

A PROFILE OF WAKE COUNTY CHILDHOOD INJURY &

INJURY PREVENTION

MAY 2014

Section V - Recommendations

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V. RECOMMENDATIONS

This section outlines recommendations for the John Rex Endowment and other stakeholders (e.g. funders, government entities, and other Wake County entities) to consider to foster learning and commitment, build capacity, and increase funding streams for childhood injury prevention. We present recommendations for: A) Foster Learning, Commitment, and Capacity among Organizations Addressing Childhood Injury & Violence Prevention in Wake County, NC; and B) Childhood Injury Secondary Data.

A. Foster Learning, Commitment, and Capacity among Organizations Addressing Childhood Injury & Violence Prevention in Wake County, NC

1. *Continued Engagement with Participating Organizations and Coalitions*

We support plans by JRE to: make available to the public the results from this project; provide follow-up technical assistance to organizations interested in increasing their capacity and program effectiveness; and promote discussion about the data collection methods and recommendations. The strategic use of the findings from this project will help to both increase awareness of injury and violence prevention in Wake County, as well as to influence the actions that can be taken by multiple stakeholders (e.g., local organizations/coalitions, state agencies, academic/research institutions) to further the efforts already underway to prevent childhood injury and violence in Wake County, NC.

2. *Enhancing Evaluation Methods to Improve Effectiveness*

The degree to which childhood injury or violence prevention organizations evaluate their programs is important as evaluation results can increase program effectiveness. A focused emphasis on evaluation could include assessing practices for formative, process, impact, and outcome evaluation. Such an assessment could include the degree to which organizations: a) develop measurements for short/medium/long-term indicators and logic models; b) collect data and use reliable data collection methods; and/or c) select appropriate data analysis methods. JRE could specifically identify and focus capacity building on evaluation components that relate to ‘program effectiveness’ and ‘program impact.’ We recommend addressing, on a programmatic level, the identification of the following topics: 1) Reach which includes: program frequency of contact; duration of contact; intensity of contact; and population groups targeted/reached by individual programs; 2) Identify whether they use Evidence-based Practices which includes: application of programs identified as *Recommended* and/or *Promising*; and 3) Fidelity of program implementation which includes: delivery schedule; meeting training requirements; determining if program messages were received by intended targets; and documentation through process evaluation.

3. *Capacity Building Courses and Evaluation Consultation*

Relevant entities could use multiple methods to deliver capacity building services to organizations addressing childhood injury and violence prevention in Wake County, NC.

- **Short-courses:** in collaboration with the NC Injury & Violence Prevention Branch, UNC Injury Prevention Research Center and/or Department of Health Behavior, mini-courses in program planning, implementation, and evaluation for childhood injury and violence prevention could be developed. These courses could be specialized one to three day courses that could be supported and tailored to those working in intentional or unintentional injuries, including the identification of best-practices.
- **Fellowship-learning experience:** organizations could be asked to nominate staff to attend a series of program planning, implementation, and evaluation training courses (e.g., over a year) to support a project identified specifically for the fellowship program. The fellows would receive guidance on their

project and have the opportunity to increase their knowledge and skill through a series of workshops held during the year long program.

- Implementing injury prevention programs and/or retaining or linking to program and evaluation consultants: to support organizations/coalitions implementing injury prevention programs, the services of program and evaluation consultants could be retained to ensure that evaluation is conducted. The quality of evaluation will be improved through the development of tailored evaluation plans. In addition, the capacity of local organizations to conduct evaluation will be enhanced.

4. Use Evidence-based Practice Compilation

We recommend that JRE consider the information summarized in this project's Compilation of evidence-based practice registries to: 1) prioritize JRE supported activities based on evidence; 2) identify effective program(s) for the leading cause of injury; 3) encourage (or require) injury prevention activities using high impact approaches; and/or 4) identify programs tailored for/in specific settings/populations. We provide examples of each below.

- Incorporate known evidence-based practices into JRE supported areas. Use of the evidence-based practice compilation could be used to shape how JRE funding announcements are worded, and could define the scoring criteria for funding applications when submitted. In addition, the Compilation could inform the extent to which funded programs are required to report and/or evaluate their progress.
- Identify effective program(s) for the leading causes of childhood injury. Programs that were reviewed by multiple institutions and that were judged 'effective' (based on generally agreed upon criteria) should be considered as *best practices*. Registries vary in their definitions, standards and criteria (Appendix I summarizes the definitions and criteria used to judge effectiveness for the 16 registries reviewed for this project). This compilation was developed to summarize the state of knowledge regarding evidence-based programs and moving forward, JRE could prioritize support for only those programs identified as 'effective' or 'best practice.'
- Encourage work in high impact areas. JRE can expand the Compilation to include additional coding for public health descriptor frameworks (e.g. the socio-ecological framework, Frieden's Health Impact Pyramid and the 3E's of Injury Prevention). Once completed, JRE could encourage (or require) that projects that have the potential to be effective may also have a greater impact (based on the frameworks studied for this project). The Compilation could be used to identify all effective interventions (for the leading causes of injury) that are known to address community and/or universal settings (i.e., high impact). Universal settings are intended to reach all populations; they are not targeted to reach a specific environment, setting, or, in some cases, age group. Emphasizing use of effective programs that focus on universal settings may increase the overall impact of JRE-funded projects to reduce the risk for or incidence of childhood injury. As an example, the registry describing evidence based practices for Motor Vehicle Crashes includes 68 programs, 36 of which address universal settings. In addition, the registry indicates that Assault includes 53 programs, with one program addressing a universal setting, and one program recommended against (e.g., Violence Prevention: Policies Facilitating the Transfer of Juveniles to Adult Justice Systems).
- Identify programs tailored for specific settings/populations. Programs in the evidence-based practices Compilation were coded for settings (e.g., school, home, primary care facility). This allows JRE staff to identify and recommend interventions for specific settings/populations, and future funding announcements could specify that organizations work with/in those settings/populations.

B. Childhood Injury Secondary Data

1. Further Analysis of Leading Cause of Childhood Injury Data

To further study causes of childhood injury in Wake County, NC, we provide several recommendations organized by the leading injury causes identified in this project by secondary data.

#1 – Motor Vehicle Traffic Crash – Occupants. Work with NC DOT to attempt to link crash report data with EMS and ED visit data. The IVP Branch is considering this idea should funds become available.

#2 – Assault. Apply Patty Schnitzer’s algorithm (Schnitzer, Slusher, Kruse, & Tarleton, 2011) for estimating child maltreatment and neglect based on *weighting* of diagnosis and mechanism of injury codes, as well as combinations of these. Meghan Shanahan, a public health researcher at the UNC Injury Prevention Research Center (IPRC), applied this method to two years of ED visits by Wake County children and identified 126 children who were likely to have experienced maltreatment, almost as many as identified by specific codes for the 7 years of ED visit data reported here. She concluded that the ED data may capture a somewhat different population of children who experience maltreatment than those identified through Child Protective Services (CPS) data, although the age distribution for each type of abuse is similar between the two data sources (Shanahan, Proescholdbell, Waller, & Deyneka, 2013).

#3 – Motor Vehicle Traffic Crash – Pedestrian. Work with NC DOT to try to link crash data with healthcare data for child pedestrian injury. JRE has previously funded a project that used NC DOT crash data to examine child pedestrian crashes in Wake County. An innovative project in Boston, MA, has utilized crash data, EMS data, and ED visits data to: examine the characteristics of pedestrian and bicycle crashes resulting in injury; develop and implement interventions; and evaluate the impact of those interventions.

#4 – Self Inflicted / Self Harm. Promote accurate hospital coding for intentional poisoning to reduce “Undetermined” poisoning codes. Sharing the results of this project with hospitals in Wake County, including highlighting areas of potential improvement in data quality through hospital coding practices, may indirectly improve the accuracy of this coding in the future.

#5 – Falls: A detailed report of Fall related injuries resulting in ED visits and/or hospital admissions should be completed. Analysis of school and community based efforts to prevent fall injuries to children should be undertaken. Ways to determine severity of fall injury and outcomes should be found or developed. Falls are by far the leading cause of childhood injury *morbidity* in Wake County. Addressing childhood injury prevention in the county necessitates a better understanding of fall related injury.

#8 – Struck by or against. Struck by or against is a non-specific and diffuse cause of injury but accounts for a large proportion of childhood injury morbidity in Wake County. Many of these injuries are sports related, as are many fall injuries. We did not explore this area in great detail in this study. A detailed report of sports related injury to children should be undertaken which would investigate all the various codes related to injury in sports activities. By undertaking a project to specifically address sports related injury, including those identified through struck by or against codes, fall codes, activity codes, and place of occurrence codes, as well as through key word searches of chief complaints and triage notes, we can better describe these injuries and identify prevention strategies. Likewise, further investigation of the community organizations involved in childhood sporting activities and prevention of injuries during participation in those activities, would further our understanding of current and potential injury prevention efforts. The location of struck by or against injuries should be explored through the Place of

Occurrence code (when available) and chief complaint and triage note descriptions; this may identify other places where children are at high risk for this type of injury (e.g. schools, parks).

#10 - Bicycle Injury. Undertake a study of bicycle injury in Wake County that utilizes ED data, including details from chief complaints and triage notes, EMS responses, and NC DOT crash reports (for those involving a motor vehicle on a public road) to gain a deeper understanding of who is at risk and where to better inform prevention efforts. Such a study could be paired with that described for pedestrian injury, although addressing bicycle injury in this way also requires examination of data for crashes that do not involve a motor vehicle or are not on a public roadway and, thus, will not have a NC DOT crash report. It may also be important to investigate existing policies regarding bicycle safety (e.g. NC statute requiring bicycle helmet use for children 15 years and younger) and how they are, or are not, enforced.

Other - Poisoning. Expand the exploration of poisoning injury in Wake County children through deeper analysis of the poisoning codes used in the ED visit and hospital discharge data, as well as the CPC call data. This is currently an area of intense public health interest nationally and in North Carolina, offering opportunities to partner and leverage resources.

2. Additional Analysis of E-Code Mechanism and Sub-Mechanism Data

To further inform what has been learned about the leading causes of injury in Wake County for this project, we suggest additional detailed analysis, at the mechanism and sub-mechanism level utilizing the depth of E-coding available in the Wake County ED visit data. Conducting such an analysis would increase understanding for some of the leading causes of injury and better inform injury prevention efforts in the community. Detailed reports should be run using newly introduced (2010 and later) “Activity” E-codes, which describe the activity that the patient was doing at the time of the injury. Since these codes are new, they haven’t been fully implemented in Wake County hospital data systems yet, but their use has been increasing since 2010. Wake County is one of the few counties in NC that is showing widespread use of these codes in their ED visit data. Such an investigation should be combined with other detailed data reports for specific causes of injury in Wake County. For example, if Falls is determined to be a child injury prevention priority for Wake County, a more detailed understanding of falls could be gleaned from this type of deeper analysis.

Examples of additional analysis include:

- A special analysis into sports related injuries in Wake County children is warranted, if this becomes an area of injury identified as a priority for prevention efforts in Wake County. Such an analysis would use all codes related to sports activity, from various mechanisms (e.g. struck by/against, falls) as well as activity and place of occurrence codes, to identify these injuries and describe further the circumstances of injury and the population experiencing these injuries. Such a report should ideally include information about community organizations addressing sports injury prevention and their efforts.
- Expand the record level review of injury related ED visits with multiple mechanism of injury codes, using the text information available in the triage notes and chief complaints, for those causes of injury determined to be priorities for prevention in Wake County. This will allow more detailed understanding of certain injury mechanisms, such as falls, self-inflicted, or pedestrian injury.
- Conduct analyses utilizing ZIP code level data for leading causes of injury in the ED visit data. This is a challenging task because 5-digit ZIP code is the most granular place of residency variable available in the ED visit data, however, ZIP codes do not conform nicely to geographic boundaries in Wake County. We still think this is a worthwhile way to further explore the data, particularly within specific priority injury causes.
- The entire coding scheme for diagnosis and intent/mechanism of injury in both hospital discharge and ED visit data will change in 2014, from ICD-9-CM to ICD-10-CM. The potential for detailed coding of

circumstances of injury will expand, as will the potential for miscoding. This change in the secondary data available should be monitored and its impact on local data for surveillance and evaluation examined. This will be taking place at the state level through ongoing work at NC DETECT.

3. Secondary Injury Data

a. Mortality Data

The ability to readily generate a multi-year child injury mortality report at the county level would be a welcome addition to the tools currently available through the State Center for Health Statistics (SCHS) website. This would make it much easier for community organizations to generate county specific injury mortality data to inform injury prevention efforts. Changes to the SCHS website will require time and effort from employees of the State Center, for whom these changes may not be a high priority. Sharing the results of from this project with NC DPH, including information about how many Wake County community organizations rely on data available from the State Center for Health Statistics and the Injury and Violence Prevention Branch, may increase the likelihood that improving the availability of the data via the website becomes a priority.

b. Hospital Discharge Data

Making hospital discharge data readily available, to projects such as this one, should be considered by the State Center for Health Statistics. This possibly could be done through a data use agreement with NC DPH, as is done for the ED visit data. This may be a challenging issue due to the mechanism by which these data are provided to the State Center for Health Statistics by the North Carolina Hospital Association. However, using these data under the current constraints is difficult and places demands on the IVP Branch staff. As with the mortality data, perhaps sharing the results of this JRE project with NC DPH, emphasizing the reliance of Wake County community organizations on data accessed via the SCHS, could emphasize the utility of greater data access for informing injury prevention efforts at the county level.

c. Emergency Department Visit Data

The ED visit data for childhood injury in Wake County were generally very good. Continued monitoring of data completeness for E-codes is necessary to insure high quality data for Wake County. NC DETECT staff currently monitor these data and provide an annual update on E-code completeness by hospital to NC DPH. If stakeholders request this information by county from either IVPB or CCHI/NC DETECT directly, this information could be added to the annual updates.

Many ED visit records in Wake County include multiple codes for mechanism of injury. Improving the specificity of the codes used and decreasing the incidence of conflicting codes (e.g. motor vehicle crash – driver and motor vehicle crash – passenger) would be helpful to anyone attempting to use these data for program planning and evaluation. Not every visit that receives an injury diagnosis code also receives an E-code. In these data, 13% of visits with an injury diagnosis did not receive an E-code; there is room for improvement by decreasing missing E-codes for ED Visits and increasing the use of specific, detailed codes rather than general and unspecified codes. The timeliness of the data provided to NC DETECT (twice a day) often results in missing data at the time of initial submission, with the expectation that records will be completed through updates to the data. While most data elements are very complete for Wake County, any measurable level of missing data can be problematic. The completeness of the data could and should be improved. By sharing the results of this project with area hospitals, including the prevalence of missing and non-specific codes, it can help educate the data providers of the importance of coding as completely and accurately as possible.

Additional textual information in triage notes of most ED visit records is invaluable when examining data at the record level for details about the injury event. Expanding the provision of triage notes in these data would help when there are questions about the coding and when specific injury causes need to be examined further. Most hospitals in Wake County provide triage notes for most ED visits to NC DETECT. By sharing the results of this project with area hospitals and, in particular, organizations based in the hospitals and addressing injury prevention efforts, it will help educate all the ED data providers in Wake County about the utility and importance of triage notes to the examination of injury details.

d. EMS Data

The EMS data we were able to access (in NC DETECT) were often incomplete for key variables (e.g. Provider Primary Impression = “Not Recorded” or “Not Applicable” for at least 40% of records each year; ZIP Code is missing for 18% - 27% each year). Improving the completeness of these variables will be necessary to use these data to identify injured children in Wake County.

We recommend working closely with Wake County EMS to improve the quality and the use of the EMS data. They know their data, are interested in using them, and should be encouraged to participate in efforts to address childhood injury prevention in Wake County. Working directly with Wake County EMS to determine what, if any, explanations are available for the instability we observed in some variables, would involve documenting data flows, coding practices and policy changes that may impact the quality of key data elements. To undertake this type of data quality assurance project would require external funding.

e. Carolinas Poison Center Data

Carolina Poison Center (CPC) data provide a fairly broad based community level response to potentially injured children. Most calls to CPC do not result in the child being referred to the ED or other medical care yet each call is made due to concern about a potentially dangerous exposure. These data provide insight into the types of exposures and risks children experience in the community that do not reach a threshold of requiring immediate medical attention. More use of CPC data at the county level, especially for large counties such as Wake, is encouraged. Community organizations interested in addressing childhood poisoning, either unintentional or self-inflicted, could use the CPC data as one source of information to inform their poisoning prevention efforts.

f. Other Data

Additional study of data from the Wake County Public Schools, Department of Social Services and Child Protective Services, and local law enforcement may shed light on other/additional important injury areas in Wake County, including: bullying behavior not necessarily resulting in physical injury; injuries in the school environment; sexual assault; sports related injuries; and child maltreatment. For example, an in-depth look at childhood injury from falls would benefit from pulling in additional data from schools (e.g. falls from playground equipment and in sports) and organizations running youth sports programs (e.g. Parks and Recreation Department and YMCA). Likewise, a detailed examination of assault related injury in children and youth would benefit from inclusion of data from law enforcement about reports of physical and sexual assault and Child Protective Services about the number of investigations for child maltreatment. In addition, an in-depth assessment of youth bullying could align recent efforts (January 2014) by the Centers for Disease Control and Prevention to develop a uniform definition of youth bullying to lay the foundation for improved bullying data (<http://www.cdc.gov/violenceprevention/pdf/bullying-definitions-final-a.pdf>).