CDC Estimates of Foodborne Illness in the United States

DIFFERENCES

Data and Methodological Differences, 2011 and 1999

The CDC 2011 estimates of illnesses, hospitalizations, and deaths from foodborne diseases in the United States are more accurate than those published in 1999. The methodology used for the 2011 estimates is different from that used in 1999. Over the past decade, investments have provided better data sources and methods, and Scallan et al. have used more sophisticated methods to model for uncertainty. These differences mean there is no strict side-by-side comparison that can be made between the two sets of estimates.

The 2011 estimates of illnesses, hospitalizations, and deaths from foodborne disease in the United States reflect improvements made since 1999 in data quality and methodology. Perhaps most importantly, these new estimates identify and rank the most important bacteria, viruses and parasites ("pathogens") responsible for causing foodborne illness. Going forward, CDC will use the 2011 data to develop estimates of the proportion of illnesses that can be attributed to specific foods. These more specific estimates can further inform policy and regulatory priorities to prevent future illnesses.

The following table highlights the major differences in data and methodology between the new estimates and those published in 1999, and how they affect the estimates of illnesses, hospitalizations, and deaths from foodborne diseases in the United States.

1999 Estimates	2011 Estimates	Effects of Differences
2011 estimate of acute gastroenteritis illnesses: more precise		
Used 1996–1997 FoodNet Population Survey and data from US studies done before 1980	Used the three most recent FoodNet surveys conducted in 2000–2001, 2002–2003, and 2006–2007	**5 times larger =** 2011 sample size (>48,000) compared with 1999 estimates (~9,000). Larger sample size resulted in more precise data.
Respondents reporting any vomiting included in definition of acute gastroenteritis	Respondents reporting vomiting for <1 day or whose illness did not restrict activities excluded from definition of acute gastroenteritis.	Stricter definition reduced rate of acute gastroenteritis.
25% = Proportion of respondents excluded from estimate of acute gastroenteritis because they reported cough or sore throat	**38% =** Proportion of respondents excluded from estimate of acute gastroenteritis because they reported cough or sore throat	Greater number of respondents excluded reduced rate of acute gastroenteritis.
0.79 = Rate of acute gastroenteritis per person per year	**0.60 =** Rate of acute gastroenteritis per person per year	**211 million in 1999 reduced to 178.8 million in 2011 =** Decline in the estimate of the total number of acute gastroenteritis illnesses
2011 estimate focused on foodborne illnesses acquired in the United States		
Included international travel-related illnesses	Excluded international travel-related illnesses	Estimates were limited to foodborne illnesses that were domestically acquired, which reduced the number of foodborne illnesses in 2011 vs. 1999.

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CS218786-D

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1999 Estimates	2011 Estimates	Effects of Differences
2011 estimate showed decline in proportion of illnesses determined to be foodborne		
40% = Proportion of norovirus illnesses estimated to be foodborne **36%** = Proportion of the known gastroenteritis pathogens and the unspecified agents estimated to be foodborne	**26%** = Proportion of norovirus illnesses estimated to be foodborne **25%** = Proportion of the known gastroenteritis pathogens and the unspecified agents estimated to be foodborne	Because norovirus causes a large number of illnesses, this reduction resulted in a big drop in the proportion of illnesses from all known gastroenteritis pathogens estimated to be foodborne, which in turn reduced the proportion of illnesses due to unspecified agents that were estimated to be foodborne. **76 million in 1999 reduced to 47.8 million in 2011** = Decline in the overall estimate of foodborne illnesses (Also due to a lower estimate of acute gastroenteritis)
2011 estimate of illnesses caused by known pathogens: more accurate		
15% = Proportion of survey respondents with bloody diarrhea seeking medical care **12%** = Proportion of respondents with nonbloody diarrhea seeking medical care	**35%** = Proportion of survey respondents with bloody diarrhea seeking medical care **18%** = Proportion of survey respondents with nonbloody diarrhea seeking medical care	Higher, more accurate estimate of medical care-seeking was used in multipliers to correct for under-diagnosis, resulting in lower illness estimates for known pathogens.
2011 estimate used "adjustment" multipliers specific for each pathogen		
Generic multipliers used to adjust for underreporting based on similarity of symptoms for known pathogens	Pathogen-specific multipliers used to adjust for under-reporting and under-diagnosis	Pathogen-specific multipliers resulted in more precise estimates.
2011 estimate modeled uncertainty for generation of estimates		
Point estimates calculated without modeling of uncertainty	Modeled uncertainty for each estimate, resulting in credible intervals for each number	Credible intervals indicate a 90% probability that the actual numbers fall within the stated ranges.

The 2011 estimates reflect innovations in data and methodology that have occurred in the past decade. As with the current study, the 1999 study used the best data and methods available at the time.

Five or 10 years from now, when we again estimate US foodborne illnesses, hospitalizations, and deaths, we expect that there will again be advances in data sources and methods that will allow greater accuracy and precision.

Although we can't compare these estimates to determine trends, we can turn to reports based on FoodNet data for information about trends in some important infections that are transmitted commonly through food.

The annual report from the Foodborne Diseases Active Surveillance Network (FoodNet) provides the best measure of disease trends. Although the report includes only a portion of the pathogens that make up the estimates, it does allow us to see changes over time for these important foodborne pathogens.

According to a 2010 FoodNet report, which included preliminary data from 2009, rates of infection were at least 25% lower for *Shigella, Yersinia,* STEC (Shiga toxin–producing *E. coli*) O157, *Campylobacter*, and *Listeria* than they were a decade ago; *Salmonella* was only 10% lower. Rates were substantially higher for *Vibrio* in 2009 than in 1996–1998.

For more information about foodborne disease trends over the past decade, please visit http://www.cdc.gov/FoodNet/index.htm.