BUAD 820
Data Analysis & Quality Management
Fall 2004

Homework 3

1. **Look at the following table from a study of unintentional carbon monoxide (CO) poisoning of Colorado residents.** A total of 981 cases of CO poisoning were reported over a six-year period. Each case was classified as Fatal or Nonfatal and by source of exposure. Answer the following questions:

Source of Exposure	Fatal	Nonfatal	Total
Fire	63	53	116
Auto Exhaust	60	178	238
Furnace	18	345	363
Kerosene or spaceheater	9	18	27
Appliance	9	63	72
Other gas-powered motor	3	73	76
Fireplace	0	16	16
Other	3	19	22
Unknown	9	42	51
TOTAL	174	807	981

   a. Let A be the event that the CO poisoning is caused by fire. Find P(A)
   b. Let B be the event that CO poisoning is caused by auto exhaust. Find P(B)
   c. Let C be the event that the CO poisoning is caused by auto exhaust and is fatal. Find P(C)
   d. Given that the source of the poisoning is fire, what is the probability that the case is fatal?
   e. Given that the case is nonfatal, what is the probability that it is caused by auto exhaust?
   f. If the case is fatal, what is the probability that the source is not a furnace or a kerosene/space heater?

2. **The results of a study made as part of a yield improvement effort** of a semiconductor manufacturing facility provided defect data for a sample of 450 wafers. The following table presents a summary of the responses to two questions:
   Was a particle found on the die that produced the wafer?
   Is the wafer good or bad?

	Condition of Die		
Quality of Wafer	**No Particles**	**Particles**	**Totals**
Good	320	14	334
Bad	80	36	116
Total	400	50	450

If a wafer is selected at random, what is the probability that:

A. It was produced from a die with no particles?
B. The wafer is bad?
C. It is a bad wafer and was produced from a die with no particles?
D. It is a bad good wafer given it was produced from a die with no particles?
E. It is a bad good wafer given it was produced from a die with particles?
F. What conclusions would you draw from this data about the quality of the wafer and the presence of a particle on the die.