

Impact of Home Visiting on the Prevention of Unintentional Injury: a quasi-experimental evaluation

Alonzo T. Folger, Ph.D.^{1,2}, Katherine A. Bowers, Ph.D.¹,
Judith W. Dexheimer, Ph.D.¹, Ting Sa, M.S.¹,
Judith B. Van Ginkel, Ph.D.^{1,2} & Robert T. Ammerman, Ph.D.^{1,2}

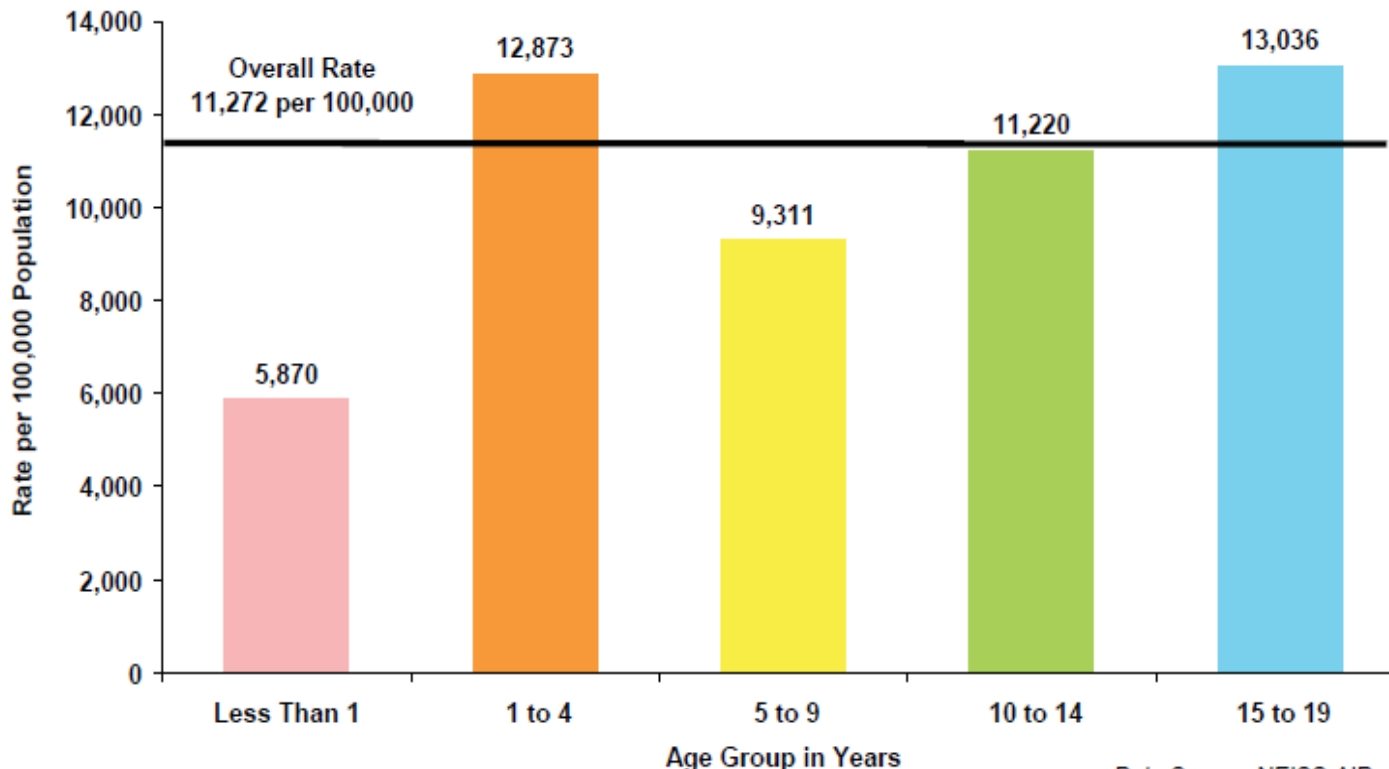
¹ Cincinnati Children's Hospital Medical Center & University of Cincinnati
College of Medicine

² Every Child Succeeds

The Collaborative Science of Home Visiting Meeting
Washington, D.C. • May 6, 2015

Injury Risk

- Unintentional injury (UI) the leading cause of death 1-19 years of age; 11-12% of children 0-5 years of age have at least one medically-attended UI
- Home environment is the most common location of UI and children from disadvantaged families have the highest risk



Source: CDC Childhood Injury Report: Patterns of Unintentional Injuries among 0 -19 Year Olds in the United States, 2000-2006.

Home Visiting and Injury Prevention

- Engagement during a window of high risk for UI
- Engagement with high risk families
- Targeted education in the home environment
- Routine surveillance or assessment and mitigation of safety hazards in the home
- *Impact?* mixed findings in the home visiting research: no effect; effects indicating lower and higher risks for UI

Study Purpose and Context

- *Purpose: evaluate the impact of a regional home visiting program on the prevention of UI during early childhood*
- *Home Visiting Program: Every Child Succeeds*
 - 1999-current
 - Southwest Ohio and Northern Kentucky
 - 9 HFA sites and 1 NFP site
 - Average of 1,500 new families per year; >22,500 since inception
- *Funding: grant from the Ohio Department of Public Safety (OPDS EMFTS Research Grant P3 , July 2014-2015)*

Methods

- Matched retrospective cohort study
- *Data linkages*: Home Visiting \cap Eligible Birth Records (2006-2013) \cap Hamilton County Injury Surveillance System
- *Study groups*: Birth comparison group matched to HV group by birth year and propensity score using the nearest neighbor algorithm
 - $\rho(x) = Pr(HV=1 | X)$, where HV=1 is HV participation and X=vector of baseline characteristics to jointly handle confounders
- *Outcomes*: injuries that caused an emergency department visit, hospitalization or death; primary ICD-9-CM: 800-995
- *Survival analyses*: time to injury (0-2 years, 0-3 years, 3-5 years) & censoring at death

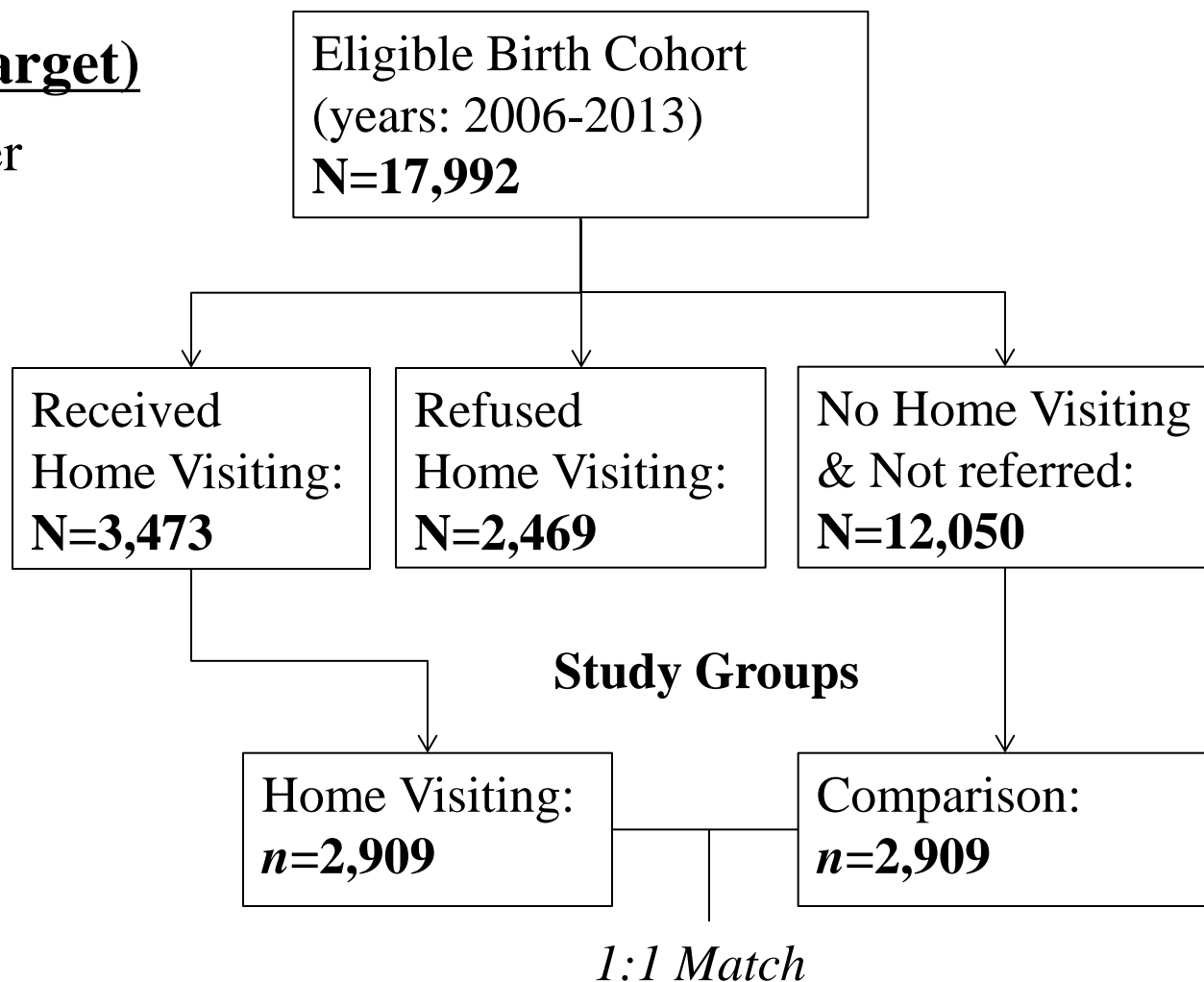
Study population

Service Eligibility (Target)

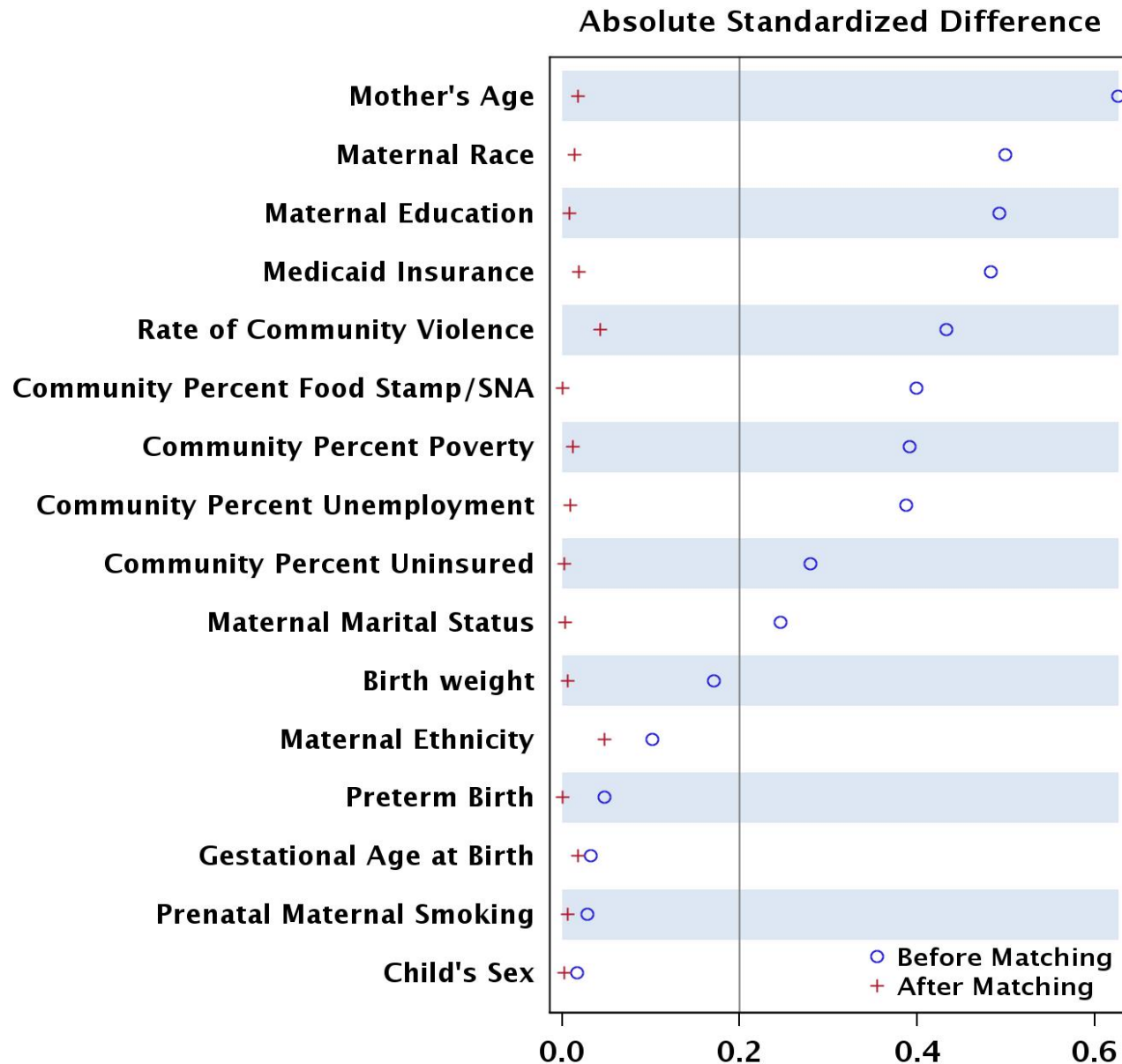
- Single or Young Mother
- Indicator of poverty
- Late prenatal care
- Hamilton County

Selection Criteria

- >25 weeks gestation at birth
- Available match from birth cohort



Balance Diagnostics



Results

Injury rates and hazard ratios (*HR*) for home visiting group, stratified by encounter type, age of child, and home visiting exposure

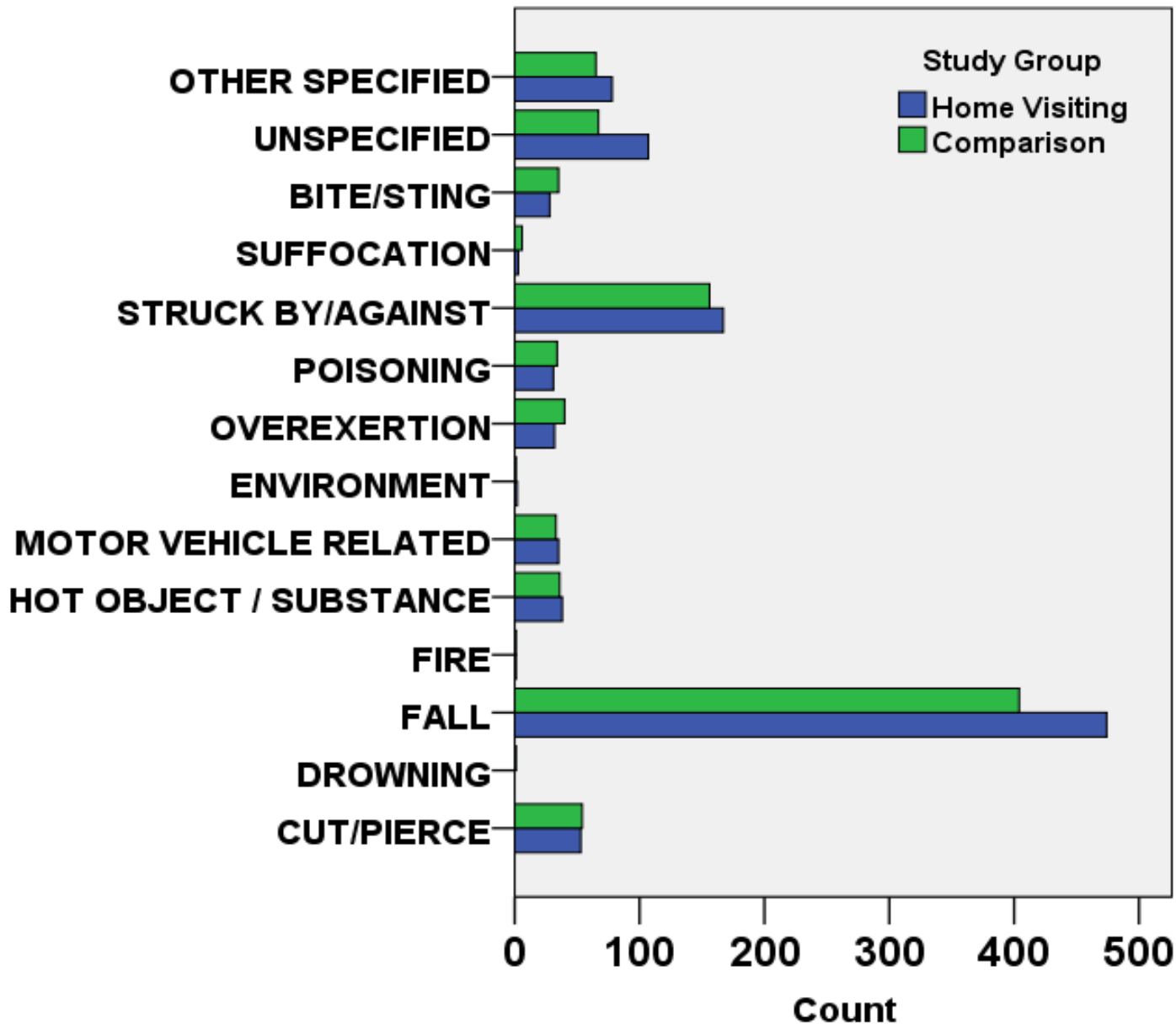
Post-natal Home Visits

	0-2 Years			0-3 Years		
	Injury%	<i>HR</i> (95% CI)	<i>p</i>	Injury%	<i>HR</i> (95% CI)	<i>p</i>
All Encounters	18.5	1.17 (1.01, 1.35)	0.03	27.2	1.15 (1.00, 1.31)	<0.05
ED Visits	18.0	1.17 (1.01, 1.36)	0.04	26.6	1.15 (1.00, 1.31)	<0.05
Hospitalizations	0.67	1.02 (0.50, 2.08)	0.95	0.95	1.05 (0.54, 2.00)	0.90

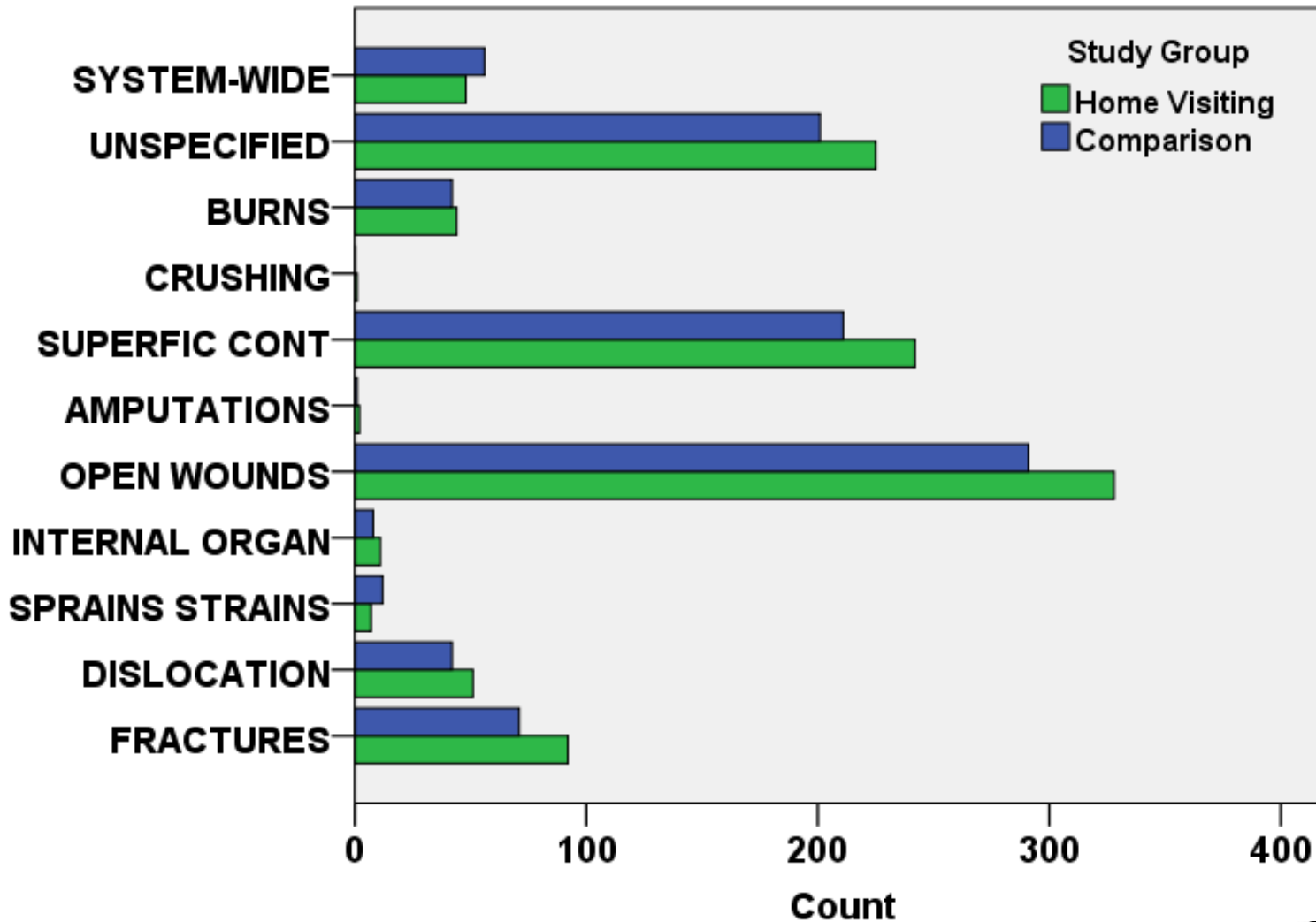
Prenatal and Post-natal Home Visits

	0-2 Years			0-3 Years		
	Injury%	<i>HR</i> (95% CI)	<i>p</i>	Injury%	<i>HR</i> (95% CI)	<i>p</i>
All Encounters	19.8	1.30 (1.06, 1.59)	0.01	29.3	1.20 (0.99, 1.45)	0.05
ED Visits	19.4	1.29 (1.05, 1.59)	0.01	28.4	1.21 (0.99, 1.46)	0.05
Hospitalizations	0.60	1.87 (0.50, 6.95)	0.35	1.26	1.51 (0.61, 3.74)	0.37

Results: Mechanism of Injury



Results: Nature of Injury



Conclusions

- Participants in the home visiting program were significantly more likely to have a medically-attended injury (namely, emergency department visits)
- Excess injuries attributed largely to *falls, struck-by against (contact injuries), open wounds, superficial trauma, fractures,* and those with *unspecified* mechanisms or nature.
- Engagement in the home visiting program both prenatally & post-natally engagement strengthens effect
- Injury prevention vs. health care promotion...surveillance bias and/or greater health care seeking behavior?

Strengths and Limitations

- Propensity score matching using maternal socio-demographic, clinical, and community-level characteristics (confounders)
- Availability and linkage of a large administrative HV dataset with population-based birth and pediatric trauma records.
- Although many steps taken to select an unbiased comparison group, a potential for selection bias remains.
- Non-hospital health care encounters were unavailable
- Hospital medical staff/registrars determine and code the intent of injury and possible misclassification bias

Acknowledgments

Robert T. Ammerman, PhD

Scientific Director, Every Child Succeeds
Professor, Behavioral Medicine and Clinical Psychology
Professor Cincinnati Children's Hospital Medical Center

Katherine Bowers, PhD

Assistant Professor, Division of Biostatistics and Epidemiology
Cincinnati Children's Hospital Medical Center

Judith Dexheimer, PhD

Assistant Professor, Division of Emergency Medicine
Cincinnati Children's Hospital Medical Center

Ting Sa, MS

Biostatistician, Division of Biostatistics and Epidemiology
Cincinnati Children's Hospital Medical Center

Judith B. VanGinkel, PhD

President, Every Child Succeeds
Professor, Cincinnati Children's Hospital Medical Center

Ohio Department of Public Safety (EMS)

Ohio Help Me Grow

Hamilton County Public Health

United Way of Greater Cincinnati

