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FOOD SAFETY IN THE 21ST CENTURY

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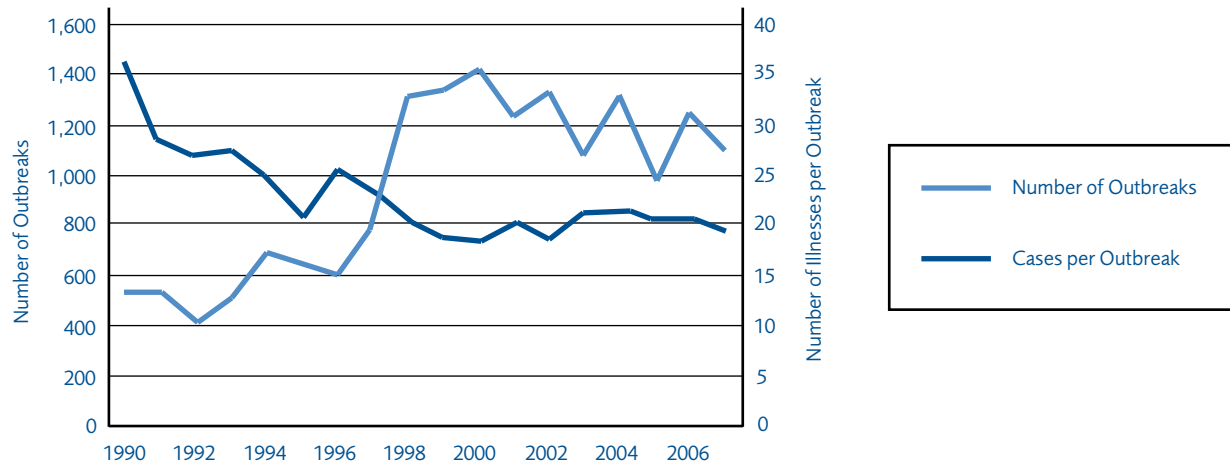
IN A MARCH 2009 address, President Obama declared, “There are certain things only a government can do. And one of those things is ensuring that the foods we eat . . . are safe and don’t cause us harm.”¹ Though this idea that only the government can control food safety risk may have been true at the turn of the 20th century, since then three important changes have occurred: (1) Food production and distribution have become more complex, (2) Many more facilities produce and handle food, and (3) Outbreaks and illnesses can more readily be tied to the facilities responsible. As food production has evolved, government must reconsider its antiquated regulation-and-inspection strategy if it wants to play an effective role in ensuring food safety.

IS FOOD GETTING LESS SAFE?

RECENT INCREASES IN reported outbreaks of food-related illnesses have spurred Congress to respond to the public’s growing concern over food safety with new legislation purported to strengthen the food safety system.² Congress’s actions reflect the common perception that food is becoming less safe, but in reality the recent increases in reported outbreaks stem from increased improvements in surveillance of the food supply system and increased press coverage of food-related illnesses.

Since 1996, the Centers for Disease Control and Prevention (CDC) has used two systems for food surveillance: FoodNet and PulseNet.³ FoodNet is an active (actively soliciting information about identified illnesses as opposed to passively receiving information) surveillance program that collects and publishes summary reports of laboratory data for several food-related pathogens in several states.⁴ PulseNet is a system of national, state, and local public health laboratories that use DNA fingerprinting to identify foodborne outbreaks associated with significant (relatively larger number of cases) pathogens quickly.⁵ Together, these two systems have increased our ability to identify more individual cases and

FIGURE 1: FOODBORNE ILLNESS OUTBREAKS OVER TIME



Source: Centers for Disease Control and Prevention, "Outbreak Surveillance Data," 2009, http://www.cdc.gov/outbreaknet/surveillance_data.html.

more outbreaks of foodborne illness, particularly outbreaks with fewer cases. As we discover more small outbreaks, we naturally find more total outbreaks (see figure 1). However, we do not know if the number of cases of foodborne disease is increasing or decreasing.

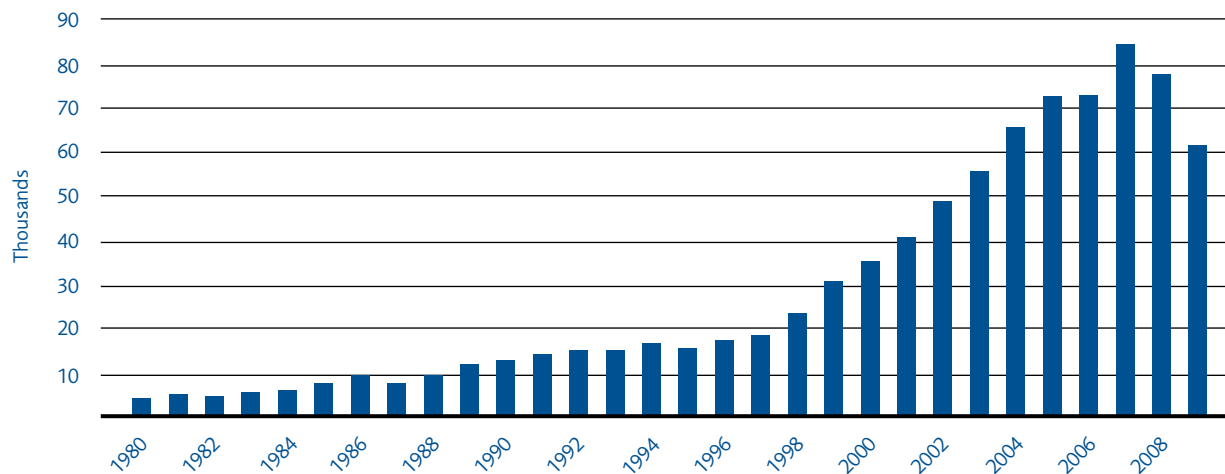
Further, the media appears to pay more attention to food-related problems than it did in the past. Figure 2 shows a marked increase in mentions of "food safety" by media outlets beginning in the mid-1990s, revealing the swell in media attention.

GOVERNMENT'S ROLE IN FOOD SAFETY

EVEN THOUGH IT is not the crisis the media makes it out to be, food safety remains a significant problem. A key question for policy makers is whether legislation that leads to more regulations and inspections will result in significant improvements in food safety. We believe it will not.

For example, FoodNet data reveals that only one major pathogen, *Vibrio*, has shown an increase in incidence of illness over the last nine years.⁶ Yet *Vibrio* was a key target of a comprehensive Food and Drug Administration (FDA) program of regulation and annual inspections for seafood beginning in the mid 1990s.⁷ By focusing on seafood safety controls, the FDA predicted it could reduce illnesses from pathogens associated with fish and shellfish, particularly *Vibrio* in shellfish. This clearly has not been the case. Poorly designed regulation failed to acknowledge that there are no effective pathogen control steps (other than icing after harvesting) for raw shellfish taken directly from the ocean and shipped to restaurants for raw consumption. This case also demonstrates the weakness of a politically motivated regulatory system, as evidenced by the motive of the large seafood manufacturers who sought the rule, in part, to impose costs on their smaller rivals. Overall, it has had a negligible impact on public health.

FIGURE 2: NUMBER OF ARTICLES IN GOOGLE NEWS ARCHIVE RELATED TO "FOOD SAFETY"



Source: Google News, news.google.com.

Since the passage of the Pure Food and Drug Act of 1906, the federal government has relied on regulation and inspection for controlling food risk. Originally, private incentives to control risk facing food producers and retailers were insufficient.⁸ Federal government oversight of food safety was most effective at the outset for two reasons. One, it was nearly impossible to trace the source of foodborne disease back to any individual company. Two, the small number of food processing plants made comprehensive inspections possible, which, in turn, allowed government inspections to act as more of a deterrent. Perhaps the last major problem that was actually solved by food safety regulation was that of botulism in canned food—more than three decades ago.⁹ Since then, the world has changed.

First, the FDA now has oversight of more than 3 million food facilities including farms, trucks, trains, airplanes, processing plants, packers, repackers, labelers, restaurants, nursing homes, prisons, schools, universities, military bases, cruise ships, warehouses, and mailed foods.¹⁰ Congress has also charged it with inspecting 2 million farms, over 900,000 restaurants, 114,000 grocery retail outlets, and 189,000 other food facilities.¹¹ Currently, the FDA inspects domestic food manufacturing plants about once every 10 years.

Currently proposed legislation seeks to increase the number of FDA inspections and improve coverage of these outlets. While state and local authorities inspect some of these facilities, any reasonable addition to the FDA's inspection resources is not likely to make much difference. Even if, as some of the legislation intends, some government entity inspects high-risk plants once every 18 months, many of these plants will not be significantly deterred because the expected cost of being caught will still be less than the cost of compliance. This is exacerbated by highly visible cases such as the Peanut Corporation of America (PCA) scandal, in which government inspections had reported filthy conditions but took no meaningful action. On the other hand, it is likely that private inspections between buyers and suppliers in the food industry occur much more frequently than government inspections.¹² In fact, Nestlé dropped PCA as a supplier (a much greater penalty than any fine the government could levy) when those same conditions were found by its private inspectors.¹³ Before government throws taxpayer money towards a possibly ineffective inspection program, it is imperative that the efficacy of such an approach be examined.

Second, the scope of food processing, packaging, and distribution methods has grown substantially. The FDA is responsible for, for example, oyster harvesting boats in the Gulf of Mexico, vegetable canning plants in Chicago, Mississippi fishing boats, egg farmers in Minnesota, delis in California, and apple pressers in Virginia. It is unlikely that one agency could ever have sufficient technical understanding of all types of foods to regulate the wide variety of risks effectively. Increased FDA inspections are likely to miss critical problems in some cases while imposing harsh fines in other cases where the identified violation does

not pose a risk. Alternatively, private inspectors are trained to find problems specific to the industry they work in and, as a result, are likely to be more effective at finding problems.

BETTER APPROACHES

INSTEAD OF FOCUSING on regulation and inspection, food safety agencies should invest more resources in discovering solutions to systemic food safety problems. Effective solutions lie in strengthening existing market relationships by providing information that facilitates outbreak tracebacks, identifies root causes of foodborne illness, and presents solutions to these problems to market participants. In some cases, government could fund research for pilot programs designed to evaluate the effectiveness and affordability of in-plant solutions. When effective solutions are found, instead of enshrining them in regulations, the government can publish them on the Web. Firms can then determine for themselves whether the solutions will work for their particular product or process and will incorporate these practices into the millions of existing detailed contracts between buyers, suppliers, and insurance companies. As one observer noted, “contractual agreements and vertical integration, or mergers, among producers and processors are becoming increasingly common in the food market.”¹⁴ Even without explicit government guidance, firms are likely to adopt solutions that are both effective and cost efficient.

To help ensure that adoption incentives for solutions are sufficient, food safety agencies should expand FoodNet beyond the 10 states where it currently has active surveillance sites (“catchment areas”).¹⁵ Expansion to more states would provide better information on causes of food safety problems. More investment in PulseNet would improve traceback and could lead to greater industry accountability.¹⁶ Both programs have tightened industry accountability for food safety problems by making it increasingly easy to tie food-related outbreaks to individual firms, resulting in more lawsuits, larger recalls, and, higher reputation costs for firms that cause problems.¹⁷ These kinds of investments are likely to be much more cost effective than more government inspections of plants since the overwhelming majority of plants do not produce outbreaks.

Finally, new technologies can help make food safer, and Congress and federal agencies should ensure that both laws and regulations facilitate their introduction using a risk/benefit framework.¹⁸ Publicizing the results of such a framework can also help with consumer acceptance of new technology. For example, a well-publicized risk/benefit framework may have helped with consumer acceptance of irradiation whose benefits were likely never well understood by the public at the same time they were bombarded with over-hyped risks. A better system might help acceptance of new technologies, like nanotechnology. Nanotechnology is just one of many promising new technologies that may help detect or prevent exposure to foodborne pathogens.

CONCLUSION

THE PERCEPTION THAT food is becoming less safe is primarily driven by increased media coverage, perhaps resulting from improved detection of smaller outbreaks. Current legislative moves to increase federal regulation and inspection are outdated and unlikely to work. Since the original food safety legislation codified this approach over 100 years ago, the food industry has grown in size and complexity, making it impossible for centralized use of these tools to solve problems. A better approach for government is to facilitate the detection of root causes of food safety events and to trace back problems to their sources in the food production and distribution chain. This approach takes advantage of the complex web of private contracts that hold manufacturers and retailers accountable for shoddy practices. By investing in information rather than regulation, the government will increase accountability, foster solutions, and improve the safety of our food supply.

ENDNOTES

1. Barack Obama, "The White House Weekly Address," March 14, 2009, http://www.whitehouse.gov/the_press_office/Weekly-Address-President-Barack-Obama-Announces-Key-FDA-Appointments-and-Tougher-F/.
2. The two bills in Congress are H.R. 2749, <http://www.opencongress.org/bill/111-h2749/show>, and S. 510, <http://www.govtrack.us/congress/bill.xpd?bill=s111-510>. For the increasing public concern over food safety, see the Pew survey at <http://www.producesafetyproject.org/admin/assets/files/0002.pdf> and the IBM survey at <http://www-03.ibm.com/press/us/en/pressrelease/27817.wss>.
3. FoodNet is the foodborne disease component of CDC's Emerging Infections Program (EIP). FoodNet is a collaborative project among CDC, the 10 EIP sites, the USDA, and the Food Safety and Inspection Service (FSIS) of the FDA. See <http://publichealth.yale.edu/eip/FoodNet.htm>.
4. CDC, "FoodNet Surveillance—What is FoodNet?" March 21, 2006, http://www.cdc.gov/foodnet/surveillance_pages/whatisfoodnet.htm. FoodNet is currently in 10 states.
5. Association of Public Health Laboratories, "PulseNet USA," <http://www.aphl.org/aphlprograms/food/pulsenet/Pages/pulsenetus.aspx>.
6. U.S. Food and Drug Administration, "Seafood HACCP," <http://www.fda.gov/Food/FoodSafety/HazardAnalysisCriticalControlPointsHACCP/SeafoodHACCP/default.htm>.
7. See CDC, *Morbidity and Mortality Weekly Report* 58, no. 13 (April 10, 2009), 333–337, figure 2, <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5813a2.htm>.
8. At the turn of the 20th century particularly, it was impossible to trace most food-borne disease back to the source of the problem.
9. Botulism is an illness caused by a toxin emitted by the pathogen *Clostridium botulinum*, one of the most virulent pathogens in existence. Although the private sector might have been able to solve the botulism problem, in 1973, the federal government virtually eliminated botulism in canned food by requiring time and temperature controls. See *Code of Federal Regulations* Title 21 § 113 Thermally-Processed Low-Acid Foods Packaged in Hermetically Sealed Containers.
10. U.S. Food and Drug Administration, *Food Protection Plan*, <http://www.fda.gov/Food/FoodSafety/FoodSafetyPrograms/FoodProtectionPlan2007/ucm132565.htm>.
11. FDA, *An Integrated Strategy for Protecting the Nation's Food Supply*.
12. U.S. Department of Agriculture "Food Safety: Private Market Mechanisms and Government Regulation," USDA Economic Research Service, <http://www.ers.usda.gov/briefing/foodsafety/private.htm#private>.
13. Lindsay Layton, "Nestlé's Inspectors Saw Rat Droppings, Rejected Peanuts," *The Washington Post*, March 20, 2009, <http://www.washingtonpost.com/wp-dyn/content/article/2009/03/19/AR2009031903204.html>.
14. Alan Barkema, Mark Drabenstott, and Kelly Welch, "The Quiet Revolution in the U.S. Food Market," *Economic Review* (May/June 1991): 25.
15. One of the problems, beyond funding, may be that CDC has strict definitions on sites that can qualify to be FoodNet sites.
16. PulseNet is run by CDC and a description can be found at <http://cdc.gov/pulsenet/>.
17. For example, see the flyer for the American Conference Institute's 3rd National Forum on Food-Borne Illness Litigation at <http://www.marlerblog.com/uploads/file/809L10-CHI.pdf>. See also Gale Prince, Presentation to the FDA's Risk Communication Advisory Committee (Washington, DC: August 13, 2009), <http://fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/RiskCommunication-AdvisoryCommittee/UCM178893.pdf>.
18. Richard Williams, review of Jo Anne Shatkin, "Nanotechnology: Health and Environmental Risks," in *Risk Analysis* 29, no 2 (February 2009): 312–313.

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