

MCCTR Community-Engaged Research Summer Institute 2019

Obesity Interventions Targeting Youth: Clinical, Community, and Policy Approaches

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Objectives

- Describe clinical approaches to treat pediatric obesity
- Identify community and policy approaches to prevent obesity in youth

Pediatric Obesity Definitions

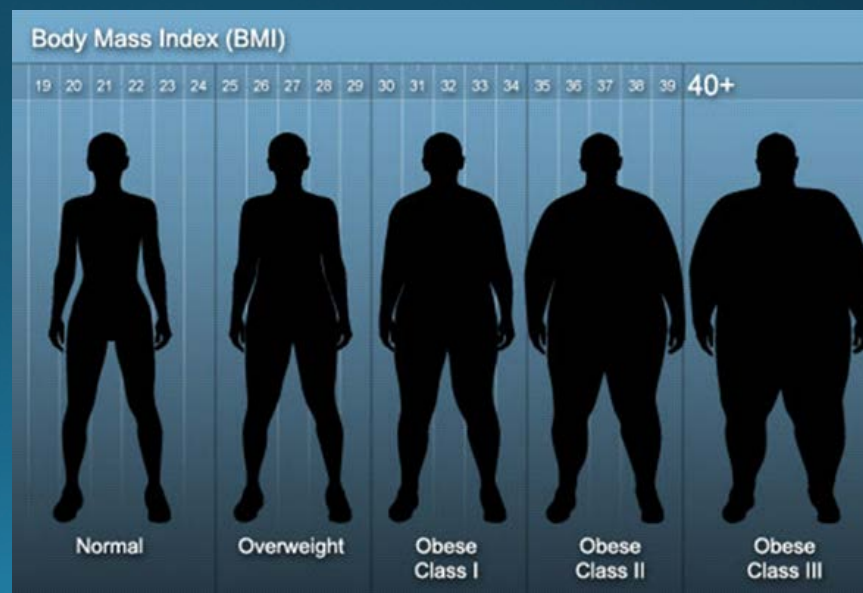
- Body mass index (BMI) = kg / m^2

- In Adults

- Overweight = BMI > 25
- Obese = BMI > 30

- In Youth

- Overweight = BMI > 85th %ile
- Obese = BMI > 95th %ile



CDC BMI Growth Charts

2 to 20 years: Boys

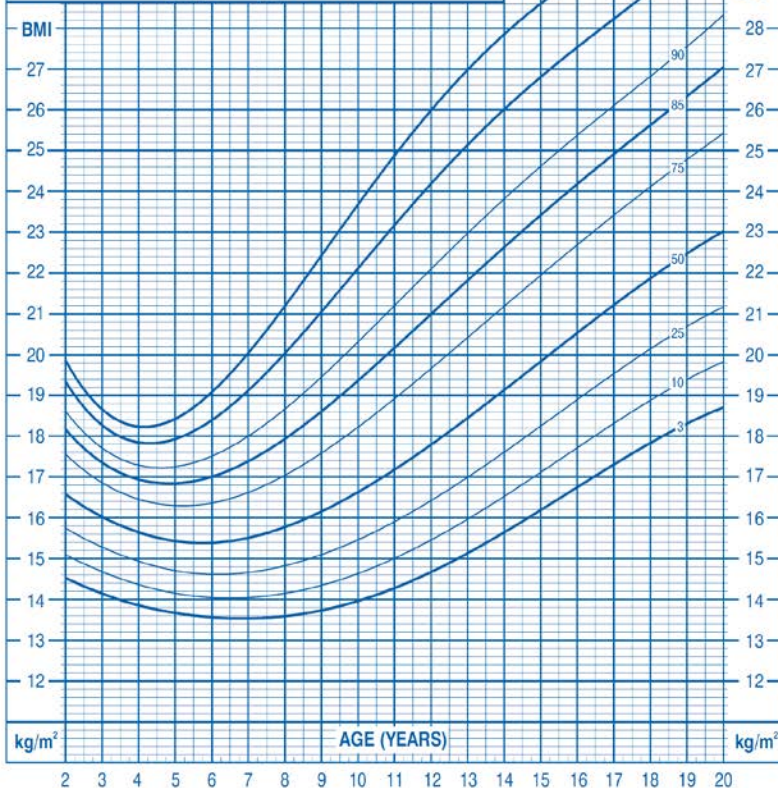
Body mass index-for-age percentiles

NAME _____

RECORD # _____

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***To Calculate BMI:** Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703



2 to 20 years: Girls

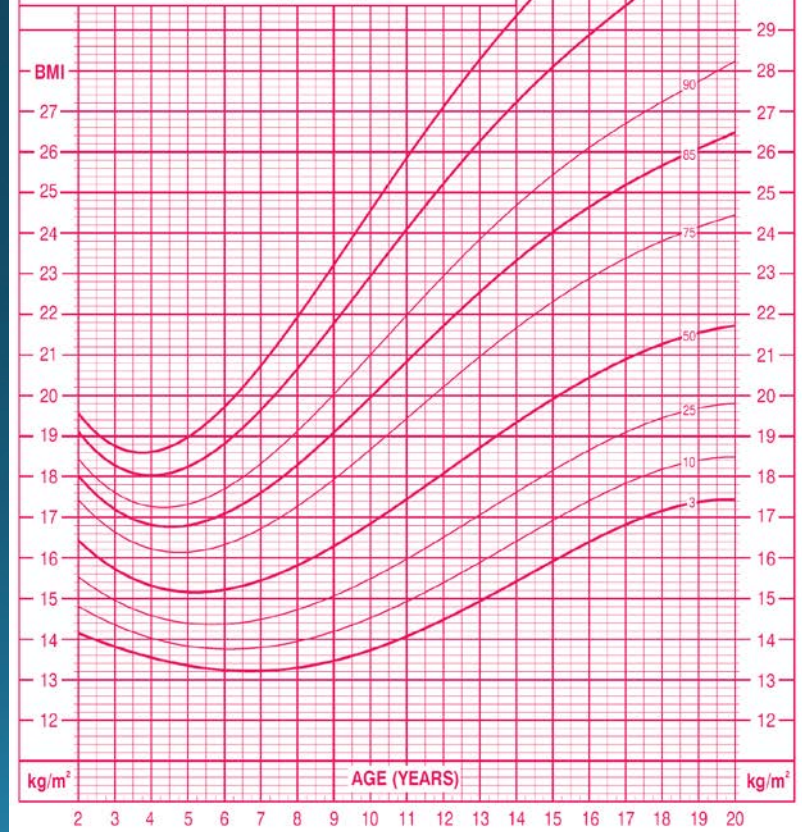
Body mass index-for-age percentiles

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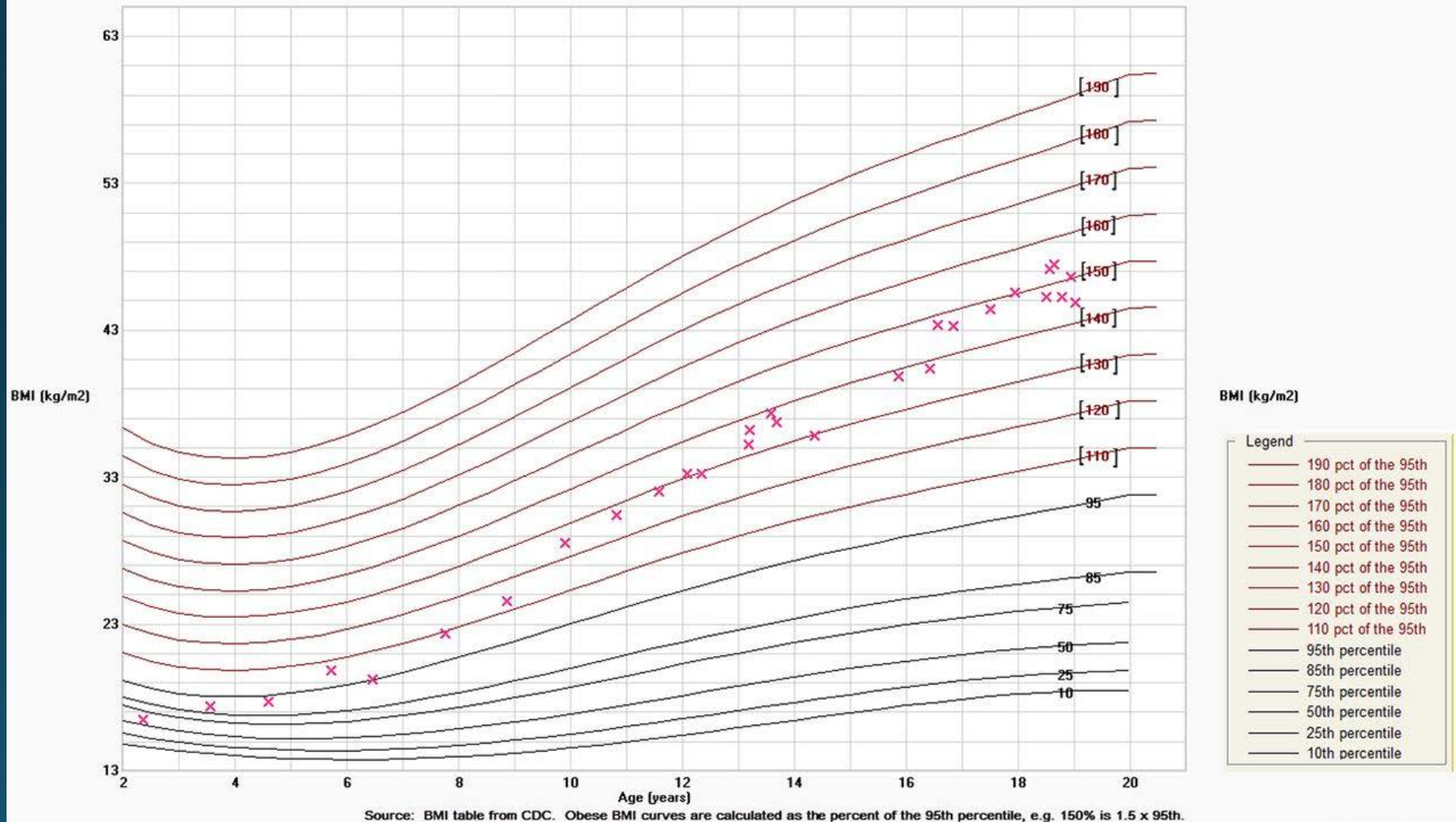
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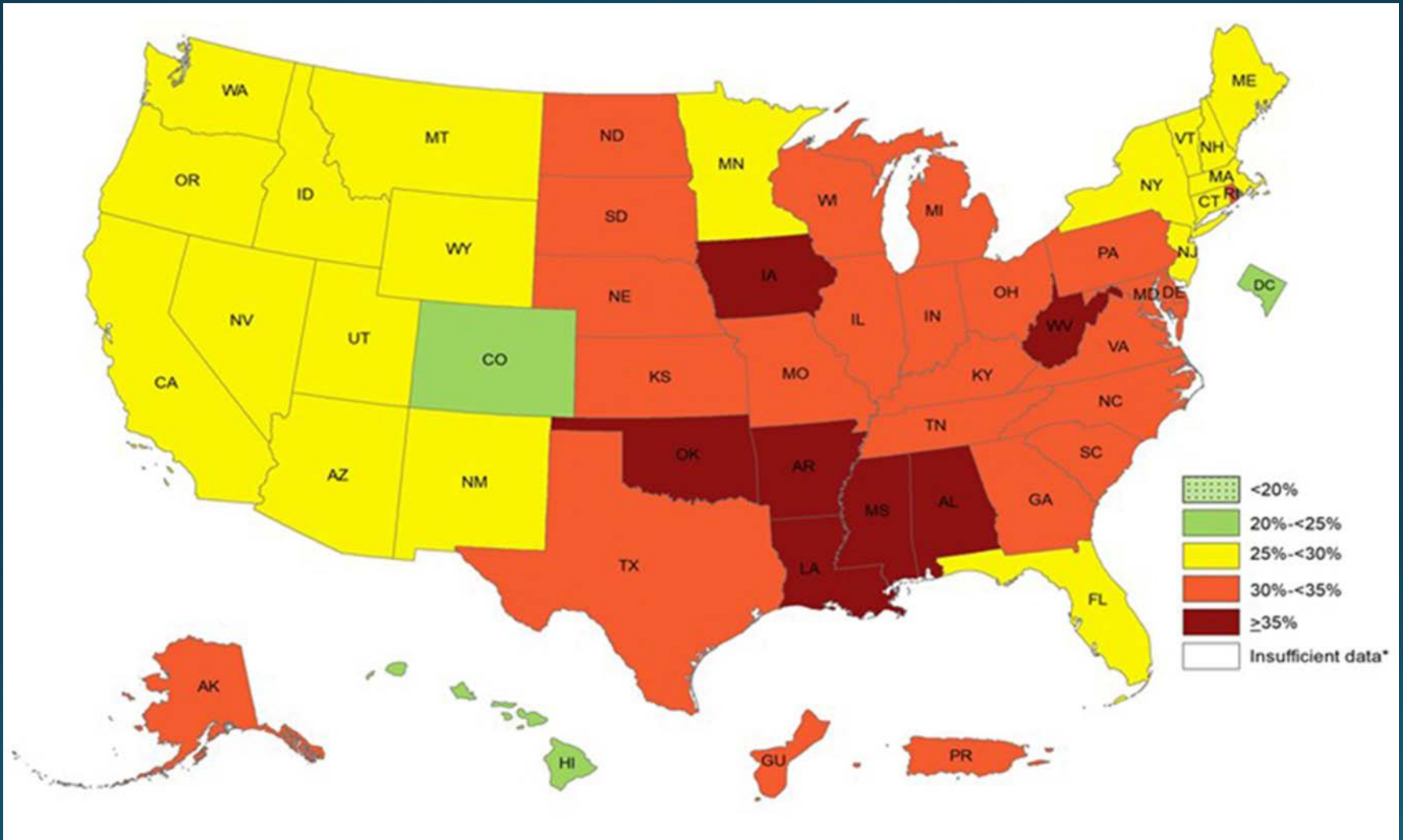
Extended BMI Growth Charts

Girls BMI - Percent of the 95th Percentile (Girls, 2-20 years)

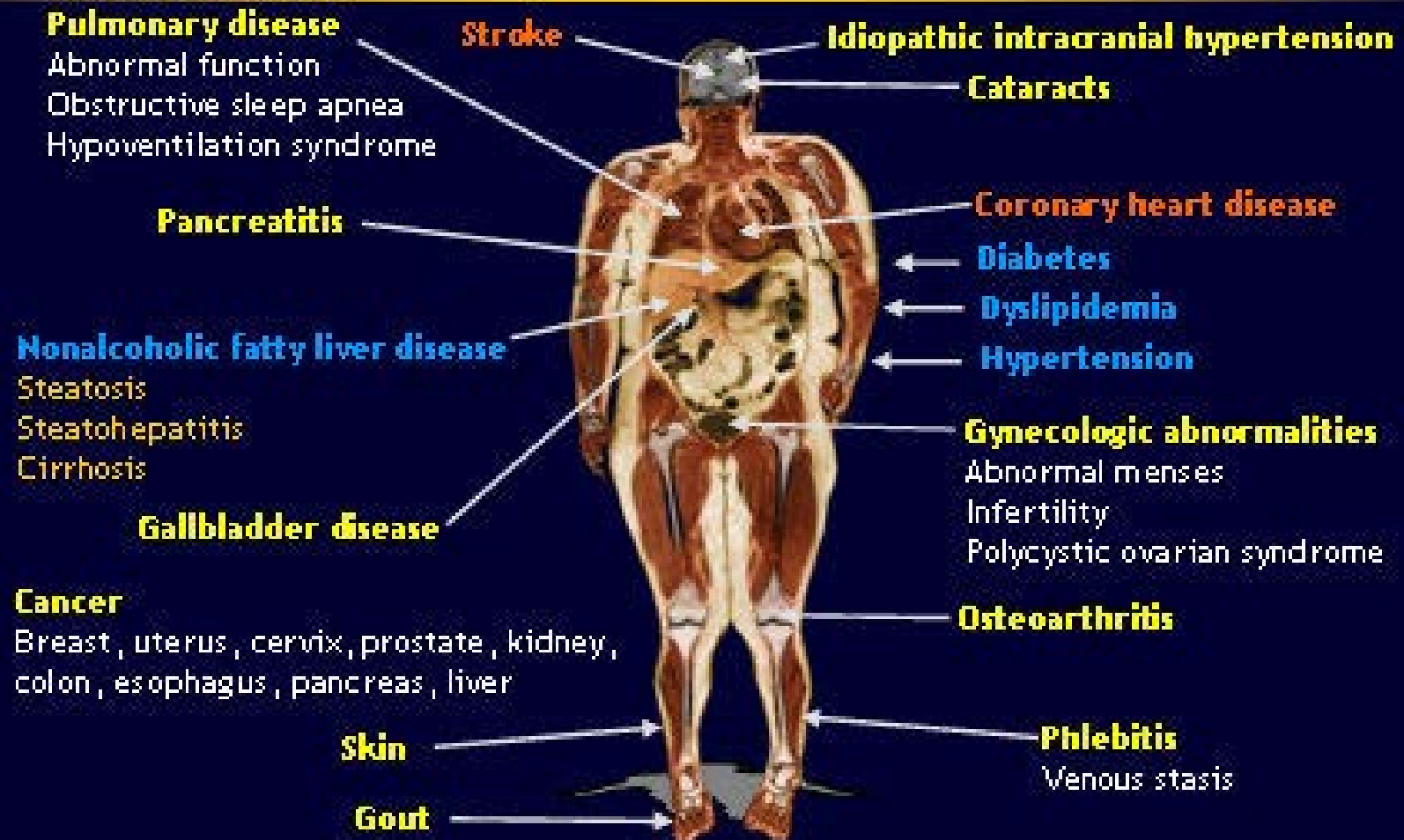


Prevalence of Obesity (BMI > 30) in U.S. Adults

Source: Behavioral Risk Factor Surveillance System 2017, CDC



Medical Complications of Obesity



Costly Medical Condition

- Medical costs \$1,429 higher per year in people who are obese compared to those who are not obese
- Costs U.S. over \$147 billion annually to treat
 - Costs Mississippi about \$925 million annually
- Projected to cost U.S. \$860-956 billion/year by 2030
 - In 2018 estimated to cost Mississippi \$3.9 billion/year
- Cost of treating comorbid diabetes
 - \$245 billion/year in US
 - \$3.2 billion/year in Mississippi

Pediatric Obesity

- Significantly impacts physical & psychological health
- U.S.
 - Overweight = ~35% of children 2-19 years old
 - Obese = 18.5% of children 2-19 years old
 - Over \$14 billion annual health care costs
- Mississippi
 - Youth 10-17 years old = 26.1% obese (Morrow, Sandridge, & Lim, under review)
 - High School students = 36.0% overweight, 18.9% obese
- Adolescents who are obese have 80% chance of being obese in adulthood

Prevalence of Obesity Classes in U.S. Children

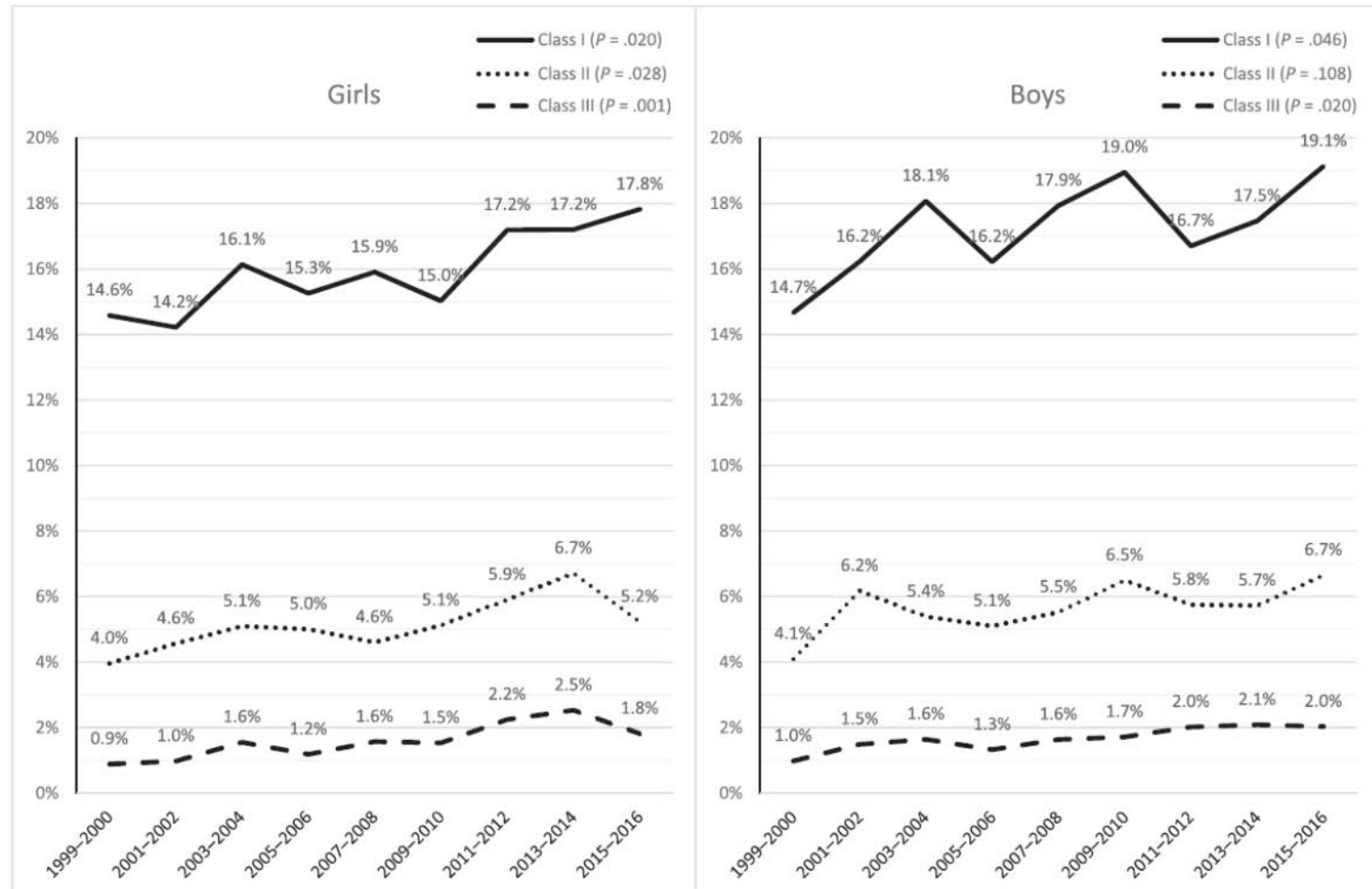


FIGURE 1

The prevalence of obesity and severe obesity among US children 2 to 19 years of age from 1999 to 2016.

Causes of Obesity

- **Genetic Syndromes**

- **MC4R Mutation - Most common = 1 to 2.5% of individuals who are obese**
- **Prader Willi – 1 in 25,000 live births**

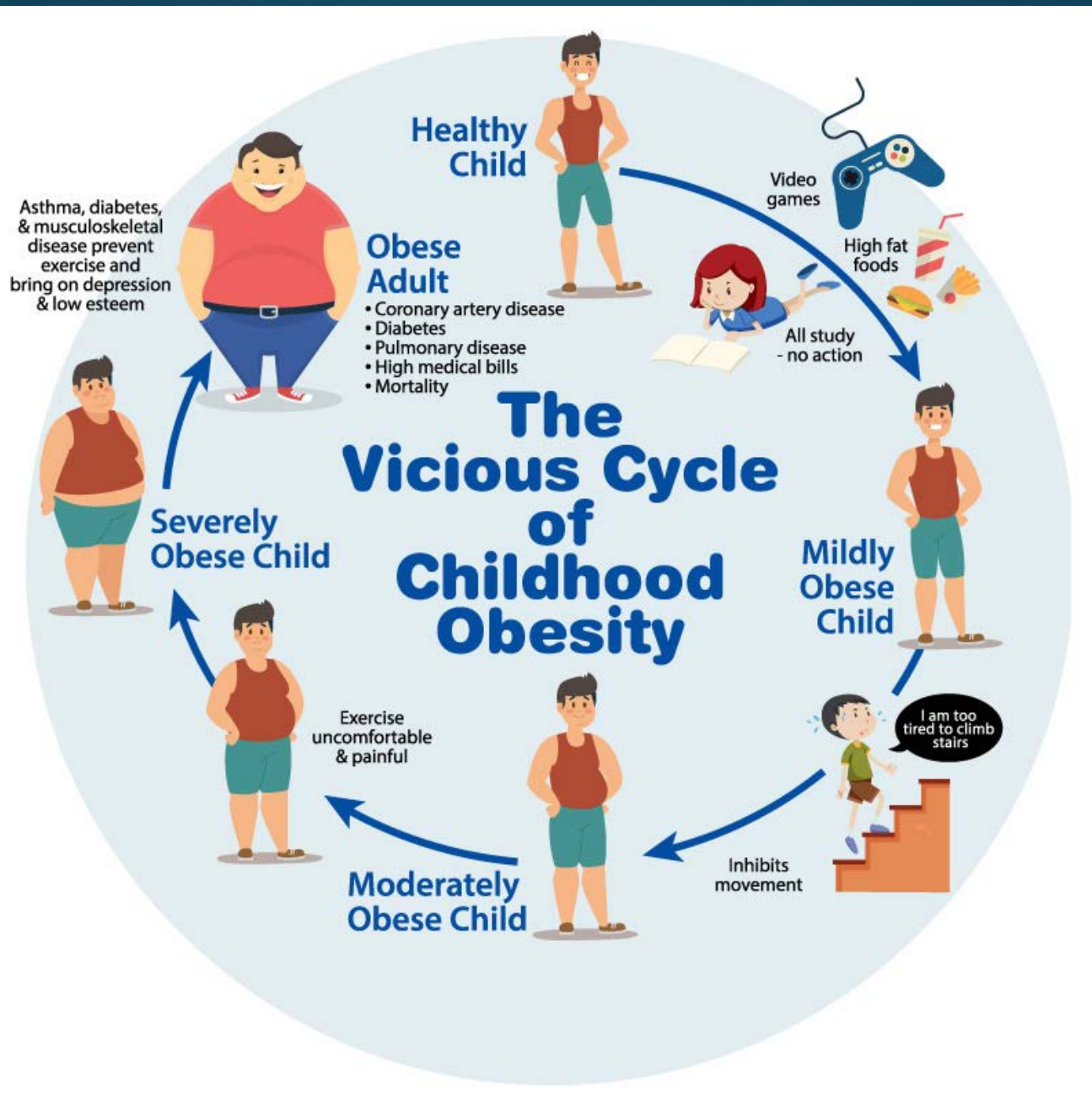
Lifestyle Behaviors

- **Physical Activity in Youth**

- ~15 minutes/day in moderate-to-vigorous physical activity
- Over 85% time in sedentary activities

- **Dietary Intake in Youth**

- Few consume diet consistent with national guidelines
- Consume large portions of high-calorie, nutrient-poor foods and sugar-sweetened beverages



Treatment of Pediatric Obesity

Expert Committee Recommendations

- **Staged Prevention and Treatment**
 - Prevention Counseling
 - Stage 1: Prevention Plus
 - Stage 2: Structured Weight Management
 - Stage 3: Comprehensive Multidisciplinary Intervention
 - Stage 4: Tertiary Care Intervention
- **Patient- and Family-centered Communication**
 - Motivational Interviewing (MI)

Prevention Counseling

- All children starting at birth
- Targets to maintain healthy weight:
 - Limit sugar sweetened beverages
 - Consume fruits & vegetables (consistent with Choose MyPlate)
 - Decrease screen time & sedentary behavior
 - Eat breakfast daily
 - Limit eating out
 - Have family meals
 - Decrease portion sizes
 - Diet high in calcium & fiber and balanced fat, carbs, and protein
 - Exclusive breast feeding for 6 mos. and then to 12 mos. or longer
 - Moderate to vigorous physical activity for at least 1 hour a day
 - Limit high calorie foods

Stage 1: Prevention Plus

- Youth 2-19 years with BMI $\geq$ 85th percentile with health risks
- Primary care physicians, advanced practice nurses, physician assistants, nurses
- Specific targets to improve weight status:
 - 5+ fruits & vegetables
 - ↓ sugar sweetened beverages
 - ↓ screen time & sedentary behavior
 - 1+ hour of physical activity each day
 - ↑ prepare meals at home
 - Family meals 5-6 times a week
 - Healthy breakfast each day
 - Avoid overly restrictive feeding behaviors
 - Involvement of whole family
 - Tailor recommendations to family and cultural values
- After 3-6 months of no improvement move to Stage 2

Stage 2: Structured Weight Management

- **Primary care offices with additional support/structure**
 - Dietician, counselor, someone trained in MI, referral to physical or exercise therapist, monthly visits, group sessions
- **Specific targets to improve weight status:**
 - Structured eating plan (3 meals & 1-2 snacks, no caloric beverages)
 - Further ↓ in screen time & sedentary behavior
 - Planned supervised 1+ hour of physical activity each day
 - Monitoring behaviors
 - Planned reinforcement for achieving targeted goals
- **After 3-6 months and no improvement move to Stage 3**

Stage 3: Comprehensive Multidisciplinary Intervention

- Youth 6+ years with BMI $\geq$ 95th percentile (or BMI 85th-94th with health risks)
- Pediatric weight management center
 - Behavioral counselor, dietician, exercise specialist, pediatrician
- Specific components:
 - Behavior modification program
 - Negative energy balance
 - Intensive parent participation ($\downarrow$ in youth older than 13)
 - Focus on home environment (stimulus control)
 - Frequent visits (ideally weekly)
 - Group sessions
- No improvement in 3-6 mos. move to Stage 4

Stage 4: Tertiary Care Intervention

- Youth 11+ years old with BMI $\geq$ 95th percentile with comorbidities or BMI $\geq$ 99th percentile
- Pediatric weight management centers
- Treatments
 - Medications
 - Very low calorie diet
 - Weight control surgery

Weight Loss Goals for Children

Age (Years)	BMI 85 th -94 th %ile No Risks	BMI 85 th -94 th %ile with Risks	BMI 95 th -99 th %ile	BMI > 99 th %ile
2-5	Maintain weight velocity	Decrease weight velocity or maintain weight	Maintain weight	Gradual weight loss (up to 1lb/mos if BMI>21)
6-11	Maintain weight velocity	Maintain weight	Gradual weight loss (1lbs/mos)	Weight loss (no more than avg. 2lbs/wk)
12-18	Maintain weight velocity; Maintain weight once growth complete	Maintain weight or gradual weight loss	Weight loss (no more than avg. 2lbs/wk)	Weight loss (no more than avg. 2lbs/wk)

Behavioral Family Interventions

- Multicomponent and interdisciplinary treatments
- Parents are critical change agents
- Treatment can be group-based, individual, or combination
- Different types of child and parent involvement
 - Family-based
 - Parent-based
 - Child-based
 - Clinic-based
 - Home-based

Behavioral Family Interventions

- Focus on using behavioral strategies to gradually modify healthy lifestyle behaviors
- Incorporate education about nutrition, physical activity, and energy balance
- Designed to encourage sustainable changes not “diets”

Treatment Research Evidence

- **Multidisciplinary Pediatric Obesity Clinical Programs**
 - **Significant improvements in child weight status and health outcomes** (Maggio et al., 2013; Nemet et al., 2013; Siao et al., 2013; Walsh et al., 2014)
- **Multicomponent behavioral family treatments “well-established” in school-age children who are overweight and obese** (Epstein et al., 2007; Janicke et al., 2014; Whitlock et al., 2010)
 - **Small to moderate improvements in child weight status**
 - **Improve health and psychosocial outcomes**
 - **Demonstrated cost effectiveness** (Borner et al., 2016)

**Why is it important
to include community
engagement in pediatric
obesity clinical settings?**

Need for Community Engagement in Clinical Settings

- Not all patients benefit from clinical and family treatments
 - Other factors need to be considered and targeted
- Community characteristics can impact engagement in health behaviors and effectiveness of interventions
 - **Example:** Increased park density related to decreases in BMI z-score in rural children participating in behavioral family weight management interventions (Armstrong, Lim, & Janicke, 2015)

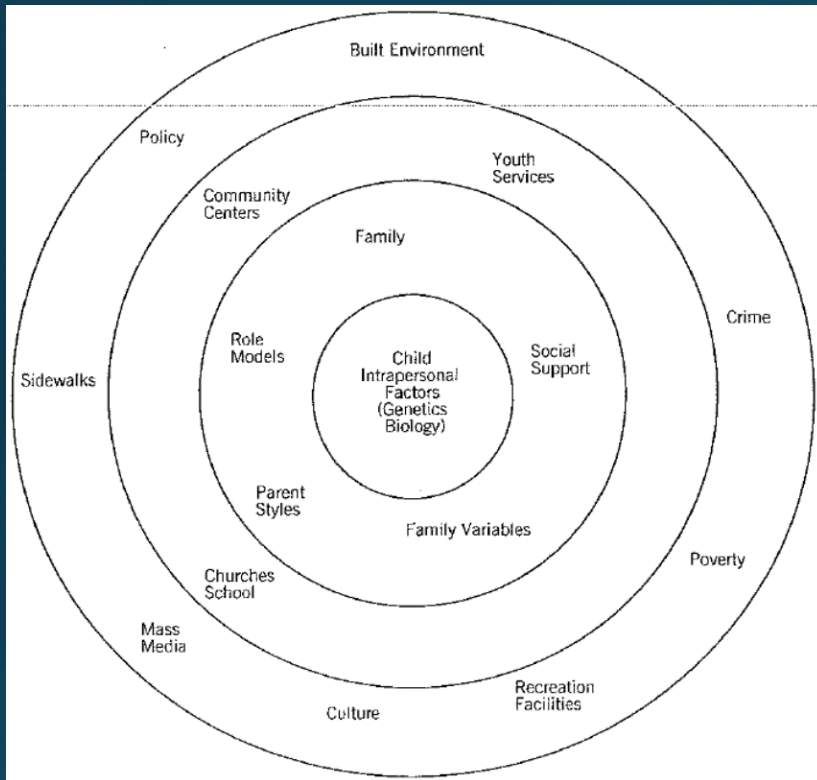
**How can community
engagement be integrated
into clinical settings?**

Integration of Community Engagement in Clinical Settings

- **Community members provide input on development, implementation, and modifications of clinical treatments**
- **Clinical interventions implemented in community based settings**
- **Train community members to provide treatment in community based settings**

Prevention of Pediatric Overweight and Obesity

Models of Health Promotion in Youth



Ecological Model of Health Promotion in Children and Adolescents from Wilson & Lawman, 2009



CDC's Whole School, Whole Community, Whole Child
<https://www.cdc.gov/healthyyouth/wsccl/>



Keener et al., 2009

**What community settings
would you target for pediatric
obesity prevention?**

Community-Based Settings

- Early childcare centers
- Schools
- Hospitals
- Food service venues
- Churches
- Occupational settings
- Parks/Recreational Spaces

Obesity Prevention in Schools

- **Local School Wellness Policies**
- **Availability of healthy foods**
- **Time for physical activity (recess, PE)**
- **Incorporate health-related topics in academic subjects**
- **School-wide health related events**
- **Team sports and after school activities**
- **Teachers/staff role model for healthy lifestyle behaviors**
- **School gardens** (Berezowitz et al., 2015)

School-Based Prevention Research Evidence

- Effective at improving weight status
- Most effective combinations of components and settings:
 - Physical activity only interventions delivered in schools with home involvement
 - Combined diet and physical activity interventions delivered in schools with both home and community components
- More research needed

CDC Recommended Community-based Strategies for Obesity Prevention

- **Increase availability of healthier and affordable food and beverage choices in public service venues**
- **Improve geographic availability of supermarkets in underserved areas**
- **Provide incentives to food retailers to locate in and/or offer healthier food and beverage choices in underserved areas**
- **Improve availability of mechanisms for purchasing foods from farms**
- **Provide incentives for the production, distribution, and procurement of foods from local farms**
- **Restrict availability of less healthy foods and beverages in public service venues**
- **Institute smaller portion size options in public service venues**
- **Limit advertisements of less healthy foods and beverages**
- **Discourage consumption of sugar-sweetened beverages**

CDC Recommended Community-based Strategies for Obesity Prevention

- **Increase support for breastfeeding**
- **Require physical education in schools**
- **Increase the amount of physical activity in PE programs in schools**
- **Increase opportunities for extracurricular physical activity**
- **Reduce screen time in public service venues**
- **Improve access to outdoor recreational facilities**
- **Enhance infrastructure supporting bicycling and walking**
- **Support locating schools within easy walking distance of residential areas**
- **Improve access to public transportation**
- **Zone for mixed-use development**
- **Enhance personal safety and traffic safety in areas where persons are or could be physically active**
- **Participate in community coalitions or partnerships to address obesity**

What policies could be implemented to prevent pediatric obesity?

Prevention Policies

- Limited inclusion of research evidence in obesity-specific policies (Gollust et al., 2014)
- Food policies need to be designed to make healthier options the preferred choice (Hawkes et al., 2015)
- Researchers should design obesity-specific research that can inform local and national policies
- Researchers/clinicians need to advocate for empirically-based prevention policies
 - Obesity Action Coalition www.obesityaction.org

Roberto et al. in *Lancet*, 2015

Domain		Policy area	Examples of potential policy actions
Food environment	N	Nutrition label standards and regulations on the use of claims and implied claims on foods	eg, nutrient lists on food packages; clearly visible "interpretive" and calorie labels; menu, shelf labels; rules on nutrient and health claims
	O	Offer healthy foods and set standards in public institutions and other specific settings	eg, fruit and vegetable programmes; standards in education, work, health facilities; award schemes; choice architecture
	U	Use economic tools to address food affordability and purchase incentives	eg, targeted subsidies; price promotions at point of sale; unit pricing; health-related food taxes
	R	Restrict food advertising and other forms of commercial promotion	eg, restrict advertising to children that promotes unhealthy diets in all forms of media; sales promotions; packaging; sponsorship
	I	Improve the nutritional quality of the whole food supply	eg, reformulation to reduce salt and fats; elimination of trans fats; reduce energy density of processed foods; portion size limits
	S	Set incentives and rules to create a healthy retail and food service environment	eg, incentives for shops to locate in underserved areas; planning restrictions on food outlets; in-store promotions
Food system	H	Harness the food supply chain and actions across sectors to ensure coherence with health	eg, supply-chain incentives for production; public procurement through "short" chains; health-in-all policies; governance structures for multi-sectoral engagement
Behaviour-change communication	I	Inform people about food and nutrition through public awareness	eg, education about food-based dietary guidelines, mass media, social marketing; community and public information campaigns
	N	Nutrition advice and counselling in health-care settings	eg, nutrition advice for at-risk individuals; telephone advice and support; clinical guidelines for health professionals on effective interventions for nutrition
	G	Give nutrition education and skills	eg, nutrition, cooking/food production skills on education curricula; workplace health schemes; health literacy programmes

Figure: World Cancer Research Fund International NOURISHING framework

Food policy framework for healthy diets and the prevention of obesity and diet-related non-communicable diseases.^{26,27} Reprinted by permission of World Cancer Research Fund International.

Conclusions

- **Obesity, including pediatric obesity, is a multi-faceted public health problem**
- **Need for more community-engaged research (and practice) to inform clinical treatments, as well as community- and policy-based prevention strategies**

Thank You!

Comments/Questions

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