

Introduction to Statistics

Math 1030

Spring 2025

Statistical Statements

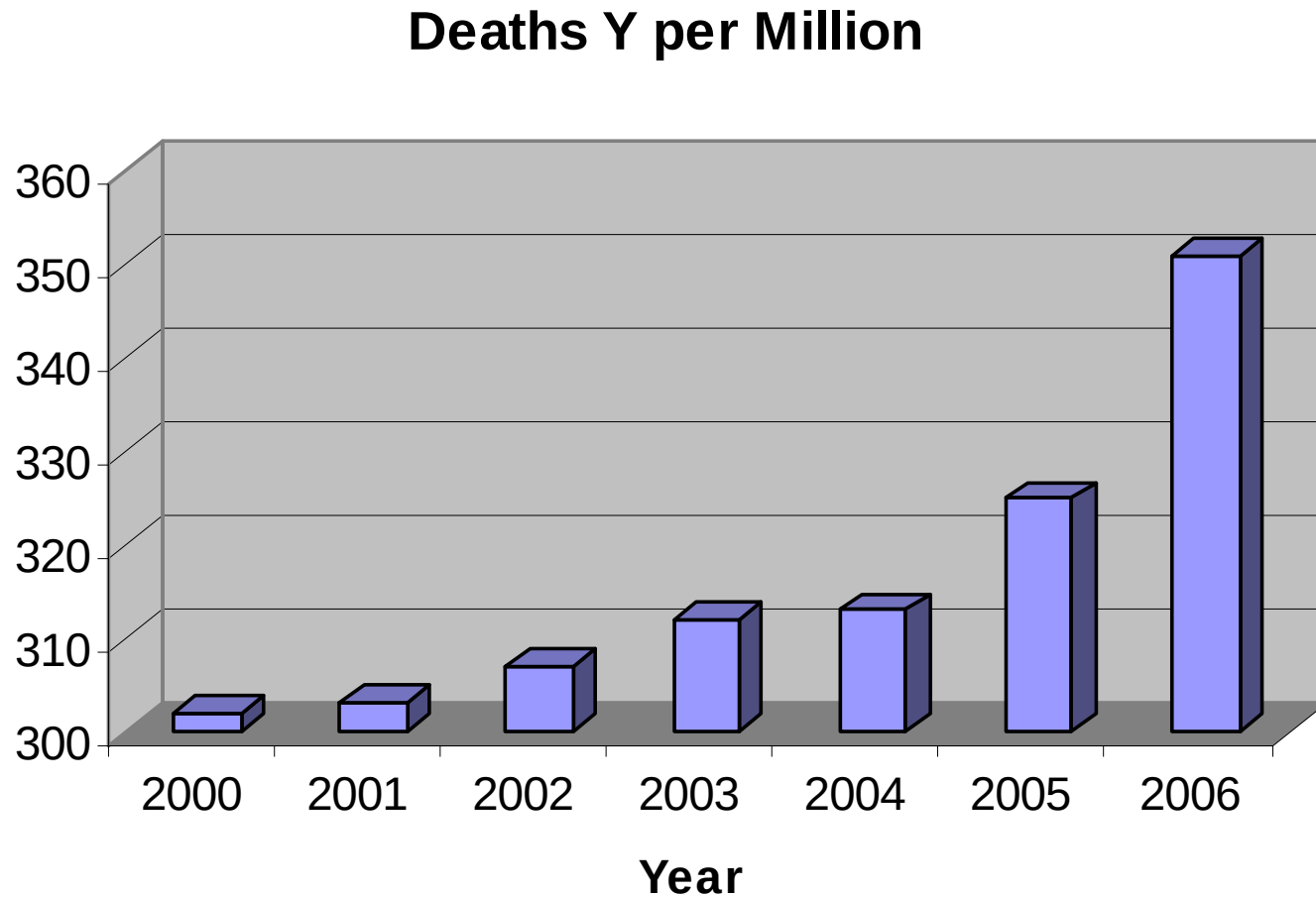
- The HIV test is 95% accurate.
- Charming Soap is 20% better!
- Congress has overspent their budget by a total of 100% over the past 20 years.
- Since the neighborhood watch program was started, crime has increased by 200%.
- When soldiers started wearing metal helmets in combat, head injuries dramatically increased.
- Education fad X improves learning.

How to lie with Statistics

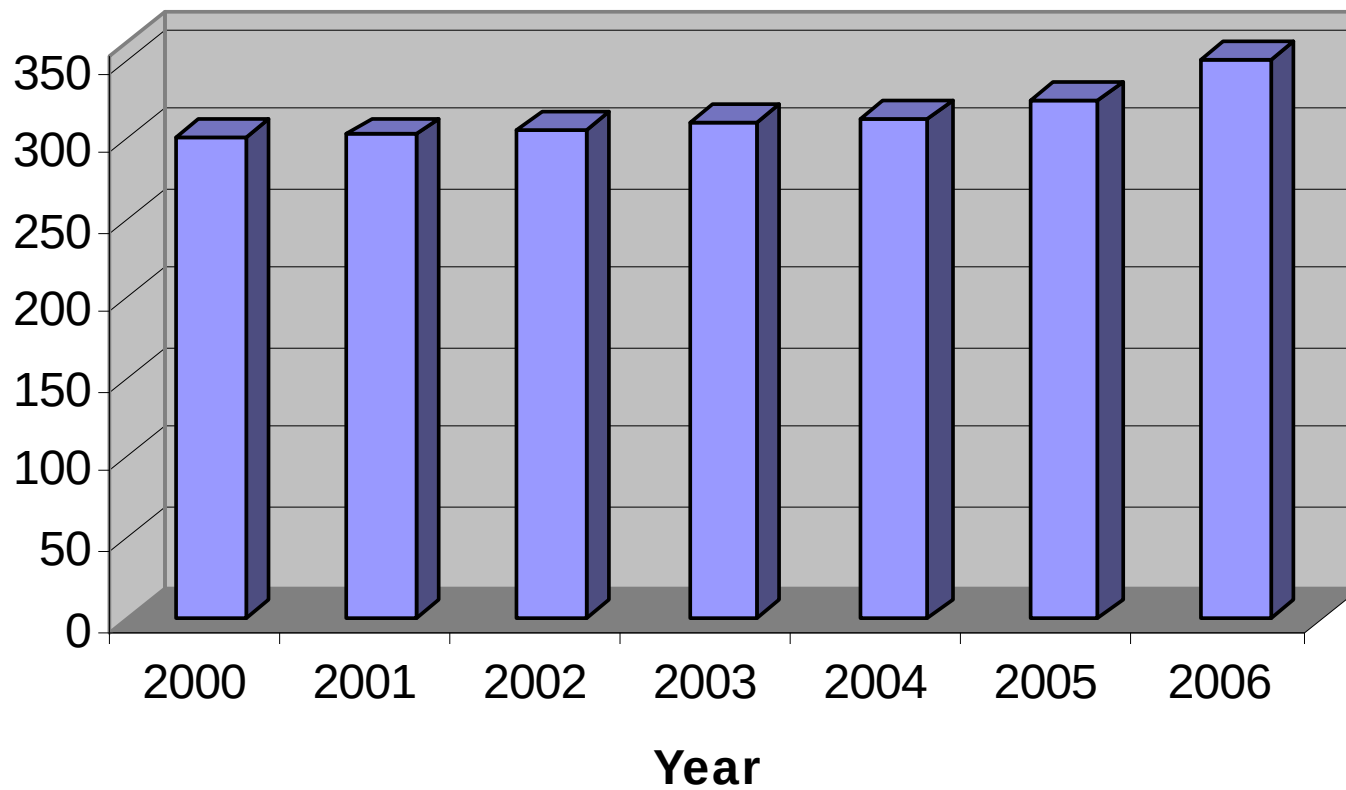
*There are three kinds of lies--
Lies, damn lies, and statistics.*

Mark Twain

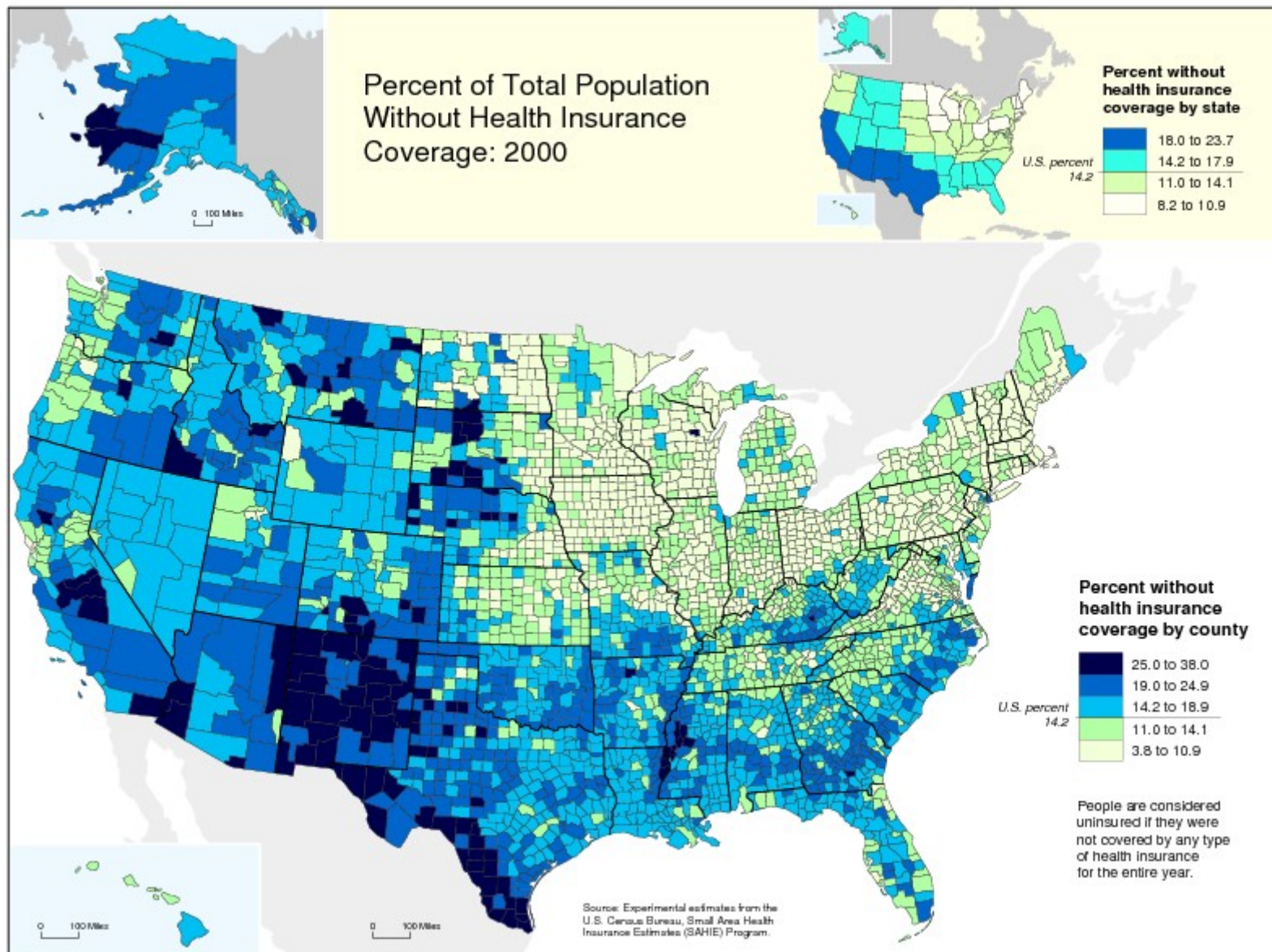
Statistical Graphs



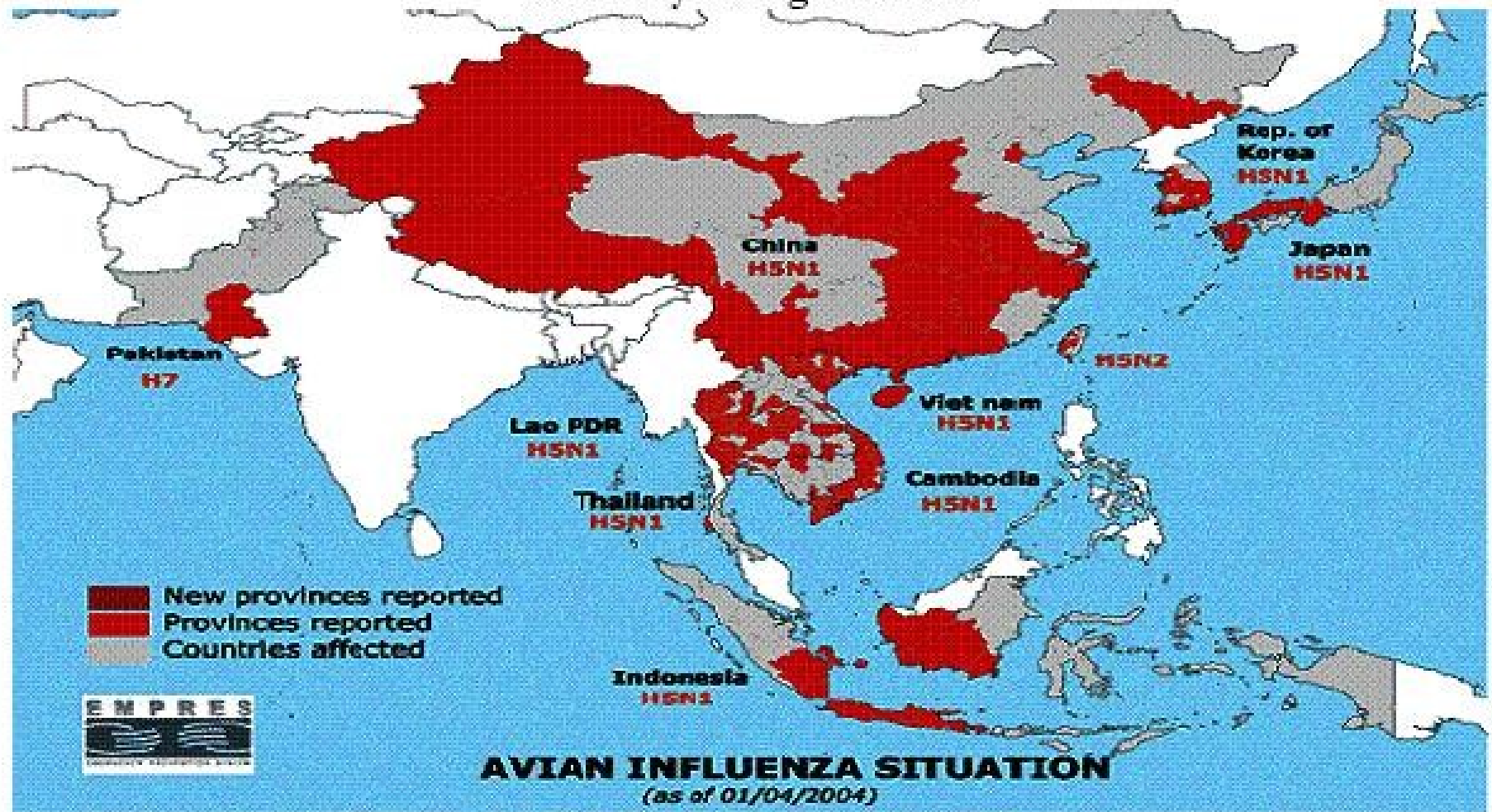
Deaths Y per Million



Epidemiology

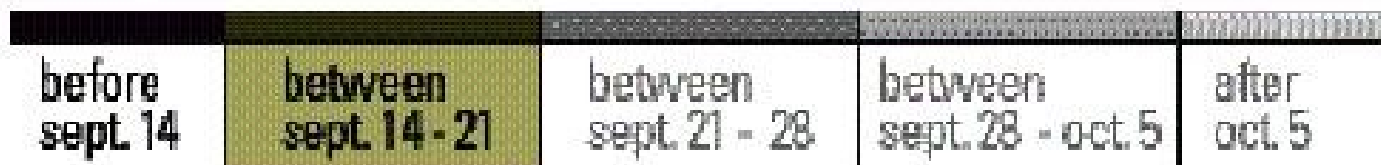
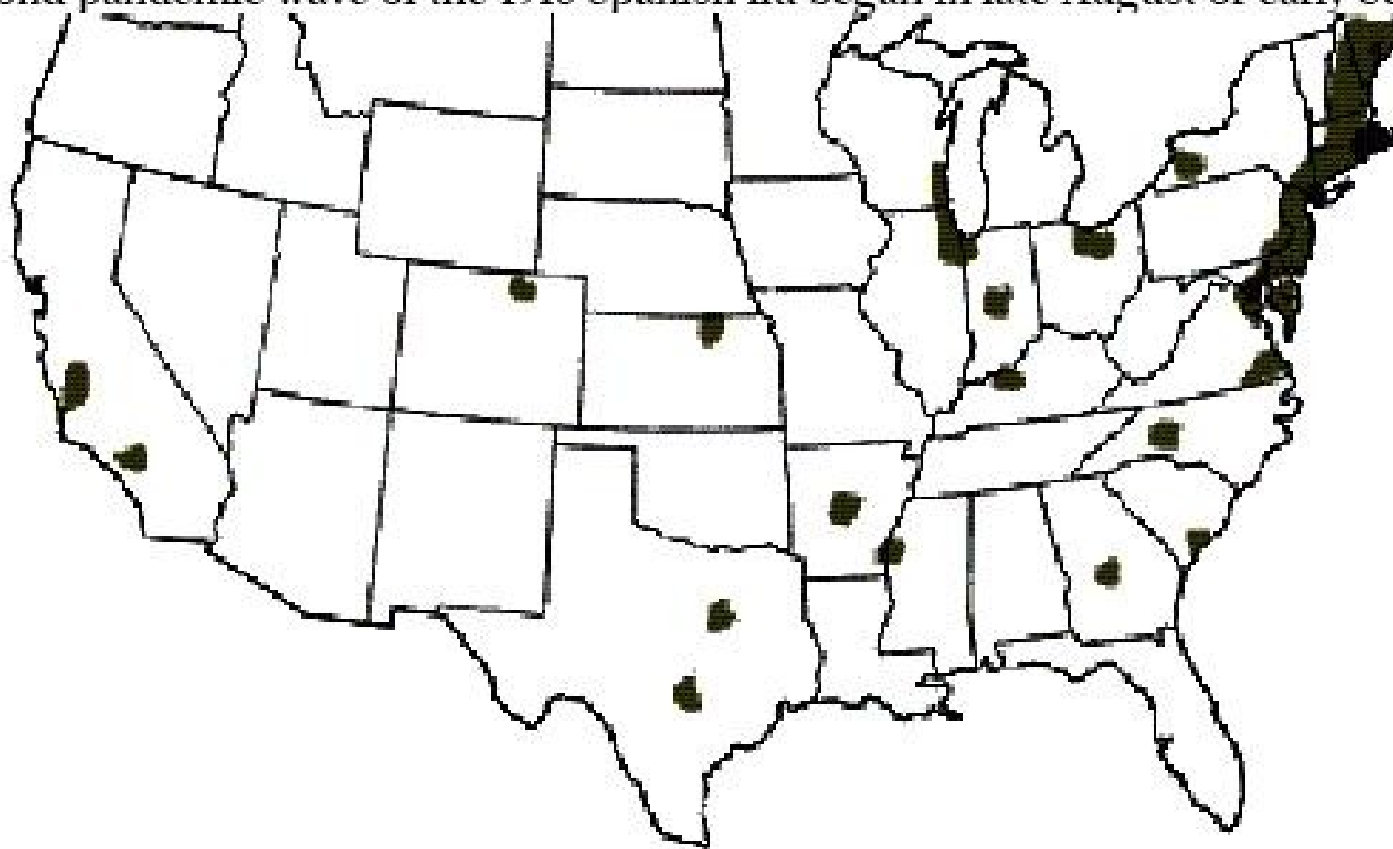


H5N1 Avian Influenza Outbreaks in Poultry during 2003-2004



Source: America's Forgotten Pandemic - The Influenza of 1918 - 1989

The second pandemic wave of the 1918 Spanish flu began in late August or early September



By Mid September, pandemic influenza was reported in most major US cities



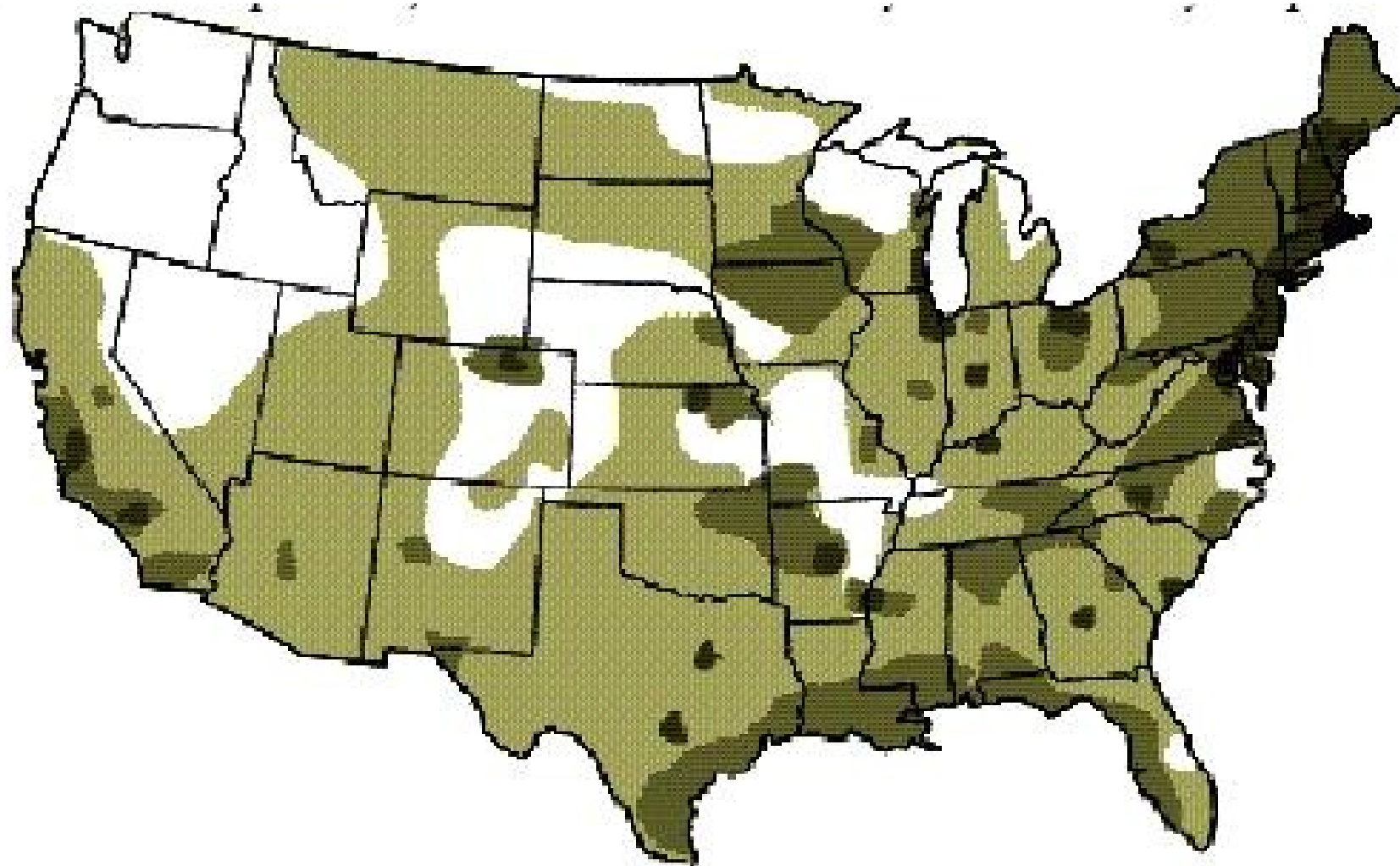
before
sept. 14

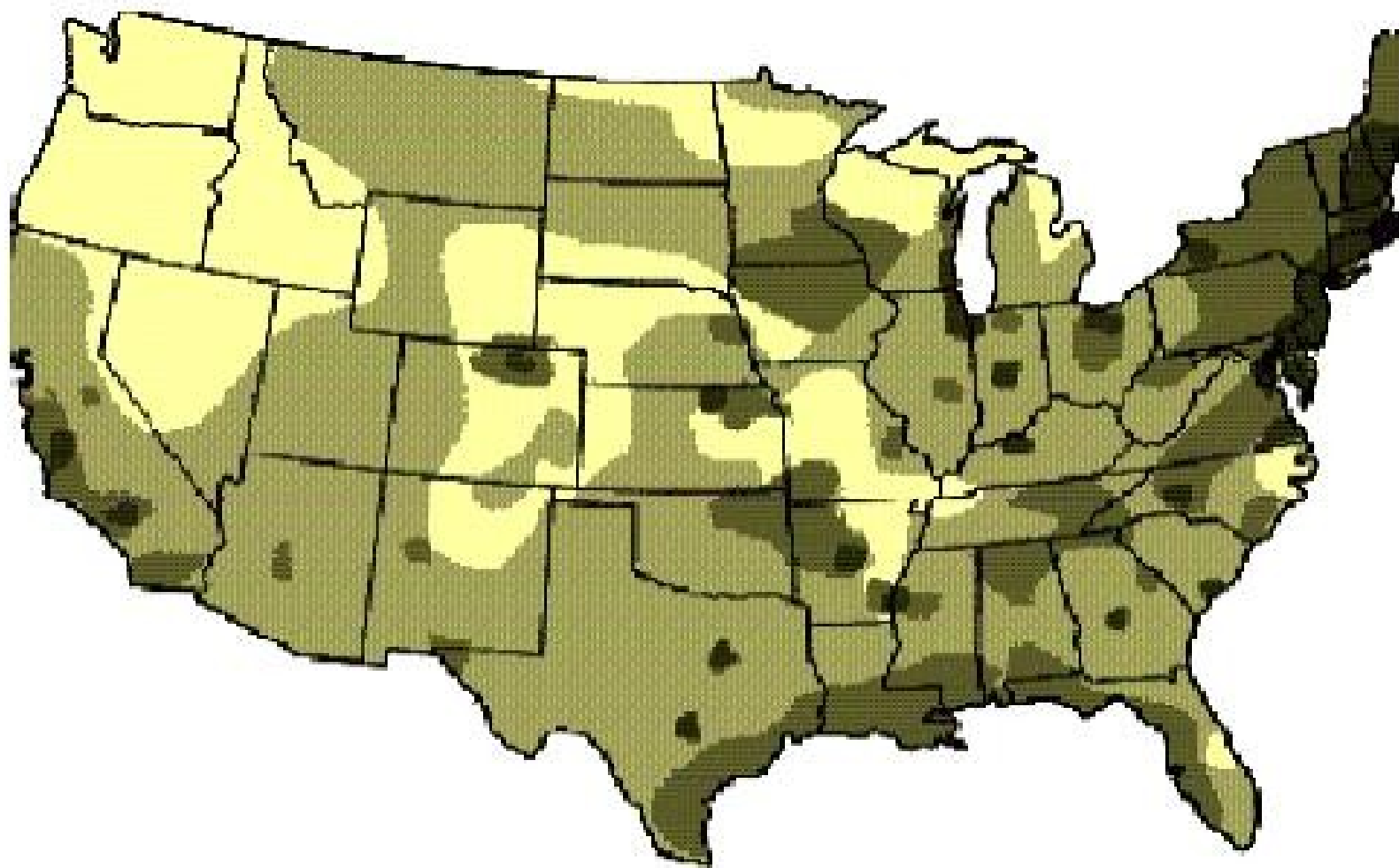
between
sept. 14 - 21

between
sept. 21 - 28

between
sept. 28 - oct. 5

after
oct. 5

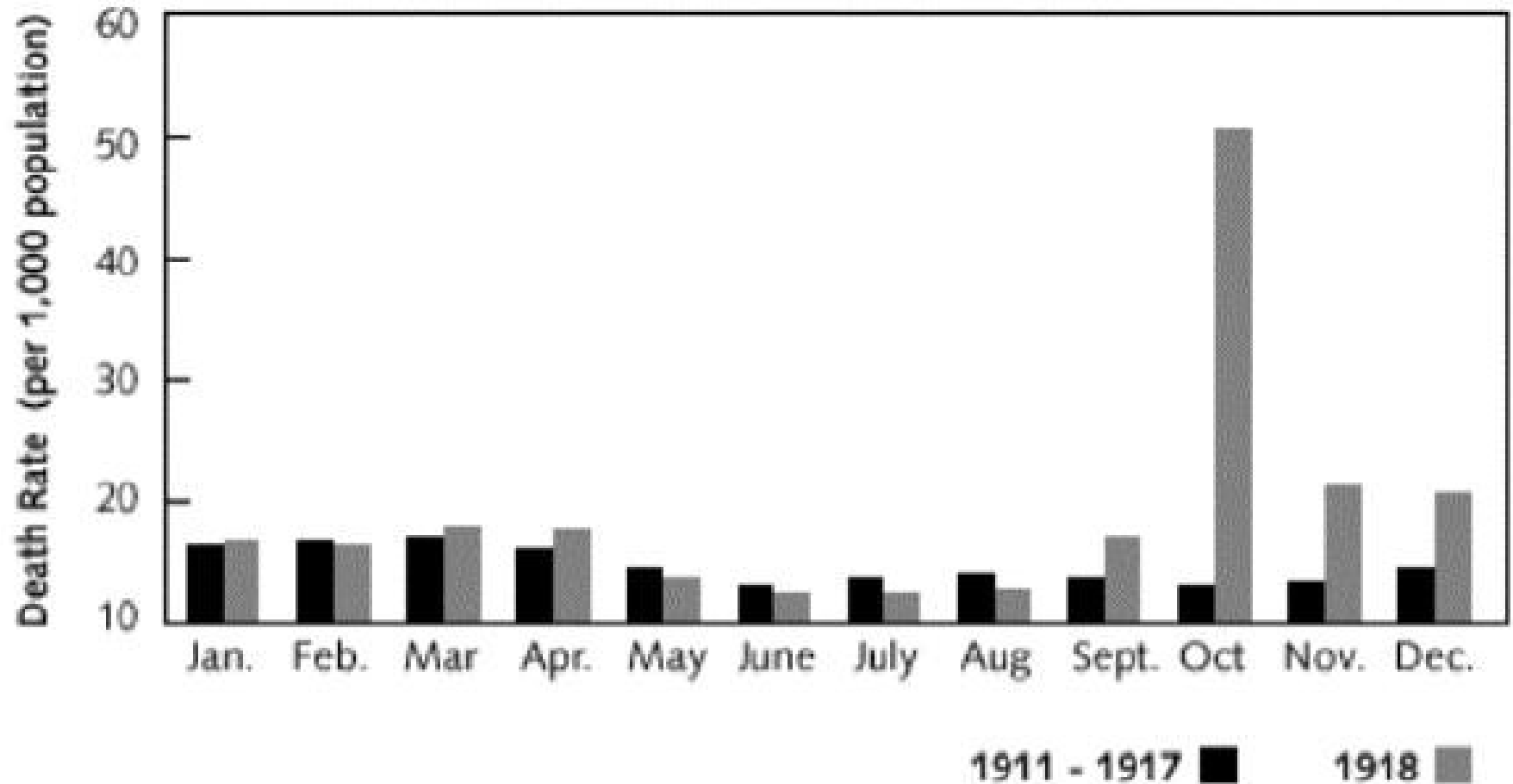




before sept. 14	between sept. 14 - 21	between sept. 21 - 28	between sept. 28 - oct. 5	after oct. 5
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Death Rates in the U.S. by Month

(per 1,000 population)



Polls

34%

4%

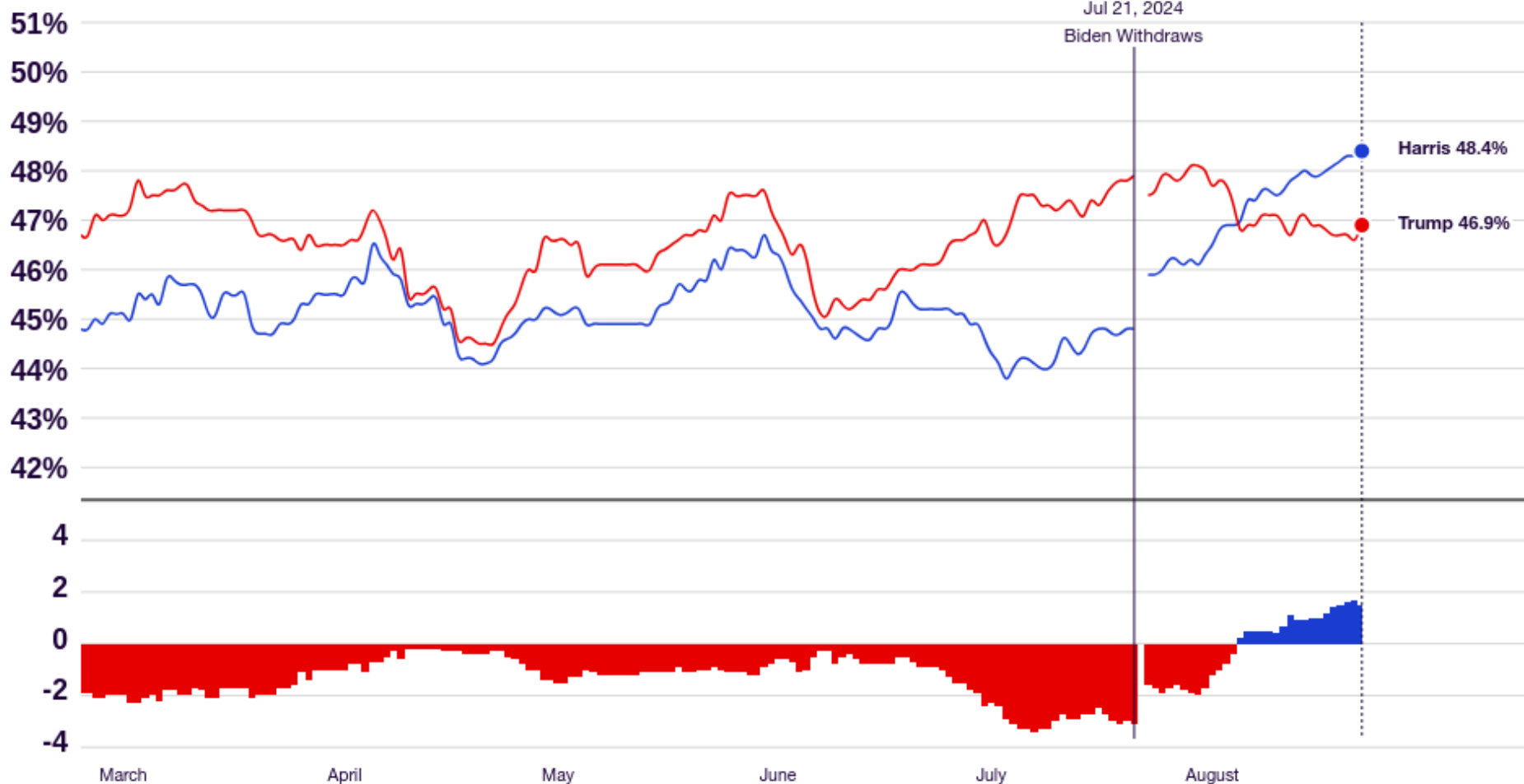


Trump vs. Harris

(Trump vs. Biden Before July 21, 2024)



Harris +1.5

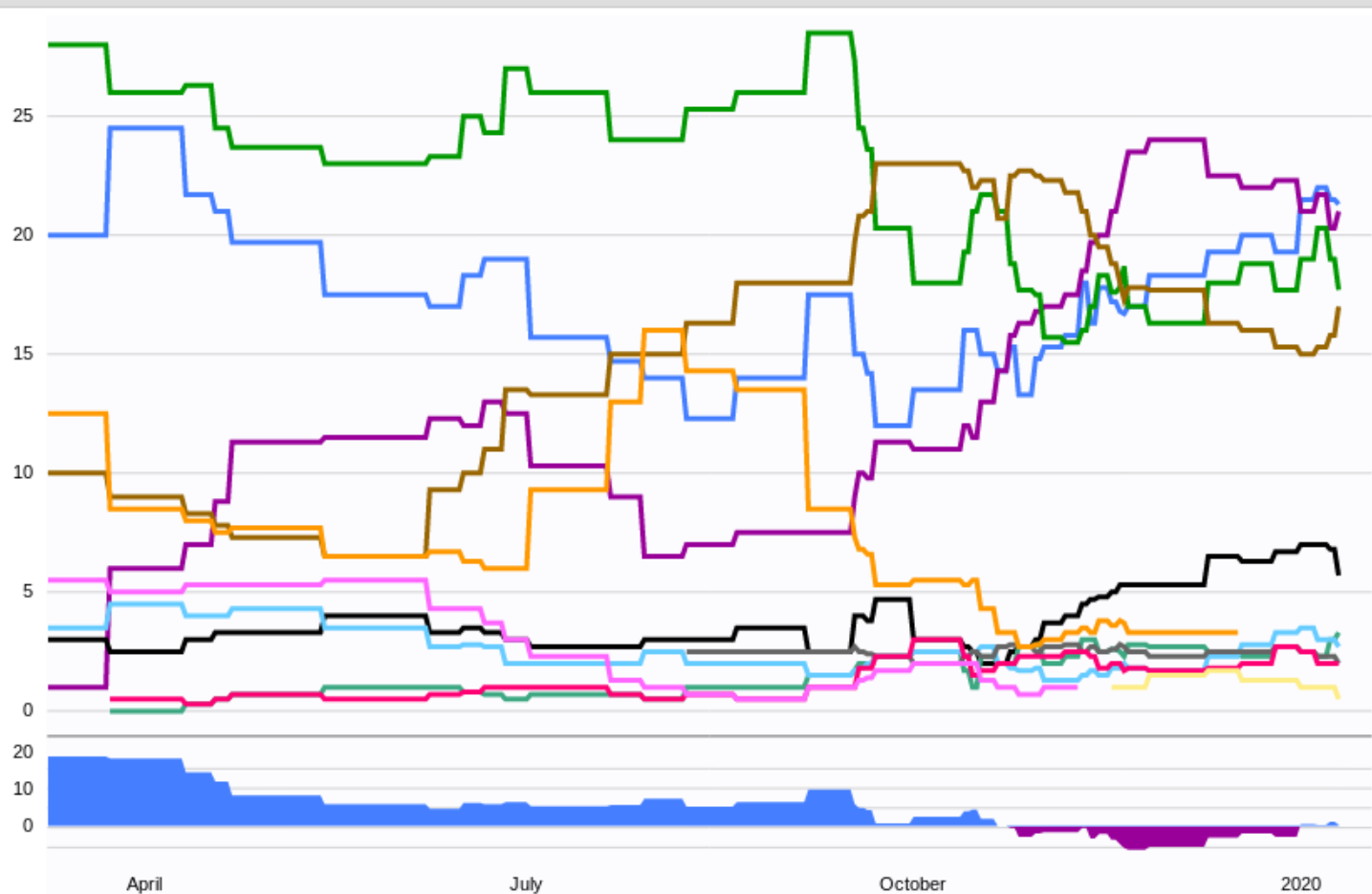


Poll	Date	Sample	Sanders	Buttigieg	Biden	Warren	Klobuchar	Yang	Booker	Steyer	Gabbard	Bloomberg	Spread
RCP Average	12/12 - 1/8	--	21.3	21.0	17.7	17.0	5.7	3.3	2.7	2.0	2.0	0.5	Sanders +0.3
DM Register/CNN	1/2 - 1/8	701 LV	20	16	15	17	6	5	3	2	2	1	Sanders +3
CBS News/YouGov	12/27 - 1/3	953 LV	23	23	23	16	7	2	2	2	1	--	Tie
Iowa State University	12/12 - 12/16	632 LV	21	24	15	18	4	3	3	2	3	0	Buttigieg +3
All Iowa Democratic Presidential Caucus Polling Data													



RCP POLL AVERAGE

Iowa Democratic Presidential Caucus

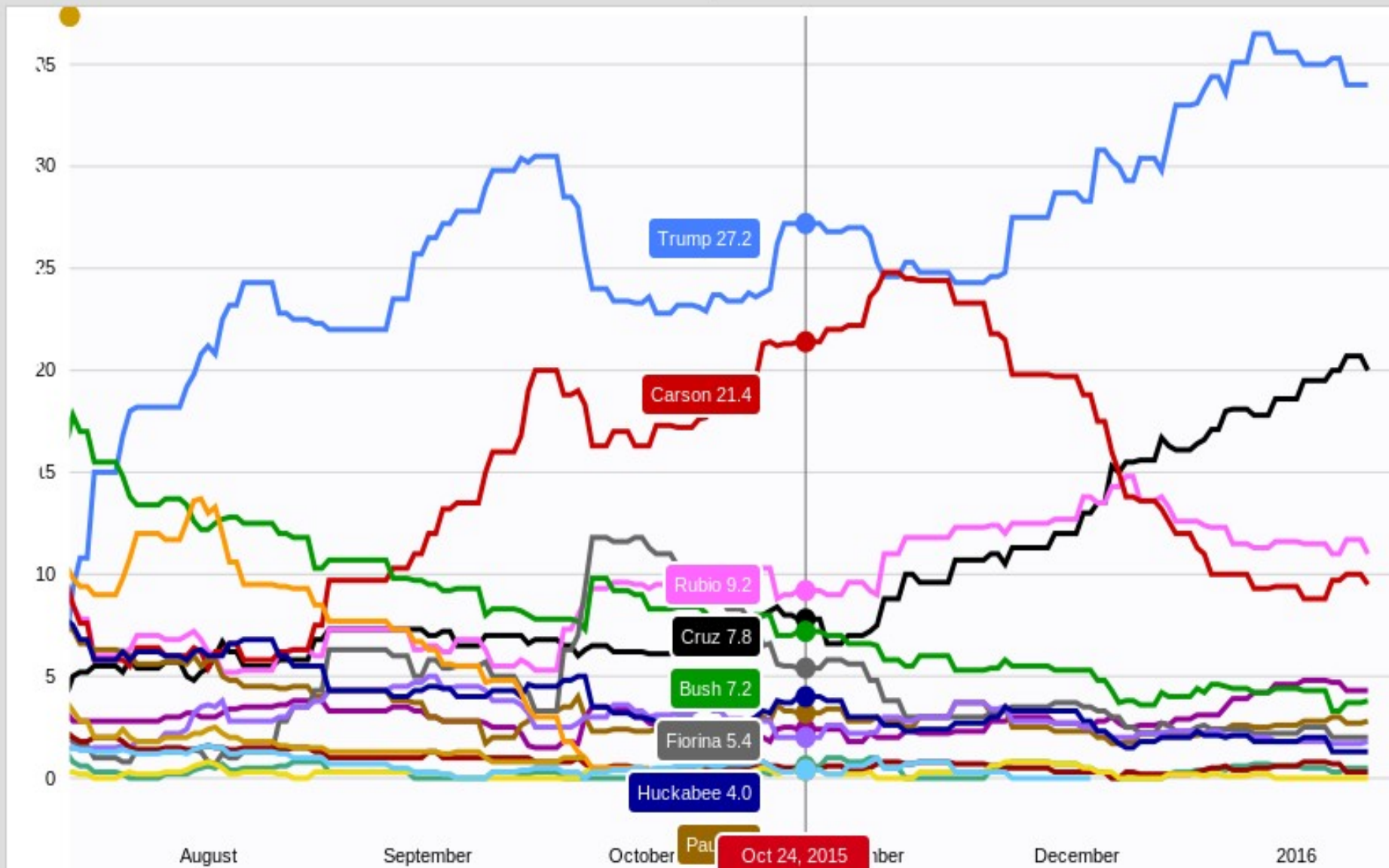




RCP POLL AVERAGE

2016 Republican Presidential Nomination

34.0	Trump	+14.0	20.0	Cruz	11.0	Rubio	9.5	Carson
4.3	Christie		3.8	Bush	2.8	Paul	2.0	Fiorina
1.8	Kasich		1.3	Huckabee	0.5	Graham	0.3	Santorum
0.0	Pataki		--	Walker	--	Jindal	--	Perry

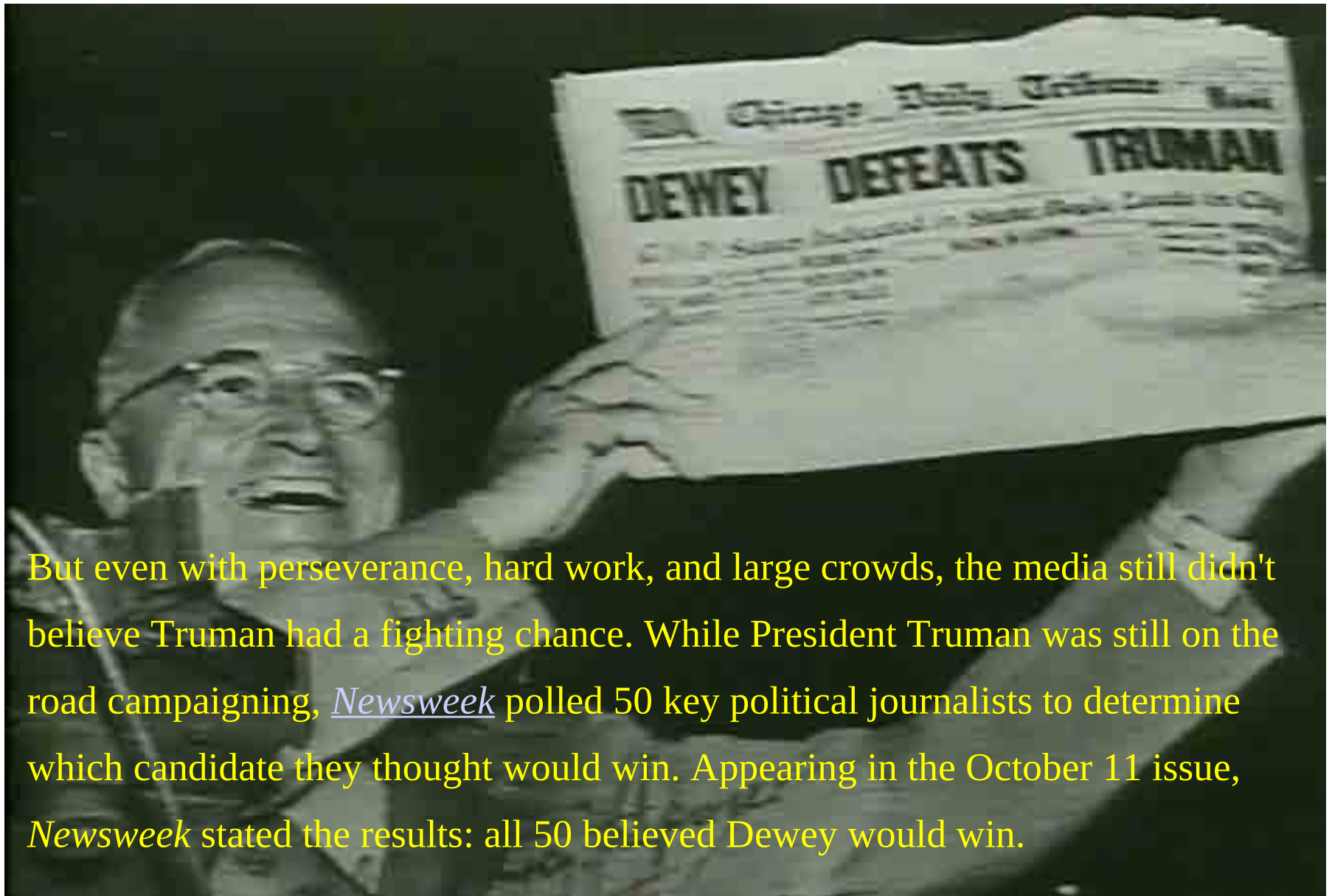


Millionaires in the Senate* / Assets in Millions

Herb Kohl (D-Wis)	\$250.0
Jay Rockefeller (D-WVa)	\$200.0
Frank Lautenberg (D-NJ)	\$45.0
Diane Feinstein (D-Calif)	\$40.0
Ted Kennedy (D-Mass)	\$35.0
John Danforth (R-Mo)	\$30.0
Robert Bennett (A-Utah)	\$27.0
Charles Robb (D-Va)	\$25.0
Clalborne Pell (D-RI)	\$15.0
John Glenn (D-Ohio)	\$13.0
Howard Metzenbaum (D-Ohio)	\$13.0
Dennis DeConcini (D-Anz)	\$8.5
Lauch Faircloth (R-NC)	\$6.0
Bob Graham (D-Fla)	\$6.0
Nancy Kassebaum (R-Kan)	\$5.0
John Warner (R-Va)	\$5.0
John McCain (R-Anz)	\$4.4
Frank Murkowski (A-Alaska)	\$3.7

Campaign Contributions 2005-6

<u>Communication, Technology</u>	Dem \$5,539,418 Rep \$10,123,848 Oth \$1,000 Total: \$15,664,266
<u>Defense</u>	Dem \$2,418,612 Rep \$4,154,067 Oth \$0 Total: \$6,572,679
<u>Energy, Natural Resources</u>	Dem \$4,080,498 Rep \$10,676,720 Oth \$0 Total: \$14,757,218
<u>Finance, Insurance</u>	Dem \$12,810,238 Rep \$23,208,416 Oth \$16,000 Total: \$36,034,654
<u>Business - Retail, Services</u>	Dem \$4,017,805 Rep \$10,192,029 Oth \$2,000 Total: \$14,211,834
<u>Health Care</u>	Dem \$7,968,291 Rep \$17,389,031 Oth \$16,000 Total: \$25,373,322
<u>Law</u>	Dem \$5,457,628 Rep \$4,784,684 Oth \$14,999 Total: \$10,257,311
<u>Organized Labor</u>	Dem \$33,789,334 Rep \$5,661,008 Oth \$292,948 Total: \$39,743,290
<u>Manufacturing</u>	Dem \$1,072,915 Rep \$3,329,572 Oth \$1,000 Total: \$4,403,487



But even with perseverance, hard work, and large crowds, the media still didn't believe Truman had a fighting chance. While President Truman was still on the road campaigning, [*Newsweek*](#) polled 50 key political journalists to determine which candidate they thought would win. Appearing in the October 11 issue, *Newsweek* stated the results: all 50 believed Dewey would win.

1936 Literary Digest Poll
sample size: 2.4 million
prediction:

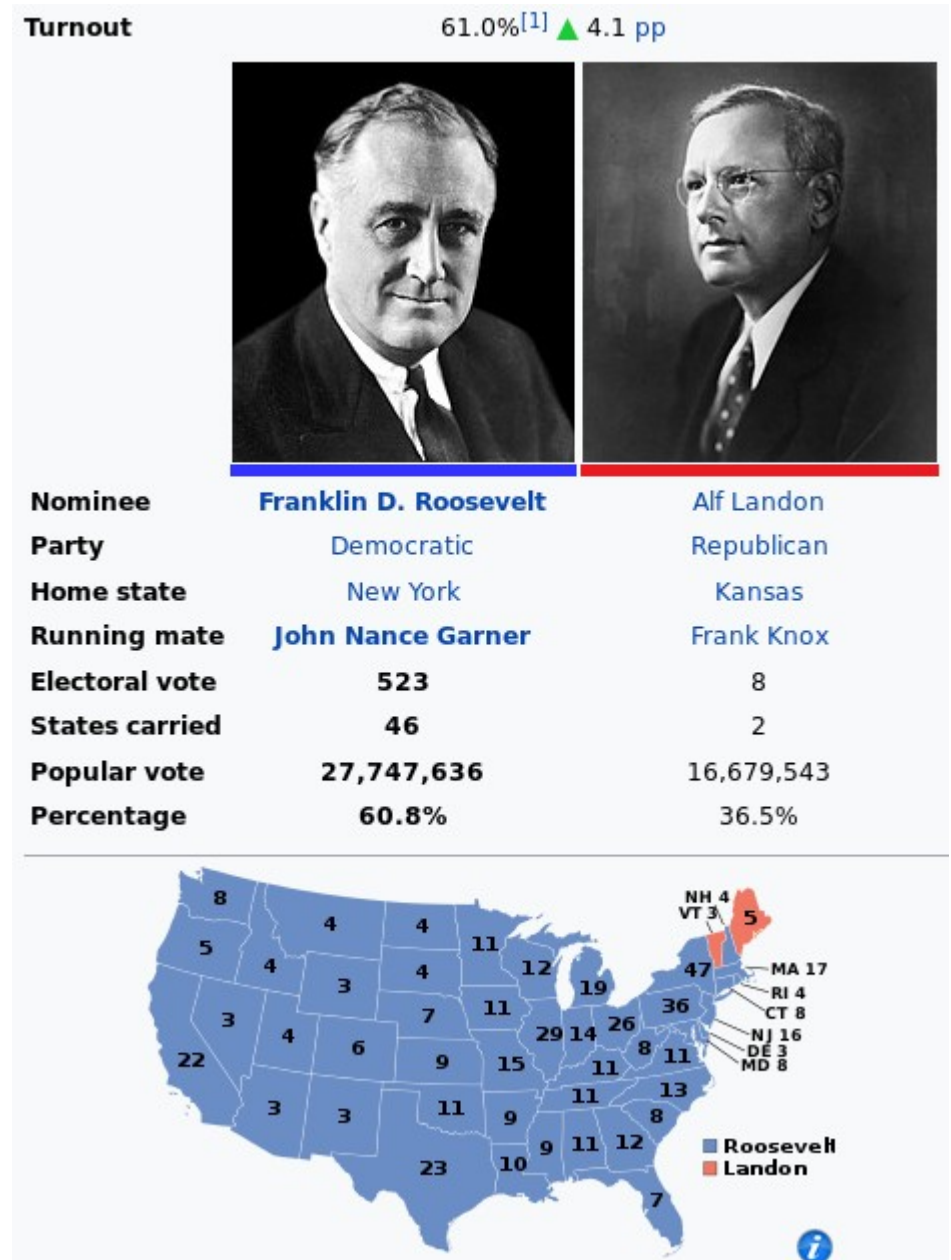
57% Landon

43% Roosevelt

FLAWS: Chose from
telephone directories,
club lists, & magazine
subscribers; 2.4 million
out of 10 million responses

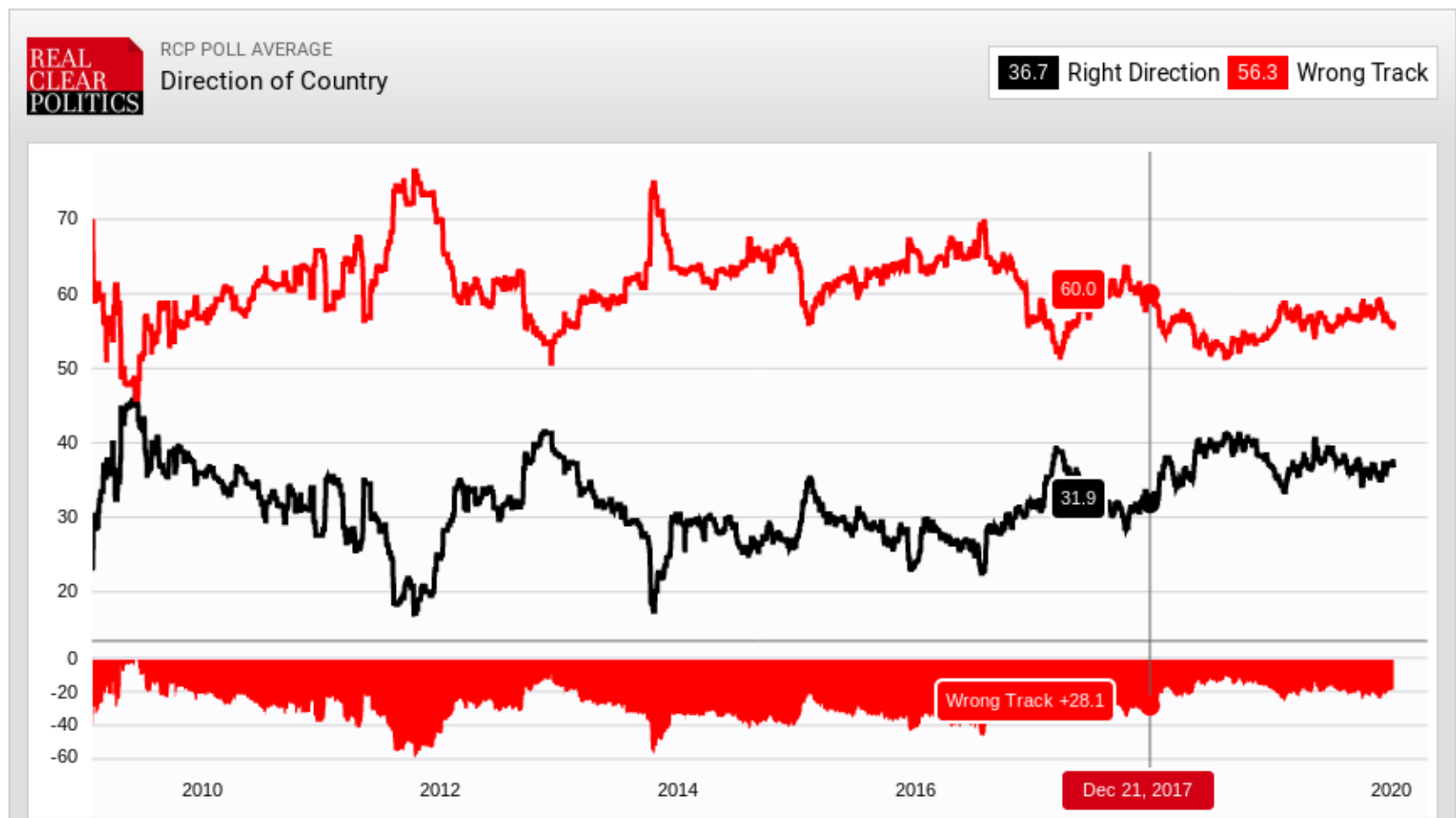
1936 Gallop Poll
sample size: 50,000
prediction:

winner: Roosevelt



Approval Ratings

Poll	Date	Sample	Right Direction	Wrong Track	Spread
RCP Average	12/4 - 1/7	--	36.7	56.3	-19.6
Reuters/Ipsos	1/6 - 1/7	957 RV	31	59	-28
Economist/YouGov	1/5 - 1/7	1185 RV	37	56	-19
Politico/Morning Consult	1/4 - 1/5	1995 RV	40	60	-20
Rasmussen Reports	12/29 - 1/2	1500 LV	41	53	-12
Harvard-Harris	12/27 - 12/29	2010 RV	39	53	-14
Monmouth	12/4 - 12/8	838 RV	32	57	-25
All Direction of Country Polling Data					



RCP Average	12/2 - 1/5	--	13.4	75.6	-62.2
The Economist/YouGov	1/1 - 1/5	1209 RV	10	67	-57
PPP (D)	12/16 - 12/17	1267 RV	13	78	-65
Monmouth	12/10 - 12/13	856 RV	16	77	-61
CBS/NY Times	12/4 - 12/8	1275 A	15	74	-59
Gallup	12/2 - 12/6	824 A	13	82	-69

All Congressional Job Approval Polling Data



RCP POLL AVERAGE

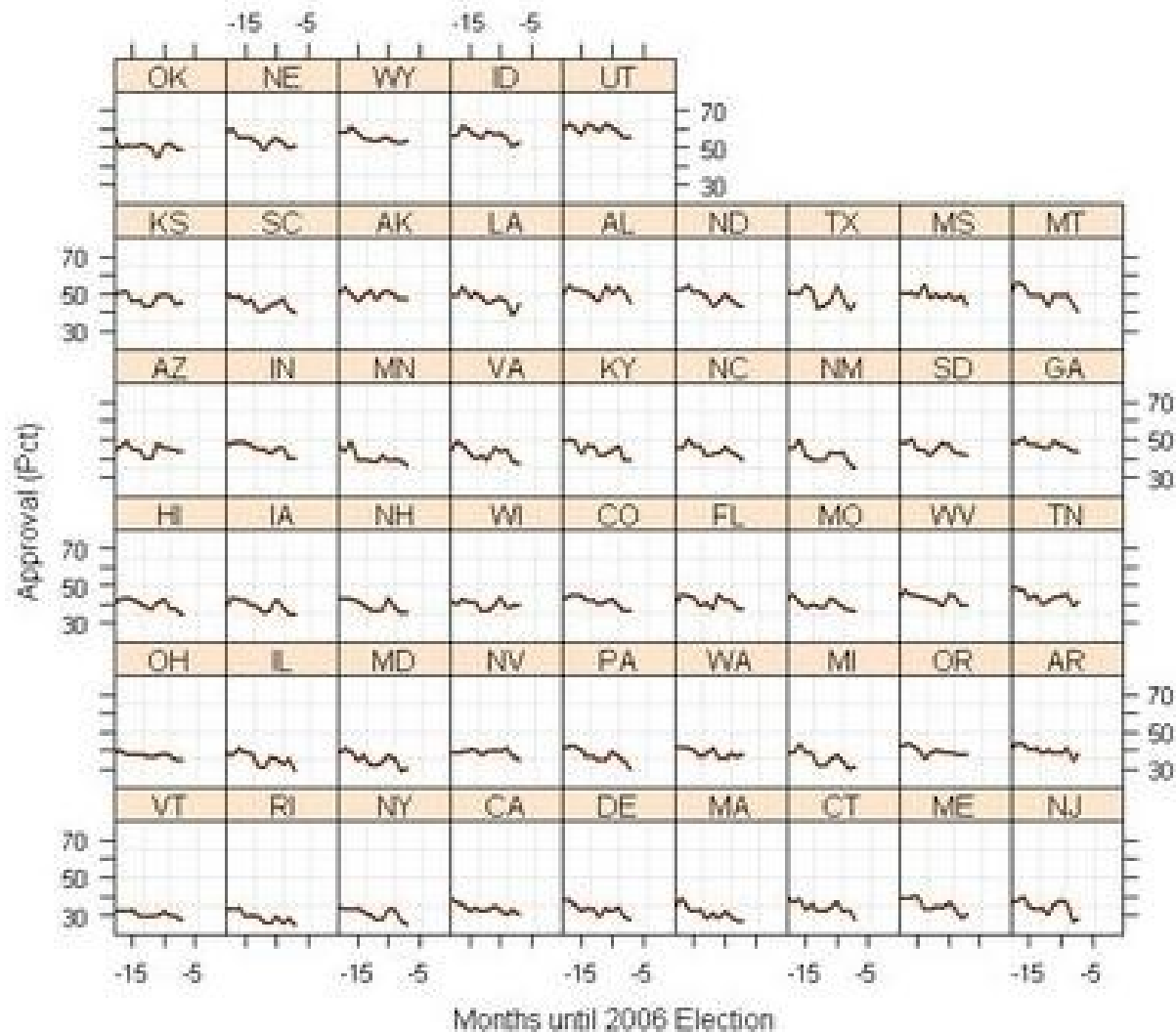
Congressional Job Approval

13.4 Approve 75.6 Disapprove



Bush approval in the 50 states from SurveyUSA

Bush approval in SurveyUSA 50 state tracking, May 2005-April 2006



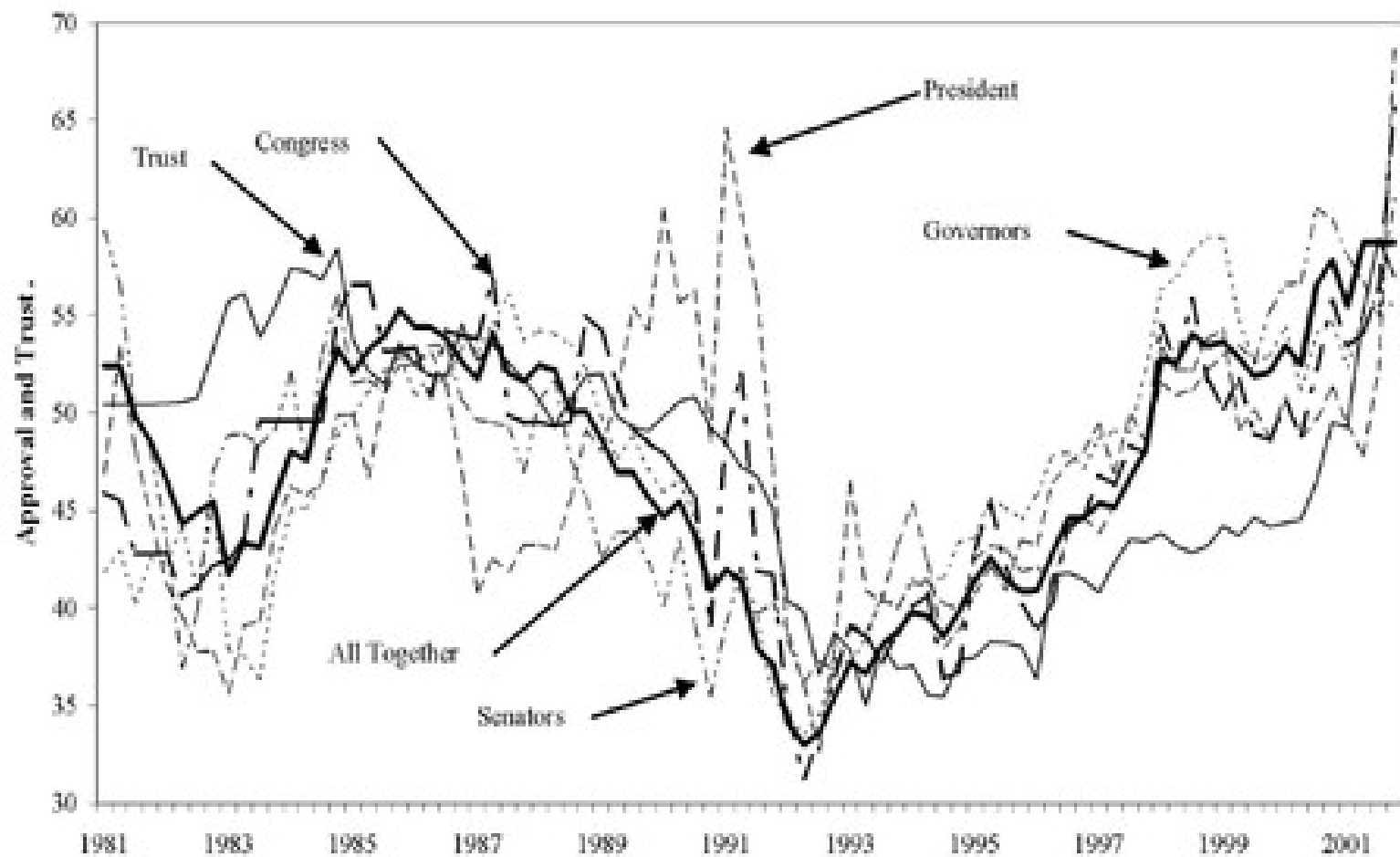
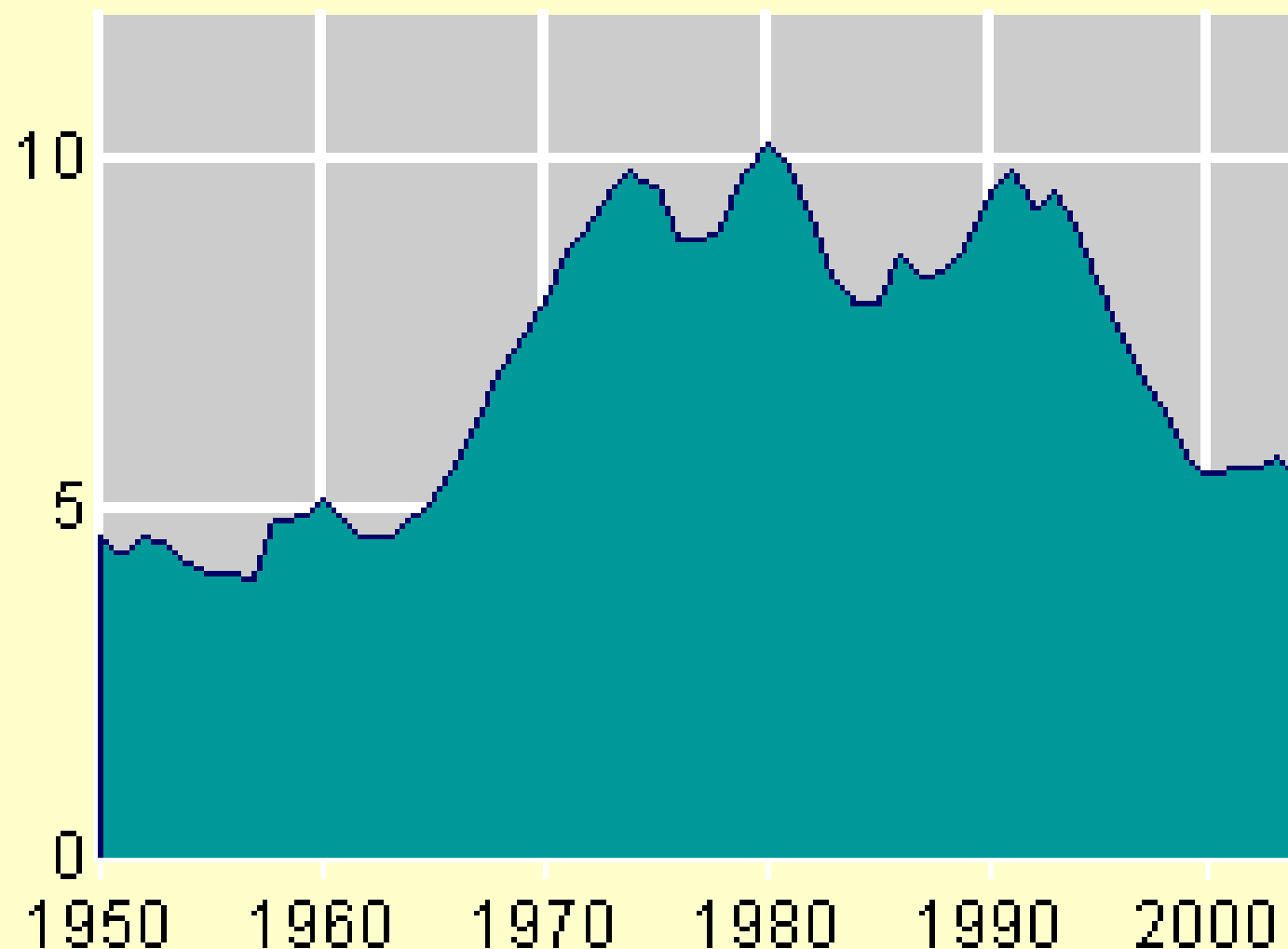


Figure 5.7: Generic Approval Quarterly, Along with Approval of Presidents, Senators, Governors, Congress, and Trust in Government

Crime Statistics

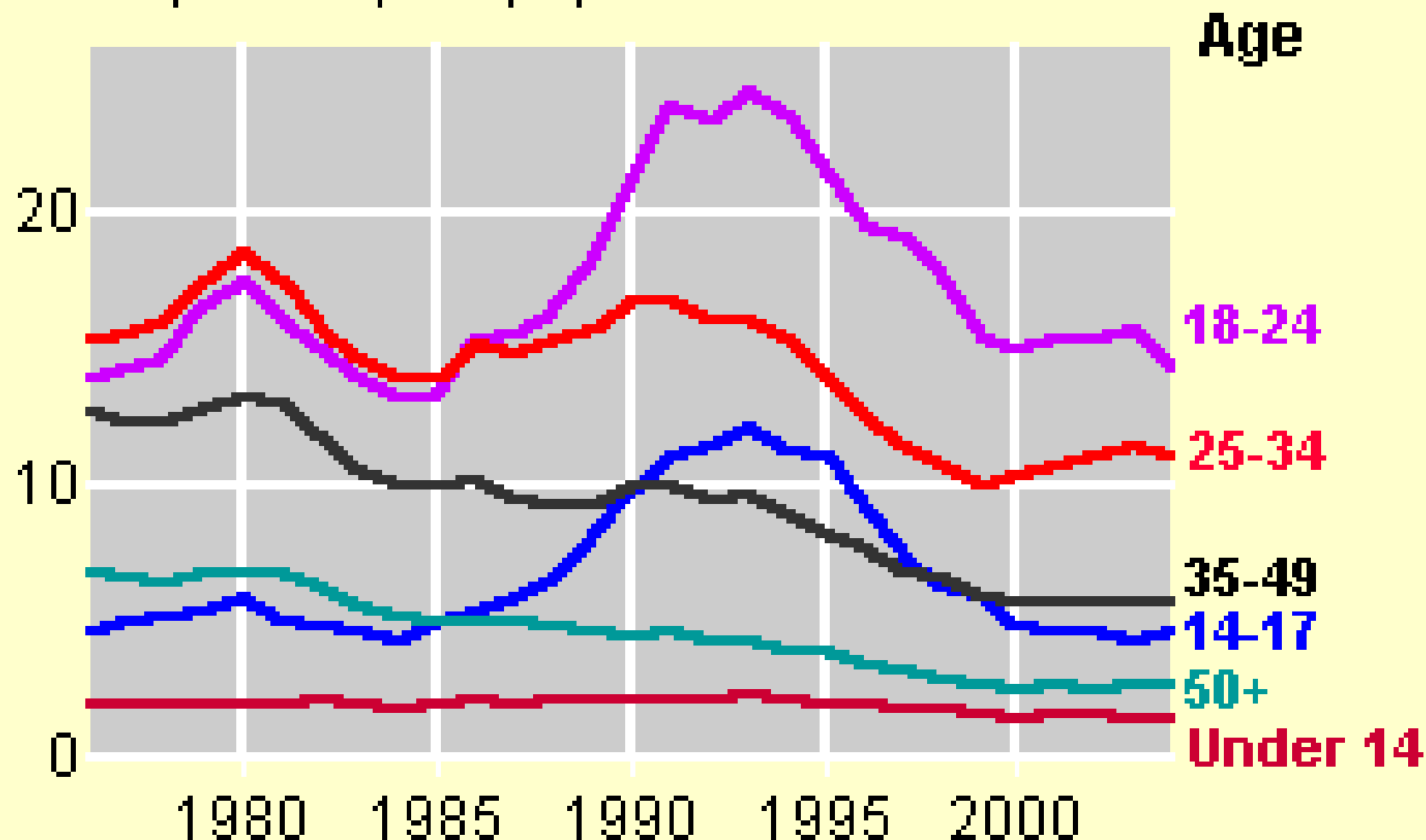
Homicide victimization, 1950-2004

Rate per 100,000 population



Homicide victimization by age, 1976-2004

Rate per 100,000 population



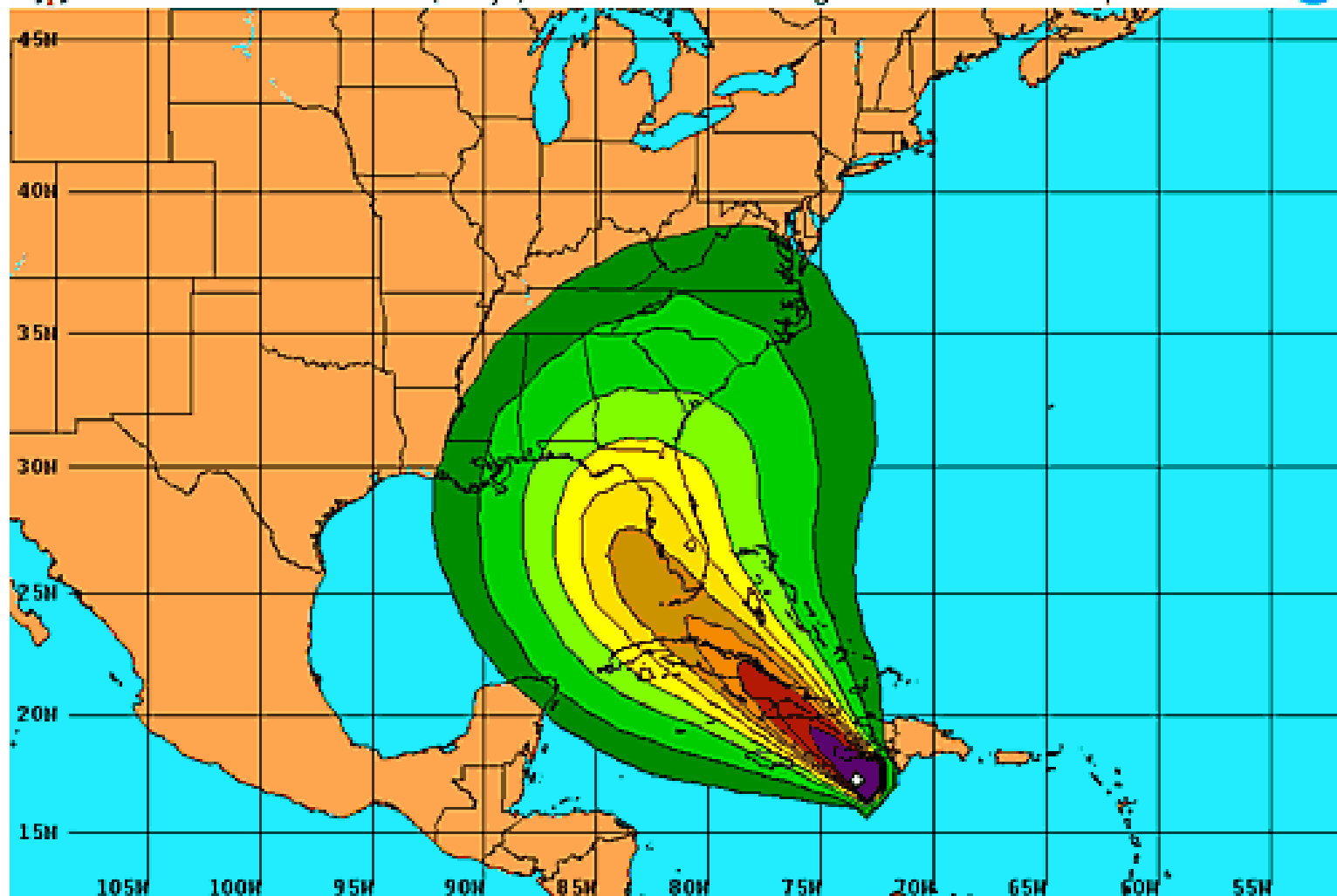
Katrina 2005



Ernesto 2006



Tropical Storm Force Wind Speed Probabilities For the 120 hours (5 days) from 8 AM EDT Sun Aug 27 to 8 AM EDT Fri Sep 1



Probabilities of sustained tropical storm force surface winds (1-minute average of 39 mph or greater) from all active tropical cyclones

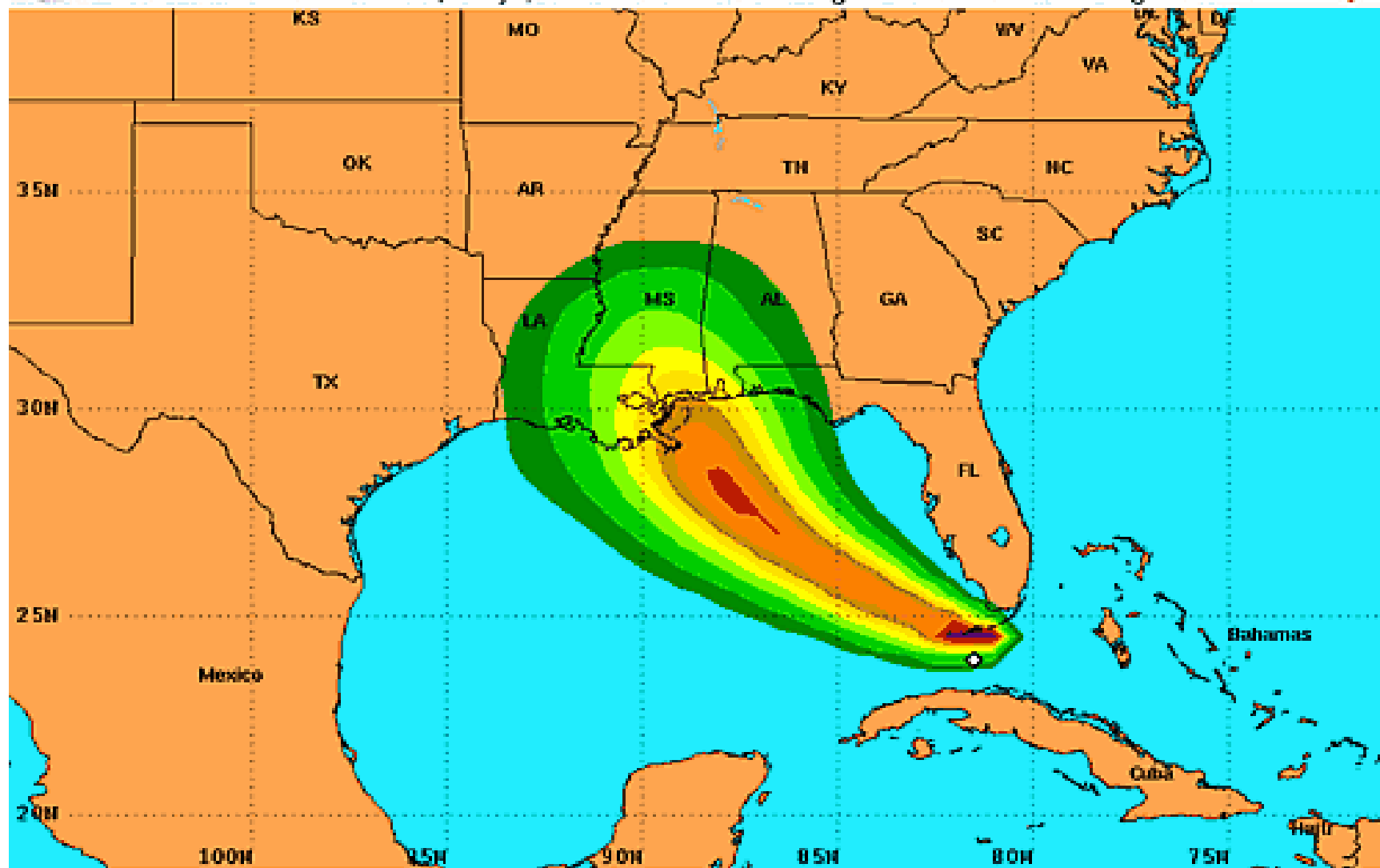
◆ indicates HURRICANE ERNESTO center location at 8 AM EDT Sun Aug 27 2006 (Forecast/Advisory #12)





50-knot Wind Speed Probabilities

For the 120 hours (5 days) from 2 PM EDT Sun Aug 26 to 2 PM EDT Fri Aug 31



Probability of 1-minute average 50-knot (58 mph) or greater surface winds from all tropical cyclones

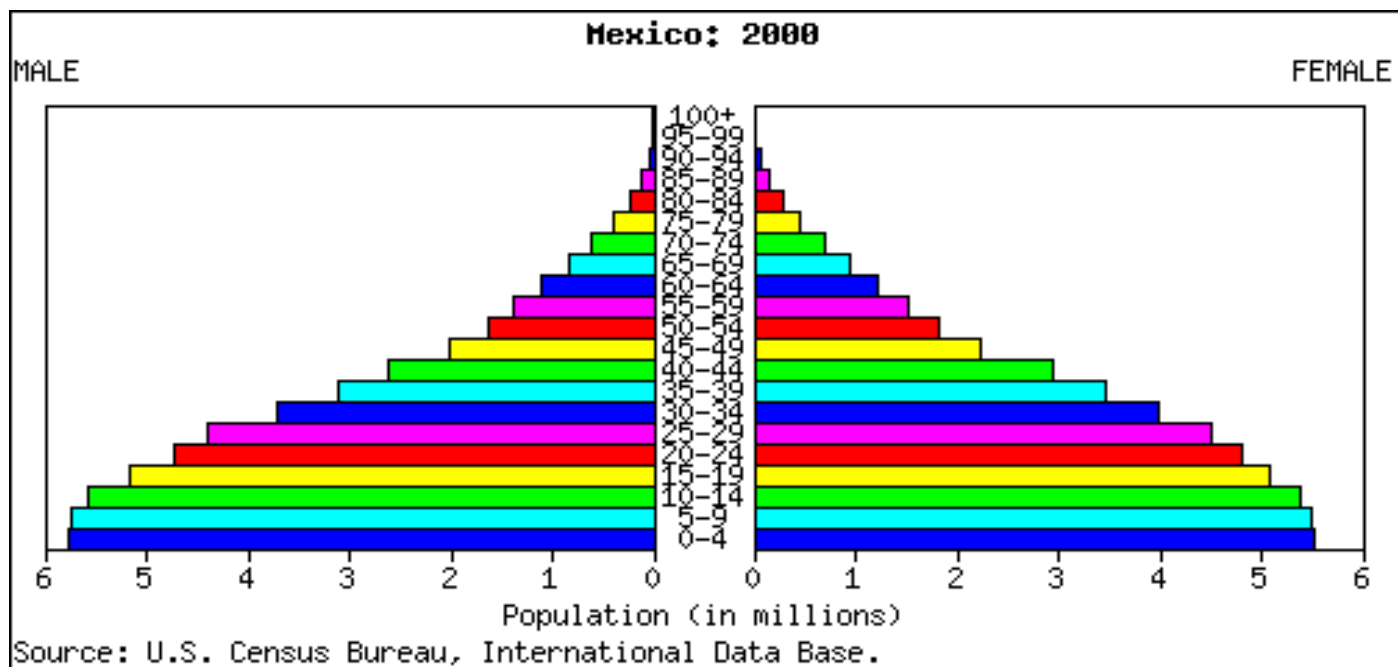
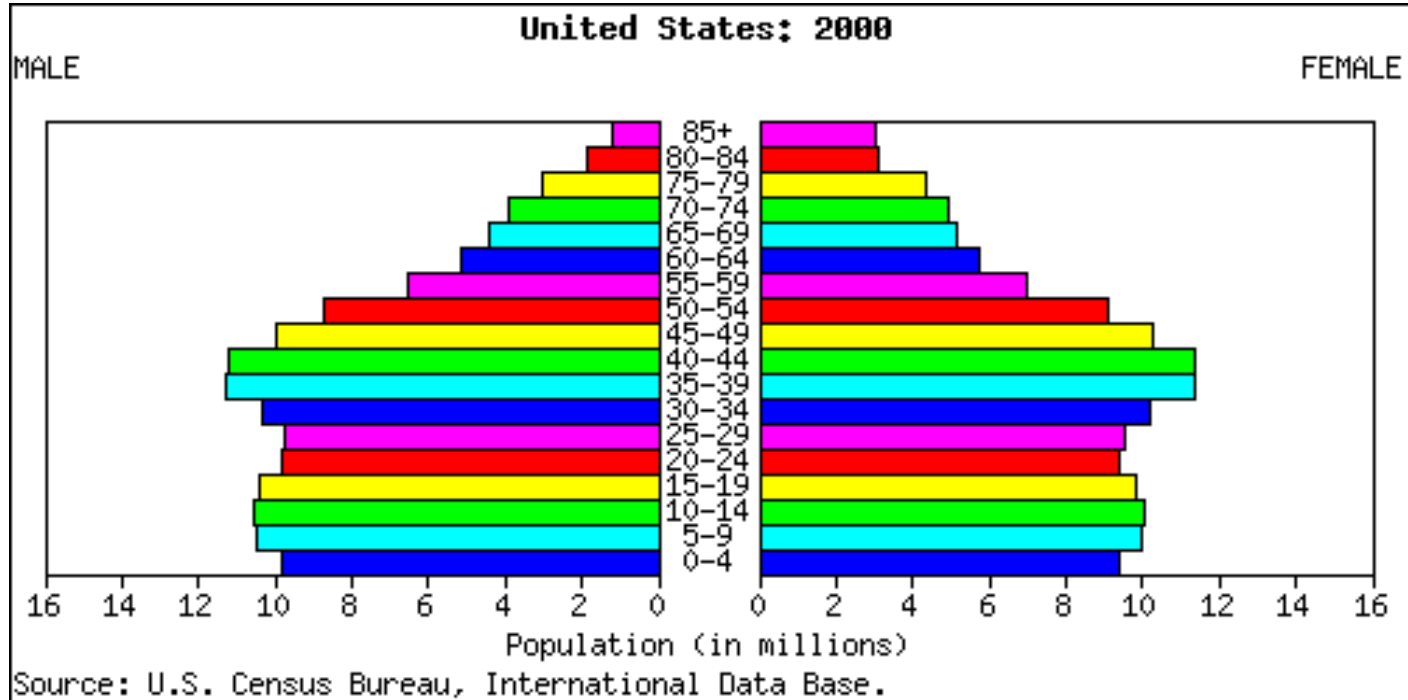
◆ indicates TROPICAL STORM ISAAC center location at 2 PM EDT Sun Aug 26 2012 (Forecast/Advisory #23)



U.S. Mainland Hurricane Strikes By Decade: 1851-2012

DECADE	Category					ALL 1,2,3,4,5	Major 3,4,5
	1	2	3	4	5		
1851-1859	7	4	4	1	0	16	5
1860-1869	5	8	2	0	0	15	1
1870-1879	8	5	6	0	0	19	6
1880-1889	11	9	4	1	0	25	5
1890-1899	8	5	5	2	0	20	7
1900-1909	10	2	4	1	0	17	5
1910-1919	8	6	4	3	0	21	7
1920-1929	7	3	3	2	0	15	5
1930-1939	9	4	3	1	1	18	5
1940-1949	7	8	6	2	0	23	8
1950-1959	8	1	8	2	0	19	10
1960-1969	4	5	3	2	1	15	6
1970-1979	6	2	4	0	0	12	4
1980-1989	9	2	4	1	0	16	5
1990-1999	2	7	4	0	1	14	5
2000-2009	8	4	6	1	0	19	7
2010-2012	3	0	0	0	0	3	0
1851-2012	120	75	70	19	3	287	91

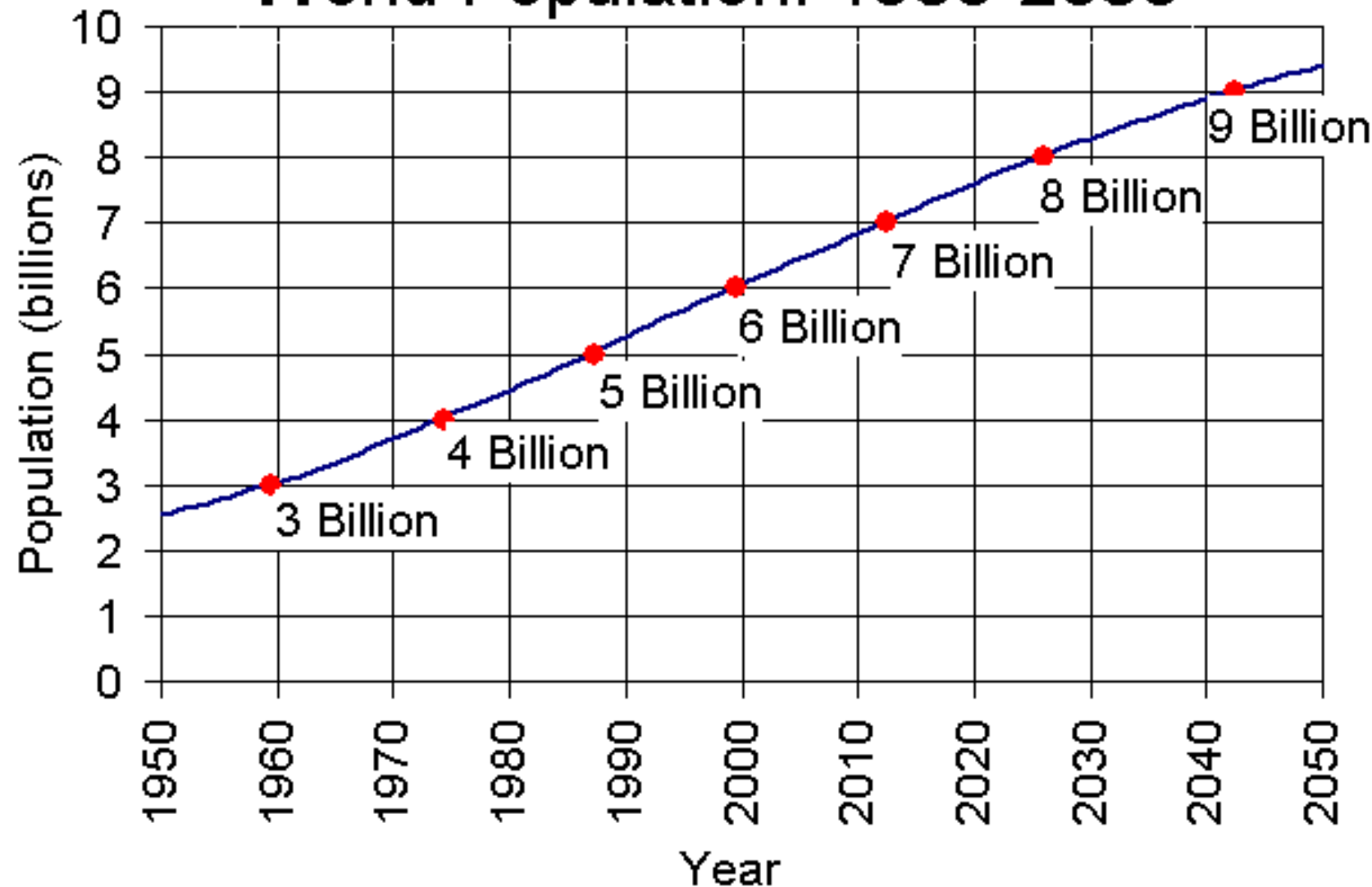
Population Growth



Countries Ranked by Population: 2006

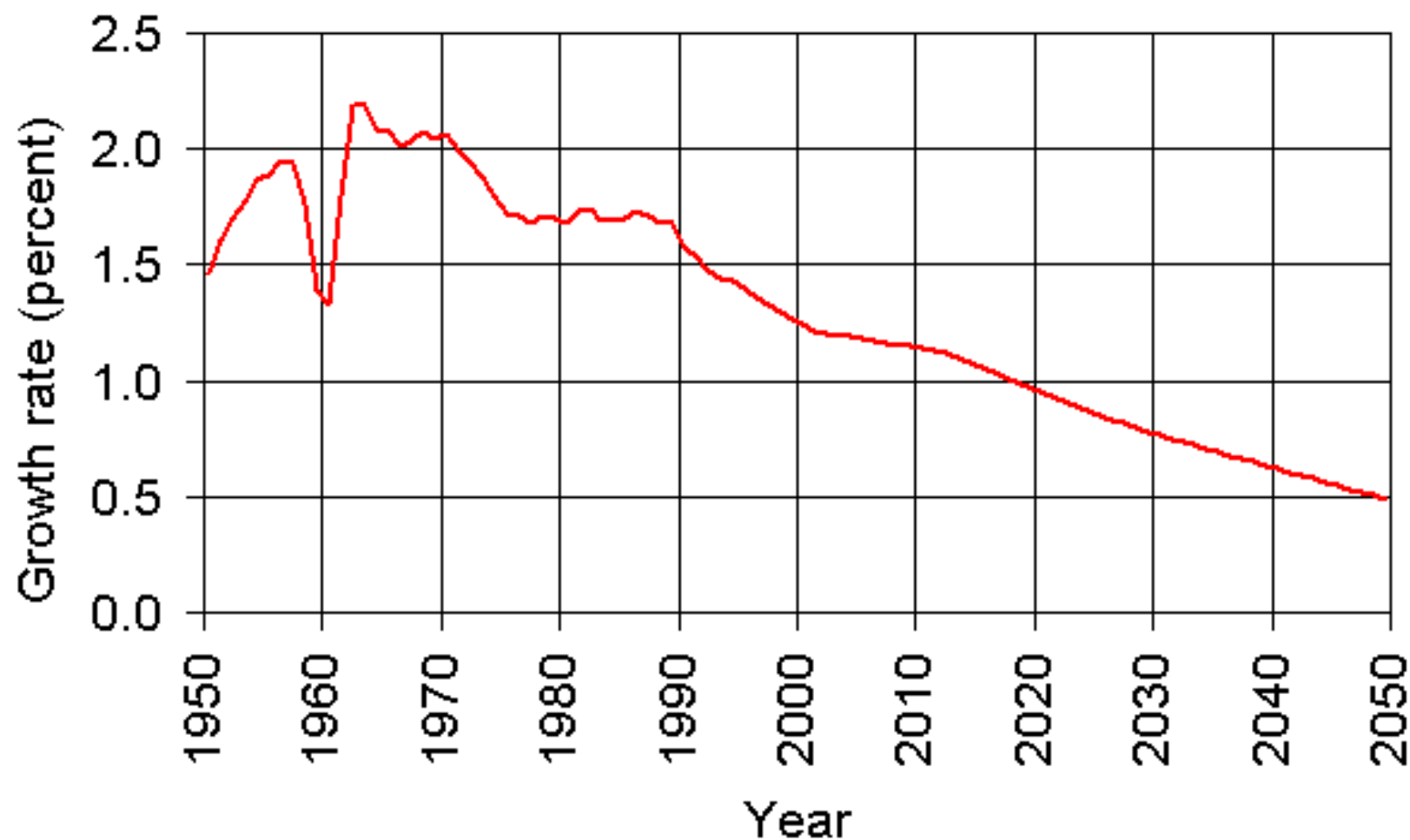
Rank	Country	Population
1	China	1,313,973,713
2	India	1,111,713,910
3	United States	298,444,215
4	Indonesia	231,820,243
5	Brazil	188,078,227
6	Pakistan	165,803,560
7	Bangladesh	147,365,352
8	Russia	142,069,494
9	Nigeria	131,859,731
10	Japan	127,463,611
11	Mexico	107,449,525
12	Philippines	89,468,677
13	Vietnam	84,402,966
14	Germany	82,422,299
15	Egypt	78,887,007
16	Ethiopia	74,777,981
17	Turkey	70,413,958
18	Iran	65,025,373
19	Thailand	64,631,595
20	Congo (Kinshasa)	62,660,551
21	France	60,876,136

World Population: 1950-2050



Source: U.S. Census Bureau, International Data Base, August 2006 version.

World Population Growth Rates: 1950-2050



Source: U.S. Census Bureau, International Data Base, August 2006 version.

US Census Data

County Statistics:

About This County (Carlton)

(Carlton) County Statistics

(MN) State Statistics

Population (Approximate)

15,814 people

4,917,991 people

% (age 25+) w/College Degree

22

25%

Population Average Age

38 years old

35 years old

Average Household size

2.4 persons

2 persons

Median Household Income

\$38,134

48574

Avg. # of Rooms in Household

5.2 rooms

5.7 rooms

Median Age of Housing Structure

47 years old

42 years old

Median Value of Housing Unit

\$83,700

\$124,183



[View Current Housing Listings in Minnesota](#)

% Owning / % Renting

77% / 23%

70% / 30%

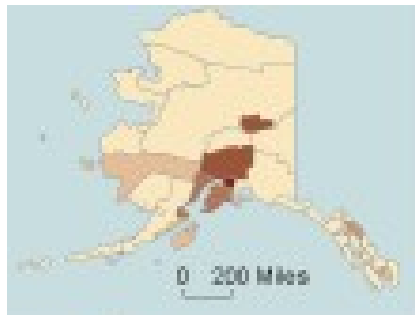
% Vacancy of Housing Units

5% vacancy rate

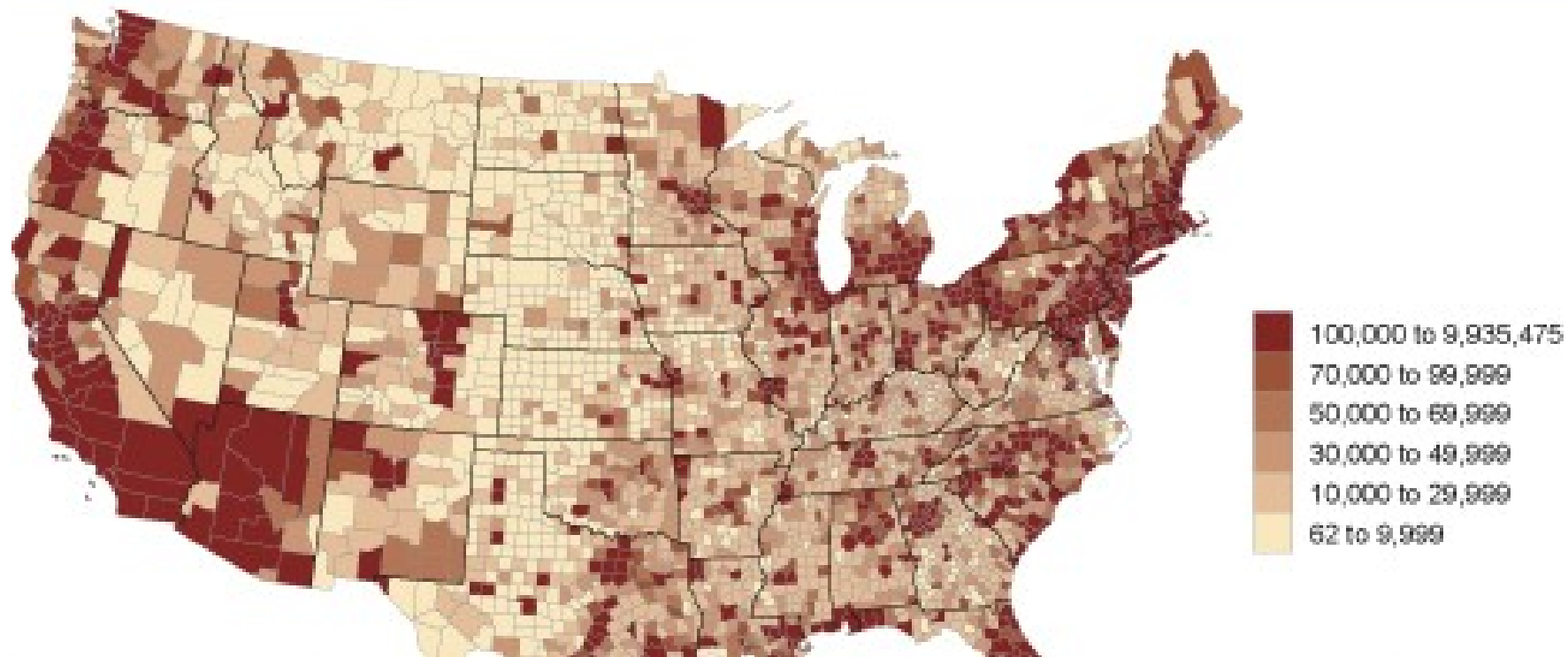
4% vacancy rate

Name	1,993	2,002	2,003	Percent Change 2002-2003 (adjusted for inflation)	Percent Change 2002-2003 (adjusted for inflation)		
United States	\$21,346	\$30,804	\$31,472	16.10%	0.20%		
Minnesota	21,636	33,180	34,031	23.80%	0.60%		
Aitkin	15,108	22,641	23,176	20.80%	0.40%		
Anoka	20,663	31,838	32,620	24.30%	0.40%		
Becker	15,312	25,794	26,540	36.50%	0.90%		
Beltrami	14,867	23,514	24,157	27.90%	0.70%		
Benton	16,741	26,860	27,420	29.00%	0.10%		
Big Stone	13,462	24,080	24,959	46.00%	1.60%		
Blue Earth	18,004	27,602	28,491	24.60%	1.20%		
Brown	17,385	26,867	28,072	27.10%	2.40%		
Carlton	16,368	25,262	25,272	21.60%	-1.90%		
Carver	24,762	40,559	40,807	29.80%	-1.40%		
Cass	16,307	26,015	26,631	28.60%	0.40%		
Chippewa	15,670	26,645	27,429	37.80%	0.90%		
Chisago	18,354	28,007	28,448	22.00%	-0.40%		
Clay	15,486	24,295	25,311	28.70%	2.10%		
Clearwater	13,421	20,835	21,374	25.40%	0.60%		
Cook	19,951	29,074	29,301	15.60%	-1.20%		

Table 2a. Projected Population of the United States, by Age and Sex: 2000 to 2050						
(In thousands except as indicated. As of July 1. Resident population.)						
Population or percent, sex, and age	2000	2010	2020	2030	2040	2050
POPULATION						
TOTAL						
TOTAL	282,125	308,936	335,805	363,584	391,946	419,854
0-4	19,218	21,426	22,932	24,272	26,299	28,080
5-19	61,331	61,810	65,955	70,832	75,326	81,067
20-44	104,075	104,444	108,632	114,747	121,659	130,897
45-64	62,440	81,012	83,653	82,280	88,611	93,104
65-84	30,794	34,120	47,363	61,850	64,640	65,844
85+	4,267	6,123	7,269	9,603	15,409	20,861
MALE						
TOTAL	138,411	151,815	165,093	178,563	192,405	206,477
0-4	9,831	10,947	11,716	12,399	13,437	14,348
5-19	31,454	31,622	33,704	36,199	38,496	41,435
20-44	52,294	52,732	54,966	58,000	61,450	66,152
45-64	30,381	39,502	40,966	40,622	43,961	46,214
65-84	13,212	15,069	21,337	28,003	29,488	30,579
85+	1,240	1,942	2,403	3,340	5,573	7,749
FEMALE						
TOTAL	143,713	157,121	170,711	185,022	199,540	213,377
0-4	9,387	10,479	11,216	11,873	12,863	13,732
5-19	29,877	30,187	32,251	34,633	36,831	39,632
20-44	51,781	51,711	53,666	56,747	60,209	64,745
45-64	32,059	41,510	42,687	41,658	44,650	46,891
65-84	17,582	19,051	26,026	33,848	35,152	35,265
85+	3,028	4,182	4,866	6,263	9,836	13,112

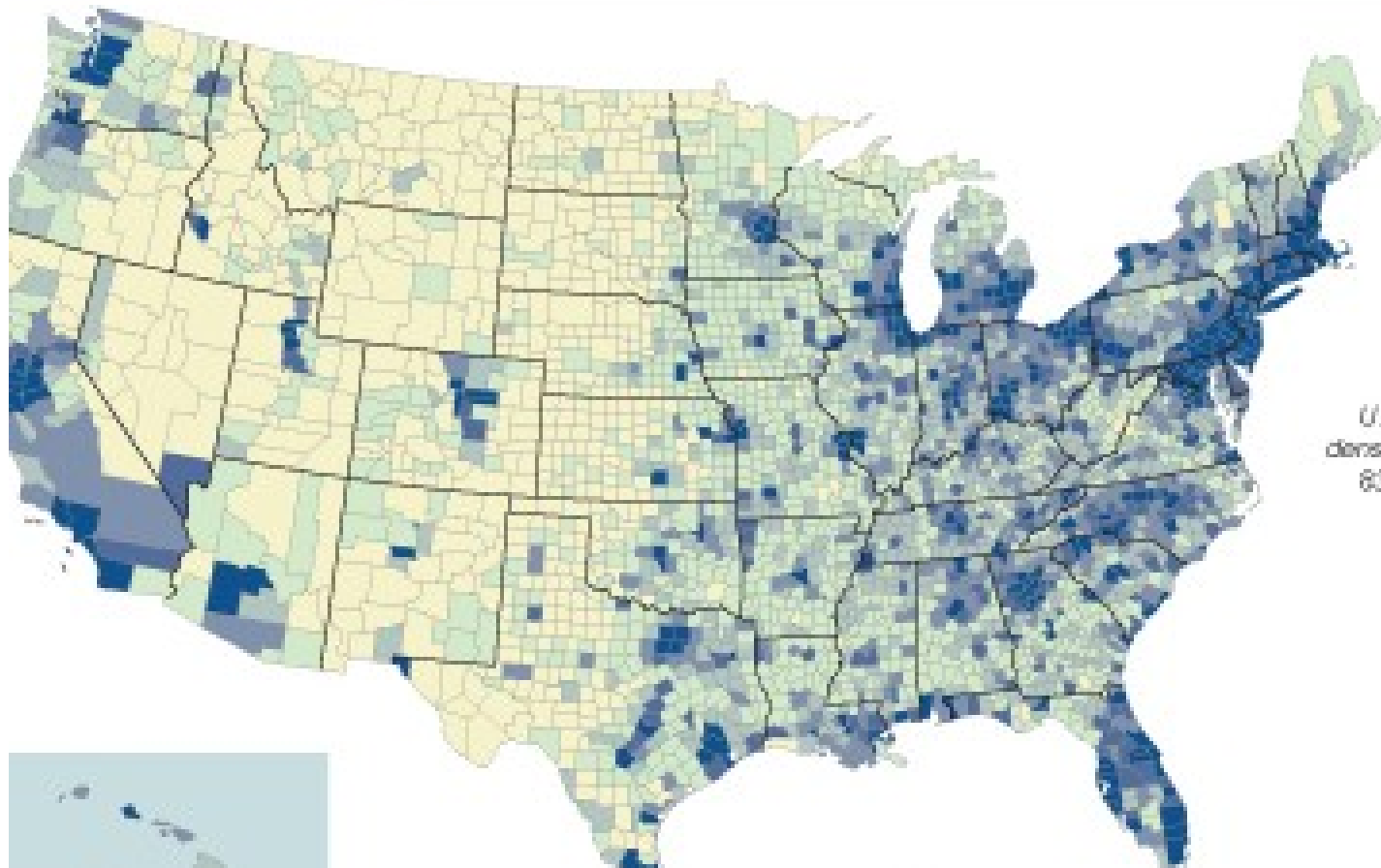


Population Size: July 1, 2005



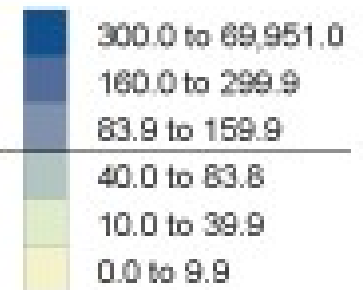
100,000 to 9,935,475
70,000 to 99,999
50,000 to 69,999
30,000 to 49,999
10,000 to 29,999
62 to 9,999

Population Density: July 1, 2005



Population per
square mile

U.S.
density
83.9



Sports


Joe Mauer 7 | C

Current Status: Active



STATS:	Full Name: Joseph Patrick Mauer
AVERAGE:	Born: 04/19/1983
.356	Birthplace: St. Paul, MN
HOME RUNS:	Height: 6'4" Weight: 220
10	Bats: Left
RBI:	Throws: Right
73	College: U/A
SB:	MLB Debut: 04/05/2004
8	



[Get gear, customized jerseys at the *twins shop*](#)

[Photo Gallery](#)

	G	AB	R	H	2B	3B	HR	RBI	TB	BB	SO	SB	CS	OBP	SLG	AVG
2006	113	424	67	151	29	4	10	73	218	63	40	8	2	.434	.514	.356
Career	279	1020	146	328	63	7	25	145	480	135	118	22	3	.398	.471	.322

Sunday, August 27, 2006

[print this page](#) 

Joe Mauer C

[Go to Player Bio >>](#)

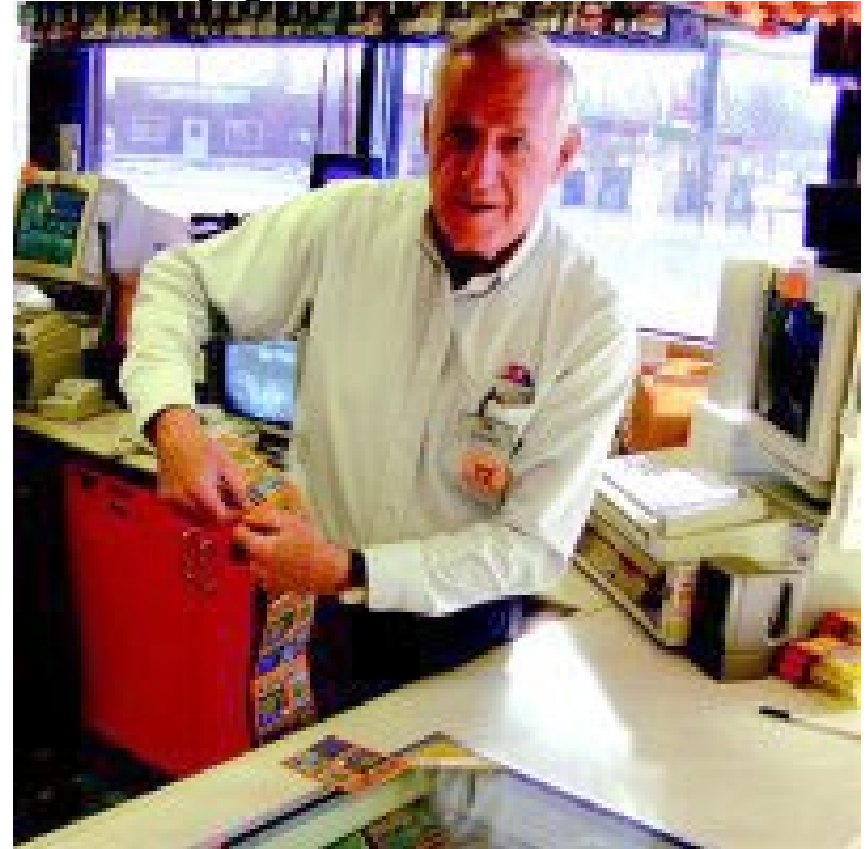
[CAREER STATS](#) | [SPLITS](#) | [GAME BY GAME LOG](#) | [HITTING CHART](#) | [POSTSEASON & ALL-STAR](#)

Hitting Stats:

[Next Stats >>](#)

SEASON	TEAM	G	AB	R	H	2B	3B	HR	RBI	TB	BB	SO	SB	CS	OBP	SLG	AVG
2004	Minnesota Twins	35	107	18	33	8	1	6	17	61	11	14	1	0	.369	.570	.308
2005	Minnesota Twins	131	489	61	144	26	2	9	55	201	61	64	13	1	.372	.411	.294
2006	Minnesota Twins	113	424	67	151	29	4	10	73	218	63	40	8	2	.434	.514	.356
Career Totals		279	1020	146	328	63	7	25	145	480	135	118	22	3	.398	.471	.322

Chance, Odds, Probability Gambling



Blaise Pascal



About Powerball



Powerball is a multi-state, mega-jackpot lotto game that is played in 29 states, the District of Columbia and the U.S. Virgin Islands. The game is administered by the [Multi-State Lottery Association](#) (MUSL). For each drawing, five white balls are picked out of a drum containing 55 balls and one red ball out of another drum containing 42 red balls. Powerball offers players [nine ways to win](#). The jackpot, won by matching all five white balls in any order and the red Powerball, is either an annuitized prize paid out in 30 graduated installments over 29 years or a lump sum payment. The jackpot is always at least \$15 million. If there is no jackpot winner for a drawing the amount increases for the next draw. The second prize, won by matching five white balls in any order, is \$200,000. Any time you match the red Powerball, you win. The overall odds of winning a prize in the game is approximately 1 in 36.6.

New

$$\binom{69}{5} \cdot \binom{26}{1} = 292,201,338$$





Risk

Insurance

Odds



Gloomy Statistics

The Rottweiler is the dog most responsible for human deaths. The golden retriever is the dog least likely to bite people.

You are more likely to be killed by a Champagne cork than a poisonous Spider.

3 people die each year testing if a 9v battery works on their tongue

142 people were injured in 1998 by not removing all pins from new shirts

31 people have died since 1996 by watering their Christmas tree while the lights were plugged in

Every year, about 13 people die after rocking a vending machine and having it fall on them.

Weird Facts/Statistics

Three quarters of a sand dune's volume is made up of air!

400 million cups of coffee are drunk around the world every day!

Americans on average eat 18 acres of pizza everyday.

Cat's Urine glows under a blacklight.

Winston Churchill was born in a ladies toilet during a dance.

The elephant is the only mammal that cant jump.

Statistical Data

Variable

- discrete variable

- continuous variable

measurement of data

- ordinal: 1st, 17th, etc.

- interval: 36 in, i.e. between 35.5 and 36.5 in

- ratio: formally most measurements like grams

Sampling

- population: all in question

- sample: portion of population measured

 - random

 - systematic

 - stratified

 - cluster

1.3 Presentation of data

data:

20, 22,22, 25,25,25,25,25,
30,30,30,30, 33,33,33

Data Frequency Table:

x	20	22	25	30	33
f	1	2	5	4	3

Organizing Data

Class Limits	Class Boundaries	Tally	Frequency	Cumulative Frequency
10-21	9.5-21.5	III	3	3
22-33	21.5-33.5	IIII	4	7
34-45	33.5-45.5	V III	8	15
46-57	45.5-57.5	V I	6	21
58-69	57.5-69.5	II	2	22
70-81	69.5-81.5	I	1	23