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Beliefs about Dementia and Risk-Reducing Behavior: An Empirical Analysis of Adults Age 40 and Above in the Midwest, Metro versus Nonmetro

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Abstract

This paper uses microdata from the AARP survey on the *Perceptions Related to a Dementia Diagnosis: Adults Age 40+* to explore the characteristics of Midwesterners who believe that they are at higher risk of dementia; both metro and nonmetro geographies were studied. Data analysis shows that 17% of the Midwesterners harbor the belief that they are at higher risk of dementia and intake of medicine to help with memory interferes with engaging in dementia risk-reducing behavior.

Introduction

Dementia is deterioration in one's cognitive abilities that impairs the successful performance of activities of daily living². Preventive treatment for Alzheimer's and related dementia (ADRD) does not exist³; complementary and alternative medicines (CAM) such as Gingko, vitamin B, and Melatonin do not prevent ADRD⁴. In spite of this, some households in the nation spent \$1,150 on CAM in 2022 (Table 1). What proportion of Midwesterners in the 40+ age group believe that they are at higher risk of dementia and how do they describe their brain health? Are they willing to get screened for dementia? What is the likelihood that they would engage in activities that would maintain their mental health? This paper addresses these and other related questions using microdata from an AARP survey on dementia.

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² Athiyaman, A. (2023). Cost of Dementia in Illinois: Metro versus Nonmetro. Research Brief, 5(12), June 9. Available: <https://iira.org/cost-of-dementia-in-illinois-metro-versus-nonmetro/>.

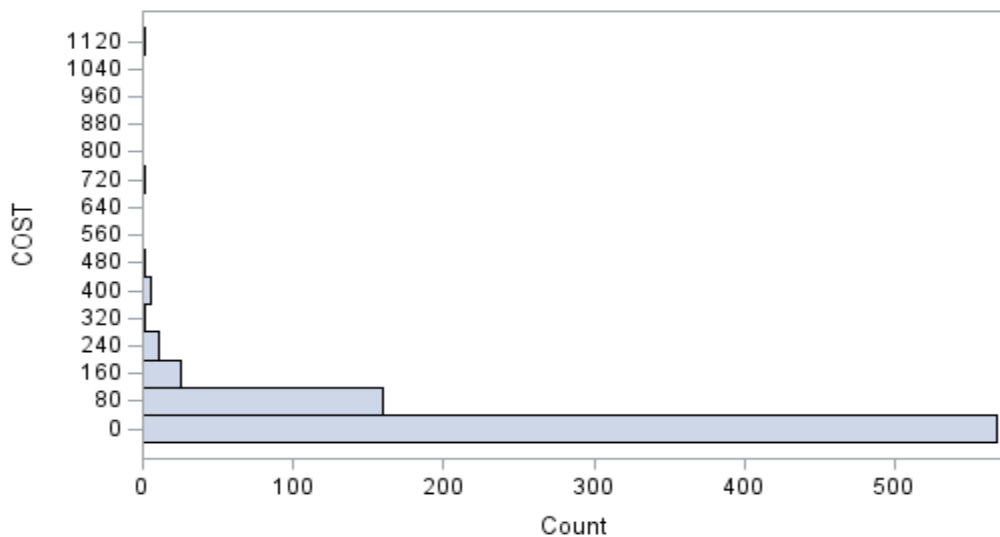
³ Kim, S., Sargent-Cox, K. A., & Anstey, K. J. (2015). A qualitative study of older and middle-aged adults' perception and attitudes towards dementia and dementia risk reduction. *Journal of Advanced Nursing*, 71(7), 1694-1703.

⁴ <https://www.nccih.nih.gov/health/alzheimers-disease-at-a-glance>.

Table 1: Consumer Expenditure on Complementary and Alternative Medicines, 2022 ⁵

Central Tendency	Value
□ Mean	41.45
□ Median	21.41
□ 3 rd Quartile	42.79
□ 2 nd Quartile	12.33
Spread Statistic	
□ Std. Deviation	72.41
□ Range	1149
□ Interquartile range	30.46
Test for Location, $\mu = 0$	
□ <i>t</i> statistic	15.91, $p < .01$
□ <i>M</i> , Sign test	386.00, $p < .01$

Distribution of the 'Cost' Variable



⁵ Data are from the Consumer Expenditure Survey, 2022; see, <https://www.bls.gov/cex/data-over-view.htm>.

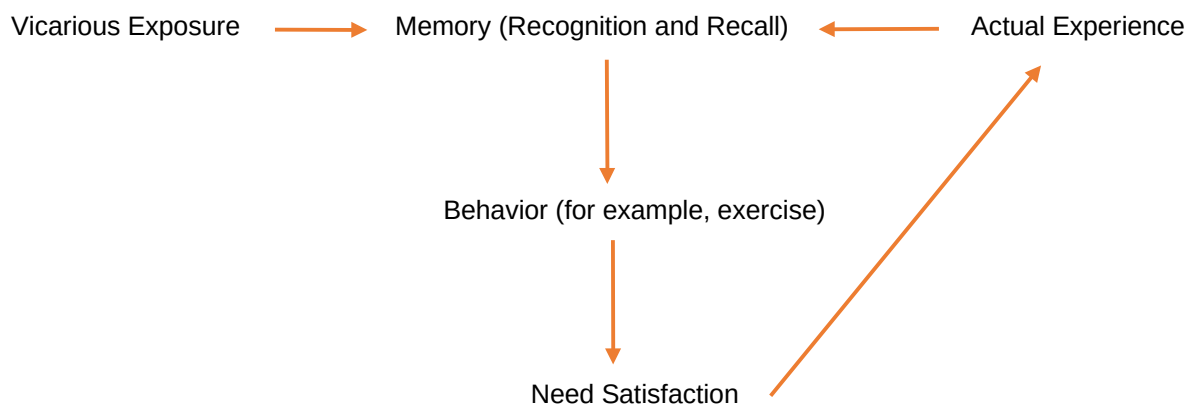
Conceptual Framework

Human behavior can be explained using three constructs: motivation, cognition, and learning. Motivation refers to the 'drivers' or energizers of behavior. Cognition is the domain for all of the mental phenomena: perception, memory, thinking, judging, etc., the focus area for this research. Learning refers to changes in behavior brought on by external conditions.

The drive to avoid physical or psychological harm will lead one to integrate needs with the external world in such manner that needs can be satisfied without harm to the individual. Thus, the need to avoid dementia will result in the individual becoming aware of a variety of goal-objects, for example, physical activity, nutritional food, etc. What these goal-objects promise in terms of need satisfaction is termed *expectations*.

Two types of experiences determine whether a goal object will be remembered: actual use experience and vicarious experience. For example, actual experience with eating nutritious and well-balanced meals could evoke feelings of wellness. These positive feelings could increase the likelihood that the act or behavior will be remembered and repeated⁶. The other, vicarious exposure, could be a health advisory or communication from a health department highlighting the goal object, for example, engaging in exercise to maintain both physical and mental health. Figure 1 is a summary of the process that relates motivation, cognition, and learning. In the figure, drive is represented by need satisfaction; learning by "actual experience", and cognition by "memory".

Figure 1: Concepts and their Relations



⁶ Reinforcement is the concept at work here; see Athiyaman, A. (2022). Youth e-cigarette use in Illinois and the Midwest: Insights from a panel study. Research Brief, 4(18), September. Available: <https://iira.org/youth-e-cigarette-use-in-illinois-and-the-midwest-insights-from-a-panel-study/>.

Methodology

Data are from the 2021 AARP Survey on perceptions related to a dementia diagnosis⁷. The survey fielded during March 12-24, 2021, yielded 3,022 responses. The Midwest region had 694 responses and they were used in data analysis.

The conceptual framework (Figure 1) implies that dementia risk-reduction behavior is a function of cognition. Thirteen items were used to measure cognition including the 'memory' concept; behavior was measured using six items (Table 2). General beliefs about dementia, for example, "If I had dementia, I would be mistreated", were also assessed. Demographic vari

ables such as sex and race were used to profile the respondents.

Chi-square analysis was used to ascertain statistical dependence among variables. The strength of the relationships among nominal variables was assessed using phi (ϕ) coefficients; Pearson correlations were used to estimate associations between interval / ratio level variables. Logistic modeling with categorical predictors was used to identify variables that predict group membership, those who engage in dementia prevention activities versus those who do not emit that behavior.

Table 2: Operational Definitions of Salient Variables

Variable	Definition
Memory	Three variables, (score values: 0 = No, 1 = Yes): Do you think that you have more problems with memory than others your age? Have you ever been told by your doctor that you have a problem with your memory? Are you taking any medications to help with your memory?
Behavior	Would you say each of the following is a part of your regular routine? Response categories: a) Eating nutritious and well-balanced meals b) Exercising c) Socializing with family, friends or others (including online socializing via Zoom, Skype, FaceTime, etc.) d) Managing stress effectively e) Getting enough restful sleep f) Engaging in mentally-stimulating activities. Value labels: 1 = No, I don't do this at all; 2 = Yes, I do this occasionally; 3 = Yes, I do this much of the time but not always; 4 = Yes, I do this almost all the time.

⁷ <https://ropercenter.cornell.edu/ipoll/study/31119812>.

Table 2: Operational Definitions of Salient Variables (Continued)

Variable	Definition
Beliefs about dementia	<p>For the following series of questions, please indicate whether you agree or disagree with each statement.</p> <ul style="list-style-type: none">a) If I had dementia, I would not want to know.b) If I had dementia, I would not want my family to know.c) If I had dementia, I would be mistreated.d) If I had dementia, I would no longer be taken seriously.e) If I had dementia, I would be considered incompetent.f) If I had dementia, I would be ashamed.g) If I had dementia, I would want to give up on life.h) If I had dementia, my doctor would not listen to me.i) If I had dementia, my doctor would not provide the best care.j) If I had dementia, I would be concerned my employer would find out. <p>Value labels: 1 = Strongly disagree; 2 = Disagree; 3 = I don't know; 4 = Agree; 5 = Strongly agree.</p>

Findings

The average age of the respondent was 60, range was 52⁸. The nonmetro respondents were much older, the median age for the nonmetro respondent was 64. The nonmetro had a higher percentage of female respondents compared to the metro, 60% for the nonmetro versus 49% for the metro. More than one-in-three in the

metro reported their education as a bachelor's degree or higher, 36%; the same number for the nonmetro is 22%. Less than one-in-ten respondents from the nonmetro were non-Whites; in contrast, the metro housed 22% of the minorities (Table 3).

⁸ Range is a measure of variability in the responses; it is the difference between the maximum and the minimum values of the variable.

Table 3: Demographics of the Respondents

Variable	Overall (n=694)	Metro (n=625)	Nonmetro (n=68)
Mean age ± SD	60 (12.14)	60 (12.06)	64 (13.0)
Gender			
□ Female	50%	49%	60%
Education			
□ LT High School	13%	14%	8%
□ HS Graduate	22%	21%	33%
□ Some College	30%	29%	37%
□ Bachelor's	16%	16%	14%
□ Master's and Above	19%	20%	8%
Race			
□ White	79%	77%	92%
□ Black	32%	5%	<1%
□ Asian	12%	13%	<1%
□ Other	5%	5%	8%
Political Orientation			
□ Republican	26%	25%	38%
□ Democrat	37%	37%	35%
□ Independent	30%	30%	23%
□ Something else	7%	7%	4%

Risk of Dementia and Acceptance of Screening for Dementia

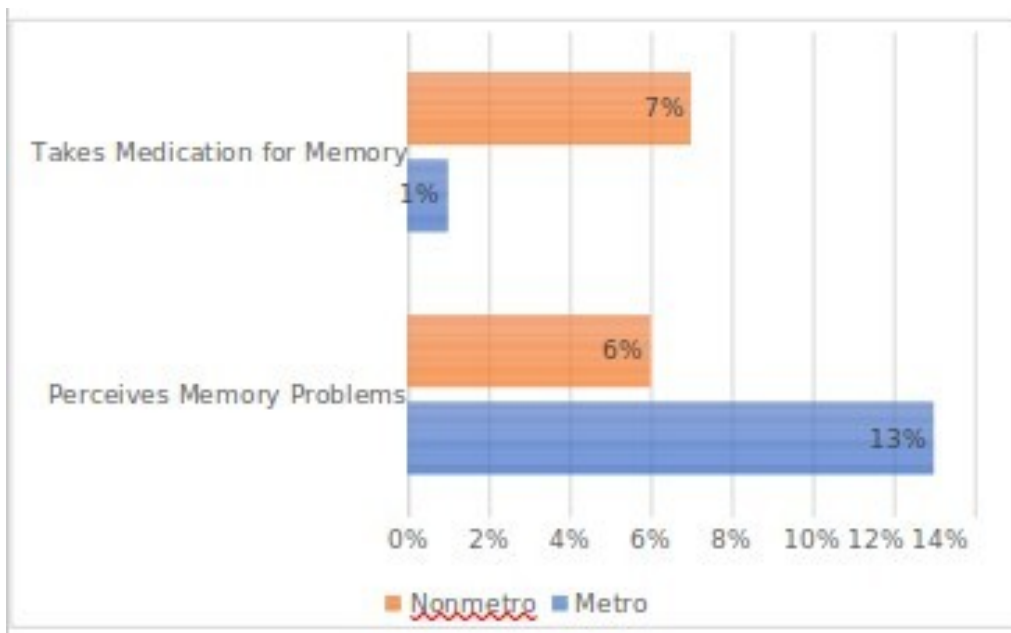
Beliefs about posing a higher risk of dementia among the population in the Census regions range from a low 16% for the South to a high 19% for the West; the Midwest had 17%⁹. A majority (93%) of those who believe in having a higher risk of dementia were willing to get tested for dementia, $\phi = 0.12$.

Cognition, Memory

When asked whether they think they have more problems with memory than others of their age, 13% of the metro respondents and 6% of the nonmetro respondents answered “yes”. However, more in the nonmetro take medications to help with their memory, 7% in the nonmetro compared to 1% in the metro (Figure 2).

⁹ Differences were not statistically significant; $\chi^2 = 2.38, p > .1$

Figure 2: Perceptions of Memory Problems and Intake of Medications to Help with Memory



A majority of the respondents both in the metro and the nonmetro rate their brain health or mental sharpness as very good or excellent, but a higher proportion in the

nonmetro rate their brain health as “poor”, 4% in the nonmetro compared to less than 1% in the metro (Table 4).

Table 4: Respondents’ Descriptions about Mental Sharpness and Memory

	Mental Sharpness		Your Memory	
	Metro	Nonmetro	Metro	Nonmetro
Excellent	17%	16%	15%	14%
Very Good	39%	42%	39%	39%
Good	33%	34%	34%	39%
Fair	9%	5%	11%	4%
Poor	<1%	4%	<1%	4%
N	625	68	622	67
χ^2, p	8.83, <.1		8.56, <.1	

Note: For exploration purposes statistical significance for dependence among variables (Type 1 error) was set at 10%.

Cognition, Beliefs About Dementia

Respondents were made aware of the definition of dementia¹⁰ and then asked for their opinion on the 10 items listed in Table 5. While the “don’t know” responses dominated the frequency of mentions, more metro residents, 46%, disagreed with

the statement that dementia would make others consider them as incompetent; the same number for the nonmetro is 33%. However, the fear of getting dementia is more among the metro respondents, 53%, compared to 49% for the nonmetro.

Table 5: Beliefs about Dementia

The questions read, “If I had dementia,” followed by the phrase given in the “items” below

Item	Metro %			Nonmetro %		
	Agree	Disagree	DK	Agree	Disagree	DK
I would not want to know	44%	9%	47%	44%	5%	51%
I would not want my family to know	36%	10%	54%	35%	10%	55%
I would be mistreated	22%	23%	55%	25%	12%	63%
I would no longer be taken seriously	14%	41%	45%	17%	41%	42%
I would be considered incompetent*	14%	46%	40%	12%	33%	55%
I would be ashamed*	22%	32%	46%	14%	15%	71%
I would want to give up on life	37%	13%	50%	35%	12%	53%
My doctor would not listen to me	23%	16%	61%	19%	23%	58%
My doctor would not provide best care	28%	16%	56%	22%	21%	57%
I would be concerned my employer would find out	23%	43%	34%	28%	27%	45%

Note: * denotes significant χ^2 at $p < .05$

¹⁰ Dementia is a term used to describe symptoms that impact memory, performance of daily activities, and communication abilities. Common dementias include Alzheimer’s disease, vascular dementia, Lewy body dementia, Parkinson’s disease, and frontotemporal dementia.

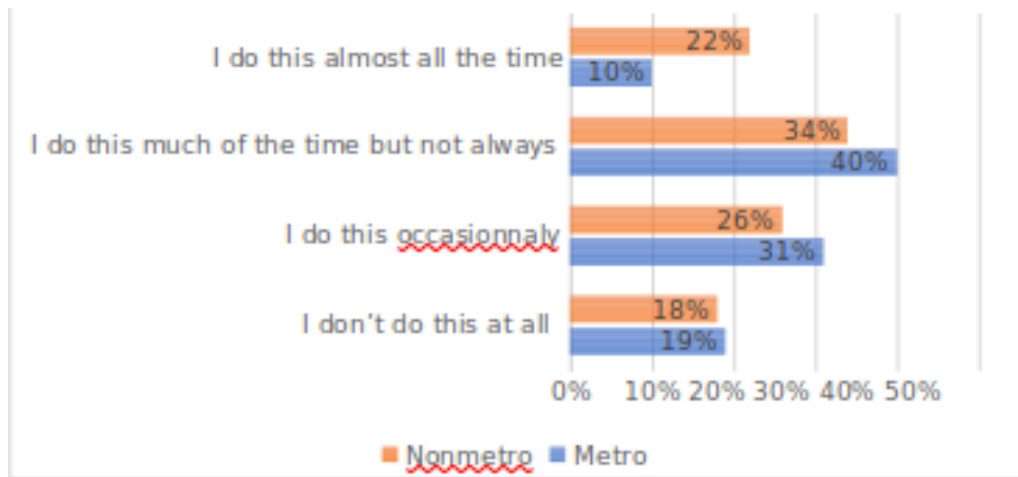
Dementia Risk-Reduction Behavior

Respondents were asked to specify dementia risk-reduction behaviors that are part of their daily routine. A total of six behaviors were examined (Table 6). The metro and the nonmetro differ only on the socializing behavior; 22% of the nonmetro respondents, more than twice the proportion of the metro respondents, state that they socialize with family and friends all the time (Figure 3).

Earlier, I provided empirics in support of the argument that nonmetro residents take medications to help with their memory

(Figure 2). Given this, to what extent does the nonmetro respondent engage in behavior that reduces dementia risk? A typical respondent who takes medication for memory occasionally eat nutritious and well-balanced meals, seldom socializes with family and friends, and only occasionally gets enough restful sleep (Table 7). Put another way, the tendency to take medications for help with memory dampens or reduces dementia risk-reducing behavior.

Figure 3: Socializing with Family and Friends: Metro vs. Nonmetro



Note: $\chi^2 = 10.17$, $p < .05$. $N = 624$ for the metro and 68 for the nonmetro.

Table 6: Risk Reduction Behavior, Metro vs. Nonmetro (N = 623-626 for the Metro and N = 65-68 for the Nonmetro)

Behavior	Response: I do this ...								ϕ
	No, Not at All		Occasionally		Much of the Time		All the Time		
	Metro	Non-metro	Metro	Non-metro	Metro	Non-metro	Metro	Non-metro	
Eating nutritious, well-balanced meals	21%	23%	45%	32%	31%	42%	3%	4%	.08
Exercising	19%	12%	25%	19%	40%	48%	16%	21%	.08
Socializing with family and friends	19%	18%	31%	26%	40%	34%	10%	22%	.12
Managing stress effectively	26%	20%	39%	50%	28%	26%	7%	4%	.07
Getting enough restful sleep	25%	19%	38%	36%	27%	30%	9%	14%	.06
Engaging in mentally-stimulating activities	26%	23%	37%	36%	28%	33%	8%	8%	.03

Table 7: Impact of Taking Medicine for Memory: Nonmetro Respondents

Behavior	Typical Values, Modal Response
Eating nutritious, well-balanced meals	Occasionally (49%)
Exercising	Occasionally (45%)
Socializing with family and friends	Not at all (33%)
Managing stress effectively	Occasionally (45%)
Getting enough restful sleep	Occasionally (70%)
Engaging in mentally-stimulating activities	Occasionally (30%)

In order to identify factors that make a person engage in dementia risk-reduction behavior, two questions guided data analysis:

- (i) are the population central tendencies, for both demographic and perceptual factors, the same for persons who do and do not engage in risk-reduction behavior;
- (ii) if not, then what combination of factors is most responsible for the differences.

Logistic procedures were used to test the effects of predictors on the respondents' dementia risk-reduction behavior; the forward selection algorithm was employed. The Wald tests of individual effects show that one's income and perceptions about memory problems and their consequences are related to one engaging in dementia risk-reduction behavior (Table 8).

Table 8: Wald Tests of Individual Effects

Effect	DF	Wald Chi-Square	p
Income	6	24.8409	.0004
More problems with memory than others of my age	1	11.2115	.0008
If dementia, can't afford health insurance	1	12.4407	.0004
If dementia, can't get long-term care insurance	1	6.7820	.0095

The odds ratios for the variables are shown in Table 9; it shows that moving one from low income, less than \$10,000, to high income, greater than \$150,000, increases one's odds of risk-reducing behavior by a factor of 14.16. Similarly, a change in perceptions about the statement "... have more problems with memory than others ...", from a "no" to a "yes" increases the odds of risk-reducing behavior by a factor of 11.21.

Table 9: Odds Ratio Estimates

Effect	Point Estimate	95% Wald CI	
Income 1 vs 7	14.161	4.035	49.706
Income 2 vs 7	3.559	1.595	7.941
Income 3 vs 7	2.807	1.437	5.483
Income 4 vs 7	2.542	1.24	5.211
Income 5 vs 7	1.43	0.619	3.306
Income 6 vs 7	2.099	1.041	4.234
More problems with memory than others my age, 0 vs 1	0.414	0.247	0.693
If dementia, can't afford health insurance	0.534	0.377	0.757
If dementia, can't get long-term care insurance	1.603	1.122	2.29

Note: Value labels for income: 1 = <\$10,000; 2 = \$10k-<\$25k; 3 = \$25k-<50k; 4 = \$50k-<\$75k; 5 = \$75k-<100k; 6 = \$100k-<\$150k; 7 = \$150k or more.

Summary and Conclusion

This paper uses microdata from the AARP survey on the “Perceptions Related to a Dementia Diagnosis: Adults Age 40+” to address a set of three questions:

- (i) What proportion of Midwesterners in the 40+ age group believe that they are at higher risk of dementia and how do they describe their brain health?
- (ii) Are they willing to get screened for dementia?
- (iii) What is the likelihood that they would engage in activities that would maintain their mental health?

The focus was on the Midwest region and metro / nonmetro geographies. A total of 694 cases were used in data analysis, 90% were from the metro. The average age of the respondent was 60. Less than one-in-ten respondents from the nonmetro were non-Whites whereas the metro was home to 22% of the non-Whites.

Statistical analysis of data reveals that:

- (i) The proportion of Midwesterners who believe that they are at a higher risk of dementia is 17%; the proportion doesn't differ among the four Census regions: Northeast, Midwest, South, and West.

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- (ii) A higher proportion in the nonmetro rate their brain health as “poor”, 4% in the nonmetro compared to less than 1% in the metro.
 - (iii) More in the nonmetro take medications to help with their memory, 7% in the nonmetro compared to less than 1% in the metro.
 - (iv) The fear of getting dementia is more among the metro respondents, 53% compared to 49% for the nonmetro.
 - (v) A majority (93%) of those who believe in having a higher risk of dementia were willing to get tested for dementia.
 - (vi) The tendency to take medications for help with memory dampens or reduces dementia risk-reducing behavior; a typical respondent who takes medication for memory occasionally eat nutritious and well-balanced meals, seldom socializes with family and friends, and only occasionally gets enough restful sleep, and
 - (vii) A change in perceptions about the statement “... have more problems with memory than others ...”, from a “no” to a “yes” response increases the odds of risk-reducing behavior by a factor of 11.21.

The results add strong support to the argument that nonmetro geographies need policy interventions to bolster and maintain the physical and mental health of the population¹¹. An immediate need would be to identify the segment of the population that are not engaged in dementia risk-reducing behavior and influence them to act; this process should begin by constructing county-level data to understand both individual and contextual factors that influence the target behavior.

¹¹ Athiyaman, A. (2023). Health Policy for Rural Illinois, Data for Policy Development. *Research Brief*, 5(4), February 25. Available: http://iira.org/wp-content/uploads/2023/07/RB5_4-Health-Policy-for-Rural-Illinois-Data-for-Policy-Development.pdf.

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