

Physical Damage Versus Business Interruption

Studies of large-scale disasters are good indicators of the major expenses that are likely to occur from a disaster of any scale. The greatest costs to businesses in disasters usually result from business disruption. This finding has fundamental importance to the economy of a practice or shelter and to its ability to function as a critical facility in a disaster.

One of the first indications that business disruption is the major cost to businesses came from a study by Phipps and Jirsa in 1992 that looked at business disruption resulting from the Loma Prieta, California, earthquake. This study found a discrepancy between engineering damage and loss of function. Since then, several other studies have evaluated through surveys the impact on businesses of disasters. These studies provide an insight into the common problems and costs associated with disasters. Typical business interruptions that increase costs are employees who cannot get to work, lack of water or electricity, customers who cannot gain access to the building, and lack of public safety and order.

Of business owners in Loma Prieta, 88% had not taken measures to mitigate the impact of an earthquake, but 92% of businesses sustained space or building damage. However, as much as 90% of the damage was estimated to be nonstructural or contents-related damage. Therefore structural damage may not be the best indicator of the real total cost of damage to businesses.

Long-term consequences of business disruption included changes in the clientele base. In the 14 months after the earthquake 35% of businesses reported a decrease in the number of clients or customers. The owners of these businesses estimated that this loss of clientele resulted in an overall loss in revenue of 23%. Although some businesses reported no change in clientele or even an increase in the number of customers, the two health provider-related businesses in this study both reported losses caused by decreased numbers of clients. Five out of six businesses that reported extensive damage also had to lay off employees permanently. Other businesses reported temporary layoffs for 7 to 60 days.

Table 12-5 Summary of the extent of damage and costs associated with the Northridge earthquake

| Extent of damage to business (%) | Likelihood of damage (%) | Average cost of damage per sq ft | Average total cost (\$) | Average days interrupted |
|----------------------------------|--------------------------|----------------------------------|-------------------------|--------------------------|
| Extensive (50) | 14 | 25.21 | 50,833 | 17.0 |
| Moderate (15) | 21 | 18.50 | 28,125 | 7.2 |
| Slight (1-5) | 57 | 1.83 | 13,408 | 5.0 |
| None | 8 | 0 | 8,375 | 2.0 |

Data from Arnold C: *The Northridge earthquake of January 17, 1994. Small business: a sample of building damage, business disruption and recovery*, Palo Alto, Calif, 1996, Building Systems Development, Inc.

These average costs do not reflect the distribution of data. In all categories some businesses were able to continue, if necessary from a trailer in a parking lot. Note that even businesses that did not sustain damage suffered business interruption and economic losses.

Table 12-6 Frequency with which repair costs were associated with damage resulting from the Northridge earthquake

| Amount (\$) | Distribution (%) |
|--------------------|------------------|
| None or negligible | 9 |
| <5000 | 41 |
| 5000-15,000 | 20 |
| 15,000-50,000 | 18 |
| 50,000-100,000 | 12 |

Data from Arnold C: *The Northridge earthquake of January 17, 1994. Small business: a sample of building damage, business disruption and recovery*, Palo Alto, Calif, 1996, Building Systems Development, Inc.

Repair costs

The average repair costs for businesses after the Northridge earthquake were over \$15,000 (median less than \$5000) per business. The effect of not being adequately prepared is reflected in the amount of damage that was paid for by the owners of the businesses: 38% of owners paid for all of the repairs out of their own business accounts, and an additional 29% of owners paid for part of the repairs out of their personal savings. Only 17% had adequate insurance for the insurance company to pay for all repair costs. Most insurance claims were settled within 6 weeks. Only 19% of businesses applied for small business loans from the Small Business Association to help finance the cost of repairs. The range in time to payment on these loans was 56 to 300 days.

Reopening costs

The cost of reopening differed primarily depending on the owner of the business. Businesses that were part of national chains usually had their costs of reopening covered from the national head office. In contrast 88% of local businesses paid for the cost of reopening out of their own resources.

Susceptibility of Businesses to Computer Failure

One major study looked at the causes of data loss in the computer industry. This study indicates the likely causes of losses associated with the use of computers and therefore has direct relevance to many veterinary practices and shelters. The single greatest factor associated with the loss of data was infrastructural problems such as power failure and power surges. Therefore continuous power supplies with surge protection are highly recommended to mitigate the impact of disasters in veterinary practice and shelters using computers. The second most common category of data loss was due to natural hazards. These made up over 20% of the causes of power losses associated with the use of computers (Table 12-9).

Table 12-9 Causes of data loss at U.S. computer installations (n = 2428 since 1982)

| Category of disaster | Example | Percent of failure |
|----------------------|---|--------------------|
| Infrastructure | Power failure | 35.2 |
| | Power surge or spike | 10.1 |
| Natural | Fire and explosion | 8.2 |
| | Flood, water damage | 6.7 |
| | Earthquake | 5.5 |
| Operational | Hardware error | 6.7 |
| | Network outage | 3.2 |
| | Human error | 3.2 |
| | Heating, ventilation, and air conditioning failure | 2.3 |
| | Software error | 1.5 |
| Other | Employee sabotage | 1.3 |
| | Contamination, insects, riots, and transportation accidents | 6.7 |

Data from Barry C: *Modified Operations and Fulfillment*, Richmond, Va, May/June 1994.