

EPI Monthly Report

Florida Department of Health in Miami-Dade County

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Racial Composition, Socioeconomic Status and Shigellosis among Children in Miami-Dade County

Isabel Griffin, MPH, Lakisha M. Thomas, MPH, Guoyan Zhang, MD, MPH

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Introduction

Shigellosis is an acute infectious disease caused by a group of bacterium called *Shigella*. Roughly 14,000 cases of shigellosis are reported in the United States each year (1). Milder cases of shigellosis often go undetected and undiagnosed. Therefore, the actual number of infections may be twenty times greater. Shigellosis is common in settings where hygiene is poor; ultimately, affecting entire communities (2). Children, especially toddlers age 2 to 4, are more likely to get shigellosis due to hand-to-mouth behavior and poor hand washing practices, which facilitate fecal-oral transmission. Typically, young children who use the restroom independently, but have a limited understanding of good hand hygiene are more susceptible to this bacterium and capable of passing it along to classmates and family members.

The number of infections due to *Shigella* varies from year to year, following a cyclical pattern of high numbers of cases every five to six years (3, 4, 5, 6). Since December 2013, there has been a significant increase in the number of reported cases of shigellosis in Miami-Dade County. The Florida Department of Health in Miami-Dade County (DOH-Miami-Dade) has confirmed 536 cases of shigellosis between January 1, 2014 and June 30, 2014, compared to a total of 107 confirmed cases during all of 2013 (Figure 1). In the past, incidence rates for Miami-Dade County and the State of Florida remained fairly similar. However, during the first six months of 2014, the rate in Miami-Dade County was 20.8 per 100,000 which exceeded the state average, 6.4 per 100,000 (Figure 2).

Several published studies have examined the role of neighborhood socioeconomic factors on notifiable gastrointestinal illness (7-11). Miami-Dade County differs from other counties in that 51.2% of its residents are foreign-born, a percentage greater than any other county in the United States. About 19.1% of its 2.5 million residents live below the poverty line and the per capita income for the county was \$23,302,

which is lower than \$26,451 for the State of Florida. The racial makeup is approximately 15.2% Non-Hispanic White, 19.0% Non-Hispanic Black and 65.6% Hispanic (12). The study explores racial composition and neighborhood socioeconomic disparities in shigellosis incidences among children ages 0-9 years in Miami-Dade County from January 2003 to June 2014.

Data Source and Method

Shigellosis cases were obtained from Merlin, the Florida Department of Health Epidemiology Disease Reporting System, with symptom onset dates between January 2003 and June 2014, as of July 2, 2014. Countywide population by age and race/ethnicity was obtained from Florida Charts, a database maintained by the Florida Department of Health (13). The census tract level population by age and race/ethnicity, percent of poverty and adult age 25 and above education data was obtained from U.S. Census Bureau, 2008-2012 American Community Survey (12).

The home address for each case of Shigellosis was geocoded and assigned to a corresponding census tract using ArcGIS software version 10 (14). The demographic information obtained from the U.S. Census was linked to each case. The poverty categories used were <10%, 10-20%, 20-30%, 30% and above. The percentage of adults aged twenty-five and older living within a particular census tract, whose education was below the high school level, was grouped as <20%, 20-30% and ≥30%.

All data analyses were conducted using SAS 9.3 (15). The Poisson regression analysis was used to estimate crude and adjusted relative risk (RR) with 95% Confidence Intervals (CI). To estimate adjusted relative risk, race/ethnicity, neighborhood poverty, education level below high school and children aged 0-9 population by race/ethnicity was included in Poisson regression analysis.

Epidemiology,
Disease Control &
Immunization
Services

8600 NW 17th Street
Suite 200
Miami, Florida 33126
Tel: (305) 470-5660
Fax: (305) 470-5533

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In Miami-Dade County, there were a total of 1,583 confirmed *Shigella* cases among children age 0-9 years between January 2003 and June 2014. Among them, 40 (2.5%) cases were excluded in analysis of socioeconomic disparities due to no geocoding address match, additionally, 41 (2.6%) cases were not included because race/ethnicity was reported as *other* or *unknown* after geocoding.

Results

Since 2003, with the exception of 2013, non-Hispanic Blacks have had an overall higher rate of shigellosis (Figure 3). Cases of *Shigella* that were outbreak associated reduced from 10.3% in 2013 to 6.3% from January to June 2014 (Figure 1). The distribution of ages from 2003 to 2014 was composed of 37.33% age 1-4, 29.16% age 5-9 and 20.9% age 18-64. There was an increase in incidence rates as poverty level within a community increased (Figure 4). Neighborhoods where more than 30% of adults had an education level under high school, had a higher incidence of shigellosis (58.7 cases per 100,000), compared to those whose adult population ranged from 20 to 30% (51.3 cases per 100,000) and communities where education was fewer than 20% (30.9 cases per 100,000) (Figure 5). When stratified by race/ethnicity and the educational level of adults in the neighborhood, shigellosis rates increased among non-Hispanic Whites in areas with a high percentage of citizens with a low level of education (Figure 6). Hispanics in a neighborhood with lower levels of education also had higher incidence rates of shigellosis (Figure 6). However, non-Hispanic Blacks had a higher incidence of shigellosis regardless of education levels, showing similar incidence levels among both high and low education communities (Figure 6). When poverty was taken into account, non-Hispanic Blacks were still found to have a higher incidence; however, the highest incidence among this group was actually in the higher-income communities where poverty levels were <20% (Figure 7). Among Hispanics, shigellosis rate increased with increasing levels of poverty. A similar trend was also seen for non-Hispanic Whites; however, the sample size for this particular group (n=16) was very small (Figure 7). Among all *shigella* cases, the proportion of daycare attend children were 38.5% in non-Hispanic White, 56.3% in non-Hispanic Black and 45.5% Hispanic children respectively. Poison regression analysis showed that non-Hispanic black and Hispanic children were 9 and 6.2 times more likely to have shigellosis compared to non-Hispanic whites after adjusted poverty, adults education level and children population (Table 1).

Discussion

Our results showed significant disparities between socioeconomic status, racial composition and shigellosis incidence among children age 0 to 9 years in Miami-Dade County from January 2003 to June 2014. Young children aged 1-4 and 5-9 accounted for 36% and 38.3% of the cases during the first six months of 2014. Daycares are ideal environments for the spread of enteric diseases, especially shigellosis, due to workers unintentionally spreading the bacteria; for example, after changing diapers and then preparing snacks. Children have poor hand hygiene at those ages, especially after using the restroom, leading to fecal contamination of doorknobs, toys, and other commonly touched and then shared items. When poverty was taken into account, non-Hispanic Blacks were still found to have a higher incidence of shigellosis; however, the highest incidence among this group was actually in higher-income communities where poverty levels were <20% (Figure 7). Additional research may be needed to better understand this trend. According to the data, overall incidence of shigellosis rose with increasing poverty (figure 4). This trend may be due to a lack of education concerning hand hygiene. Limitations to the study included the fact that our sample consisted of mostly symptomatic cases of shigellosis, as these results may not represent the overall picture of shigellosis in Miami-Dade County.

Intervention

Health alerts regarding shigellosis were sent out to physicians, schools, and daycares in Miami-Dade County. The DOH-Miami-Dade provided recommendations that children shouldn't return to daycare until after 36 hours of being on antibiotics or until the child had two negative stool samples. During case management and interview, epidemiologists educated parents about this bacteria and ways to prevent it according to CDC guidelines. CDC recommends washing hands with soap and water carefully and frequently, especially after using the restroom, after changing diapers, and before preparing foods or beverages (1). Parents were advised to keep children with diarrhea out of daycare settings and to avoid swallowing water from ponds, lakes and pools. Parents were also encouraged to review hand-washing practices with their children.

Healthcare providers can report suspect cases of shigellosis to the Florida Department of Health in Miami-Dade County at 305-470-5660 (24/7, 365).

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Figure-1. Reported Cases of Shigellosis and Percent of Outbreak Associated Cases, Miami-Dade County, January 2005-June 2014

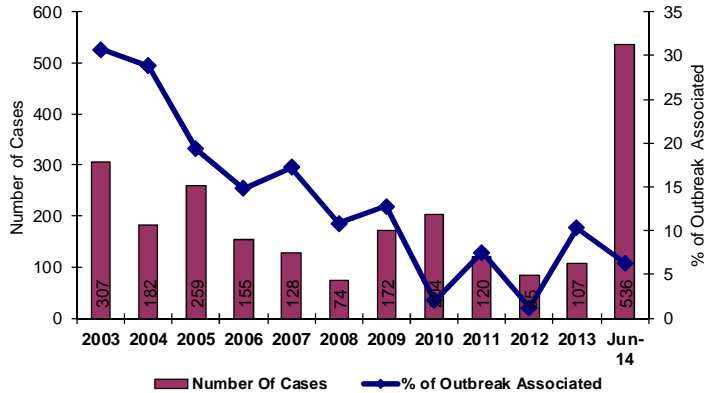


Figure-4. Incidence Rate of Shigellosis among Children Age 0-9 Years by Percentage of Poverty Level in Miami-Dade County, January 2003-June 2014

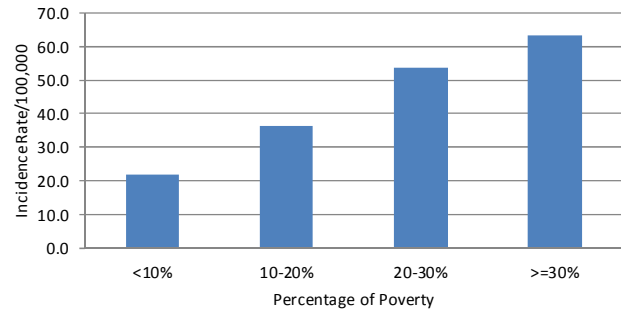


Figure-2. Incidence Rate of Shigellosis in Miami-Dade County and Florida, January 2003-June 2014

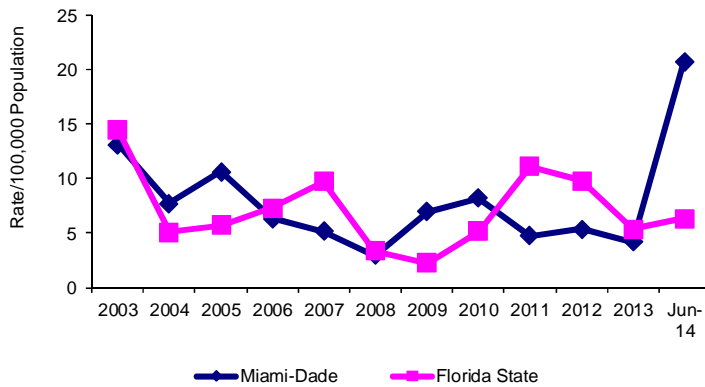


Figure-5. Incidence Rate of Shigellosis among Children Age 0-9 Years by Percentage of Adult Education Below High School in Miami-Dade County, January 2003-June 2014

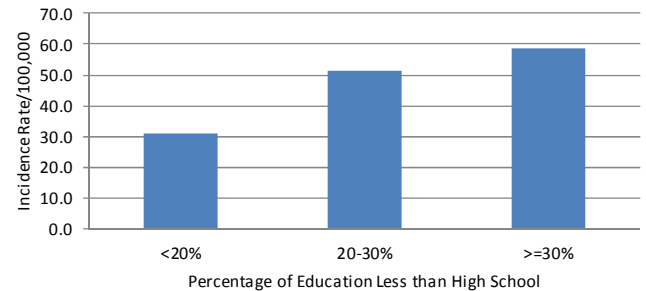


Figure-3. Incidence Rate of Shigellosis by Race/Ethnicity in Miami-Dade County, January 2003-June 2014

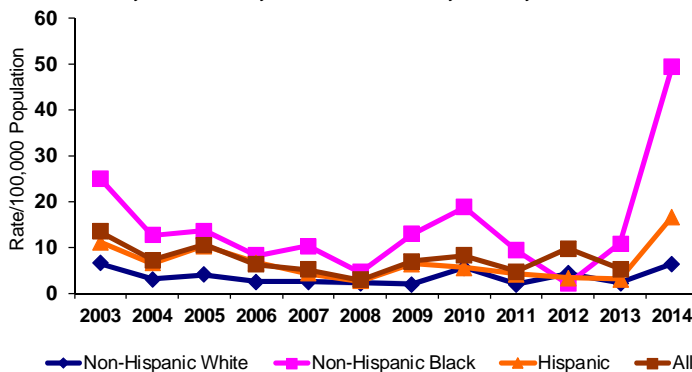
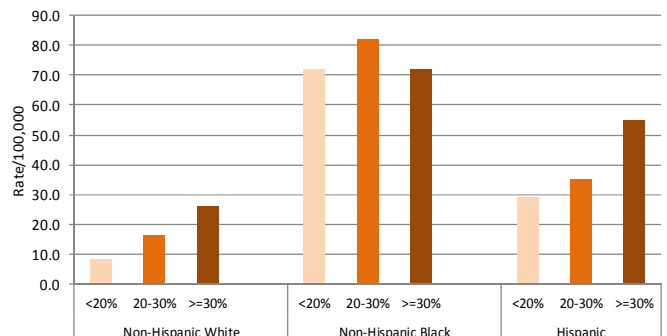


Figure-6. Incidence Rate of Shigellosis among Children Age 0-9 Years by Race/ethnicity and Percentage of Adult Education Below High School in Miami-Dade County, January 2003-June 2014



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Figure-7. Incidence Rate of Shigellosis among Children Age 0-9 Years by Race/ethnicity and Percentage of Poverty Level in Miami-Dade County, January 2003-June 2014

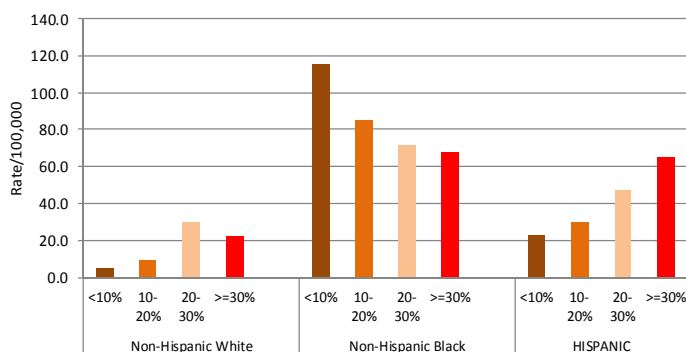


Table-1. Poisson Regression Analysis of Socioeconomic Characteristics and Shigellosis

	Unadjusted RR	Adjusted RR (95% CI)
Race/ethnicity		
Non-Hispanic White	1	1
Non-Hispanic Black	11.1 (8.5-14.5)	9.0 (6.9-11.9)
Hispanic	15.1 (11.6-19.8)	6.2 (4.8-8.2)
% of Poverty		
<10%	1	1
10-20%	1.7 (1.4-2.0)	1.4 (1.2-1.7)
20-30%	3.0 (2.5-3.5)	1.7 (1.3-2.0)
>=30%	3.5 (3.0-4.2)	1.8 (1.5-2.2)
% of Education below High School among Adults		
<20%	1	1
20-30%	1.9 (1.7-2.2)	1.3 (1.2-1.5)
>=30%	2.4 (2.1-2.7)	1.4 (1.2-1.7)

RR: Relative Risk

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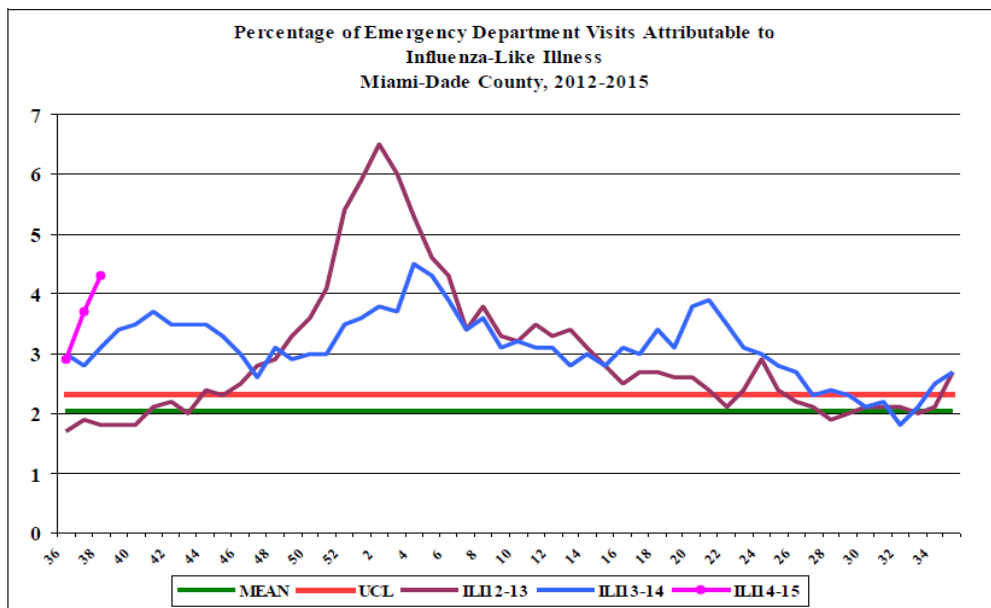
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Influenza-Like-Illness, All Age



During this period, there were 25,243 ED visits; among them 1,087 (4.3%) were ILI. At the same week of last year, 3.1% of ED visits were ILI.

PARTICIPATE IN INFLUENZA SENTINEL PROVIDER SURVEILLANCE

Florida Department of Health in Miami-Dade County **NEEDS Influenza Sentinel Providers!**

TO REPORT ANY DISEASE AND FOR INFORMATION CALL:
Epidemiology, Disease Control & Immunization Services

- Childhood Lead Poisoning
- Prevention Program305-470-6877
- Hepatitis305-470-5536
- Immunizations or outbreaks305-470-5660
- HIV/AIDS Program305-470-6999
- STD Program305-575-5430
- Tuberculosis Program305- 575-5415
- Immunization Service305-470-5660
- To make an appointment.....786-845-0550

Sentinel providers are key to the success of the Florida Department of Health’s Influenza Surveillance System. Data reported by sentinel providers gives a picture of the influenza virus and ILI activity in the U.S. and Florida which can be used to guide prevention and control activities, vaccine strain selection, and patient care.

- Providers of any specialty, in any type of practice, are eligible to be sentinel providers.
- Most providers report that it takes **less than 30 minutes a week** to compile and report data on the total number of patients seen and the number of patients seen with influenza-like illness.
- Sentinel providers can submit specimens from a subset of patients to the state laboratory for virus isolation **free of charge**.

For more information, please contact
Lakisha Thomas at 305-470-5660.

About the Epi Monthly Report

The Epi Monthly Report is a publication of the Florida Department of Health in Miami-Dade County: Epidemiology, Disease Control & Immunization Services. The publication serves a primary audience of physicians, nurses, and public health professionals. Articles published in the Epi Monthly Report may focus on quantitative research and analysis, program updates, field investigations, or provider education. For more information or to submit an article, contact Lakisha Thomas at (305) 470-5660.

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Miami-Dade County Monthly Report Select Reportable Disease/Conditions August 2014

Diseases/Conditions	2014 Current Month	2014 Year to Date	2013 Year to Date	2012 Year to Date
HIV/AIDS				
AIDS*	37	378	510	375
HIV	138	954	985	715
STD				
Infectious Syphilis*	33	240	236	215
Chlamydia*	827	6473	6858	6375
Gonorrhea*	241	1423	1618	1633
TB				
Tuberculosis**	12	92	79	57
Epidemiology, Disease Control & Immunization Services				
Epidemiology				
Campylobacteriosis	31	263	253	233
Chikungunya Fever	16	32	0	0
Ciguatera Poisoning	8	17	15	13
Cryptosporidiosis	5	20	15	15
Cyclosporiasis	0	1	2	1
Dengue Fever	8	22	24	15
Escherichia coli, Shiga Toxin-Producing	5	12	4	4
E. coli, Non-O157	0	0	0	0
Encephalitis, West Nile Virus	0	0	0	0
Giardiasis, Acute	20	151	173	143
Influenza Novel Strain	0	0	0	0
Influenza, Pediatric Death	0	1	1	2
Legionellosis	6	14	18	11
Leptospirosis	0	0	0	0
Listeriosis	0	2	1	1
Lyme disease	1	3	2	3
Malaria	2	5	7	5
Meningitis (except aseptic)	1	14	26	15
Meningococcal Disease	1	7	14	11
Salmonella serotype Typhi (Typhoid Fever)	0	1	1	2
Salmonellosis	70	399	371	301
Shigellosis	31	617	39	40
Streptococcus pneumoniae, Drug Resistant	1	36	63	49
Toxoplasmosis	0	0	0	0
Vibriosis	0	5	10	3
West Nile Fever	0	0	0	0
Immunization Preventable Diseases				
Measles	0	0	0	0
Mumps	0	0	0	0
Pertussis	5	24	34	46
Rubella	0	0	0	0
Tetanus	0	0	0	0
Varicella	5	34	49	33
Hepatitis				
Hepatitis A	2	23	19	19
Hepatitis B (Acute)	1	8	10	13
Lead				
Lead Poisoning	10	44	65	54

*Data is provisional at the county level and is subject to edit checks by state and federal agencies.

** Data on tuberculosis are provisional at the county level.