Childhood Obesity Research Demonstration (CORD) Projects:

Implementing evidence based interventions to support healthy children in low income families

Carrie Dooyema and Heidi Blanck (presenters)
Other CORD team members: Brook Belay, Aly Goodman Division of Nutrition, Physical Activity, and Obesity

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National Center for Chronic Disease Prevention and Health Promotion
Division of Nutrition, Physical Activity, and Obesity

DNPAO Strategic Priorities: Reaching All Americans Across the Lifespan

Getting a Healthy Start
- Breastfeeding
- Early Child Nutrition

Growing Up Strong & Healthy
- Early Care and Education (ECE) and Schools (DPH)
- Child Obesity Management ★

Maintaining Good Nutrition
- Healthy Food Environment
- Vitamin & Mineral Malnutrition

Keeping Active
- Activity-Friendly Communities
- Increasing Physical Activity

Childhood Obesity: Status and Impact

Scope and Cost

- **17.5% of children** aged 6-11 and **20.5% of adolescents** aged 12-19 have obesity (2011-2014)
  - **5.6% of children** aged 6-11 had severe obesity
- **14.5% of low-income children** (2014) aged 2-4 who enrolled in WIC had obesity
- Nearly **1 in 4 young adults** are too heavy to serve in our military
- Children who are overweight or obese as preschoolers are **5 times** as likely as normal-weight children to be overweight or obese as adults. Adult obesity costs an estimated **$147 billion per year** in medical costs.

Childhood Obesity Recommendations

Addressing childhood obesity requires a complex network of care between the community, public health and healthcare systems

- The National Academy of Medicine recommends taking action in **multiple settings** where children learn, live and play including: child care centers, schools, pediatricians' offices, and communities

- The U.S. Preventive Services Task Force recommends that **providers screen children** aged **6 years or older** for obesity, and provide referrals to **intensive lifestyle modification** programs for children with obesity (Grade B)

Building the Foundation: CORD 1.0
FY 2011-2016

Authorization

- Children's Health Insurance Program Reauthorization Act of 2009
- Required a multisectoral approach

Focus: Reduce Obesity by –

- Increasing children's physical activity and consumption of fruits, vegetables, and healthier beverages
- Ensuring adequate sleep
- Decreasing screen time and
- Decreasing consumption of sugary drinks and high calorie foods

Target Audience and Required Settings

- Low-income children aged 2-12 years in key settings (ECE, schools, community, healthcare)

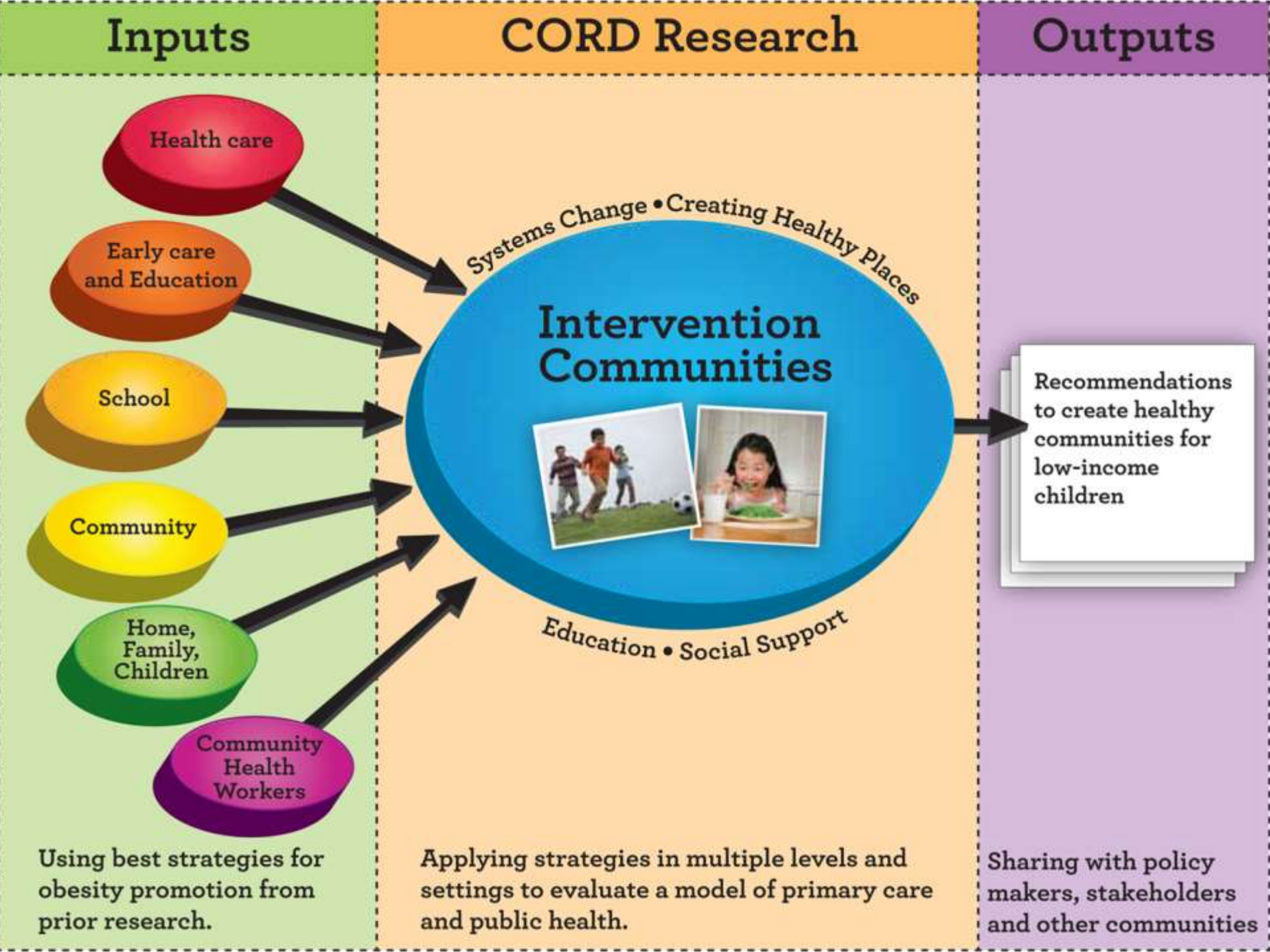
Grantees:

- The University of Texas Health Science Center at Houston
- San Diego State University
- Massachusetts State Department of Public Health
- The University of Houston served as the evaluation center for the project

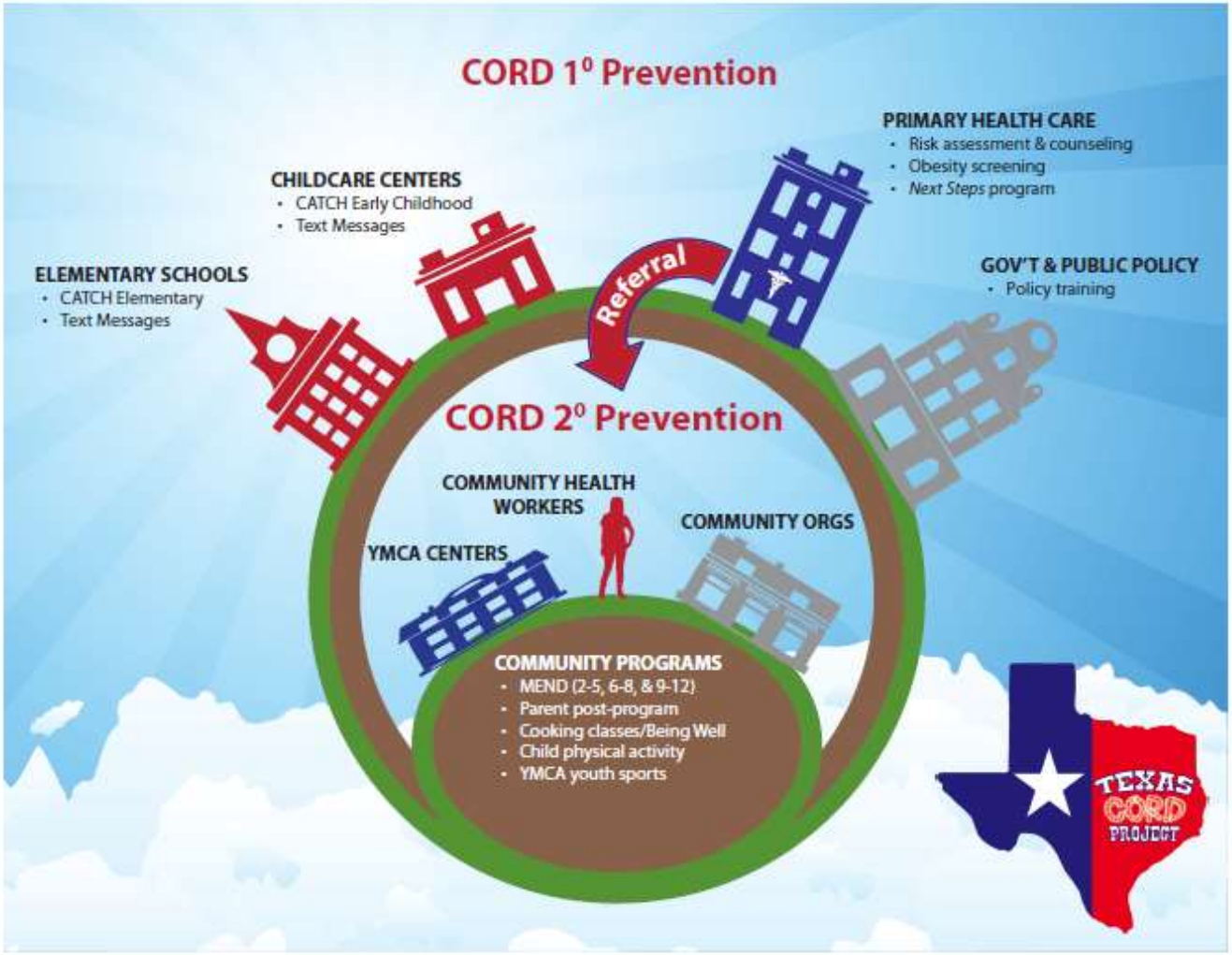
CORD

Integrating Primary Care and Public Health

- 1 in 6 U.S. youth have obesity, disparities exist
- Few published studies from multiple-setting interventions with improved behaviors and reduced obesity among children (AHRQ 2013)
- CORD Included both prevention and treatment of childhood obesity in children 2-12 years of age
- Portfolio of interventions include
  - Policy, System, Environmental (PSE) change in health care, schools, ECEs and community settings
  - Individual family pediatric weight management interventions for children >85th percentile in community health centers/YMCAs


Inputs
CORD Research
Outputs
Health care
Early care and Education
School
Community
Home, Family, Children
Community Health Workers
Systems Change • Creating Healthy Places
Intervention Communities
Education • Social Support
Recommendations to create healthy communities for low-income children
Using best strategies for obesity promotion from prior research.
Applying strategies in multiple levels and settings to evaluate a model of primary care and public health.
Sharing with policy makers, stakeholders and other communities

TX CORD Study Design



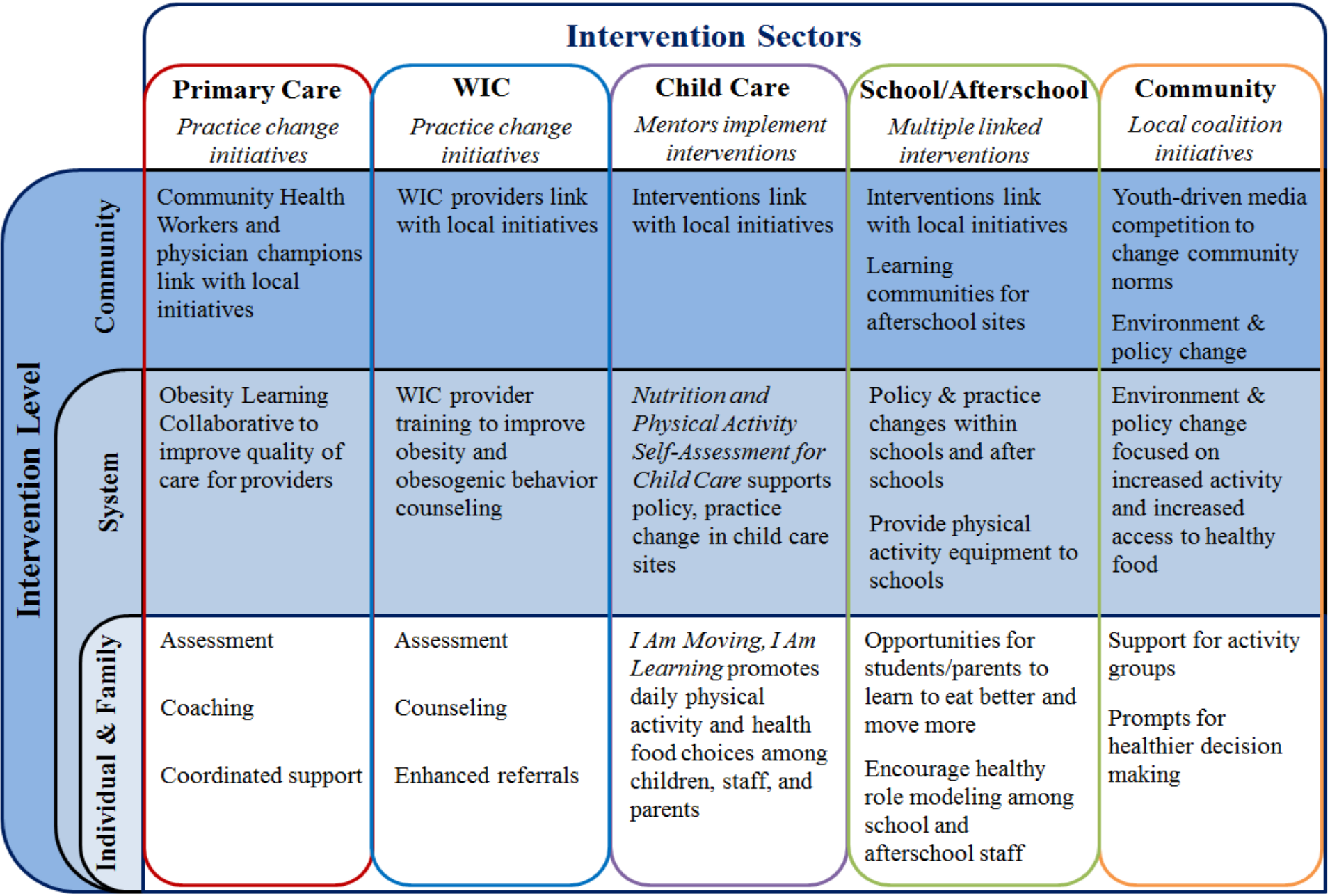
Hoelscher et al., 2015

UTHealth School of Public Health Austin Regional Campus
The University of Texas Health Science Center at Houston

MICHAEL & SUSAN DELL CENTER for HEALTHY LIVING

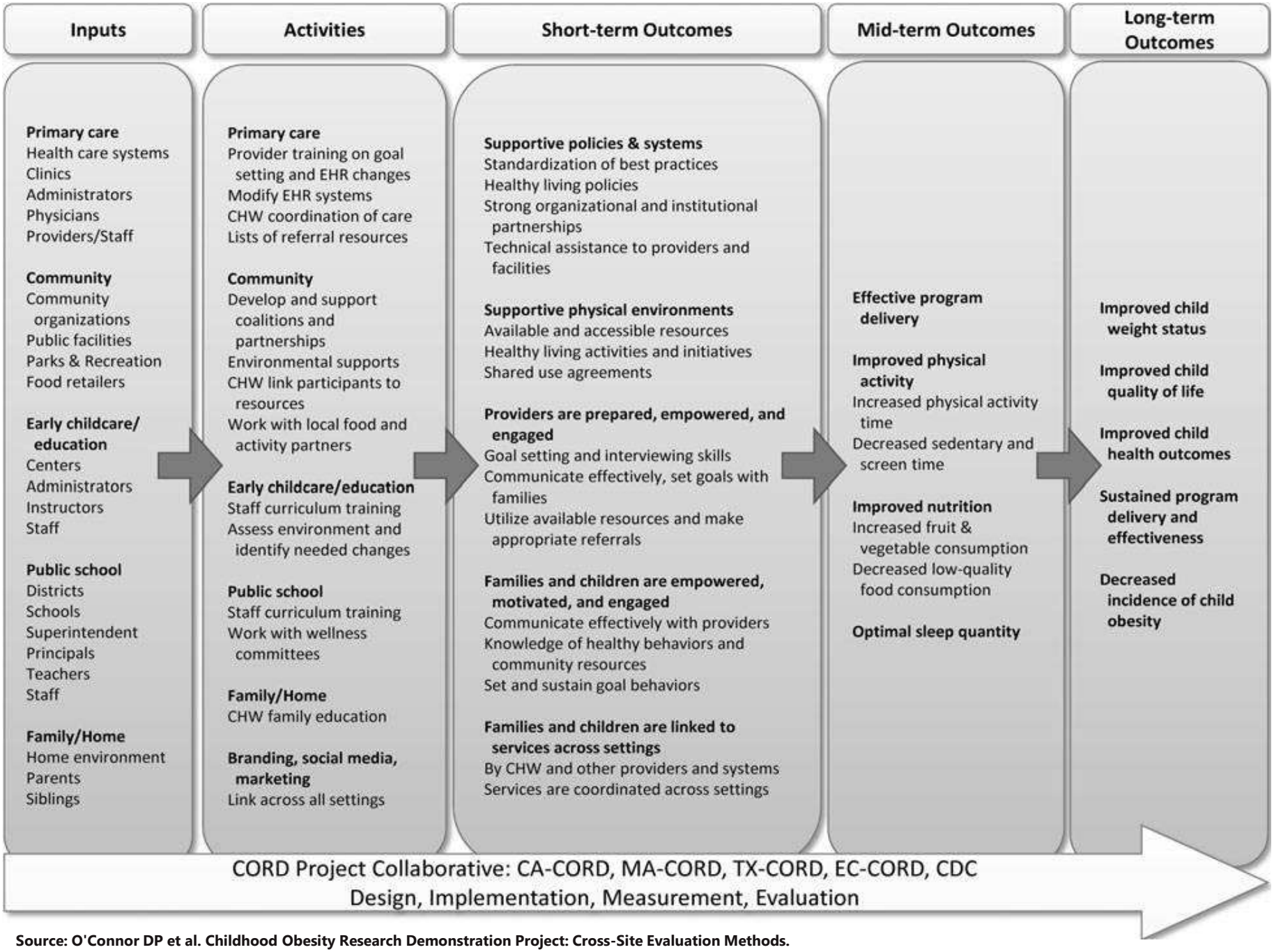
BCM Baylor College of Medicine

USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine



Source: Taveras EM et al. Design of the Massachusetts Childhood Obesity Research Demonstration (MA-CORD) Study; Child Obesity February, 2015

MassGeneral Hospital for Children



Source: O'Connor DP et al. Childhood Obesity Research Demonstration Project: Cross-Site Evaluation Methods. Child Obesity February, 2015

CORD Grantees

CORD grantees

- Mix of urban and rural communities
- High % of low income residents
- High childhood obesity prevalence in community (baseline data)
  - ECE obesity prevalence: ~ 14.4% (CA) 19% (TX)
  - School aged (5th graders): 35.2% (TX), 27% girls and 31.5% boys (CA)
- High proportion of Hispanics
- State and local health department linkages
  - MA and TX state health department linkages
  - CA local health department linkages
- Integrated community health workers (CHWs)
- Focused on consistent messaging

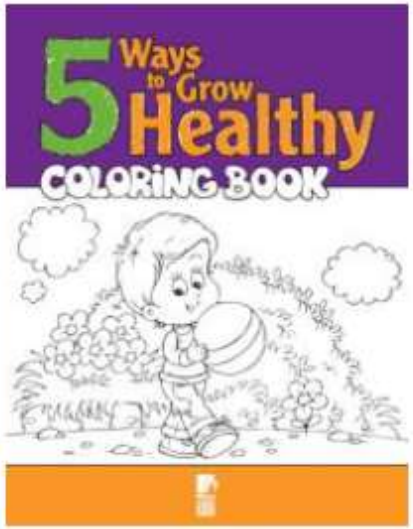
CORD Grantee Work: Bottom Line Up Front

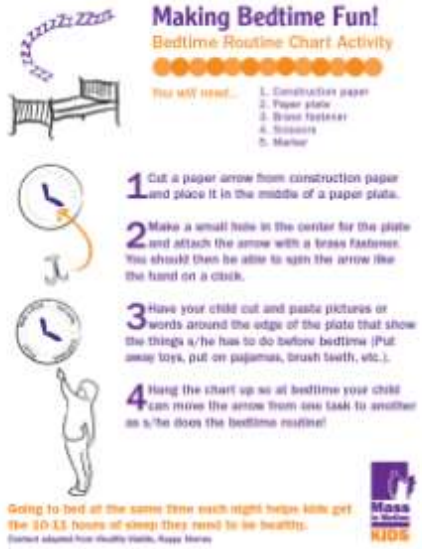
- CORD grantees used a “whole of community” approach
  - Used evidence based interventions in multiple settings
  - Provided high quality training, technical assistance and support to key people in children’s lives
  - Taught us that evidence based interventions can be delivered and implemented in communities to benefit low-income children and their families

Evidence Based Interventions and Evaluation

- Grantees used packaged evidence based interventions
  - Health Care
    - EHR clinic decision best practices - STAR study
    - Family program: Mind Exercise Nutrition Do It! (MEND/CATCH)
  - School
    - CATCH, SPARK, Eat Well Keep Moving, Planet Health
  - Early Care and Education (ECE)
    - CATCH EC, SPARK, NAP SACC
  - Community – PSE improvements, farmers markets, PA opportunities
- Collected similar process and outcome measures
- Collected information about program costs
- Branded their work and communication messages

MA-CORD Intervention Materials





Available at: http://massinmotionnewbedford.org/resources-links/

Healthcare Setting

- CORD grantees worked with 17 different healthcare centers
  - 5 FQHCs and 12 clinics
- Interventions included
  - Provider training and improve coordination of care
  - EHR clinic decision best practices - STAR study
  - CHW support and integration into care team
  - Development of education and community referral materials
  - Motivational interviewing (AAP Next Steps)
  - Referral to family intervention programs for children >85th

- Interventions for children and families with overweight and obesity
  - Family program: Mind Exercise Nutrition Do It! (MEND/CATCH) - TX
  - Healthy Weight Clinic model developed by NICHQ - MA
  - CHW led intervention family centered wellness program - CA

Reach and Initial Findings

Between 2012 and 2016,

115 healthcare providers in 17 clinics

reaching 22,300 children

Trained on optimal obesity care and referral to enroll low-income children with obesity in **structured, family-centered pediatric weight management programs**

Our Impact: Growing Up Strong & Healthy Initial Findings

Healthcare

- MA researchers found a decline in BMI z-score for all FQHC Children
  - Intervention site #1 had a downward trend in BMI z-score compared to comparison site, controlling for age, sex and race (-0.16 units/year (95% CI: -0.21, -0.11), $p<0.0001$) [1]
  - Decreased BMI of children in the Federally Qualified Health Center that fully implemented a weight management program[1]
- TX's MEND/CATCH 6-12 program was more efficacious for BMI reduction at 3 months but not 12 months compared to Next Steps in underserved children [2]
- No effects on BMI found in CA site
- Improvements in provider practices/satisfaction with care (TX and MA) [3]

Refs: 1. Taveras et al, Obesity 2017, 2. Butte et al, Obesity 2017, 3. Webinar: https://sph.uth.edu/research/centers/dell/webinars/webinar.htm?id=3ce732ff-a4ac-4713-9fa0-14d102606ccd

Early Childhood (WIC and ECE)

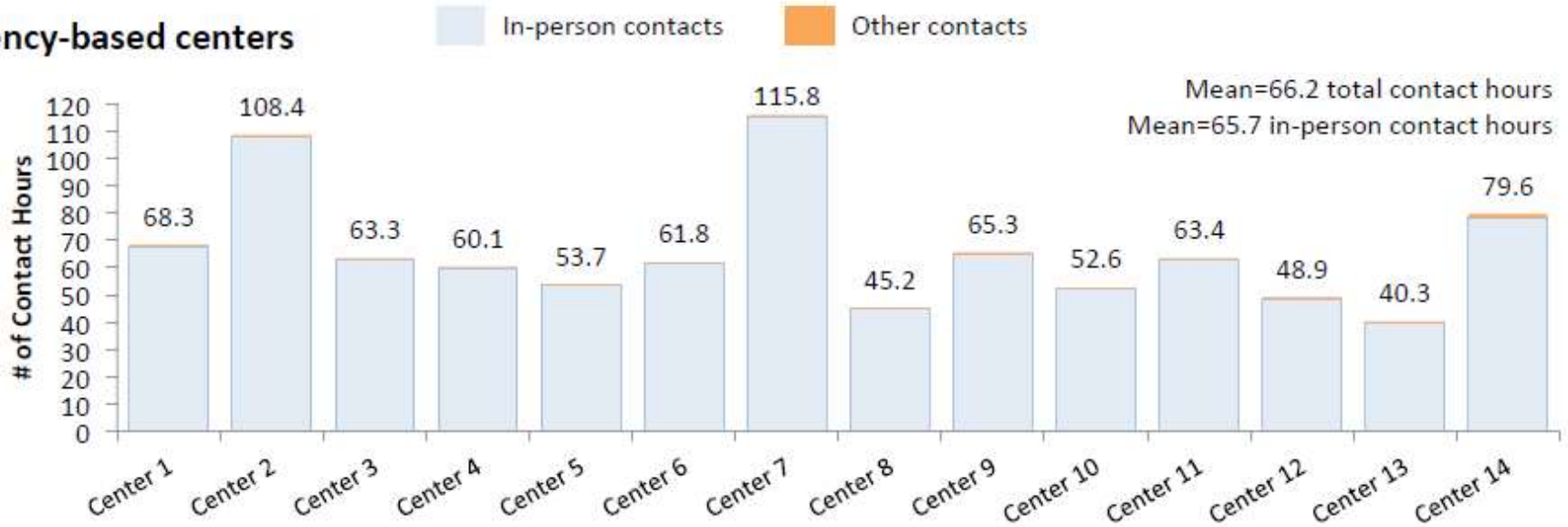
- CORD grantees worked with 58 ECEs and WIC clinics (MA)
- ECE interventions included:
  - NAP SACC assessments at 0, (12), 24 mos
    - Policy and environmental changes to ECEs
  - Extensive trainings, toolkits, use of mentors, and technical assistance
  - Use of evidence based interventions: CATCH EC, SPARK
  - Measured BMI and provided info to parents (CA)
  - Newsletters to parents, posters

- WIC interventions (MA only)
  - WIC provider trainings and modules
  - Train the trainer program
  - Educational materials and common messaging

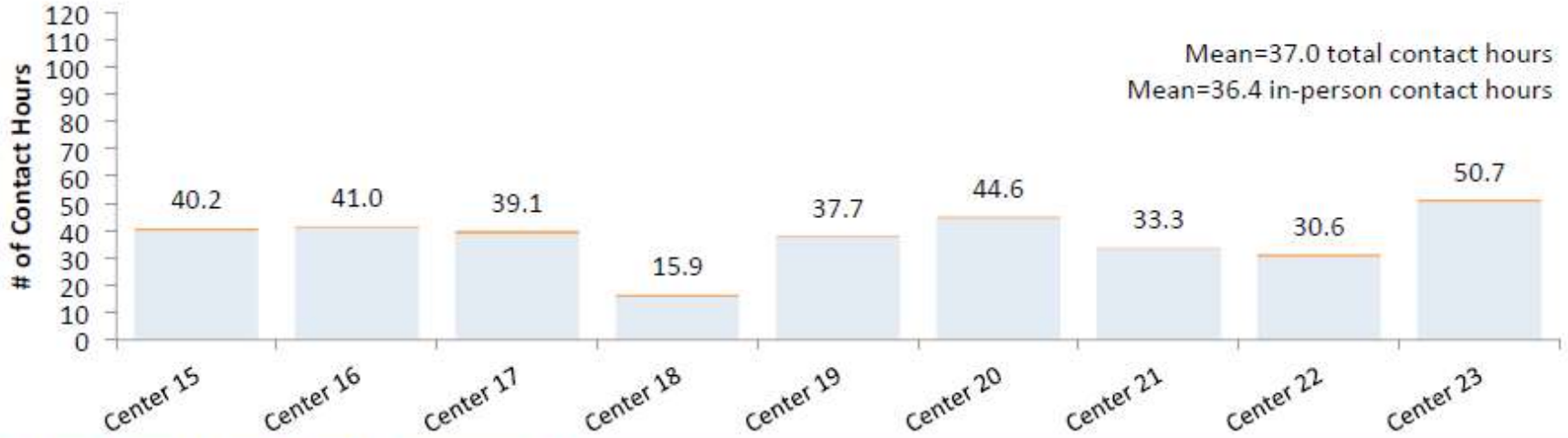
https://sph.uth.edu/research/centers/dell/webinars/webinar.htm?id=70bcffe5-977f-4eee-8e44-9106be004020

Contact Hours

Agency-based centers



Private centers



Our Impact: Growing Up Strong & Healthy Initial Findings

Early Care and Education Reach

Reach: 58 ECEs (~5,174 children)

Early Care and Education Results

- **Decrease in the BMI z-scores** of children in intervention Head Start programs compared to usual Head Start programs, and changed some behaviors (TX only grantee to capture BMI)
- PSE changes to ECEs

Women, Infants, Children (WIC)

- **Reduced obesity risk factors** at WIC intervention sites (MA)[1]

1. Woo Baidal, JA et al. (2017)
2. https://sph.uth.edu/research/centers/dell/webinars/webinar.htm?id=70bcffe5-977f-4eee-8e44-9106be004020

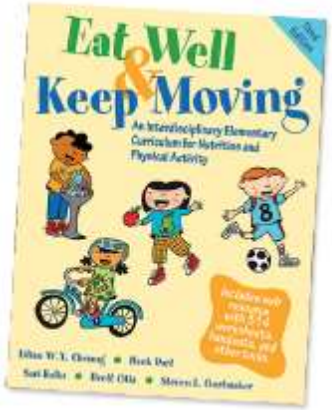
School Setting

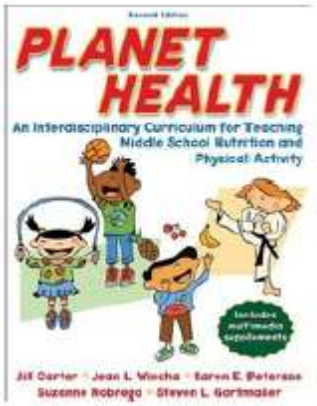
- CORD grantees worked with 74 schools in 6 districts (~41,500 children)
  - Elementary and middle schools
- Interventions included:
  - Evidence based interventions such as CATCH, SPARK, Eat Well Keep Moving, Planet Health
  - Grantees working with wellness committees/wellness champions for PSE changes (Example: water jets installed)
  - BMI screening for select grades
  - Media campaigns and messaging of key behaviors (10,5,2,1,0)
  - Trainings, technical assistance, wellness champions, mini-grants
  - Afterschool and out of school time interventions (Boys and girls club, Parks and Rec – MA and CA)

- Several papers written outlining school stakeholder engagement and school work

School sector intervention

1. Evidence-based health education curricula
2. Teacher training & resources on the curricula
3. School Wellness Champions & district coordinators
4. Media competition for students
5. Provision of physical activity supplies





OSNAP creating healthy spaces for kids

Food & Fun AfterSchool

Mass in Motion KIDS

(http://www.eatwellandkeepmoving.org/; http://www.planet-health.org/; http://osnap.org/; http://www.foodandfun.org/)

Our Impact: Growing Up Strong & Healthy Initial Findings

School

MA CORD

- Statistically significant decline in obesity prevalence among 7th students in one of the two intervention communities
- Behavioral improvements were reported by 4th and 7th grade students (SSB intake, water intake, screen time)[1,2]

TX CORD

- No differences when comparing Intervention vs. Comparison by grade level
- High implementation related to better outcomes than moderate or low implementation in most cases (manuscript in progress; webinar slides)

1. Franckle RL, et al. 2017

Reach Estimation Summary

- CORD Evaluation Center estimated CORD 1.0 reach
  - 58 ECEs (5,174 children)
  - 74 schools with (41,500 children)
  - 17 health centers (22,000 children)
  - 888 providers (teachers, ECE staff, healthcare staff)
  - 149 organizations
- Integrated Community Health Workers
  - CHWs served many roles
    - Integrated into the healthcare setting (MA and CA)
    - Delivered interventions (CA and TX)
    - Supported children and families (all)
    - Provided counseling and MI, linked to resources (all)

CORD 1.0 Reflections

- Whole of Community, Low-income Families (large percentage of Medicaid, CHIP)
  - Example: TX-CORD ECE parent survey 73% were Hispanic, 86% had an annual income of <25K, and ~86% were on Medicaid
- Stakeholder engagement essential
- Dose of interventions varied by grantee: contact hours for 2º prevention (kids >85th)
  - TX CORD ~120 hours
  - MA CORD ~27 hours
  - CA CORD ~11 hours
- Exposure to interventions in multiple settings varied
  - TX CORD ~ 25% of kids in 2º prevention interventions in schools or ECE with intervention
  - MA CORD ~ 96% of kids in 2º prevention interventions in schools with intervention
- Participation/retention rates varied

Cross site evaluation lessons learned

- Individual and cross site evaluations
  - Planned common measures to aid cross site evaluation (+)
  - Difficulties in pooling data and dealing with interventions with different intensities and sample sizes (-)
  - Collected a lot of process data (+)

Baseline Participant Characteristics	Public health only N= 148	Primary Care Plus Only N=377	Integrated N= 268	Comparison N=371	All groups N=1164
	Mean (SD) or N (%)				
Male, n (%)	72 (48%)	203 (54%)	148 (55%)	180 (49%)	603 (52%)
Mean age at baseline	7.8 (1.9)	6.7 (2.9)	7.9 (2.2)	7.1 (3.0)	
2-5 years, n (%)	27 (18%)	168 (45%)	58 (22%)	152 (41%)	405 (35%)
6-8 years, n (%)	79 (54%)	116 (31%)	120 (45%)	98 (26%)	413 (35%)
9-12 years, n (%)	42 (28%)	93 (25%)	90 (34%)	121 (33%)	346 (30%)
Site					
CA-CORD, n (%)	106 (72%)	171 (46%)	123 (46%)	148 (40%)	548 (47%)
TX-CORD, n (%)	42 (28%)	159 (43%)	55 (21%)	150 (41%)	406 (35%)
MA-CORD, n (%)	0 (0%)	43 (11%)	87 (33%)	72 (19%)	202 (17%)

Cross site evaluation lessons learned

- Pooled CORD baseline data of children >85th percentile (n=1156)
  - 30% overweight
  - 42% obese
  - 29% severely obese
- BMI of parents 33.2 (n=816)

- Majority Hispanic (97% CA, 86% TX, 77% MA)

- Age
  - 2 to 5 years 35%
  - 6 to 8 years 35%
  - 9 to 12 years 30%

CORD Lessons Learned

- Common measures
  - Common measures formed by consensus
  - Less sensitive to change
- Cross site evaluation
  - Planned common measures to aid cross site evaluation
  - Difficulties in pooling data and dealing with interventions with different intensities and sample sizes
- Cost evaluation
  - Required grantees to do cost evaluation and capture costs
  - Methodological consensus difficult when grantees are trying get interventions up and rolling

Intervention Costs

Program	Total Cost	No. of participants	Cost per participant
CATCH Early Childhood	$70,573	2,700	$26.14
CATCH Elementary	$23,470	19,138	$1.23
MEND	$663,779	315	$2,107
Next Steps	$18,165	234	$164

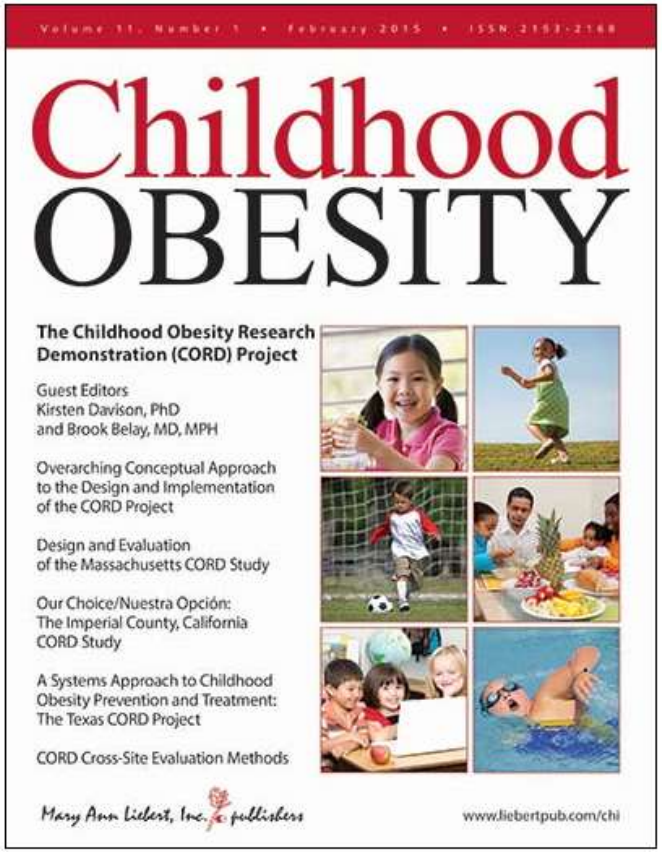
CORD Summary

1. Low income children and families are interested in family weight management programs and will attend
2. Dose matters — Improvement in child BMI was influenced by intervention compliance (attendance)
3. All settings matter

"The results, albeit modest, from these three settings, collectively demonstrate the potential power of multisector, multilevel, approaches to childhood obesity prevention.*"

*Economos CD, Hammond, RA . Designing Effective and Sustainable Multifaceted Interventions for Obesity Prevention and Health Communities. *Obesity (Silver Spring)*. 2017: Jul;25(7):1155-1156.

Advancing the Science



- 28 Publications
- 3 Toolkits
- Preventing Chronic Disease Special Collection of 5 papers focusing on implementation science
  - 3 on stakeholder engagement
  - 1 on ECE directors/teachers
  - 1 on recruitment to MEND/CATCH
- Webinar Series on CORD Findings and Lessons Learned

Moving Forward: Building on Lessons Learned CORD 2.0

Authorization

- The Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) appropriated an additional $10 million and extended the program for 2 years (2016-2018)

Focus

- The role of healthcare providers and program teams for management of childhood obesity in the healthcare setting and community settings

Target Audience

- Low-income children and their families (aged 6-12 years) who are overweight or obese in healthcare or community settings

Grantees:

- The Massachusetts Department of Public Health in collaboration with Massachusetts General Hospital
- Arizona State University-Tempe

CORD 2.0

- Mass Dept of Health/Mass General
  - Children randomized to FQHCs HWC or YMCA (MEND – Healthy Weight and Your Child program
  - To date over 300 children enrolled (target 400)

- Arizona State University & Northwestern (coPIs) – Raising Healthy Children/Family Check-up 4 Health
  - Family Check Up is an evidence based parenting intervention for problem behavior and they have tailored it to include more topics related to obesity
  - Sites include 2 FQHCs and Phoenix Children's Hospital
  - Using behavioral health specialists to deliver the intervention
  - Actively recruiting

Moving Forward: National Association of Community Health Centers

Cooperative agreement

- Funded the National Association of Community Health Centers to implement MEND program in 16 FQHCs in 4 states

Focus

- Dissemination and Implementation science
- Using a with a learning collaborative model to help with implementation
- Target of 420 children through MEND program

Target Audience

- Low-income children and their families (aged 6-12 years) who are overweight or obese in FQHCs.

Resources

- DNPAO CORD website for CORD handout and publications list
  - https://www.cdc.gov/obesity/strategies/healthcare/cord1.html
  - Collection in Preventing Chronic Disease on implementation science (December 2017)
  - Child Obesity Supplement with baseline and design papers (Feb 2015)
  - Webinar series hosted by Michael and Susan Dell Center for Healthy Living - Healthcare (webinars 1 and 4), Early childhood (webinar 2), Schools (webinar 3)
  - CORD created resources: Next Steps provider booklet, CATCH EC implementation guide, CHW Obesity training and toolkit
- Other resources
  - SNAP-Ed toolkit, Center TRT website, NCI Cancer Control PLANET
  - NACDD webinar series on USPSTF recommendations
  - Scientific papers

Acknowledgements

CORD PIs and their study teams CORD 1.0

- TX: Deanna Hoelscher & Nancy Butte
- MA: Tom Land
- CA: Suchi Ayala
- UH (Eval Center): Dan O'Connor

CORD 2.0 MA: Tom Land and Elsie Taveras

AZ: Cady Berkel and JD Smith

- Federal steering committee members from ACF, CMS, HRSA, NIH, AHRQ
- DNPAO advisors, supporters, and former CORD team members
- DPH - School Health Branch advisors
- DHDSP advisors

Thank You!

For more information, contact:
Carrie Dooyema – igb7@cdc.gov

For more information on CORD 1.0 visit our website at:
https://www.cdc.gov/obesity/strategies/healthcare/cord1.html

For more information on CORD 2.0 visit our website at:
https://www.cdc.gov/obesity/strategies/healthcare/cord2.html

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Questions?