Indicators for Measuring Shared Risk and Protective Factors Linked to Motor Vehicle and Traumatic Brain Injuries

An Interim Report of the Shared Risk and Protective Factor Measurement Toolkit

Disclaimer:

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention. This report provides technical assistance for states in preparing Annual Progress Reports and as such is not intended for distribution or use beyond that purpose.

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Overview

A key purpose of the Core State Violence Injury Prevention Program (CoreSVIPP) cooperative agreement is to decrease injury and violence related morbidity and mortality **by decreasing risk factors and increasing protective factors shared across multiple forms of injury and violence.** In Year 1 of the CoreSVIPP cooperative agreement, the Centers for Disease Control and Prevention's (CDC) Injury Center provided evaluation resources (e.g., **The Shared Risk and Protective Factor Measurement Toolkit**) to help states identify indicators to measure the impact of their work on Shared Risk and Protective Factors linked to multiple forms of **violence**. This interim report provides additional guidance for Year 2 Annual Progress Reports (APRs) on measuring the impact of CoreSVIPP work on Shared Risk and Protective Factors linked to **unintentional injury** (Motor Vehicle (MV) injury, Traumatic Brain Injury (TBI)).

What this resource is:
The purpose of this technical assistance resource is to provide CoreSVIPP awardees with potential indicators to measure the impact of their work on Shared Risk and Protective Factors linked to multiple unintentional injury outcomes. The indicators selected from this resource should be reported by CoreSVIPP awardees on their APR under Strategy 4 as "intermediate indicators" for unintentional injury sub-strategies. Each CoreSVIPP recipient is encouraged to choose at least one indicator from this resource for each CoreSVIPP strategy supported through the funded State Violence and Injury Prevention Program.

Additionally, this resource is meant to support CoreSVIPP awardees with their strategic planning through providing information and guidance on risk and protective factors shared across the four CoreSVIPP focus areas, on empirical sources related to these factors, and on the indicators that exist for measuring these factors.

What will you find in this resource?

1) **Shared Risk and Protective Factors Linked to Multiple Forms of Unintentional Injury: Preliminary Findings from the Empirical Literature**
   The matrices in this section provide a visual overview of Shared Risk and Protective Factors linked to MV injury and TBI that have been identified through findings from the research literature. Each matrix also notes where these risk and protective factors are shared with CoreSVIPP violence focus areas (Child Abuse and Neglect (CAN), Intimate Partner Violence/Sexual Violence (IPV/SV)).

2) **How Can You Measure These Factors To Capture Your CoreSVIPP Strategy Progress?**
   This section lists indicators that can be used to measure the impact of your work on Shared Risk and Protective Factors linked to MV injury and TBI. This section is organized by strategy type (e.g., Child Passenger Safety, Impaired Driving, Teen Driver Safety, Sports Concussion). Under each strategy type, there are tables for each Shared Risk and Protective Factor associated with that strategy (e.g., seatbelt use, substance use, policies and laws aligned with the best available evidence) and indicators that can be used to measure that risk or protective factor.

3) **What Is the Evidence Behind These Shared Risk And Protective Factors?: How These Factors Are Defined By The Injury Prevention Literature**
   This section provides a summary of the specific ways that Shared Risk and Protective Factors have been identified and defined in the research literature when they have also been found to be significantly associated with MV injury and/or TBI.

What this resource is not:
This document is not a full supplement to **the Shared Risk and Protective Factor Measurement Toolkit**. An updated **Shared Risk and Protective Factor Measurement Toolkit** is not expected until late in the current CoreSVIPP funding cycle, past the point that indicators for tracking impact through CoreSVIPP should be selected. ***Therefore, CoreSVIPP awardees should plan on identifying indicators for measuring Shared Risk and Protective Factors related to their MV and TBI work based on this report.*** While it is likely that some of the identified Shared Risk and Protective Factors, related measurement indicators, and empirical sources will change between this interim report and the fully updated Measurement Toolkit, the content of this report has been carefully selected based on current CoreSVIPP recipient needs, empirical evidence, and alignment with the CoreSVIPP Notice of Funding Opportunity.

Where did the indicators in this resource come from?
Detailed information on how these indicators and highlighted Shared Risk and Protective Factors were selected can be found in the **Methodology of This Report** section below.

What to do if you have questions, concerns, or feedback:
CDC is expanding this list of factors and indicators, based on an ongoing literature review. As such, we welcome your thoughts and feedback. If you have questions about this report and the content within, we encourage you to contact us **here** (toolkitfeedback@cdc.gov) If you have more specific questions about applying these indicators to your CoreSVIPP work, reach out to your State Support Team.

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Methodology of This Report

The Development of this Report

This report is designed to bring some of the empirical findings identified to date in an ongoing literature review to CoreSVIPP awardees to help inform their current reporting needs. To develop this report, a team first reviewed the Year 1 APRs to determine which MV and TBI strategies were being used across states. Next, Shared Risk and Protective Factors from the ongoing review that overlap with these strategies were selected. Third, an abbreviated literature review was conducted to fill gaps in our current understanding of risk and protective factors linked to MV and TBI by searching Google Scholar (sorted by relevance) for peer reviewed papers on both of these injury outcomes. Last, an inventory of indicators for measuring these Shared Risk and Protective Factors was developed from a variety of sources (e.g., APRs, CDC subject matter experts, review of known data sources such as the Youth Risk Behavior Survey, empirical sources such as peer-reviewed papers).

How were the Shared Risk and Protective Factors identified?

Shared Risk and Protective Factors were selected based on their connection to outcomes, in particular to MV injuries and Traumatic Brain Injuries for this report. *Note: Some Shared Risk and Protective Factors included in this report were found to predict other upstream factors (e.g., Rigid Gender Norms is connected to Seat Belt Use) rather than the outcome itself (i.e., MV injury in this example). This is because these Shared Risk and Protective Factors were considered consistent enough with CoreSVIPP work to be included in the current report without a direct tie to the outcome of interest. For more detailed information in how each factor connects to outcomes/other factors, see the section* **What Is the Evidence Behind These Shared Risk And Protective Factors?: How These Factors Are Defined By The Injury Prevention Literature.**

Shared Risk and Protective Factors were identified from two types of literature reviews:

1) Preliminary findings from the ongoing comprehensive review: factors from this comprehensive review that mapped onto current CoreSVIPP work were included.

2) Smaller literature reviews of specific topics through the first 10 pages of Google Scholar (sorted by relevance).

Each factor had to have at least one empirical source to be included in this report (see the below details on the inclusion and exclusion criteria for how empirical sources were selected).

It is important to note that not all risk and protective factors were included in this review. Factors were only included if they were shared across more than one CoreSVIPP topic area *and* if they seemed relevant for current CoreSVIPP work. The findings from the ongoing comprehensive review will provide a more thorough list of these factors (and related indicators).

The Shared Risk and Protective Factors available in this report and related key terms can be found in the section **Shared Risk and Protective Factors Linked to Multiple Forms of Unintentional Injury: Preliminary Findings from the Empirical Literature.**

How were indicators for measuring Shared Risk and Protective Factors selected?

The primary goal of this report was to identify indicators for measuring shared risk and protective factors linked to MV injury and/or TBI that are both *valid* and *feasible* for use by CoreSVIPP awardees for the current APR. Indicators were identified through:

1) Year 1 APRs: When states reported indicators that were generalizable to other states *and* reflected relevant Shared Risk and Protective Factors, they were included in this report. Some indicators were modified to increase their generalizability and to ensure that they capture the intermediate-level of Shared Risk and Protective Factor work (i.e., were not reflective of implementation or of long-term outcomes). Examples include indicators for measuring seat belt use.

2) Known data sources (e.g., Youth Risk Behavior Survey) and guidance from CDC subject matter experts (e.g., Child Passenger Safety related indicators, Sports Concussion related indicators).

3) The empirical literature: An example includes the indicator for measuring Rigid Gender Norms.

Additionally, indicators were only included in this report if they were related to current CoreSVIPP work, meaning that not all factors that are listed in the **matrices** have measurement indicators included in this report (i.e., Access to Healthcare, Association with Deviant Peers, Association with Prosocial Peers, Built Environment, Educational Attainment, Neighborhood Poverty, History of Violent Victimization, Low Cognitive Abilities, Medication Adverse Effects and Misuse (including Opioids), Poor Behavioral Control/Impulsiveness), Psychological/Mental Health Problems, and Sleep Problems).

However, most of these Shared Risk and Protective Factors *do* have indicators available in **the Shared Risk and Protective Factor Measurement Toolkit** that was developed last year for CoreSVIPP awardees to identify shared risk and protective factor indicators related to their *violence* work (i.e., Association with Deviant Peers (under Association with Delinquent Peers), Association with Prosocial Peers, Neighborhood Poverty, History of Violent Victimization, Poor Behavioral Control/Impulsiveness, and Psychological/Mental Health Problems).

Additionally, Family Support and Connectedness, Rigid Gender Norms, and Substance Use have a more extensive list of indicators included in **the Shared Risk and Protective Factor Measurement Toolkit**; the indicators for these factors within this report have been limited to be most closely tied to MV injury and TBI.

Indicators within this report and key terms related to these indicators can be found in the section **How Can You Measure These Factors To Capture Your CoreSVIPP Strategy Progress?**

How were recommended indicators selected?

In order to measure and communicate about the impact of the CoreSVIPP program as a whole, it is ideal if CoreSVIPP awardees measure the Shared Risk and Protective Factors related to their strategies in consistent ways across states. Because of the large number of indicators provided, recommended indicators have been selected to increase this alignment. While CoreSVIPP awardees are encouraged to prioritize indicators that are **most closely tied** to their work, it is preferable that states choose a state or local level recommended indicator if those fit well with their strategies and activities. Recommended indicators are those that best met criteria for validity (e.g., methodologically sound, closely tied to the risk/protective factor) and feasibility (e.g., easily accessible).

Wherever possible, recommended indicators have been identified both for **state level** data (these are best for strategies that are likely to have state-wide impact) and **local level** (these are best for strategies that are focused at the community level and are unlikely to show state-wide impact).

What were our inclusion and exclusion criteria for the empirical sources?

The empirical sources (e.g., peer-reviewed papers) for this review did not necessarily follow the same exclusion criteria as the ongoing comprehensive review. While some sources were pulled from the comprehensive review, smaller reviews were conducted for each searched topic. Sometimes, this included literature published before the year 2000. Additionally, because this report is also meant to help CoreSVIPP awardees with strategic planning, empirical findings from all over the world were included and the search was not limited to findings from the United States. However, to increase relevance to CoreSVIPP work, when a particular area was lacking a source from the United States, special searchers were conducted to supplement this literature. Sources were only included if they cited a significant finding related to MV injuries or Traumatic Brain Injuries. These empirical sources can be found in the section **What Is the Evidence Behind These Shared Risk And Protective Factors?: How These Factors Are Defined By The Injury Prevention Literature.**

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Shared Risk and Protective Factors Linked to Multiple Forms of Unintentional Injury: Preliminary Findings from the Empirical Literature

The matrices below indicate when a risk or protective factor is related to an unintentional injury or violence outcome. The four CoreSVIPP focus areas (MV injuries, TBI, CAN, and IPV/SV) are each represented across the top of the matrices below. Since TBI is an outcome that can result from the other three focus areas (i.e., MV-related TBI, CAN-related TBI, IPV/SV-related TBI), additional columns have been added to provide more information on how Shared Risk and Protective Factors are linked to TBI by each of these types of injury.

Shared Risk and Protective Factors are listed on the left side of the matrices, with protective factors grouped in the first matrix and risk factors grouped in the second matrix. The factors in both matrices are organized by socioecological level (individual, relationship, community, societal; Bronfenbrenner, 1977*). *Note: The Shared Risk and Protective Factors listed in the matrices below are all tied to either MV injury or TBI; the other factors tied to violence can be found in **the Shared Risk and Protective Factor Measurement Toolkit**.*

When a connection has been made between a relevant injury/violence outcome and a Shared Risk and Protective Factor, the box at that intersection is purple.

Users may click on these boxes to find more detailed information. Additional outcomes that may be associated with that risk or protective factor are listed in the "Other" column.

Detailed definitions, or the ways in which Shared Risk and Protective Factors have been defined in studies that have found empirical connections to MV or TBI, can be found in the section **What Is the Evidence Behind These Shared Risk And Protective Factors?: How These Factors Are Defined By The Injury Prevention Literature** or through clicking on the purple boxes in the matrices.

Measurement indicators of these Shared Risk and Protective Factors can be found in the section **How Can You Measure These Factors to Capture Your CoreSVIPP Strategy Progress?** or through the links found in the Table of Contents.

**Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. American psychologist, 32(7), 513.*

Key Terms for Shared Risk and Protective Factors

***Listed below are some key terms that will help users navigate this section*.**

Shared Risk or Protective Factor **:** Risk factors are things that increase the likelihood that an injury outcome will occur. Protective factors are things that decrease the likelihood that an injury outcome will occur or buffer against/lessen the harmful effects of risk factors. Shared Risk and Protective Factors are those that have been empirically linked by at least one, peer-reviewed study to two or more injury or violence outcomes.

Unspecified TBI *(Unspecified Traumatic Brain Injury)*: For this report, TBIs that are linked to another CoreSVIPP focus area (e.g., MV-related TBI, CAN-related TBI, IPV/SV-related TBI, Sports Concussion) are specifically and independently identified. The Unspecified TBI category is, therefore, reserved for signaling Shared Risk and Protective Factors that relate to one of the following *other* TBI outcomes: 1) multiple types of TBI (e.g., including two or more specific types of brain injury such as MV-related TBI *and* Sports Concussion), 2) TBIs whose origins are not specifically identified in the research, or 3) the cause of the TBI is a type of injury that is not a CoreSVIPP focus (e.g., falls).

Sports Concussion : Sports concussions are TBIs that are attributed to injuries from athletic activities, whether recreational, competitive, or through other sport engagement.

MV All Injuries : This category represents empirical evidence for any type of MV injury (i.e., crash, injury, or fatality) that is not limited to TBIs.
MV TBI : This category represents only TBIs that are attributed to a MV crash or injury.

CAN All Injuries: This category represents empirical evidence for any type of Child Abuse and Neglect perpetration that is not limited to the perpetration of abusive head trauma in children. CAN TBI :This category represents only empirical evidence linked to the perpetration of pediatric abusive head trauma.

IPV/SV IPV: This category is limited to empirical evidence for perpetration of IPV (including physical, emotional, or mixed types of violence), either in adult only samples or in samples for which the age is not specified. TDV: This category is limited to empirical evidence for TDV (including physical, emotional, or mixed types of violence), in samples where teens are the perpetrators and victims. SV: This category is limited to empirical evidence for SV for populations of any age. IPV/SV TBI: This category is limited to the perpetration of a TBI related to IPV, TDV, or SV.

Other Injury Outcomes: This column provides a space to indicate where there is empirical evidence to support a relationship between a Shared Risk and Protective Factor and any other type of injury or violence outcome (e.g., Suicide, Opioid Overdose).

Note: Specific information on how each of the Shared Risk and Protective Factors is defined in the empirical literature can be found in the section **What Is the Evidence Behind These Shared Risk And Protective Factors?: How These Factors Are Defined By The Injury Prevention Literature**

The Matrix (Protective Factors)

Shared Risk or Protective Factor		Unspecified TBI	Sports Concussion	MV		CAN		IPV/SV				Other Injury Outcomes
				All Injuries	MV TBI	All Injuries	CAN TBI	IPV	TDV	SV	IPV/SV TBI	
Protective Factors												
Societal	**Access to Healthcare**	■		■								*Bullying, Suicide*
Societal	**Policies and Laws Aligned with the Best Available Evidence**			■	■	■						*Bullying, Suicide, Youth Violence*
Community	**Coordination of Resources and Services**		■			■						
Relationship	**Association with Prosocial Peers**			■					■			*Bullying, Suicide, Youth Violence*
Relationship	**Family Support and Connectedness**			■		■			■			*Bullying, Suicide, Youth Violence*
Individual	**Child Backseat Sitting Location**			■	■							
Individual	**Educational Attainment**	■					■					*Opioid Overdose*
Individual	**Proper Child Safety Seat Use**			■	■							
Individual	**Seat Belt Use**			■	■							

TBI = Traumatic Brain Injury, MV = Motor Vehicle, CAN = Child Abuse and Neglect, IPV/SV = Intimate Partner Violence = Intimate Partner Violence, SV = Sexual Violence, TDV = Teen Dating Violence

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Instructions: To link to the detailed definitions for each specific risk and protective factor/outcome relationship, click on the purple box.

The Matrix (Risk Factors)

Shared Risk or Protective Factor		Unspecified TBI	Sports Concussion	MV		CAN		IPV/SV				Other Injury Outcomes
				All Injuries	MV TBI	All Injuries	CAN TBI	IPV	TDV	SV	IPV/SV TBI	
Risk Factors												
Societal	**Policies and Laws Not Aligned with the Best Available Evidence***			■		■		■				
Community	**Built Environment**	■		■								
Community	**Neighborhood Poverty**	■		■		■		■		■		*Suicide, Youth Violence, Opioid Overdose*
Relationship	**Association with Deviant Peers***			■				■	■	■		*Bullying, Youth Violence*
Individual	**History of Violent Victimization**	■				■	■	■	■	■		*Bullying, Elder Abuse and Neglect, Suicide, Youth Violence*
Individual	**Impaired Driving**			■	■							
Individual	**Low Cognitive Abilities**	■		■								
Individual	**Medication Adverse Effects and Misuse (including opioids)**	■		■								*Opioid Overdose*
Individual	**Poor Behavioral Control/Impulsiveness**			■		■		■	■	■		*Bullying, Elder Abuse and Neglect, Suicide, Youth Violence, Opioid Overdose*
Individual	**Psychological/Mental Health Problems**			■		■		■	■	■		*Elder Abuse and Neglect, Suicide, Youth Violence*
Individual	**Rigid Gender Norms***			■		■		■	■	■		*Bullying, Suicide, Youth Violence*
Individual	**Sleep Problems**			■	■							
Individual	**Substance Use**	■		■		■		■	■	■		*Bullying, Elder Abuse and Neglect, Suicide, Youth Violence*

TBI = Traumatic Brain Injury, MV = Motor Vehicle, CAN = Child Abuse and Neglect, IPV/SV = Intimate Partner Violence = Intimate Partner Violence, SV = Sexual Violence, TDV = Teen Dating Violence

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Note: For Shared Risk and Protective Factors with an *, the name of the factor has been changed from its original name in **the Shared Risk and Protective Factor Measurement Toolkit (Harmful Gender Norms is now Rigid Gender Norms; Health, Educational, Economic, and Social Policies & Laws not Aligned w/Best Available Evidence is now Policies and Laws Not Aligned with Best Available Evidence; Association with Delinquent Peers is now Association with Deviant Peers).*

Instructions: To link to the detailed definitions for each specific risk and protective factor/outcome relationship, click on the purple box.

How Can You Measure These Factors To Capture Your CoreSVIPP Strategy Progress?

Key Terms For Measurement Indicators

***Listed below are some key terms that will help users navigate this section*.**

Indicator Metric used to measure the risk or protective factor of interest. Note, unless otherwise determined by a state support team, indicators that are associated with protective factors (see **The Shared Risk/Protective Factor It Measures** explanation below) are expected to increase over the CoreSVIPP funding cycle, while indicators that are associated with risk factors are expected to decrease over time).

Type of Data This column indicates whether the indicator is available from an existing data source (secondary) or if it will require that you or a partner collect your own data (primary).

Data Source This column lists where the indicator data comes from for secondary indicators (e.g., Fatality Analysis Reporting System (FARS), Behavioral Risk Factor Surveillance System (BRFSS)), or the methods by which it can be collected for primary data (e.g., data collection, surveys, scales, observational data).

The Shared Risk/ Protective Factor It Measures Risk factors are things that increase the likelihood that an injury outcome will occur. Protective factors are things that decrease the likelihood that an injury outcome will occur or buffer/decrease the risk of it occurring. Shared Risk and Protective Factors are those that have been empirically linked by at least one, peer-reviewed study to two or more injury or violence outcomes.

Associated Outcomes This column lists the injury outcomes associated with the risk and protective factor and its indicator.

Recommended? Those indicators that **are most highly encouraged and recommended for use** by CoreSVIPP funded states are marked in this column. For more information about how these recommended indictors were selected, see the **Methodology of This Report** section.

Motor Vehicle Injury Prevention Strategies

These tables provide a review of Shared Risk and Protective Factors broken down by the types of MV injury prevention strategies implemented under Core SVIPP.

Strategy Type: Child Passenger Safety

Example Activities: *Child Safety Seat Inspections by Certified Technicians, Distributing Child Safety Seats*

Indicators for Measuring Proper Child Backseat Sitting Location:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/ Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Percent of children aged 12 and under involved in a fatal crash who were in the back seat at the time of the crash and were not fatally injured	Secondary	Fatality Analysis Reporting System (FARS)	Child Backseat Sitting Location	MV, TBI		For **State** Level
Percent of parents who report that their children aged 12 years and under "always" sit in the backseat	Primary	Survey	Child Backseat Sitting Location	MV, TBI		For **Local** Level
Percent of children aged 12 years and under sitting in the backseat	Primary	Observational surveys and measures, e.g., inspection checklists or children seen exiting the rear of the vehicle	Child Backseat Sitting Location	MV, TBI	Note: This indicator is best used when observing populations where it is known that children are less than 12 years old (e.g., elementary school carpool lines).	
Percent of children aged 12 and under involved in a MV crash who were in the rear seat at the time of the crash	Secondary	Crash Outcome Data Evaluation System (CODES)	Child Backseat Sitting Location	MV, TBI	Note: CODES data not available in all states	

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Indicators for Measuring Proper Child Safety Seat Use:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Percent of children aged 8 and under involved in a fatal crash who, at the time of the crash, were properly buckled up in a car seat, booster seat, or seat belt (whichever is appropriate for their age, height, and weight) and were not fatally injured	Secondary	Fatality Analysis Reporting System (FARS)	Proper Child Safety Seat Use	MV, TBI	Note: Additional guidance on age-appropriate child safety seats can be found here.	For **State** Level
Percent of children properly buckled up in a correctly installed car seat, booster seat, or seat belt, whichever is appropriate for their age, height and weight (i.e., having the proper seat, installing the seat properly, and using the seat properly at the time of inspection)	Primary	Observational surveys and measures, such as an inspection checklist	Proper Child Safety Seat Use	MV, TBI	Note: 1) Some states may modify this indicator to track progress with special populations, such as non-English speaking, children with special transportation needs, or low-income families 2) Additional information can be found here.	For **Local** Level
Percent of families whose restraint practices were improved after child safety seat checks	Primary	Observational surveys and measures, such as an inspection checklist or score sheet completed by home visitation partner or inspector pre-post inspection	Proper Child Safety Seat Use	MV, TBI		

Table is continued on the next page.

Indicators for Measuring Proper Child Safety Seat Use, Cont.:						
Number of tickets issued for child passenger safety violations	Partner	Department of Motor Vehicles/Department of Driver Services Ticketing Data, Law Enforcement Data, City Data	Proper Child Safety Seat Use	MV, TBI	Note: This indicator may be expected to increase or decrease over the funding cycle depending on the strategy being implemented (e.g., it may be expected that checkpoint/enforcement strategies result in an increase whereas car seat installation programs may result in a decrease).	
Percent of children aged 0-8 years who were properly buckled up in a car seat, booster seat, or seat belt, whichever is appropriate for their age, height and weight	Partner	Child Restraint Survey from the Highway Safety Office	Proper Child Safety Seat Use	MV, TBI	Note: Additional guidance on age-appropriate child safety seats can be found here.	
Percent of children aged 8 and under involved in a motor crash who were reported being restrained in a child safety seat at the time of the crash	Secondary	Crash Outcome Data Evaluation System (CODES)	Proper Child Safety Seat Use	MV, TBI	Note: CODES data is not available in all states.	
Percent of children aged 0-8 years who were properly buckled up in a car seat, booster seat, or seat belt, whichever is appropriate for their age, height and weight	Primary	Observational surveys and measures, such as a passive observation study form, or inspection checklist	Proper Child Safety Seat Use	MV, TBI	Note: Additional guidance on age-appropriate child safety seats can be found here.	

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Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence:						
Indicator:	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Number of elements of policies/laws based on the best available evidence for child passenger safety* **introduced** to state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Available Evidence	MV, TBI	Note: *Elements of Child Passenger Safety policies/laws consistent with the best available evidence: • Children riding in a car to use the proper restraint devices (car seats, booster seats, or seat belts) appropriate for their age, height, & weight. ▪ Birth to 2: Children in a rear-facing seat until age 2 or they reach the upper weight or height limit of that seat ▪ Age 2-5: forward-facing car seat until at least age 5 or they reach the upper weight or height limit of that seat. ▪ Age 5 until seat belts fit properly: Once children outgrow their forward-facing seat, they should be buckled in a booster seat until seat belts fit properly. The recommended height for proper fit is 57". ▪ Booster seat provisions requiring children who have outgrown car seats to use booster seats through age 8 years or until seat belts fit properly. • Children ages 12 and under required to sit in the back seat.	For **State** Level
Number of elements of policies/laws based on the best available evidence for child passenger safety* **signed/enacted** by state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Available Evidence	MV, TBI		For **State** Level
Number of activities related to policies/laws based on the best available evidence for child passenger safety* integrated into state violence and injury prevention plans	Secondary	State Violence and Injury Prevention Plans	Policies and Laws Aligned with the Best Available Evidence	MV, TBI		For **State** Level

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Strategy Type: Impaired Driving Prevention

Example Activities: *Ignition Interlock Programs, Alcohol Brief Interventions, Educating stakeholders on impaired driving policies based on the best available evidence*

Indicators for Measuring Impaired Driving:

Indicator	Type of Data	Data Source	The Shared Risk/Protective Factor It Measures	Associated Outcomes	Notes	Recommended?
Percent of adults who reported at least one episode of alcohol impaired driving in the past 30 days	Secondary	Behavioral Risk Factor Surveillance Survey (BRFSS)	Impaired Driving	MV, TBI	Note: This indicator is also a standardized long-term indicator on the CoreSVIPP APR. Although it is being collected for overall program monitoring, for state states, this indicator may also serve to provide an intermediate measure of their selected goals.	For **State** Level
Percent of **high school** students who report **riding** in a car or other vehicle in the last 30 days that was driven by someone who had been drinking alcohol	Secondary	Youth Risk Behavior Survey (YRBS)	Impaired Driving	MV, TBI	Note: 1) This indicator is also a standardized long-term indicator on the CoreSVIPP APR. Although it is being collected for overall program monitoring, for state states, this indicator may also serve to provide an intermediate measure of their selected goals. 2) For some states, this indicator may be available at the large school district level.	For **State** Level
Percent of **high school** students who reported **driving** a car or other vehicle in the last 30 days when they had been drinking alcohol	Secondary	Youth Risk Behavior Survey (YRBS)	Impaired Driving	MV, TBI	Note: For some states, this indicator may be available at the large school district level.	For **State** Level

Table is continued on the next page.

Indicators for Measuring Impaired Driving, Cont.:						
Percent of **middle school** students who report ever **riding** in a car driven by someone who had been drinking alcohol	Secondary	Youth Risk Behavior Survey (YRBS)	Impaired Driving	MV, TBI	Note: 1) For some states, this indicator may be available at the large school district level 2) Data for middle school students is only available in some states.	For **State** Level
Percent of students who report **driving** a car or other vehicle in the last 12 months after using alcohol or drugs	Primary	Student Survey	Impaired Driving	MV, TBI	Note: For sub-samples (i.e., not statewide), a pre-post survey would be more sensitive to impact than statewide data (e.g., YRBS). Additionally, nuanced changes (e.g., "during the last 12 months" or "during the last 30 days") can be modified to fit program specifics.	For **Local** Level
Percent of students who report **riding** in a car or other vehicle in the last 12 months that was driven by someone who was under the influence of alcohol or drugs	Primary	Student Survey	Impaired Driving	MV, TBI	Note: For sub-samples (i.e., not statewide), a pre-post survey would be more sensitive to impact that statewide data (e.g., YRBS). Additionally, nuanced changes (e.g., "during the last 12 months" or "during the last 30 days") can be modified to fit program specifics.	For **Local** Level
Arrests for driving or operating any vehicle while drunk or under the influence of intoxicants for Juveniles (less than 18 years)	Secondary	State Uniform Crime Reports (UCR)	Impaired Driving	MV, TBI		
Percent of drivers involved in an alcohol-related fatal MV crash who also had a previous DWI conviction	Secondary	Fatality Analysis Reporting System (FARS)	Impaired Driving	MV, TBI	Note: Even though this is a downstream outcome (i.e., fatality), it is directly tied to alcohol use, and is therefore also an indicator of upstream behavior (i.e., impaired driving).	

Table is continued on the next page.

Indicators for Measuring Impaired Driving, Cont.:						
Percent of **drivers** involved in fatal crashes who had a BAC at or above .08	Secondary	Fatality Analysis Reporting System (FARS)	Impaired Driving	MV, TBI	Note: 1) These data are also available at the .00, .01, .05, and .15 BAC levels. 2) Even though this is a downstream outcome (i.e., fatality), it is directly tied to alcohol use, and is therefore also an indicator of upstream behavior (i.e., impaired driving).	
Percent of **MV fatalities** where the driver had a BAC at or above .08	Secondary	Fatality Analysis Reporting System (FARS)	Impaired Driving	MV, TBI	Note: 1) These data are also available at the .00, .01, .05, and .15 BAC levels. 2) Even though this is a downstream outcome (i.e., fatality), it is directly tied to alcohol use, and is therefore also an indicator of upstream behavior (i.e., impaired driving).	
Percent of MV fatal crashes in which police reported alcohol involvement	Secondary	Fatality Analysis Reporting System (FARS)	Impaired Driving	MV, TBI		
Percent of MV fatal crashes in which police reported drug involvement	Secondary	Fatality Analysis Reporting System (FARS)	Impaired Driving	MV, TBI		
Rate of MV fatalities (driver BAC .08+) per 100,000,000 miles traveled	Secondary	Fatality Analysis Reporting System (FARS)	Impaired Driving	MV, TBI	Note: 1) Even though this is a downstream outcome (i.e., fatality), it is directly tied to alcohol use, and is therefore also an indicator of upstream behavior (i.e., impaired driving). 2) This indicator is also a standardized long-term indicator on the CoreSVIPP APR. Although it is being collected for overall program monitoring, for state states, this indicator may also serve to provide an intermediate measure of their selected goals.	

Table is continued on the next page.

Indicators for Measuring Impaired Driving, Cont.:						
Percent of MV crashes in which the driver tested positive for alcohol or drugs, or in which law enforcement suspected the driver of alcohol or drug use	Secondary	Crash Outcome Data Evaluation System (CODES)	Impaired Driving	MV, TBI	Note: CODES data is not available in all states.	

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Indicators for Measuring Substance Use:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Percent of adults who report having had, on an occasion, 4 or more drinks at any one time for a woman or five or more drinks at any one time for a man	Secondary	Behavioral Risk Factor Surveillance Survey (BRFSS)	Substance Use	MV, TBI, CAN, IPV, SV, TDV, Youth Violence, Bullying, Suicide, Elder Maltreatment	Note: There is a list of more specific and sensitive indicators (by substance type, contextual behaviors, age, etc.) available in the Shared Risk and Protective Factor Measurement Toolkit.	For **State** Level
Percent of **high school students** who report ever having used alcohol or substances (e.g., marijuana, cocaine, methamphetamine, etc.) over the course of their lives	Secondary	Youth Risk Behavior Survey (YRBS)	Substance Use	MV, TBI, CAN, IPV, SV, TDV, Youth Violence, Bullying, Suicide, Elder Maltreatment	Note: 1) There is a list of more specific and sensitive indicators (by substance type, contextual behaviors, age, etc.) available in the Shared Risk and Protective Factor Measurement Toolkit. 2) For some states, this indicator may be available at the large school district level.	For **State** Level
Percent of **middle school students** who report ever having used alcohol or substances (e.g., marijuana, cocaine, methamphetamine, etc.) over the course of their lives	Secondary	Youth Risk Behavior Survey (YRBS)	Substance Use	MV, TBI, CAN, IPV, SV, TDV, Youth Violence, Bullying, Suicide, Elder Maltreatment	Note: 1) There is a list of more specific and sensitive indicators (by substance type, contextual behaviors, age, etc.) available in the Shared Risk and Protective Factor Measurement Toolkit. 2) For some states, this indicator may be available at the large school district level. 3) Data for middle school students is only available in some states.	For **State** Level

Table is continued on the next page.

Indicators for Measuring Substance Use, Cont.						
Percent of adults who report using marijuana	Secondary*	Behavioral Risk Factor Surveillance Survey (BRFSS)	Substance Use	MV, TBI, CAN, IPV, SV, TDV, Youth Violence, Bullying, Suicide, Elder Maltreatment	Note: 1) *This is an optional module of the BRFSS; therefore, access varies across states. 2) There is a list of more specific and sensitive indicators (by substance type, contextual behaviors, age, etc.) available in the Shared Risk and Protective Factor Measurement Toolkit.	
Percent of drivers involved in a fatal MV crash who had a positive drug test result	Secondary	Fatality Analysis Reporting System (FARS)	Substance	MV, TBI, CAN, IPV, SV, TDV, Youth Violence, Bullying, Suicide, Elder Maltreatment	Note: Because not all drug tests reflect recent use/current impairment, this is a better indicator of substance use patterns than intoxication at the time of MV crash.	

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Indicators for Measuring Policies and Laws Aligned with the Best Evidence:						
Indicator:	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Number of elements of policies/laws based on the best available evidence for preventing impaired driving* **introduced** to the state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Evidence	MV, TBI	Note: *Elements of Impaired Driving policies/laws based on the best available evidence include: • **Blood Alcohol Concentration Limits** ▪ Legislation that sets the threshold for impaired driving at a BAC of .08 or lower ▪ Zero tolerance for underage drinking and driving. Illegal for a person under the age of 21 to drive with any measurable amount of alcohol in their blood. • **Ignition Interlocks** ▪ Requirement or strong incentive to install interlocks (ex: A law covering all offenders with significant reduction of hard license suspension period if interlock is installed). ▪ Strong, swift, and appropriate penalties (ex: Extension of interlock time, home monitoring, fail breath test, or tamper or otherwise circumvent interlock).	For **State** Level
Number of elements of policies/laws based on the best available evidence for preventing impaired driving* **signed/enacted** by the state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Evidence	MV, TBI		For **State** Level
Number of activities regarding impaired driving policies/laws based on the best available evidence* integrated into state violence and injury prevention plans	Secondary	State Violence and Injury Prevention Plans	Policies and Laws Aligned with the Best Evidence	MV, TBI		For **State** Level

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Strategy Type: Motorcycle Safety Strategies for Preventing Motor Vehicle Injuries

Example Programs: *Educating stakeholders on motorcycle safety policies/laws that are based on the best available evidence*

Indicators for Measuring Policies and Laws Aligned with the Best Evidence:

Indicator	Type of Data	Data Source	The Shared Risk/Protective Factor It Measures	Associated Outcomes	Notes	Recommended?
Number of elements of policies/laws based on the best available evidence for motorcycle safety* **introduced** to state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Evidence	MV, TBI	Note: *Elements of Motorcycle Safety policies/laws based on the best available evidence Include: • Universal helmet requirement (applies to all motorcycle operators and passengers).	For **State** Level
Number of elements of policies/laws based on the best available evidence for motorcycle safety* **signed/enacted** by state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Evidence	MV, TBI		For **State** Level
Number of activities supporting universal helmet policies based on the best available evidence* integrated into state violence and injury prevention plans	Secondary	State Violence and Injury Prevention Plans	Policies and Laws Aligned with the Best Evidence	MV, TBI		For **State** Level

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Strategy Type: Seat Belt Use

Example Programs: *Battle of the Belt, Teens in the Driver Seat, Educating stakeholders on seat belt policies/laws that are based on the best available evidence*

Indicators for Measuring Rigid Gender Norms:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Percent of respondents scoring high scores on the Conformity to Masculine Roles Inventory	Primary	Conformity of Masculine Roles Inventory (CMNI)	Rigid Gender Norms	MV, TBI, IPV, SV, CAN, TDV, Youth Violence, Bullying	Note: 1) The CMNI can be found in Mahalik, J. R., Locke, B. D., Ludlow, L. H., Diemer, M. A., Scott, R. P., Gottfried, M., & Freitas, G. (2003). Development of the Conformity to Masculine Norms Inventory. Psychology of Men & Masculinity, 4(1), 3 2) There is a list of additional Rigid Gender Norm indicators (under Harmful Gender Norms) available in the Shared Risk and Protective Factor Measurement Toolkit.	For **Local** Level

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Seat Belt Use Indicators

Indicators for Measuring Seat Belt Use:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Percent of adults who report "always" or "nearly always" wearing seat belts when driving or riding in a car	Secondary	Behavioral Risk Factor Surveillance Survey (BRFSS)	Seat Belt Use	MV, TBI	Note: This indicator is also a standardized long-term indicator on the CoreSVIPP APR. Although it is being collected for overall program monitoring, for state states, this indicator may also serve to provide an intermediate measure of their selected goals.	For **State** Level
Percent of **high school** students who reported wearing a seat belt "most of the time" or "always" when riding in a car with someone else	Secondary	Youth Risk Behavior Survey (YRBS)	Seat Belt Use	MV, TBI	Note: For some states, this indicator may be available at the large school district level.	For **State** Level
Percent of **middle school** students who reported wearing a seat belt "most of the time" or "always" when riding in a car	Secondary	Youth Risk Behavior Survey (YRBS)	Seat Belt Use	MV, TBI	Note: 1) For some states, this indicator may be available at the large school district level 2) Data for middle school students is only available in some states.	For **State** Level
Percent of high school students reporting wearing a seat belt "most of the time" or "always" when **driving** a car	Primary	Student Survey	Seat Belt Use	MV, TBI	Note: For sub-samples (i.e., not statewide), a pre-post survey would be more sensitive to impact that statewide data (e.g., YRBS).	For **Local** Level
Percent of high school students reporting wearing a seat belt "most of the time" or "always" when **riding** in a car driven by someone else	Primary	Student Survey	Seat Belt Use	MV, TBI	Note: For sub-samples (i.e., not statewide), a pre-post survey would be more sensitive to impact that statewide data (e.g., YRBS).	For **Local** Level

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Indicators for Measuring Seat Belt Use, Cont.						
Percent of MV occupants (any age) using seat belts	Secondary	National Highway Traffic Safety Administration - Traffic Safety Performance Core Outcome Measures	Seat Belt Use	MV, TBI		
Percent of adolescents/teens wearing seat belts	Primary	Observational seat belt surveys or measures, such as seat belt checkpoints conducted by partners, for instance the state Department of Transportation, Highway Safety Office, law enforcement, etc.	Seat Belt Use	MV, TBI		
Percent of teen **drivers** wearing a seat belt	Primary	Observational seat belt surveys or measures, such as seat belt checkpoints conducted by partners, for instance the state Department of Transportation, Highway Safety Office, law enforcement, etc.	Seat Belt Use	MV, TBI		
Percent of **drivers** wearing a seatbelt at the time of a MV crash	Secondary	Crash Outcome Data Evaluation System (CODES)	Seat Belt Use	MV, TBI	Note: CODES data is not available in all states.	
Percent of **passengers** wearing a seatbelt at the time of a MV crash	Secondary	Crash Outcome Data Evaluation System (CODES)	Seat Belt Use	MV, TBI	Note: CODES data is not available in all states.	
Percent of MV occupants involved in a fatal crash who, at the time of the crash, were using a seat belt and were not fatally injured	Secondary	Fatality Analysis Reporting System (FARS)	Seat Belt Use	MV, TBI		

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Seat Belt Use Indicators

Indicators for Measuring Policies and Laws Aligned with the Best Evidence:						
Indicator:	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Number of elements of seat belt policies/laws based on the best available evidence* **introduced** to the state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Evidence	MV, TBI	Note: *Elements of Seat Belt policies/laws based on the best available evidence include: • Primary Seat Belt- Allow police officers to stop and ticket someone for not buckling up (vs. secondary seat belt laws, which allow officers to give tickets only if they have pulled the driver over for another reason). • Seat belt laws are most effective when they cover occupants in all seats of the vehicle (including rear passengers). • Increased fines for violating seat belt laws.	For **State** Level
Number of elements of seat belt policies/laws based on the best available evidence* **signed/enacted** by the state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Evidence	MV, TBI		For **State** Level
Number of activities related to seat belt policies based on the best available evidence* integrated into state violence and injury prevention plans	Secondary	State Violence and Injury Prevention Plans	Policies and Laws Aligned with the Best Evidence	MV, TBI		For **State** Level

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Strategy Type: Teen Driver Safety

Example Programs: Graduated Driver's Licensing, Intermediate Driver's Licensing, Checkpoints, Teens in the Driver Seat, Share the Keys

Indicators for Measuring Impaired Driving in Teens:

Indicator	Type of Data	Data Source	The Shared Risk/Protective Factor It Measures	Associated Outcomes	Notes	Recommended?
Percent of high school students who report **riding** in a car or other vehicle in the last 30 days driven by someone who had been drinking alcohol	Secondary	Youth Risk Behavior Survey (YRBS)	Impaired Driving	MV, TBI	Note: 1) This indicator is also a standardized long-term indicator on the CoreSVIPP APR. Although it is being collected for overall program monitoring, for state states, this indicator may also serve to provide an intermediate measure of their selected goals. 2) For some states, this indicator may be available at the large school district level.	For **State** Level
Percent of high school students who report **driving** a car or other vehicle in the last 30 days when they had been drinking alcohol	Secondary	Youth Risk Behavior Survey (YRBS)	Impaired Driving	MV, TBI	Note: For some states, this indicator may be available at the large school district level.	For **State** Level
Percent of students who report **riding** in a car or other vehicle driven by a peer who was under the influence of alcohol or drugs in the last 12 months	Primary	Student Survey	Impaired Driving	MV, TBI	Note: For sub-samples (i.e., not statewide), a pre-post survey would be more sensitive to impact that statewide data (e.g., YRBS). Additionally, nuanced changes (e.g., "during the last 12 months" or "during the last 30 days") can be modified to fit program specifics.	For **Local** Level

Table is continued on the next page.

Indicators for Measuring Impaired Driving in Teens, Cont.:						
Percent of high school students who report **driving** a car or other vehicle in the last 12 months after using alcohol or drugs	Primary	Student Survey	Impaired Driving	MV, TBI	Note: For sub-samples (i.e., not statewide), a pre-post survey would be more sensitive to impact that statewide data (e.g., YRBS). Additionally, nuanced changes (e.g., "during the last 12 months" or "during the last 30 days") can be modified to fit program specifics.	For **Local** Level
Arrests for driving or operating any vehicle while drunk or under the influence of intoxicants for Juveniles (less than 18 years)	Secondary	State Uniform Crime Reports (UCR)	Impaired Driving	MV, TBI		
Percent of MV fatalities where the teen driver (aged 15 to 19) had a BAC at or above .08	Secondary	Fatality Analysis Reporting System (FARS)	Impaired Driving	MV, TBI	Note: 1) These data are also available at the .00, .01, .05, and .15 BAC levels. 2) Even though this is a downstream outcome (i.e., fatality), it is directly tied to alcohol use, and is therefore also an indicator of upstream behavior (i.e., impaired driving).	

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Indicators for Measuring Family Support and Connectedness with Teens:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Percent of parents who report intent to use a parent-teen driving contract	Primary	Survey	Family Support and Connectedness	MV, TBI	Note: 1) There is a list of more specific and sensitive indicators (by substance type, contextual behaviors, age, etc.) available in the Shared Risk and Protective Factor Measurement Toolkit.	
Percent of parents who report **increased intent** to use a parent-teen driving contract	Primary	Pre-Post Survey	Family Support and Connectedness	MV, TBI	Note: 1) There is a list of more specific and sensitive indicators (by substance type, contextual behaviors, age, etc.) available in the Shared Risk and Protective Factor Measurement Toolkit.	
Percent of teen drivers with a completed parent-teen driving contract	Primary	Survey	Family Support and Connectedness	MV, TBI	Note: 1) There is a list of more specific and sensitive indicators (by substance type, contextual behaviors, age, etc.) available in the Shared Risk and Protective Factor Measurement Toolkit.	For **Local** Level

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Indicators for Measuring Substance Use in Teens:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Percent of high school students who report ever having used alcohol or substances (e.g., marijuana, cocaine, methamphetamine, etc.) over the course of their lives	Secondary	Youth Risk Behavior Survey (YRBS)	Substance Use	MV, TBI	Note: 1) There is a list of more specific and sensitive indicators (by substance type, contextual behaviors, age, etc.) available in the Shared Risk and Protective Factor Measurement Toolkit. 2) For some states, this indicator may be available at the large school district level.	For **State** Level

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Indicators for Measuring Seat Belt Use in Teens:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Percent of **high school** students who reported wearing a seat belt "most of the time" or "always" when riding in a car with someone else	Secondary	Youth Risk Behavior Survey (YRBS)	Seat Belt Use	MV, TBI	Note: For some states, this indicator may be available at the large school district level.	For **State** Level
Percent of high school students reporting wearing a seat belt "most of the time" or "always" when **driving** a car	Primary	Student Survey	Seat Belt Use	MV, TBI	Note: For sub-samples (i.e., not statewide), a pre-post survey would be more sensitive to impact that statewide data (e.g., YRBS).	For **Local** Level
Percent of high school students reporting wearing a seat belt "most of the time" or "always" when **riding** in a car with someone else	Primary	Student Survey	Seat Belt Use	MV, TBI	Note: For sub-samples (i.e., not statewide), a pre-post survey would be more sensitive to impact that statewide data (e.g., YRBS).	For **Local** Level
Percent of **middle school** students who reported wearing a seat belt "most of the time" or "always" when riding in a car	Secondary	Youth Risk Behavior Survey (YRBS)	Seat Belt Use	MV, TBI	Note: 1) For some states, this indicator may be available at the large school district level. 2) Data for middle school students is only available in some states.	
Percent of adolescent/teen **MV occupants** wearing seat belts in cars driven by teen drivers	Primary	Observational surveys and measures	Seat Belt Use	MV, TBI		
Percent of teen drivers wearing a seatbelt at the time of a MV crash	Secondary	Crash Outcome Data Evaluation System (CODES)	Seat Belt Use	MV, TBI	Note: CODES data not available in all states	
Percent of teen passengers wearing a seatbelt at the time of a MV crash when the driver was also a teen	Secondary	Crash Outcome Data Evaluation System (CODES)	Seat Belt Use	MV, TBI	Note: CODES data is not available in all states	

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Indicators for Measuring Seat Belt Use in Teens:						
Percent of youth aged 15-18 involved in a fatal crash who, at the time of the crash, were using a seatbelt and were not fatally injured	Secondary	Fatality Analysis Reporting System (FARS)	Seat Belt Use	MV, TBI		

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Indicators for Measuring Policies and Laws Aligned with the Best Evidence:						
Indicator:	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Number of elements of teen driver safety policies/laws aligned with the best available evidence* **introduced** to the state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Evidence	MV, TBI	NOTE: *Elements of Teen Driver Safety policies/laws based on the best available evidence include: • **Graduated/ Intermediate Driver's Licensing** ▪ Learner's Permit: Teens can drive only under the supervision of a licensed, adult driver. • 16-years-old as the minimum age. • Mandatory holding period of at least six months. ▪ Intermediate License (also called provisional license): Teens can drive without supervision under lower risk driving conditions. Two common restrictions include limits on nighttime driving and driving with teen passengers. • No unsupervised nighttime driving from at least 10:00 pm to 5:00 am.	For **State** Level
Number of elements of teen driver safety policies/laws aligned with the best available evidence* **signed/enacted** by the state legislature	Secondary	State Legislative Record	Policies and Laws Aligned with the Best Evidence	MV, TBI		For **State** Level

Table is continued on the next page.

Indicators for Measuring Policies and Laws Aligned with the Best Evidence, Cont.:						
Number of activities related to teen driver safety policies/laws based on the best available evidence* integrated into state violence and injury prevention plans	Secondary	State Violence and Injury Prevention Plans	Policies and Laws Aligned with the Best Evidence	MV, TBI	• Limit the number of teen passengers that may accompany a teen driver without adult supervision to zero or one (not including family members). ▪ Unrestricted License: Teens can drive independently and previous restrictions are lifted • 18-years-old as the minimum age • Parent-teen driving agreements • **Blood Alcohol Level Limits** ▪ Zero tolerance for underage drinking and driving. Illegal for a person under the age of 21 to drive with any measurable amount of alcohol in their blood.	For **State** Level
Percent of parents who report having **completed training** on their state Graduated Driver's License law	Primary	Survey	Policies and Laws Aligned with the Best Evidence	MV, TBI		
Percent of parents who report **being aware** of their state Graduated Driver's License law	Primary	Survey	Policies and Laws Aligned with the Best Evidence	MV, TBI		

Table is continued on the next page.

Indicators for Measuring Policies and Laws Aligned with the Best Evidence, Cont.:						
Percent of parents who report **increased awareness** of their state Graduated Driver's License law	Primary	Pre-Post Survey	Policies and Laws Aligned with the Best Evidence	MV, TBI		
Percent of parents who report **attitudes supportive of** their state Graduated Driver's License law	Primary	Survey	Policies and Laws Aligned with the Best Evidence	MV, TBI		
Percent of parents who report **increased attitudes supportive** of their state Graduated Driver's License law	Primary	Pre-Post Survey	Policies and Laws Aligned with the Best Evidence	MV, TBI		
Percent of parents who report intent to use a parent-teen driving contract	Primary	Survey	Policies and Laws Aligned with the Best Evidence	MV, TBI		
Percent of parents who report **increased intent** to use a parent-teen driving contract	Primary	Pre-Post Survey	Policies and Laws Aligned with the Best Evidence	MV, TBI		
Percent of teen drivers with a completed parent-teen driving contract	Primary	Survey	Policies and Laws Aligned with the Best Evidence	MV, TBI		
Percent of intended audience with **written** local/organizational policies aligned with best available research evidence for Teen Driver Safety	Primary	Survey	Policies and Laws Aligned with the Best Evidence	MV, TBI	Note: The intended audience may depend upon the activities being implemented (e.g., schools, school districts). The indicator can be tailored to each applicable group.	

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Traumatic Brain Injury Prevention Strategies

These tables provide a review of Shared Risk and Protective Factors broken down by the types of TBI Prevention strategies implemented under Core SVIPP.

Strategy Type: Sports Concussion Prevention Strategies

Example Activities: *Educating stakeholders on Sports Concussion policies/laws (e.g., Return to Play, Return to Learn) based on the best available evidence, Implementing sports concussion policies (e.g., Return to Play, Return to Learn) based on the best available evidence, training coaches and school officials on concussion management, ImPACT Neuropsychological Testing, Heads Up*

Indicators for Measuring Coordination of Resources and Services:

Indicator	Type of Data	Data Source	The Shared Risk/Protective Factor It Measures	Associated Outcomes	Notes	Recommended?
Percent of students with a Sports Concussion who had a concussion management team consisting of both a healthcare provider and school personnel	Primary	Survey	Coordination of Resources and Services	TBI		For **State and Local** Levels

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Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Number of elements of policies and laws based on the best available evidence for returning to school/academics following a sports concussion (e.g., Return to Learn)* **Introduced** to state legislature	Secondary	State Legislative Record	Policies/Laws Aligned with Best Available Evidence	TBI	Note: 1) *Elements of Return to Learn policies/laws consistent with the best available evidence Include: • Creation of a concussion management team to check on students with concussion for any changes in behavior or increased problems with school work. • Development of a plan that includes special support or help for students during the school day to help with their recovery. 2) It is important to note that Return to Learn has yet to be evaluated in a comprehensive manner; as such, the best available evidence is quickly changing as new findings emerge.	For **State** Level
Number of elements of policies and laws based on the best available evidence for returning to school/academics following a sports concussion (e.g., Return to Learn)* **signed/enacted** by state legislature	Secondary	State Legislative Record	Strong Laws and policies	TBI		For **State** Level

Table is continued on the next page.

Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence, Cont.:						
Number of elements of policies and laws based on the best available evidence for returning to sport activities following a sports concussion (e.g., Return to Play)* **introduced** to state legislature	Secondary	State Legislative Record	Policies/Laws Aligned with Best Available Evidence	TBI	Note: *Elements of Return to Play policies/laws consistent with the best available evidence Include: • Educate Coaches, Parents, and Athletes: Inform and educate coaches, athletes, and their parents and guardians about concussion through training and/or a concussion information sheet. • Remove Athlete from Play: An athlete who is believed to have a concussion is to be removed from play right away. • Obtain Permission to Return to Play: An athlete can only return to play or practice after at least 24 hours and with permission from a health care professional.	For **State** Level
Number of elements of policies and laws based on the best available evidence for returning to sport activities following a sports concussion (e.g., Return to Play)* **signed/enacted** by state legislature	Secondary	State Legislative Record	Policies/Laws Aligned with Best Available Evidence	TBI		For **State** Level
Number of activities related to sports concussion policies/laws based on the best available evidence (e.g., Return to Play, Return to Learn) integrated into state violence and injury prevention plans	Secondary	State Violence and Injury Prevention Plans	Policies/Laws Aligned with Best Available Evidence	TBI	Note: Elements of Return to Learn policies/laws consistent with the best available evidence and Return to Play policies/laws consistent with the best available evidence are listed above.	For **State** Level

Table is continued on the next page.

Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence, Cont.:						
State health department has been granted rulemaking/regulatory authority for state sports concussion policies	Secondary	State Legislative Record	Policies/Laws Aligned with Best Available Evidence	TBI		
Number of rules and regulations developed by the state health department through their rulemaking regulatory authority for state sports concussion policies	Secondary	State Health Department Records	Policies/Laws Aligned with Best Available Evidence	TBI	Note: This only applies to the states that have been granted rulemaking regulatory authority	
Percent of intended audience who report **completing training** on concussion protocols aligned with the best available evidence	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes, schools, school districts, recreational athletic groups/divisions/leagues). The indicator can be tailored to each applicable group.	For **State and Local** Levels

Table is continued on the next page.

Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence, Cont.:						
Percent of intended audience who **adhere to** local and/or state *Return to Learn* policies	Primary	School Survey Data	Policies/Laws Aligned with Best Available Evidence	TBI	Note: 1) The intended audience may depend upon the activities being implemented (e.g., schools, school districts, recreational athletic groups/divisions/leagues). The indicator can be tailored to each applicable group. 2) It is important to note that Return to Learn has yet to be evaluated in a comprehensive manner; as such, the best available evidence is quickly changing as new findings emerge.	For **State and Local** Levels
Percent of intended audience who **adhere to** local and/or state Return to Play policies	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., schools, school districts, recreational athletic groups/divisions/leagues). The indicator can be tailored to each applicable group.	For **State and Local** Levels
Percent of student athletes reporting symptoms of a sports-related concussion who stopped playing and were checked by a medical provider	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI		For **State and Local** Levels
Percent of students with a Sports Concussion who received permission from a health care professional before returning to play	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI		For **State and Local** Levels

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Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence, Cont.:						
Percent of intended audience who report **completing training** on *Return to Learn* local and/or state policies	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: 1) The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes, schools, school districts, recreational athletic groups/divisions/leagues). The indicator can be tailored to each applicable group. 2) It is important to note that Return to Learn has yet to be evaluated in a comprehensive manner; as such, the best available evidence is quickly changing as new findings emerge.	
Percent of intended audience who report **completing training** on *Return to Play* local and/or state policies	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes, schools, school districts, recreational athletic groups/divisions/leagues). The indicator can be tailored to each applicable group.	

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Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence, Cont.:						
Percent of intended audience who report **being aware** of *Return to Learn* local and/or state policies	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes). The indicator can be tailored to each applicable group.	
Percent of intended audience who report **being aware** of *Return to Play* local and/or state policies	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes). The indicator can be tailored to each applicable group.	
Percent of intended audience who report **increased awareness** of *Return to Learn* local and/or state policies	Primary	Pre-Post Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: 1) The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes). The indicator can be tailored to each applicable group. 2) It is important to note that Return to Learn has yet to be evaluated in a comprehensive manner; as such, the best available evidence is quickly changing as new findings emerge.	

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Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence, Cont.:						
Percent of intended audience who report **increased awareness** of *Return to Play* local and/or state policies	Primary	Pre-Post Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes). The indicator can be tailored to each applicable group.	
Percent of intended audience who report **attitudes supportive of** concussion protocols	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes). The indicator can be tailored to each applicable group.	
Percent of intended audience who report **increased attitudes supportive** of concussion protocols	Primary	Pre-Post Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes). The indicator can be tailored to each applicable group.	
Percent of intended audience who report increased awareness of **concussion signs and symptoms**	Primary	Pre-Post Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes). The indicator can be tailored to each applicable group.	

Table is continued on the next page.

Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence, Cont.:						
Percent of intended audience who report increased awareness of **what to do if concussion occurs**	Primary	Pre-Post Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes). The indicator can be tailored to each applicable group.	
Percent of intended audience who say they **intend to report** concussion signs/symptoms	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., coaches, health care professionals, parents of student athletes, school personnel, student athletes). The indicator can be tailored to each applicable group.	
Percent of intended audience with **written** concussion management policies aligned with best available evidence for *Return to Learn*	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: 1) The intended audience may depend upon the activities being implemented (e.g., schools, school districts, recreational athletic groups/divisions/leagues). The indicator can be tailored to each applicable group. 2) It is important to note that Return to Learn has yet to be evaluated in a comprehensive manner; as such, the best available evidence is quickly changing as new findings emerge.	

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Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence, Cont.:						
Percent of intended audience with **written** concussion management policies aligned with best available evidence for *Return to Play*	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., schools, school districts, recreational athletic groups/divisions/leagues). The indicator can be tailored to each applicable group.	
Percent of intended audience implementing baseline neurocognitive testing (e.g., ImPACT)	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the activities being implemented (e.g., schools, school districts, recreational athletic groups/divisions/leagues). The indicator can be tailored to each applicable group.	
Percent of children examined by a health care professional (e.g., doctor, nurse) or athletic trainer after receiving an injury or blow to the head that resulted in symptoms of a concussion (e.g., memory loss, confusion, loss of consciousness/being knocked out, blurry vision, nausea) as a result of playing organized sports, either in competition or during practice	Primary	Ohio State BRFSS	Policies/Laws Aligned with Best Available Evidence	TBI	Note: Ohio is pilot testing this indicator on its state-specific BRFSS.	

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Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence, Cont.:						
Percent of children removed from play for the day by an adult (such as a coach or trainer) after receiving an injury or blow to the head that resulted in symptoms of a concussion (e.g., memory loss, confusion, loss of consciousness/being knocked out, blurry vision, nausea) as a result of playing organized sports, either in competition or during practice	Primary	Ohio State BRFSS	Policies/Laws Aligned with Best Available Evidence	TBI	Note: Ohio is pilot testing this indicator on its state-specific BRFSS.	

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Strategy Type: Unspecified Traumatic Brain Injury Prevention Strategies

Example Programs: *Adherence to CDC Mild Traumatic Brain Injury Guidelines, Concussion Management Teams*

Indicators for Measuring Coordination of Resources and Services:

Indicator	Type of Data	Data Source	The Shared Risk/Protective Factor It Measures	Associated Outcomes	Notes	Recommended?
Percent of students with any TBI who had a concussion management team consisting of both a healthcare provider and school personnel	Primary	Survey	Coordination of Resources and Services	TBI		For **State and Local** Levels

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Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence:						
Indicator	**Type of Data**	**Data Source**	**The Shared Risk/Protective Factor It Measures**	**Associated Outcomes**	**Notes**	**Recommended?**
Percent of intended audience who **report using** CDC's Mild TBI Guidelines for Adults	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the Guideline activities being implemented (e.g., health care providers, emergency departments, healthcare systems, hospitals). The indicator can be tailored to each specific group.	For **State and Local** Levels
Percent of intended audience who **report using** CDC's Pediatric Mild TBI Guidelines	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: 1) The intended audience may depend upon the Guideline activities being implemented (e.g., health care providers, emergency departments, healthcare systems, hospitals). The indicator can be tailored to each specific group. 2) This indicator is subject to estimate timeline of CDC Pediatric Mild TBI Guideline availability	For **State and Local** Levels
Percent of intended audience to which CDC's Mild TBI Guidelines for Adults have been **distributed**	Primary	Internal	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the Guideline activities being implemented (e.g., health care providers, emergency departments, healthcare systems, hospitals). The indicator can be tailored to each specific group.	

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Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence:						
Percent of intended audience to which CDC's Pediatric Mild TBI Guidelines have been **distributed**	Primary	Internal	Policies/Laws Aligned with Best Available Evidence	TBI	Note: 1) The intended audience may depend upon the Guideline activities being implemented (e.g., health care providers, emergency departments, healthcare systems, hospitals). The indicator can be tailored to each specific group. 2) This indicator is subject to estimate timeline of CDC Pediatric Mild TBI Guideline availability	
Percent of intended audience who report being **aware** of CDC's Mild TBI Guidelines for Adults	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the Guideline activities being implemented (e.g., health care providers, emergency departments, healthcare systems, hospitals). The indicator can be tailored to each specific group.	
Percent of intended audience who report being **aware** of CDC's Pediatric Mild TBI Guidelines	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: 1) The intended audience may depend upon the Guideline activities being implemented (e.g., health care providers, emergency departments, healthcare systems, hospitals). The indicator can be tailored to each specific group. 2) This indicator is subject to estimate timeline of CDC Pediatric Mild TBI Guideline availability.	

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Unspecified Traumatic Brain Injury Prevention Indicators

Indicators for Measuring Policies and Laws Aligned with the Best Available Evidence:						
Percent of intended audience who have **adopted** the CDC Mild TBI Guidelines for Adults	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: The intended audience may depend upon the Guideline activities being implemented (e.g., health care providers, emergency departments, healthcare systems, hospitals). The indicator can be tailored to each specific group.	
Percent of intended audience that have **adopted** the CDC Pediatric Mild TBI Guidelines	Primary	Survey	Policies/Laws Aligned with Best Available Evidence	TBI	Note: 1) The intended audience may depend upon the Guideline activities being implemented (e.g., healthcare providers, emergency departments, healthcare systems, hospitals). The indicator can be tailored to each specific group. 2) This indicator is subject to estimate timeline of CDC Pediatric Mild TBI Guideline availability	

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Instructions for Finding Secondary Data Sources:

Secondary Data Source	Link	Other Instructions
Behavioral Risk Factor Surveillance Survey (BRFSS)	**https://www.cdc.gov/brfss/annual_data/annual_data.htm**	Data files are available in ASCII and SAS Transport formats.
Fatality Analysis Reporting System (FARS)	**https://www-fars.nhtsa.dot.gov/Main/index.aspx**	1) Click on the "Query FARS Data" tab at the top of the screen, 2) Select a year from the drop down at the top of the screen and click "submit," 3) Select Option 3 and click "submit" 4) Select variables applicable to indicator of interest
National Traffic Highway Safety Administration (NTSA)- Traffic Safety Performance Core Outcome Measures	**https://cdan.nhtsa.gov/STSI.htm**	Click on the state of interest on the map to access state-specific data
Youth Risk Behavior Survey (YRBS)	**https://www.cdc.gov/healthyyouth/data/yrbs/data.htm**	Data files are available in ASCII , SAS, SPSS, and Access formats.
	https://www.cdc.gov/healthyyouth/data/yrbs/participation.htm	Some states have access to YRBS indicators and data at the large school district level.

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Additional Resources on Policies and Laws Based on the Best Available Evidence:

Topic Area	Source(s)
Child Passenger Safety	• CDC What Works: Strategies to Increase Restraint Use • CDC Child Passenger Safety Infographics
Impaired Driving Prevention	• CDC Policy Impact: Teen Driver Safety • CDC What Works: Strategies to Reduce or Prevent Drunk Driving • Community Guide: Motor Vehicle Injury – Alcohol-Impaired Driving: 0.08% Blood Alcohol Concentration (BAC) Laws • Community Guide: Systematic Review of Alcohol Impaired Driving Review of Lower BAC Laws for Inexperienced Drivers • CDC Eight program keys for strong state alcohol ignition interlock programs • CDC Increasing Alcohol Ignition Interlock Use Successful Practices for States
Motorcycle Safety	• CDC Motorcycle Safety • The Community Guide Motorcycle Safety: Universal Motorcycle Helmet Laws • CDC Motorcycle Safety Guide
Seat Belt Use	• CDC What Works: Strategies to Increase Restraint Use
Teen Driver Safety	• CDC GDL Planning Guide • CDC Policy Impact: Teen Driver Safety • NHTSA Countermeasures that Work, 8th Edition
Sports Concussion Prevention	• CDC Get a Heads Up on Concussion in Sports Policies • CDC Implementing Return to Play: Learning from the Experiences of Early Implementers
Traumatic Brain Injury Guidelines	• CDC Updated Mild TBI Guidelines for Adults

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What Is the Evidence Behind These Shared Risk And Protective Factors?: How These Factors Are Defined By The Injury Prevention Literature

This section provides definitions of each Shared Risk and Protective Factor related to each relevant outcome to which it is connected. **These definitions are derived from the original research articles** that found significant, empirical associations between each Shared Risk and Protective Factor and injury outcomes. More information about the inclusion and exclusion of relevant empirical sources can found in the section **Methodology of This Report**. More information about how the outcomes themselves are defined can be found in the **Key Terms for Shared Risk and Protective Factors** for the section **Shared Risk and Protective Factors Linked to Multiple Forms of Unintentional Injury: Preliminary Findings from the Empirical Literature**.

How does Access to Healthcare connect to…

Unspecified Traumatic Brain Injuries?

Definition	Reference
Having medical insurance	Alban, R. F., Berry, C., Ley, E., Mirocha, J., Margulies, D. R., Tillou, A., & Salim, A. (2010). Does health care insurance affect outcomes after traumatic brain injury? Analysis of the National Trauma Databank. The American Surgeon, 76(10), 1108-1111.

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Motor Vehicle Injuries?

Definition	Reference
Implementation of an organized system of trauma care	Nathens, A. B., Jurkovich, G. J., Cummings, P., Rivara, F. P., & Maier, R. V. (2000). The effect of organized systems of trauma care on motor vehicle crash mortality. JAMA, 283(15), 1990-1994.

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How does Policies and Laws Aligned with the Best Available Evidence connect to…

Motor Vehicle Injuries?

Definition	Reference
Policy requiring in person driver's license renewal (for drivers 86 years and older only)	Grabowski, D. C., Campbell, C. M., & Morrisey, M. A. (2004). Elderly licensure laws and motor vehicle fatalities. *JAMA*, 291(23), 2840-2846.
Primary enforcement of restraint laws and laws deterring drunk driving	Nathens, A. B., Jurkovich, G. J., Cummings, P., Rivara, F. P., & Maier, R. V. (2000). The effect of organized systems of trauma care on motor vehicle crash mortality. *JAMA*, 283(15), 1990-1994.

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Motor Vehicle Traumatic Brain Injuries?

Definition	Reference
Mandatory bicycle helmet legislation.	Macpherson, A. K., To, T. M., Macarthur, C., Chipman, M. L., Wright, J. G., & Parkin, P. C. (2002). Impact of mandatory helmet legislation on bicycle-related head injuries in children: a population-based study. *Pediatrics*, *110*(5), e60-e60.
Traffic safety laws	Redelmeier, D. A., Tibshirani, R. J., & Evans, L. (2003). Traffic-law enforcement and risk of death from motor-vehicle crashes: case-crossover study. *The Lancet*, *361*(9376), 2177-2182.
Mandatory motorcycle helmet use laws	Chiu, W. T., Kuo, C. Y., Hung, C. C., & Chen, M. (2000). The effect of the Taiwan motorcycle helmet use law on head injuries. *American journal of public health*, *90*(5), 793.; Kraus, J. F., Peek, C., & McArthur, D. L. (1995). The effect of the 1992 California motorcycle helmet use law on motorcycle crash fatalities and injuries. *Journal of Emergency Medicine*, *4*(13), 590; Kraus, J. F., & Peek, C. (1995). The impact of two related prevention strategies on head injury reduction among nonfatally injured motorcycle riders, California, 1991–1993. *Journal of neurotrauma*, *12*(5), 873-881; Peek-Asa, C., & Kraus, J. F. (1997). Estimates of injury impairment after acute traumatic injury in motorcycle crashes before and after passage of a mandatory helmet use law. *Annals of emergency medicine*, *29*(5), 630-636.

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Child Abuse and Neglect?

Definition	Reference
Spending on social insurance	Briggs, C. M., & Cutright, P. (1994). Structural and cultural determinants of child homicide: a cross-national analysis. *Violence and Victims*, 9(1), 3-16.

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How does Coordination of Resources and Services connect to…

Sports Concussion?

Definition	Reference
A team-based approach to managing students' return to school after a concussion with collaboration between the student and family, healthcare professionals and school staff	Baker, J. G., Rieger, B. P., McAvoy, K., Leddy, J. J., Master, C. L., Lana, S. J., & Willer, B. S. (2014). Principles for return to learn after concussion. *International journal of clinical practice*, *68*(11), 1286-1288.

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Child Abuse and Neglect?

Definition	Reference
Improvement of interagency collaboration and developing a more consistent response in how families are provided services.	Daro, D., Huang, L. A., & English, B. (2009). The Duke Endowment Child Abuse Prevention Initiative: A Midpoint Assessment. *Chapin Hall at the University of Chicago*.

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How does Association with Prosocial Peers connect to…

Motor Vehicle Injuries?

Definition	Reference
Youth association with peers who take school seriously and youth association with others involved in positive activities	Pelham III, W. E., & Dishion, T. J. (2018). Prospective prediction of arrests for driving under the influence from relationship patterns with family and friends in adolescence. *Addictive behaviors*, *78*, 36-42.

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Note: This definition ties Association with Prosocial Peers to a Shared Risk Factor (Impaired Driving) rather than a MV injury outcome. It was included in this report due to its close relevance to CoreSVIPP work (with many CoreSVIPP awardees doing work that address both Association with Prosocial Peers, and Impaired Driving).

Teen Dating Violence?

Definition	Reference
Friendship quality (security, presence of conflict (reverse scored), pro-social conflict resolution, disclosure, and closeness)	Linder, J. R., & Collins, W. A. (2005). Parent and peer predictors of physical aggression and conflict management in romantic relationships in early adulthood. *J Fam Psychol*, 19(2), 252-262. doi:10.1037/0893-3200.19.2.252

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How does Family Support/Connectedness connect to…

Motor Vehicle Injuries?

Definition	Reference
Parental monitoring and participation in positive family activities	Pelham III, W. E., & Dishion, T. J. (2018). Prospective prediction of arrests for driving under the influence from relationship patterns with family and friends in adolescence. *Addictive behaviors*, *78*, 36-42.

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Note: This definition ties Family Support and Connectedness to a Shared Risk Factor (Impaired Driving) rather than a MV injury outcome. It was included in this report due to its close relevance to CoreSVIPP work (with many CoreSVIPP awardees doing work that address both Family Support and Connectedness, and Impaired Driving).

Child Abuse and Neglect?

Definition	Reference
Family and social support for parents	MacLeod, J., & Nelson, G. (2000). Programs for the promotion of family wellness and the prevention of child maltreatment: A meta-analytic review. *Child abuse & neglect*, 24(9), 1127-1149.
Mother's healthy intimate partner relationship/high emotional intimacy with romantic partner, high maternal warmth	Jaffee, S. R., Bowes, L., Ouellet-Morin, I., Fisher, H. L., Moffitt, T. E., Merrick, M. T., & Arseneault, L. (2013). Safe, stable, nurturing relationships break the intergenerational cycle of abuse: a prospective nationally representative cohort of children in the United Kingdom. *J Adolesc Health*, 53(4 Suppl), S4-10. doi:10.1016/j.jadohealth.2013.04.007;
Romantic partner warmth and positive communication	Conger, R. D., Schofield, T. J., Neppl, T. K., & Merrick, M. T. (2013). Disrupting intergenerational continuity in harsh and abusive parenting: the importance of a nurturing relationship with a romantic partner. *J Adolesc Health*, 53(4 Suppl), S11-17. doi:10.1016/j.jadohealth.2013.03.014

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Teen Dating Violence?

Definition	Reference
Higher bonding to parents	Maas, C. D., Fleming, C. B., Herrenkohl, T. I., & Catalano, R. F. (2010). Childhood predictors of teen dating violence victimization. *Violence and Victims*, 25(2), 131-149.

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How does Child Backseat Sitting Location connect to…

Motor Vehicle Injuries?

Definition	Reference
Children seated in the rear seat and children seated in the rear center seats (for cars without airbags or only driver and front passenger airbags)	Braver, E. R., Whitfield, R., & Ferguson, S. A. (1998). Seating positions and children9s risk of dying in motor vehicle crashes. *Injury Prevention*, 4(3), 181-187
Children properly restrained and seated in the rear of the car	Durbin, D. R., Chen, I., Smith, R., Elliott, M. R., & Winston, F. K. (2005). Effects of seating position and appropriate restraint use on the risk of injury to children in motor vehicle crashes. *Pediatrics*, 115(3), e305-e309.

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Motor Vehicle Traumatic Brain Injuries?

Definition	Reference
Children seated in the back seat	Al-Jazaeri, A., Zamakhshary, M., Al-Omair, A., Al-Haddab, Y., Al-Jarallah, O., & Al-Qahtania, R. (2012). The role of seating position in determining the injury pattern among unrestrained children involved in motor vehicle collisions presenting to a level I trauma center. *Annals of Saudi medicine*, *32*(5), 502.

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How does Educational Attainment connect to… *Unspecified Traumatic Brain Injuries?*	
Definition	**Reference**
Higher education level before sustaining a TBI (decreases vulnerability for lower post-injury IQ)	Kesler, S. R., Adams, H. F., Blasey, C. M., & Bigler, E. D. (2003). Premorbid intellectual functioning, education, and brain size in traumatic brain injury: an investigation of the cognitive reserve hypothesis. *Applied neuropsychology*, 10(3), 153-162.

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Child Abuse and Neglect Traumatic Brain Injuries?	
Definition	**Reference**
Maternal education level higher than high school	Keenan, H. T., Runyan, D. K., Marshall, S. W., Nocera, M. A., Merten, D. F., & Sinal, S. H. (2003). A population-based study of inflicted traumatic brain injury in young children. *JAMA*, *290*(5), 621-626.

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How does Proper Child Safety Seat Use connect to…

Motor Vehicle Injuries?

Definition	Reference
Children seated in the rear seat and children seated in the rear center seats (for cars without airbags or only driver and front passenger airbags)	Braver, E. R., Whitfield, R., & Ferguson, S. A. (1998). Seating positions and children9s risk of dying in motor vehicle crashes. *Injury Prevention*, 4(3), 181-187
Children properly restrained and seated in the rear of the car	Durbin, D. R., Chen, I., Smith, R., Elliott, M. R., & Winston, F. K. (2005). Effects of seating position and appropriate restraint use on the risk of injury to children in motor vehicle crashes. *Pediatrics*, 115(3), e305-e309.

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Motor Vehicle Traumatic Brain Injuries?

Definition	Reference
Children belted at the time of a motor vehicle crash	Osberg, J. S., & Di Scala, C. (1992). Morbidity among pediatric motor vehicle crash victims: the effectiveness of seat belts. *American journal of public health*, *82*(3), 422-425.

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How does Seat Belt Use connect to…
Motor Vehicle Injuries?

Definition	Reference
Children seated in the rear seat and children seated in the rear center seats (for cars without airbags or only driver and front passenger airbags)	Braver, E. R., Whitfield, R., & Ferguson, S. A. (1998). Seating positions and children9s risk of dying in motor vehicle crashes. *Injury Prevention*, 4(3), 181-187.

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Motor Vehicle Traumatic Brain Injuries?

Definition	Reference
Children belted at the time of a motor vehicle crash	Osberg, J. S., & Di Scala, C. (1992). Morbidity among pediatric motor vehicle crash victims: the effectiveness of seat belts. *American journal of public health*, *82*(3), 422-425.
Seat belt use	Porter, R. S., & Zhao, N. (1998). Patterns of injury in belted and unbelted individuals presenting to a trauma center after motor vehicle crash: seat belt syndrome revisited. *Annals of emergency medicine*, 32(4), 418-424.

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How does Policies and Laws Not Aligned with Best Available Research Evidence connect to…

Motor Vehicle Injuries?

Definition	Reference
Relaxation of state speed limits	Nathens, A. B., Jurkovich, G. J., Cummings, P., Rivara, F. P., & Maier, R. V. (2000). The effect of organized systems of trauma care on motor vehicle crash mortality. *JAMA*, 283(15), 1990-1994.

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Child Abuse and Neglect?

Definition	Reference
State policies with interrupted eligibility for health care insurance for children (e.g., 12 months).	Klevens, J., Barnett, S. B. L., Florence, C., & Moore, D. (2015). Exploring policies for the reduction of child physical abuse and neglect. *Child abuse & neglect*, 40, 1-11.
The presence of waitlists to access child care.	Klevens, J., Barnett, S. B. L., Florence, C., & Moore, D. (2015). Exploring policies for the reduction of child physical abuse and neglect. *Child abuse & neglect*, 40, 1-11.

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Intimate Partner Violence?

Definition	Reference
Lack of laws and sanctions against IPV (a qualitative study)	Lewis, M. J., West, B., Bautista, L., Greenberg, A. M., & Done-Perez, I. (2005). Perceptions of service providers and community members on intimate partner violence within a Latino community. *Health Educ Behav*, 32(1), 69-83. doi:10.1177/1090198104269510.
Perceived unwillingness of community members to intervene/assist women in a violent relationship	McDonnell, K. A., Burke, J. G., Gielen, A. C., O'Campo, P., & Weidl, M. (2011). Women's perceptions of their community's social norms towards assisting women who have experienced intimate partner violence. *J Urban Health*, 88(2), 240-253. doi:10.1007/s11524-011-9546-9.
Weak community sanctions against IPV and lack of access to shelters or family support	Counts, D. A., Brown, J. K. (1992). Sanctions and sanctuary: Cultural perspectives on the beating of wives. Boulder, CO: Westview Pr.

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How does Built Environment connects to…

Unspecified Traumatic Brain Injuries?

Definition	Reference
Rural location	Gabella, B., Hoffman, R. E., Marine, W. W., & Stallones, L. (1997). Urban and rural traumatic brain injuries in Colorado. Annals of epidemiology, 7(3), 207-212.

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Motor Vehicle Injuries?

Definition	Reference
Areas with street posted speed limit of greater than 64 miles per hour, a high traffic volume, and marked crosswalks	Mueller, B. A., Rivara, F. P., Lii, S. M., & Weiss, N. S. (1990). Environmental factors and the risk for childhood pedestrian-motor vehicle collision occurrence. *American journal of epidemiology*, 132(3), 550-560.
Living in a multifamily dwelling without access to a yard or play area adjacent to home and living on busier streets	Mueller, B. A., Rivara, F. P., Lii, S. M., & Weiss, N. S. (1990). Environmental factors and the risk for childhood pedestrian-motor vehicle collision occurrence. *American journal of epidemiology*, 132(3), 550-560.
Marked crosswalks that were not accompanied with stop signs or traffic signals	Koepsell, T., McCloskey, L., Wolf, M., Moudon, A. V., Buchner, D., Kraus, J., & Patterson, M. (2002). Crosswalk markings and the risk of pedestrian–motor vehicle collisions in older pedestrians. *JAMA*, 288(17), 2136-2143.
Urban sprawl	Ewing, R., Schieber, R. A., & Zegeer, C. V. (2003). Urban sprawl as a risk factor in motor vehicle occupant and pedestrian fatalities. *American journal of public health*, 93(9), 1541-1545.
Rural location	Zwerling, C., Peek-Asa, C., Whitten, P. S., Choi, S. W., Sprince, N. L., & Jones, M. P. (2005). Fatal motor vehicle crashes in rural and urban areas: decomposing rates into contributing factors. *Injury Prevention*, 11(1), 24-28.

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How does Neighborhood Poverty connect to…

Unspecified Traumatic Brain Injuries?

Definition	Reference
Economically deprived urban areas	Das-Gupta, R., & Turner-Stokes, L. (2002). Traumatic brain injury. *Disability and Rehabilitation*, *24*(13), 654-665.
Economically depressed areas	Zink, B. J. (1996). Traumatic brain injury. *Emergency Medicine Clinics*, *14*(1), 115-150.

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Motor Vehicle Injuries?

Definition	Reference
Living in a census track with median income levels of less than $20,000 annually	Mueller, B. A., Rivara, F. P., Lii, S. M., & Weiss, N. S. (1990). Environmental factors and the risk for childhood pedestrian-motor vehicle collision occurrence. *American journal of epidemiology*, 132(3), 550-560.

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Child Abuse and Neglect?

Definition	Reference
Neighborhood impoverishment (high poverty, high unemployment rates)	Deccio, G., Horner, W. C., & Wilson, D. (1994). High-Risk Neighborhoods and High-Risk Families. *Journal of Social Service Research*, 18(3-4), 123-137. doi:10.1300/J079v18n03_06.

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Neighborhood Poverty Definitions

Intimate Partner Violence?

Definition	Reference
Concentrated Disadvantage	Pinchevsky, G. M., & Wright, E. M. (2012). The impact of neighborhoods on intimate partner violence and victimization. *Trauma Violence Abuse*, 13(2), 112-132. doi:10.1177/1524838012445641
Neighborhood low income	Bonomi, A. E., Trabert, B., Anderson, M. L., Kernic, M. A., & Holt, V. L. (2014). Intimate partner violence and neighborhood income: a longitudinal analysis. *Violence Against Women*, 20(1), 42-58. doi:10.1177/1077801213520580.

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Sexual Violence?

Definition	Reference
Poverty, food insecurity	Jewkes, R., Fulu, E., Roselli, T., & Garcia-Moreno, C. (2013). Prevalence of and factors associated with non-partner rape perpetration: findings from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific. *The Lancet Global Health*, 1(4), e208-e218. doi:10.1016/s2214-109x(13)70069-x.

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How does Association with Deviant Peers connect to…

Motor Vehicle Injuries?

Definition	Reference
Proportion of youth's friends who behave well in school (reverse coded), misbehave or break rules, experiment with smoking or other substances, and dress or act like a gang member.	Pelham III, W. E., & Dishion, T. J. (2018). Prospective prediction of arrests for driving under the influence from relationship patterns with family and friends in adolescence. *Addictive behaviors*, *78*, 36-42.

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Note: This definition ties Association with Deviant Peers to a Shared Risk Factor (Impaired Driving) rather than a MV injury outcome. It was included in this report due to its close relevance to CoreSVIPP work (with many CoreSVIPP awardees doing work that address both Association with Deviant Peers, and Impaired Driving).

Intimate Partner Violence?

Definition	Reference
Association with peers with negative gender beliefs	Reitzel-Jaffe, D., & Wolfe, D. A. (2001). Predictors of Relationship Abuse Among Young Men. *Journal of Interpersonal Violence*, 16(2), 99-115. doi:10.1177/088626001016002001

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Teen Dating Violence?

Definition	Reference
Friends who participate in violence towards peers and dating partners; involvement with antisocial peers; aggressive peer contexts	Capaldi, D. M., Knoble, N. B., Shortt, J. W., & Kim, H. K. (2012). A Systematic Review of Risk Factors for Intimate Partner Violence. *Partner Abuse*, 3(2), 231-280. doi:10.1891/1946-6560.3.2.231
Association with peers who report doing something dangerous on a dare, alcohol use, skipping school, lying to parents, and fighting	Casey, E. A., & Beadnell, B. (2010). The structure of male adolescent peer networks and risk for intimate partner violence perpetration: findings from a national sample. *J Youth Adolesc*, 39(6), 620-633. doi:10.1007/s10964-009-9423-y
Friends who have physically or sexual abused dating partners	Reed, E., Silverman, J. G., Raj, A., Decker, M. R., & Miller, E. (2011). Male perpetration of teen dating violence: associations with neighborhood violence involvement, gender attitudes, and perceived peer and neighborhood norms. *J Urban Health*, 88(2), 226-239. doi:10.1007/s11524-011-9545-x

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Association with Deviant Peers Definitions

Sexual Violence?

Definition	Reference
Friends who have physically or sexual abused dating partners	Reed, E., Silverman, J. G., Raj, A., Decker, M. R., & Miller, E. (2011). Male perpetration of teen dating violence: associations with neighborhood violence involvement, gender attitudes, and perceived peer and neighborhood norms. *J Urban Health*, 88(2), 226-239. doi:10.1007/s11524-011-9545-x
Association with sexually aggressive, hyper masculine, and delinquent peers	Murnen, S. K., & Kohlman, M. H. (2007). Athletic participation, fraternity membership, and sexual aggression among college men: A meta-analytic review. *Sex Roles*, 57(1-2), 145-157
Association with peers who condone sexual violence-supportive attitudes, beliefs, and behaviors	Abbey, A., Parkhill, M. R., Clinton-Sherrod, A. M., & Zawacki, T. (2007). A comparison of men who committed different types of sexual assault in a community sample. *Journal of interpersonal violence*, 22(12), 1567-1580;
Association with peers who engage in delinquent behaviors (theft, weapon use)	Basile, K. C., Hamburger, M. E., Swahn, M. H., & Choi, C. (2013). Sexual Violence Perpetration by Adolescents in Dating versus Same-Sex Peer Relationships: Differences in Associated Risk and Protective Factors. West *J Emerg Med*, 14(4), 329-340. doi:10.5811/westjem.2013.3.15684

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How does History of Violent Victimization connect to…

Unspecified Traumatic Brain Injuries?

Definition	Reference
Violent assault victimization	Thornhill S, Teasdale G, Murray G, McEwan J, Roy C, Penny K (2000) Disability in young people and adults one year after head injury: prospective cohort study. *Brit Med J* 320: 1631–1635.
Penetrating injury from gunshot wounds	Jennett, B., & Frankowski, R. F. (1990). The epidemiology of head injury. In Braakman, R. (Ed), *Handbook of Clinical Neurology* (1-16). New York: Elsevier Science.

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Child Abuse and Neglect?

Definition	Reference
Parents' history of child maltreatment in family of origin	Pears, K. C., & Capaldi, D. M. (2001). Intergenerational transmission of abuse: A two-generational prospective study of an at-risk sample. *Child abuse & neglect*, 25(11), 1439-1461.

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Child Abuse and Neglect Traumatic Brain Injuries?

Definition	Reference
Child abuse victimization	Greenwald, B. D., Burnett, D. M., & Miller, M. A. (2003). Congenital and acquired brain injury. 1. Brain injury: epidemiology and pathophysiology. *Archives of physical medicine and rehabilitation*, *84*(3 Suppl 1), S3-7.

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Intimate Partner Violence?

Definition	Reference
Abuse within the context of parental intimate partner violence as a child	Ernst, A. A., Weiss, S. J., & Enright-Smith, S. (2006). Child witnesses and victims in homes with adult intimate partner violence. *Acad Emerg Med*, 13(6), 696-699. doi:10.1197/j.aem.2005.12.020.
Childhood physical, abuse, childhood sexual abuse, childhood emotional abuse, sexual victimization	Fulu, E., Jewkes, R., Roselli, T., & Garcia-Moreno, C. (2013). Prevalence of and factors associated with male perpetration of intimate partner violence: findings from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific. *The Lancet Global Health*, 1(4), e187-e207. doi:10.1016/s2214-109x(13)70074-3.

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Teen Dating Violence?

Definition	Reference
Youth victimization from conventional crime, maltreatment, victimization by peers and siblings, sexual victimization, and witnessing violence	Hamby, S., Finkelhor, D., & Turner, H. (2012). Teen dating violence: Co-occurrence with other victimizations in the National Survey of Children's Exposure to Violence (NatSCEV). *Psychology of Violence*, 2(2), 111-124. doi:10.1037/a0027191.

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Sexual Violence?

Definition	Reference
Childhood emotional and physical abuse	Abbey, A., Wegner, R., Pierce, J., & Jacques-Tiura, A. J. (2012). Patterns of Sexual Aggression in a Community Sample of Young Men: Risk Factors Associated with Persistence, Desistance, and Initiation Over a One Year Interval. *Psychol Violence*, 2(1), 1-15. doi:10.1037/a0026346
Exposure to childhood physical abuse, emotional abuse, and neglect. History of experience of homophobic violence	Jewkes, R., Fulu, E., Roselli, T., & Garcia-Moreno, C. (2013). Prevalence of and factors associated with non-partner rape perpetration: findings from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific. *The Lancet Global Health*, 1(4), e208-e218. doi:10.1016/s2214-109x(13)70069-x
Childhood sexual abuse, physical abuse, emotional abuse, sexual violence victimization during adolescence or adulthood	Tharp, A. T., DeGue, S., Valle, L. A., Brookmeyer, K. A., Massetti, G. M., & Matjasko, J. L. (2012). A systematic qualitative review of risk and protective factors for sexual violence perpetration. *Trauma Violence Abuse*, 14(2), 133-167. doi:10.1177/1524838012470031

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How does Impaired Driving connect to…

Motor Vehicle Injuries?

Definition	Reference
Being BAC-positive at hospital admission	Stoduto, G., Vingilis, E., Kapur, B. M., Sheu, W. J., McLellan, B. A., & Liban, C. B. (1993). Alcohol and drug use among motor vehicle collision victims admitted to a regional trauma unit: demographic, injury, and crash characteristics. *Accident Analysis & Prevention*, 25(4), 411-420.
Recent use of cannabis and combining use of cannabis and alcohol	Ramaekers, J. G., Berghaus, G., van Laar, M., & Drummer, O. H. (2004). Dose related risk of motor vehicle crashes after cannabis use. *Drug and alcohol dependence*, 73(2), 109-119.

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Motor Vehicle Traumatic Brain Injuries?

Definition	Reference
Motor vehicle crashes involving alcohol and drug use	Neyens, D. M., & Boyle, L. N. (2012). Crash risk factors related to individuals sustaining and drivers following traumatic brain injuries. *Accident Analysis & Prevention*, *49*, 266-273.

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How does Low Cognitive Abilities connect to…

Unspecified Traumatic Brain Injuries?

Definition	Reference
Lower cognitive ability before sustaining a TBI (increases vulnerability for post injury cognitive symptoms over time)	Fay, T. B., Yeates, K. O., Taylor, H. G., Bangert, B., Dietrich, A. N. N., Nuss, K. E., ... & Wright, M. (2010). Cognitive reserve as a moderator of postconcussive symptoms in children with complicated and uncomplicated mild traumatic brain injury. *Journal of the International Neuropsychological Society*, 16(1), 94-105.

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Motor Vehicle Injuries?

Definition	Reference
Being diagnosed with Alzheimer type dementia	Friedland, R. P., Koss, E., Kumar, A., Gaine, S., Metzler, D., Haxby, J. V., & Moore, A. (1988). Motor vehicle crashes in dementia of the Alzheimer type. *Annals of neurology*, 24(6), 782-786.
Poor performance on a free-recall memory test	Foley, D. J., Wallace, R. B., & Eberhard, J. (1995). Risk factors for motor vehicle crashes among older drivers in a rural community. *Journal of the American Geriatrics Society*, 43(7), 776-781.

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How does Medication Adverse Effects and Misuse (including opioids) connect to…

Unspecified Traumatic Brain Injuries?

Definition	Reference
Anticoagulant therapy and platelet aggregation inhibitors	Roozenbeek, B., Maas, A. I., & Menon, D. K. (2013). Changing patterns in the epidemiology of traumatic brain injury. *Nature Reviews Neurology*, *9*(4), 231.

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Motor Vehicle Injuries?

Definition	Reference
Missing a dose of antiepileptic drug (for individuals with epilepsy)	Krauss, G. L., Krumholz, A., Carter, R. C., Li, G., & Kaplan, P. (1999). Risk factors for seizure-related motor vehicle crashes in patients with epilepsy. *Neurology*, 52(7), 1324-1324.
Benzodiazepines, particularly longer-acting forms or in large quantities	Thomas, R. E. (1998). Benzodiazepine use and motor vehicle accidents. Systematic review of reported association. *Canadian Family Physician*, 44, 799.
Nonsteroidal anti-inflammatory drugs	Foley, D. J., Wallace, R. B., & Eberhard, J. (1995). Risk factors for motor vehicle crashes among older drivers in a rural community. *Journal of the American Geriatrics Society*, 43(7), 776-781.
Cyclic antidepressants and opioid analgesics	Leveille, S. G., Büchner, D. M., Koepsell, T. D., McCloskey, L. W., Wolf, M. E., & Wagner, E. H. (1994). Psychoactive medications and injurious motor vehicle collisions involving older drivers. *Epidemiology*, 5(6), 591-598.

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How does Poor Behavioral Control/Impulsiveness connect to…

Motor Vehicle Injuries?

Definition	Reference
Low conscientiousness	Arthur Jr, W., & Doverspike, D. (2001). Predicting motor vehicle crash involvement from a personality measure and a driving knowledge test. *Journal of Prevention & Intervention in the Community*, 22(1), 35-42.

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Child Abuse and Neglect?

Definition	Reference
High maternal hostility	Brown, J., Cohen, P., Johnson, J. G., & Salzinger, S. (1998). A longitudinal analysis of risk factors for child maltreatment: Findings of a 17-year prospective study of officially recorded and self-reported child abuse and neglect. *Child abuse & neglect*, 22(11), 1065-1078.
Parent anger/hyper-reactivity	Stith, S. M., Liu, T., Davies, L. C., Boykin, E. L., Alder, M. C., Harris, J. M., . . . Dees, J. E. M. E. G. (2009). Risk factors in child maltreatment: A meta-analytic review of the literature. *Aggression and Violent Behavior*, 14(1), 13-29. doi:10.1016/j.avb.2006.03.006.
Parents' high reactivity and impulsivity	Black, D. A., Heyman, R. E., & Slep, A. M. S. (2001). Risk factors for child physical abuse. *Aggression and violent behavior*, 6(2), 121-188.
Parents' lack of understanding of children's needs, child development and parenting skills and predisposition for aggressive coping	Dukewich, T. L., Borkowski, J. G., & Whitman, T. L. (1996). Adolescent mothers and child abuse potential: An evaluation of risk factors. *Child abuse & neglect*, 20(11), 1031-1047.

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Intimate Partner Violence?

Definition	Reference
Aggressiveness, antisocial personality disorder, hostility, and conduct disorder	Capaldi, D. M., Knoble, N. B., Shortt, J. W., & Kim, H. K. (2012). A Systematic Review of Risk Factors for Intimate Partner Violence. *Partner Abuse*, 3(2), 231-280. doi:10.1891/1946-6560.3.2.231

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Poor Behavioral Control/Impulsiveness

Teen Dating Violence?

Definition	Reference
Antisocial behavior (theft, vandalism, aggression, substance abuse)	Lavoie, F., Herbert, M., Tremblay, R., Vitaro, F., Vezina, L., & McDuff, P. (2002). History of family dysfunction and perpetration of dating violence by adolescent boys: A longitudinal study. *Journal of Adolescent Health*, 30, 375–383.
Aggression	Kerr, D. C. R., & Capaldi, D. M. (2011). Young men's intimate partner violence and relationship functioning: long-term outcomes associated with suicide attempt and aggression in adolescence. *Psychological Medicine*, 41, 759–769.
History of physical, verbal, and sexual aggression	Gidycz, C. A., Warkentin, J. B., & Orchowski, L. M. (2007). Predictors of perpetration of verbal, physical, and sexual violence: A prospective analysis of college men. *Psychology of Men and Masculinity*, 8(2), 79–94.

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Sexual Violence?

Definition	Reference
Adolescent delinquency	Abbey, A., Jacques-Tiura, A. J., & LeBreton, J. M. (2011). Risk factors for sexual aggression in young men: an expansion of the confluence model. *Aggress Behav*, 37(5), 450-464. doi:10.1002/ab.20399.
Aggression	Tharp, A. T., DeGue, S., Valle, L. A., Brookmeyer, K. A., Massetti, G. M., & Matjasko, J. L. (2013). A systematic qualitative review of risk and protective factors for sexual violence perpetration. *Trauma, Violence, & Abuse*, 14(2), 133-167.

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How does Psychological/Mental Health Problems connect to…

Motor Vehicle Injuries?

Definition	Reference
Psychiatric disorders or schizophrenia	Charlton, J., Koppel, S., O'Hare, M., Andrea, D., Smith, G., Khodr, B., ... & Fildes, B. (2004). Influence of chronic illness on crash involvement of motor vehicle drivers.

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Child Abuse and Neglect?

Definition	Reference
Parental depression, parental post-traumatic stress disorder	Pears, K. C., & Capaldi, D. M. (2001). Intergenerational transmission of abuse: A two-generational prospective study of an at-risk sample. *Child abuse & neglect*, 25(11), 1439-1461.
Paternal psychopathology	Brown, J., Cohen, P., Johnson, J. G., & Salzinger, S. (1998). A longitudinal analysis of risk factors for child maltreatment: Findings of a 17-year prospective study of officially recorded and self-reported child abuse and neglect. *Child abuse & neglect*, 22(11), 1065-1078.

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Intimate Partner Violence?

Definition	Reference
Depression	Herrenkohl, T. I., Kosterman, R., Mason, W. A., & Hawkins, J. D. (2007). Youth violence trajectories and proximal characteristics of intimate partner violence. *Violence and victims*, 22(3), 259-274.; Fulu, E., Jewkes, R., Roselli, T., & Garcia-Moreno, C. (2013). Prevalence of and factors associated with male perpetration of intimate partner violence: findings from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific. *The Lancet Global Health*, 1(4), e187-e207. doi:10.1016/s2214-109x(13)70074-3.

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Psychological/Mental Health Problems Definitions

Teen Dating Violence?

Definition	Reference
Anxiety, depression	Foshee, V. A., Reyes, H. L., & Ennett, S. T. (2010). Examination of sex and race differences in longitudinal predictors of the initiation of adolescent dating violence perpetration. *Journal of Aggression, Maltreatment and Trauma*, 19(5), 492–516. doi:10.1080/10926771.2010.495032.
Trauma-related symptoms (anger, anxiety, hyperactivity, posttraumatic stress, dissociation, depression, and sexual dysfunction)	Wolfe, D. A., Wekerle, C., Scott, K., Straatman, A.-L., & Grasley, C. (2004). Predicting abuse in adolescent dating relationships over 1 year: The role of child maltreatment and trauma. *Journal of Abnormal Psychology*, 113(3), 406–415. doi:10.1037/0021-843X.113.3.406.
Emotional distress (depression, anxiety, anger)	Tschann, J. M., Pasch, L. A., Flores, E., Marin, B. V. O., Baisch, E. M., & Wibbelsman, C. J. (2009). Nonviolent aspects of interparental conflict and dating violence among adolescents. *Journal of Family Issues*, 30(3), 295–319. doi:10.1177/0192513 X08325010.

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Sexual Violence?

Definition	Reference
Axis I and II disorders, antisocial and psychopathic disorders, anxiety	Tharp, A. T., DeGue, S., Valle, L. A., Brookmeyer, K. A., Massetti, G. M., & Matjasko, J. L. (2013). A systematic qualitative review of risk and protective factors for sexual violence perpetration. *Trauma, Violence, & Abuse*, 14(2), 133-167

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How does Rigid Gender Norms connect to…

Motor Vehicle Injuries?

Definition	Reference
Men who report greater conformity to masculine gender norms and perception of men's health behaviors	Mahalik, J. R., Burns, S. M., & Syzdek, M. (2007). Masculinity and perceived normative health behaviors as predictors of men's health behaviors. *Social science & medicine*, *64*(11), 2201-2209.

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Note: This definition ties Rigid Gender Norms to a Shared Risk Factor (Seat Belt Use) rather than a MV injury outcome. It was included in this report due to its close relevance to CoreSVIPP work (with many CoreSVIPP awardees doing work that address both Rigid Gender Norms and Seat Belt Use).

Child Abuse and Neglect?

Definition	Reference
Fathers' Machismo	Ferrari, A. M. (2002). The impact of culture upon child rearing practices and definitions of maltreatment. *Child abuse & neglect*, 26(8), 793-813.
Female status (female participation in labor force, ratio of female to male enrollment in higher education)	Briggs, C. M., & Cutright, P. (1994). Structural and cultural determinants of child homicide: a cross-national analysis. *Violence and Victims*, 9(1), 3-16.

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Rigid Gender Norms Definitions

Intimate Partner Violence?

Definition	Reference
Attitudes unsupportive of gender equity	Fulu, E., Jewkes, R., Roselli, T., & Garcia-Moreno, C. (2013). Prevalence of and factors associated with male perpetration of intimate partner violence: findings from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific. *The Lancet Global Health,* 1(4), e187-e207. doi:10.1016/s2214-109x(13)70074-3.
Inequitable gender attitudes	Fleming, P. J., McCleary-Sills, J., Morton, M., Levtov, R., Heilman, B., & Barker, G. (2015). Risk factors for men's lifetime perpetration of physical violence against intimate partners: results from the international men and gender equality survey (IMAGES) in eight countries. *PLoS One*, 10(3), e0118639. doi:10.1371/journal.pone.0118639
Masculine gender role stress (stress related to physical inadequacy, emotional inexpressiveness, subordination to women, intellectual inferiority, performance failure)	Moore, T. M., Stuart, G. L., McNulty, J. K., Addis, M. E., Cordova, J. V., & Temple, J. R. (2008). Domains of masculine gender role stress and intimate partner violence in a clinical sample of violent men. *Psychology of Men & Masculinity*, 9(2), 82-89. doi:10.1037/1524-9220.9.2.82.
Societies where women do not have economic decision-making power, easy access to divorce, or opportunities to participate in the workforce with other women	Levinson, D. (1989). Family violence in cross-cultural perspective. Thousand Oaks, CA: Sage Publications.

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Teen Dating Violence?

Definition	Reference
Negative attitudes toward women, adversarial sexual beliefs, rape myth acceptance	Reitzel-Jaffe, D., & Wolfe, D. A. (2001). Predictors of Relationship Abuse Among Young Men. *Journal of Interpersonal Violence*, 16(2), 99-115. doi:10.1177/088626001016002001
Negative attitudes towards gender and sex	Reed, E., Silverman, J. G., Raj, A., Decker, M. R., & Miller, E. (2011). Male perpetration of teen dating violence: associations with neighborhood violence involvement, gender attitudes, and perceived peer and neighborhood norms. *J Urban Health*, 88(2), 226-239. doi:10.1007/s11524-011-9545-x

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Rigid Gender Norms Definitions

Sexual Violence?

Definition	Reference
Association with male peer groups with strong norms and ideologies supporting traditional masculinity (athletic groups, fraternities)	Murnen, S. K., & Kohlman, M. H. (2007). Athletic participation, fraternity membership, and sexual aggression among college men: A meta-analytic review. *Sex Roles*, 57(1-2), 145-157.
Cultural attitudes that are unsupportive of gender equity, and attitudes supporting sexual entitlement, and dominance over women	Jewkes, R., Fulu, E., Roselli, T., & Garcia-Moreno, C. (2013). Prevalence of and factors associated with non-partner rape perpetration: findings from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific. *The Lancet Global Health*, 1(4), e208-e218. doi:10.1016/s2214-109x(13)70069-x.
Economic, political, and legal gender inequality	Baron, L., & Straus, M. A. (1987). Four theories of rape: A macrosociological analysis. *Social Problems*, 34(5), 467-489.
Homophobic teasing	Espelage, D. L., Basile, K. C., & Hamburger, M. E. (2012). Bullying perpetration and subsequent sexual violence perpetration among middle school students. *J Adolesc Health*, 50(1), 60-65. doi:10.1016/j.jadohealth.2011.07.015.
Hostile masculinity (sexual dominance, stereotypes about women, hostility toward women)	Abbey, A., Jacques-Tiura, A. J., & LeBreton, J. M. (2011). Risk factors for sexual aggression in young men: an expansion of the confluence model. *Aggress Behav*, 37(5), 450-464. doi:10.1002/ab.20399.

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How does Sleep Problems connect to…

Motor Vehicle Injuries?

Definition	Reference
Drivers who felt that they were falling asleep, drove longer distances with greater risk for each additional 100 miles, and had less than nine hours sleep over the last 48 hours	Cummings, P., Koepsell, T. D., Moffat, J. M., & Rivara, F. P. (2001). Drowsiness, counter-measures to drowsiness, and the risk of a motor vehicle crash. *Injury Prevention*, 7(3), 194-199.
Obstructive sleep apnea/hyponoea	Mulgrew, A. T., Nasvadi, G., Butt, A., Cheema, R., Fox, N., Fleetham, J. A., ... & Ayas, N. T. (2008). Risk and severity of motor vehicle crashes in patients with obstructive sleep apnoea/hypopnoea. *Thorax*, 63(6), 536-541.
Sleep disorder breathing	Young, T., Blustein, J., Finn, L., & Palta, M. (1997). Sleep-disordered breathing and motor vehicle accidents in a population-based sample of employed adults. *Sleep*, 20(8), 608-613.
Sleep apnea	Charlton, J., Koppel, S., O'Hare, M., Andrea, D., Smith, G., Khodr, B., ... & Fildes, B. (2004). Influence of chronic illness on crash involvement of motor vehicle drivers.

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Motor Vehicle Traumatic Brain Injuries?

Definition	Reference
Driver fatigue	Neyens, D. M., & Boyle, L. N. (2012). Crash risk factors related to individuals sustaining and drivers following traumatic brain injuries. *Accident Analysis & Prevention*, *49*, 266-273.

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How does Substance Use connect to…

Unspecified Traumatic Brain Injuries?

Definition	Reference
Intoxication with a blood alcohol concentration of 0.8% or higher	Tagliaferri, F., Compagnone, C., Korsic, M., Servadei, F., & Kraus, J. (2006). A systematic review of brain injury epidemiology in Europe. *Acta neurochirurgica*, *148*(3), 255-268.

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Motor Vehicle Injuries?

Definition	Reference
Alcohol abuse and dependence	Charlton, J., Koppel, S., O'Hare, M., Andrea, D., Smith, G., Khodr, B., ... & Fildes, B. (2004). Influence of chronic illness on crash involvement of motor vehicle drivers.
Early age of onset of drinking alcohol (particularly for those starting under age 14)	Hingson, R., Heeren, T., Levenson, S., Jamanka, A., & Voas, R. (2002). Age of drinking onset, driving after drinking, and involvement in alcohol related motor-vehicle crashes. *Accident Analysis & Prevention*, 34(1), 85-92.; Hingson, R. W., Edwards, E. M., Heeren, T., & Rosenbloom, D. (2009). Age of drinking onset and injuries, motor vehicle crashes, and physical fights after drinking and when not drinking. *Alcoholism: Clinical and Experimental Research*, 33(5), 783-790.

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Child Abuse and Neglect?

Definition	Reference
Prenatal maternal alcohol and drug use	Smith, D. K., Johnson, A. B., Pears, K. C., Fisher, P. A., & DeGarmo, D. S. (2007). Child maltreatment and foster care: unpacking the effects of prenatal and postnatal parental substance use. *Child Maltreat*, 12(2), 150-160. doi:10.1177/1077559507300129

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Intimate Partner Violence?

Definition	Reference
Alcohol and drug use	Feingold, A, Kerr, D. C., & Capaldi, D. M. (2008). Associations of substance use problems with intimate partner violence for at-risk men in long-term relationships. *Journal of Family Psychology*, 22(3),429-438.
Alcohol misuse	Fulu, E., Jewkes, R., Roselli, T., & Garcia-Moreno, C. (2013). Prevalence of and factors associated with male perpetration of intimate partner violence: findings from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific. *The Lancet Global Health*, 1(4), e187-e207. doi:10.1016/s2214-109x(13)70074-3.
Alcohol use and binge drinking	Shorey, R. C., Brasfield, H., Zapor, H. Z., Febres, J., & Stuart, G. L. (2015). The relation between alcohol use and psychological, physical, and sexual dating violence perpetration among male college students. *Violence Against Women*, 21(2), 151-164. doi:10.1177/1077801214564689.

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Teen Dating Violence?

Definition	Reference
Drug and alcohol use, drinking frequency	Schnurr, M. P., & Lohman, B. J. (2008). How much does school matter? An examination of adolescent dating violence perpetration. *Journal of youth and adolescence*, 37(3), 266-283.; Cleveland, H. H., Herrera, V. M., & Stuewig, J. (2003). Abusive males and abused females in adolescent relationships: Risk factor similarity and dissimilarity and the role of relationship seriousness. *Journal of Family Violence*, 18(6), 325-339.
Early initiation of alcohol use	Swahn, M. H., Simon, T. R., Arias, I., & Bossarte, R. M. (2008). Measuring sex differences in violence victimization and perpetration within date and same-sex peer relationships. *Journal of Interpersonal Violence*, 23(8),1120-1138; Reyes, H. L., Foshee, V. A, Bauer, D. J., & Ennett, S. T. (2011). The role of heavy alcohol use in the developmental process of desistance in dating aggression during adolescence. *Journal of Abnormal Child Psychology*, 39(2),239-250.

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Substance Use Definitions

Sexual Violence?

Definition	Reference
Alcohol problems, drug use	Jewkes, R., Fulu, E., Roselli, T., & Garcia-Moreno, C. (2013). Prevalence of and factors associated with non-partner rape perpetration: findings from the UN Multi-country Cross-sectional Study on Men and Violence in Asia and the Pacific. *The Lancet Global Health*, 1(4), e208-e218. doi:10.1016/s2214-109x(13)70069-x.
Alcohol use and binge drinking	Shorey, R. C., Brasfield, H., Zapor, H. Z., Febres, J., & Stuart, G. L. (2015). The relation between alcohol use and psychological, physical, and sexual dating violence perpetration among male college students. *Violence Against Women*, 21(2), 151-164. doi:10.1177/1077801214564689.
Heavy alcohol consumption	Abbey, A., Jacques-Tiura, A. J., & LeBreton, J. M. (2011). Risk factors for sexual aggression in young men: an expansion of the confluence model. *Aggress Behav*, 37(5), 450-464. doi:10.1002/ab.20399.

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