



## Exploring obesity in a ten-year school-based health screening

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## Background

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*Childhood obesity has advanced into a fast-growing epidemic, disproportionately impacting minorities and low socioeconomic populations, especially those living in rural environments.*

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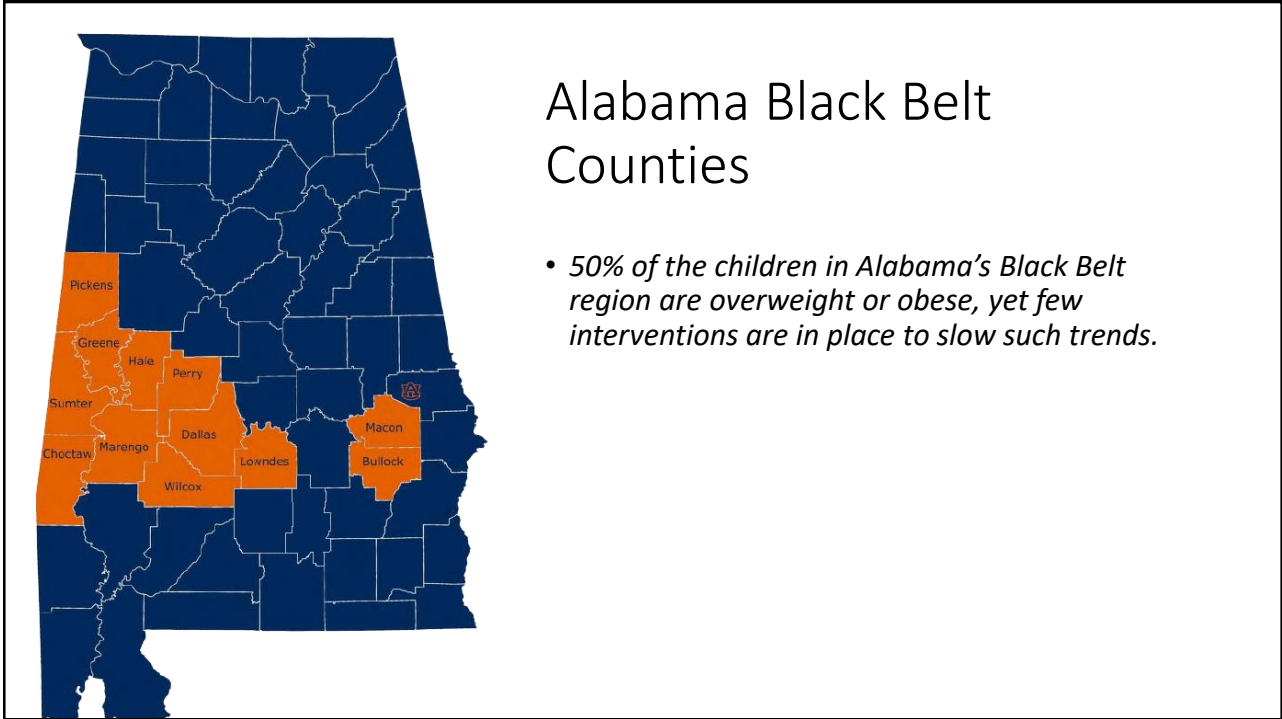
*Obese children tend to become obese adults, and 280,000 deaths are attributed to obesity in the United States annually.*

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*In addition to physical effects, obesity has been identified as a risk factor for low self-esteem and other psychological problems.*

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*Region and Population*

- *The Black Belt Region encompasses 18 counties.*
- *The plantation history of this region has left it in a state of economic depression, underemployment, and poor social services.*
- *Contains 9 out of 10 of the poorest counties in Alabama.*

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# TigerCheck™

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## Screenings

- Blood Pressure
- HR/ RR
- Physical Assessments
- Weight
- Height
- Vision
- Hearing
- Dental
- Scoliosis
- Abnormal findings



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## Intervention (Year 2010-present)

- TigerCheck™- we partner with K-12 schools for child health screening.
- Faculty and undergraduate nursing students provide an in-school basic screenings.
- Scoliosis screening for middle school students (4<sup>th</sup>-7<sup>th</sup>), depending on school, is also part of the assessment.

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## Follow-up

- Data obtained during these screenings are entered into an electronic database and shared with the school nurse at the individual schools.
- Individual student health data is then shared with the parents and recommendations for any follow-up with health care providers is provided.

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## Counties with Intervention

- Macon
- Bullock
  
- Lee
- Tallapoosa

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## County 1, Alabama

- *Population:*  
18,895;  
80.4% black, 17.3% white, 1.9% Hispanic
- *Median household income: \$35,450*
- *Data*  
47.7% male, 52.3% female,  
97.7% black, 1.5% white, 0.3% Hispanic, and 0.5% other

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## County 2, Alabama

- *Population:*

- 10,320;
- 70.3% black, 26.6% white, 8.6% Hispanic

- *Median household income: \$33,866*

- *Data*

43.8% male, 56.2% female,  
86.6% black, 0.6% white, 12% Hispanic, and 0.8% other

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## Methods

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- *The school-based screening intervention was implemented in 10 schools in across 3 counties in eastern Alabama from fall 2010 to spring 2019.*
- *This intervention continues, but we wanted to explore data pre-pandemic.*
- *The schools are located in low-income, rural communities with rates of child poverty (27%) and obesity (22%) all above statewide and national averages.*
- *The intervention was developed based on a longstanding collaboration between the school district and academic nursing program.*
- *Observations and data analysis conducted by nurses were approved by the Institutional Review Board.*

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## Data Analysis

- $N = 11604$ 
  - 46% male
  - 54% female
- Height and weight used to calculate BMI using Center for Disease Control and Prevention (CDC)
  - $BMIz = [(BMI/M)^L - 1] / (L * S)$  where respective M, L and S values were sourced from the CDC identified data within 3 standard deviations of the mean respective to sex and age.
  - $BMIz > |3|$  indicates data that fall significantly above the 97% percentile and below the 3rd percentile, statistical grounds to exclude from analysis.
  - BMI between the 15th and 85th percentile classifies healthy weight; BMI at or above the 85th percentile is considered overweight; BMI at or above the 95th percentile is considered obese.

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## BMI Results

BMI * Year						
BMI						
Year	Mean	N	Std. Deviation	Minimum	Maximum	% of Total Sum
1	21.8098405	2321	6.22299200	12.6540000	61.7308876	20.2%
2	21.6531830	2479	6.46028302	12.5363512	54.0561323	21.4%
3	20.8843364	1998	5.73776486	12.8829654	54.0769231	16.7%
4	21.0429769	472	6.29993356	12.8151042	57.6229508	4.0%
5	21.6443894	736	5.88175943	13.1757600	55.5947880	6.4%
6	22.0716140	1431	6.24396326	12.5363510	50.1097830	12.6%
7	22.1824278	545	6.00371129	12.5467825	67.6665000	4.8%
8	21.8931381	498	5.53293463	13.1757600	48.9147950	4.4%
9	21.5749126	780	6.14997889	12.8416130	50.3028500	6.7%
10	21.2521315	344	6.36740075	13.0479850	64.7298617	2.9%
<b>Total</b>	<b>21.5963625</b>	<b>11604</b>	<b>6.15061708</b>	<b>12.5363510</b>	<b>67.6665000</b>	<b>100.0%</b>

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Specific findings to address

*Findings highlighted an increase in average BMI in both males and females.*

*As the child aged we noted a trending decrease in average male and increase in average female BMI over the period.*

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- Initiate Play
- Communicate with healthcare professionals
- Interdisciplinary

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# Conclusion

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- *Immediate intervention must be implemented to combat increasing pediatric BMI trends, specifically targeted towards females ages 7-11 as this population experienced the greatest increase in BMI over the 10-year period.*
- *Meta analysis shows promising results of long-term (2 years or longer) school-based interventions on childhood obesity. Such interventions focus on increasing physical activity, decreasing sedentary behavior, and nutritional education*
- *The long-term nature of successful interventions provides a strong argument for programs combating childhood obesity to be incorporated into public Elementary education in rural Alabama counties.*
- *Drastic increase in BMI appearing as early as 2nd grade shows that proactive intervention needs to be implemented before the age of 7. Such intervention should remain in place for a minimum of 2 years, increasing the likelihood of effectiveness.*

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# Acknowledgments

- Lora Bozeman



- Sarah Servine



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## References

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