough study on the relationship between age and anthropometric of Malaysian children is essential. Without the knowledge of this relationship, it is impossible to determine the proper transition age in choosing an appropriate CRS. Thus, a further study on this topic is required to determine the transition age for the correct CRS to be used.

**b) To Include Exemption Criterion into Child Restraint Law**

Ideally, optimal protection can be provided to the children whenever they are travelling in a moving vehicle with appropriate CRS. However, the restrictions in real world situation have to be taken into consideration when implementing a child restraint law. Public transport (taxi and bus) operators may not bear the responsibility of preparing CRS for child passengers which may unnecessarily increase their operation cost and impractical in terms of providing the safety requirements and preparing appropriate CRS for all children of different ages, height and weight. However, parents can always prepare CRS for their children whenever they are travelling on public transport. The authority should also consider enforcing mandatory gradual use of CRS by students on school buses. Thus, it is essential to engage with related stakeholders before implementing this child restraint law for proper execution.

The authority also needs to consider some limitations on the usage of CRS to be included in the list of exemption. Firstly, the limited space in a passenger car may not be sufficient to fit a third CRS. In such a situation, a child should be allowed to be in the front seat restrained with CRS, where the front passenger airbag must be deactivated. Furthermore, for emergency and unexpected situations, children can be allowed to travel without CRS when the travelling distance is short. Some old cars may not be manufactured or assembled with rear seatbelts which may prevent the installation of CRS. For such vehicles, it should be included in the exemption criterion and excluded from the mandatory use of CRS. However, the vehicle owners must obtain written approval from the relevant authority before being exempt from the child restraint law. Since 1 January 2009, the use of rear seatbelt has been made compulsory in Malaysia. Thus, it is fair to mandate that all vehicles manufactured after the said date must be assembled with rear seatbelts and shall not be exempted from using CRS.

**c) To Conduct Public Engagement with Related Stakeholders**

Prior to implementing the child restraint law, it is best to engage with all related stakeholders including car manufacturers, public transport operators, CRS manufacturers and various parent representatives to obtain their feedback in the limitation and possible impacts to social cost. These engagements are crucial to delivering important messages to the related stakeholders in preparing for the full implementation of CRS usage. With more feedback from the public and stakeholders, it could further enhance the implementation roadmap and reduce the resistance against the implementation of child restraint law since comments from the general public have already been considered before introducing the child restraint law.

**e) To Advocate the Public through Education Program, Awareness Campaign and Strict Enforcement by Respective Authority**

Without proper knowledge of CRS, parents tend to face difficulty in selecting the right CRS for their children and securing the CRS properly in their vehicle. These issues are well known in countries such as Australia, Japan and the United States. To effectively implement and enforce child restraint law in Malaysia, the implementation road path must be fully supported with an education program, awareness campaign and most importantly, stringent enforcement by the respective authority. Besides, the implementation of child restraint law should be supported by private entities to effectively execute the initiatives including campaign, advocacy, consultation service, certification, community clinics and enforcement. For example, in the United Kingdom, private entities are actively involved in providing accredited training and advice to those responsible for the fitment of CRS. A qualification in accredited training is crucial in ensuring child seat advisors have strong knowledge of the law, vehicle technologies, child growth and development. The implementation of child restraint law must be driven by the ambition and vision in creating such an environment where the awareness of CRS usage is high.

In terms of promoting CRS, coordinated car seat checking, community checks and enforcement checks have to be conducted frequently to achieve its high usage rate. Activities such as community checks can be regularly held in supermarket or commercial area car parks by the local authority and private entities to provide correct information to the public to minimize CRS misuse. In terms of stringent enforcement, the respective authorities must conduct frequent checks on private passenger cars with regard to the usage of CRS and convey a message related to its legal implications to the driver. It must be reiterated that this is an educational exercise and where appropriate, the driver will be encouraged to acquire and use the correct and compatible CRS rather than face a fine. In short, a coordinated education program and awareness campaign need to be conducted properly prior to the implementation of child restraint law in Malaysia to ensure optimal outcomes.

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## Research Report

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