Racial and Ethnic Disparities in Foodborne Illness, 2000

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Abstract

Background: Food preference and preparation methods vary by race and ethnicity. Several foodborne disease outbreaks have been associated with practices unique to certain populations. Outbreaks of *Listeria monocytogenes* (*Lm*) and *Yersinia enterocolitica* infections have been associated with unpasteurized cheese in Hispanics and with chitterlings in African-American communities. We examined how the burden of foodborne illness varies in the US among specific racial and ethnic groups compared to non-Hispanic Whites.

Methods: In 2000, the Foodborne Diseases Active Surveillance Network (FoodNet) conducted surveillance for laboratory-diagnosed cases of *Campylobacter, Escherichia coli* O157, *Lm*, *Salmonella* (including *S.* Typhi), *Shigella*, *Vibrio*, and *Yersinia* in the states of Connecticut, Georgia, Minnesota and Oregon and selected counties in California, Maryland, New York and Tennessee. The catchment area included 29.5 million persons, 11% of the US population. We compared rates of laboratory-diagnosed illness for Hispanics, African-Americans, and Asians with rates for non-Hispanic Whites. For certain pathogens we compared rates of disease from 1996-2000 using Poisson regression.

Results: The incidence per 100,000 population of infections of *Campylobacter* was 16.0, *E. coli* O157 2.3, *Lm* 0.4, non-typhoidal *Salmonella* 14.5, *S.* Typhi 0.1, *Shigella* 8.0, *Vibrio* 0.2, and *Yersinia* 0.5. The incidence was higher in Hispanics than non-Hispanic Whites for *Shigella* (RR=2.8, 95% CI=2.4-3.3) and *S.* Typhi (14.6, 4.2-50.4). The incidence was higher in African-Americans than Whites for *Shigella* (1.5, 1.4-1.8) and *Yersinia* (6.0, 3.9-9.3) but not for *E. coli* O157 (0.2, 0.1-0.3) or *Campylobacter* (0.4, 0.3-0.5). The incidence was higher in Asians than Whites for *Yersinia* (3.8, 1.8-8.2), *Vibrio* (5.1, 2.2-11.9) and *S.* Typhi (45.7, 16.3-128.2) but not for *E. coli* O157 (0.2, 0.3-0.8) or *Shigella* (0.5, 0.3-0.7).

Conclusion: The marked variation in rates of illness among ethnic and racial groups suggests that further work is needed to identify high-risk food consumption practices and to target educational messages to these populations. Physicians evaluating patients with diarrheal illness should ask about food habits that may be unique to a patient's ethnicity or race. Physicians should also consider incorporating food safety education into routine health maintenance.

Background

- Each year in the United States foodborne illnesses cause an estimated:
  - 76 million illnesses
  - 325,000 hospitalizations
  - 5,000 deaths
- Several foodborne outbreaks have been associated with practices unique to specific racial or ethnic populations
  - Listeriosis associated with Mexican-style cheese in Hispanic communities
  - Yersiniosis associated with chitterlings in African-American communities

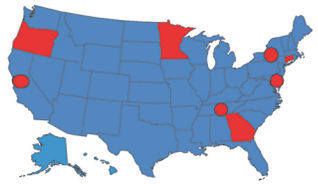
Objectives

- To compare rates of illness, by pathogen, among different racial and ethnic groups in 2000
- For those infections where there are disparities, determine if disparity has changed from 1996-2000

Data Source

- FoodNet, the foodborne disease component of CDC's Emerging Infections Program (EIP)
- Collaborative effort among CDC, FDA, USDA and 9 state health departments
- Laboratory-based active surveillance for 7 bacterial foodborne pathogens: ***Campylobacter***, ***E. coli* O157**, and other Shiga toxin-producing ***E. Coli*** (STEC), ***Listeria monocytogenes***, ***Salmonella***, ***Shigella***, ***Vibrio***, ***Yersinia***

FoodNet, 2000



Population = 29,507,966 persons (11% US population)

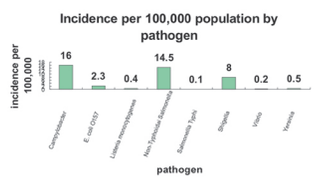
Data Analysis

- Laboratory-confirmed infections identified in FoodNet from 1996-2000
- Relative rates (RRs) calculated using non-Hispanic Whites as referent group
  - Cases with missing race or ethnicity excluded
- Poisson regression used to assess change in incidence over time by race and ethnicity

Results

- 12,373 laboratory-confirmed cases of bacterial foodborne illness in 2000

Incidence per 100,000 population by pathogen



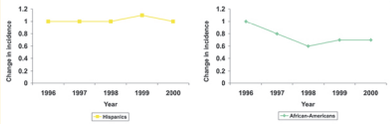
Campylobacter

- Higher incidence among Hispanics relative to Whites
- Lower incidence among African-Americans relative to Whites

	Relative Rate (RR)	95% CI
Whites	1.0	-----
Hispanics	**1.4**	**1.1, 1.5**
African-Americans	**0.4**	**0.3, 0.5**
Asians	1.0	0.9, 1.2
Native Americans	1.1	0.7, 1.8

Campylobacter, 1996-2000

- No change in incidence in Hispanics
- Decline in incidence in African-Americans



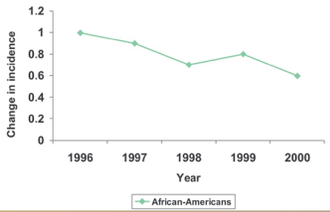
Non-Typhoidal *Salmonella*

- Minimally higher incidence among African- Americans relative to Whites

	Relative Rate (RR)	95% CI
Whites	1.0	-----
Hispanics	1.0	0.9, 1.2
African-Americans	**1.2**	**1.1, 1.3**
Asians	1.2	1.0, 1.4
Native Americans	0.8	0.5, 1.5

Non-Typhoidal *Salmonella*, 1996-2000

- Decline in incidence in African-Americans



Shigella

- Higher incidence among Hispanics, African-Americans and Native Americans relative to Whites
- Lower incidence among Asians relative to Whites

	Relative Rate (RR)	95% CI
Whites	1.0	-----
Hispanics	**2.8**	**2.4, 3.3**
African-Americans	**1.5**	**1.4, 1.8**
Asians	**0.5**	**0.3, 0.7**
Native Americans	**1.9**	**1.1, 3.4**

E. coli O157 and other STEC

- Lower incidence among African-Americans and Asians relative to Whites

	Relative Rate (RR)	95% CI
Whites	1.0	----
Hispanics	0.6	0.4, 1.0
African-Americans	**0.2**	**0.1, 0.3**
Asians	**0.5**	**0.3, 0.8**
Native Americans	0.6	0.2, 2.4

Yersinia

- Higher incidence among African Americans and Asians

	Relative Rate (RR)	95% CI
Whites	1.0	----
Hispanics	2.4	1.0, 5.6
African-Americans	**6.0**	**3.9, 9.3**
Asians	**3.8**	**1.8, 8.2**
Native Americans	0.0	n/a

Listeria monocytogenes

	Relative Rate (RR)	95% CI
Whites	1.0	----
Hispanics	1.5	0.7, 3.1
African-Americans	0.8	0.4, 1.4
Asians	0.3	0.0, 1.6
Native Americans	0.0	n/a

Vibrio

- Higher incidence among Asians relative to Whites

	Relative Rate (RR)	95% CI
Whites	1.0	----
Hispanics	1.8	0.6, 6.0
African-Americans	0.8	0.3, 2.3
Asians	**5.1**	**2.2, 11.9**
Native Americans	0.0	n/a

Salmonella Typhi

- Higher incidence among Hispanics and Asians relative to Whites

	Relative Rate (RR)	95% CI
Whites	1.0	----
Hispanics	**14.6**	**4.2, 50.4**
African-Americans	1.9	0.4, 9.8
Asians	**45.7**	**16.3, 128.2**
Native Americans	0.0	n/a

Conclusions

- Higher incidence of *Campylobacter, Shigella*, and *Salmonella* Typhi among Hispanics compared with non-Hispanic Whites in 2000
- Higher incidence of non-Typhoidal *Salmonella, Shigella* and *Yersinia* among African-Americans compared with non-Hispanic Whites in 2000
- Higher incidence of *Yersinia*, *Vibrio*, and *Salmonella* Typhi among Asians compared with non-Hispanic Whites in 2000
- Disparities between African-Americans and non-Hispanic Whites for *Campylobacter* and Non-Typhoidal *Salmonella* infections have decreased since 1996
- Unclear why disparities continue to exist

Further Studies

- Limitations of current study
  - Missing data
  - Challenge of modeling effects of changing surveillance population
- Disparities in disease burden should be verified and elucidated through further analyses with related datasets
  - Market research data
  - Census long form data

Recommendations

- Additional studies needed to identify high-risk food consumption practices
- Prevention strategies and food safety education should target high risk racial and ethnic groups
- When evaluating patients with diarrheal illness, physicians should ask about food habits unique to a patient's ethnicity or race
- Physicians should consider incorporating food safety education into routine health Maintenance

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