



Infant and Child Injuries in Georgia: A Study Comparing Injuries in Child Care Facilities with Infant and Child Injuries in the General Population

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Background



- Conducted by Dr. John Carter from the Rollins School of Public Health at Emory University
- Purpose was to determine if the risk of injury to children from birth to age five in child care settings is greater than the risk of injury to the same age children in the general population.
- Overall, goal is to identify ways to reduce injuries and fatalities in child care.

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Data Sources



- Georgia Hospital Discharge (HD) Data
- DECAL Incident Reports on injuries requiring medical attention
- Included only ER visits and hospital discharges
 - Injuries treated in physicians' offices or clinics are not captured in the HD data, so the true incidence of injury is higher than the estimate.

Methods Procedures



- Compiled incidences of injuries requiring emergency room care or hospitalization in the **general population** for infants and children through age five.
- Compiled incidences of injury in **child care settings** that required medical attention. This included recoding child care data to compare to the general population.
- Estimated the incidences of injuries in child care settings and compared them to the general population. Reviewed investigative reports to determine if injury occurred and if licensing rule violation resulting in injury was substantiated.

Incidences of Injury in Young Children (Ages 0-6)

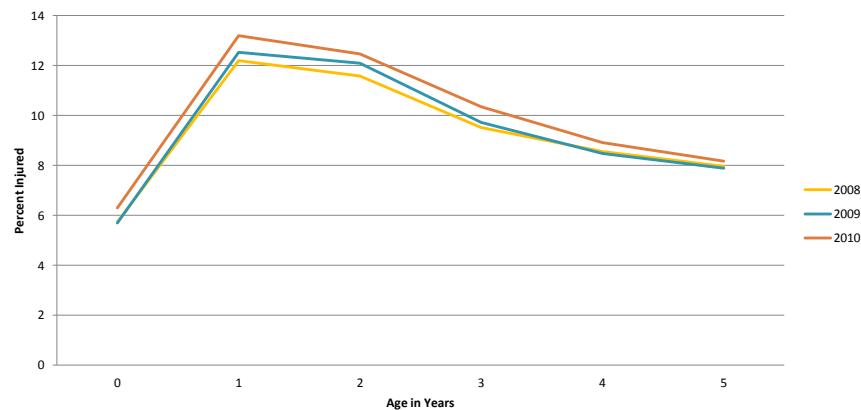


- Utilized Georgia Hospital Discharge Data.
 - Injuries treated in physicians offices or clinics are not captured. True incidence will be higher than estimate.
 - For counts of **injuries**, a child is counted only once in a given year even if the child had multiple injuries and/or multiple visits.
- Events associated with injuries are identified through two ranges of ICD9 codes.
 - External cause (fall from ladder) is identified by an E-Code.
 - Injury Code-type of injury (burn, fracture of skull).

Number of Injuries by Year (General Population)



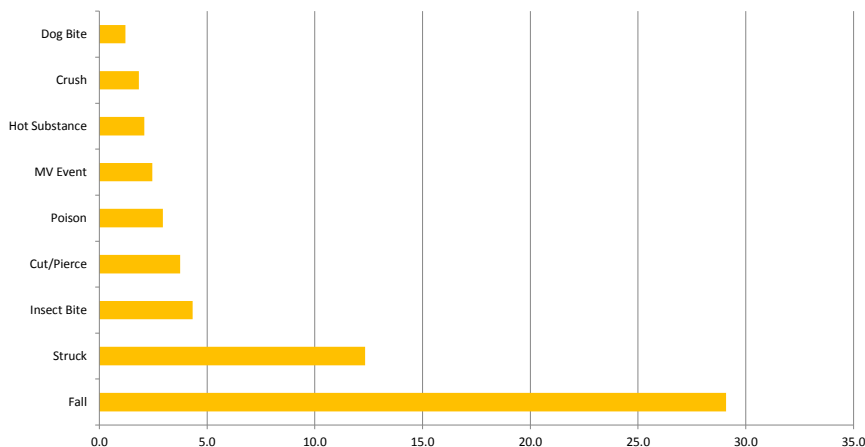
Figure 1: Annual Injury Risk by Age in Years, GA, 2008-2010, (ER Visits and Hospital Discharges)



E-Codes (Number of Events; General Population)



Figure 2: Number of Events (1000s) by Cause, 2010, Ages < 6



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7

Types of Injuries (General Population)



Table 3: 2010 Injury Records, by Type of Injury, Ages < 6

Type of Injury	Number	% of Total	Rate (per 1,000)
Open Wound Of Head, Neck, And Trunk	18,770	23.0	22.7
Open Wound Of Upper Limb	2,767	3.4	3.3
Open Wound Of Lower Limb	2,067	2.5	2.5
Certain Traumatic Complications And Unspecified Injuries	10,667	13.0	12.9
Contusion With Intact Skin Surface	10,446	12.8	12.6
Superficial Injury	7,833	9.6	9.5
Effects Of Foreign Body Entering Through Orifice	5,453	6.7	6.6
Fracture Of Upper Limb	4,406	5.4	5.3
Fracture Of Lower Limb	1,347	1.6	1.6
Fracture Of Skull	534	0.7	0.6
Burns	2,618	3.2	3.2
Dislocation	2,566	3.1	3.1
Sprains And Strains Of Joints And Adjacent Muscles	2,432	3.0	2.9
Poisoning By Drugs, Medicinal And Biological Substances	2,207	2.7	2.7
Intracranial Injury, Excluding Those With Skull Fracture	1,100	1.3	1.3
Crushing Injury	319	0.4	0.4
Other And Unspecified Effects Of External Causes	2,995	3.7	3.6
Toxic Effects Of Substances Chiefly Non-medicinal As To Source	1,953	2.4	2.4
Complications Of Surgical And Medical Care	1,167	1.4	1.4
All Other	117		
Total	81,764		

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8

Estimating Injury in Child Care Settings



- Compiled injuries reported in DECAL Incident Reports from June 2007 to May 2012. A total of 805 incidents were identified.
- Reviewed narrative of the incident and recoded external cause of injury to match hospital discharge data to allow comparison.
- If enough information was available, type of injury, (i.e., fracture) was added to the database.
 - From a prevention perspective, the cause of injury is better factor. However, in many reports this was not included or was unknown.

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9

Number of Injuries by Age of Child (Child Care Population)



Table 4: DECAL Injury Incident Reports, by Report Year and Age

Age (Years)	2007	2008	2009	2010	2011	2012	Total
0	12	15	27	21	24	12	111
1	10	40	28	30	47	13	168
2	11	24	27	36	30	14	142
3	10	21	16	27	42	12	128
4	13	25	15	27	33	15	128
5	2	8	9	13	11	10	53
Ages < 6	58	133	122	154	187	76	730
Ages 6 - 12	6	14	10	15	18	4	67
Unknown Age	1	4	1	2			8
Total	65	151	133	171	205	80	805

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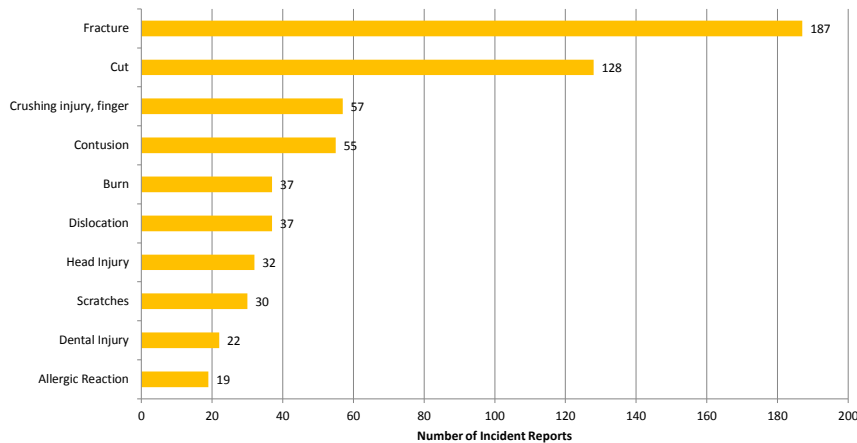
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10

Type of Injury (Child Care Population)



Figure 3: DECAL Reported Incidents, by Type of Injury



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11

Estimating Injury in Child Care



- Estimated child care enrollment from Georgia Child Care Economic Impact Study: 276,586 (ages zero to four)
 - Assume an average of eight hours per day per child
- The ER and HD data identified more than 80,000 infants and children with an injury related event each year from 2008 through 2010.
 - If children in child care had the same risk for injury as the general child population, then approximately 7,200 of those 80,000 events should occur in a child care facility.
 - Only 730 incident reports occurred in the five-year period – 126 injuries per year.
- Analysis implies that children are safer in a child care facility than they are in other situations – at home, with a relative, with a baby sitter, etc.

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12

Comparing Injuries in the General Population to Injuries in Child Care



**Table 5: Comparison of DECAL Incident Report Rates (Five-year Average)
with ER/HD Rates (2010), Selected Injuries, Ages < 6**

Type of Injury	ER/HD Reports			DECAL Reports			Rate Ratio
	Number	% of Total	Rate (per 1,000)	Number	% of Total	Rate (per 1,000)	
Open Wound Of Head, Neck, And Trunk	18,770	23.0	22.7	108	14.8	0.297	76.5
Fracture Of Upper Limb	4,406	5.4	5.3	136	18.6	0.374	14.3
Fracture Of Lower Limb	1,347	1.6	1.6	58	7.9	0.159	10.2
Fracture Of Skull	534	0.7	0.6	12	1.6	0.033	19.6
Dislocation	2,566	3.1	3.1	37	5.1	0.102	30.5
Burns	2,618	3.2	3.2	37	5.1	0.102	31.1
All Injuries	81,764		98.8	730		2.01	49.3

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13

DECAL Investigation Results



- DECAL incident reports were investigated to determine if any alleged rule violation(s) were substantiated and if any related violations were identified in the investigation.
- Approximately 54% of all reports were substantiated, but the proportion ranges from 35% to over 90%.
- An additional 10% of all incidents had a related finding, although the alleged violation was not substantiated.
- Twenty-two percent of the reported incidents did not identify the external cause of the injury.
 - The proportion of incidents with an undetermined cause decreased as the age of the child increased.

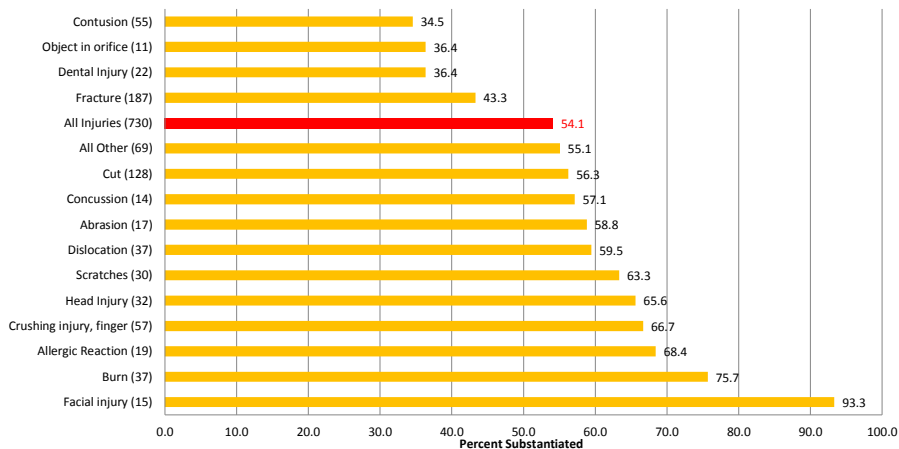
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14

Substantiated Findings by Type of Injury



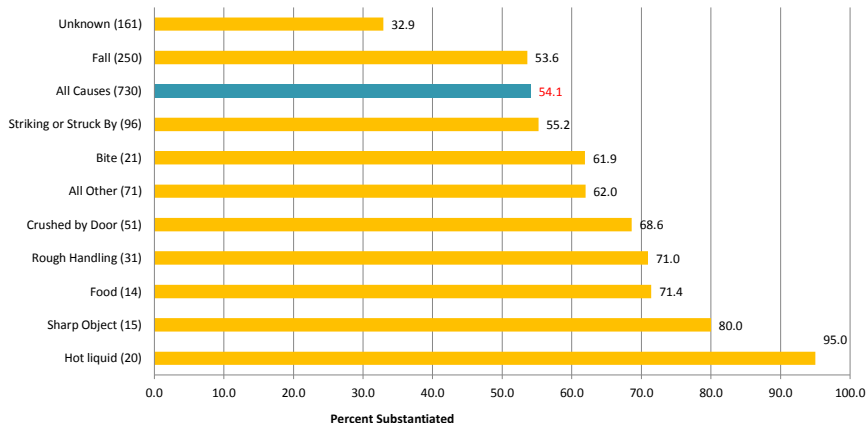
Figure 4: Substantiated Findings, by Type of Injury



Substantiated Findings by External Cause of Injury



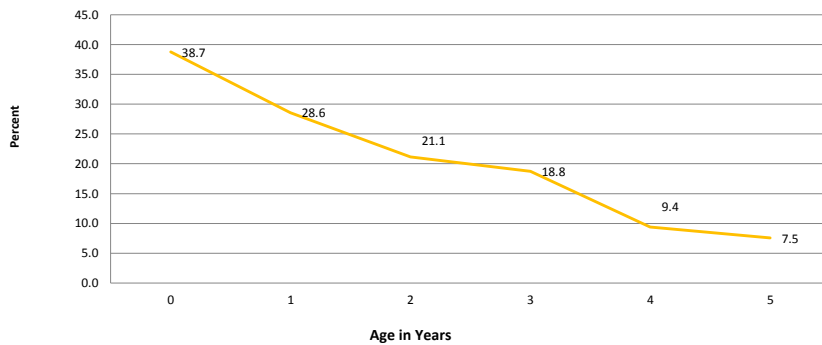
Figure 5: Substantiated Findings, by External Cause of Injury



“Undetermined” Causes by Age



Figure 6: Percent of DECAL Incident Reports with Undetermined Cause of Injury, FY2008 - 2012



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17

Findings



- In Georgia in 2010 approximately one out of every 10 children under the age of six had an emergency room visit or hospital stay (ER/HD) related to an injury.
- A child under age six in the general population is about 50 times more likely to sustain an injury requiring medical services than a child in a child care facility.
- The injury risks vary by type of injury, but any specific injury is at least 10 times more likely in the general child population than in the child care population.

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18

Recommendations



- Expand DECAL database to include type and cause of injury. Use the same hospital discharge codes.
- Provide additional training and public awareness about the highest number of causes of injuries, e.g.,
 - Finger Crushing
 - Burns
 - Allergic Reactions
- Focus training on fractures, the largest injury category.

Data Limitations



- The estimated child population injury rate is an underestimate of the true rate. Injuries treated in a clinic or physician's office are not included, since no statewide data system captures outpatient services.
- The injury estimates for infants/children in child care facilities are developed from a DECAL-prepared database of injury incident reports. Assume that facilities underreport injuries.
- The general "exposure" time in child care is an estimate based on assumptions. This estimate factors into the expected risk of injury used to determine a comparison ratio.



John T. Carter. (2014). *An Assessment of the Risk of Preventable Deaths Among Children in Child Care in Georgia (2007-2009)*. Atlanta, GA: Rollins School of Public Health, Emory University.