

General public health and environmental approaches to address pregnancy BMI and excessive gestational weight gain

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National Academies' Workshop: Exploring New Evidence on Weight Gain During Pregnancy and Perinatal Outcomes.
Friday, Sept. 5, 2025.



Eunice Kennedy Shriver National Institute
of Child Health and Human Development

Disclosures

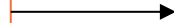
No financial relationships to disclose

Public health approaches: Obesity Policy Action Framework



Upstream

Economic, social,
physical environments



Food environment
Physical activity environment
Social determinants of health

- Land-use/urban planning
- Food marketing restrictions
- Production subsidies/taxes
- Food ingredient & labeling regulations



Midstream

Population behaviors



Food intake
Physical activity

- School food & physical education/activity policies
- Workplace wellness programs
- Educational campaigns



Downstream

Health services,
clinical interventions



Clinical care
standards & access

- Clinical practice guidelines
- Dietitian staffing
- Research funding

Public health approaches

- **Primarily guidelines and recommendations**
- **22 documents/clinical practice guidelines**
- **8 countries**

COUNSELING RECOMMENDATIONS

Advise patients on:

- “Risks of obesity in pregnancy and refer to weight-reduction interventions before conception.”
- “Importance of healthy weight gain during pregnancy and adherence to gestational weight gain recommendations.”

Health policies and guidelines

COMPONENTS

- Provide counseling, dietitian referral
- Support individual strategies
- Address barriers
- Goal-setting
- Monitoring
- Promote healthy diet, regular physical activity
- Sensitivity to weight-related concerns

United States Preventive Services Task Force

RECOMMENDATION

“Offer effective behavioral counseling interventions aimed at promoting healthy weight gain and preventing excess gestational weight gain.”

COMPONENTS

- In-person
- Referrals
- Multiple components (e.g., technology-supported coaching or counseling)

KNOWLEDGE GAPS

- Contact number, frequency
- Session length
- Tailoring

Public health approaches: gaps

- Specific weight management guidelines
- Evidence-based intervention strategies
- Implementation guidelines
- Community-level policies
- Healthcare provider training/knowledge/capacity

Interventions

Evidence to inform practice
guidelines

- Early pregnancy
- Clinical setting
- Individual behavior/lifestyle change
- Prepregnancy interventions primarily in participants with fertility issues

Intervention outcomes

HEALTH OUTCOMES

Reduced risk of excessive
GWG, emergency
cesarean delivery,
macrosomia, LGA
(Cantor 2021)

COST EFFECTIVENESS

4.75x return on
investment due to
savings from reduced
adverse events
(Lloyd 2022)

Effective approaches

INTERVENTION TARGETS

- Greater GWG decreases in **diet only** (2.65 kg) vs. **physical activity only** (1.04 kg) or **mixed** interventions (0.74 kg)

DELIVERY APPROACHES

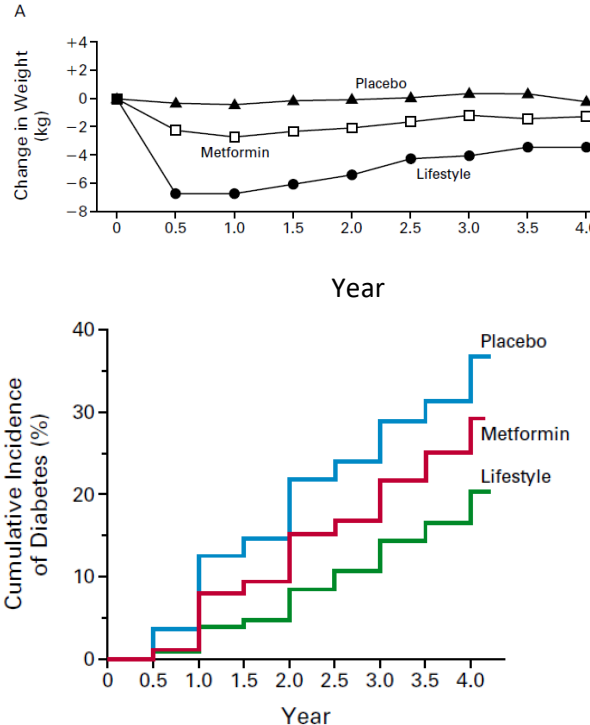
- **Individual** (vs. group) delivery format
- **Face-to-face** mode (vs. remote)
- Delivery by **allied health staff** (vs. medical, researcher, other)
- **6+** sessions

Lack of evidence on optimal intervention content

The Diabetes Prevention Program (DPP)

Intervention

- 16-lesson curriculum, 1:1 for 24 weeks, followed by monthly individual sessions, optional group sessions.
- Flexible, culturally sensitive, individualized
- Targets 7% weight loss
- ≥ 150 min weekly physical activity
- Healthy, low-calorie, low-fat diet



Changes in body weight by study group

Cumulative incidence of diabetes by study group ($p < 0.001$ for differences between groups)

- **58% lower** incidence in **lifestyle** vs. control group
- **39% lower** in **lifestyle** group vs. metformin group
- **31% lower** in **metformin** vs. control group

The National Diabetes Prevention Program (NDPP):

A template for public health approaches to improve prepregnancy weight and gestational

REACH

- 1,500 delivery organizations
- 1 Million Americans across all 50 states
- Targets 5% weight loss

HEALTH OUTCOMES

- 46% decrease in self-reported type 2 diabetes risk over 2 years
- Lower BMI ($\Delta -0.5 \text{ kg/m}^2$, $p < 0.001$) and triglycerides ($\Delta -21 \text{ mg/dl}$, $p = 0.004$)

COST EFFECTIVENESS

- 88% probability that NDPP enrollment is cost-saving over 2 years for adults with prediabetes
- \$4600 savings per person
- \$160,000 savings per case of diabetes prevented

Herman et al, 2024. DOI: [10.1016/j.jdiacomp.2023.108527](https://doi.org/10.1016/j.jdiacomp.2023.108527).

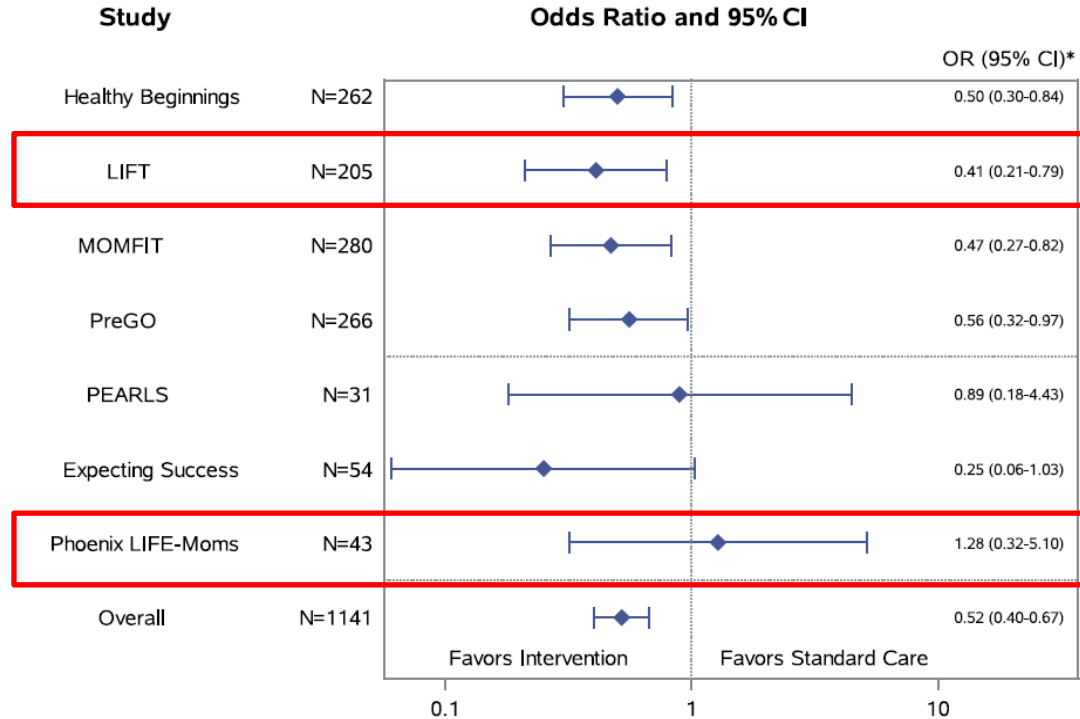
Ackerman, 2025. DOI: [10.2337/dci24-0100](https://doi.org/10.2337/dci24-0100)

Kuo et al, 2025. DOI: [10.2337/dc24-1110](https://doi.org/10.2337/dc24-1110)

LIFE – Moms (2012 – 2015)

Consortium of
collaborative trials
to promote optimal
gestational weight
gain

DPP – based GWG interventions



* Adjusted for baseline BMI category (overweight, obese)

Figure 2 Forest plot for primary outcome.

Additional evidence

Denver Health system study (2013 – 2019)

- NDPP participants at high-risk for type 2 diabetes
- Participants < 40 years who became pregnant and delivered after attending NDPP for ≥ 1 month (**n=32**) vs. usual care (**n=26**)

Results

- Lower BMI between baseline and conception (-1.8 ± 0.6 kg/m², $p = 0.002$)
- Lower frequency of obesity at conception (56.7% vs. 88%, $p = 0.01$)
- Less likely to screen for gestational diabetes in early pregnancy (4.0% vs. 25.0%, $p = 0.02$)

Additional evidence

Montana DPP (2008 – 2015)

- N = 5091 females at high-risk for type 2 diabetes, with (n=298) and without gestational diabetes hx

Results

- **5.0±6.5 kg** mean weight loss
- **45%** achieved 5% weight loss
- **29%** achieved 7% weight loss
- No differences between participants with and without gestational diabetes hx

Next steps

NDPP-NextGen parallel RCT (recruiting)

- Target n = 360
 - overweight/obesity
 - moderate-to-high likelihood of pregnancy within 24 months
- Randomized 1:1 to NDPP – based pre-conception intervention vs. usual care

Outcomes

- post-conception BMI and fasting glucose (<8 weeks gestation)
- Neonatal adiposity (< 2 days)

Sauder et. al, 2023
NCT05674799
<https://doi.org/10.1016/j.cct.2023.107305>

American Journal of Obstetrics & Gynecology

Clinical opinion

“The DPP has been found to be an effective technique to induce behavioral changes and weight reduction, and reduce cardiometabolic risk factors in general, especially for individuals with a history of gestational diabetes.”

*“To decrease or delay the risk of developing type 2 diabetes mellitus after gestational diabetes, **postpartum care should include a recommendation that the individual participates in a CDC-recognized DPP.**”*

ENVIRONMENTAL INTERVENTIONS

No environmental interventions
targeting prepregnancy BMI or
gestational weight gain

Key challenges

- Multiple environments
- Need for collaboration among multiple stakeholders
- Long timelines to measure impact

Shape Up, Somerville 2003



- Community Based Participatory Research
- Modified multiple environments to improve child eating and physical activity behaviors
- Decreased BMI in children and their parents over 2 years

<https://www.somervillema.gov/sites/default/files/shape-up-somerville-story.pdf>

Economos et al, 2013. DOI: 10.1016/j.ypmed.2013.06.001

Coffield et al., 2015. DOI: <https://dx.doi.org/10.2105/ajph.2014.302361>

Regulating food labels to change food environments

Lessons from the Chilean food labeling initiative

1. Front-of-package labeling for packaged foods “high in” sugars, saturated fat, sodium, calories (only foods with added sugars, added saturated fats, or added sodium, and high energy density)
2. Marketing ban on cartoon characters and ads on TV programs for “high-in” foods
3. School ban of foods with warning labels

Implementation timeline

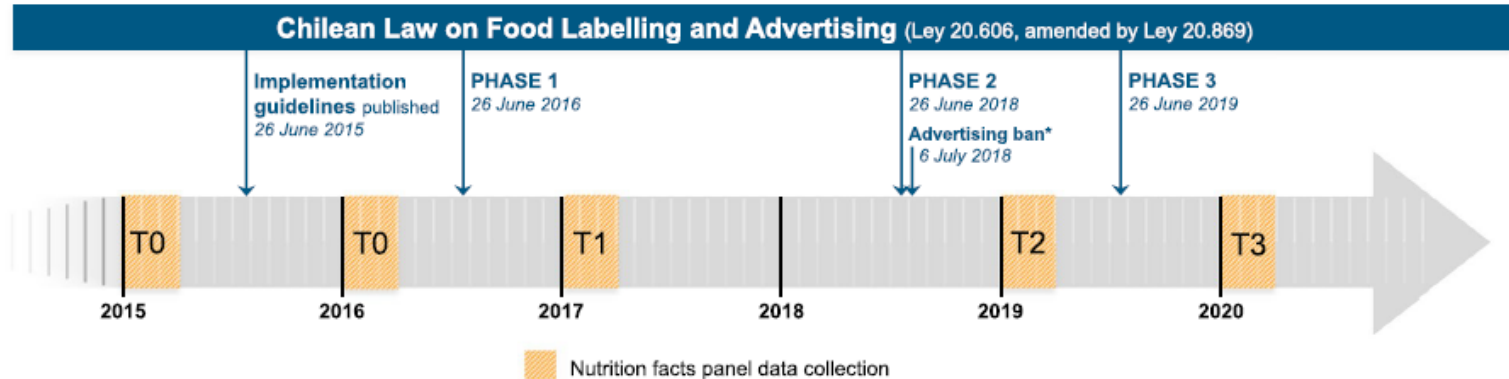


Fig. 1 Timeline of the implementation of the Chilean Law of Food Labelling and Advertising and data collection. T0, preimplementation period; T1, postimplementation of the 1st phase of the law; T2, postimplementation of the 2nd phase of the law; T3, postimplementation of the 3rd phase of the law

Front-of-package food warning labels

Calories



Sugar



Saturated fat



Trans fat



Sodium



CONTIENE EDULCORANTES,
NO RECOMENDABLE EN NIÑOS

Sweeteners

CONTIENE CAFEÍNA
EVITAR EN NIÑOS

Caffeine



Environmental impact of Chilean packaged food regulations



14% - 36%

**Reduced proportion of available
foods “high-in” target nutrients
(due to reformulation)**



44% - 58%

**Reduced child and adolescent
exposure to
“high-in” food advertising**



88%

**Reduction in # of school foods
“high-in” target nutrients**



25%

**Reduction in purchases of
target nutrients from “high-in”
foods**

Conclusions and future directions

Current landscape

- Public health efforts **focused on clinical guidelines**
- **Limited community or environmental** interventions

Evidence and gaps

- **Behavioral interventions** can be effective
- Need **more evidence** to inform specificity, implementation, and reach

Promising approaches

- **NDPP**
- Policies and regulations to improve the **food environment**

Credits

Special thanks to the people who made and released these free resources.

- Presentation template by [SlidesCarnival](#)
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