

PIER Matrix for Problem Definition Library

This is a library of pre-filled matrices for various pediatric injury areas. The systems level modifiable contributing factors are identified from the literature. You may notice that some of the factors are root causes that are cross cutting through various forms of injury, increasing impact if they are addressed. This section is then used to develop the systems level problem definition, informed by national population-level data, in the second column from the right. The template is below:

Countermeasures	Systems Level Modifiable Contributing Factors	(Aggregate) Modifiable Contributing Factors	Intersectional Identities Impacted (i.e. ability, class, gender, immigrant status, race, sexual orientation, etc.)	Systems Level Problem Definition	(Aggregate) Problem Definition
Natural and Built Environment (i.e. infrastructure)	Prefilled			Prefilled	Format below
Equipment & Technology (i.e. car seat, gun safe)					
Education					
Treatment & Recovery (post-event)					
Others					

Problem Definition Format: In our *(identify local/regional/state)* context, *(state magnitude of problem & population most impacted)*. This is impacted by *(state contributing factors)*.



PIER Matrix for Problem Definition for Drowning

Countermeasures	Systems Level Modifiable Contributing Factors	(Aggregate) Modifiable Contributing Factors	Intersectional Identities Impacted (i.e. ability, class, gender, immigrant status, race, sexual orientation, etc.)	Systems Level Problem Definition	(Aggregate) Problem Definition
Natural and Built Environment (i.e.infrastructure)	Historic segregation and closure of swimming areas leading to reduced access to swimming opportunities		Race, class	Drowning disproportionately impacts children who are neurodivergent, whose families have historically had less access to swimming opportunities due to their race or class, and children who are more often exposed to water, impacted by historic segregation and both historic and contemporary poor access to protective factors such as lifeguard monitored pools, accessible swim lessons, and high quality timely resuscitative measures.	
	Close proximity to natural bodies of water		Race, class		
	Lack of consistent multilingual safety signage		Race, class, language		
	Lack of lifeguards in swimming areas		Class		
Equipment & Technology (i.e.car seat, gun safe)	Prohibitive cost of US Coast Guard approved life jacket (>\$30)		Class		
	Inconsistent availability of life jacket loaner stations and life rings		Class		
	Safety equipment instructions in limited languages & grade level		Language		
Education	Swimming lessons: Lack of access due to cost, availability for multilingual, geographic area, or children with disabilities		Ability, language, class, race		
	CPR Education: Not consistently offered, multilingual access, cost		Class, language		
Treatment & Recovery (post-event)	Language barriers leading to delays in EMS response		Language		
	Delayed EMS Response time due to distance		Rurality		
	Lack of access to trauma center with high pediatric readiness		Rurality		
	Worse trauma outcomes in Black children		Race		
	Reduced access to rehab and mental health services		Race, class		
	Reduced caretaker availability based on leave policies at work		Race, class		
Others					



PIER Matrix for Problem Definition for Firearm Injuries

Countermeasures	Systems Level Modifiable Contributing Factors	(Aggregate) Modifiable Contributing Factors	Intersectional Identities Impacted (i.e. ability, class, gender, immigrant status, race, sexual orientation, etc.)	Systems Level Problem Definition	(Aggregate) Problem Definition
Natural and Built Environment (i.e.infrastructure)	Limited access to green spaces		Race, class	Firearm injuries are the leading cause of death in children and disproportionately impact children who live in rural areas, and children who are of Black or American Indian/Alaska Native background; impacted by societal factors such as Black and indigenous communities living in dense poverty, built environment factors such as abandoned lots and less green spaces in those communities, and access to timely and high quality trauma care.	
	Historic redlining leading to segregated neighborhoods with deep poverty		Race, class		
	Less space to commune leading to less opportunity to diffuse conflict by bystanders		Race, class		
Equipment & Technology (i.e.car seat, gun safe)	Lack of affordable biometric gun safe/lock box		All		
	Availability of guns in neighborhood		Race, class		
	Lack of technology for biometric gun		All		
	Safety equipment instructions in limited languages and grade level		Language		
Education	Firearm safety classes costly and prohibitive to certain populations		Class, ability		
	CPR Education: Not consistently offered, multilingual access, cost		Class, language		
Treatment & Recovery (post-event)	Language barriers leading to delays in EMS response		Language		
	Delayed EMS Response time due to distance		Rurality		
	Lack of access to trauma center with high pediatric readiness		Rurality		
	Worse trauma outcomes in Black children		Race		
	Reduced access to rehab and mental health services		Race, class		
	Reduced caretaker availability based on leave policies at work		Race, class		
Others					



PIER Matrix for Problem Definition for SUID/Infant Suffocation

Countermeasures	Systems Level Modifiable Contributing Factors	(Aggregate) Modifiable Contributing Factors	Intersectional Identities Impacted (i.e. ability, class, gender, immigrant status, race, sexual orientation, etc.)	Systems Level Problem Definition	(Aggregate) Problem Definition
Natural and Built Environment (i.e. infrastructure)	Lack of stable housing leads to Increased risk of unsafe sleep environment (such as adult bedding, bed sharing, sleeping on couch, etc.)		Race, class	SUID, which has significant racial and geographic disparities and is often secondary to suffocation from unsafe sleep environments, is impacted by exposure to various societal factors such as racism and poverty; and social drivers of health such as unstable housing, lack of paid family leave and difficulty accessing safe sleep products.	
Equipment & Technology (i.e. car seat, gun safe)	Recalls (and therefore less availability) of low cost mobile sleep options for infants		Class		
	Safety equipment instructions in limited languages and grade level		Language		
Education	Lack of culturally and linguistically tailored education for diverse community		Ability, language, class, race		
	CPR Education: Not consistently offered, multilingual access, cost		Class, language		
Treatment & Recovery (post-event)	Language barriers leading to delays in EMS response		Language		
	Delayed EMS Response time due to distance		Rurality		
	Lack of access to trauma center with high pediatric readiness		Rurality		
	Worse trauma outcomes in Black children		Race		
	Reduced access to rehab and mental health services		Race, class		
	Stigma due to police and CPS involvement, leading to less disclosure and therefore less risk perception in community		Race, class		
	Reduced caretaker availability based on leave policies at work		Race, class		
Others					



PIER Matrix for Problem Definition for Fire/Burn Injuries

Countermeasures	Systems Level Modifiable Contributing Factors	(Aggregate) Modifiable Contributing Factors	Intersectional Identities Impacted (i.e. ability, class, gender, immigrant status, race, sexual orientation, etc.)	Systems Level Problem Definition	(Aggregate) Problem Definition
Natural and Built Environment (i.e.infrastructure)	Lack of building code enforcement		Race, class	Injuries from fire disproportionately impact families who are rural, Black, and American Indian/Alaska Native; impacted by dense poverty, built environment factors such as less fire safe homes and crowded housing conditions, and lack of access to timely and high quality trauma/burn care.	
	Lack of fire-retardant materials in housing		Class		
	Poorly functioning building heating systems and need for space heaters/other forms of heat		Class		
Equipment & Technology (i.e.car seat, gun safe)	Lack of maintenance of fire detection systems by landlord/home owner		Class		
	Lack (or poor function) of fire extinguisher systems		Class		
	Safety equipment instructions in limited languages and grade level		Language		
Education	CPR Education: Not consistently offered, multilingual access, cost		Class, language		
Treatment & Recovery (post-event)	Language barriers leading to delays in EMS response		Language		
	Delayed EMS Response time due to distance		Rurality		
	Lack of access to trauma center with high pediatric readiness		Rurality		
	Worse trauma outcomes in Black children		Race		
	Reduced access to rehab and mental health services		Race, class		
	Reduced caretaker availability based on leave policies at work		Race, class		
Others					



PIER Matrix for Problem Definition for Traffic Injuries

Countermeasures	Systems Level Modifiable Contributing Factors	(Aggregate) Modifiable Contributing Factors	Intersectional Identities Impacted (i.e. ability, class, gender, immigrant status, race, sexual orientation, etc.)	Systems Level Problem Definition	(Aggregate) Problem Definition
Natural and Built Environment (i.e. infrastructure)	Poor road design and traffic infrastructure, including lack of traffic calming measures, sidewalks, crosswalks, poor intersection design and lighting		Race, class	Road traffic injuries remain a leading cause of death in children, and significant disparities which disproportionately impact children of Black, AI/AN and rural backgrounds persist; impacted by factors such as historical redlining, lack of traffic calming and pedestrian friendly built environment features, and lack of access to timely and high quality trauma care.	
	Presence of arterial roads leading to higher speed and larger traffic volume		Race, class		
	Lack of infrastructure for adverse weather conditions		Class, rurality		
Equipment & Technology (i.e. car seat, gun safe)	Lack of pedestrian detection devices, crash avoidance, and other safety features as standard		Class		
	Lack of impaired driving detection on cars		Class		
	Lack of accessibility of child restraint systems in taxi, rideshare		Class		
	Cost of child restraint systems		Class		
	Safety equipment instructions in limited languages and grade level		Language		
Education	Lack of pedestrian education in multiple languages and for children with special needs		Ability, language, class		
	Lack of driving courses for driver without English proficiency		Language		
	Lack of standardized Graduated drivers license programs across nation		Class		
	CPR Education: Not consistently offered, multilingual access, cost		Class, language		
Treatment & Recovery (post-event)	Language barriers leading to delays in EMS response		Language		
	Delayed EMS Response time due to distance		Rurality		
	Lack of access to trauma center with high pediatric readiness		Rurality		
	Worse trauma outcomes in Black children		Race		
	Reduced access to rehab and mental health services		Race, class		
	Caretaker availability based on leave policies at work		Race, class		
Others					

