Chapter 4

Analysis of Jury Verdict Data for Foodborne Illness

One purpose of this report is to perform a preliminary exploration of product liability law for foodborne illness and the incentives it provides firms to produce safer food. To this end, the analysis described here used U.S. jury verdict data on foodborne illness lawsuits for 1988-97. We analyzed the frequency and size of awards by illness severity, pathogen, and food subcategories. We used multivariate analyses to examine the simultaneous effects of the various factors that might affect whether or not plaintiffs receive foodborne illness jury verdicts and the size of the award.

U.S. Foodborne Illness Court Data

The universe of U.S. foodborne illness cases is unknown because there is no national system documenting all product liability cases, particularly those dropped or settled out of court. Therefore, we focused exclusively on foodborne illness lawsuits that were tried and resulted in jury verdicts. We identified foodborne illness jury verdicts by systematically searching two major jury verdict databases, the West Group's Westlaw Jury Verdicts and Settlement Summaries (West Group, Inc., Eagan, Minnesota) and the Lexis-Nexis Verdicts Library (Reed Elsevier PLC, London, England). Although these databases include both trials and settlements, we discarded the settlement data as they were not representative.[11] These databases included descriptive summaries of civil jury verdicts, gathered by jury verdict reporting firms that collect and sell information about legal cases for use by practicing attorneys. Information provided about each verdict was limited, and omitted whether verdicts had been overturned or reduced through the post-trial appeal process.

Most jury verdict reporting firms cover a single State or metropolitan area, although none collect every verdict in their covered area. In some areas of the country with competing firms, the firms believed that every foodborne illness jury verdict in the area was reported by at least one firm, assuring complete reporting. However, at least some foodborne illness jury verdicts went unreported in other areas of country. Jury verdict reporting firms also claim that the product liability jury trials included in their databases were selected without any bias in favor of plaintiff verdicts or large awards. Thus, the foodborne illness jury verdicts identified by the firms in areas without complete reporting appeared to be a representative sample of all foodborne illness jury trials in these areas.

We searched the Westlaw and Lexis-Nexis (WLN) databases for every jury verdict involving personal injuries due to pathogen-contaminated food between 1988 and 1997. Relevant jury verdicts in the WLN databases were identified by searching for the general classification term "food poisoning" or the names of common foodborne pathogens or illnesses (botulism, *Campylobacter*, campylobacteriosis, ciguatera, ciguatoxin, *Clostridium*, *Cryptosporidium*, *Cyclospora, E. coli*, hepatitis, *Listeria*, listeriosis, *Salmonella, Shigella, Staphyloccocus, Toxoplasma*, toxoplasmosis, *Trichinella*, trichinosis, *Vibrio*, and *Yersinia*).

Cases were included only if they met our definition of a foodborne illness case: the illness (1) produced symptoms consistent with foodborne illness (e.g., gastrointestinal distress) in the medical literature, (2) was linked to food, and (3) was claimed to have resulted from pathogens or foreign objects that are "organic" or could have been living in the food.

The data include lawsuits whose trial dates or dates of resolution were between 1988 and 1997. The analysis was limited to the 1988-97 period because most of the jury verdict reporting firms did not begin providing their case summaries to Westlaw or to Lexis-Nexis until the late 1980's.

The results from the WLN databases search were supplemented with information from a few published case histories. We identified 178 "foodborne illness" jury trials in 32 States that reached legal resolution during the 10-year period, 1988-1997. None of the 178 jury trials were class action suits, although some involved more than one injured plaintiff, such as a family with the same foodborne illness.

After identifying the foodborne illness jury verdicts, we then searched the entire Lexis-Nexis Litigation

[11] For example, settlement data are prone to selection biases such as the differences between confidential settlements and settlements that are disclosed to the public.

Library database to determine whether each foodborne illness jury verdict had been appealed to a higher court. Two lawsuits had been unsuccessfully appealed by defendants. Several others had been remanded for retrial, but we were unable to determine the outcome so they were dropped from the analysis.

We compared the verdicts from the areas with full reporting and sample reporting to determine whether there were any systematic differences that might reflect sampling bias in the areas with sample reporting. The comparison was performed by conducting a likelihood ratio test of multivariate models predicting the outcome of trials in each area. The test revealed no significant difference between the population of verdicts drawn from each area (χ^2=13.9, d.f.=10, P>.05), suggesting that the sampling was unbiased. Based on this evidence, the 178 cases identified by searching the WLN databases appear to provide representative information about foodborne illness lawsuits resulting in jury verdicts in areas with both full and partial jury verdict reporting during 1988-97.

A number of different characteristics of each foodborne illness lawsuit were coded in a computer database, including the date of the incident that caused the injury, the type of food and pathogen involved, the severity of the illness, the date of the trial verdict, the outcome of the trial, and the amount of any damage award. Descriptive information in the published WLN summaries varied. For example, all cases reported the outcome/verdict, but three cases did not report compensation amounts, and few reported claimed expenses.

Financial damage awards were updated to 1998 dollars using the Bureau of Labor Statistics' annual Consumer Price Index for all urban consumers to ensure comparability between lawsuits.[12] For many of the subsequent sections, we report three main statistics about awards:

Mean award: This is the average monetary compensation awarded to plaintiffs who received compensation. This statistic excludes cases won by defendants, cases where plaintiffs won but did not receive compensation, and cases for which we did not have information on awards.

Median award: This is the midpoint of monetary compensation awarded to plaintiffs who received compensation. This statistic excludes cases won by defendants, cases where plaintiffs won but did not receive compensation, and cases for which we did not have information on awards.

Expected award: This is the mean plaintiff award multiplied by the percent of foodborne illness jury trials won by plaintiffs. The only cases excluded here are those for which we did not have information on awards. This is the most relevant statistic for the purpose of this report as it shows the expected monetary transaction as a result of a foodborne illness lawsuit between different parties in the chain of food production, distribution, and consumption.

Findings

Time to Legal Resolution

In general, the time to a legal resolution is the sum of several components:

- the time between the incident (e.g., illness or injury) and the filing of the complaint,
- the time between the filing of the complaint and the beginning of the trial,
- the time between the beginning of the trial and the announcement of the verdict,
- the time between the verdict and the filing of an appeal (if one is filed),
- the time it takes for the appeal to a final judgment (if an appeal is filed), and
- the time between a conclusive plaintiff victory and the receipt of any compensation.

Of the 178 court decisions for foodborne illness lawsuits in the WLN data, 110 observations provided information on the time between the alleged foodborne illness incident and the legal resolution. The average time elapsed between the date of the incident that resulted in illness and the date of the jury verdict was 3.1 years (median of 2.8 years). One case was not tried for nearly 10 years, although another case was tried in just 5 months. The WLN data do not permit a more descriptive breakdown of time components.

The average time required to bring a foodborne illness lawsuit to trial was comparable to the average time elapsed between the filing of a product liability lawsuit and the trial verdict (2.5 years) reported in a study of all product liability cases in five States during 1983-85 (GAO, 1989, p. 49). The slow pace of foodborne illness litigation may impose significant costs on con-

[12] Source: <http://146.142.4.24/cgi-bin/srg>. [Accessed Feb. 22, 1999].

sumer plaintiffs. Nevertheless, delay may be advantageous for consumers who developed long-term chronic complications of foodborne illness and who were well advised to wait to determine the full extent of their injuries before filing a lawsuit specifying monetary damages (Rosenbaum, 1998).

Frequency and Size of Awards

Most plaintiffs failed to convince juries that defendants were legally responsible for causing their illness. One-third of the verdicts (31.4 percent) resulted in a monetary award for the consumer. For the 55 cases where the plaintiffs prevailed, the mean award to plaintiffs was $133,280 (table 2). However, the distribution of awards was highly skewed because some awards were much larger, including two awards over $1 million. The median award of $25,560 consequently provides a better indication of the typical jury award for damages resulting from foodborne illness. The total amount awarded to the 55 cases that prevailed in court was $7.3 million, but the two largest awards accounted for over half (51 percent) of this sum.

An alternative measure of the amount awarded in foodborne illness lawsuits is the expected award. The expected award is the mean award multiplied by the percent of jury trials won by plaintiffs (i.e., 31.4 percent). The expected award was $41,888, nearly two-thirds larger than the median plaintiff award. Consumers and firms involved in foodborne illness lawsuits could take this expected award into account when making decisions about whether to resolve a lawsuit prior to trial. Consumers could expect to receive this amount if they went to trial, less their legal and court fees which typically total about one-third of the award. Conversely, firms could expect to pay this amount if they go to trial, in addition to their legal fees and any other costs associated with a public trial such as loss of business reputation.

Court Awards by Severity Category

The jury verdict summaries provided only minimal information on illness severity. Therefore, we subdivided the 178 court cases into three categories by severity: cases involving a premature death, cases involving hospitalization but not a premature death, and all other cases involving less severe illnesses. Six lawsuits (3 percent) involved a death, and another one-third of the lawsuits (60 percent) involved nonfatal injuries severe enough to require hospitalization. The average length of hospitalization was 9 days, although one plaintiff was hospitalized for 49 days.

Injury severity is a major factor affecting an expected award. Of the six lawsuits involving a premature death, juries awarded damages in four (66.7 percent). The expected award for a lawsuit that claimed a premature death as a result of a foodborne illness was $183,053, far higher than the expected award ($44,713) for lawsuits involving nonfatal foodborne illnesses requiring hospitalization, and the expected award ($32,563) for all other illnesses (table 3). This pattern is consistent with the finding of the 1989 GAO report on general product liability cases in five States in which the size of the award varied by the type and degree of injury.

Table 2—Compensation for consumer plaintiffs in foodborne illness lawsuits decided by jury verdicts, 1988-97[1]

Outcome	Sample size	Percent won by plaintiffs	Range of compensation	Mean award	Median award	Expected award[2]	Total amount compensated
	Number	*Percent*	*1998 Dollars*				
Plaintiff[3]	55	100	2,256-2,368,858	133,280	25,560	133,280	7,330,412
Defendant[4]	120	0	0	0	0	0	0
Total	175	31.4	0-2,368,858	133,280	25,560	41,888	7,330,412

[1] Data updated to 1998 dollars using Bureau of Labor Statistics Consumer Price Index for all urban consumers. Of the 178 court decisions, 175 had published information on awards.
[2] The expected award is the average award multiplied by the percent of foodborne illness jury trials won by plaintiffs.
[3] Plaintiff verdict or award combined.
[4] Defendant verdict or judgment combined. Occasionally, unsuccessful plaintiffs covered defendants' court costs but these were not enumerated here.

Table 3—Compensation in foodborne illness court cases by severity category, 1988-97[1]

Illness severity	Court cases with award information	Percent won by plaintiff	Mean award	Median award	Expected award[2]
	Number	*Percent*	*- - - - - - - 1998 dollars - - - - - -*		
Premature death	6	66.7	274,580	185,828	183,053
Hospitalized and survived	60	31.7	141,199	61,814	44,713
Other cases	109	29.4	110,916	11,746	32,563
Total	175	31.4	133,280	25,560	41,888

[1] Only 175 of the 178 court decisions had award information so the award totals do not represent statistics for all court awards.
[2] The expected award is the mean plaintiff award multiplied by the percent of foodborne illness jury trials won by plaintiffs. The only cases excluded here are cases for which we did not have information on awards.

Table 4—Foodborne pathogens, toxins, or illnesses involved in foodborne illness lawsuits decided by jury verdicts, 1988-97

Pathogen	Lawsuits	
	Number	*Percent*[1]
Salmonella (any serotype)	39	21.9
Hepatitis (any type)	10	5.6
Staphylococcus	6	3.4
Vibrio vulnificus	6	3.4
Shigella (any type)	5	2.8
Campylobacter	4	2.2
Mold	4	2.2
E. coli[2]	3	1.7
Botulism (*Clostridium botulinum*)	2	1.1
Ciguatera	2	1.1
Salmonella and *Staphylococcus* (combined)	1	0.6
Streptococcus	1	0.6
Trichinella spiralis	1	0.6
Vibrio parahaemolyticus	1	0.6
Adverse reaction to protective immunization after exposure to foodborne hepatitis	1	0.6
Not specified	92	51.7
Total	178	100

[1] Percents may not add to 100 due to rounding.
[2] The case summaries for the three lawsuits involving *E. coli* did not mention the serotype, but all three cases appeared to involve *E. coli* O157:H7.

Court Awards by Implicated Pathogen

The ability of consumer plaintiffs to identify the specific pathogen and food item that made them ill is likely to have an important effect on the outcome of a trial because of the emphasis placed on establishing a causal link between a defective product and the alleged injury under product liability law. Less than half (48 percent) of the jury verdict reports implicated a specific foodborne pathogen, toxin, or illness (table 4). Some reports may have failed to record pathogen names, so the actual proportion of lawsuits that implicated a specific pathogen might be somewhat higher. Among the jury verdict reports that named a pathogen, *Salmonella* was the most frequently cited pathogen, followed by hepatitis (any type).[13]

Plaintiffs who alleged illness from a specific pathogen were more likely to receive compensation (41.7 percent) than plaintiffs who did not implicate a specific pathogen (22 percent), and the expected award was far higher when a specific illness or pathogen was alleged. These findings suggest the importance of establishing a causal link for a plaintiff to prevail in a foodborne illness trial and receive compensation (table 5).

[13] Knowledge about the different pathogens varies greatly, meaning that there is uneven documentation, scientific literature, and legal precedent for the different pathogens in foodborne illness litigation.

Court Awards by Implicated Food

Most jury verdict reports (92 percent) identified some kind of food as the cause of illness (table 6). However, one-fourth of the reports simply named meals such as “dinner” or food categories such as “fast food” that presumably included multiple food items, leaving the precise source of illness unclear. In contrast, two-thirds of the jury verdict reports (66 percent) identified a specific food item or food as the cause of illness. The most frequently mentioned foods were sandwiches, followed by seafood (excluding oysters) and chicken. Only three lawsuits mentioned packaged meals such as canned foods or frozen meals, suggesting that litigation involving packaged meals was either uncommon or likely to be resolved out of court.

Interestingly, cases whose jury verdict summaries alleged a specific food as the cause of the illness resulted in a lower percentage of favorable plaintiff verdicts (26.3 percent) than cases that did not name a specific food (e.g., “dinner” or “fast food”) (41.0 percent) (table 7). This finding is counterintuitive because of the importance of establishing a causal link.

Table 5—Compensation in foodborne illness court cases by pathogen category, 1988-97[1]

Pathogen category	Court cases with award information	Decision for plaintiffs	Mean award	Median award	Expected award[2]
	Number	*Percent*	*1998 dollars*		
Alleged illness from a specific pathogen	84	41.7	197,599	55,061	82,333
Unspecified pathogen	91	22.0	20,722	11,960	4,554
Total	175	31.4	133,280	25,560	41,888

[1] Of the 178 court decisions, 175 had award information. Therefore, the award totals do not represent statistics for all court awards.
[2] The expected award is the mean plaintiff award multiplied by the percent won by plaintiffs. The only cases excluded here are cases for which we did not have information about awards.

This finding may reflect a lack of detail about the trials reported in the jury verdict summaries. Some trials may have alleged a specific food, but jury verdict reporters did not consider this information important to record. However, the expected award was higher for those alleging a specific food ($48,593) than for those who did not ($29,358).

Court Awards by Type of Defendant

Plaintiffs may sue multiple defendants for several reasons. For example, even in cases where there is a strong indication of wrongdoing by restaurants, such as documented improper cooking temperatures, plaintiffs may think that the illness was first caused further back in the food production chain by the pathogen contaminating the product or by sloppy slaughtering practices or poor sanitation in processing, and they wish to hold all parties accountable (Rosenbaum, 2000). Alternatively, suing multiple defendants may also be a sign that the plaintiff does not have sufficient evidence of causation to isolate and name one defendant (Clark, 2000).

Table 8 reports foodborne illness lawsuits by defendant type. Of the 178 court cases, 135 (75.8 percent) named one defendant, 30 (16.9 percent) named two defendants, and 13 (7.3 percent) named three or more defendants, for a total of 234 separate defendants.[14] Most defendants were restaurant franchises with parent companies, the second largest category of defendants.

Table 6—Food items involved in foodborne illness lawsuits decided by jury verdicts, 1988-97

Food item	Lawsuits	
	Number	*Percent*[1]
Single vehicle		
Sandwiches (excluding hamburgers and egg sandwiches)	15	8.4
Seafood (excluding oysters)	11	6.2
Chicken	10	5.6
Hamburgers and ground beef	9	5.1
Oysters	9	5.1
Salad	7	3.9
Sausages and unknown meat	5	2.8
Beverages (excluding milk)	5	2.8
Mexican food	5	2.8
Baked goods (excluding desserts with raw egg)	4	2.2
Chinese food	4	2.2
Packaged meals (e.g., canned food, TV dinner)	3	1.7
Pork	3	1.7
Ice cream	2	1.1
Beef (excluding hamburgers and ground beef)	2	1.1
All other single vehicle (e.g., honey, lasagna)	19	10.8
Multiple vehicle (e.g., "restaurant food," "fast food," "dinner")	46	25.8
Not specified	15	8.4
Total	178	100

[1] Percents may not add to 100 due to rounding.

[14] We did tabulations on up to only three defendants per case because almost all cases had three or fewer defendants. The total number of defendants is slightly underestimated because a few cases had four or more defendants.

Table 7—Compensation in foodborne illness court cases by food category, 1988-97[1]

Food category	Court cases with award information	Decision for plaintiff	Mean award	Median award	Expected award[2]
	Number	*Percent*	*1998 dollars*		
Alleged illness from a specific food	114	26.3	184,652	27,584	48,593
Did not specify food	61	41.0	71,634	18,707	29,358
Total	175	31.4	133,280	25,560	41,888

[1] Only 175 of the 178 court decisions had award information so the award totals do not represent statistics for all court awards.
[2] The expected award is the mean plaintiff award multiplied by the percent won by plaintiffs. The only cases excluded here are cases for which we did not have information on awards.

Table 8—Defendants in foodborne illness court cases by firm type, 1988-97

Defendant	Total defendants[1]	
	Number	*Percent*
Restaurants	74	31.6
Foodstores	27	11.5
Distributors	11	4.7
Manufacturer[2]	29	12.4
Parent	60	25.6
Other[3]	33	14.1
Total	234	100.0

[1] Of the 178 court cases, 43 had multiple defendants for an overall total of 234 defendants. Tabulations were performed on up to three defendants per case. The number of defendants is underestimated for cases with more than three defendants because of insufficient information.
[2] Includes producers such as dairies and egg farms.
[3] Includes nine people, five hotel restaurants, three insurers, two each of clubs, cruise lines, food service, and vending machine firms, and 1 each of casino, deli, department store, fair vendor, government entity, investor, psychiatric institution, and railroad.

Other Information Provided by Court Data

Of the 175 court cases with award information, public health authorities were involved in 23 (13 percent), and of these 23 lawsuits, plaintiffs won 11 (47.8 percent). Both plaintiffs and defendants used expert witnesses. Expert witnesses, such as physicians, are likely to be called only when their testimony is considered essential. Plaintiffs called one or more physicians as expert witnesses in 67 percent of the foodborne illness lawsuits. In contrast, only 45 percent of the defendants called physicians. The disparity in the use of medical experts shows that establishing the role of a foodborne pathogen in causing an illness was a more important issue for plaintiffs because they have the burden of proving that a food caused the illness.

Key Findings

Despite their greater reliance on medical experts, most consumer plaintiffs failed to convince juries that defendant firms were legally responsible for causing their illness. One-third of the foodborne illness lawsuits (31 percent) resulted in a monetary award for the consumer. Only a few of the jury verdict summaries provided commentaries describing why juries decided in favor of firms rather than consumers. Some of the specific reasons cited for deciding in favor of firms included failures by plaintiffs to prove that a food product was defective or to prove that the plaintiff actually consumed the food product.

However, even if plaintiffs receive awards, the awards may not cover the costs incurred from the illness and from pursuing litigation (e.g., court costs and legal fees). Although the WLN data provided some information about the costs of illness—medical expenses and lost productivity, for instance—the data did not provide information about the costs of pursuing litigation, and the data were too weak to compare the costs of illness for each case against the monetary outcome of each case.

The data do, however, provide some insight into the magnitude of the claimed medical expenses and claimed lost productivity. Of the 178 court cases, 81 provided at least partial information on claimed medical expenses, ranging from $18 to $342,830, with a median of $5,612 (mean $19,292), and 42 provided some information about claimed lost productivity, ranging from $30 to $274,966, with a median of $1,905 (mean of $20,151) (all in 1998 dollars).

Even with a favorable verdict, plaintiffs may not receive damages set by a jury if: (1) the defendant does not have enough money or insurance to cover the award, (2) the award exceeds a State-mandated cap, or (3) a jury award is reduced by the trial judge or during settlement discussions prior to appeal, or on appeal (Broder, 1986).

Information about the defenses used for the foodborne illness lawsuits is incomplete and may not be representative of all defenses. However, in 26 lawsuits, the

defense argued that no one else became ill with foodborne illness. In 10 lawsuits, the defense argued that the plaintiff had a pre-existing illness that either was the cause of the current illness or was the current illness. In 19 lawsuits, the defense argued that the timing of the specific foodborne illness after ingestion of allegedly contaminated food was inconsistent with the incubation period of that foodborne illness. In six lawsuits, the defense admitted liability.

Multivariate Analyses of the Court Data

We consider three general factors potentially affecting foodborne illness jury verdicts: lawsuit characteristics, plaintiff characteristics, and defendant characteristics.

Lawsuit Characteristics

In addition to the strength of the case, plaintiff litigation success rates and the amount of awards in court trials generally vary by jurisdiction (e.g., small claims, civil, State, Federal, county) and by the nature of the injury, which is correlated with the type of law (e.g., contract, property, torts, and their subcategories such as product liability in the case of tort law) (Eisenberg, 1991; Daniels and Martin, 1986). Geographic variations may arise because of differences in propensity to sue, access to lawyers and the legal system, or State laws.

Therefore, the first characteristic of a lawsuit considered here is the State where it is filed. Because data were not available by State on all outcomes of the foodborne illness subset of personal injury lawsuits or for personal injury lawsuits as a whole, available Federal data were used to better understand regional differences. Of all Federal district-court civil cases, there were 1,898 completed trials with reported outcomes during 1988-97 for the personal injury subcategory of product liability (Eisenberg and Clermont, 2000). After aggregating by State, plaintiff success rates ranged widely from zero to 66.7 percent, while mean awards ranged widely from $0 to $8,160,156.[15] If these results hold for the foodborne illness subset of personal injuries, plaintiffs in some areas of the country may be more likely to win foodborne illness trials and receive larger awards than plaintiffs in other areas.

A second lawsuit characteristic is whether the plaintiff can provide sufficient evidence linking his/her illness to a specific foodborne pathogen that may have been in a food produced by the defendant. This information is likely to have an important effect on the outcome because of the emphasis that the law places on establishing a causal link between an illness and a product.

A third lawsuit characteristic is whether a public health authority was involved. This characteristic is important because the critical issue in most litigated foodborne illness lawsuits is causation: whether the plaintiff can prove that his/her illness resulted from exposure to the particular food item at issue. In outbreak situations, plaintiffs often rely upon the investigating public health authority to supply the epidemiological link; in cases where the public health authority cannot establish the link, the plaintiff's case may be weaker.

A fourth lawsuit characteristic is whether plaintiffs or defendants used medical witnesses to support their case. However, expert witnesses, such as physicians who receive large consulting fees, are likely to be called only when their testimony is considered essential. Merritt and Barry (1999) found that in product liability lawsuits, plaintiffs were more likely than defendants to employ expert witnesses. This makes sense as plaintiffs have the burden of proof. Merritt and Barry did not explore the impact of using these witnesses on case outcomes or awards.

Plaintiff Characteristics

Plaintiff characteristics might influence foodborne illness trial outcomes. Children and the elderly are categories of people particularly at risk from the more severe complications of foodborne illness. Merritt and Barry (1999) found tentative indications that minors were more likely than adults to win malpractice claims. While jurors are not supposed to act on sympathy, they are inclined to favor the plaintiff in cases involving children (Clark, 2000).

Illness severity is another plaintiff characteristic likely to be a factor in whether or not a plaintiff prevails, perhaps partly because more severe cases (e.g., hospitalized cases) tend to have more testing and better documentation to support plaintiffs' claims. Merritt and Barry (1999) used a 12-point scale to rate various degrees of injury to the plaintiff ranging from "1" (pure property damage and no injury to health) to "12" (death), and found that the most severely injured plaintiffs were not more likely to win in court. This outcome may result because severe cases tend to involve

[15] Updated to 1998 dollars using the Bureau of Labor Statistics' consumer price index (CPI) for all urban consumers.

larger damages, in turn increasing the defendant's insurer's incentive to contest the lawsuit. Other studies indicated that awards varied by injury type and severity (GAO, 1989; Rodgers, 1993) and were higher in tort trials involving death (Tabarrok and Helland, 1999).

In addition to medical costs and lost productivity, some plaintiffs in foodborne illness lawsuits claimed other damages, such as emotional distress, loss of consortium (i.e., a spouse's help and affection), and pain and suffering. A dollar value for these damages is difficult to assess because of their subjective nature. If plaintiffs can provide convincing evidence that these complications existed and can be valued fairly, then awards might be higher.

Defendant Characteristics

Defendant characteristics may help explain foodborne illness outcomes as well. According to one hypothesis, if juries perceive that certain defendants can afford to pay more (i.e., have deep pockets), they tend to make these defendants pay higher awards than otherwise. Although some studies, such as Tabarrok and Helland (1991), in the case of jury trials, and Shanley (1991), in the case of awards paid to plaintiffs after post-trial award adjustments, appear to support this hypothesis, Vidmar (1997) raised important questions about the validity of this hypothesis such as whether there were plausible alternative explanations. And, proponents of the deep-pocket hypothesis did not investigate whether affluence affects which side will prevail in court. Plaintiff victories may be less likely in cases against deep-pocket defendants since such defendants may have greater incentives to protect their corporate reputations and market share (i.e., more to lose) and have greater financial resources with which to do so (e.g., hire more and better experts and lawyers). Overall, however, the impact of deep pockets is still unclear, particularly if jurors tend to believe that all defendant food firms have insurance that might cover any award they might decide to give the plaintiff.

Design of Analysis

We performed two multivariate regression analyses to examine the effects of the various factors that might influence whether or not plaintiffs win foodborne illness jury verdicts (Win Model, n=175) and the size of the award in the case of plaintiff victories (Award Model, n=55). For the Win Model, the logit model was selected to handle the dichotomous dependent variable, which indicated whether the plaintiff prevailed. Ordinary least squares (OLS) regression was used for the Award Model. The dependent variable for the award amount was highly skewed, so it was transformed to a logged variable.[16]

Independent Variables and Their Hypothesized Effects

The Win Model

Table 9 presents the definitions and mean values for the independent variables used in both models. The Win Model included 11 independent variables, which are hypothesized to affect the odds of an award. These independent variables can be categorized into lawsuit, plaintiff, and defendant characteristics.

As a proxy for the unmeasured regional differences potentially affecting the outcome of a lawsuit, a variable representing plaintiff success rates for personal injury lawsuits by State (RATERAW) was included in the model. The data are from an Internet-accessible database of Federal district-court civil cases with reported outcomes, 1988-97 (Eisenberg and Clermont, 2000). States with higher plaintiff success rates in Federal trials for personal injury lawsuits are anticipated to have higher plaintiff success rates in jury decisions for the foodborne illness subcategory of personal injury lawsuits.

Four other independent variables measured the characteristics of the lawsuit. It was anticipated that lawsuits implicating specific foodborne pathogens (PATHOGEN) were more likely to result in plaintiff victories and that public-health officials' involvement (PUBLIC) would provide substantiating information for a plaintiff's claim, increasing the chances of a plaintiff award. It was also anticipated that the plaintiff's chances of prevailing would be increased by plaintiffs' use of medical expert witnesses (PWITDOC) and reduced by defendants' use of these witnesses (DWITDOC).

Another variable, YEAR1993, indicates whether a lawsuit was resolved in 1993 or later, in anticipation that plaintiffs are more likely to prevail after 1993 because of increased public awareness of food safety hazards and related litigation after the large 1993 outbreak

[16] Sample selection models could have also been used here, but we decided that logit and OLS regressions were appropriate for the purpose of this report.

from undercooked hamburgers contaminated with *E. coli* O157:H7. This outbreak was one of the most well-publicized outbreaks in terms of incidence, severity, and legal and economic ramifications, and could have affected jurors' perceptions of the role of firms in causing foodborne illness.

The Win Model also includes two independent variables (HOSPITAL, DEATH) measuring the severity of the plaintiff's illness. We hypothesize that more severe illnesses are more likely to result in plaintiff victories because of greater medical documentation and because juries might be more sympathetic toward these cases. Similarly, a variable indicating whether or not one or more of the plaintiff(s) was a child (CHILD) was included in anticipation that juries may be more sympathetic toward child or infant plaintiffs.

Two variables measured defendant characteristics. The first variable (DEEPPOCK) was included to measure the impact of defendants with "deep pockets" on the plaintiffs' odds of winning. The criteria used to determine whether a defendant had deep pockets were presumed to be met if there was any evidence that the defendant had one or more of the following: (1) three or more retail operations, (2) 40 or more full-time employees, (3) two or more manufacturing plants, or (4) three or more warehouses. Two other defendants, a State government unit and a country club, were also considered to have deep pockets. Under these criteria, roughly half of the lawsuits in our sample had at least one deep-pocket defendant. The anticipated relationship for this variable is unclear. The second variable indicated whether one or more defendants was a restaurant (REST). We anticipated that the plaintiffs' chances of winning would increase if plaintiffs and

Table 9—Definitions and mean values of independent variables

Variables	Win model (win/no win) (N=175)	Award model (award size) (N=55)
RATERAW (the weighted average win rate per State in completed Federal District product liability jury trials for personal injury)	.3005	
PATHOGEN (1 if a specific foodborne pathogen, toxin, or illness was implicated; 0 otherwise)	.4800	
PUBLIC (1 if a public health authority was involved; 0 otherwise)	.1314	
PWITDOC (1 if the plaintiff employed one or more doctors as expert witnesses; 0 otherwise)	.9657	
DWITDOC (1 if the defendant employed one or more doctors as expert witnesses; 0 otherwise)	.5600	
YEAR1993 (1 if the lawsuit was resolved in 1993 or later; 0 otherwise)	.5086	.3818
HOSPITAL (1 if the plaintiff(s) was hospitalized; 0 otherwise)	.3429	.3455
DEATH (1 if the lawsuit involved a death; 0 otherwise)	.0343	.0727
CHILD (1 if one or more of the plaintiff(s) was a child; 0 otherwise)	.0914	.1091
DEEPPOCK (1 if one or more of the defendants had "deep pockets"; 0 otherwise)	.5429	.3455
REST (1 if one or more of the defendants was a restaurant; 0 otherwise)	.4229	
CHRONIC (1 if the lawsuit involved a chronic complication; 0 otherwise)		.1636
DISTRESS (1 if plaintiffs claimed emotional distress; 0 otherwise)		.1091
LOSSCONS (1 if plaintiffs claimed loss of consortium; 0 otherwise)		.1091
PAINSUFF (1 if plaintiff claimed pain and suffering; 0 otherwise)		.1455
AVGRAW (the average award in thousand dollars per State in completed Federal District product liability trials for personal injury)		$2,081.78

Table 10—Multivariate analyses of foodborne illness jury verdicts

	Win model (win/no win)		Award model	
	Predicted relationsihp	Logit coefficient	Odds ratio[1]	Regression coefficient
INTERCEPT	——	0.77 (0.94)	——	9.29 (0.43)
RATERAW	+	-2.29 (2.51)	0.10	
PATHOGEN	+	0.97* (0.41)	2.63	
PUBLIC	+	0.28 (0.58)	1.32	
PWITDOC	+	0.06 (0.24)	1.06	
DWITDOC	-	-0.93** (0.36)	0.39	
YEAR1993	+	-0.64 (0.39)	0.53	-0.22 (0.38)
HOSPITAL	+	-0.07 (0.43)	0.94	1.12** (0.39)
DEATH	+	1.34 (1.02)	3.82	3.06** (0.67)
CHILD	+	0.53 (0.62)	1.69	0.28 (0.60)
DEEPPOCK	?	-1.24** (0.39)	0.29	0.41 (0.38)
REST	+	-0.51 (0.40)	0.60	
CHRONIC	+			1.62** (0.47)
DISTRESS	+			0.95 (0.60)
LOSSCONS	+			0.82 (0.57)
PAINSUFF	+			0.25 (0.50)
AVGRAW	+			-0.0001 (0.0001)
Sample size		175		55

*Significant at the .05 level.
**Significant at the .01 level.
Numbers in parentheses are standard errors.
[1] The odds ratio is the marginal logit effect.

defendants are relatively close together in the chain of food production, distribution, and consumption, such as the relationship between a restaurant and a restaurant customer, facilitating the identification of linkages between an illness and a responsible firm.

The Award Model

The Award Model has 10 independent variables, 5 of which were also included in the Win Model: HOSPITAL, CHILD, DEATH, YEAR1993, and DEEPPOCK. All five were anticipated to have positive relationships with award amount. An additional severity measure was added for chronic complications (CHRONIC) in anticipation that the associated higher costs would increase awards. The Award Model also included variables for claims such as emotional distress (DISTRESS), loss of consortium (LOSSCONS), and pain and suffering (PAINSUFF); all were expected to raise award amounts. The final variable is the average Federal personal injury award (in thousand dollars) by State (AVGRAW) using the Eisenberg and Clermont (2000) data. We anticipated that States with higher Federal awards for personal injury lawsuits would also have higher jury awards for the foodborne illness subcategory of personal injury lawsuits.

Regression Results and Interpretation

The Win Model

Table 10 presents the findings of the multivariate analyses. The logit regression provides an odds ratio which measures the multiplicative effect of the independent variables on the odds of a plaintiff judgement. The max-rescaled R^2 is 0.2791 for this model (a pseudo-R^2 for models with binary dependent variables, provided by SAS).[17]

In the Win Model, DEEPPOCK, DWITDOC, and PATHOGEN all had statistically significant effects on the plaintiff's chances of winning. When the lawsuit involved one or more deep-pocket defendants, the odds of a judgment for the plaintiff decreased by 29 percent, suggesting that defendants with greater financial resources were either more successful in their defense or more likely to settle stronger cases out of court.

[17] For a general linear model, Cox and Snell (1989, pp. 208-209) proposed a generalized coefficient of determination, and this was later adjusted by Nagelkerke (1991) for use in models with binary dependent variables (i.e., the max-rescaled R^2).

When the defendants used medical experts, the odds of a plaintiff victory decreased by 39 percent. This relationship was expected as a defendant's medical experts can highlight weaknesses in a plaintiff's case and place doubt in the minds of jurors as to the integrity of any linkages between a particular foodborne illness and the implicated food product. Implicating a specific foodborne illness or pathogen that caused the illness increased the odds of a plaintiff victory by over 260 percent, suggesting that the stronger the link between an ill individual and a particular foodborne pathogen, the stronger the plaintiff's case.

The Award Model

After controlling for the fact that plaintiffs receive larger awards for product liability injury trials in some areas of the country than others, three variables in the Award Model were significant at the 1 percent level: HOSPITAL, CHRONIC, and DEATH (model R^2=0.5283; adj. R^2=0.4211). These findings make intuitive sense as once it has been decided that the plaintiff will prevail, the injury severity is a determinant of award size. These significant effects accord well with previous research on award size (GAO 1989; Rodgers 1993; Tabarrok and Helland, 1999) and suggest that juries try to fairly compensate plaintiffs for their losses. Meanwhile, claimed emotional distress, loss of consortium, and pain and suffering were not significantly influential in determining damages, perhaps because of the subjective nature of these claims. The nonsignificant effect of both DEEPPOCK and CHILD also fits this picture: juries are compensating for a specific injury, regardless of whether or not the plaintiff was a child or if the defendant had deep pockets.

Discussion

Our findings emphasize the importance of consumer plaintiffs identifying the particular pathogen that caused their illness, and whether or not the illness was caused by consumer or firm error. The award model showed that juries base monetary awards on illness severity while relatively subjective considerations, such as pain and suffering, emotional distress, and loss of consortium, were not significant factors. Also, whether the plaintiff was a child or whether the defendant had deep pockets were not significant factors.

Undoubtedly the greatest research gaps concern how often foodborne illness lawsuits are filed, how many are settled or otherwise resolved before trial, and how settlements differ from jury verdicts. And, as settlements comprise the bulk of all outcomes and have different characteristics than verdicts, information on settlements is critical to understanding foodborne illness litigation. Future research may provide evidence that the strongest incentives from the legal system for food firms to improve food safety are from the threat of large outbreaks with associated widespread litigation and from the threat of uninsured economic losses.