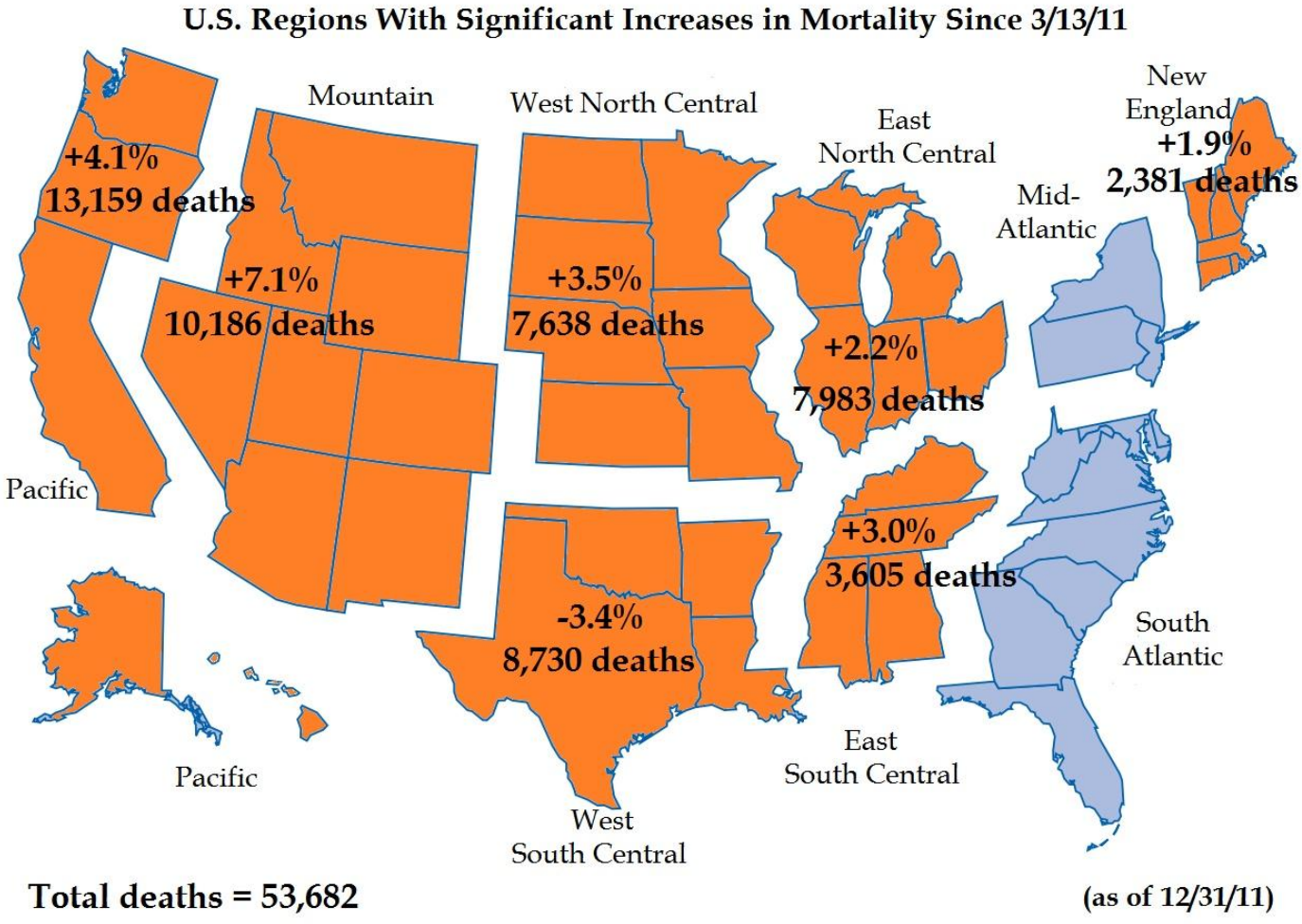
EXCESS DEATHS IN U.S. SUMMARY FOR 2011

By Bobby1

January 16, 2012

The week 52 mortality statistics for 2011 (through December 31) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 53,682.



There has been a dramatic increase in excess mortality in the Pacific region for the months of November and December. Over 5,000 excess deaths occurred in this region in this time period, which is more than March, April, and May combined.

The East South Central region also had a spike in this time frame, and the West North Central and West South Central region also had increases in December.

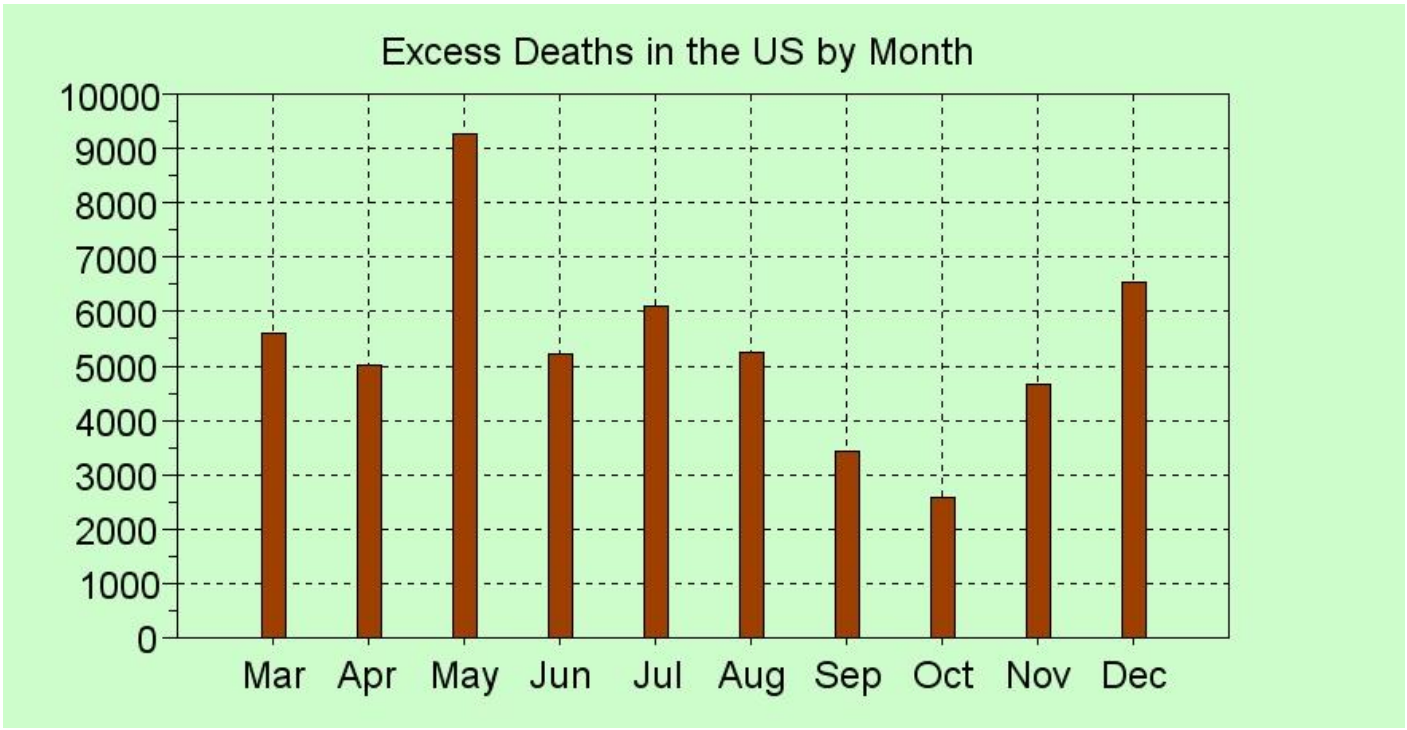
The numbers for the West North Central region are increased from previous analyses due to the incorporation of St. Louis mortality data (see below).

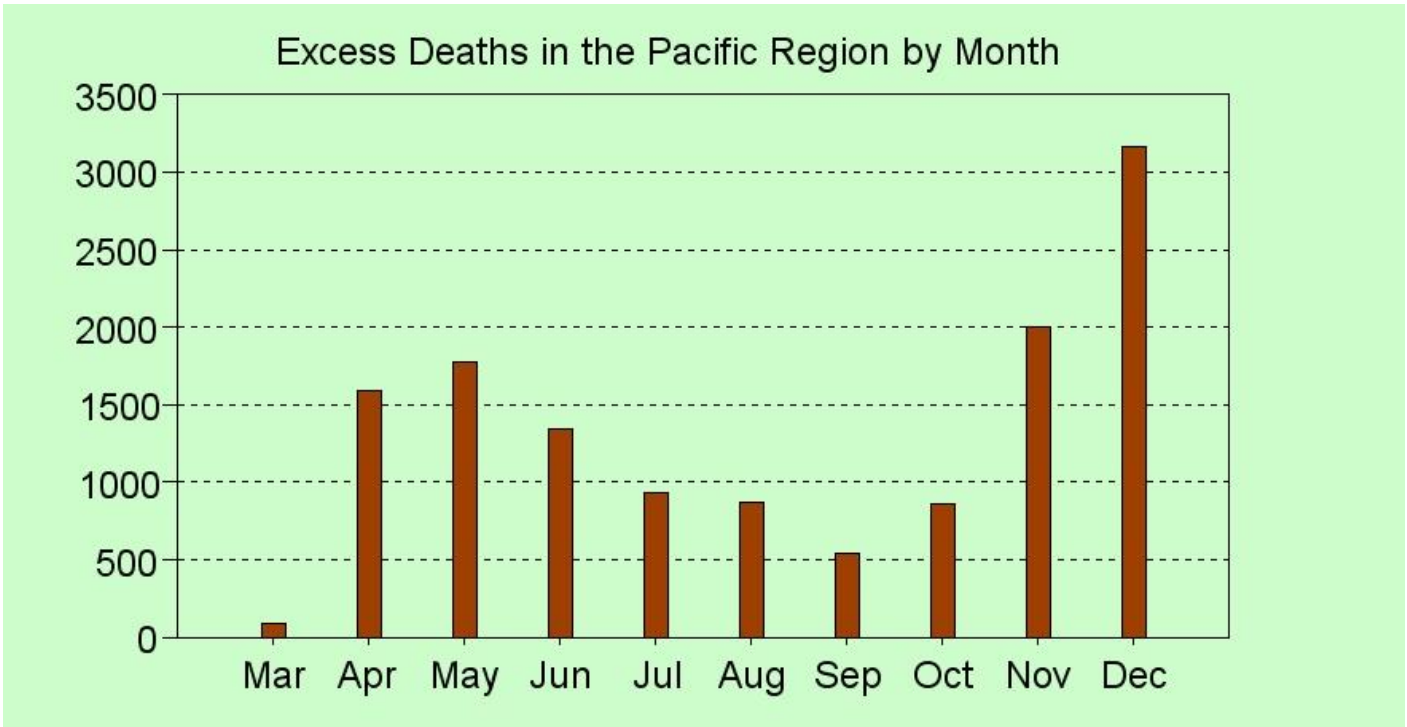
Table. Excess deaths in the U.S. by month.

Month	Excess deaths in US
March	5,604
April	5,025
May	9,261
June	5,223
July	6,090
August	5,245
September	3,442
October	2,583
November	4,654
December	6,555

Table. Excess deaths in the Pacific region by month.

Month	Excess deaths in Pacific region
March	89
April	1,588
May	1,773
June	1,340
July	936
August	869
September	546
October	856
November	2,000
December	3,162


Excess Deaths in the US by Month
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Excess Deaths in the Pacific Region by Month
3500
3000
2500
2000
1500
1000
500
0
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

The greatest number of excess deaths in the U.S. occurred in May. The Pacific region, however, had an even sharper mortality increase in November and December.

The following table indicates significant increases in mortality by age group. Earlier in the year, the 65 and over age group was most at risk, but by the end of the year, the 25-44 age range had higher percentage increases in three regions.

Table. Significant increases in 2011 mortality from 2010 by age group.

	Age range				
Region	**65+**	**45-64**	**25-44**	**1-24**	**Infants**
Pacific	4.3%	3.5%	7.9%		
Mountain	7.5%	6.8%			
East North Central	1.9%	2.5%	6.0%		
East South Central	2.3%	5.1%	7.3%		

Pneumonia and influenza deaths increased sharply in the West North Central and East North Central regions. This is probably mainly due to pneumonia.

Table. Percentage change in pneumonia and influenza deaths in 2011 by region.

Region	Percentage change
Pacific	+3.4%
Mountain	+7.3%
West North Central	+12.2%
West South Central	-5.0%
East North Central	+11.3%
East South Central	-1.2%
New England	+2.2%
Mid-Atlantic	-0.6%
South Atlantic	-2.6%

St. Louis had the greatest percentage increase in mortality of the cities studied, almost twice the amount of the second highest, Tucson:

Table. Percentage increase in mortality for U.S. cities (>5%).

City	Percentage increase
St. Louis MO	36.4%
Tucson AZ	18.5%
New Haven CT	17.8%
Little Rock AR	16.7%
South Bend IN	15.5%
Lansing MI	13.8%
Waterbury CT	13.8%
Boise ID	12.7%
Mobile AL	12.4%
Paterson NJ	11.3%
Denver CO	11.0%
Shreveport LA	10.8%
San Diego CA	10.4%
Grand Rapids MI	10.1%
Ogden UT	9.0%
Atlanta GA	9.0%
Detroit MI	8.3%
Syracuse NY	8.0%
Chattanooga TN	7.9%
Honolulu HI	7.8%
Wilmington DE	7.7%
Long Beach CA	7.6%
Minneapolis MN	7.6%
Omaha NE	7.5%
Colorado Springs CO	7.2%
Allentown PA	6.8%
Portland OR	6.6%
Charlotte NC	6.6%
San Jose CA	6.5%
New Bedford MA	6.1%
Hartford CT	6.1%
Philadelphia PA	5.8%
Fort Wayne IN	5.4%
Akron OH	5.1%
Albany NY	5.1%

INFANT MORTALITY

The present techniques are not well suited for the study of infant mortality, and they were not meant to be. But several cities were found to have significant increases in infant mortality.

Table. Percentage increase in infant mortality.

City	Increase in infant mortality
Lansing MI	143.4%
Atlanta GA	129.0%
Ogden UT	81.2%
Albuquerque NM	32.3%
Boston MA	27.3%
Tucson AZ	17.1%

EXCESS DEATHS IN JAPAN

The Asahi Shimbun reported that the Japanese health ministry estimated that 64,000 more deaths occurred in Japan in 2011 than in 2010. Of these deaths, 20,000 or so can be attributed to the earthquake and tsunami. The article states that there is a trend toward higher death rates due to Japan's aging society. So we can say that, based on this information, no more than 44,000 excess deaths occurred in Japan after the Fukushima nuclear disaster. When compared to the estimate of 53,000+ in this study, one might conclude that more people have died in the U.S. than in Japan due to the disaster.

http://ajw.asahi.com/article/behind_news/social_affairs/AJ201201020058

QUESTIONS AND ANSWERS

Q: You mentioned something about the mortality numbers in West North Central region and St. Louis. Could you explain?

A: The St. Louis data was excluded due to its high weekly variability. It appeared to be untrustworthy. But lately, other cities have shown high variability, sudden drop-offs,

increases, and missing data. So St. Louis was put back in, and the estimate for the region increased.

Q: What is the reason for the high weekly variability?

A: Unknown, it might have something to do with inconsistencies in data collection methods, or it could be intentional. The excess deaths for the Pacific region increased sharply in November and December, while they fell sharply in the South Atlantic region by virtually the same amount. Houston rose sharply until mid-summer, and then it fell even more sharply after that. This is unlikely to be due to random variation.

Q: Mangano and Sherman came out with a peer-reviewed publication (at http://www.radiation.org/) which estimated post-Fukushima deaths in the US to be around 14,000. How does this compare with your current study?

A: If you go to the end of this document, you will find the initial estimate at week 27 to be 21,000+. This includes 3 more weeks than the Mangano and Sherman study. They looked at the US as a whole, while this study looked at 9 regions separately. Excess deaths for each region were not counted unless they passed a significance criterion at some point. Deaths for the South Atlantic region (which had received less radioactive deposition) declined, but were not counted. On the other hand, deaths in the Mid-Atlantic region increased, but also were not counted. There are significant differences in the aims of the two studies. Mangano and Sherman apparently desired to firmly establish a level of excess deaths in the US. This author was more interested in regions, and how the pattern of deaths was distributed and moving over time. Finally, this study includes all of 2011 after the Fukushima disaster, while Mangano and Sherman looked at 14 weeks.

Q: How confident are you in your estimate of 53,000 excess deaths in the US?

A: First of all, this is not the number that the author thinks have died in the US. It is what the author computed from the data of the Centers for Disease Control and Prevention when the precautionary principle was applied. Infant mortality is up in many cities, but is not significant for any region (though it may be when the whole country is studied). But the number of miscarriages, stillbirths and abortions is probably much higher. The rate of live births would have gone down, and therefore infant mortality would tend to be underrepresented. Unfortunately, there was no access to live birth data. If deaths of

unborn babies are counted, and the data problems mentioned above are considered, the actual number of excess deaths is probably 75,000 or higher.

Q: Do you plan to continue this analysis in 2012?

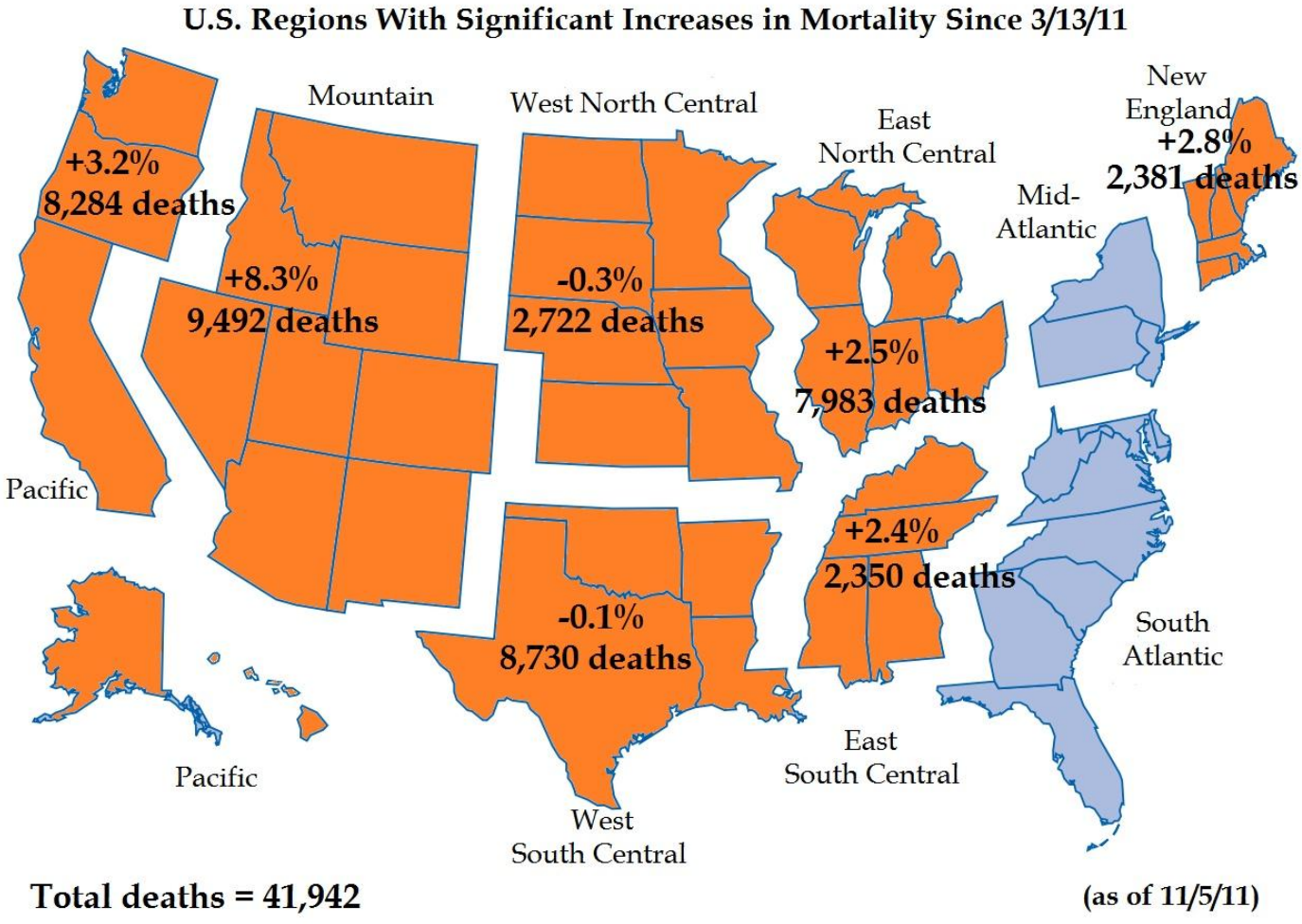
A: This study was launched months ago, when it was still thought that Fukushima had emitted roughly the same amount of radiation as Chernobyl. It was meant to be a short-term study, and that the spike in deaths would go away soon. Now it is obvious that it is much worse than Chernobyl, and the statistical techniques will have to be modified for a long-term tracking of mortality. There are no plans in the near future to perform these modifications.

POST-FUKUSHIMA EXCESS DEATHS IN U.S. UPDATED FOR NOVEMBER 5

By Bobby1

November 10, 2011

The latest week 44 mortality statistics (through November 5) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 41,942.



After a spike a few weeks ago in the East North Central and East South Central regions, these areas have returned to normal mortality rates recently.

The mortality rates in the West North Central and West South Central regions have dipped below 2010 levels, to the extent that it has made up for earlier increases. This indicates that radioactive releases in these regions hastened the death of people who were already sick. A substantial portion of the high number of deaths in the West South Central region seems likely to have resulted from the fires in Arizona, New Mexico, and Texas earlier this year. Smoke and runoff water containing radioactive materials contributed up to perhaps 5,000 deaths.

The Pacific and Mountain regions continue with a higher than normal mortality rate.

Infant mortality increase is significant in the Mountain region (+9.1%), and is high in the New England region (+13.5%), but the figure here has passed above the significance threshold.

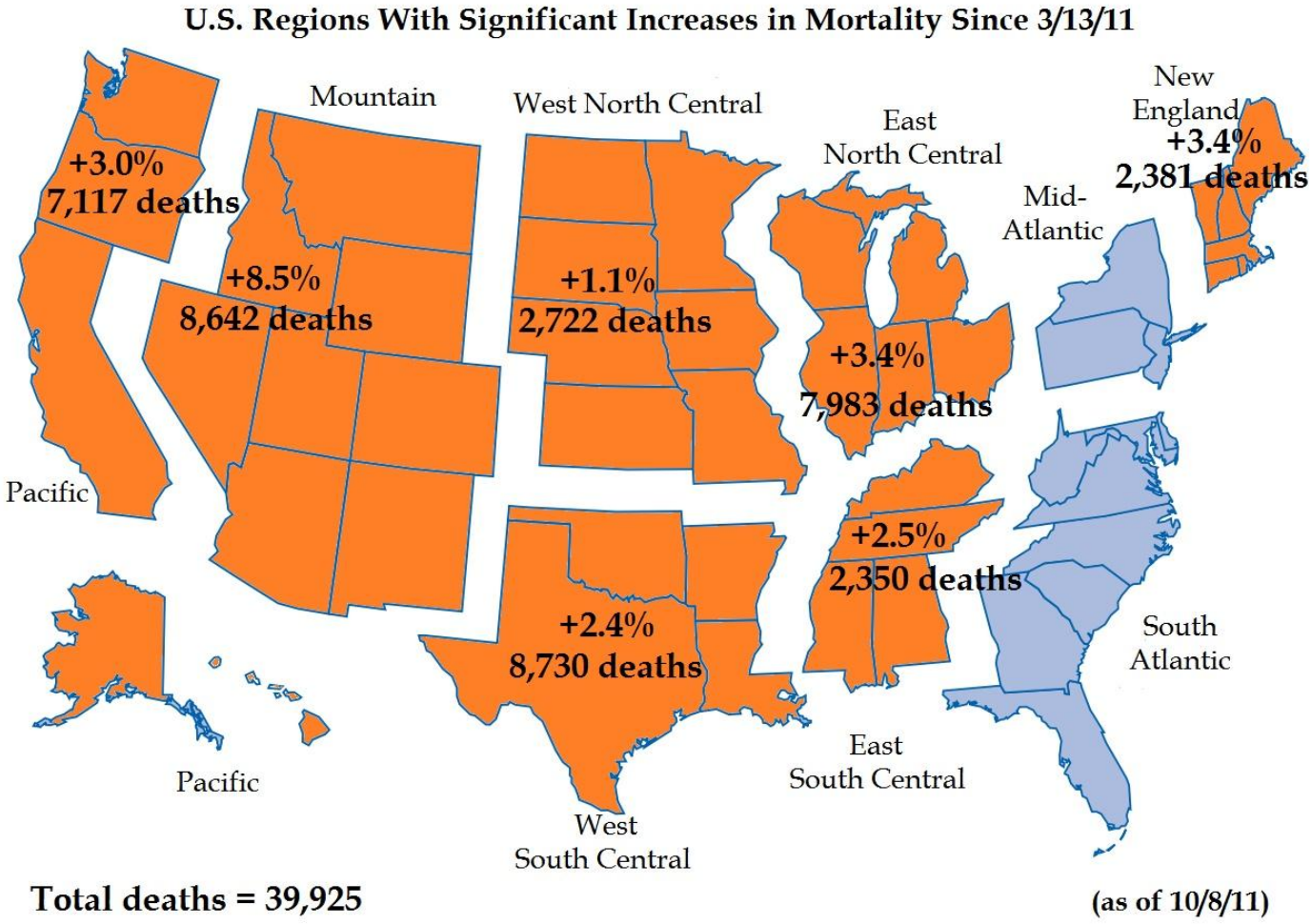
Increases in pneumonia and influenza deaths are significant in the Mountain region (+6.8%), the West North Central region (+12.9%), the East North Central region (+13.4%), and the New England region (+3.5%).

POST-FUKUSHIMA EXCESS DEATHS IN U.S. UPDATED FOR OCTOBER 8

By Bobby1

October 13, 2011

The latest week 40 mortality statistics (through October 8) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 39,925.



The East South Central region (Kentucky, Tennessee, Mississippi, Alabama) was found to have a significant mortality increase in week 39, and these deaths are now being counted.

In the past two-week period, more excess deaths have occurred east of the Mississippi River than west of it.

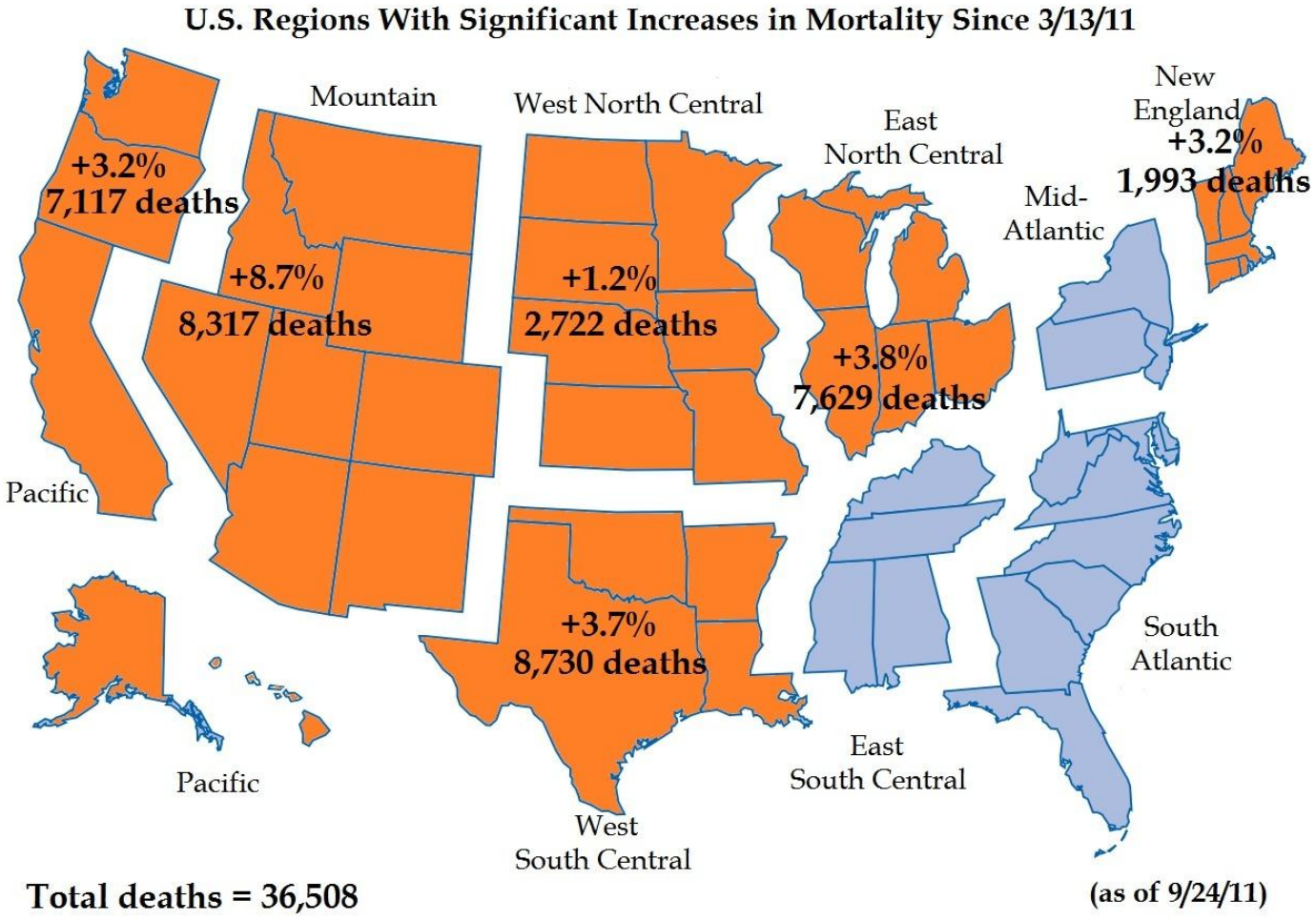
Infant mortality increase is now significant in the Mountain region (+8.8%), and the New England region (+18.6%).

POST-FUKUSHIMA EXCESS DEATHS IN U.S. UPDATED FOR SEPTEMBER 24

By Bobby1

September 30, 2011

The latest week 38 mortality statistics (through September 24) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 36,508.



After a moderate increase in the week 35 mortality rate, the Pacific region has dropped back to normal levels.

The West North Central and West South Central regions continue to drop back to normal levels.

The New England region mortality rate increased moderately (+5% to +10%) in week 36 and 37, and slightly in week 38.

The Mountain region increased slightly in weeks 37 and 38, after 7 consecutive double-digit weekly increases.

The East North Central region exhibited moderate increases in weeks 36 and 38 (+5.2% and +9.6%, respectively). This area (Wisconsin, Michigan, Illinois, Indiana, Ohio) currently has the fastest increasing death rate in the US.

The following table lists US cities with double-digit percentage increases in mortality since March 13.

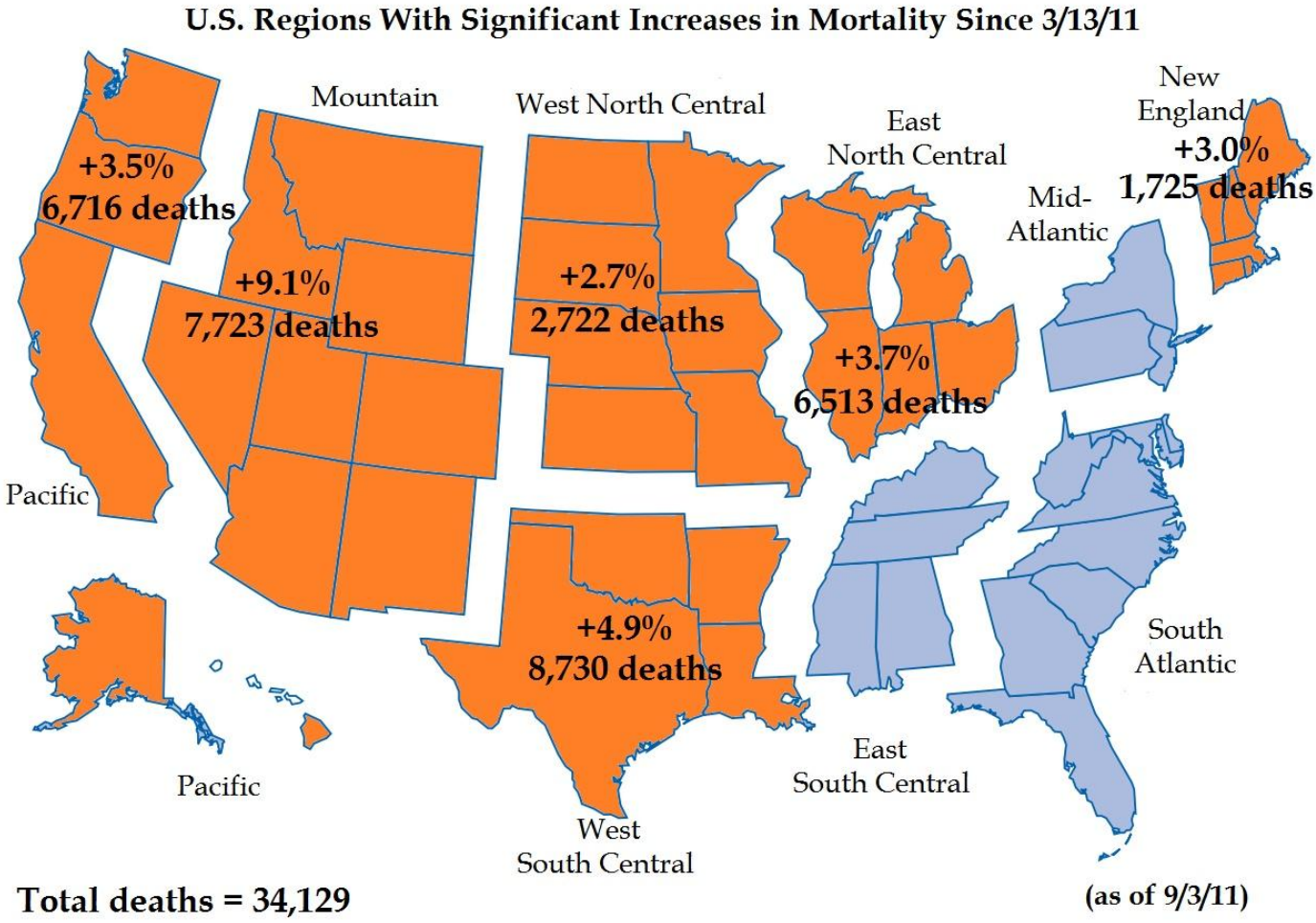
New Haven CT	34.0%
Paterson NJ	26.6%
South Bend IN	25.6%
Tucson AZ	23.7%
New Bedford MA	18.7%
Boise ID	18.6%
Lansing MI	17.0%
Waterbury CT	16.8%
Detroit MI	15.4%
Syracuse NY	14.3%
Little Rock AR	13.4%
Berkeley CA	13.2%
Atlanta GA	11.3%
Charlotte NC	11.2%
Peoria IL	11.0%
Ogden UT	10.9%
Grand Rapids MI	10.9%
St. Paul MN	10.3%
Columbus OH	10.3%

POST-FUKUSHIMA EXCESS DEATHS IN U.S. UPDATED FOR SEPTEMBER 3

By Bobby1

September 8, 2011

The latest week 35 mortality statistics (through September 3) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 34,129.



There has been a change in the percentage increase in deaths for the map above. The percentages now reflect the time from the Fukushima disaster to the current week. This does not affect the mortality calculation.

A moderate increase (+9.4%) in mortality occurred in week 35 for the Pacific region (compared to 2010), along with a slight increase (+2.0%) last week.

A sharp increase (+12.4%) occurred in the Mountain region (along with +21.1% last week). This is the sixth consecutive double-digit increase for this region.

A sharp decrease (-20.2%) was seen in the West South Central region, and very slight changes (-0.2%, +0.1%, +1.8%) occurred in the West North Central, East North Central, and New England regions, respectively.

Overall, for the period August 21 – September 3, mortality in the USA has returned to 2010 levels, except for the Pacific and especially Mountain regions, where deaths continue to climb.

The following table breaks down total excess deaths by month.

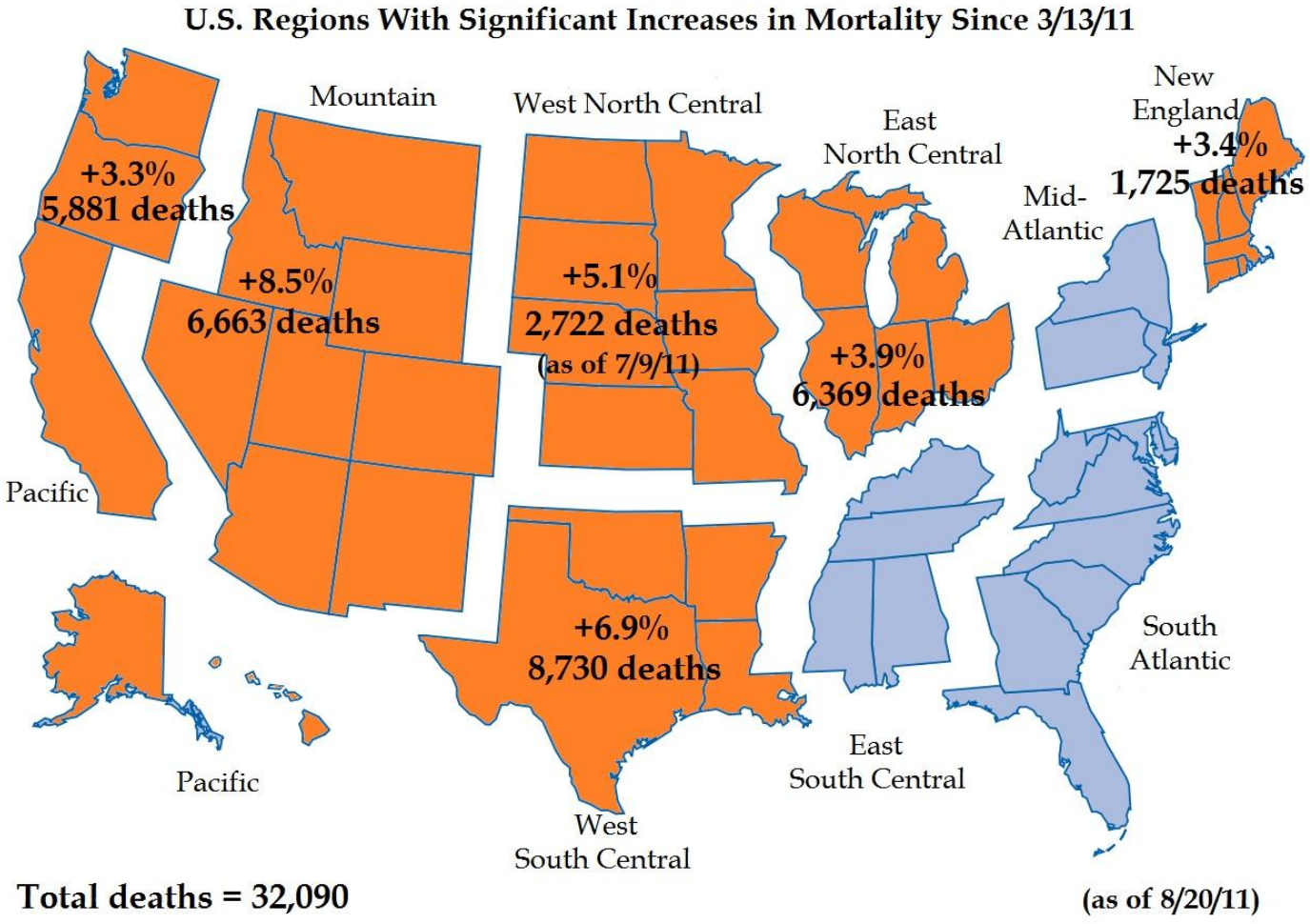
Month	Excess Deaths
March	3,201
April	4,304
May	10,441
June	4,958
July	5,449
August	5,332

POST-FUKUSHIMA EXCESS DEATHS IN U.S. UPDATED FOR AUGUST 20

By Bobby1

August 26, 2011

The latest week 33 mortality statistics (through August 20) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 32,090.



Slight increases in deaths, compared to 2010, were observed in the Pacific region (+3.5%) and the New England region (+3.3%).

Sharp increases in deaths were seen in the Mountain region (+14.8%) and the West South Central region (+10.2%).

A moderate increase (+8.9%) was observed in the East North Central region.

A moderate decrease (-5.2%) was observed in the West North Central region.

The following table indicates significant increases in deaths by region and age group, as of August 20.

Regions	Age Groups				
	Elderly > 65	**45-64**	**25-44**	**1-24**	**Infants < 1**
Pacific	3.6%	4.2%			
Mountain	8.0%	11.2%			
West North Central*	5.7%	1.2%			
West South Central	6.1%	5.4%	18.7%		
East North Central	4.1%	4.8%			
New England	2.6%				

* - as of 7/9/11

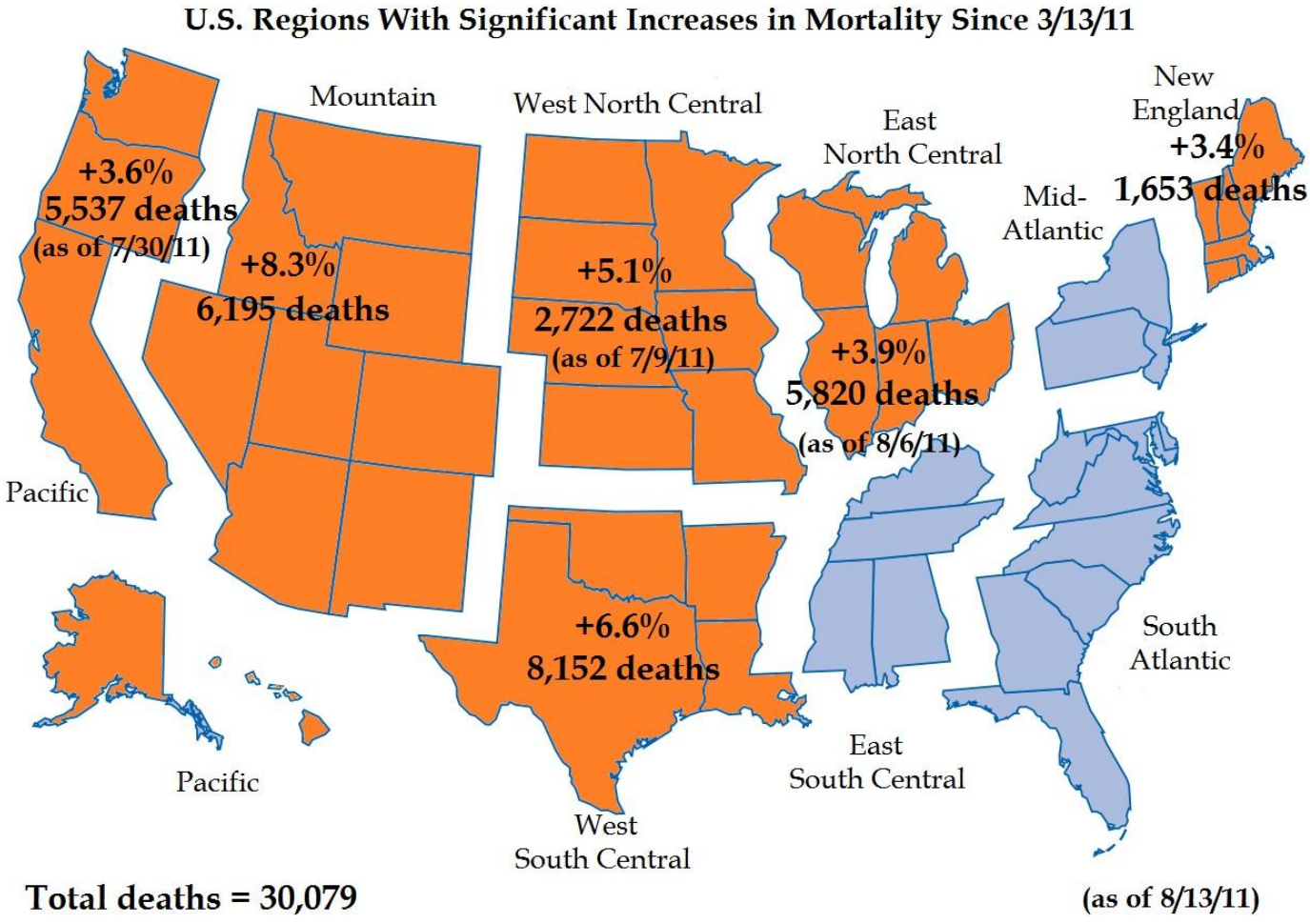
Previous updates continue below.

POST-FUKUSHIMA EXCESS DEATHS IN U.S. NOW EXCEED 30,000

By Bobby1

August 19, 2011

The latest week 32 mortality statistics (through August 13) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 30,079.



Sharp increases in deaths for week 32, compared to 2010, were observed in the Mountain (+23.5%), West North Central (+12.2%), and New England (+14.0%) regions.

A moderate increase was seen in the West South Central region (+6.6%).

Slight decreases were observed in the Pacific (-3.2%) and East North Central (-0.8%) regions.

The following table compares the excess death estimates obtained from week 27 through week 32.

Week	Excess Deaths
27	21,385
28	23,542
29	24,937
30	27,752
31	28,797
32	30,079

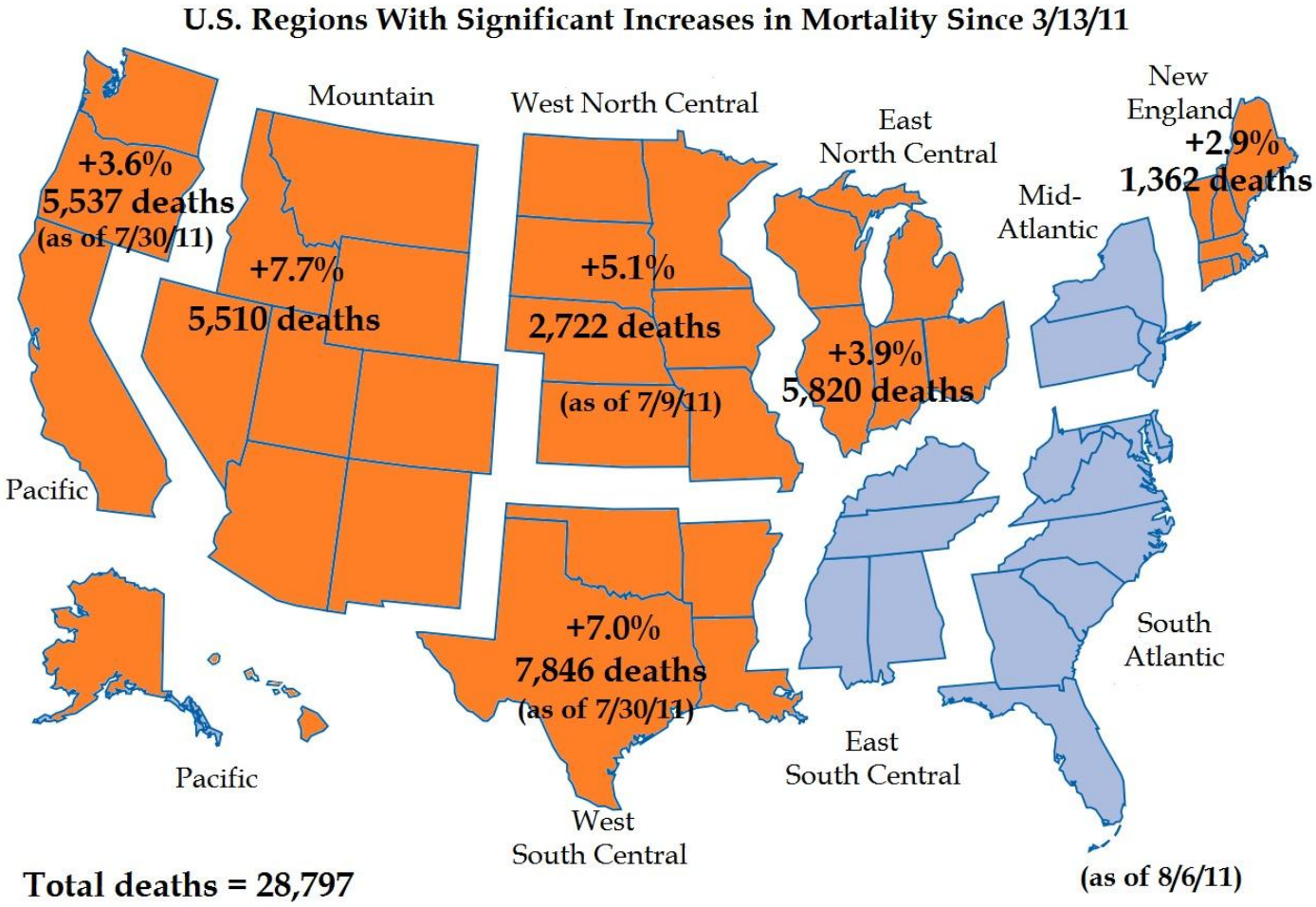
Previous updates continue below.

POST-FUKUSHIMA EXCESS DEATHS IN U.S. UPDATED FOR AUGUST 6

By Bobby1

August 11, 2011

The latest week 31 mortality statistics (through August 6) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 28,797.



The Pacific region has seen a slight decrease in the excess death rate (compared to the same period in 2010) for week 31 (-2.0%).

The Mountain region has seen a sharp increase in number of deaths for week 31 (+13.3%).

The West North Central region has seen a slight decrease for week 31 (-2.6%).

The West South Central region has seen a slight decrease for week 31 (-1.2%) after a huge increase last week.

The East North Central region has seen a moderate increase for week 31 (+8.6%).

The New England region has seen a slight increase for week 31 (+2.3%).

The following table displays cities with sharp (double-digit) increases in deaths over this period.

City	Increase	As of date
New Haven CT	40.1%	8/6
South Bend IN	25.0%	8/6
Houston TX	22.6%	7/30
Boise ID	21.9%	8/6
Berkeley CA	21.6%	7/30
New Bedford MA	20.6%	8/6
Lansing MI	19.7%	8/6
Detroit MI	18.3%	8/6
El Paso TX	16.0%	7/30
Rockford IL	14.7%	8/6
Lincoln NE	14.4%	7/9
Grand Rapids MI	13.9%	8/6
Ogden UT	13.8%	8/6
Peoria IL	12.5%	8/6
Omaha NE	12.1%	7/9
Shreveport LA	11.4%	7/30
Portland OR	10.8%	7/30
Denver CO	10.5%	8/6
Tucson AZ	10.2%	8/6

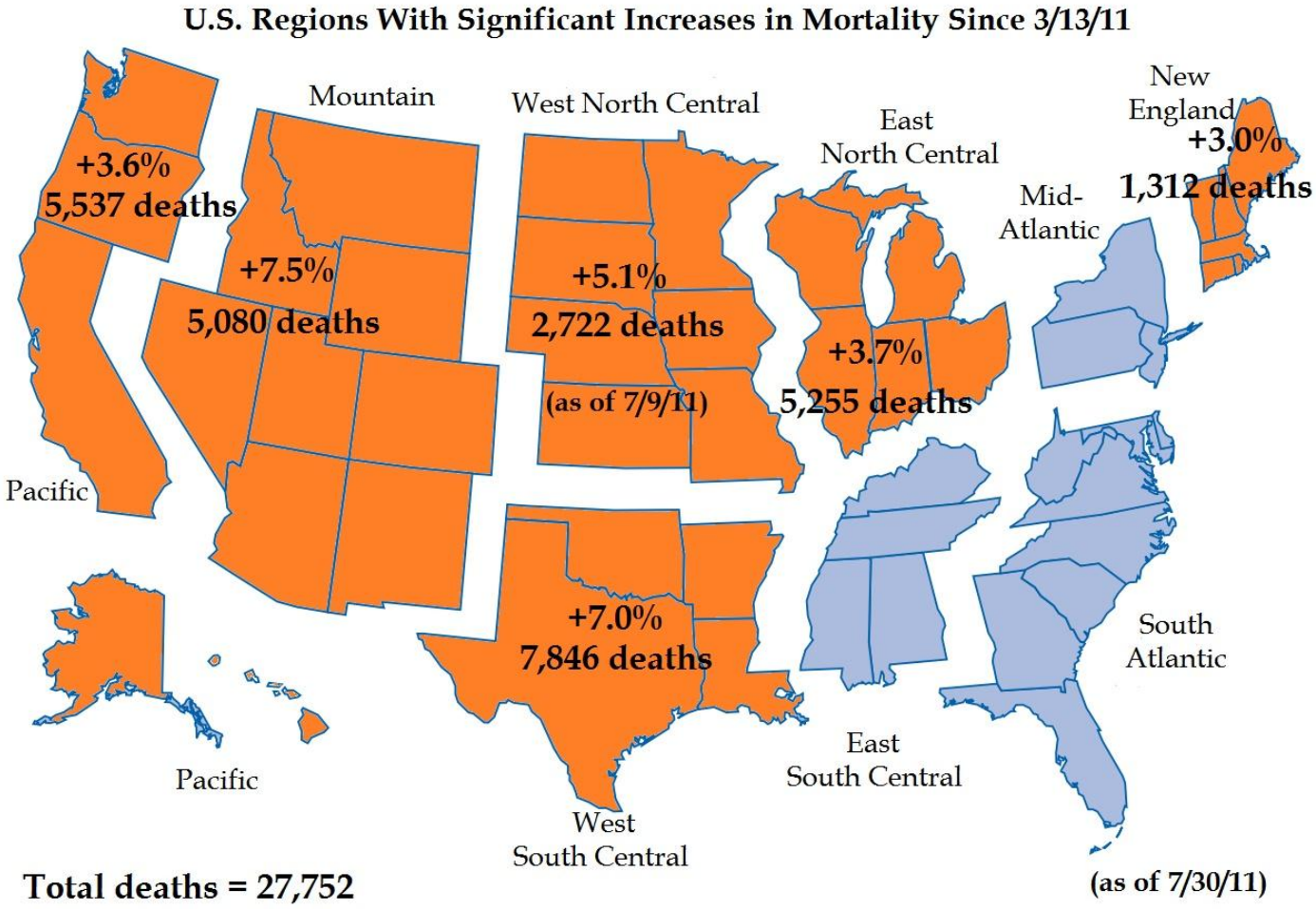
Previous updates continue below.

EXCESS DEATHS IN U.S. UPDATED FOR JULY 30

By Bobby1

August 4, 2011

The latest week 30 mortality statistics (through July 30) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 27,752.



The Pacific region has seen a moderate increase in the excess death rate for week 30 (+7.6% compared to the same period in 2010). The mortality rate is accelerating here again.

The Mountain region has seen a sharp increase in excess deaths for week 30 (+14% compared to the same period in 2010). The mortality rate is accelerating here again.

The West North Central region has seen a slight increase for week 30 (+3%). It remains beneath the level of significance it achieved in week 27, though.

The West South Central region has seen a sharp increase for week 30 (+29.4%). The mortality rate is accelerating here again.

The East North Central region has seen a slight increase for week 30 (+1.3%). It has dropped for three weeks in a row but remains above 2010 levels.

The New England region has seen a moderate increase for week 30 (+7%). It has dropped compared to week 29 but remains above 2010 levels.

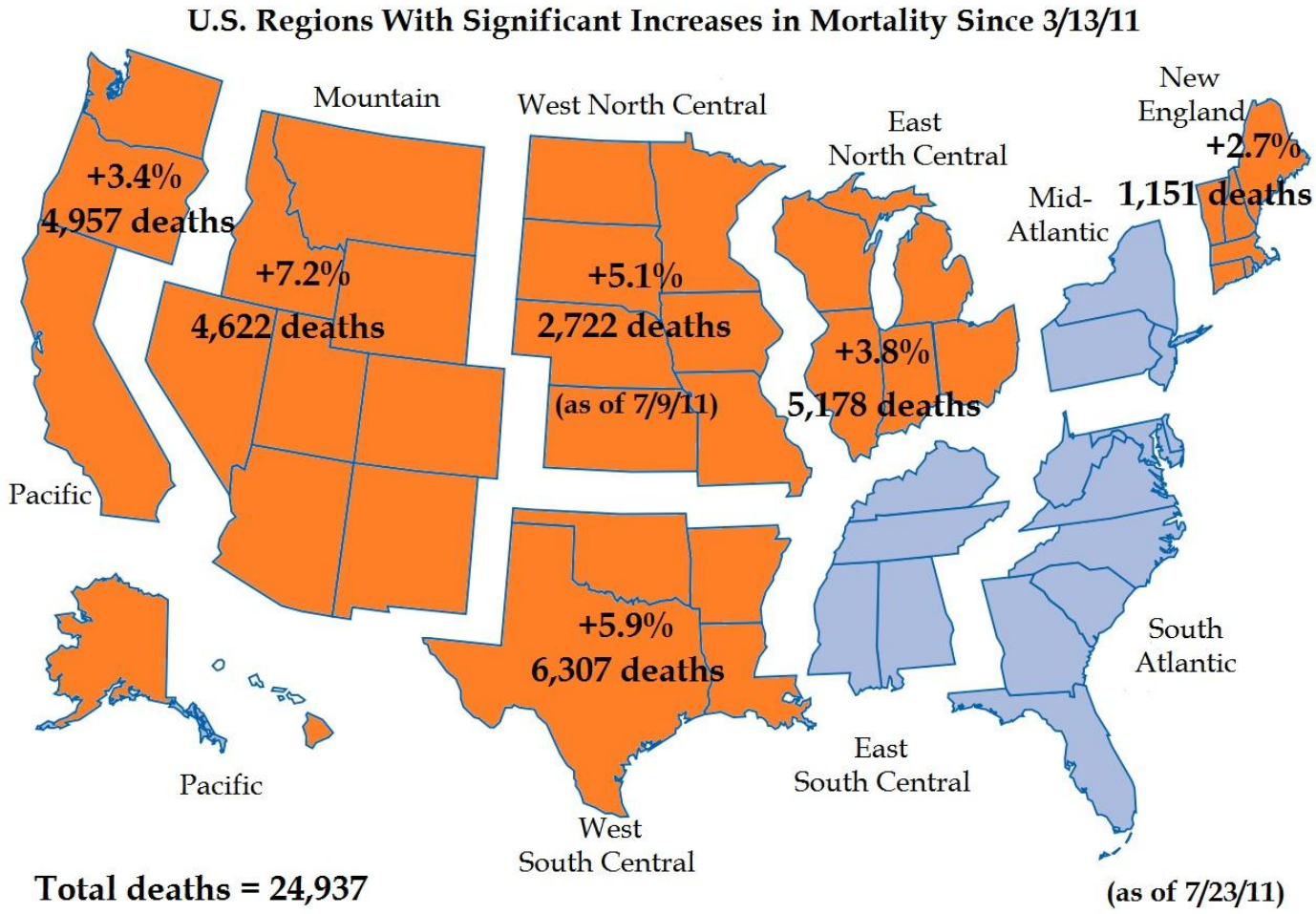
Previous updates continue below.

POST-FUKUSHIMA EXCESS DEATHS IN U.S. NEARS 25,000

By Bobby1

July 29, 2011

The latest week 29 mortality statistics (through July 23) issued by the Centers for Disease Control and Prevention now indicate that the number of excess deaths in the U.S. since the Fukushima nuclear power plant disaster now stands at 24,937.



The mortality rate in the West North Central region has returned to normal.

The mortality rate in the Pacific, Mountain, and East North Central regions is still above the adjusted 2010 norm, but is dropping.

The mortality rate in the West South Central and New England regions continues to accelerate.

The Las Conchas fire in New Mexico which has burned areas previously contaminated with radioactive substances, and caused large smoke plumes, now makes it impossible to attribute all U.S. excess deaths to Fukushima.

The previous article, based on deaths through week 27 (July 9), is attached below.

Fukushima Death Toll in the U.S. Surpasses 21,000

By Bobby1

The nuclear power plant disaster at Fukushima following the Great Tohuku Earthquake and tsunami in Japan has led to widespread radioactive contamination of Japan's air, water, soil, and food, and a large area of Japan has been evacuated. The radionuclides that have been released into the atmosphere have spread across the northern hemisphere due to prevailing westerly winds at mid- and upper levels. In a previous article[1], the author analyzed the elevated levels of beta radiation in the United States following the disaster. In this study, the mortality in the U.S. resulting from this contamination is investigated.

As of July 9, 2011, the total number of deaths in the U.S. from Fukushima radioactive contamination is estimated to be **21,385**.

METHODS Data were collected from the Morbidity and Mortality Weekly Report, which is published online from the Centers for Disease Control and Prevention (CDC)[2]. Weekly data from 115 cities was obtained for weeks 11 to 27 in year 2011 (weeks ending March 19 to July 9), and for the same numbered weeks in 2010.

The idea is very simple: Compare the number of deaths in those 17 weeks in 2011 with the same 17 weeks in 2010. Any excess increase of deaths (corrected for population growth only) were considered to be due to Fukushima.

The CDC divides the nation into 9 surveillance regions (see Table 1 and Figure 1). In each of these regions, the increase in mortality was computed. Using the 2009 death rate[3], the 2010 U.S. census data[4] and the estimated annual growth in population from 2010 to 2011[5] , the increases were scaled for the population of each region, and counts of total deaths were obtained (see Table 1). Only regions with a significant increase in deaths were counted.

In order to obtain the statistical results, the test PTMP (Permutation Tests for Matched Pairs) was employed[6]. This routine is available from the software package Blossom[7]. In order to obtain the aggregated statistical results for each region, and for all regions, the data for each city were standardized to zero mean and unit variance beforehand.

In obtaining rates and death counts, missing data was replaced by the average for the time period for the corresponding year. For the statistical analyses, both observations were dropped if either or both of the paired data were missing. Some cities were dropped (such a Phoenix AZ and St. Louis MO) due to too many missing data, and when partial counts for that city were indicated.

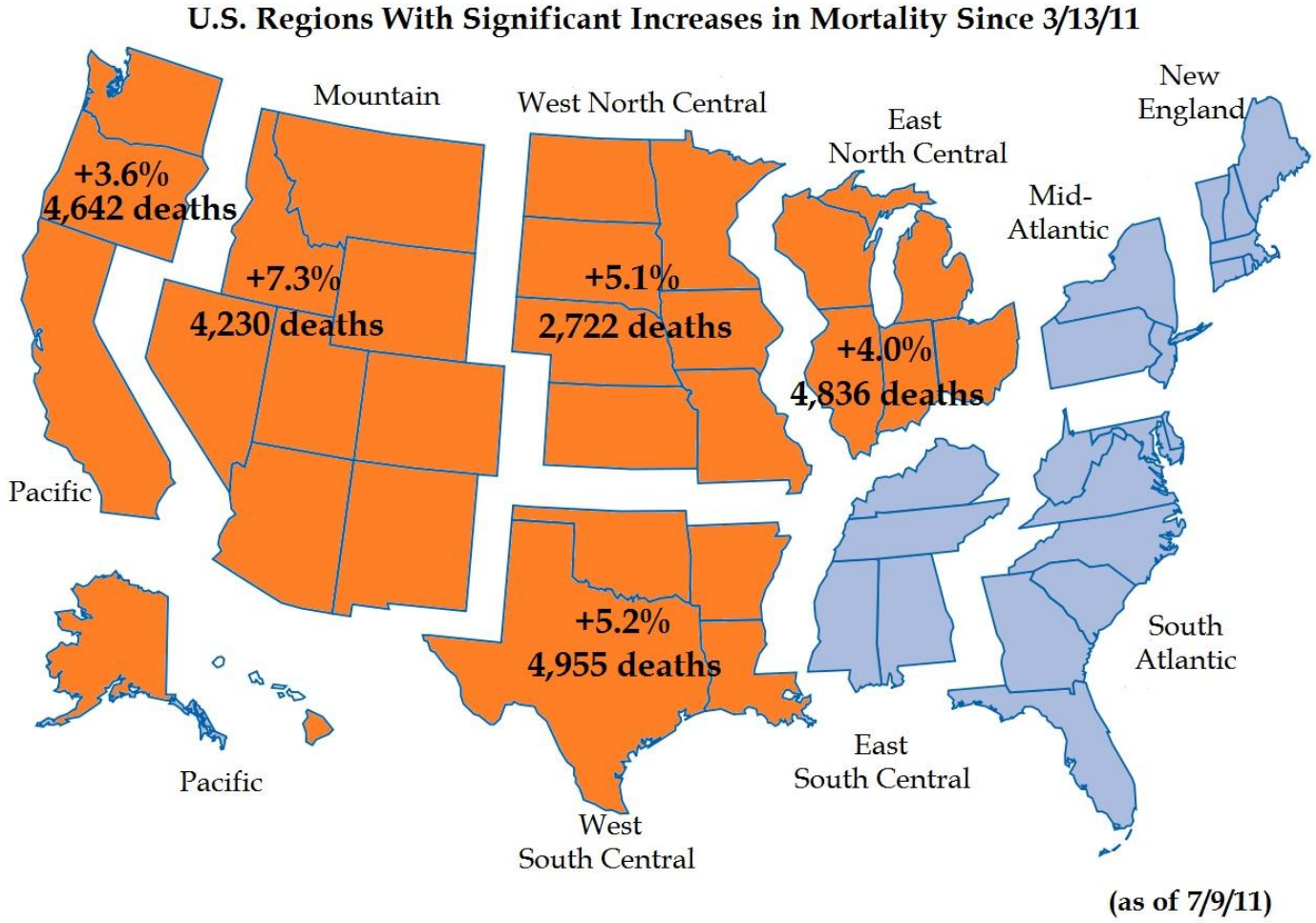
Table 1. Increase in mortality for the 17 weeks, total deaths, and significance levels for each region which had a significant increase.

Region	N	$p <$	Mortality Increase	Total Deaths
Pacific	526	.002	3.6%	4,642
Mountain	304	.001	7.3%	4,230
West North Central	274	.058	5.1%	2,722
West South Central	328	.010	5.2%	4,955
East North Central	676	.001	4.0%	4,836
All 5 Regions	2108	**.001**	**4.7%**	**21,385**

Table 2. Increase in deaths by region and age group.

Regions	Age Groups				
	Elderly > 65	45-64	25-44	1-24	Infants < 1
Pacific	4.0%				
Mountain	6.3%	10.4%			
West North Central	5.7%	1.2%			
West South Central	5.1%		15.5%		
East North Central	3.4%	7.3%			

Figure 1. Percent increase in mortality and number of deaths for each significant region (indicated by color).



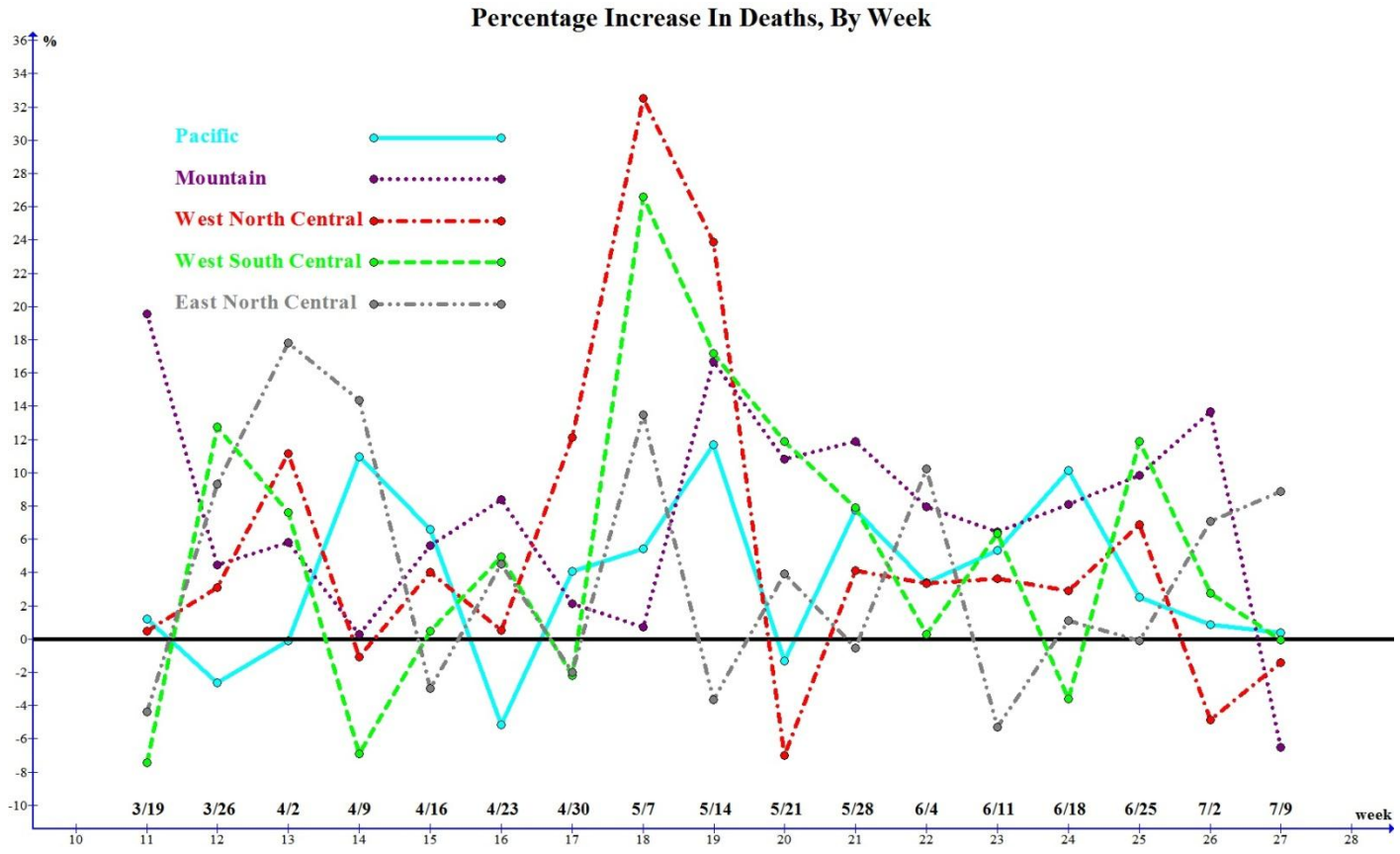
RESULTS Significant increases in mortality were found in the Pacific, Mountain, West North Central, West South Central, and East North Central regions. Note that the westerly regions of the U.S. had significant increases in mortality, while the east coast areas did not. This is consistent with the existence of higher concentrations of airborne radionuclides in areas closer to the destroyed nuclear power plant in Japan.

The other regions, East South Central, Mid-Atlantic, New England, and South Atlantic were tested with *p*-values of .467, .800, .210, and 1.0, respectively. All except the South Atlantic

region also had increases in mortality. If these four regions had been counted, it would have added 7,879 additional deaths to the estimate here.

Figure 2 shows a spike in deaths at May 7 and May 14 for every region. Most of the rates are above the zero line.

Figure 2. Percentage increase in mortality by week, for each region.



The cities which constitute each region with a significant increase in deaths are indicated in Table 3. Mortality increases by city and age group are found in Table 4. These results are not corrected for population growth. Some of the base rates from 2010 are very small. This should be kept in mind if a large percentage increase is seen in some category.

Table 3. Cities making up each significant region.

Region				
Pacific	**Mountain**	**West North Central**	**West South Central**	**East North Central**
Berkeley CA	Albuquerque NM	Des Moines IA	Austin TX	Akron OH
Fresno CA	Boise ID	Duluth MN	Baton Rouge LA	Canton OH
Glendale CA	Colorado Springs CO	Kansas City KS	Corpus Christi TX	Chicago IL
Honolulu HI	Denver CO	Kansas City MO	Dallas TX	Cincinnati OH
Long Beach CA	Las Vegas NV	Lincoln NE	El Paso TX	Cleveland OH
Los Angeles CA	Ogden UT	Minneapolis MN	Houston TX	Columbus OH
Pasadena CA	Pueblo CO	Omaha NE	Little Rock AR	Dayton OH
Portland OR	Salt Lake City UT	St. Paul MN	San Antonio TX	Detroit MI
Sacramento CA	Tucson AZ	Wichita KS	Shreveport LA	Evansville IN
San Diego CA			Tulsa OK	Fort Wayne IN
San Francisco CA				Gary IN
San Jose CA				Grand Rapids MI
Santa Cruz CA				Indianapolis IN
Seattle WA				Lansing MI
Spokane WA				Milwaukee WI
Tacoma WA				Peoria IL
				Rockford IL
				South Bend IN
				Toledo OH
				Youngstown OH

Table 4. Increases in death rate by city. An entry denotes a significant result.

	Age Groups					
City	**All Ages**	**Elderly > 65**	**45-64**	**25-44**	**1-24**	**Infants < 1**
Berkeley CA	24.6%		74.2%			
Fresno CA				19.3%		
Los Angeles CA	6.2%	7.8%				
Sacramento CA			9.5%			
San Francisco CA		6.4%				
San Jose CA					29.2%	
Seattle WA	5.4%	11.3%				
Boise ID	24.6%	26.5%				
Denver CO	11.8%	8.9%		32.9%	63.6%	
Las Vegas NV	9.1%	7.2%	10.9%			
Ogden UT			74.7%			
Salt Lake City UT			10.3%			
Tucson AZ				14.3%		
Duluth MN				126.7%		
Lincoln NE	14.4%	13.7%				
Minneapolis MN		13.9%				
Omaha NE	12.1%	13.9%				
Wichita KS			16.1%			
El Paso TX			19.0%			
Houston TX	16.2%			122.2%	137.8%	
Little Rock AR		15.9%				
Cleveland OH			13.3%			
Detroit MI	27.1%		27.3%	38.1%		52.9%
Grand Rapids MI	13.1%	12.3%				
Lansing MI	23.0%		83.8%			*
Peoria IL	19.2%		44.6%	86.8%		
Rockford IL	15.2%	12.4%				
South Bend IN	28.3%	26.0%	38.5%		100.0%	
Toledo OH			16.5%			

* - 10 infant deaths in 2011 period vs. 0 in 2010 period.

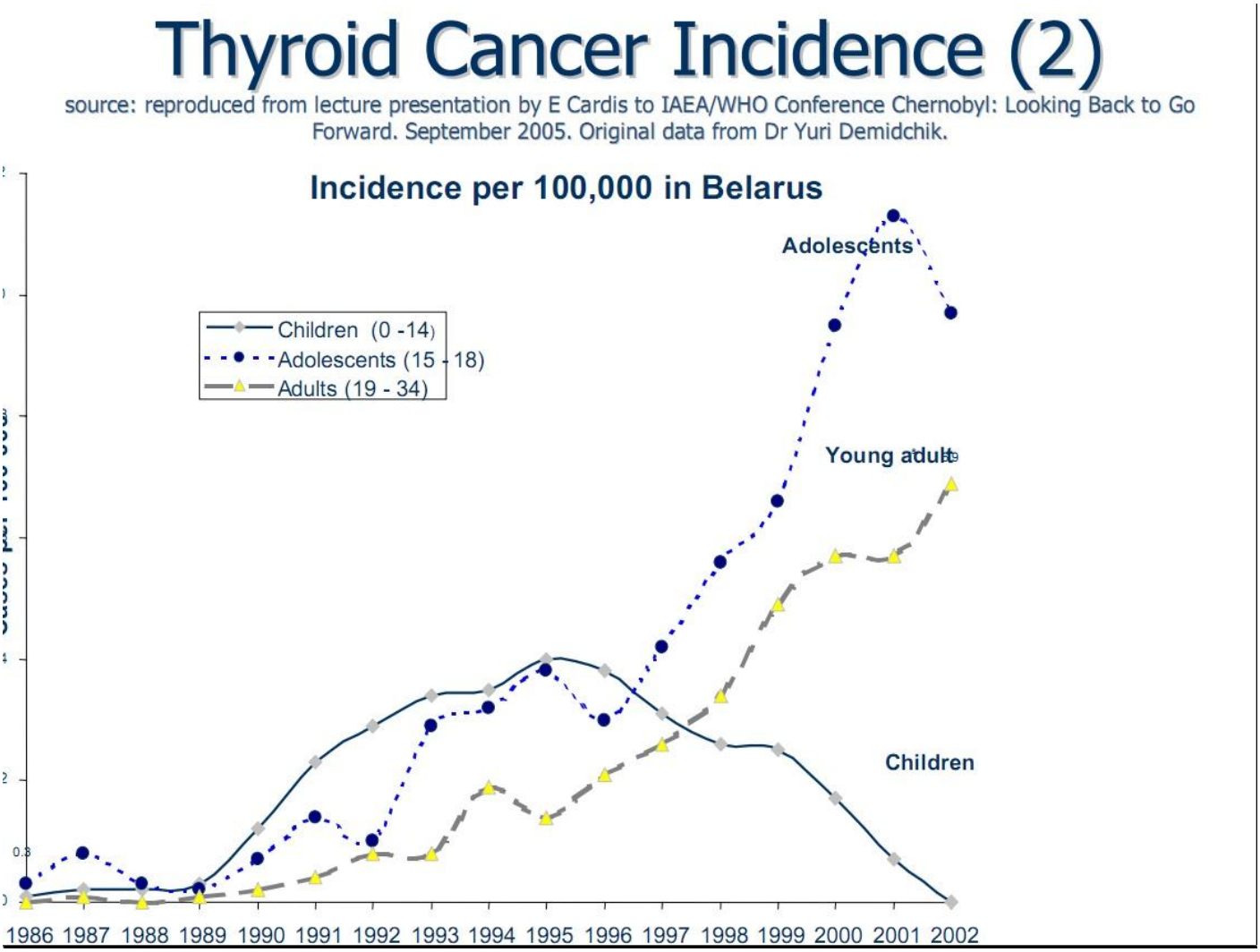
THE FUTURE If the current increase in the mortality rate continues at its current pace, well over one million deaths will occur by the year 2031. Table 5 summarizes the cumulative deaths in the U.S. for selected time periods.

Table 5. Cumulative deaths in the U.S. for future years assuming current death rate.

Year	Cumulative Deaths
2012	65,592
2016	327,960
2021	655,920
2031	1,311,840

Of course, the health effects of radiation exposure usually do not appear until 5-20 years after the exposure, and the death rate may increase dramatically in coming years. Figure 3 displays the incidence of thyroid cancer per year in Belarus following the Chernobyl disaster in 1986. The current data analyzed here corresponds to one-third of the way between 1986 and 1987.

Figure 3. Thyroid cancer incidence in Belarus following the Chernobyl disaster. (Reproduced from I. Fairlie, "Health effects from Chernobyl."[8])



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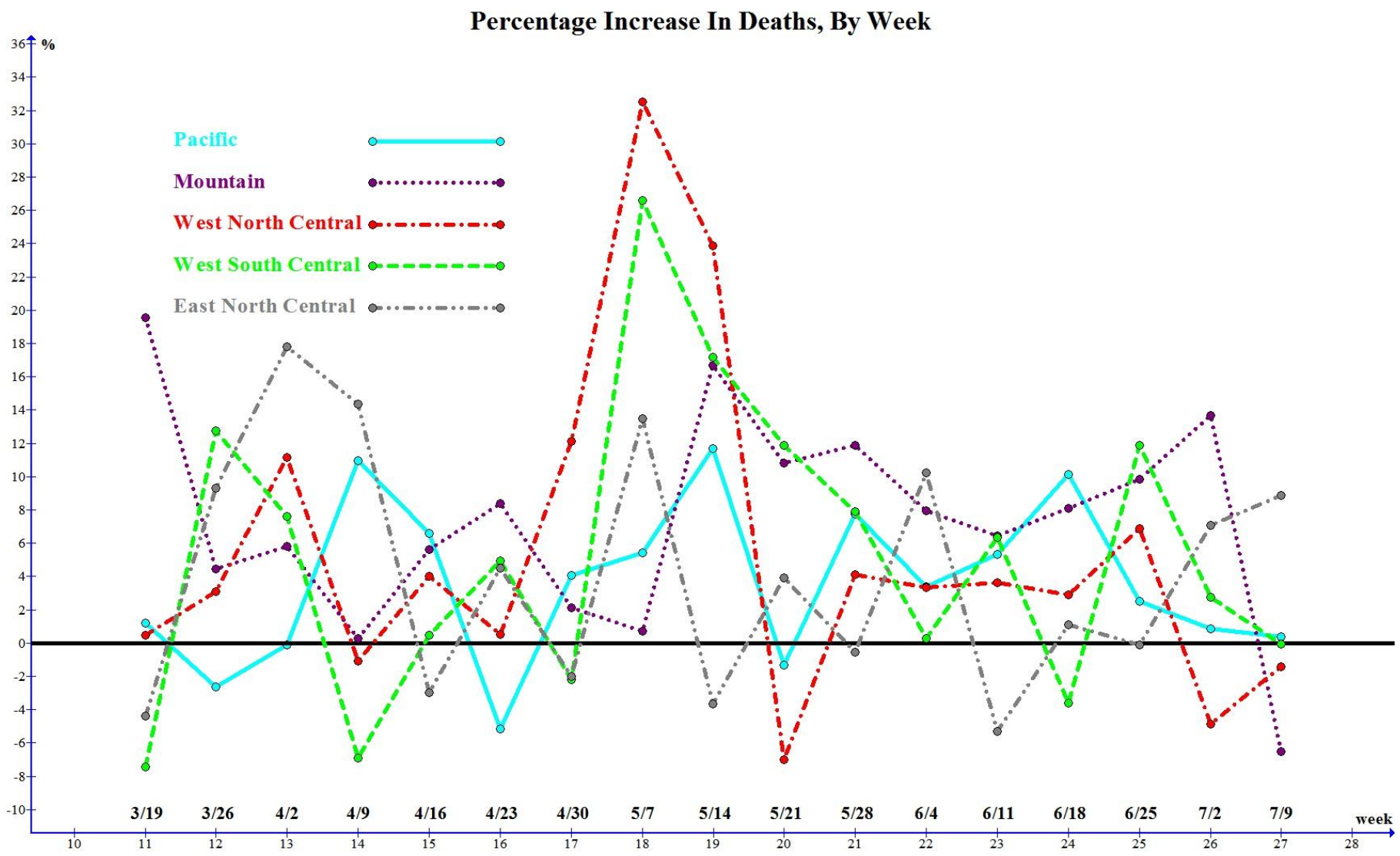
4. http://quickfacts.census.gov/qfd/index.html

5. http://www.msnbc.msn.com/id/40764172/ns/us_news-life/t/population-growth-slowest-census-shows/
6. This study uses a statistical significance threshold of $p < .10$. Fukushima radiation should either increase the number of deaths, or not. No one would expect it to reduce deaths. So a one-sided analysis was desired, but PTMP is a two-sided test. For the two-sided PTMP test, the significance level of $p < .10$ corresponds to a one-sided level of $p < .05$. We are interested in the practical and social significance of the results, the social and policy implications of these findings in the early stages of a public health crisis. The term "significance" rather than "statistical significance" will henceforth be used.
7. http://www.fort.usgs.gov/products/software/blossom/
8. http://www.**chernobylc**ongress.org/fileadmin/user_upload/pdfs/fairlie.pdf


Percentage Increase In Deaths, By Week
%
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
Pacific
Mountain
West North Central
West South Central
East North Central
3/19
3/26
4/2
4/9
4/16
4/23
4/30
5/7
5/14
5/21
5/28
6/4
6/11
6/18
6/25
7/2
7/9
week
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28