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The Illinois Institute for Rural Affairs (IIRA) works to improve the quality of life for rural residents by partnering with public and private agencies on local development and enhancement efforts.



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## **Cost of Dementia in Illinois: Metro versus Nonmetro**

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### **Abstract**

This paper explores metro-nonmetro differences in the prevalence of Alzheimer's dementia. Data analysis suggests that more nonmetro Illinoisans experience cognitive difficulties; dementia is less of a concern for metro residents, men, and for persons not enrolled in Medicare / Medicaid Programs; and Alzheimer's dementia cost is estimated at \$76.9billion.

### **Introduction**

Dementia, a syndrome with multiple determinants, is defined as deterioration in cognitive abilities that impairs the successful performance of activities of daily living<sup>2</sup>. Age is a salient determinant for memory loss, but dementia may erode other mental faculties such as language, judgment, and problem-solving abilities<sup>3</sup>.

Dementia affects more than 6.7mil people in the nation and Alzheimer's disease is the most common cause of dementia<sup>4</sup>. The majority of people afflicted by Alzheimer's dementia are age 65 or older. Figure 1 shows the lifetime risk of Alzheimer's dementia by age and gender; the risk is higher for females.

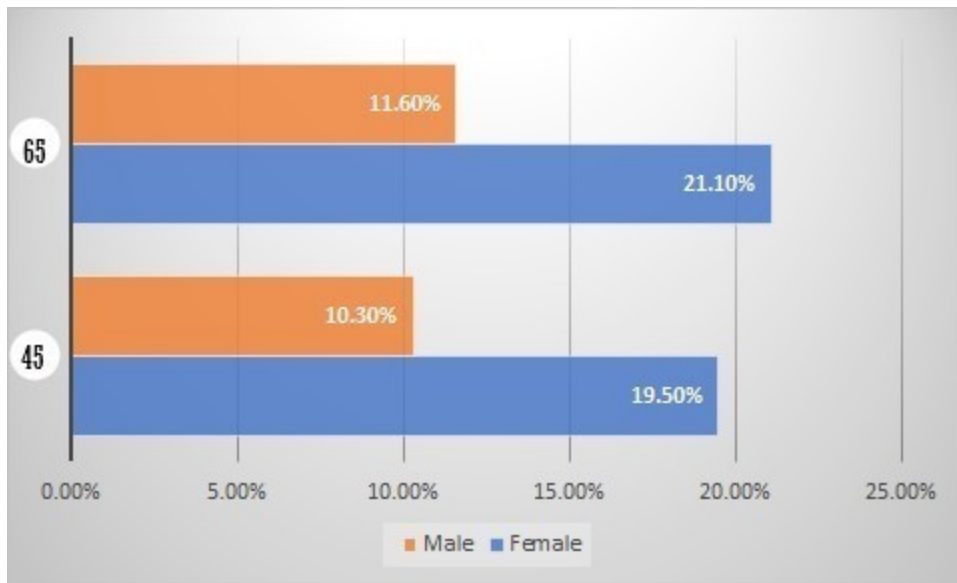
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<sup>2</sup> Loscalzo, J., Fauci, A. S., Kasper, D. L., Hauser, S. L., Longo, D. L., & Jameson, J. L. (2022). *Harrison's Principles of Internal Medicine*. 21<sup>st</sup> edition. NY: McGraw Hill.

<sup>3</sup> Griem, J., Stone, J., Carson, A., & Kopelman, M. D. (2016). Psychologic/functional forms of memory disorder. *Handbook of Clinical Neurology*, 139, 407-417.

<sup>4</sup> Tom, S. E., Hubbard, R. A., Crane, P. K., Haneuse, S. J., Bowen, J., McCormick, W. C., ... & Larson, E. B. (2015). Characterization of dementia and Alzheimer's disease in an older population: updated incidence and life expectancy with and without dementia. *American journal of public health*, 105(2), 408-413.

**Figure 1: Lifetime Risk for Alzheimer's Dementia at 45 and 65, by Sex**



In reality, 12% of women and 9% of men age 65 and above suffer from Alzheimer's dementia<sup>6</sup>. Ethnic differences in disease prevalence exist, the proportion of ethnic minorities with Alzheimer's dementia is greater than that of the White Americans<sup>7</sup>; structural racism is often used to explain

these differences<sup>8</sup>.

Cost estimates of Alzheimer's dementia vary<sup>9</sup>; for example, Medicare payments for persons 65 years of age and older afflicted with Alzheimer's dementia averaged \$43,444 per person in 2022; the comparable payment for non-dementia sufferers was \$14,593 per person<sup>10</sup>. The average, lifetime total cost of care, that is, costs from the time of diagnosis to death, is estimated at \$392,874.

<sup>5</sup> Chene G, Beiser A, Au R, Preis SR, Wolf PA, Dufouil C, et al. (2015). Gender and incidence of dementia in the Framingham Heart Study from mid-adult life. *Alzheimer's and Dementia*, 11(3), 310-20.

<sup>6</sup> Rajan KB, Weuve J, Barnes LL, McAninch EA, Wilson RS, Evans DA. (2021). Population estimate of people with clinical AD and mild cognitive impairment in the United States (2020-2060). *Alzheimer's and Dementia*, 17(12), 1966-75.

<sup>7</sup> Power MC, Bennett EE, Turner RW, Dowling NM, Ciarleglio A, Glymour MM, et al. (2021). Trends in relative incidence and prevalence of dementia across non-Hispanic black and white individuals in the United States, 2000-2016. *JAMA Neurology*, 78(3), 275-84.

<sup>8</sup> Bailey ZD, Feldman JM, Bassett MT (2021). How Structural Racism Works - Racist Policies as a Root Cause of U.S. Racial Health Inequities. *New England Journal of Medicine*, 384(8), 768-73. Also, see Athiyaman, A. (2023). Health Policy for Rural Illinois: Data for Policy Development, *Research Brief*, 5(4), February. Available [http://www.iira.org/wp-content/uploads/2023/03/RB\\_5\\_4-Health-Policy-for-Rural-Illinois-Data-for-Policy-Development.pdf](http://www.iira.org/wp-content/uploads/2023/03/RB_5_4-Health-Policy-for-Rural-Illinois-Data-for-Policy-Development.pdf).

<sup>9</sup> See, Yang Z, Zhang K, Lin PJ, Clevenger C, Atherly A. (2012). A longitudinal analysis of the lifetime cost of dementia. *Health Services Research*, 47(4), 1660-78.

<sup>10</sup> Data are from the Alzheimer's Association, [www.alz.org](http://www.alz.org).

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What is the prevalence of dementia in metro / nonmetro Illinois? What are the correlates of “cognitive difficulty”? What proportions of population age 65 and above are at risk of dementia? What is the cost of dementia, county-wise? This paper addresses these and other related questions using a variety of data at the macro, meso, and micro level.

## Methodology

Two different datasets were used to gain insights into the research questions: American Community Survey (ACS)<sup>11</sup> and the National Health Interview Survey (NHIS)<sup>12</sup>. Table 1 lists the variables mined from the data sources.

The ACS provides data at the PUMA<sup>13</sup> level; for example, PUMA 00104 contains information about four rural counties: Jo Daviess, Carroll, Lee, and Whiteside. PUMA data on responses to the question on “cognitive difficulty” (Table 1) were used to gain insights into the prevalence of dementia in the metro / nonmetro regions. Also, cognitive difficulty was used as the dependent variable in a Logit analysis to identify covariates of the criterion.

The ACS data on population were used to estimate the number of people at risk for contracting Alzheimer’s dementia. Three age groups were studied: 65-74, 75-84, and greater than or equal to 85. The risk

estimates given in Table 2<sup>14</sup> were adjusted using a ‘prevalence factor’ computed using the correlation between cognitive difficulty and dementia<sup>15</sup>; NHIS variables, “DEMENEV\_A” and “COGMEMDEF\_A” were used to compute the correlation<sup>16</sup>.

Finally, cost of dementia was estimated using two sets of information: life expectancy and average, annual cost of care for dementia patients. Life expectancy, the average number of years one is expected to live, was used as a ceiling to measure one’s remaining life, in years<sup>17</sup>. To this ‘distance’ measure,  $k$ , two types of costs were allocated<sup>18</sup>:

$let (k - 5) > 5 = l ; cost 1 = l \times \$ 43,444.$   
 $for k - 5 \leq 5 = a , cost 2 = a \times \$ 80,618.$   
 $if k is negative , then cost = \$ 80,618.$

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<sup>14</sup> Adapted from, Rajan KB, Weuve J, Barnes LL, McAninch EA, Wilson RS, Evans DA. (2021). Population estimate of people with clinical AD and mild cognitive impairment in the United States (2020-2060). *Alzheimer’s and Dementia*, 17(12), 1966-75.

<sup>15</sup> The r-based binomial effect size display was used as the weight; see, Athiyaman, A. (2023). Climate and Mortality in Nonmetro Illinois: Retrospective Study, 1999-2021 and Projections of Mortality for 2030. *Research Brief*, 5(7), April 3. Available: <http://www.iira.org/wp-content/uploads/2023/03/RB-57-Climate-and-Mortality-in-Nonmetro-Illinois-Retrospective-Study-1999-2021-and-Projections-of-Mortality-for-2030.pdf>.

<sup>16</sup> See Appendix 2.

<sup>17</sup> Appendix 1 contains data on life expectancy for Illinois counties.

<sup>18</sup> Adopted from Alzheimer’s Association. 2023 *Alzheimer’s Disease Facts and Figures*. Alzheimer’s Dementia, 19(4). DOI 10.1002/alz.13016; see their Table 15, p. 67, and Kelley AS, McGarry K, Gorges R, Skinner JS. (2015). The burden of health care costs for patients with dementia in the last 5 years of life. *Annals of Internal Medicine*;163, 729-36.

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<sup>11</sup> <https://www.census.gov/programs-surveys/acs/data.html>.

<sup>12</sup> <https://www.cdc.gov/nchs/nhis/data-questions-nares-documentation.htm>.

<sup>13</sup> PUMA codes are used to classify counties into metro / nonmetro regions; see, <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/pumas.html>.

To obtain estimates for 2021, a discount rate of 5% was applied to the cost computations. Microdata from ACS was

used to compute dementia cots for PUMA regions.

**Table 1: Variables and their Definitions**

<b>Study</b>	<b>Variable</b>	<b>Operational Definition</b>
ACS, 2017-2021	Geography	1 = rural; 0 = other
	Sex: Respondent's sex	1 = Male; 2 = Female
	RAC1P: Respondent's ethnicity	1 = White; 2 = Black; 3 = Asian; 4 = other
	PRIVCOV: Private insurance	1 = Yes; 0 = No
	PUBCOV: Public insurance	1 = Yes; 0 = No
	HINS3: Respondent has Medicare	1 = Yes; 0 = No
	HINS4: Respondent has Medicaid	1 = Yes; 0 = No
	AGE: Respondent's age	Ratio level data.
	DDRS: Self-care difficulty	1 = Yes; 0 = No
	DPHY: Ambulatory difficulty	1 = Yes; 0 = No
	DIS: Disabilities	1 = Yes; 0 = No
	DREM: Cognitive difficulties	1 = Yes; 0 = No
	DOUT: Independent living difficulty	1 = Yes; 0 = No
	FS: Food stamp reciprocity	1 = Yes; 0 = No
	NPF: Number of persons in family	Numerical
SCHL: Educational attainment	1 = ≤ HS; 2 = Some Col; 3 = Bach. Or Master's; 4 = Profess / PhD	
POVPIP: Income to poverty	1 = ≤ 500%; 2 = > 500%	
NHIS, 2021	COGMEMDFF_A: Difficulty in remembering and concentrating	1 = No; 2 = Some; 3 = A lot; 4 = Cannot do.
	DEMENEV_A: Ever had dementia	1 = Yes; 2 = No.
	Sex	1 = Male; 2 = Female.
	Race	1 = White; 2 = Black; 3 = Asian; 4 = Hispanic.

**Table 2: Age and Risk of Alzheimer’s Dementia**

Age Group	Percentage of At-Risk Population
65-74	5%
75-84	13.1%
85 or Older	33.3%

**Note:** See Footnote 14 for data source.

**Findings**

Prevalence of Dementia

More nonmetro Illinoisans experience cognitive difficulties, 7% for the nonmetro

residents compared to 5% for the metro; Black and “other” ethnicities are the most affected (Table 3).

**Table 3: Cognitive Difficulties by Race, Metro and Nonmetro**

	Metro				Nonmetro			
	White	Black	Asian	Other	White	Black	Asian	Other
Yes	4%	7%	3%	4%	7%	12%	5%	8%
N	6.99mi	1.64mil	0.67mil	1.43mil	1.23mi	46,779	8,367	48,135

Correlates of Cognitive Difficulty

Table 4 shows the results of the model run to estimate the probability of no cognitive difficulty among the population; as shown in the table, all demographic variables, including age, is related to the criterion. The estimated odds ratio reveals that

dementia is less of a concern for metro residents, men, and for persons not enrolled in Medicare / Medicaid programs. In contrast, age is related to experiencing cognitive difficulty; family income does not correlate with the disease.

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**Table 4: Wald Tests of Individual Effects, Covariates for Dementia**

Effect	DF	Wald Chi-Square	$p > \chi^2$
Geography	1	39.14	<.0001
Sex	1	166.99	<.0001
Food Stamp	1	663.59	<.0001
Age	1	52.05	<.0001
Medicare	1	3025.02	<.0001
Medicaid	1	3129.15	<.0001
Family income	1	286.75	<.0001

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**Odds Ratio**

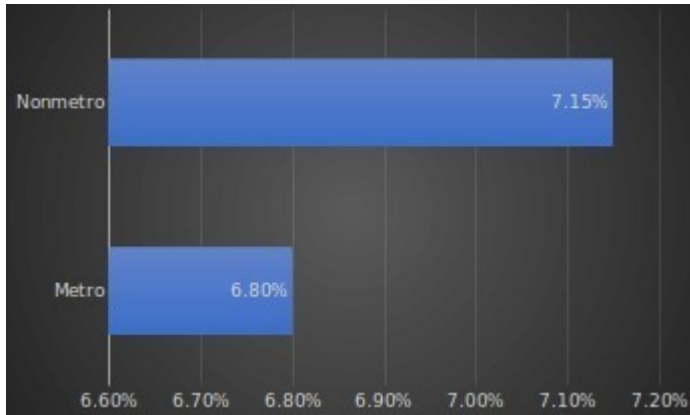
Effect	Point Estimate
Geography, metro versus nonmetro	1.126
Sex, Male versus Female	0.816
Food Stamp, No versus Yes	0.584
Age	1.004
Medicare, No versus Yes	4.002
Medicaid, No versus Yes	3.112
Family income	1.000

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**Alzheimer's Dementia, Risk Computations**

Table 5 shows the estimates of “at-risk” population numbers for the top 3 metro and nonmetro counties; Appendix 2 contains data for all the counties. In all, approximately 137,000 Illinoisans are susceptible to Alzheimer's dementia; the disease is expected to impact more in the nonmetro (Figure 2).

**Figure 2: Number of People at Risk for Alzheimer’s Dementia, Metro / Nonmetro**



**Note:** N, Metro = 117,085; N, Nonmetro = 20,762.

**Table 5: Population at Risk of Dementia, Top Three Metro and Nonmetro Counties**

Metro County	Number of People at Risk of Dementia			% of Total, 65+
	Age 65 to 74	Age 75 to 84	Age 85 plus	
Ford	42	63	94	8%
Bond	57	69	106	7%
Macoupin	166	192	304	7%

Nonmetro County	Number of People at Risk of Dementia			% of Total, 65+
	Age 65 to 74	Age 75 to 84	Age 85 plus	
LaSalle	372	494	607	7%
Adams	224	340	406	7%
Whiteside	207	269	355	7%

Cost of Dementia

The cost of Alzheimer’s dementia for Illinois, ceteris paribus, is estimated at \$76.9billion; it constitutes around 9% of

the state’s GDP (Table 6). Proportionally, the cost is higher for females, their lengthier life expectancy is the determinant. Appendix 3 lists costs by PUMA regions.

**Table 6: Cost of Dementia: Estimates for Metro and Nonmetro by Race and Gender**

	White		Black		Asian		Others	
	Male	Female	Male	Female	Male	Female	Male	Female
Metro	\$18,806,629,038	\$26,119,463,445	\$5,319,856,318	\$7,254,535,386	\$1,258,109,103	\$2,138,601,994	\$2,062,501,198	\$2,003,685,375
Nonmetro	\$4,536,867,517	\$6,809,757,255	\$234,022,239	\$122,048,524	\$13,759,179	\$25,628,208	\$106,888,713	\$91,405,284



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## Summary and Conclusion

It is estimated that in 2020, 230,000 Illinoisans had Alzheimer's dementia. The disease is expected to affect 260,000 in 2025<sup>19</sup>. This paper explores metro-nonmetro differences in the prevalence of Alzheimer's dementia. Furthermore, it highlights the demographic correlates of "cognitive difficulty" and estimates the number of people, age 65 and above, with risk of dementia. The paper concludes by estimating the cost of dementia, PUMA region-wise.

Microdata for empirical analysis were sourced from ACS, 2017-2021, and NHIS, 2021. Data analysis suggests:

1. More nonmetro Illinoisans experience cognitive difficulties, 7% for the nonmetro compared to 5% for the metro.
2. Dementia is less of a concern for metro residents, men, and for persons not enrolled in Medicare / Medicaid programs.
3. Approximately 137,000 Illinoisans are susceptible to Alzheimer's dementia; Ford County in the metro and LaSalle County in the nonmetro have the greatest number of dementia patients, relative to their 65+ population numbers, and
4. The cost of Alzheimer's dementia is estimated at \$76.9billion.

This research supports my earlier observation that health policy in Illinois should inform or address the social determinants of health<sup>20</sup>; a larger proportion of ethnic minorities, especially the Blacks, tend to suffer from dementia.

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<sup>19</sup> See footnote 18.

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<sup>20</sup> Athiyaman, A. (2023). Health and Healthcare Disparities in Illinois: Metro versus Nonmetro. *Research Brief*, 5(3), February 16. Available: [http://www.iira.org/wp-content/uploads/2023/02/RB5\\_3-Health-and-Healthcare-Disparities-in-Illinois-Metro-vs-Nonmetro.pdf](http://www.iira.org/wp-content/uploads/2023/02/RB5_3-Health-and-Healthcare-Disparities-in-Illinois-Metro-vs-Nonmetro.pdf).

## Appendix 1: Life Expectancy Data, Illinois Counties\*

<b>County</b>	<b>Life Expectancy (in Years)</b>	<b>County</b>	<b>Life Expectancy (in Years)</b>	<b>County</b>	<b>Life Expectancy (in Years)</b>
Adams	77.8	Hardin	73.8	Morgan	76.7
Alexander	70.5	Henderson	77.6	Moultrie	77.1
Bond	78.4	Henry	78.1	Ogle	78.5
Boone	79.3	Iroquois	75.9	Peoria	76.8
Brown	78.9	Jackson	77.3	Perry	77.3
Bureau	78.1	Jasper	81.2	Piatt	80
Calhoun	80.4	Jefferson	75.3	Pike	76.5
Carroll	78.1	Jersey	76.1	Pope	79.1
Cass	76.4	Jo Daviess	80.5	Pulaski	74
Champaign	80.1	Johnson	77	Putnam	80.8
Christian	76.5	Kane	81	Randolph	77
Clark	76.1	Kankakee	76.6	Richland	76.7
Clay	76.5	Kendall	81.2	Rock Island	77.4
Clinton	80.2	Knox	76.3	St. Clair	75.6
Coles	77.7	Lake	81	Saline	73.2
Cook	78.6	LaSalle	76.5	Sangamon	77.7
Crawford	78.9	Lawrence	75.1	Schuyler	76.4
Cumberland	79.7	Lee	78.3	Scott	78.1
DeKalb	78.7	Livingston	76.1	Shelby	79.3
De Witt	74.9	Logan	76.8	Stark	76.1
Douglas	79.2	McDonough	77.8	Stephenson	77.8
DuPage	81.9	McHenry	80.3	Tazewell	78.3
Edgar	75.8	McLean	79.4	Union	75.2
Edwards	76.3	Macon	76.3	Vermilion	74.6
Effingham	77.7	Macoupin	76.7	Wabash	78.6
Fayette	78.1	Madison	76.3	Warren	76.6
Ford	76.3	Marion	73.6	Washington	79.4
Franklin	74.9	Marshall	77.2	Wayne	76.5
Fulton	75.9	Mason	75.1	White	74.8
Gallatin	73.2	Massac	74.8	Whiteside	77.6
Greene	76.7	Menard	79.9	Will	79.2
Grundy	77.2	Mercer	78.1	Williamson	77.3
Hamilton	77.6	Monroe	80.7	Winnebago	76.2
Hancock	78.3	Montgomery	76.1	Woodford	79.1

\*Source: National Center for Health Statistics - Mortality Files 2018-2020

## Appendix 2: Alzheimer's Dementia: Risk Calculations for Illinois Counties

Metro County	Age		
	65-74	75-84	85 and Above
Alexander	24	31	18
Bond	57	69	106
Boone	167	191	208
Calhoun	18	27	32
Champaign	508	601	675
Clinton	112	160	164
Cook	14,350	18,032	21,029
DeKalb	245	289	314
DeWitt	55	76	68
DuPage	2,804	3,349	3,629
Ford	42	63	94
Grundy	139	168	173
Henry	184	242	290
Jackson	160	175	250
Jersey	75	106	108
Kane	1,391	1,684	1,526
Kankakee	328	441	490
Kendall	277	285	273
Lake	1,975	2,265	2,673
Macon	373	483	629
Macoupin	166	192	304
Madison	849	1,117	1,138
Marshall	48	68	82
McHenry	905	1,002	1,083
McLean	438	521	557
Menard	45	58	57
Mercer	60	85	94
Monroe	113	139	188
Peoria	575	720	904
Piatt	61	73	93
Rock Island	508	680	743
Sangamon	670	825	832
St. Clair	777	940	1,050
Stark	22	32	32
Tazewell	444	594	705
Vermilion	264	359	355
Will	1,798	2,076	2,008
Williamson	235	316	292
Winnebago	933	1,078	1,524
Woodford	123	160	208

## Appendix 2: Alzheimer's Dementia: Risk Calculations for Illinois Counties (Continued)

Nonmetro County	Age		
	65-74	75-84	85 and Above
Adams	224	340	406
Brown	16	20	29
Bureau	127	197	167
Carroll	71	101	94
Cass	42	50	72
Christian	115	177	172
Clark	54	72	98
Clay	50	60	86
Coles	147	178	265
Crawford	65	86	96
Cumberland	38	43	75
Douglas	62	85	117
Edgar	68	96	98
Edwards	24	30	41
Effingham	108	134	209
Fayette	72	109	110
Franklin	139	194	200
Fulton	124	173	180
Gallatin	22	33	27
Greene	42	64	52
Hamilton	30	47	40
Hancock	73	98	126
Hardin	21	25	27
Henderson	28	42	55
Iroquois	100	155	152
Jasper	33	43	51
Jefferson	131	179	163
Jo Daviess	115	144	163
Johnson	51	65	83
Knox	194	275	257
LaSalle	372	494	607
Lawrence	47	69	69
Lee	123	157	204
Livingston	121	153	256
Logan	89	111	195
Marion	134	175	198
Mason	53	73	79
Massac	48	78	92
McDonough	87	107	180
Montgomery	99	142	173
Morgan	118	149	218
Moultrie	49	69	72
Ogle	173	222	318
Perry	72	94	106
Pike	53	71	116
Pope	19	22	26
Pulaski	22	30	21

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## Appendix 2: Alzheimer's Dementia: Risk Calculations for Illinois Counties

	Age		
	65-74	75-84	85 and Above
Putnam	25	31	27
Randolph	103	130	186
Richland	53	92	83
Saline	85	102	167
Schuyler	30	41	38
Scott	17	27	25
Shelby	85	112	148
Stephenson	184	247	319
Union	64	90	108
Wabash	42	53	87
Warren	57	81	86
Washington	51	77	65
Wayne	60	84	113
White	51	76	92
Whiteside	207	269	355

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Note: Binomial Effect Size display for the correlation between COGMEMDFF\_A and DEMENEV\_A is 0.63.

**Appendix 3: Cost of Dementia, County-Wise Numbers**

PUMA	White		Black		Asian		Asian		Others	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
105	366,571,840	425,454,607	14,221,516	60,540,046	0	0	48,782,821	12,098,383	0	0
401	363,126,463	881,562,331	0	8,376,244	0	0	80,618	36,974,750	0	0
900	849,295,865	798,015,138	29,929,911	34,100,781	0	0	13,250,840	10,555,526	0	0
1104	266,978,546	402,459,506	85,272,368	103,732,212	0	20,890,678	0	23,480,965	0	0
1105	140,261,941	290,434,847	143,583,075	181,516,724	8,403,515	0	24,051,614	5,643,288	0	0
1204	292,750,444	354,702,563	3,674,754	14,879,053	0	7,447,972	9,271,116	36,851,145	0	0
1205	404,552,710	562,930,137	73,874,395	83,962,143	0	0	21,785,945	10,885,627	0	0
1300	390,433,690	599,656,109	18,934,594	52,605,141	0	3,224,736	1,352,641	0	0	0
1500	274,583,027	369,372,784	65,859,288	68,955,490	0	0	21,238,318	10,695,484	0	0
1701	394,677,419	714,069,761	65,347,676	70,816,371	0	13,551,886	14,579,631	31,435,045	0	0
1900	313,170,452	552,532,090	3,297,058	0	0	46,819,494	0	0	0	0
2000	343,082,236	331,951,798	17,450,342	31,341,596	0	2,852,055	0	2,906,062	0	0
2100	258,935,217	407,442,867	47,389,486	10,935,021	22,886,974	9,961,622	0	2,370,169	0	0
2200	368,017,612	636,442,267	77,774,436	35,698,821	0	0	1,209,276	4,867,515	0	0
2300	413,575,101	340,373,807	59,821,282	147,372,892	14,344,780	18,038,711	19,923,243	0	0	0
2400	455,240,969	385,035,852	0	0	1,692,978	0	0	21,452,345	0	0
2601	131,681,275	269,982,591	0	35,808,069	0	0	8,747,095	2,324,850	0	0
2801	816,969,303	664,771,976	133,284,867	125,825,273	159,302,552	8,745,190	112,475,932	12,508,885	0	0
2901	345,552,025	467,180,699	19,705,936	17,333,298	0	18,945,324	14,279,482	5,643,288	0	0
3005	157,867,365	271,780,362	18,785,539	29,983,507	3,635,872	0	67,887,364	15,317,496	0	0
3007	170,959,596	215,109,716	0	0	0	27,813,348	6,046,380	8,061,840	0	0
3008	255,809,481	353,243,963	49,213,862	0	0	0	148,829,496	39,537,263	0	0
3009	297,072,994	241,719,368	0	0	0	12,189,442	0	4,659,730	0	0
3102	181,350,822	320,373,122	14,596,812	193,845,400	0	2,418,552	12,150,174	33,780,390	0	0
3105	262,669,082	241,870,676	0	0	0	0	114,980,222	0	0	0
3106	185,173,517	113,888,484	36,099,948	70,606,100	9,617,769	66,464,354	5,240,196	24,619,110	0	0
3107	215,493,693	258,501,484	8,585,847	7,909,190	0	9,271,116	0	0	0	0

**Appendix 3: Cost of Dementia, County-Wise Numbers (Continued)**

PUMA	White		Black		Asian		Others	
	Male	Female	Male	Female	Male	Female	Male	Female
3108	199,722,878	270,936,352	53,634,761	51,653,467	16,609,745	0	2,821,644	10,883,484
3202	190,180,086	278,500,477	6,449,472	3,627,828	19,751,508	27,746,395	4,434,012	38,669,750
3203	152,186,498	229,399,401	18,821,894	5,643,288	8,593,879	85,169,466	0	6,852,564
3204	139,221,001	271,130,836	0	31,727,068	8,988,933	20,105,058	1,684,916	7,255,656
3205	212,336,653	387,802,095	30,954,524	48,482,770	0	34,383,868	0	20,623,541
3207	173,407,711	266,416,382	2,418,552	15,619,134	58,870,859	40,946,074	21,989,557	38,648,449
3208	218,498,289	346,340,738	10,958,276	25,749,289	82,583,189	88,888,946	22,751,556	12,173,366
3209	146,392,878	205,282,853	11,243,815	13,212,066	10,190,159	42,829,381	7,555,761	8,497,137
3306	231,489,539	315,492,235	5,643,288	0	0	38,667,136	8,834,548	
3307	243,701,017	183,415,528	100,052,005	58,491,473	4,481,800	34,345,793	40,240,802	24,076,859
3308	181,771,360	322,663,936	0	4,837,104	0	52,805,052	13,705,128	23,097,147
03309	208,645,328	358,361,340	18,172,362	15,317,496	29,902,496	31,844,268	24,222,833	13,144,105
3310	183,785,462	343,519,810	0	14,914,404	3,224,736	24,825,172	7,255,656	5,410,565
03401	139,443,004	310,881,433	18,958,103	17,365,195	26,890,802	11,617,098	7,255,656	51,851,167
3407	178,252,101	405,284,302	203,782,573	251,392,250	11,689,668	15,115,909	6,070,549	90,535,061
3408	128,068,856	205,910,174	120,261,383	15,317,468	0	31,427,555	59,551,705	33,608,690
3409	373,955,738	540,846,752	77,877,314	38,024,147	0	22,138,458	20,020,861	31,683,017
3410	497,161,972	498,913,339	40,482,126	19,236,399	11,286,576	7,231,459	0	2,418,552
3411	295,972,806	343,737,052	81,609,425	63,248,315	0	9,674,208	10,093,145	7,658,748
3412	174,942,003	159,440,281	46,839,528	111,570,098	0	0	8,868,024	
3413	111,342,045	249,410,131	236,971,492	424,257,641	0	0	33,426,146	17,571,302
3414	265,085,706	197,396,408	207,985,923	260,054,220	0	0	18,139,140	
3415	317,687,467	424,502,994	8,304,872	21,766,968	0	19,348,416	79,493,122	54,528,167
3416	201,187,551	497,112,358	14,331,885	31,115,181	2,705,282	14,850,263	0	34,606,544
03417	236,341,868	227,521,232	17,506,820	39,054,439	23,782,428	68,966,045	0	9,609,704
3418	197,437,150	360,523,418	0	28,221,062	32,035,754	63,187,739	0	8,061,840
3419	147,295,687	260,090,140	24,904,054	37,592,331	29,756,238	35,333,595	48,443,791	25,797,888
3420	418,633,049	553,978,122	12,124,450	64,285,601	62,357,642	156,399,060	28,368,338	96,898,313
3421	467,716,221	596,201,619	99,180,908	85,264,780	82,981,509	105,030,104	35,375,416	18,542,232
3422	257,553,180	408,227,694	44,007,055	7,246,493	29,396,418	83,863,763	36,663,740	16,929,864
3501	410,508,605	500,510,736	153,432,171	84,501,404	126,031,205	83,460,359	1,999,326	56,146,325
3502	100,728,017	236,416,334	51,932,126	10,668,043	10,761,943	145,112	50,832,528	806,184
3503	176,276,091	376,320,854	29,001,133	46,232,833	88,591,440	62,082,054	32,117,660	46,301,748

**Appendix 3: Cost of Dementia, County-Wise Numbers (Continued)**

PUMA	White		Black		Asian		Asian		Others	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
3504	213,939,874	241,320,483	27,003,483	32,386,810	47,485,373	100,958,405	50,343,839	23,209,309		
3520	272,105,551	365,406,895	4,980,811	4,837,104	31,759,596	40,214,257	20,888,210	47,807,888		
3521	133,580,213	201,480,214	332,582,369	674,664,014	5,643,288	22,385,201	120,420,893	87,359,430		
3522	50,735,164	196,866,150	39,246,188	13,705,128	0	13,302,036	108,541,971	95,580,391		
3523	47,008,792	190,467,800	300,204,712	496,277,957	0	0	183,634,740	109,249,319		
3524	89,135,930	108,201,666	102,598,428	80,033,686	0	16,123,680	64,658,196	167,235,034		
3525	195,001,525	200,684,853	97,766,774	50,248,933	14,503,246	4,659,720	14,344,780	0		
3526	164,260,699	152,692,707	63,052,046	48,482,041	152,080,409	266,943,600	82,230,354	48,636,900		
3527	142,803,681	204,339,568	2,499,158	17,635,228	5,288,541	22,180,369	32,552,482	112,930,816		
3528	47,925,444	25,074,366	398,161,934	547,819,778	0	17,736,048	45,307,134	0		
3529	45,858,844	162,104,312	399,644,301	743,660,264	0	24,191,143	3,834,826	77,324,250		
3530	137,476,515	199,156,780	319,138,585	337,137,480	0	0	25,104,404	17,736,048		
3531	26,667,793	16,518,425	296,656,734	616,393,655	0	0	0	5,926,016		
3532	33,096,784	98,915,787	181,091,402	259,419,680	0	2,644,270	8,028,959	14,914,404		
3601	270,659,220	342,307,260	0	0	0	7,255,656	0	20,549,091		
3602	205,631,242	445,738,949	0	0	0	18,945,324	4,232,445	3,224,736		
3700	237,961,262	364,840,970	20,684,109	0	0	0	0	2,444,618		
104	485,792,804	456,516,971	3,368,383	16,929,864	0	7,255,656	50,349,450	7,658,748		
202	525,554,316	843,336,420	27,909,483	18,378,938	0	0	7,718,974	5,094,063		
300	353,311,474	529,842,958	5,223,160	26,946,657	0	0	9,674,208	5,476,668		
501	452,524,530	706,085,079	0	12,697,391	0	3,990,591	652,895	8,094,423		
600	329,582,859	405,418,586	18,281,314	11,286,576	10,623,801	0	403,092	0		
700	399,796,050	609,917,893	19,424,189	0	0	3,627,828	1,330,197	6,852,564		
800	540,523,229	878,773,252	97,190,286	10,443,435	0	10,754,133	17,718,659	20,859,998		
1001	414,141,475	687,093,119	0	13,636,257	0	0	2,015,460	6,449,472		
1602	295,335,534	629,444,402	12,187,438	3,264,475	1,045,126	0	0	6,852,564		
2501	494,306,680	678,408,111	27,967,778	8,464,932	2,090,252	0	12,455,513	24,066,785		
2700	245,998,570	384,920,466	22,470,209	0	0	0	4,570,265	0		