



Emory Global Diabetes
Research Center



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Identifying Georgia Counties For Diabetes and Hypertension Programming: Which would Yield Greatest Population Health Benefit?

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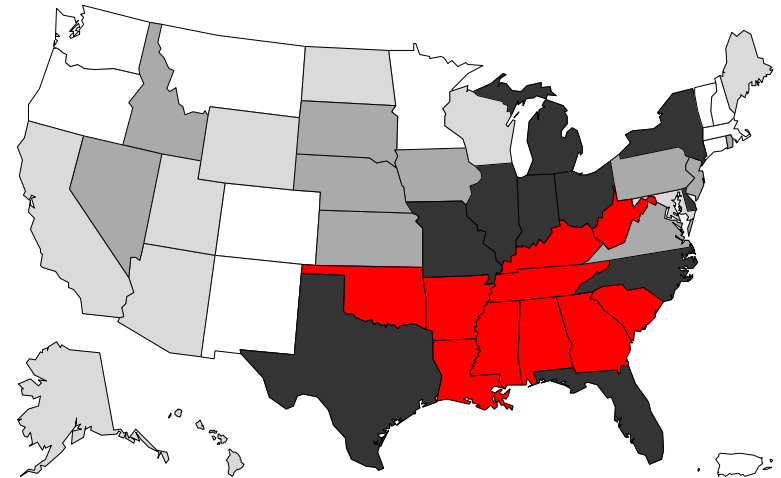
Overview

- Background and Objectives
- Methods
- Results
- Summary and conclusion

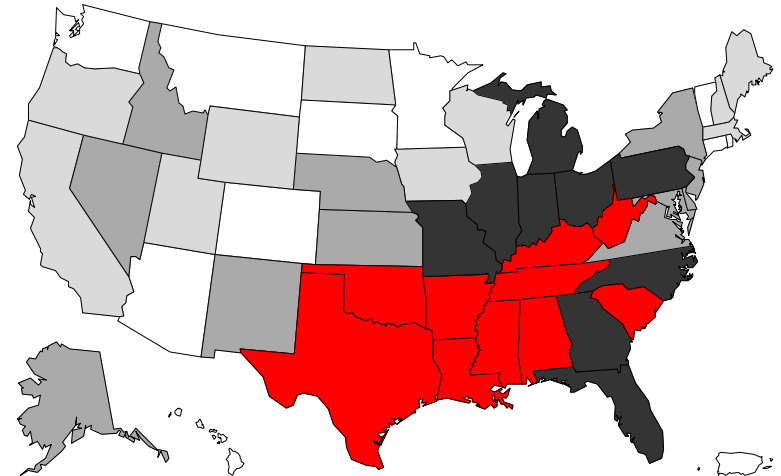
Background

- Georgia has among the highest levels of cardiovascular disease risk factors in the nation
- Diabetes and hypertension specifically are two preventable and treatable conditions that contribute significantly to the state disease burden

Distribution of CV Risk Index for Men



Distribution of CV Risk Index for Women



Q1 Lowest Q2 Q3 Q4 Q5 Highest

Cardiovascular (CV) risk index is a composite of current smoking, obesity, physical inactivity, alcohol abstinence, hypertension, elevated cholesterol, and diabetes estimated from principal components analysis. Data are from 2005 BRFSS, ages 40-69 years.

Objectives

- Use existing data sources to identify counties within Georgia where:
 - Establishing new or expanding Diabetes Prevention Programs (DPP) would yield the greatest population health benefit
 - Establishing or expanding hypertension control programs would yield the greatest population health benefit

Approach

- Identify counties with the highest proportion of **populations at risk** for diabetes and hypertension or poor outcomes
 - Consider pre-diabetes
 - Consider obesity, a shared risk factor for both diabetes and hypertension
 - Consider hospitalizations among young and middle aged adults, a special and high priority population at risk

Data sources

Behavioral Risk Factor Surveillance System, 2011-2012

Best available data to identify high risk populations

Justification:

- Only survey that provides reasonable estimates of high risk populations at the public health district level that can also be extrapolated to counties
- County-level identifiers only available up through 2012

Georgia OASIS Hospital Discharge Files

Provides data by county on hospitalizations designated due to diabetes and hypertension, respectively

Hospitalizations considered a “sentinel” marker of population risk

Indicators

Variable	Data source	Level of aggregation	Definition
Eligible for Diabetes Prevention Program (DPP)	BRFSS 2012	Public Health District	Being overweight (BMI ≥ 24) AND reporting pre-diabetes
Adult obesity	CDC estimates 2013. Derived from BRFSS; obtained from RWJF	County	BMI over 30
Diabetes hospitalizations in adults aged < 65 y	Georgia Oasis; discharge data 2015	County	% of total discharges due to diabetes; ages 20-44 y and 45-64 y
Hypertension hospitalizations in adults aged < 65 y	Georgia Oasis; discharge data 2015	County	% of total discharges due to hypertension ; ages 20-44 y and 45-64 y

Analysis

- Estimate prevalence/proportion of each indicator by county or health district
- Rank each variable into quintiles
- Create a summary “county risk score” that is the sum of the quintile ranking for each indicator
 - higher score=worse ranking within the state

Results

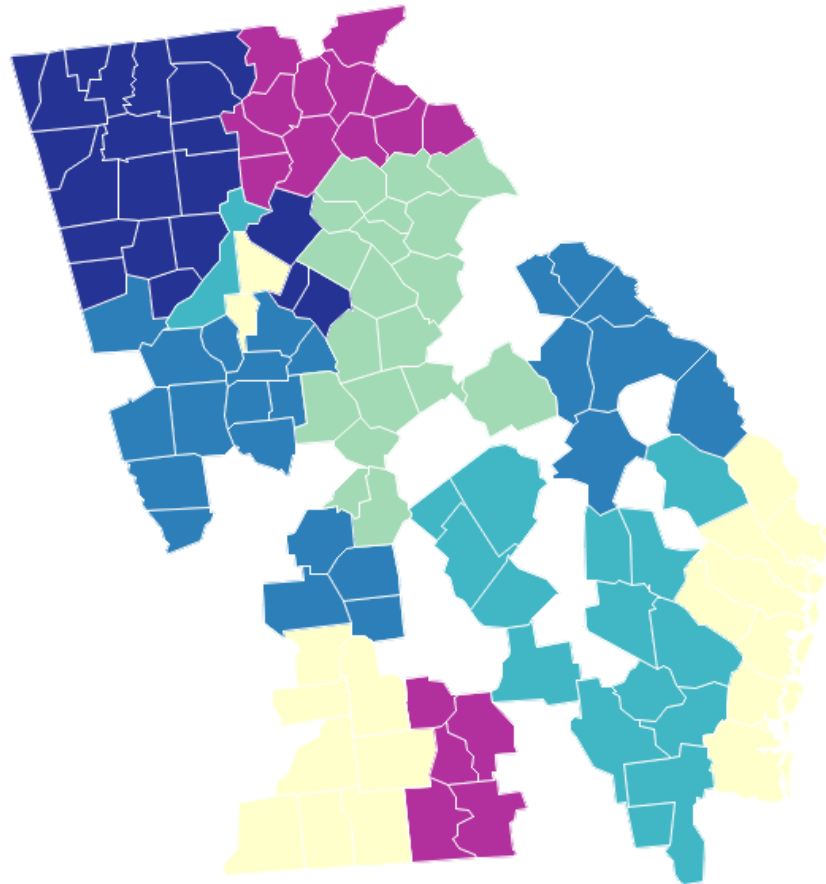
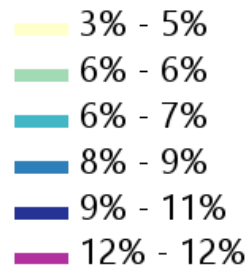
Adults at high risk for diabetes

“High risk” defined as overweight (BMI ≥ 24) AND having pre-diabetes. This is the definition used by DPP Trial group to define individuals eligible for the DPP intervention trial.

Health District	High Risk, %	Overweight, %	Pre-diabetes, %
1-1 Northwest	9.5 \pm 2.1	71.2 \pm 3.5	12.2 \pm 2.3
1-2 North Georgia	10.8 \pm 3.1	71.2 \pm 3.8	12.4 \pm 3.2
10-0 Northeast	6.2 \pm 1.8	72.9 \pm 4.1	7.8 \pm 1.9
2-0 North	11.9 \pm 3.1	71.7 \pm 3.3	14.1 \pm 3.2
3-1 Cobb-Douglas	10.1 \pm 2.3	63.5 \pm 3.8	12.5 \pm 2.5
3-2 Fulton	6.6 \pm 1.8	58.6 \pm 3.8	9.0 \pm 2.1
3-3 Clayton	3.5 \pm 2.0	83.2 \pm 4.1	4.4 \pm 2.1
3-4 East Metro	9.0 \pm 1.9	68.4 \pm 3.6	9.6 \pm 2.0
3-5 DeKalb	3.9 \pm 1.7	67.5 \pm 3.7	6.0 \pm 2.0
4-0 LaGrange	8.2 \pm 2.1	67.2 \pm 4.0	10.1 \pm 2.2
5-1 South Central	6.4 \pm 2.1	71.2 \pm 6.4	10.6 \pm 3.8
5-2 North Central	6.1 \pm 1.5	75.9 \pm 3.6	7.4 \pm 1.7
6-0 East Central	8.3 \pm 2.1	78.7 \pm 3.3	12.4 \pm 2.7
7-0 West Central	8.8 \pm 2.4	80.4 \pm 4.1	10.2 \pm 2.6
8-1 South	12.2 \pm 4.0	71.7 \pm 5.1	13.8 \pm 4.2
8-2 Southwest	2.7 \pm 1.0	72.1 \pm 4.1	4.1 \pm 1.2
9-1 Coastal	5.5 \pm 1.5	70.7 \pm 3.7	7.4 \pm 1.8
9-2 Southeast	7.0 \pm 1.9	74.2 \pm 5.3	9.8 \pm 2.7

Geographical distribution of individuals with high diabetes risk

High Risk for Diabetes, %



High risk defined as overweight (BMI ≥ 24) AND having pre-diabetes. Counties missing shading were not included in the 2012 BRFSS publicly available data. Shading reflects quartiles of risk.

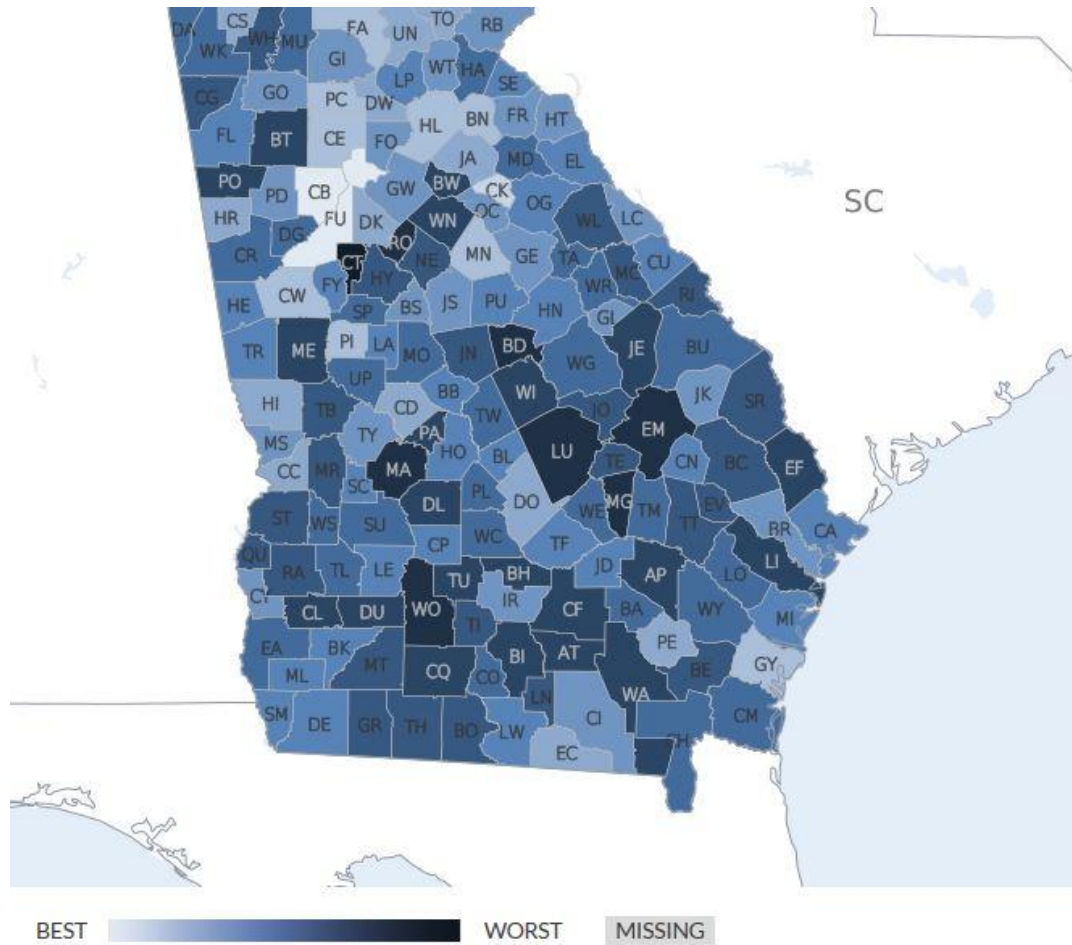
Potential cases prevented (annual)

	Size of high risk population	Number expected diabetes cases with no DPP (currently observed scenario)	Expected fewer new diabetes cases with DPP		
			100% coverage of DPP	50% coverage of DPP	25% coverage of DPP
1-1 Northwest	28487	3134	1766	883	442
1-2 North Georgia	28345	3118	1757	879	439
10-0 Northeast	17290	1902	1072	536	268
2-0 North	35657	3922	2211	1105	553
3-1 Cobb-Douglas	32102	3531	1990	995	498
3-2 Fulton	25459	2800	1578	789	395
3-3 Clayton	3761	414	233	117	58
3-4 East Metro	48643	5351	3016	1508	754
3-5 DeKalb	13882	1527	861	430	215
4-0 LaGrange	31711	3488	1966	983	492
5-1 South Central	3594	395	223	111	56
5-2 North Central	14391	1583	892	446	223
6-0 East Central	24317	2675	1508	754	377
7-0 West Central	13078	1439	811	405	203
8-1 South	15125	1664	938	469	234
8-2 Southwest	4842	533	300	150	75
9-1 Coastal	17314	1905	1073	537	268
9-2 Southeast	12299	1353	763	381	191
TOTAL	395,000	43,464	24,498	12,249	6,124

Location of DPP programs

<i>County</i>	<i>City</i>	<i>Program</i>
Carroll	Carrollton	Tanner Medical Center/Carrollton
	Villa Rica	Tanner Medical Center/Villa Rica
Catoosa	Ringgold	North Georgia Community YMCA
Chatham	Savannah	St. Joseph's/Candler Diabetes Management
Cobb	Marietta	Cheerful Habits LLC
	Powder Springs	Lakeview Seventh Day Adventist Church
	Marietta	McCleskey-East Cobb YMCA
	Marietta	Northeast Cobb YMCA
	Kennesaw	Northwest YMCA
Coweta	Newnan	Summit Family YMCA
DeKalb	Atlanta	Cowart-Ashford Dunwoody YMCA
	Decatur	Decatur Family YMCA
	Atlanta	East Lake Branch YMCA
	Decatur	Midha Medical Clinic
	Stone Mountain	Wade Walker Park YMCA
Douglas	Douglasville	New South Development Corporation
Floyd	Rome	Diabetes Education Department-Floyd Diabetes Prevention Program
	Rome	Floyd Medical Center
Fulton	Atlanta	Andrew and Walter Young Family YMCA
	Atlanta	Buckhead Functional Medicine
	Atlanta	Carl E. Sanders Family YMCA at Buckhead
	Atlanta	Collier Heights Recreation Center
	Roswell	Integrative CAP Health Practices LLC
	Atlanta	Providence Missionary Baptist Church
	Atlanta	The Villages at Carver Family YMCA
	Atlanta	Thrive Now Nutrition
Gwinnett	Lawrenceville	J. M. Tull-Gwinnett Family YMCA
	Norcross	Robert D. Fowler Family YMCA
Hall	Gainesville	JA Walters YMCA - Northeast Georgia Medical Center
Lowndes	Valdosta	Barnes Healthcare Services
Muscogee	Columbus	Midtown Medical Center Conference Center
Thomas	Thomasville	Thrive Physical Therapy and Fitness

Adult obesity

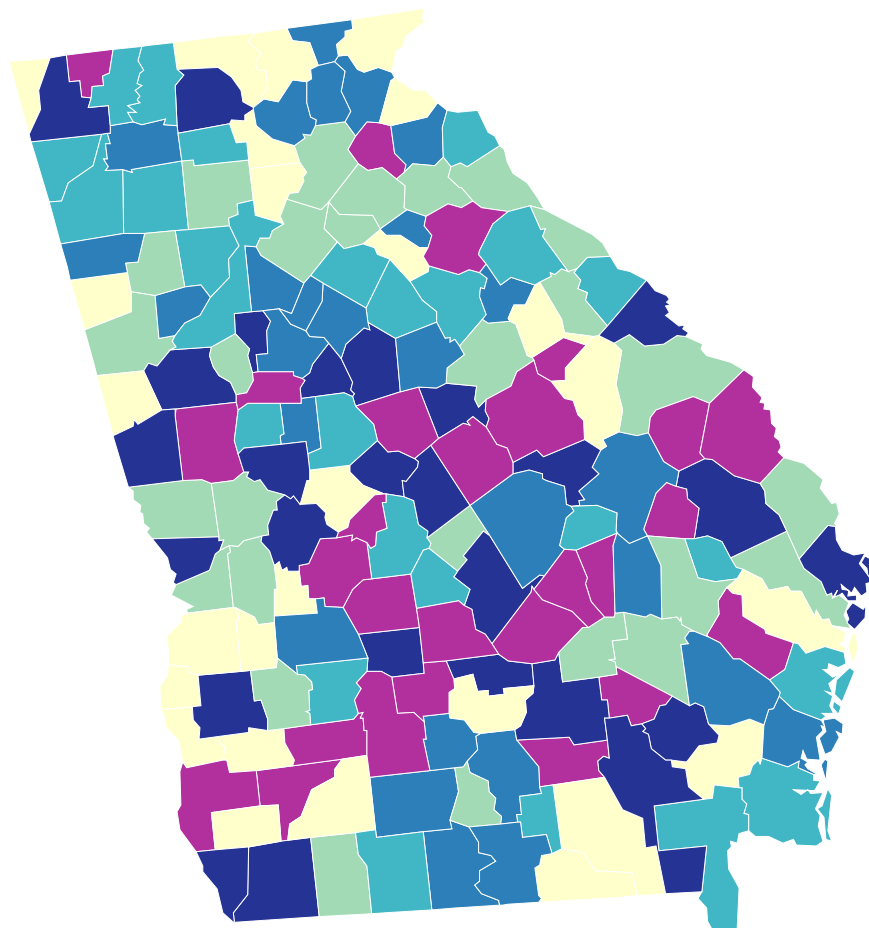
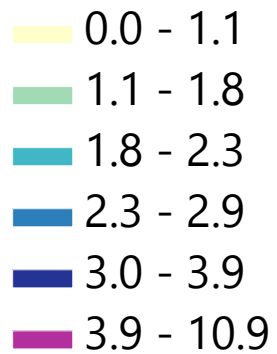


Robert Wood Johnson County Health Rankings, 2017

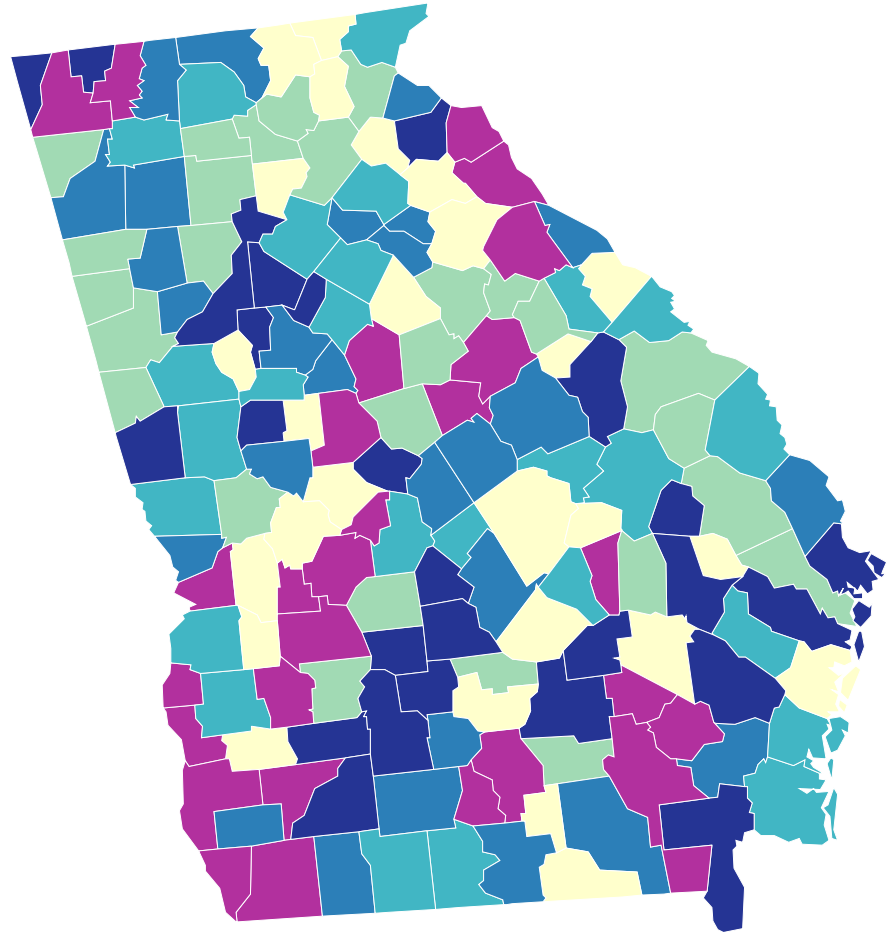
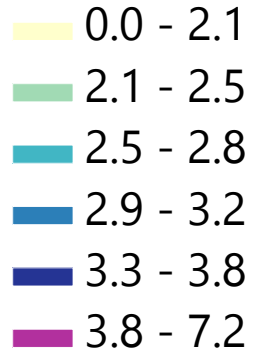
Summary of indicators available at the County-level

Variable	Percentile			
	20	40	60	80
Adult obesity	28.8	30.9	32.1	34
% Diabetes discharges, 20-44y	1.3	1.9	2.7	3.7
% Diabetes discharges, 45-64y	2.2	2.6	3	3.7
% Hypertension discharges, 20-44y	0	0.4	0.6	1
% Hypertension discharges, 45-64y	0.5	0.7	1.1	1.6
Risk Score	6	9	11	14

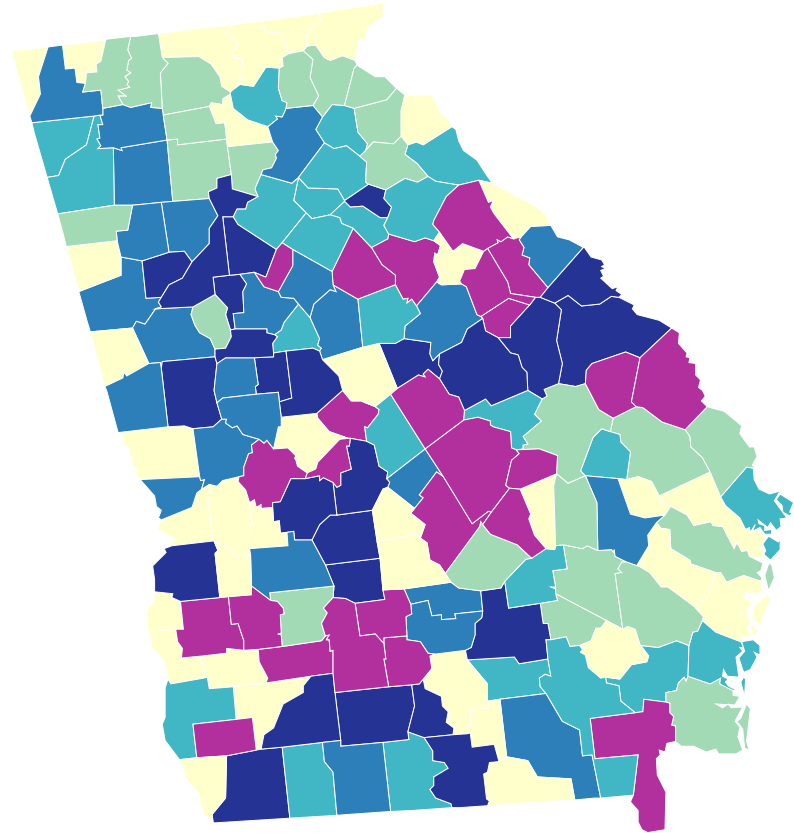
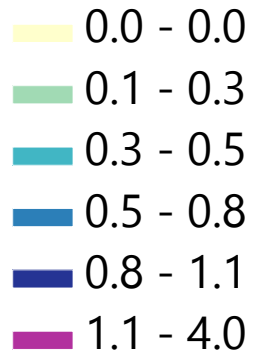
% Diabetes Discharges, 20-44y



% Diabetes Discharges, 45-64y

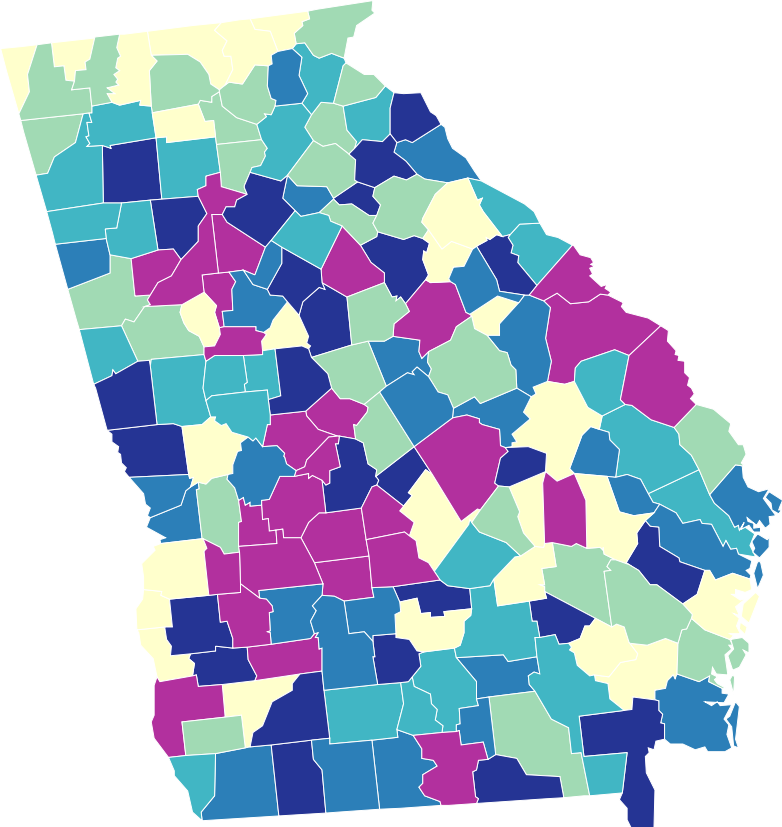


% Hypertension Discharges, 20-44y



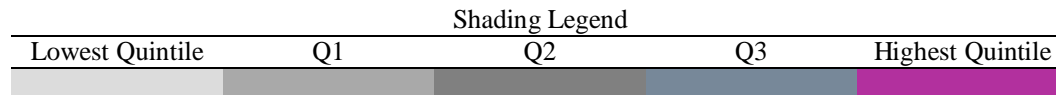
% Hypertension Discharges, 45-64y

- 0.0 - 0.4
- 0.4 - 0.7
- 0.7 - 0.9
- 0.9 - 1.2
- 1.2 - 1.7
- 1.7 - 3.4



The 10 most vulnerable counties: Composite score

County	Adult Obesity, %	% Hospitalizations of total in that age group				Risk Score	Number of DPP programs
		Diabetes, 20-44y	Diabetes, 45-64y	Hypertens ion, 20-44y	Hypertens ion, 45-64y		
Macon	36.4	3.9	5.8	1.1	1.9	20	0
Peach	34.4	5.0	4.9	1.7	2.4	20	0
Dougherty	34.4	5.4	3.7	1.4	1.9	19	0
Turner	34.6	6.5	3.7	1.4	1.1	19	0
Clayton	38.0	3.5	3.3	1.1	1.9	18	0
Worth	36.7	5.2	3.7	1.9	1.1	18	0
Bibb	31.3	3.5	3.7	1.2	1.8	17	0
Dooly	34.7	7.5	2.4	1.1	2.2	17	0
Wilkinson	34.5	7.6	2.9	1.7	1.2	17	0
Bacon	32.7	4.7	5.3	0.3	1.7	16	0



Conclusions

- Using multiple measures of population vulnerability, we examined diabetes and hypertension related risk factors and outcomes in GA
- Counties with the highest number of individuals at high risk for diabetes (pre-diabetes + overweight) were located in the northern part of the state
- Counties at highest risk for poor diabetes and hypertension outcomes using hospitalizations in ages < 65 were scattered throughout the state, but tended to be located in central and southern GA

Conclusions, con'd

- The discrepancy between the two approaches (prevalence of pre-diabetes among the overweight versus hospitalizations) may be due to self-reported data used for the pre-diabetes indicator
 - Individuals who have better resources may be more aware of their pre-diabetes, while the individuals with least resources are more prone to preventable hospitalizations
- Tracking hospitalizations may be a better way of identifying vulnerable counties with existing data