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A Web-Based Tool for Calculating the Cost of Foodborne Illness

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Government analysts estimate the cost and distribution of foodborne illness—illness caused by either naturally occurring pathogens or deliberate or accidental contamination of foods with toxic or other harmful substances—to help policymakers target food safety policies to programs where they will do the most good. Estimating costs requires a number of assumptions about illness incidence and burden. ERS's Foodborne Illness Cost Calculator (www.ers.usda. gov/data/foodborneillness/) provides policymakers and the general public with detailed information about the assumptions behind foodborne illness costs and provides the flexibility to change these assumptions and generate custom cost estimates. The Calculator describes the assumptions and calculations behind the ERS cost estimates for two foodborne pathogens, *Salmonella* and, as of spring 2006, Shiga-toxin producing *E. coli* O157 (STEC O157).

Create Custom Cost Estimates

Example: Change the number of cases

Some potential uses of the Calculator include determining the cost of illness for a State or community where the incidence of STEC O157 is known, estimating the cost of illness due to an STEC O157 outbreak, or updating the cost of STEC O157 when a new estimate of annual cases becomes available.

For example, ERS's cost estimate for STEC O157 of $431.4 million (in 2005 dollars) is based on the Centers for Disease Control and Prevention's (CDC) 1999 estimate of 73,480 annual cases. Newly released data from CDC's FoodNet program for monitoring foodborne illness show a 29-percent decrease in the incidence of lab-diagnosed STEC O157 cases in 2005 compared with the 1996-98 baseline period. A calculator user could assume that the number of annual cases has decreased by the same percentage. - Entering this assumption (which is equivalent to 52,171 cases) into the Calculator, without changing any other assumptions, yields a new cost estimate of $304.5 million (in 2005 dollars).

Example: Calculate costs of contaminated ground beef

The Calculator could also be used to estimate the cost of STEC O157 illnesses due to a specific food vehicle, such as ground beef. The 2001 risk assessment conducted by USDA's Food Safety and Inspection Service estimated that ground beef contaminated with *E. coli* O157: H7 caused a median of 19,000 illnesses each year, distributed across a range of health outcomes.

The outcomes include 17,200 cases who didn't see a physician; 1,400 cases who visited a physician; 310 nonfatal cases who were hospitalized without developing the serious complication, hemolytic uremic syndrome (HUS); 80 nonfatal HUS cases; and 10 fatal HUS cases.

Plugging these outcome estimates into the Calculator and changing no other assumptions puts the estimated cost of STEC O157 infections due to contaminated ground beef at $71.4 million (in 2005 dollars).

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Data Sets

Foodborne Illness Cost Calculator: STEC O157

What can I do?

1. Change the number of cases of illness or the distribution of cases by severity
2. Change assumptions about the use or costs of medical care
3. Change assumptions about the amount or value of time lost from work
4. Include estimates of the cost of pain and suffering
5. Change assumptions about the costs of premature death
6. Adjust for inflation for any year from 1997 to 2005
7. View results in two additional formats: outcome tree or pie chart

ERS cost estimate: STEC O157, all sources, 2005 dollars (6) (7) Tree diagram Pie chart

Cost component	Not hospitalized: Didn't visit physician; survived — Change per case costs for Severity 1	Not hospitalized: Visited physician; survived — Change per case costs for Severity 2	Hospitalized: Didn't have HUS[1]; survived — Change per case costs for Severity 3	Hospitalized: Had HUS but not ESRD[2]; survived — Change per case costs for Severity 4	Hospitalized: Had HUS and ESRD; survived — Change per case costs for Severity 5	Hospitalized: Didn't have HUS; died — Change per case costs for Severity 6	Hospitalized: Had HUS; died — Change per case costs for Severity 7	Total
(1) Number of cases (Change number of cases)	57,656	13,656	1,797	300	10	23	38	73,480
All illness	*dollars*							
(2) Medical:	147,991	4,094,750	10,202,955	10,313,802	7,124,106	130,406	1,306,290	33,320,300
Medications	147,991	223,994	85,248	8,347	389	908	932	467,810
Office visits	0	1,914,507	202,338	63,916	2,131	2,590	8,096	2,193,577
Emergency room	0	1,956,249	566,332	136,448	4,548	7,249	17,283	2,688,109
Hospitalization	0	0	9,349,036	10,105,092	336,836	119,659	1,279,978	21,190,602
Chronic medical	0	0	0	0	6,780,202	0	0	6,780,202
(3) Productivity, nonfatal	1,404,428	2,418,294	926,893	18,761	493,965	18,516	11,770	5,292,626
(4) Disutility, nonfatal	0	0	0	0	0	0	0	0
(5) Premature death	0	0	0	0	47,485,493	97,481,442	247,864,296	392,831,230
ERS total cost, 2005	1,552,420	6,513,044	11,129,848	10,332,563	55,103,563	97,630,363	249,182,356	431,444,157
ERS average cost per case, 2005	27	477	6,194	34,442	5,510,356	4,244,798	6,557,430	5,872

[1]Hemolytic uremic syndrome
[2]End-stage renal disease (with shortened life expectancy)

This article is drawn from . . .

ERS's Foodborne Illness Cost Calculator, available at: www.ers.usda.gov/data/foodborneillness/