

Supporting Table 1. Comparison of Rural-Urban Classification Indexes: United States, Midwest, and Wisconsin

					Land Area (square miles)				Geographical Units				Total Population				Papers
					Urban		Rural		Urban		Rural		Urban		Rural		
Index	Geographical Unit	Urban Codes	Rural Codes	Region	Square Miles	% of Total	Square Miles	% of Total	Count	% of Total	Count	% of Total	Total	% of Total	Total	% of Total	
UACE (2010)	Census Blocks	Urban Area Urban Cluster	None	USA	106,386	3.0%	3,425,519	97.0%					249,253,271	80.7%	59,492,267	19.3%	Johnson 2016 <sup>1</sup> Pruitt 2015 <sup>2</sup> Virani 2011 <sup>3</sup>
				Midwest	23,013	3.1%	727,510	96.9%					50,771,646	75.9%	16,155,355	24.1%	
				Wisconsin	1,879	3.5%	52,279	96.5%					3,989,638	70.2%	1,697,348	29.9%	
FAR (2010)	ZIP/ 0.5^2 km grid	None	1-4	USA	1,725,471	48.0%	1,868,901	52.0%	25,008	82.4%	5,329	17.6%	296,083,828	96.1%	12,156,019	3.9%	Pruitt 2015 <sup>2</sup>
				Midwest	419,503	54.7%	347,517	45.3%	7175	76.8%	2172	23.2%	62,923,209	94.1%	3,955,309	5.9%	
				Wisconsin	43,892	78.2%	12,214	21.8%	629	86.8%	96	13.2%	5,497,147	96.8%	182,725	3.2%	
RUCA (2010) (option 1)	Census Tract	1-3	4-10	USA	847,792	24.0%	2,683,986	76.0%	59,389	81.3%	13,390	18.3%	257,810,493	83.5%	50,935,045	16.5%	Onega 2017 <sup>4</sup> Cetnar 2013 <sup>5</sup> White 2011 <sup>6</sup>
				Midwest	170,061	22.7%	580,432	77.3%	12604	74.1%	4409	25.9%	50,817,496	75.9%	16,109,505	24.1%	
				Wisconsin	15,689	29.0%	38,469	71.0%	971	68.9%	423	30.0%	4,045,911	71.1%	1,641,075	28.9%	
RUCA (2010) (option 2)	Census Tract	1.0, 1.1, 2.0, 2.1, 3.0, 4.1, 5.1, 7.1, 8.1, and 10.1	Others	USA	921,261	26.1%	2,610,517	73.9%	60,026	82.5%	12,753	17.5%	260,671,526	84.4%	48,074,012	15.6%	Bradley 2020 <sup>7</sup> Yaghjian 2019
				Midwest	184,952	24.6%	565,542	75.4%	12743	74.9%	4270	25.1%	51,408,846	76.8%	15,518,155	23.2%	
				Wisconsin	16,483	30.4%	37,675	69.6%	987	70.8%	407	29.2%	4,124,850	72.5%	1,562,136	27.5%	
RUCA(z) (2013) (option 1)	ZCTA	1-3	4-10	USA					24,497	59.7%	16,553	40.3%					Hung 2020 <sup>8</sup> Onega 2019 Kinney 2016 <sup>9</sup>
				Midwest					5362	47.1%	6031	52.9%					
				Wisconsin					408	45.6%	487	54.4%					
RUCA(z) (2013) (option 2)	ZCTA	1.0, 1.1, 2.0, 2.1, 3.0, 4.1, 5.1, 7.1, 8.1, and 10.1	Others	USA					28,277	68.9%	12,773	31.1%					Rogers 2020 <sup>10</sup> Freeman 2019 <sup>11</sup> Markossian 2016 <sup>12</sup>
				Midwest					6496	57.0%	4897	43.0%					
				Wisconsin					521	58.2%	374	41.8%					
RUCC (2013)	County	1-3	4-9	USA	978,308	27.7%	2,553,597	72.3%	1,167	37.1%	1,976	62.9%	262,452,132	85.1%	43,293,406	15.0%	Gosain 2019 <sup>13</sup> Zahnd 2018 <sup>14</sup> Blake 2017 <sup>15</sup>
				Midwest	182,601	24.3%	567,922	75.7%	302	28.6%	753	71.4%	51,690,737	77.2%	15,236,264	22.8%	
				Wisconsin	16,821	31.1%	37,337	68.9%	26	36.1%	46	63.9%	4,178,924	73.5%	1,508,062	26.5%	
UIC (2013)	County	1-2	3-12	USA	978,308	27.7%	2,553,597	72.3%	1,167	37.1%	1,976	62.9%	262,452,132	85.0%	46,293,406	15.0%	Mobley 2019 <sup>16</sup> Cole 2013 <sup>17</sup> Baldwin 2013 <sup>18</sup>
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NCHS URCSC (2013)	County	1-4	5-6	USA	978,308	27.7%	2,553,597	72.3%	1,167	37.1%	1,976	62.9%	262,452,132	85.0%	46,293,406	15.0%	Garcia 2019 <sup>19</sup> Callaghan 2018 <sup>20</sup>
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CBSA (2013)	County	Metro Statistical Area Micro Statistical Area	Non-core	USA	1,674,010	47.4%	1,857,895	52.6%	1,808	57.5%	1,335	42.5%	289,606,345	93.8%	19,139,193	6.2%	Yaghjian 2019 Tran 2019 <sup>21</sup> Hashibe 2018 <sup>22</sup>
				Midwest	343,220	45.7%	407,302	54.3%	534	50.6%	521	49.4%	60,583,984	90.5%	6,343,017	9.5%	
				Wisconsin	27,836	51.4%	26,321	48.6%	40	55.6%	32	44.4%	4,957,944	87.2%	729,042	12.8%	
IRR (2010)	County	Set: < 0.5000	Set: >= 0.5000	USA	877,936	24.9%	2,652,796	75.1%	1,162	37.0%	1,979	63.0%	273,069,268	88.5%	35,521,346	11.5%	Cohen 2017 <sup>23</sup> Waldorf 2015
				Midwest	179,070	23.9%	571,452	76.1%	309	29.3%	746	70.7%	55,588,772	83.1%	11,338,229	16.9%	
				Wisconsin	18,579	34.3%	35,579	65.7%	29	40.3%	43	59.7%	4,631,271	81.4%	1,055,715	18.6%	

Schiefelbein AM, Krebsbach JK, Taylor AK, et al. Same People, Different Results: Categorizing Cancer Registry Cases Across the Rural-Urban Continuum. *WMJ*. 2024;123(2); published online April 1, 2024.

Rural-Urban classification indexes in use in current cancer research and the amount and percentage of total land area, number of geographical units, and population that each index allocates to urban and rural codes. Indexes include Urban Rural Classification of Urban Areas and Urban Clusters (UACE), Frontier and Remote Area Codes (FAR), Rural-Urban Commuting Area (RUCA), ZIP Code Tabulation Area Rural-Urban Commuting Area (RUCA(z)), Rural-Urban Continuum Codes (RUCC), Urban Influence Codes (UIC), National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties, Core Based Statistical Areas (CBSA), and Index of Relative Rurality (IRR). RUCA codes are divided into rural and urban groupings based on 2 separate processes, represented as option 1 and option 2 for each the census-tract and ZCTA-based codes. The year in parentheses indicates the version of the index that was used. Midwest states include North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, and Ohio.

**Supporting Table 2.** Agreement Between Binary and Ternary Rural-Urban Indexes Across Census Tracts, Land Area, and Population for the United States and UW Health Pancreatic Cancer Registry Patients

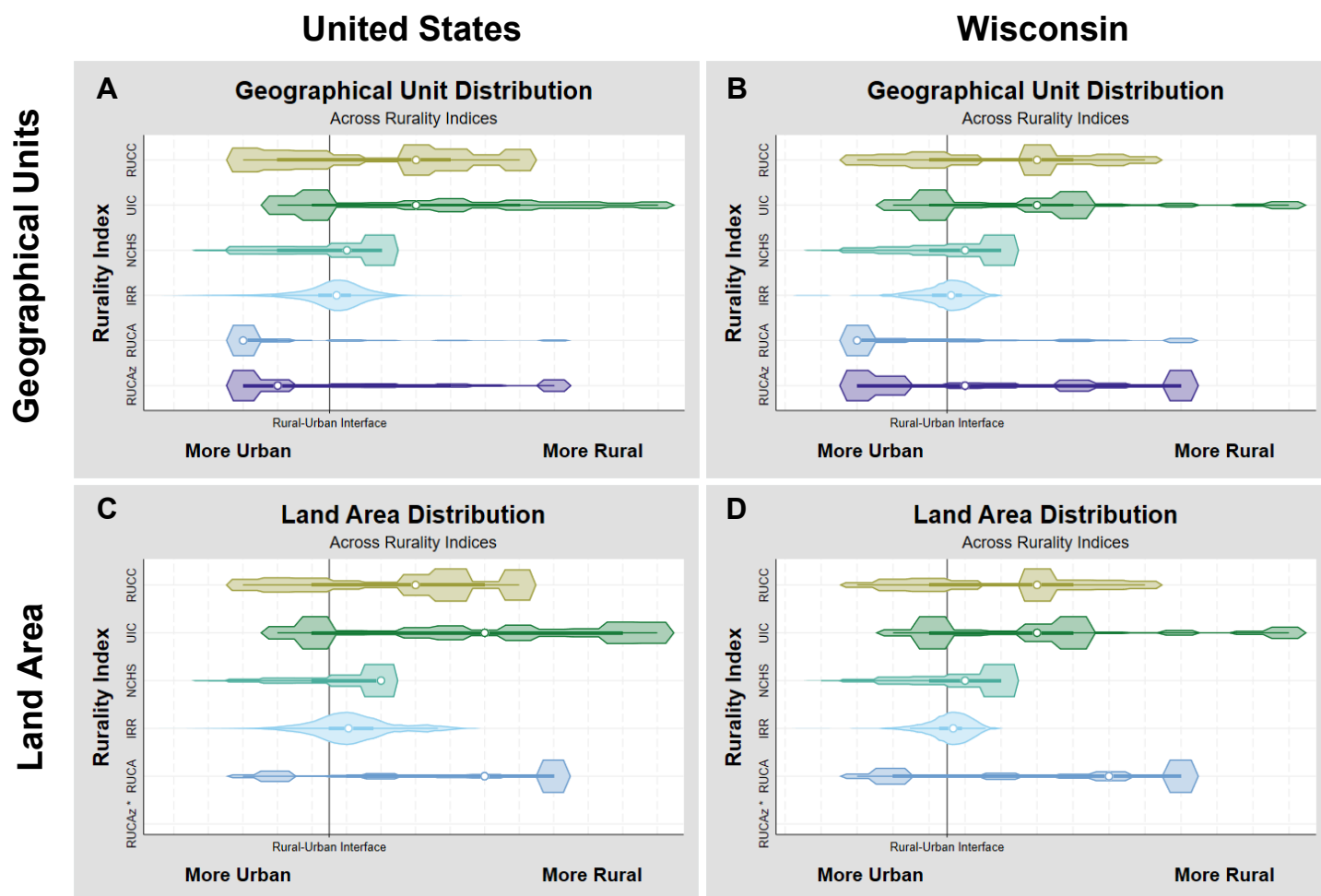
				Land Area (square miles)			Census Tracts			Population			Registry Patients*		
Variable Type	Indexes Included	Agreement and Disagreement	Rural - Urban Category	Count	Percent	% agree- or disagreement	Count	Percent	% agree- or disagreement	Count	Percent	% agree- or disagreement	Count	Percent	% agree- or disagreement
Binary	RUCC, UIC, NCHS, IRR, RUCA	Agree	Metropolitan	535,871	15.2%	78.7%	57,051	78.4%	88.3%	247,994,082	80.3%	88.8%	908	59.0%	73.4%
			Non-metropolitan	2,242,865	63.5%		7,242	10.0%		26,248,722	8.5%		222	14.4%	
		Disagree	Metropolitan & Non-metropolitan	751,869	21.3%	21.3%	8,448	11.6%	11.6%	34,347,840	11.1%	11.1%	408	26.5%	26.5%
Binary	RUCC & RUCA	Agree	Metropolitan	676,901	19.2%	86.6%	58,050	79.8%	94.5%	252,306,164	81.7%	94.9%	920	59.8%	91.0%
			Non-Metropolitan	2,382,706	67.5%		10,742	14.8%		40,789,077	13.2%		480	31.2%	
		Disagree	Metropolitan & Non-metropolitan	472,171	13.4%	13.4%	3,987	5.5%	5.5%	15,650,297	5.1%	5.1%	138	9.0%	9.0%
Ternary	RUCC, UIC, NCHS, IRR, RUCA	Agree	Metropolitan	535,871	15.2%	41.3%	57,051	78.4%	81.8%	247,994,082	80.3%	83.4%	908	59.0%	60.4%
			Micropolitan	250,702	7.1%		2,104	2.9%		8,722,475	2.8%		21	1.4%	
			Rural/Noncore	672,911	19.1%		399	0.5%		886,289	0.3%		1	0.1%	
		Disagree (1 level)	Metropolitan & Micropolitan	353,001	10.0%	47.3%	5,610	7.7%	14.2%	24,208,656	7.8%	13.2%	244	15.9%	28.8%
			Micropolitan & Rural/Noncore	1,319,251	37.4%		4,739	6.5%		16,639,958	5.4%		200	13.0%	
		Disagree (2 levels)	Metropolitan & Rural/Noncore	186,851	5.3%	5.3%	1,421	2.0%	2.0%	4,639,840	1.5%	1.5%	28	1.8%	1.8%
		Disagree (all levels)	Metropolitan, Micropolitan, & Rural/Noncore	212,017	6.0%	6.0%	1,417	1.9%	1.9%	5,499,314	1.8%	1.8%	136	8.8%	8.8%
Ternary	RUCC & RUCA	Agree	Metropolitan	676,901	19.2%	54.1%	58,050	79.8%	88.3%	252,306,164	88.4%	88.8%	920	59.8%	74.9%
			Micropolitan	405,347	11.5%		5,071	7.0%		405,347	0.1%		184	12.0%	
			Rural/Noncore	827,415	23.4%		1,177	1.6%		827,415	0.3%		49	3.2%	
		Disagree (1 level)	Metropolitan & Micropolitan	201,571	5.7%	38.3%	2,484	3.4%	9.6%	10,777,424	3.8%	9.5%	87	5.7%	21.7%
			Micropolitan & Rural/Noncore	1,149,944	32.6%		4,494	6.2%		16,270,060	5.7%		247	16.0%	
		Disagree (2 levels)	Metropolitan & Rural/Noncore	270,599	7.7%	7.7%	1,503	2.1%	2.1%	4,872,873	1.7%	1.7%	51	3.3%	3.3%

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\* RUCA(z) was used in place of RUCA for the Registry Patients since patient ZIP codes were available in the registry and census tracts were not.

Count and percent agreement of census tracts, land area (square miles), population, and Registry patients across Rural-Urban Continuum Codes (RUCC), Urban Influence Codes (UIC), National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties, Index of Relative Rurality (IRR), Rural-Urban Commuting Area (RUCA), and ZIP Code Tabulation Area Rural-Urban Commuting Area (RUCA(z)) when those indexes are treated as binary and ternary rural-urban variables. The Index of Relative Rurality was missing data for 0.1% of the US Population and Registry Patients.

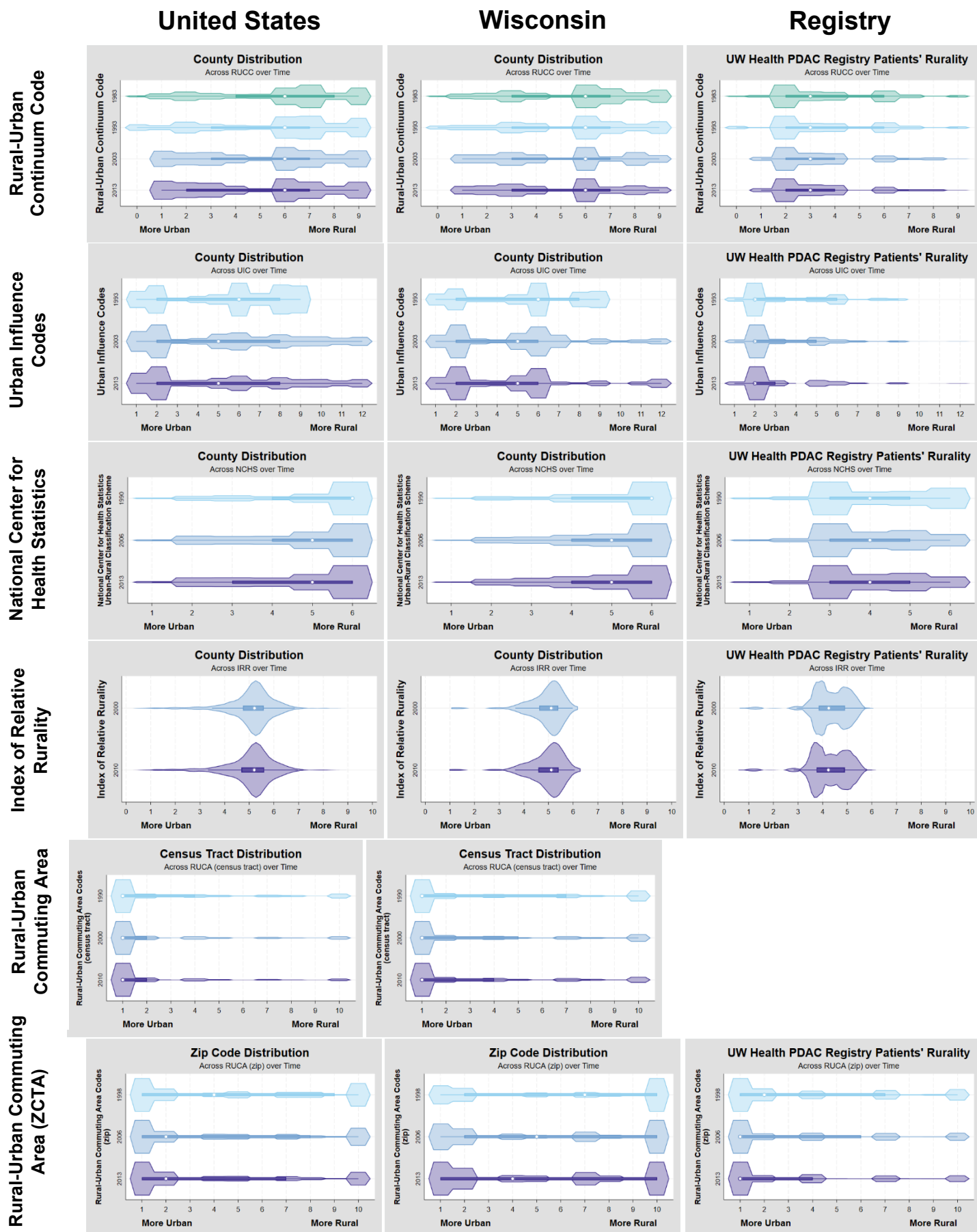
Supporting Figure 1. Comparison of Rural-Urban Indexes by Land Area and Geographical Unit Distributions



Geographical unit is measured at the county-level for Rural-Urban Continuum Codes (RUCC), Urban Influence Codes (UIC), National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties, and Index of Relative Rurality (IRR), census-tract level for Rural-Urban Commuting Area (RUCA), and ZIP Code Tabulation Area (ZCTA) level for ZCTA Rural-Urban Commuting Area (RUCA(z)) for the United States (A) and Wisconsin (B). Land area distributions are shown for the United States (C) and Wisconsin (D). Each index is standardized such that the 'Rural-Urban Interface' line lies between those values that the index has designated as urban (left of line) and rural (right of line). Center points indicate the median of the index, boxes indicate the inter-quartile range, and spikes indicate the upper- and lower-adjacent values (1.5 times the inter-quartile range).

\* RUCA(z) is based on 2013 ZCTAs. Land Area data is not available at the ZCTA-level for 2013, so those distributions are excluded from the figure.

Supporting Figure 2. Geographical Unit Distributions Over Time Across the United States, Wisconsin, and UW Health Pancreatic Cancer Registry Patients



Geographical unit is measured at the county-level for Rural-Urban Continuum Codes (RUCC), Urban Influence Codes (UIC), National Center for Health Statistics (NCHS) Urban-Rural Classification Scheme for Counties, and Index of Relative Rurality (IRR), census tract level for Rural-Urban Commuting Area (RUCA), and ZIP Code Tabulation Area (ZCTA) level for ZCTA Rural-Urban Commuting Area (RUCA(z)). Center points indicate the median of the index, boxes indicate the inter-quartile range, and spikes indicate the upper- and lower-adjacent values (1.5 times the inter-quartile range). Changes in the RUCC and UIC ranges are a result of changes in their respective methodologies.