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Safe N' Sound:

An Evidence-Based Tool to Prioritize Injury Messages for Pediatric Health Care

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Abstract

Safe N' Sound is a computer-based tool that prioritizes key injury risks for toddlers and infants and provides tailored feedback. The program was implemented in 5 pediatric sites. Caregiver risk behaviors were analyzed and compared with corresponding national and state morbidity and mortality data. The priority risks identified were generally consistent with the incidence of injury. Frequencies of several risk behaviors varied across sites and differences were observed across ages. Use of a prioritization scheme may facilitate risk behavior counseling and reasonably result in a decrease in injury mortality or morbidity.

Keywords

anticipatory guidance; childhood injury; tailored communication; unintentional injury

From 1970 to 2007, unintentional injury has been and remains the leading cause of fatality for children aged 1 to 4 years, accounting for 34% to 37% of all childhood deaths in that time frame.¹ Incidents occurring at homes continue to be in the top-10 leading causes of infant/toddler fatal and nonfatal injuries in the United States.²

Counseling by pediatricians is currently recommended as a population-wide injury prevention strategy³ that can positively affect individual caregiver behavior.^{4–6} However, only an estimated 42% of the US children receive injury counseling in pediatric offices.⁶ Although provider attitudes toward injury prevention are favorable, level of knowledge varies and barriers to injury prevention counseling inhibit adequate provision.⁷ Primary reasons for low levels of injury prevention anticipatory guidance have been well documented^{8–10} indicating a need for counseling recommendations to be brief and targeted. In fact, targeted preschool age injury prevention advice that focuses on limited topics and messages delivered from a health care provider have been shown to be more efficacious than broader, all inclusive educational approaches.¹¹

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An important barrier to the provision of brief injury prevention counseling is the reality that there are numerous relevant injury prevention behaviors that could potentially be addressed, more than can be reasonably or effectively covered in a brief clinical encounter. Thus, a systematic method is needed for determining what topics to address. Previous research has examined the utility of basing the selection of injury prevention messages on parent interest or preference. Although such an approach aligns with parent interest for information and may therefore increase parents' attention to the information, the topics selected by parents showed no relation to actual injury risks.¹² Given that both message specificity and perceived relevance are critical components for motivating behavior change,^{13,14} an approach based on prioritizing the child's existing injury risks from parental practices may inform the counseling topics in a brief clinical visit.

Advances in health communication technology allow information collected from a computerized assessment to individualize the information provided. Theories of persuasion support that parents will be more likely to attend to messages if they believe they are highly relevant; tailoring the message increases its perceived relevance. Although tailoring can be based on demographics or psychosocial characteristics, in this case, we discuss tailoring on the basis of injury risk behaviors. To do so, however, requires selecting among a vast array of risk behaviors. A comprehensive risk assessment takes considerable time and is likely to identify more behaviors than what can be reasonably addressed. Thus, the use of a prioritization scheme within a tailored injury prevention program could be an efficient way to assist providers and families in identifying the most important behavior changes.

Safe N' Sound is a computerized tailored injury prevention assessment, risk prioritization, and anticipatory guidance program designed to prioritize and tailor injury prevention messages for parents of children aged 0 to 4 years. Parents complete a computer-based injury prevention assessment and receive individualized health communications addressing specific behaviors to reduce the child's injury risk; content of the tailored messages is grounded in social cognitive theory.¹⁵ Previous research has demonstrated the efficacy of the program in promoting greater behavior change than generic information. Parents who received tailored materials were more likely than those who received generic materials to adopt a new safety behavior.^{16,17} The brief computer-based parent-completed assessment is conducted in a prioritized way to minimize assessment time and deliver the highest-priority injury prevention messages. For each age group, questions are asked beginning with the highest-priority prevention behaviors, and the assessment ends when 2 priority risk areas are identified. Tailored print messages addressing these areas are then provided to the parent, along with a brief summary for the health care provider, which may be used to direct anticipatory guidance. The development of the prioritization scheme was guided by practice recommendations and review of the injury prevention literature; however, we had no way of knowing in advance the extent to which the resulting identified risks would yield a distribution of risks similar to actual injury data when the program was implemented in pediatric clinical care. This analysis examined the specific injury risks behaviors identified by the prioritization scheme for program users across multiple pediatric clinics and compared the frequency of these risks areas with state and national injury morbidity and mortality data. This analysis allowed us to determine the extent to which a prioritization based on self-reported injury risk behaviors corresponds to child injury risks in populations as a whole. If so, then addressing the identified injury risks would reasonably result in a reduction in injury morbidity and mortality, therefore suggesting targets for injury control.

METHODS

The *Safe N' Sound* program was implemented in 5 pediatric clinics for 9 months. These included rural and urban sites, sliding fee clinics, and primarily private pay practices, as well

as practices with high and low patient census. *Safe N' Sound* was placed in each waiting room accompanied by a banner and sign inviting caregivers of infants and children aged up to 4 years to participate; users self-selected for participation. Participant responses were anonymous and no identifying data were collected. Findings regarding the extent of program use by parents and providers in this translation study have been published previously.¹⁸ This study was approved by the institutional review board of the Carolinas Medical Center in Charlotte, North Carolina.

Program data

Caregivers completed questions related to their injury prevention behaviors on the basis of the relevant risks for their child's age and recommended prevention practices. The questions addressed specific risk behaviors within 6 broad injury categories—motor vehicle occupant, drowning, burn/fire, suffocation, falls, and poisoning. Specific risk behaviors were prioritized for each age group by the study team on the basis of the American Academy of Pediatrics recommendations and literature reviews on injury risk behavior. Consideration was given to the potential injury severity associated with the risk behavior as well as the availability and effectiveness of recommended countermeasures. For example, the highest priority was given to motor vehicle injury risks because of high potential lethality, effectiveness of car seats, and continuity throughout the age span. Within each broad injury category, multiple questions queried specific risk behaviors; for example, using an incorrect type of car seat, inconsistent use of seat, and removing the child from seat for care while traveling. Across all injury categories, specific risks were assessed in descending priority order (Table 1) for the child's age group. Once 2 injury risk behaviors were identified, the questionnaire was considered complete and *Safe N' Sound* printed 4 pages of injury prevention material specifically tailored to the identified risk behaviors. Three pages were designated for the caregiver (a summary sheet and one sheet addressing each of the 2 risks identified) and a 1-page summary was designated for the health care provider. If only 1 risk or no risk was identified, caregivers received messages reinforcing current injury prevention practices and encouraging attention to developmentally relevant changes in preventive behaviors.

Because the assessment ended when 2 risks were identified, not all risks were assessed for each caregiver. The study was designed to examine translation of this evidence-based program into clinical practice, where time and other practical constraints are highly relevant. Thus, the program was designed to address only 2 priority risk behaviors to focus behavior change efforts on the most critical behaviors, and did so in a prioritized order to minimize the parents' time completing the assessment. Because multiple well-child visits occur across a child's development, subsequent completion of the assessment at future visits would then result in messages targeting the next highest-priority behaviors or new developmentally relevant behaviors. Following completion of the injury assessment, the program collected demographic data. Responses were stored in the computer database and downloaded following study completion. Some parents started but did not complete the assessment; for this analysis, responses were included if the assessment was completed through the identification of 2 risk responses or fully completed but with only 1 or no risks identified.

Injury incidence

Nationwide and North Carolina state mortality data, as well as national morbidity data, were generated from the Centers for Disease Control and Prevention WISQARS database. Data were generated in 5-year intervals from 2003 to 2007, and the annual mean was calculated. To facilitate comparison of incidence data with the frequency of priority risks for program users, percentages for each injury area were calculated as a percentage of the total mortality or morbidity specifically from the 6 injury areas addressed by the program. Thus, injuries

from areas such as pedestrian or firearm (which were not covered in *Safe N' Sound*) were not included in the denominator.

North Carolina morbidity data were collected from the North Carolina Emergency Department database, NC DETECT, using the basic query line function for e-codes in the 6 injury categories matching the Centers for Disease Control and Prevention's matrix for injury coding and definitions for the years 2007 to 2009, which are the first years of data availability. Rates were calculated using the population numbers from the North Carolina State Center for Health Statistics database for years of reference. Mean annual incidence was calculated.

RESULTS

Across the 5 sites, 902 parents/guardians completed the program. Demographic characteristics of the program users are reported in Table 2.

Specific risk behaviors

The specific risk behaviors identified as one of the 2 highest-priority messages for each age group are presented in Table 1. For burn/fire risk, failing to check/change the smoke detector battery was the most common risk behavior for each age group; high hot-water temperature was a common risk for infants aged 0 to 6 months. Lack of stair gate use was a common fall risk among infants aged 7 to 11 months, while access to a second floor window was a frequent risk for children aged 2 to 4 years (and the only fall risk assessed for these age groups). Having soft objects in the bed was the most common suffocation risk for infants aged 0 to 6 months, while small toys and choking-risk foods were frequent risks among children aged 1 to 3 years. Use of the wrong type of car seat (or no car seat) and inconsistent car seat use were frequently reported by caregivers of children across all ages. The lowest frequencies for these 2 risks were in the 1-year age group (7.2% and 6.3%, respectively), whereas the highest frequencies of these risk responses occurred in the 4-year age group (25% and 16.7%). Across ages, access to standing water, and access to an unfenced pool were the most common drowning risks, although the rates of these risks were lower than the other behaviors assessed. In general, poisoning risks were the least frequently identified as one of the top-2 priority risks.

Frequency of identified priority injury categories and injury incidence data

Table 3 presents the frequency with which injury risk behaviors pertaining to each general injury area were identified by the *Safe N' Sound* program as one of the top-2 risks, along with corresponding national and state mortality and morbidity data. The most frequent areas identified as a priority injury risk for program users were behaviors pertaining to motor vehicle (33%) and fire/burn (25%), followed by suffocation (17%) and falls (12%). Frequency of motor vehicle risk showed the most variance across sites. In all sites, behaviors pertaining to poisoning were the least frequently identified as one of the top-2 priority risk behaviors (4%) and behaviors related to drowning the next least frequent (7%). National and state mortality data indicate suffocation as the highest cause of fatality, followed by drowning and motor vehicles (mortality from drowning is greater nationally; mortality for motor vehicles is greater statewide); falls were the most frequent causes of morbidity.

Table 3 also presents the frequency of risk areas identified by age. For example, among infants younger than 1 year, behaviors related to burn/fire and motor vehicle injuries were identified more frequently as a top risk for program users than these injury types are represented in the incidence data. Behaviors related to protecting the child in motor vehicles

was identified as a top priority for 37% of the program users with infants younger than 1 year. In comparison, motor vehicle injuries accounted for 8% of national fatalities in this age group, 10% of state fatalities, 4% of national morbidity, and 6% of state morbidity. Overall, for children aged 1 year and older, the frequency of risks identified was more consistent with injury incidence data than for those younger than 1 year. A few exceptions include the higher frequency of burn/fire risk among the 1-year age group and motor vehicle risk among the 4-year age group than their corresponding national and state injury rates.

CONCLUSIONS

Findings from the translation of this evidence-based injury prevention program suggest that use of a prioritization scheme to direct the provision of injury prevention anticipatory guidance may be a reasonable strategy to balance the need to provide such guidance with the time and attention constraints of a single office visit.

In general, the risks identified by *Safe N' Sound* were more consistent with mortality than morbidity incidence, reflecting the greater prioritization assigned to mortality risks in the program's development. Some differences existed in the frequency of risks identified by *Safe N' Sound* compared with the incidence data, with greater identification of burn/fire and motor vehicle risks, and less frequent identification of suffocation and drowning risks. These differences may reflect difficulties in obtaining accurate self-report of some risks, common reporting of certain risks judged to have high potential lethality, and inability to assess every risk behavior in each injury area.

The greater identification of burn/fire and motor vehicle risks is likely related to the high frequency of reported failure to check or change smoke detector batteries, to use the correct type of car seat, and to use the car seat consistently, all behaviors which were high in the priority ranking. These risks were assigned high priority because although fires and motor vehicle crashes are infrequent compared with injuries like falls, they can be highly lethal when they occur. The frequency of these risks, specifically the rates of car seat use and changing smoke detector batteries, is consistent with the literature on injury prevention priorities.⁷ The less frequent identification of suffocation and drowning risks may be due to difficulty in accurately assessing specific risk behaviors that contribute to these injuries. For instance, reporting of unsafe sleep position, presence of potentially hazardous items in the crib, or access to standing water may be less accurate than assessment of more concrete behaviors like use of a car seat or changing smoke detector batteries. Furthermore, cosleeping is known to be associated with suffocation fatalities, but was not assessed in this version of the program. In addition, access to residential pools among program users may not have accurately reflected the community drowning risk. Identification of fall risk was disproportionately lower than injury incidence morbidity in part because these risk behaviors were assigned lower prioritization than risks with greater lethality, and, in part, because of the inability to assess all risk behaviors within this broad category.

Other differences in the frequencies of risks identified by age were consistent with what is known about developmental changes and caregiver behavior. For example, motor vehicle risk was most frequently identified for infants younger than 1 year and for children aged 4 years. For infants younger than 1 year, this is the time when car seat usage is beginning and habits regarding use are being established by caregivers; thus, there may be less consistent use. Greater risk among children aged 4 years would also be anticipated because caregivers may not appropriately transition to booster seat usage.

It is notable that there were differences in the risk areas identified across the clinical sites. For example, clinic 4 had a substantially higher frequency of motor vehicle risk than the

other clinics and variance across clinics in burn/fire and suffocation risk was also observed. These findings suggest the utility of a tailored approach. Given the limited time allotted to a clinical encounter and thereby the limitation on the number of topics that can be covered at each visit, being able to identify the most relevant topics for the population served by each clinic would be expected to increase the effectiveness of anticipatory guidance to specific groups. Tailoring prevention to populations served with minimal time and effort and in a fluid manner can adapt to any shift in demographics.

Findings from *Safe N' Sound* also may highlight messaging that currently receives inadequate attention. For example, lack of checking smoke detector batteries was a frequently identified risk, yet may be overlooked by providers in favor of inquiring only about having a smoke detector—a very infrequent risk. Given the numerous potential injury prevention behaviors, the ability to assess a greater range of behaviors and prioritizing messages to family needs may be most likely to address varying individual injury risks and thereby impact injury incidence rates.

The development of the *Safe N' Sound* prioritization system illustrates challenges in determining how to prioritize the provision of health information. Although such a prioritization system targets crucial injury prevention behaviors, it could potentially neglect common but less severe injuries such as falls. In addition, although a broad range of injury risk behaviors were potentially assessed, notable omissions from the program are cosleeping as well as pedestrian, bicycle, and firearm injuries, all of which are being considered as a future addition. The large range of potential injury prevention behaviors that could be included highlights the dilemma of reconciling the need for a brief priority-based assessment with multiple areas of risk potential in a population, even those risks that are not injury related. Use of the program does not preclude the use of any other educational messages within the counseling setting to address local and individual areas of priority or preference. Finally, it is unknown whether message prioritization on the basis of reported risk, parent interest, or other methods would yield greater effectiveness, that is, greater reduction in injury incidence or injury impact. Study limitations include a single geographic region and self-selection of program users. Respondents may have been those who were more interested in injury prevention, were more comfortable with computer usage, or who had only 1 child to care for during their visit, allowing greater availability to complete an assessment while in the waiting room. Injury risk behaviors were identified through self-report and may have been impacted by perceived social desirability or recall bias. The number and scope of questions included in the assessment was necessarily limited by the need for brevity. Items assessed were consistent with injury prevention recommendations at the time of program development; further research should continue to identify the most critical behaviors to assess for health messaging. Notably, a Spanish version of the program was not yet developed at the time of this study but is now available; future research should address the use of the Spanish version of the program.

In addition to providing an evidence-based behavior change program that closely matches injury incidence risk, *Safe N' Sound* may advance the childhood injury prevention agenda by providing a way to prioritize and tailor messaging to each child's injury risk in a way that corresponds with new health information mediums such as electronic medical records.

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Table 1
 Prioritization Order of Specific Injury Risk Behaviors by Age Group and Percentage of Caregivers for Whom the Specific Behavior Was Identified as One of Their 2 Highest-Priority Risk Behaviors^a

Specific Risk Behavior	0-6 mo (n = 160)		7-11 mo (n = 91)		1 y (n = 166)		2 y (n = 83)		3 y (n = 103)		4 y (n = 299)	
	Order	%	Order	%	Order	%	Order	%	Order	%	Order	%
Motor vehicle occupant												
Incorrect type of car seat or no car seat used	1	13.5	1	19.4	1	7.2	1	11.6	1	14.4	1	25
Car seat not always used	2	16.7	2	13.1	2	6.3	2	10.3	2	6.2	2	16.7
Takes child out of car seat while riding	3	6.4	3	4.6	3	1.6	3	1.3	3	3.1	3	5.6
Drowning												
Pool not fenced	...	...	4	0.6	4	3	4	2.6	4	3.1	4	4.8
Leaves child alone in pool	...	...	5	0	5	0	5	0	5	0	5	0
Leaves child alone in tub	4	2.1	8	0.6	8	1.3	...	...	...	...	...	...
Child can access standing water (eg, kiddie pools or other containers)	...	...	9	2.3	9	1.6	9	7.1	9	10.8	9	4.7
Burns/fires												
No smoke detector	6	2.1	6	0	6	2	6	0.6	6	1.5	6	2.2
Smoke detector battery not checked or changed	7	14.2	7	17.1	7	22.4	7	20	7	17.9	7	12.9
Hot water temperature too high	11	12.4	18	1.1	18	2	12	0.6	10	9.7	10	9.3
Unused electrical outlets in home uncovered	...	...	19	1.7	19	0.3	20	0	...	...	...	...
Holds child while cooking	12	2.8	20	0.6	20	0	...	...	...	...	...	...
Cooks with child in the kitchen	...	...	...	...	...	...	21	0	18	0	18	0
Suffocation												
Unsafe sleep position	5	6	...	...	...	...	...	...	...	...	...	...
Soft objects in child's bed	10	13.8	...	...	...	...	...	...	...	...	...	...
Plays with small toys that can fit in the mouth	8	2.1	11	4	11	11.8	10	18.7	...	...	...	...
Child given foods that have choking risk	9	0.4	12	2.3	12	15.1	11	12.3	11	19	11	7.4
Loops on window/blinds cords	...	...	23	0.6	23	0	19	0	...	...	...	...
Falls												
Leaves child alone on bed, table, or countertop	13	1.4	...	...	...	...	...	...	...	...	...	...
Leaves child in high chair not strapped in	15	1.1	...	...	...	...	...	...	...	...	...	...
No stair gate	...	...	10	12	10	6.9	...	...	...	...	...	...
Stair gate not always closed	...	...	...	1.7	...	5.6	...	...	...	...	...	...

Specific Risk Behavior	0-6 mo (n = 160)		7-11 mo (n = 91)		1 y (n = 166)		2 y (n = 83)		3 y (n = 103)		4 y (n = 299)	
	Order	%	Order	%	Order	%	Order	%	Order	%	Order	%
Uses walker with wheels	14	5	...	...	...	...	...	...	...	...	...	...
Child can get to open the second floor window	8	13.5	8	10.3	8	9.7
Poisoning												
Cleaning supplies kept in reach	14	0.6	14	0.3	13	0	12	1	12	0
Cleaning supplies in unlocked cabinets	15	5.7	15	2	14	0.6	13	0	13	1.1
Medicines in reach	16	0	16	0	15	0.6	14	0	14	0.2
Medicine in unlocked cabinets	17	2.9	17	3.6	16	0	15	2.1	15	0.5
Medicines with no child-proof cap	24	0	24	0.3	22	0	19	0	19	0
Purses/bags from visitors accessible to child	21	1.1	21	1.3	17	0	16	1	16	0
Poison-control number not available	22	0	22	0.3	18	0	17	0	17	0

⁴The order indicates the order in which the items were assessed, and hence the prioritization order. Items with “...” were not assessed for this age group.

Table 2

Demographic Characteristics of Those Who Completed Program Assessment (N = 861)^a

Characteristic	Clinic 1, n (%)	Clinic 2, n (%)	Clinic 3, n (%)	Clinic 4, n (%)	Clinic 5, n (%)	Total, n (%)
Child age						
0–6 mo	50 (16.4)	18 (16.1)	44 (25.7)	35 (16)	9 (16.4)	156 (18.1)
7–11 mo	28 (9.2)	11 (9.8)	20 (11.7)	27 (12.3)	2 (3.6)	88 (10.2)
12–17 mo	25 (8.2)	24 (21.4)	12 (7)	20 (9.1)	11 (20)	92 (10.7)
18–23 mo	17 (5.6)	8 (7.1)	17 (9.9)	18 (8.2)	8 (14.5)	68 (7.9)
2 y	32 (10.5)	10 (8.9)	15 (8.8)	18 (8.2)	3 (5.5)	78 (9.1)
3 y	29 (9.5)	17 (15.2)	21 (12.3)	22 (10)	10 (18.2)	99 (11.5)
4 y	123 (40.5)	24 (21.4)	42 (24.6)	79 (36.1)	12 (21.8)	280 (32.5)
Sex of child						
Female	145 (47.7)	49 (43.8)	83 (48.5)	99 (45.2)	24 (43.6)	421 (48.9)
Male	159 (52.3)	63 (56.3)	88 (51.5)	120 (54.8)	31 (56.4)	440 (51.1)
Relationship to child						
Mother	124 (48.6)	82 (82)	134 (83.2)	119 (68.8)	41 (83.7)	500 (67.8)
Father	65 (25.5)	15 (15)	20 (12.4)	23 (13.3)	4 (8.2)	127 (17.2)
Grandmother/ grandfather	5 (2.0)	1 (1)	2 (1.2)	14 (8.1)	1 (2.0)	23 (3.1)
Guardian or other	61 (23.9)	2 (2)	5 (3.1)	17 (9.8)	3 (6.1)	88 (11.9)
Education						
Less than high school	37 (15.9)	2 (2.1)	9 (5.8)	45 (27.3)	2 (4.2)	95 (13.6)
High school diploma or equivalent	19 (8.2)	6 (6.3)	6 (3.8)	51 (30.9)	6 (12.5)	88 (12.6)
Some college	22 (9.4)	15 (15.6)	31 (19.9)	31 (18.8)	11 (22.9)	110 (15.8)
College graduates	89 (38.2)	51 (53.1)	84 (53.8)	21 (12.7)	21 (43.8)	266 (38.1)
Postgraduate	66 (28.3)	22 (22.9)	26 (16.7)	17 (10.3)	8 (16.7)	139 (19.9)
Total income, \$						
Less than 29 000	34 (15.7)	6 (6.9)	15 (10.3)	102 (67.1)	6 (13.0)	163 (25.2)
30 000–49 999	18 (8.3)	17 (19.5)	18 (12.4)	23 (15.1)	9 (19.6)	85 (13.2)
50 000–74 999	33 (15.3)	23 (26.4)	30 (20.7)	9 (5.9)	16 (34.8)	111 (17.2)
75 000 or more	131 (60.6)	41 (47.1)	82 (56.6)	18 (11.8)	15 (32.6)	287 (44.4)
Race						
White	142 (58.2)	80 (83.3)	99 (63.1)	16 (9.4)	35 (72.9)	372 (52)

Characteristic	Clinic 1, n (%)	Clinic 2, n (%)	Clinic 3, n (%)	Clinic 4, n (%)	Clinic 5, n (%)	Total, n (%)
African American	18 (7.4)	5 (5.2)	20 (12.7)	72 (42.1)	9 (18.8)	124 (17.3)
Asian	12 (4.9)	4 (4.2)	7 (4.5)	6 (3.5)	1 (2.1)	30 (4.2)
Hispanic/Latino	15 (6.1)	4 (4.2)	15 (9.6)	51 (29.8)	3 (6.3)	88 (12.3)
Native American/ American Indian	12 (4.9)	0	4 (2.5)	7 (4.1)	0	23 (3.2)
Other	45 (18.4)	3 (3.1)	12 (7.6)	19 (11.1)	0	79 (11)

^aForty-one of the 902 users did not respond to any of the demographic questions. Of the 861 participants who provided demographic data, items could be skipped if the participant either chose not to respond or stopped the assessment because of being called to their visit.

Table 3
 Identification of 2 Highest-Priority General Risk Areas for Kiosk Users Compared With National and State Injury Incidence Data by Age Group^a

	Motor Vehicle Occupant, n (%)	Drowning, n (%)	Burn/Fire, n (%)	Suffocation, n (%)	Falls, n (%)	Poisoning, n (%)
Program users						
All clinics	559 (33)	125 (7)	432 (25)	283 (17)	207 (12)	62 (4)
Clinic 1	235 (39)	50 (8)	130 (22)	88 (15)	77 (13)	19 (3)
Clinic 2	41 (19)	15 (7)	75 (34)	47 (21)	32 (15)	10 (5)
Clinic 3	67 (20)	20 (6)	103 (31)	62 (19)	49 (15)	18 (5)
Clinic 4	200 (46)	32 (7)	95 (22)	54 (12)	39 (9)	8 (2)
Clinic 5	16 (15)	8 (7)	29 (26)	30 (29)	10 (9)	7 (6)
Injury incidence data						
Mortality						
National	271.6 (13)	517.4 (25)	246.8 (12)	918.0 (45)	61.8 (3)	47.4 (2)
State	20.3 (19)	17.0 (16)	11.7 (11)	52.7 (50)	1.7 (2)	2.0 (2)
Morbidity						
National	46703.0 (4)	2530.2 (0.2)	67305.4 (6)	13439.4 (1)	983500.6 (84)	52469.8 (5)
State	4039 (6)	181 (0.3)	3914 (6)	500 (1)	50233 (78)	5717 (9)
Age < 1 y						
Program users	168 (37)	12 (3)	125 (27)	75 (16)	59 (14)	18 (4)
Mortality						
National	80.2 (8)	58.4 (6)	32.6 (3)	778.8 (79)	20 (2)	17.6 (2)
State	5.7 (10)	2.3 (4)	4.3 (7)	45.7 (78)	0.7 (1)	0
Morbidity						
National	6649.2 (4)	563.8 (0.4)	11118.2 (7)	6287 (4)	122382.4 (80)	5480.8 (4)
State	135.7 (6)	5.3 (0.2)	155.3 (6)	43 (2)	1916.7 (79)	184 (8)
Age 1 y						
Program users	46 (15)	18 (6)	81 (27)	82 (27)	53 (17)	24 (8)
Mortality						
National	44.6 (12)	171 (47)	46.2 (13)	76.6 (21)	15 (4)	11.6 (3)
State	4 (24)	6.3 (38)	1 (6)	4.3 (26)	0	1 (6)
Morbidity						
National	8203 (3)	829.8 (0.3)	26789.4 (8)	3430.6 (1)	267113.2 (82)	19369.8 (6)

	Motor Vehicle Occupant, n (%)	Drowning, n (%)	Burn/Fire, n (%)	Suffocation, n (%)	Falls, n (%)	Poisoning, n (%)
Age 2 y						
State	255 (4)	12 (1)	549 (9)	32.7 (1)	4591.3 (75)	655.3 (11)
Program users	36 (23)	15 (10)	33 (21)	48 (31)	21 (14)	2 (1)
Mortality						
National	46.4 (15)	148.6 (48)	58.8 (19)	31.8 (10)	12.6 (4)	9.6 (3)
State	4.7 (40)	3 (26)	2 (17)	1 (9)	0.3 (3)	0.7 (6)
Morbidity						
National	9509.2 (3)	552.8 (0.2)	14009.6 (5)	1656.4 (1)	239487.8 (85)	16782.6 (6)
State	290 (5)	18.7 (0.3)	289.7 (5)	47.3 (1)	4121 (76)	654.7 (12)
Age 3 y						
Program users	46 (24)	27 (14)	57 (29)	37 (19)	20 (10)	8 (4)
Mortality						
National	51 (23)	83.4 (37)	59.8 (27)	18 (8)	7.8 (4)	4 (2)
State	3 (29)	3.3 (32)	2.7 (26)	1.3 (13)	0	0
Morbidity						
National	10493.6 (5)	247.2 (0.1)	9016 (4)	1188.2 (1)	194177.2 (87)	7362.6 (3)
State	305.7 (7)	14.3 (0.3)	177.7 (4)	28 (1)	3315 (81)	270.7 (7)
Age 4 y						
Program users	263 (47)	53 (10)	136 (24)	41 (7)	54 (10)	10 (2)
Mortality						
National	49.4 (28)	56 (31)	49.4 (28)	12.8 (7)	6.4 (4)	4.6 (3)
State	3 (38)	2 (25)	1.7 (21)	0.3 (4)	0.7 (8)	0.3 (4)
Morbidity						
National	11848 (7)	336.6 (0.2)	6372.2 (4)	876 (1)	160340.2 (88)	3474.2 (2)
State	352 (10)	10 (0.3)	133 (4)	15.7 (1)	2776.3 (81)	140 (4)

^aPercentages for risk areas identified for all program users do not sum to 100% because there were kiosk users who did not have any risk areas identified. National totals are an annual average from the years 2003 to 2007; state totals are annual average from years 2007 to 2009. Percentages for each injury area are calculated as a percentage of the total injury mortality or morbidity from the 6 injury areas (injuries from other areas not included in the denominator).