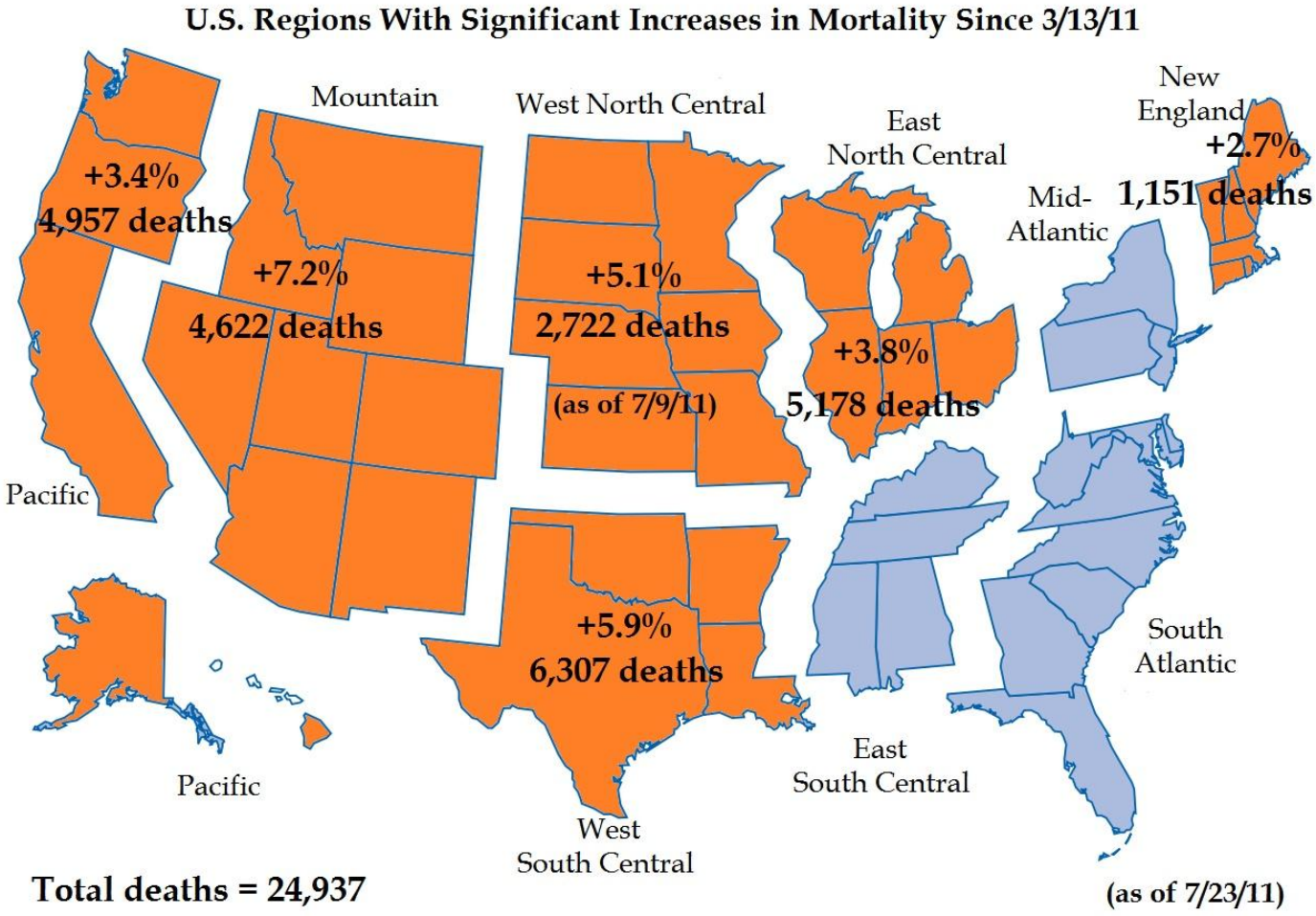
POST-FUKUSHIMA EXCESS DEATHS IN U.S. NEARS 25,000

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.

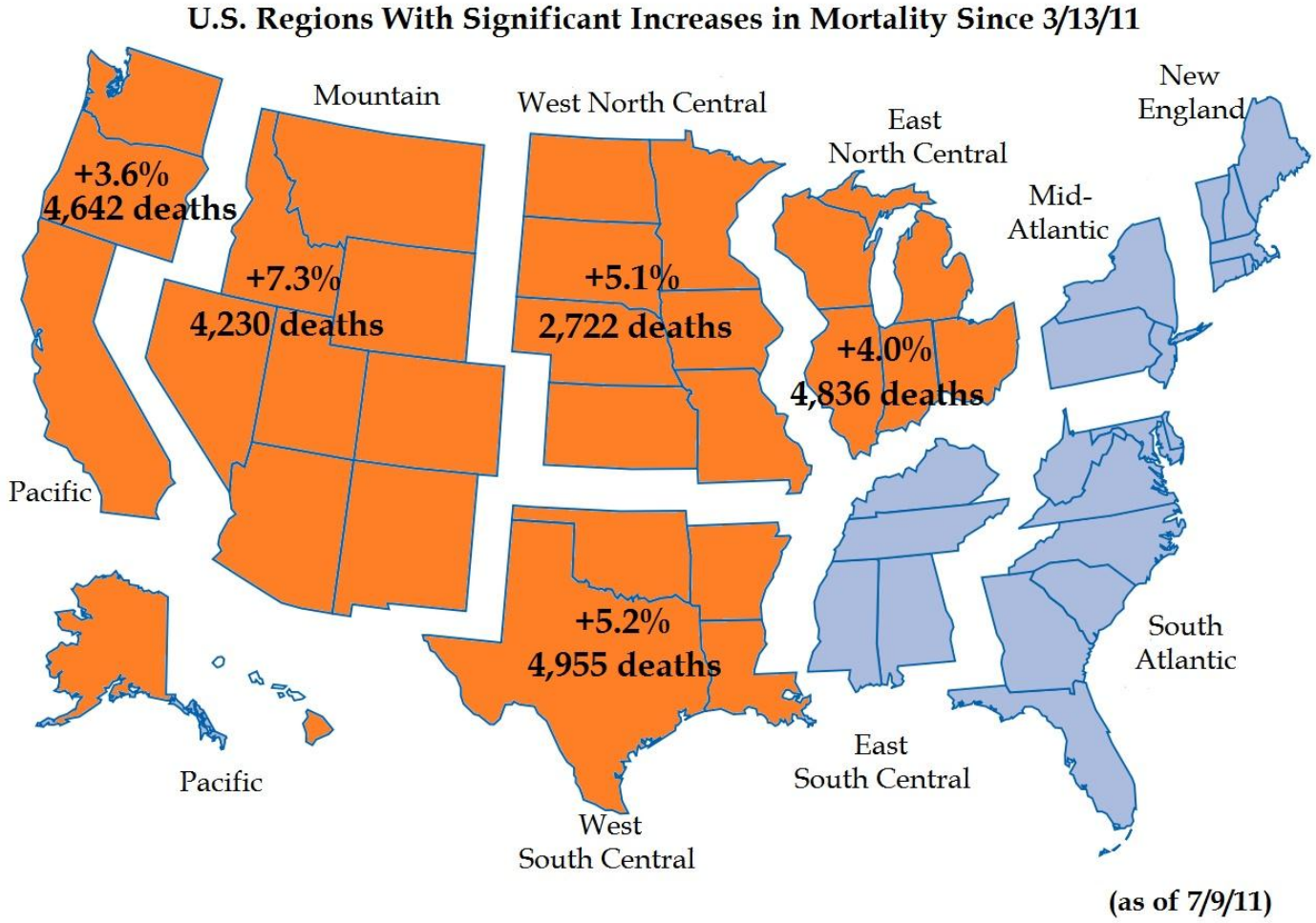
Table 1. Increase in mortality for the 17 weeks, total deaths, and significance levels for each region which had a significant increase.

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).



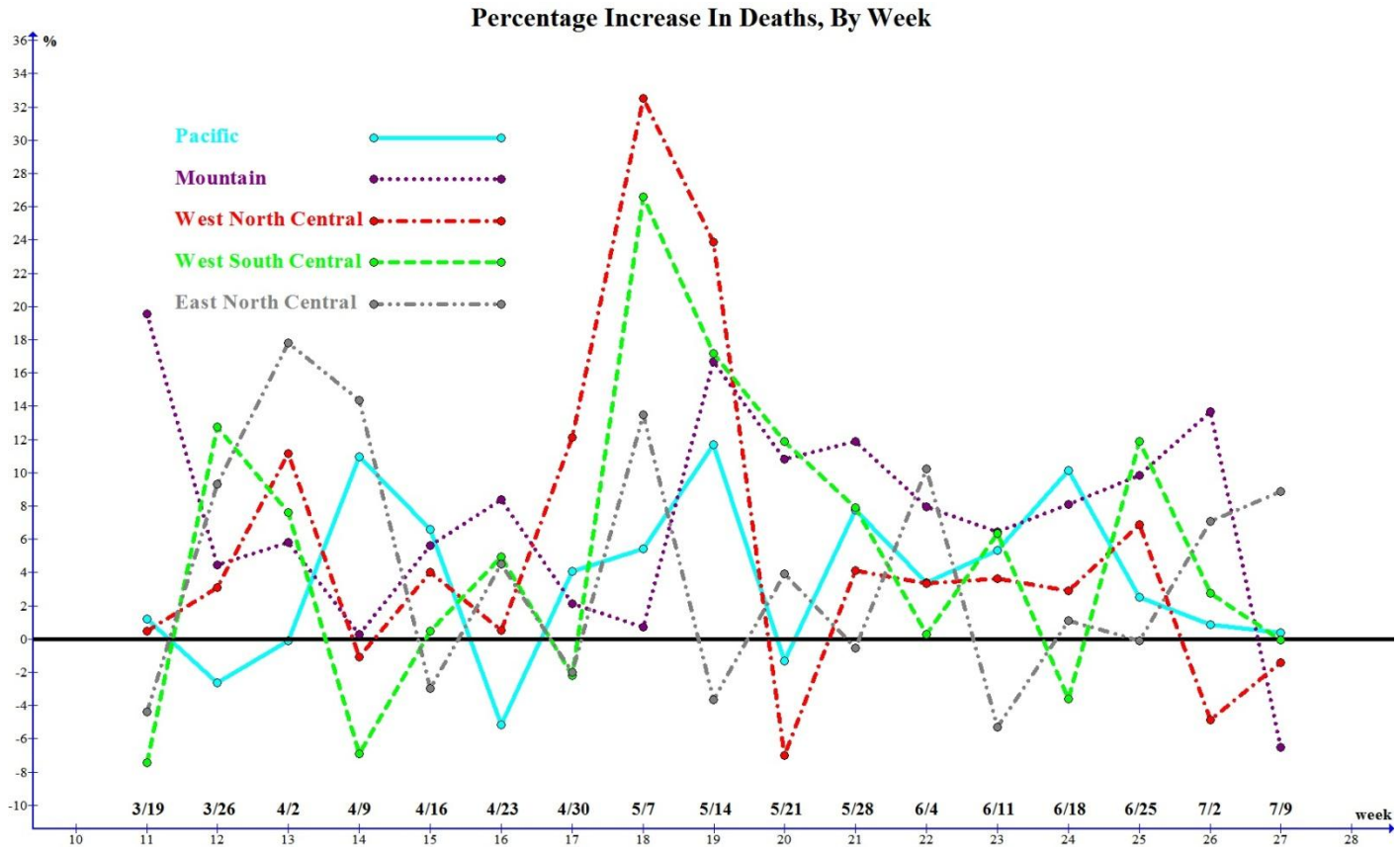
RESULTS Significant increases in mortality were found in the Pacific, Mountain, West North Central, West South Central, and East North Central regions. Note that the westerly regions of the U.S. had significant increases in mortality, while the east coast areas did not. This is consistent with the existence 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.

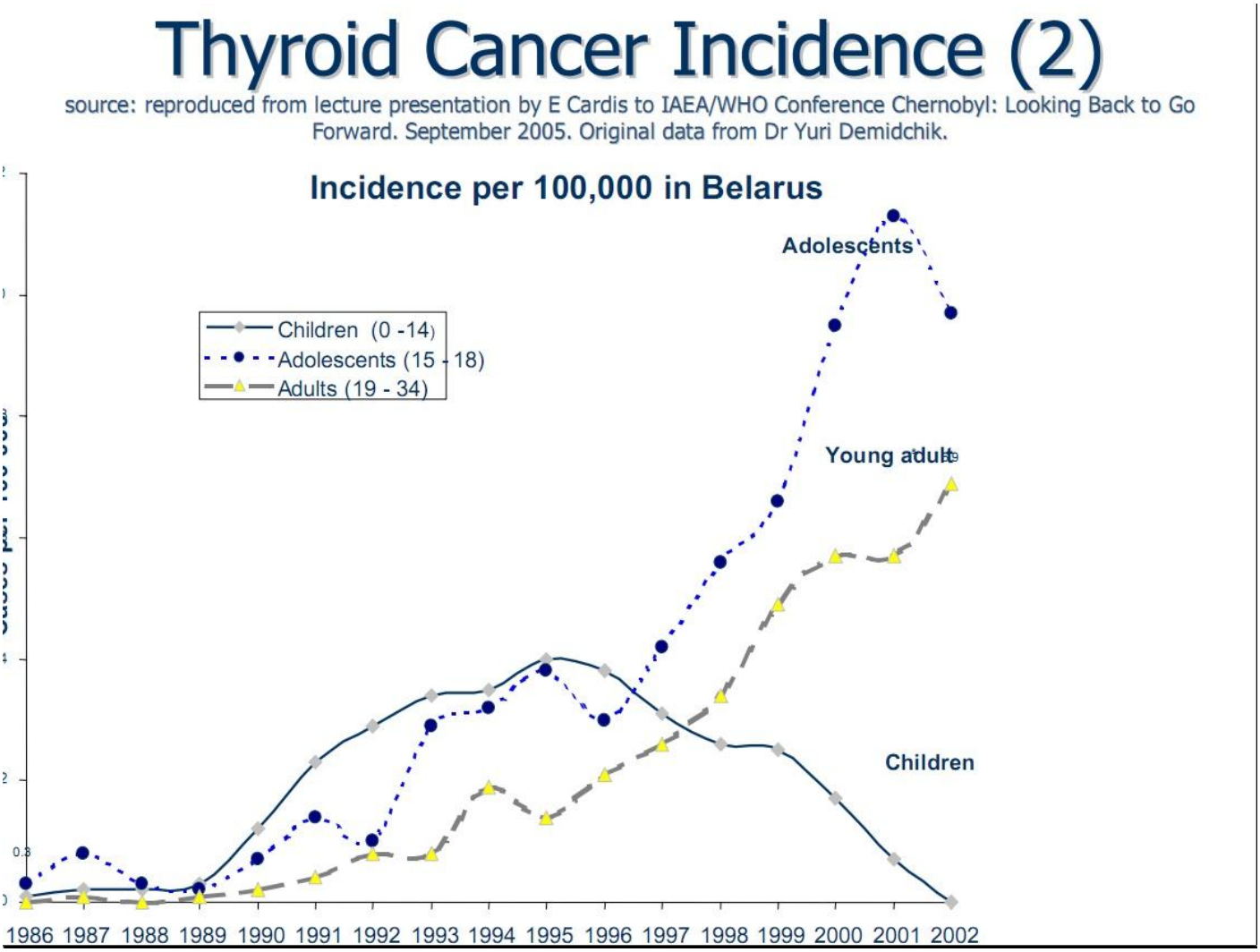
THE FUTURE If the current increase in the mortality rate continues at its current pace, well over one million deaths will occur by the year 2031. Table 5 summarizes the cumulative deaths in the U.S. for selected time periods.

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.

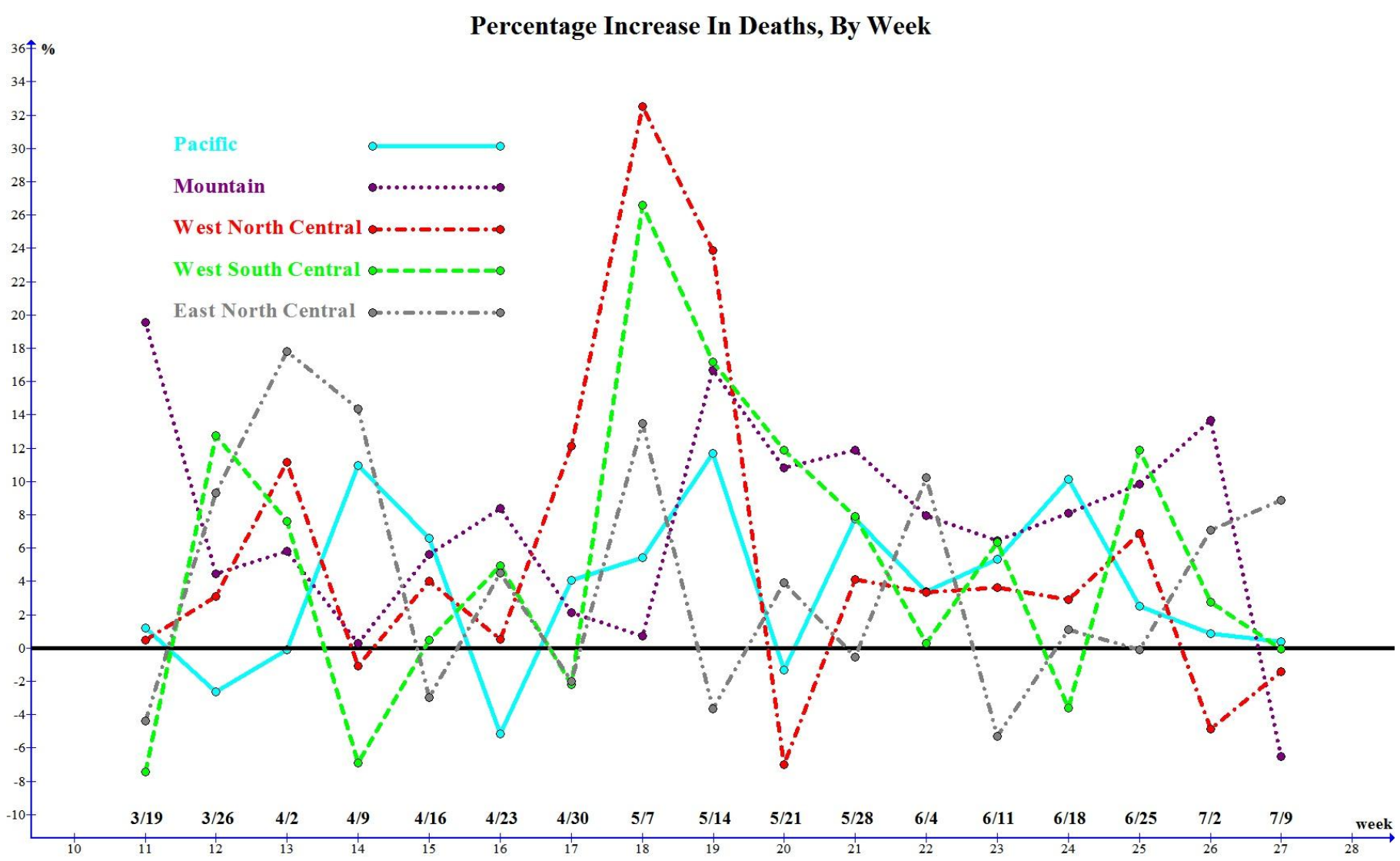
Figure 3. Thyroid cancer incidence in Belarus following the Chernobyl disaster. (Reproduced from I. Fairlie, "Health effects from Chernobyl."[8])



REFERENCES

1. Bobby1, "**Beta Radiation in the United States Following the Fukushima Disaster",** http://houseoffoust.com/group/?p=1102, http://freepdfhosting.com/e9ba1877d6.pdf
2. http://wonder.cdc.gov/mmwr/mmwrmort.asp
3. 793.7 per 100,000, http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_04.pdf
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
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18
16
14
12
10
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6
4
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-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
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