

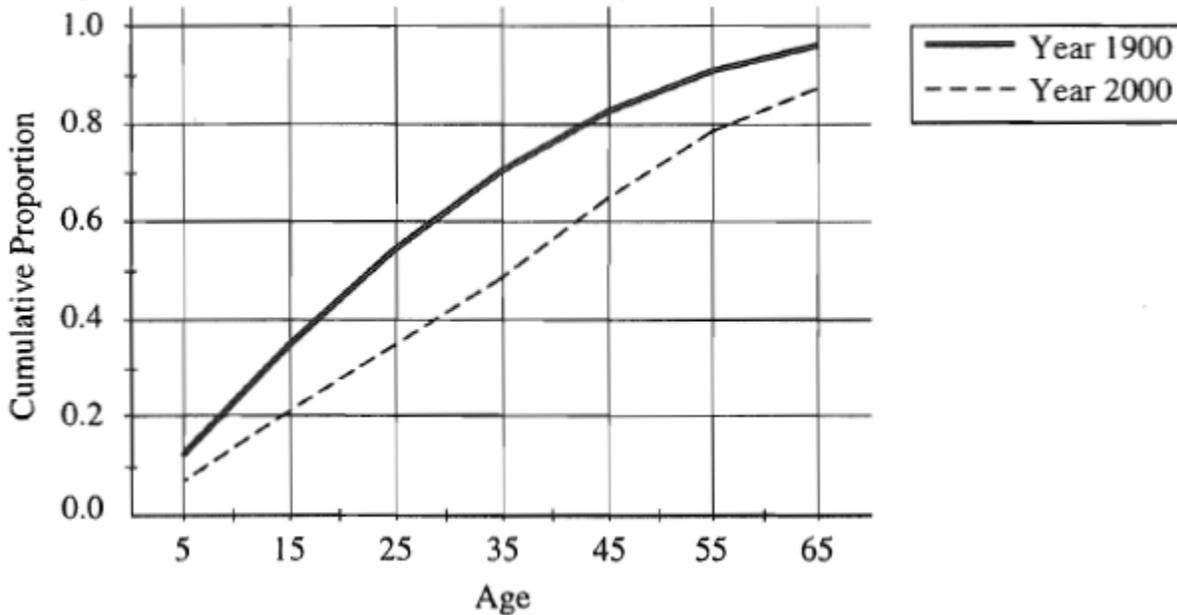
AP Stats POW #15

DIRECTIONS: Show all your work. Indicate clearly the method you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

AGE DATA

Age	1900	2000
5	0.121	0.066
15	0.344	0.209
25	0.540	0.344
35	0.700	0.480
45	0.822	0.643
55	0.906	0.781
65	0.959	0.870

1. The table of data above provides the cumulative proportions for the United States population at selected ages for the years 1900 and 2000. For example, 0.344 or 34.4 percent of the population was at or under age 15 in 1900, while only 0.209 or 20.9 percent will be at or under age 15 in the year 2000. The graph below shows the cumulative proportions plotted against age for the years 1900 and 2000. The data and graph are to be used to compare the age distribution for the year 1900 with the projected age distribution for the year 2000.



- Approximate the median age for each distribution.
- Approximate the interquartile range for each distribution.
- Using the results from parts (a) and (b), write a sentence or two for a history textbook comparing the age distributions for the years 1900 and 2000.

2. Researchers want to see whether training increases the capability of people to correctly predict outcomes of coin tosses. Each of twenty people is asked to predict the outcome (heads or tails) of 100 independent tosses of a fair coin. After training, they are retested with a new set of 100 tosses. (All 40 sets of 100 tosses are independently generated.) Since the coin is fair, the probability of a correct guess by chance is 0.5 on each toss. The numbers correct for each of the 20 people were as follows.

Score Before Training (number correct)	Score After Training (number correct)
46	61
48	62
50	53
54	46
54	50
54	52
54	53
54	59
54	60
54	61
55	55
56	59
57	55
58	50
58	56
61	58
61	64
63	57
64	61
65	54
Sum 1,120	Sum 1,126

To answer the following questions, you may want to enter these data into your calculator. As a check that you have entered the data correctly, the sum of the first column is 1,120 and the sum of the second column is 1,126.

- a. Do the data suggest that after training people can correctly predict coin toss outcomes better than the 50 percent expected by chance guessing alone?
Give appropriate statistical evidence to support your conclusion.
- b. Does the statistical test that you completed in part (a) provide evidence that this training is effective in improving a person's ability to predict coin toss outcomes?
If yes, justify your answer. If no, conduct an appropriate analysis that would allow you to determine whether or not the training is effective.
- c. Would knowing a person's score before training be helpful in predicting his or her score after training?
Justify your answer.