

# Healthy Weight on FHIR

How FHIR capabilities can help CDC  
better prevent & control obesity

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The findings and conclusions in this presentation are those of the author and not necessarily those of CDC

# CDC Division of Nutrition, Physical Activity, and Obesity

**Who We Are:** Primary Federal Public Health Division focused on improving nutrition, increasing physical activity, and preventing obesity through population-based work.

## **What our work does:**

- ❑ Assists mothers who want to breastfeed
- ❑ Helps people stay active
- ❑ Ensures healthier foods are available for children in education settings and for consumers who want to eat better to maintain health
- ❑ Improves uptake of evidence-based clinical strategies for preventing & treating obesity

# How We Do It:

- **Surveillance** - Monitor trends in behaviors & obesity
- **Applied research, evaluation & translation** - understand what works to promote health
- **Training, tools, guidance** - for grantees and partners to stay up-to-date on key strategies and best practices
- **Strategic communications and partnerships** - to build networks of support and change social norms

*Partnerships*

*Health Equity*

# Obesity

## ■ **Obesity is common**

- 2/3 of U.S. adults are overweight or obese
- 36% of U.S. adults are obese = 78 million people
- By 2030, an estimated 40% of the population will be obese (Finkelstein, 2012)

## ■ **Obesity is serious**

- Continues to be a major public health problem
- Increases the risk for a number of chronic diseases
- Reduces quality of life, causes social stigmatization

# Importance of Obesity Prevention

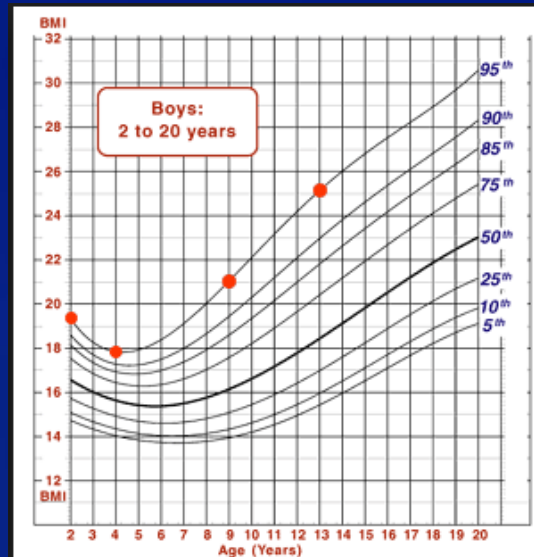
- >50% of premature morbidity & mortality is caused by behavioral and social determinants such as nutrition, exercise, smoking and socioeconomic status
- **Unhealthy lifestyle behaviors are the root cause of global non-communicable disease burden**
  - Leading cause of disability adjusted life years
  - Account for ~63% of all deaths

# Overweight and Obesity

Measure:

Body Mass Index (BMI) =  $\text{weight (kg)} / [\text{height (m)}]^2$

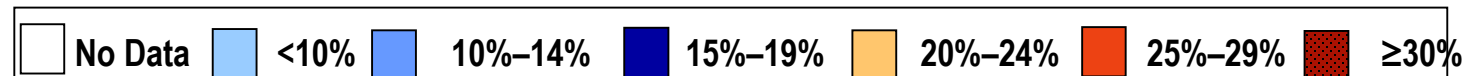
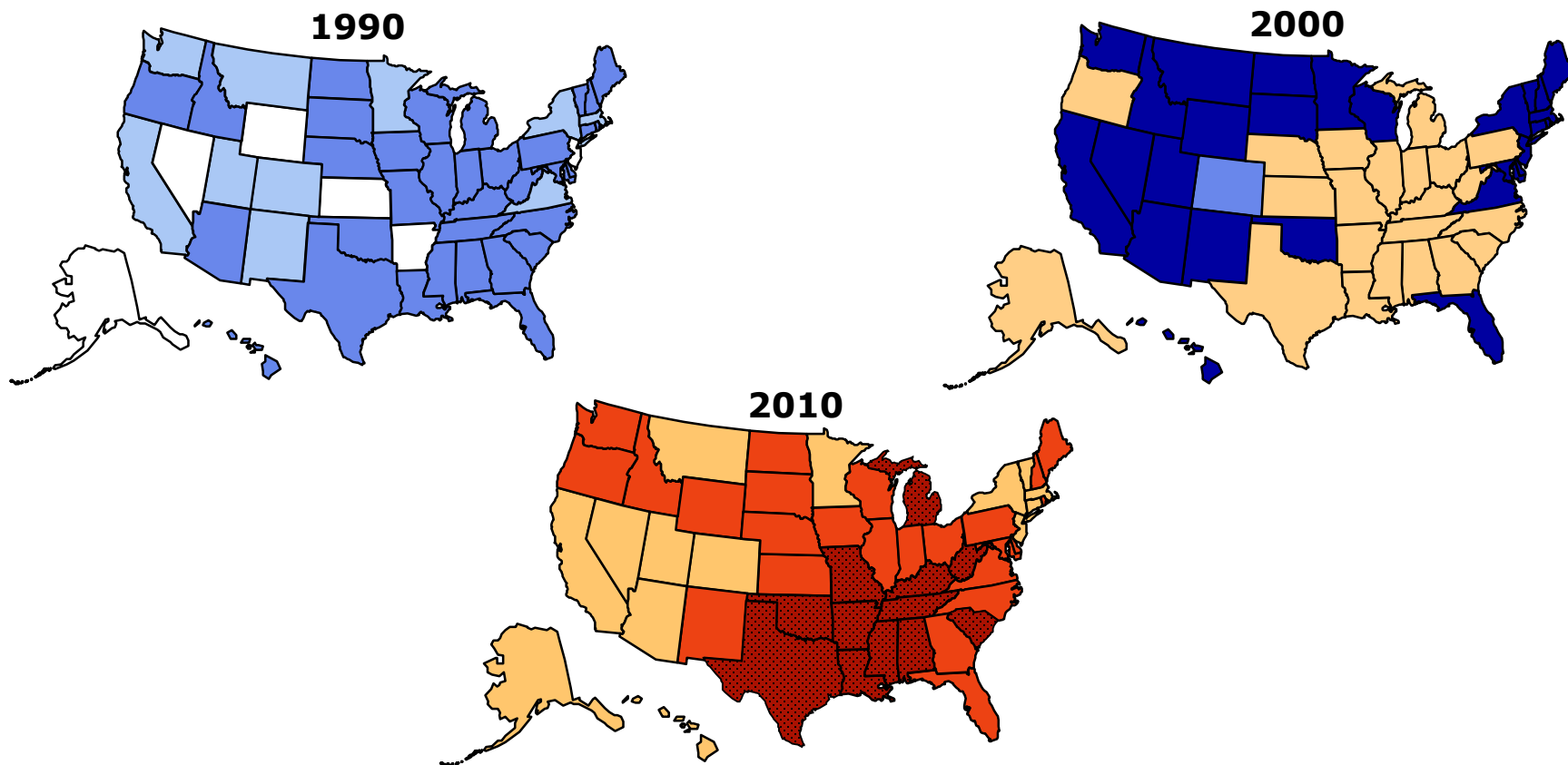
Category	Children and Adolescents (BMI for Age Percentile Range)	Adults (BMI)
<b>Underweight</b>	Less than the 5th percentile	Less than 18.5 kg/m <sup>2</sup>
<b>Healthy weight</b>	5th percentile to less than the 85th percentile	18.5 to 24.9 kg/m <sup>2</sup>
<b>Overweight</b>	85th percentile to less than the 95th percentile	25.0 to 29.9 kg/m <sup>2</sup>
<b>Obese</b>	Equal to or greater than the 95th percentile	30.0 kg/m <sup>2</sup> or greater



# Obesity Trends\* Among U.S. Adults

## BRFSS, 1990, 2000, 2010

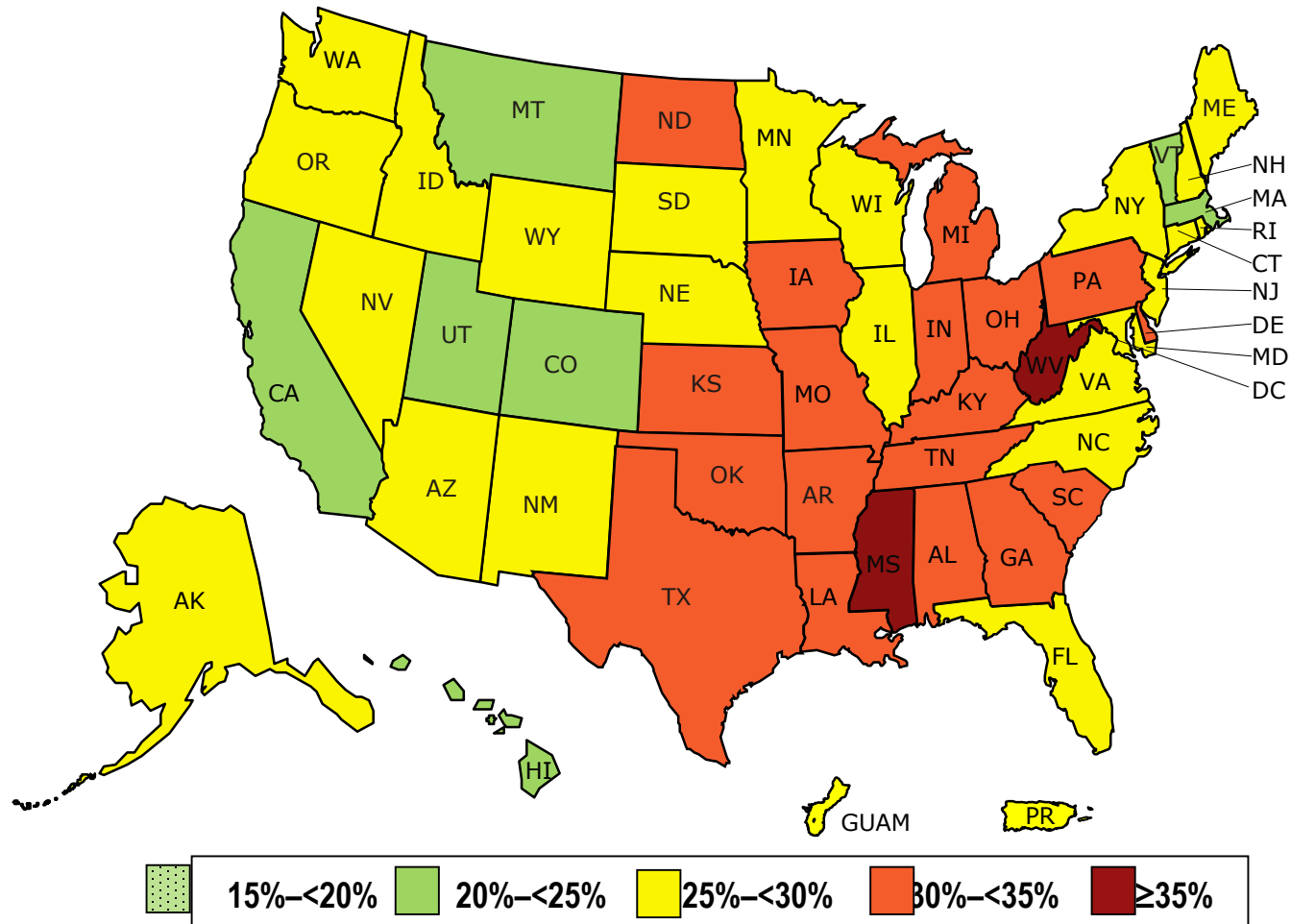
(\*BMI  $\geq 30$ , or about 30 lbs. overweight for 5'4" person)



Source: Behavioral Risk Factor Surveillance System, CDC.

# Prevalence\* of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2013

**\*Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.**



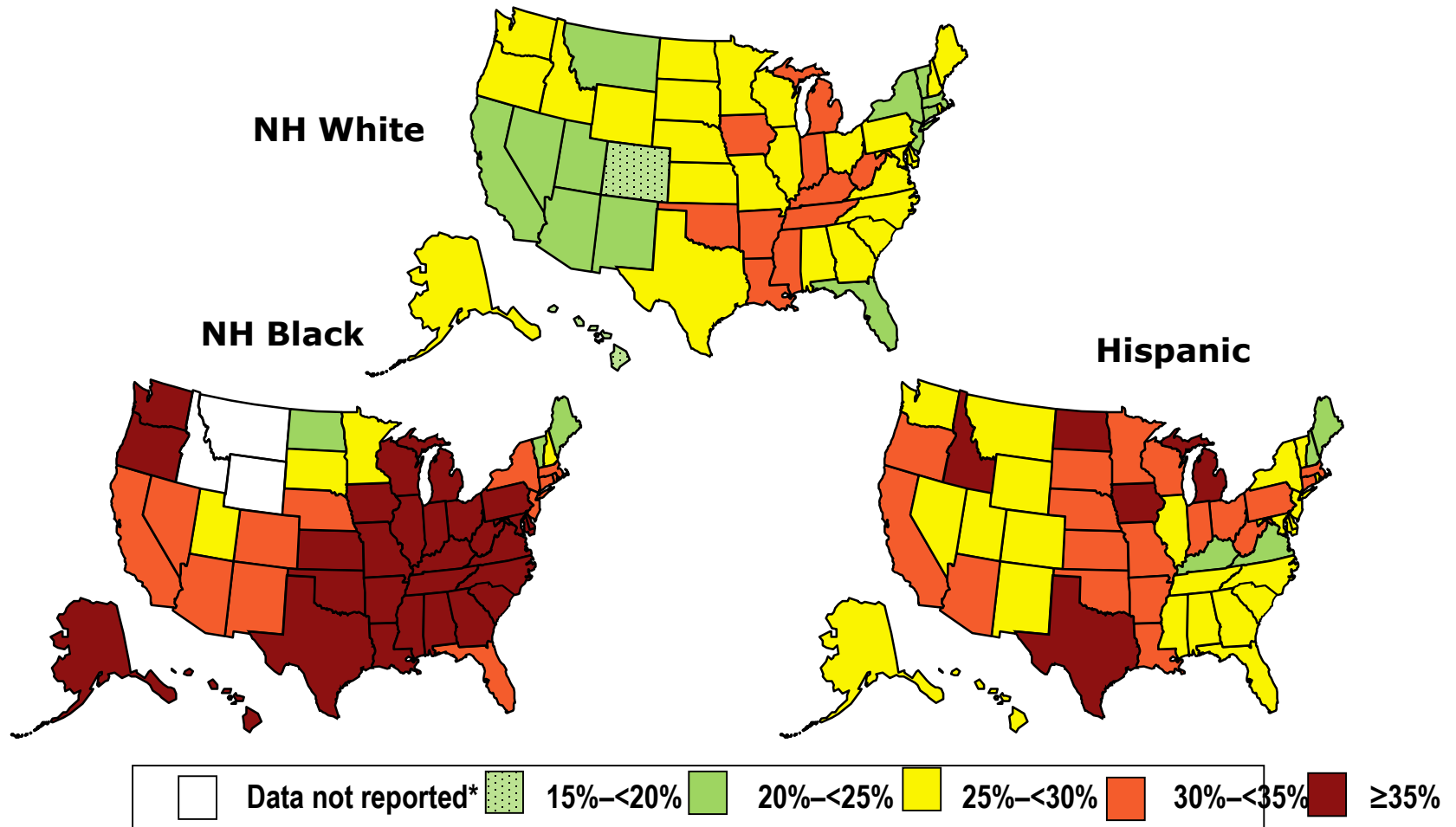
Source: Behavioral Risk Factor Surveillance System, CDC.





# Wide Gap in Health

## Prevalence of Self-Reported Obesity Among U.S. Adults by Race/Ethnicity and State, BRFSS, 2011-2013



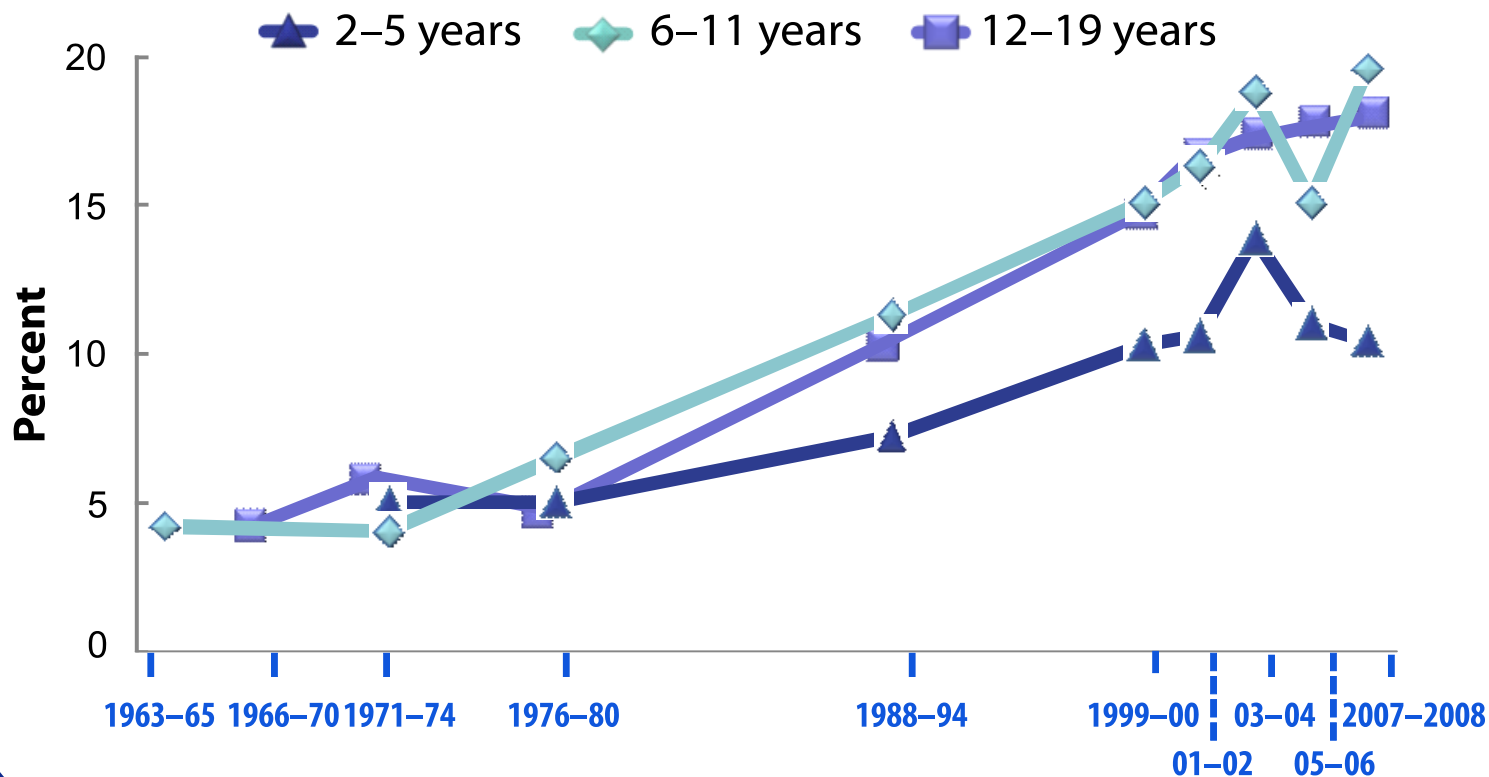
\* Sample size <50 or the relative standard error (dividing the standard error by the prevalence)  $\geq 30\%$ .

Source: Behavioral Risk Factor Surveillance System, CDC.



# Rapid Increases in Obesity Among U.S. Youth

## *NHANES 1963-2008*

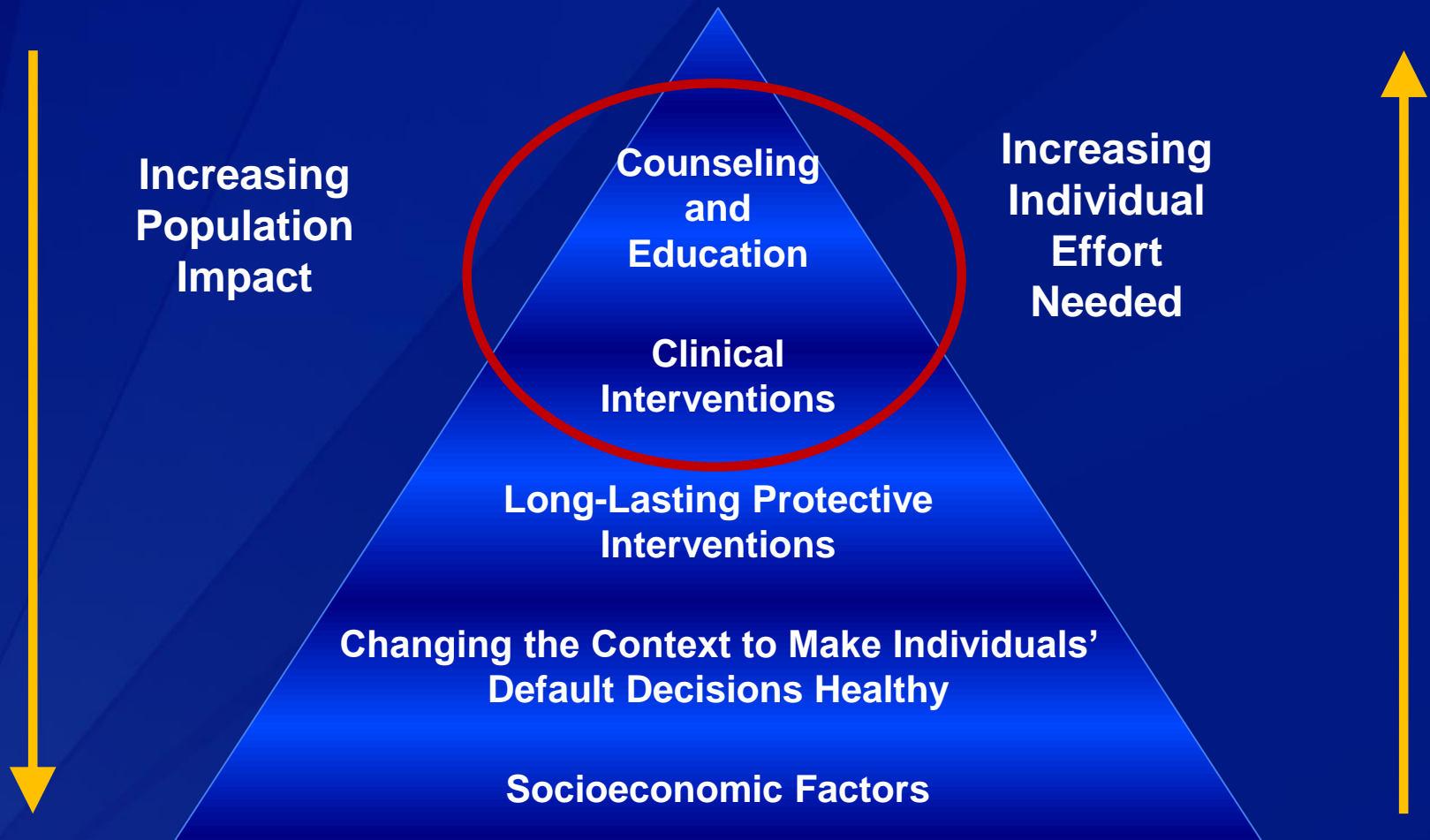


National Health Examination Surveys II (ages 6-11) and III (ages 12-17).  
National Health and Nutrition Examination Surveys I, II, III and 1999-2008.  
[www.cdc.gov/nchs/data/hestat/obesity\\_child\\_07\\_08/obesity\\_child\\_07\\_08.htm](http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.htm).

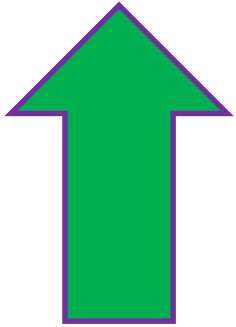
# **Childhood Obesity: Common, Serious, Costly**

- **1 in 8 children**
- **Each Kindergarten classroom has 2-5 obese students**
- **Obesity tracks into adulthood**
- **Negative health consequences**
  - For example: high cholesterol, elevated blood sugar, asthma, poor mental health, bullying
- **Obesity is costly to society**
  - Adult obesity, \$147 billion in medical costs (2008)

# The Health Impact Pyramid



# Behavioral Targets for Obesity



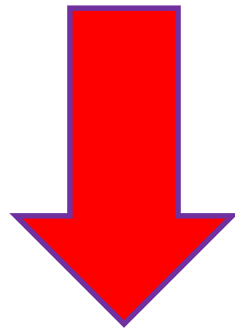
Breastfeeding

Fruits and vegetables

Healthy beverages/water

Daily physical activity

Sleep



Energy dense (nutrient poor)  
foods - added sugars/solid fat

Sugary drinks

Television/Passive Screen Time

# **U.S. Preventive Services Task Force Recommendations**

- **ALL children & adults be screened for obesity**
  - Measure height & weight
  - Plot on an age-appropriate growth chart
- **Offer or refer those with obesity to:**
  - Intensive, family-based, comprehensive programs
  - Include dietary, physical activity & behavioral components

# Expert Clinical Guidelines

- **Screening BMI**
- **Screening for healthy behaviors**
  - 8-10** hours of sleep per night
  - 5** fruits & veggies per day
  - <2** hours of screen time per day
  - 1** hour of physical activity
  - 0** sugar-sweetened beverages
- Motivational interviewing
- Laboratories/other testing
- Referral



# R<sub>x</sub> for Healthier Living

## IDEAS FOR HEALTHIER LIVING

- 5** Eat at least 5 fruits and vegetables every day.
- 2** Limit screen time (for example, TV, video games, computer) to 2 hours or less per day.
- 1** Get 1 hour or more of physical activity every day.
- 0** Drink fewer sugar-sweetened drinks.  
Try water and low-fat milk instead.

## MY HEALTHY LIFESTYLE GOALS

- ☐ Eat \_\_\_\_\_ fruits and vegetables each day.
- ☐ Reduce screen time to \_\_\_\_\_ minutes per day.
- ☐ Get \_\_\_\_\_ minutes of physical activity each day.
- ☐ Reduce number of sugared drinks to \_\_\_\_\_ per day.

\_\_\_\_\_  
**Patient name**

\_\_\_\_\_  
Patient or Parent/Guardian signature

\_\_\_\_\_  
Doctor signature

\_\_\_\_\_  
Date



*America's Move to Raise a  
Healthier Generation of Kids*

[www.LetsMove.gov](http://www.LetsMove.gov)

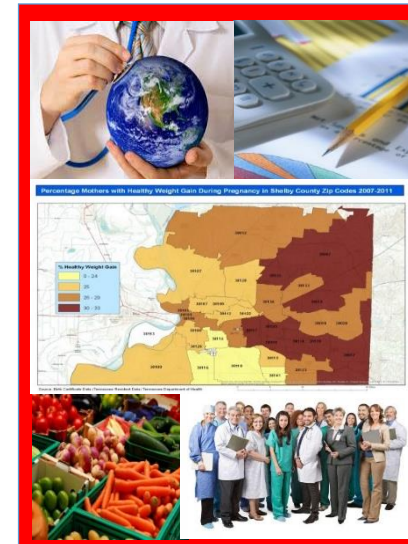


# CDC Healthy Weight (HW) Electronic Health Information Initiative

## EHR: HEALTHCARE PROVIDERS



## PUBLIC HEALTH & COMMUNITY/PRACTICE GROUPS



Clinical Practice -  
Quality Improvement  
Data

Electronic Data  
Exchange using  
standards  
(HL7/IHE) with  
common data  
metrics

Community  
Health Data

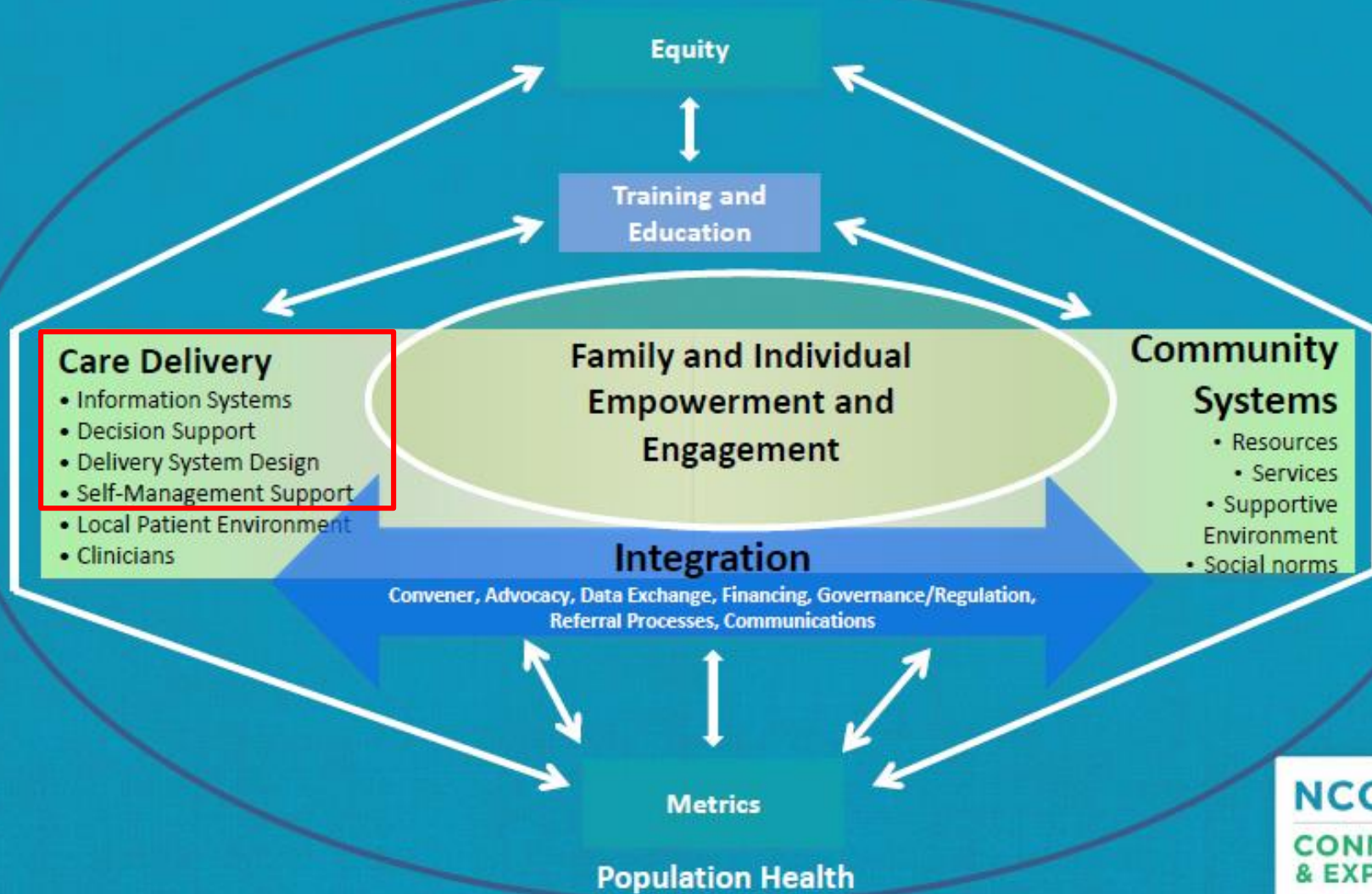
- Improving care quality metrics: Calculate/Plot BMI Percentile
- Clinical decision supports: Flags, Prompts, Resources for Patients
- Capturing quality weight & behavior data in EHR

- Population health information for other stakeholders
- Targeting resources; informing & improving programs
- Improved local HW surveillance

## How will Health IT help???

- Data for surveillance, at local level
- Healthy Weight EHR improvements have been shown to improve:
  - Data capture
  - Quality of healthcare delivery (\$\$\$)
  - Referral rates to community-based treatment programs
  - Communication among healthcare providers, provider/payor groups & public health entities
  - Improved outcomes for children and adults (i.e., lowering of BMI)

# Framework for Integrated Clinical and Community Systems of Care



# Opportunities/Assets

- **HITECH Act of 2009 provided funding incentives for health care providers to buy & meaningfully use EHRs**
- **Meaningful Use Stage 1 –**
  - Record height & weight
  - Calculate BMI
  - Plot height, weight & BMI data on growth charts
- **Recognition as priority by national/international gov't & non-profit medical & public health organizations**
- **FHIR**

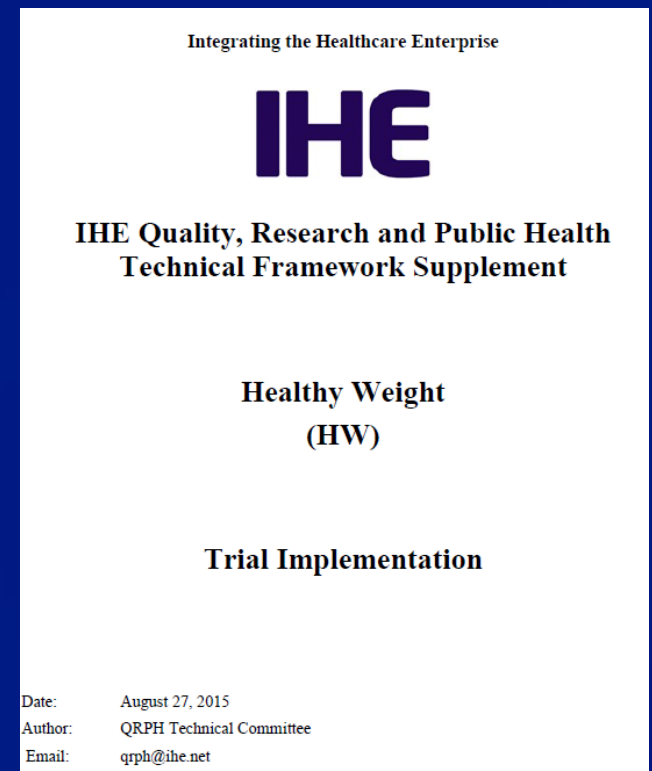
# The Gap

- **EHR-based Healthy Weight clinical management and Body Mass Index (BMI) information collection is inadequate & inefficient:**
  - EHRs are underutilized to support clinical care
    - Gap: EHR functionality is insufficient
      - In 2013, 1 out of 5 primary care doctors reported that their EHR does not perform basic function of calculating BMI
      - <10% report advanced functions such as referral to community resources
  - Multiple approaches to communicate BMI information
    - Gap: Interoperability is poor
      - Multiple current methods of data exchange include dual data entry & multiple interfaces
  - Data extraction for research, evaluation & surveillance difficult
    - Not built into clinical EHRs
    - Proprietary
    - Open-source applications (pophealthnet) – not user friendly



# Healthy Weight Interoperability Standards

- **HL7 v2.5.1**
  - Implementation guide
  - Simple message
- **IHE Healthy Weight Profile**
  - CDA
  - Robust, but complex
  - Difficulty with implementation
  - Poor uptake



# The Dream? - Healthy Weight on FHIR?

- **Bridging the divide between families, clinicians, communities & public health**
  - Waiting room – collect patient data
  - Exam room – prompt best practices, help clinician workflow
  - Referrals to community resources (mapped!)
  - Community – receipt/transfer of information
  - Structured data capture for -
    - ❖ Clinical quality improvement (\$\$\$)
    - ❖ Local surveillance
    - ❖ Program evaluation
- **Open-source, publicly available**

## Resources for Team

- CDC scientists
- CDC data
- Network of partners
- Local healthcare provider groups
- Background reading/materials
- Project examples:



# SMART on FHIR App

## Pediatric Growth Charts by Boston Children's Hospital

[View More by This Developer](#)

By Boston Children's Hospital

Open iTunes to buy and download apps.



[View in iTunes](#)

This app is designed for both iPhone and iPad

Free

Category: Medical

Updated: Apr 09, 2015

Version: 2.1

Size: 16.0 MB

Language: English

Seller: Children's Hospital Corporation

© 2015 Pascal Pfiffner

You must be at least 17 years old to download this app.

Frequent/Intense

Medical/Treatment Information

**Compatibility:** Requires iOS 7.0 or later. Compatible with iPhone, iPad, and iPod touch.

### Customer Ratings

Current Version:

★★★★☆ 6 Ratings

All Versions:

★★★★☆ 22 Ratings

More by Boston Children's Hospital



Boston Children's MyChildren's...  
[View In iTunes](#)



### Description

Whether you are a parent caring for your own child or a pediatrician, this growth charts app is for you! It allows you to track children's growth over time and display the data points on any of the included WHO and CDC growth charts. You can track height, weight, head circumference and BMI and determine the corresponding percentiles.

[Boston Children's Hospital Web Site](#) [Pediatric Growth Charts by Boston Children's Hospital Support](#)

[...More](#)

### What's New in Version 2.1

- Export your kids' data to a spreadsheet to view in Numbers or Excel
- Export and import all data on multiple devices of yours; a great way to backup your data

### Screenshots

iPhone | iPad

**Choose a Child**

Girls 0 - 24 months | Girls 0 - 24 months

WHO | WHO

Girls 0 - 24 months | Girls 0 - 24 months

WHO | WHO

Girls 2 - 5 years | Girls 2 - 5 years

WHO | WHO

**CDC Percentiles**

Age: 5 yr

Length: 116 cm 94%

Weight: 19.5 kg 67%

BMI: 14.5 kg/m² 18%

Female Male

7 8 9 kg

4 5 6

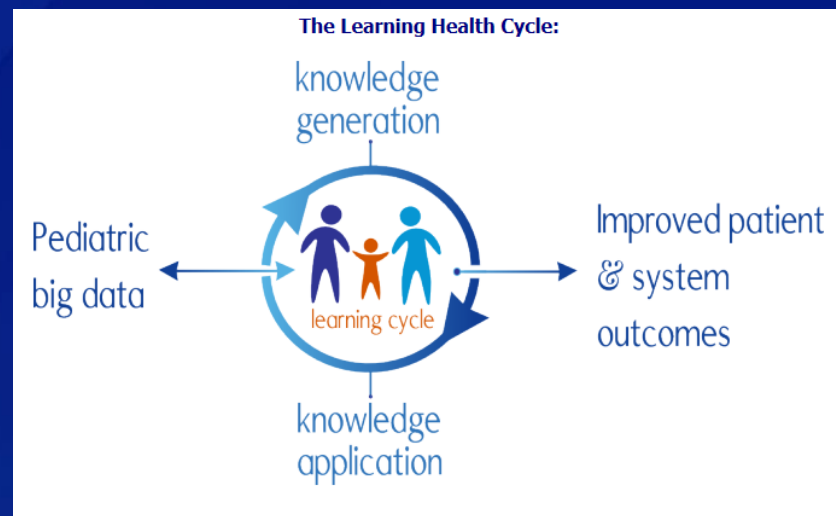
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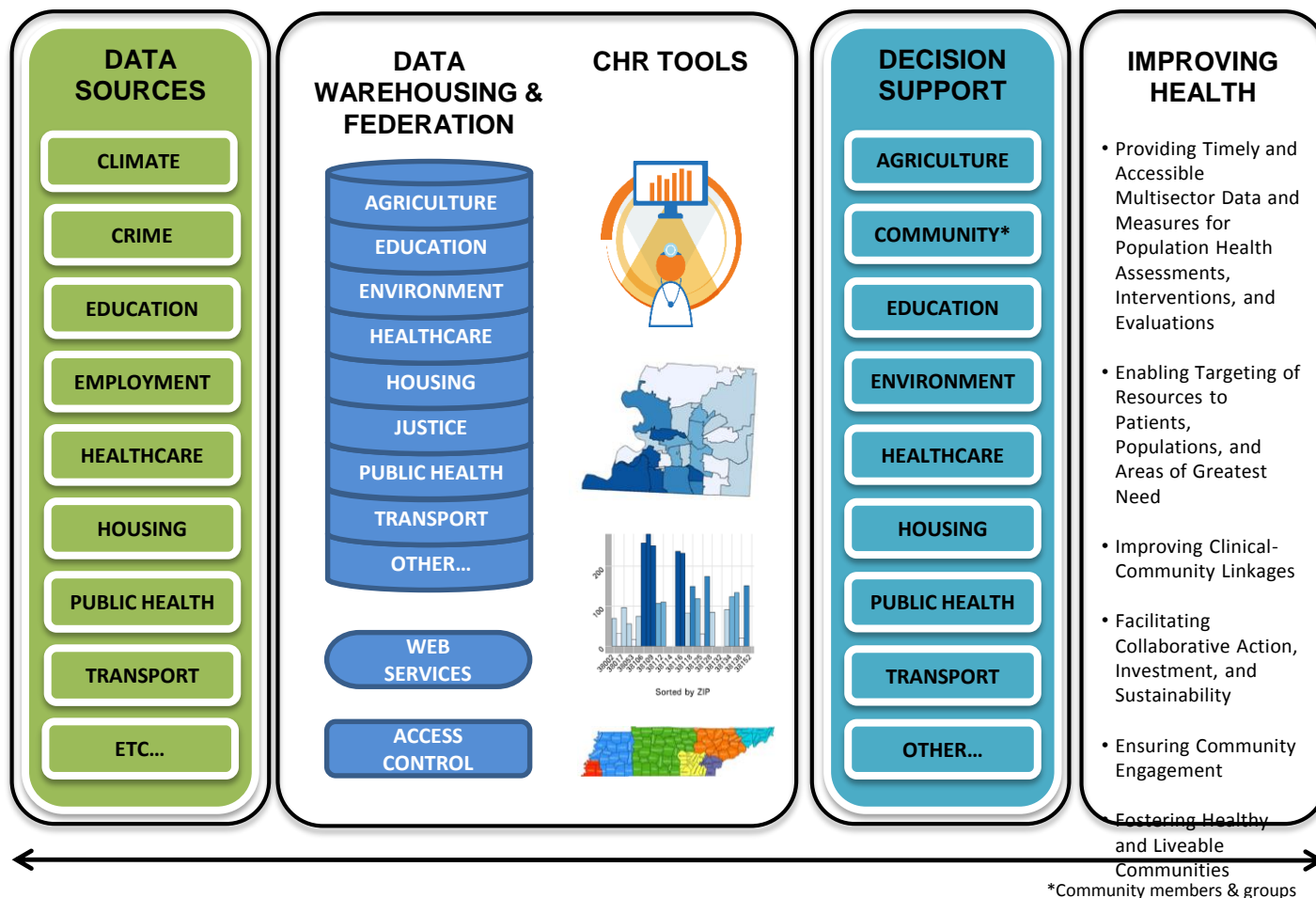


### What is PEDSnet?

PEDSnet is a pediatric **learning health system** dedicated to discovering and implementing new ways of providing the best care and improving health care outcomes.



# Memphis/Shelby County Community Health Record



## Tasks (that I know of 😊)

- **Map key healthy weight data elements to existing FHIR resources**
  - Identifiers
  - Demographics
  - Metrics (height, weight, laboratories)
  - Behaviors
- **Identify gaps & propose solutions using FHIR for healthy weight behaviors & other elements**
- **Use resources to develop healthy weight applications**

# Thank you!

DNPAO Resources:

[www.cdc.gov/nccdphp/dnpao](http://www.cdc.gov/nccdphp/dnpao)



How to get involved in your community:

[www.letsmove.gov](http://www.letsmove.gov)

Contact:

[agoodman@cdc.gov](mailto:agoodman@cdc.gov)