HEALTHY FOOD AMERICA | Research Report

June 2019 | www.healthyfoodamerica.org

Healthy Food Pricing Incentives: Designing successful programs

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OCTOBER 14, 2019

HEALTHY FOOD AMERICA
Moving Science to Action

UNIVERSITY of WASHINGTON

Acknowledgments

We thank the following for sharing their expertise:

- Tatiana Andreyeva, University of Connecticut and Rudd Center for Food Policy & Obesity
- Alyssa Auvinen, Washington State Department of Health
- Kylie Ball, Deakin University
- Skye Cornell, Wholesome Wave
- Joel Gittelsohn, Johns Hopkins Bloomberg School of Public Health
- Oran B. Hesterman, Fair Food Network
- Bridget Igoe, City of Seattle
- Allison Karpyn, University of Delaware
- Julia Koprak, The Food Trust
- Francois Millard, Vitality Group International
- Courtney Parks, Gretchen Swanson Center for Nutrition
- Michele Polacsek, University of New England
- Hilary Seligman, EatSF and University of California, San Francisco
- Dwayne Wharton, The Food Trust
- Parke Wilde, Tufts University

This work was partially supported by a Nimble Fund Grant from the Pacific Hospital Preservation and Development Authority and general support from Panta Rhea Fund

Introduction

Research question

- Substantial body of research shows that incentives increase healthy food consumption and purchases, particularly of fruits and vegetables
- What are the specific attributes of a healthy food pricing incentive that make it effective?”
    - Size and frequency of the incentive?
    - Type of food subsidized?
    - Source of food (e.g. supermarket, farmers market, restaurant, etc.)?
    - Type of incentive (discount, subsidy, rebate or match)?
    - Mechanism for delivery (e.g. EBT/ debit cards, paper vouchers, tokens)

PLOS ONE

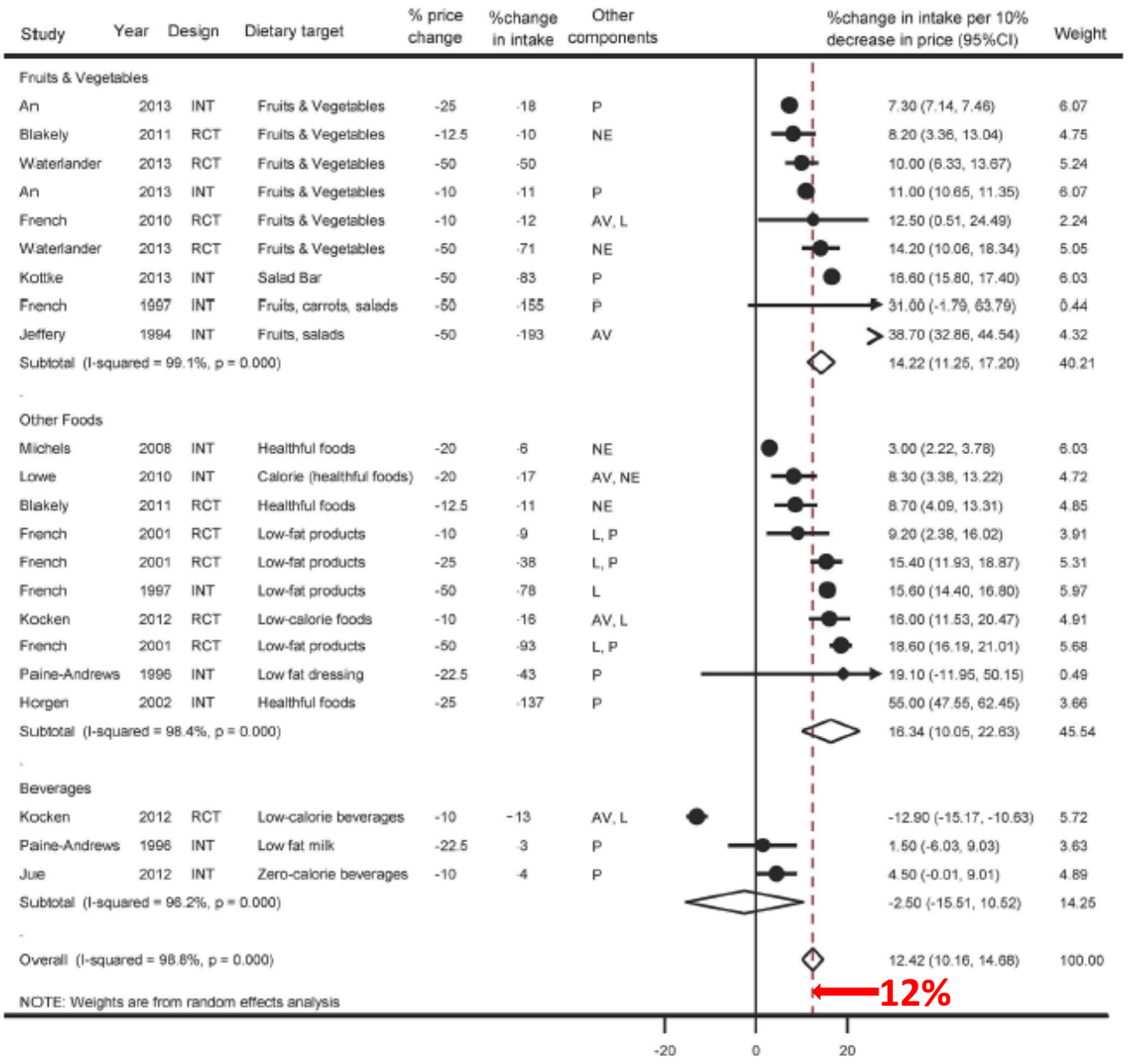
RESEARCH ARTICLE

The prospective impact of food pricing on improving dietary consumption: A systematic review and meta-analysis

Ashkan Afshin[1,2‡*], José L. Peñalvo[2‡], Liana Del Gobbo[2,3], Jose Silva[4], Melody Michaelson[5], Martin O'Flaherty[6], Simon Capewell[6], Donna Spiegelman[7,8,9,10], Goodarz Danaei[8,9], Dariush Mozaffarian[2]

Table 3. Results of grading of the prospective interventional and observational evidence for effectiveness of food pricing interventions to improve diet and adiposity.

Policy	American Heart Association[1]	U.S. Preventive Services Task Force[2]	CDC Community Guide[3]
Subsidies			
To increase consumption of fruits and vegetables	Class I, Level of Evidence A	Grade A, High Level of Certainty	Strong Evidence, Strongly Recommended
To increase consumption of other healthful foods[4]	Class I, Level of Evidence A	Grade A, High Level of Certainty	Strong Evidence, Strongly Recommended
To increase consumption of healthful beverages[5]	Class IIb, Level of Evidence B	Grade C, Moderate Level of Certainty	Insufficient Evidence
To reduce BMI	Class IIb, Level of Evidence B	Grade C, Moderate Level of Certainty	Insufficient Evidence
Taxation			
To decrease consumption of SSBs	Class IIa, Level of Evidence B	Grade B, Moderate Level of Certainty	Sufficient Evidence–Recommended
To decrease consumption of unhealthful foods[6]	Class IIb, Level of Evidence B	Grade C, Moderate Level of Certainty	Insufficient Evidence
To reduce BMI	Class IIb, Level of Evidence B	Grade C, Moderate Level of Certainty	Insufficient Evidence



10% decrease in price increases consumption of healthy foods by 12%

Methods

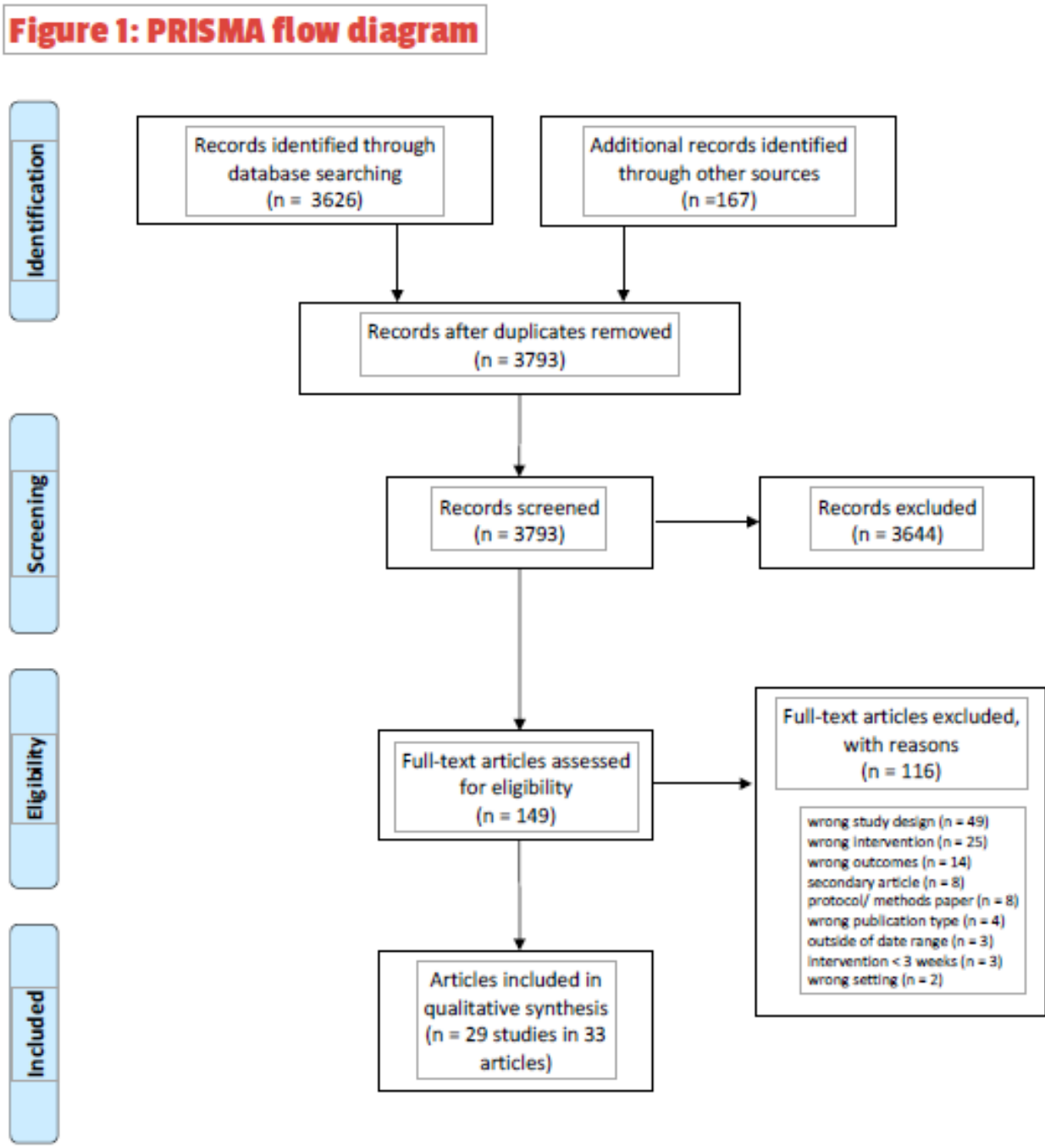
Systematic review: methods

- **Databases and search dates**: PubMed, Cochrane, and Google from 2008-2018
- **Data collection**: Two reviewers independently selected articles, cross-checked extracted data
- **Study quality assessment**: Score based on eight criteria
- **Outcomes**: Within-group change in the pricing intervention arm or the difference in differences in consumption or purchase of fruits and/or vegetables or of healthy foods more broadly defined

Inclusion criteria

- **Publication Type and Language**: Peer-reviewed, English-language articles with original data.
- **Study Design**: Controlled trial, quasi-experiment, natural experiment, single-group pre/post, time series, and prospective cohort with intervention of at least 3 weeks duration.
- **Setting**: Any country and most food purchasing settings (stores, restaurants, cafeterias, and farmers markets but not vending and online sales or free fruit and vegetable programs offered in primary schools).
- **Intervention**: Healthy food pricing incentive (a monetary award that reduces the price of healthy foods)
- **Outcome**: Must include measure of healthy food consumption, purchase, sales, or consumer expenditure data at the consumer level.

PRISMA flow diagram



Analysis plan

Case Control Approach

- Grouped studies: At least one significant outcome vs. none.
- Qualitatively assessed whether feature was found more or less commonly in significant studies relative to non-significant ones.

Cohort Approach

- Grouped studies based on presence of a given feature
- Qualitatively assessed whether the frequency of significant studies differed by feature.

Significant: % large incentive

Non-Significant: % large incentive

Large Incentive: % significant

Small Incentive: % significant

Key informant interviews

- Included 14 experts in the design, implementation and evaluation of incentives:
  - NGO
  - Business
  - Government
  - Academic
- Conducted semi-structured telephone interviews
- Coded notes
- Identified themes and areas of agreement and discordance

Results

Study characteristics

Targeted foods/beverages: Fruits and vegetables (28 of 29)

- Both fresh and processed: 10 studies
- Additional foods meeting healthy food criteria: 10 studies

Incentive size: varied widely, per household

- Amount per week: $1.30 to $10.00 (median $6.08)
- Proportion of price: 10% to 100% (median 30%)
- Caps:
  - $5-120 per month per household (14 studies)
  - $10 per shopping trip or per day (2 studies)

Form of incentive:

- Electronic: 15 studies (automatic price deduction at POS or automatic credit back to a debit/gift card.)
- Physical: 14 studies (e.g. paper coupons)

Study characteristics

Site:

- Food stores: 13 (mostly supermarkets)
- Cafeterias/restaurants: 6
- Farmers markets: 5
- Stores and farmers markets: 2
- Multiple locations: 3

Duration:

- Short (3-5 weeks): 6
- Medium (8 weeks to 4 months): 13
- Long (24 weeks to 29 months): 10

Co-interventions: 22 studies

- Nutrition education, on-site healthy product promotion and placement, or unhealthy food purchasing restrictions
- Assessment of co-intervention independent of pricing intervention in 9

Study characteristics

Participants:

- Income: 16 enrolled exclusively low-income participants
- Race: 11 predominantly non-white/9 predominantly white

Study design:

- Pre and post: 27
- Comparison group: 17
- Random assignment to group: 14
- Rigorous data collection methods: 15

Effectiveness of incentives

- **Twenty-three of 29 studies: statistically significant effect of incentives on at least one outcome measure**
- Fruit and/or vegetable *consumption* DID:
  - 0.28 - 0.38 times/day
  - 0.8-1.8 servings/day
  - 0.11 - 0.24 cups/day
  - DID as percentage of baseline value for all study participants: 18% - 82%
- Fruit and/or vegetable *sales or purchases* DID:
  - 31-278 grams per day
    DID as percentage of baseline value for all study participants: 8% - 59%
  - $0.34 – $8.16 per week
    DID as percentage of baseline value for all study participants : 23% - 194%

What foods should be eligible for incentives?

Include a broad selection of healthy foods (e.g. fresh and processed and additional types of healthy foods)

Considerations:

- Simplest to include only fresh produce
- Frozen and canned fruits stretches the incentive value further and less perishable but need to exclude high sodium and sugar products
- Do not limit to local produce unless supporting local agriculture is the primary goal - adds considerable complexity to program implementation
- More likely to impact vegetable outcomes vs. fruit outcomes

What should the amount of incentives be?

Incentive size or cap did not appear to be associated with significant outcomes

Considerations:

- Needs more study
- Trade-off: larger incentives without caps (greater cost per participant) vs. numbers of people who benefit
- Some key informants suggested minimum of:
  - 20-30% price decrease for supermarkets
  - 50% for famers markets
- If a cap – suggested range from $50 to $100 per month per household

How often and for how long should the incentive be awarded?

Providing incentives on more than on occasion (vs. once) and for longer durations (> 24 weeks) was somewhat more common in effective programs

An association between the time when the incentive could be used (immediately or in the future) and significant outcomes was not apparent

Considerations:

- While simpler to provide the incentive once upon enrollment, consider more frequent provision
- It would seem that immediate redemption of incentives would increase use, but this hypothesis has not yet been tested

What type of incentive?

The type of incentive (discount, match, rebate, subsidy) did not appear to be associated with significant study outcomes

Considerations:

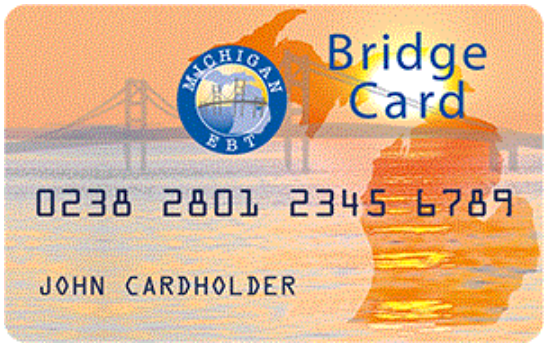
- This finding should be viewed with caution - there were relatively few studies in each category

How should the incentive be provided?

Studies with electronic provision of incentives had significant findings more often than those with physical incentives

Considerations:

- Electronic provision provides a seamless customer experience
- Electronic incentives can be used immediately, and this may increase redemption rates.
- Electronic systems facilitate data collection and monitoring.



Where should incentives be redeemed?

Redemption at stores more likely to report significant findings compared to farmers markets

Considerations:

- For increasing healthy food access: supermarkets (and other stores that are participants' preferred and accessible shopping sites)
- For supporting local ag or building community: farmers markets
- Challenges:
  - Supermarkets - staff training, cashier turnover, data system.
  - Farmers markets – implementing electronic payment systems, seasonal, access for people with low incomes, often higher prices
  - Smaller groceries – electronic data systems, stocking perishable produce
  - Cafeterias and restaurants - cashier training and turnover

Should additional co-intervention components be added?

An association between the presence of a co-intervention and study significance was not apparent

Considerations:

- Innovative or enhanced co-interventions should be evaluated
- Prior reviews have concluded that store-based nutrition education not effective.
- Key informants: mixed opinions about adding education co-interventions
- Key informants: if include, recommend cooking and nutrition education

Additional considerations

- **Outreach, enrollment and marketing**:
  - Partnerships with WIC, Medicaid and SNAP and community-based organizations
  - User-friendly: easy to understand, easy to use, simple enrollment, available where the participants prefer to shop
  - Expand eligibility: SNAP or WIC but not enrolled, working poor, Medicaid-enrolled or eligible, health conditions needing specific diets (DM)
- **Training**: Training for frontline staff about issuing and redeeming incentives and educating customers.

Additional considerations

- **Partnerships for implementation**: Farmers Market Associations, local food advocates, SNAP and WIC programs, health care providers, supermarkets and other food stores, public health agencies
- **Local food**: Geographic restrictions on eligible products may add considerable administrative complexity
- **Chronic disease self-management support**: Food prescription program at health care sites

Discussion

Caveats and limitations

- Qualitative analysis:
  - Variety of outcome measures precluded meta-analysis
  - Small number of studies with similar features precluded statistical testing of the association of feature and outcome significance
- Used statistical significance as the criterion for a positive study rather than effect size
- Included both controlled and single group analyses
- Many studies combined incentives with co-interventions
- Extent of implementation not consistently reported

Equity

- Nearly all studies included low SES but fewer ethnically/racially diverse.
- Interaction with SES (five studies) - mixed findings
  - Ball et al: **No effect modification** by area level income in a supermarket discount study
  - Blakely et al: **No effect modification** by individual SES in supermarket discount study
  - Thorndike et al: **No significant effects in lower-education** customers in a hospital cafeteria rebate study
  - Buscail: **Smaller (and non-significant) effects among households with precarious economic circumstances** in supermarket and farmers market subsidy intervention.
  - Polacsek: **Effect size greater among SNAP participants** than among non-participants in supermarket discount study
- Interaction with race/ethnicity (two studies) -mixed findings
  - One found **no interaction** and the second saw a **no effect in indigenous** minority group
- **Additional information on variation of effectiveness by socioeconomic status and race/ethnicity needed.**

Challenges

- **Funding**:
  - GusNIP – up to $250 million over five years, although will only support modest expansion (may need $4B/year)
  - SNAP enhancements
  - Sugary drink taxes
  - Health sector community benefit funds
  - Industry?

- **Technology**: Setting up electronic transaction systems and overcoming interoperability barriers
- **Defining healthy foods:** Maintaining a list of eligible processed and packaged foods is difficult - product nutritional content changes over time, new products, need agreement on the nutrition criteria for inclusion

More to learn

- **Outcomes**:
  - Overall diet quality of all household members
  - Substitution effects
  - Health outcomes (weight, diabetes, biomarkers)
- **Program design**:
  - **Incentive size and variation by food type** (e.g. higher rate for vegetable incentives)
  - **Mechanism** (e.g. rebate, subsidy, etc.)
  - **Timing** (e.g. immediate use or in the future)
  - **Duration** of enrollment
  - **Redemption sites**
  - **Co-interventions** (e.g. added value of nutrition education, healthy product placement and promotion, discouraging less healthy foods)
  - **Sustainability** of effects

More to learn

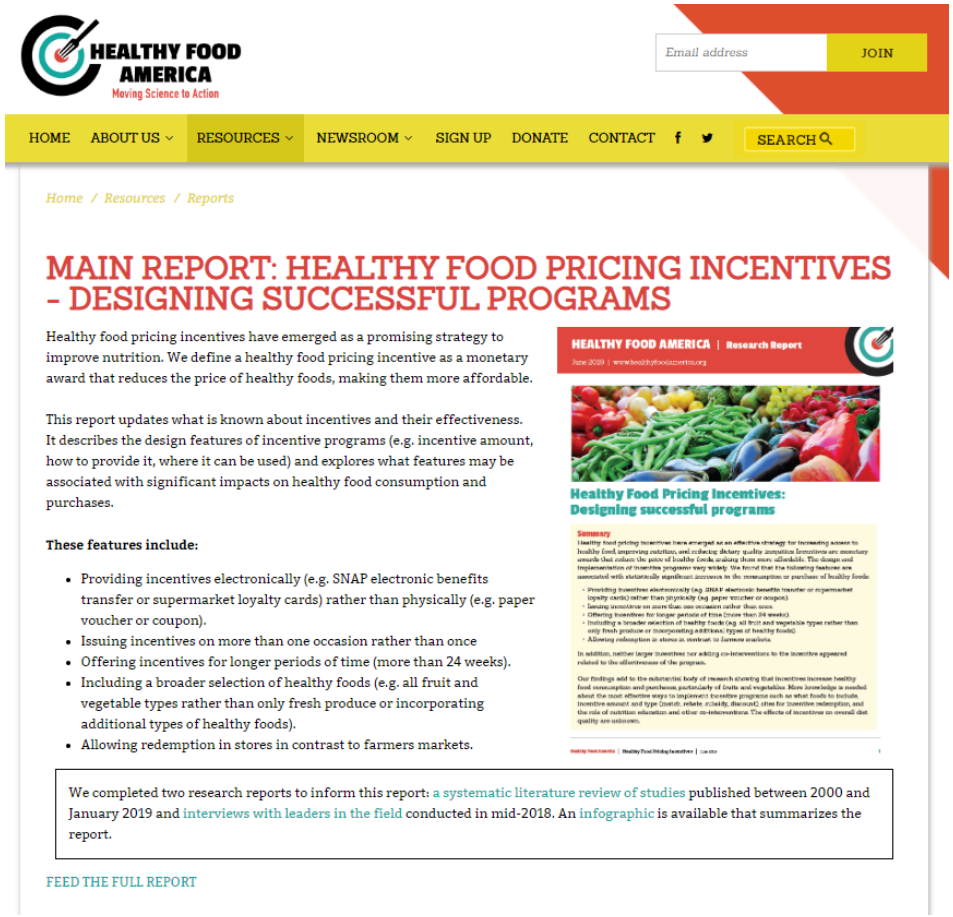
- **Economic effects**:
  - Participants: Food security, total food expenditures, net household income
  - Industry: Impacts on retailer, distributor, manufacturer and producer total revenues – might costs of incentives be offset by additional sales?
  - Cost-effectiveness from the perspectives of government, the health sector, and food system.
- **Intensity versus reach**:
  - Larger incentives and high/no caps vs.
  - Enrolling larger numbers of participants

To recap:

The following features are associated with statistically significant increases in the consumption or purchase of healthy foods:

- **Providing incentives electronically** (e.g. SNAP electronic benefits transfer or supermarket loyalty cards) rather than physically (e.g. paper voucher or coupon).
- **Issuing incentives on more than on occasion** rather than once
- **Offering incentives for longer periods of time** (more than 24 weeks).
- **Including a broader selection of healthy foods** (e.g. all fruit and vegetable types rather than only fresh produce or incorporating additional types of healthy foods).
- **Allowing redemption in stores** in contrast to farmers markets.

In addition, neither larger incentives nor adding co-interventions to the incentive appeared related to effectiveness.



http://www.healthyfoodamerica.org/healthy_food_pricing_incentives

Thank you

Study quality

A simple quality assessment tool was developed for use in Excel. Each study received a composite score ranging from 0-8 based on the following 8 criteria :

- pre/post data (scored 1 if available),
- comparison group (scored 1 if present),
- strong primary outcome measure (scored 1 if used electronic sales data or 24 hour dietary recalls),
- power > 80% (scored 1),
- participant study completion rate >80% or attrition rate < 20% (scored 1),
- missing data < 10% or adequately addressed by study methods (scored 1),
- intervention fidelity (scored 1 if authors mentioned fidelity and gave reasons why it was good, if the discount was automatically applied, or if the incentive usage rate was > 60%),
- confounding addressed (scored 1 if appropriate covariates were used).

KI findings

When feasible, offering incentives electronically is the preferred mechanism (e.g. electronic benefits transfer [EBT] or loyalty card) and incentives should be redeemable immediately.

WIC or SNAP participation is the most commonly used program eligibility criterion. It is worth considering expanding eligibility to include people with Medicaid insurance, people eligible for WIC or SNAP but not enrolled, working poor not eligible for these programs, food insecure people, and/or children.

The site where the incentive is redeemed matters. Stores are the preferred site when increasing access to healthy foods is the primary goal. Farmers markets are the preferred site when community building or supporting local agriculture is the primary goal.

The benefits of including nutrition or cooking education as a component of incentive programs are uncertain.

Collaboration contributes to program success. Partners may include healthy food advocates, food retailers, local and state government agencies including public health, WIC and SNAP, Farmers Market Associations and health care providers.

Outreach, marketing and training of frontline staff providing the incentives are critical components of an incentive program.

KI findngs

Incentive programs increase consumption and purchase of healthy foods.

The goal of the program matters. While some communities may prioritize increasing affordability of healthy foods, others may be primarily interested in supporting local agriculture. There are usually trade-offs between pursuing these goals. An incentive program should meet the specific goals and needs of the community it serves.

Fresh fruits and vegetables are the foundation of any incentive program. Expanding eligible products to include frozen or canned fruits and vegetables or even other types of foods that meet nutritional requirements may be desirable. However, doing so increases program complexity and presents implementation challenges.

The optimal size of the incentive remains to be determined. The suggested amount of the incentive as a proportion of the food price ranged from 40-100% for farmers markets and 10-50% for supermarkets. Some experts favored eliminating caps on amount of incentives a participant could earn while others felt a cap of $50-100 was reasonable as a way to limit per-participant costs so that more people could benefit from the program.

Incentive programs need to be user-friendly: easy to understand, easy to utilize and available where the target population already shops.

KI findings

The experts called out some challenges faced by incentive programs:

Securing funds to sustain and expand the program. Potential sources include federal and state governments, taxes, private foundations, health care organizations and grocery retailers.

Implementing the technology needed for seamless electronic incentive awards.

Training retailer staff to consistently deliver the program.

Making sure that people eligible for the program know about it and use it.

Allaying concerns about fraud, whether actual or perceived.

Research and program evaluation is needed to clarify the specific components of incentive programs that constitute best practices, including types of eligible foods, size of incentive, award caps, immediate vs. delayed receipt and use of incentives, provision of the incentive as a direct subsidy vs. match, engagement of smaller retailers in addition to supermarkets, inclusion of nutrition and cooking education as a co-intervention, expansion of eligibility requirements, and measurement of co-benefits (e.g. economic effects on local agriculture and small businesses). Additional knowledge gaps include defining the impact of incentives on diet quality and health metrics.

- Discount is an incentive that offers consumers a reduced price on specific items when they are purchased. The reduced price is often in the form of a certain percentage of the regular price. Frequently a discount is provided electronically at the point of sale, but it could also be provided via a coupon that is received by the consumer prior to the purchase (13 studies).

- Match is an incentive that matches all or a portion of the amount a consumer spends on eligible foods to provide additional buying power and thereby increases the amount a consumer can purchase. The incentive amount is directly tied to the dollar amount a consumer spends (e.g. $1 for every $1 spent, or for every $2 spent). It is often provided in the form of vouchers or tokens received during the shopping trip or prior (2 studies).

- Rebate is an incentive that provides cash back to a consumer after the purchase. The value of the rebate is often a certain percentage of the price of the item (e.g. a 30% rebate on $1 worth of apples would reimburse the consumer $0.30). The rebate is earned on eligible foods but can be used for any type of future purchase and can be considered a reimbursement (7 studies).

- Subsidy is an incentive that provides a cash value amount to a consumer to purchase specific foods. It is not linked to how much a consumer spends. A subsidy is often provided ahead of time in the form of a voucher, token or coupon but could be added electronically to a debit card (7 studies).

PLOS | MEDICINE

RESEARCH ARTICLE

Reducing US cardiovascular disease burden and disparities through national and targeted dietary policies: A modelling study

Jonathan Pearson-Stuttard[1,2☯*], Piotr Bandosz[1,3☯], Colin D. Rehm[4], Jose Penalvo[5], Laurie Whitsel[6], Tom Gaziano[7], Zach Conrad[5], Parke Wilde[5], Renata Micha[5], Ffion Lloyd-Williams[1], Simon Capewell[1], Dariush Mozaffarian[5‡], Martin O'Flaherty[1‡]

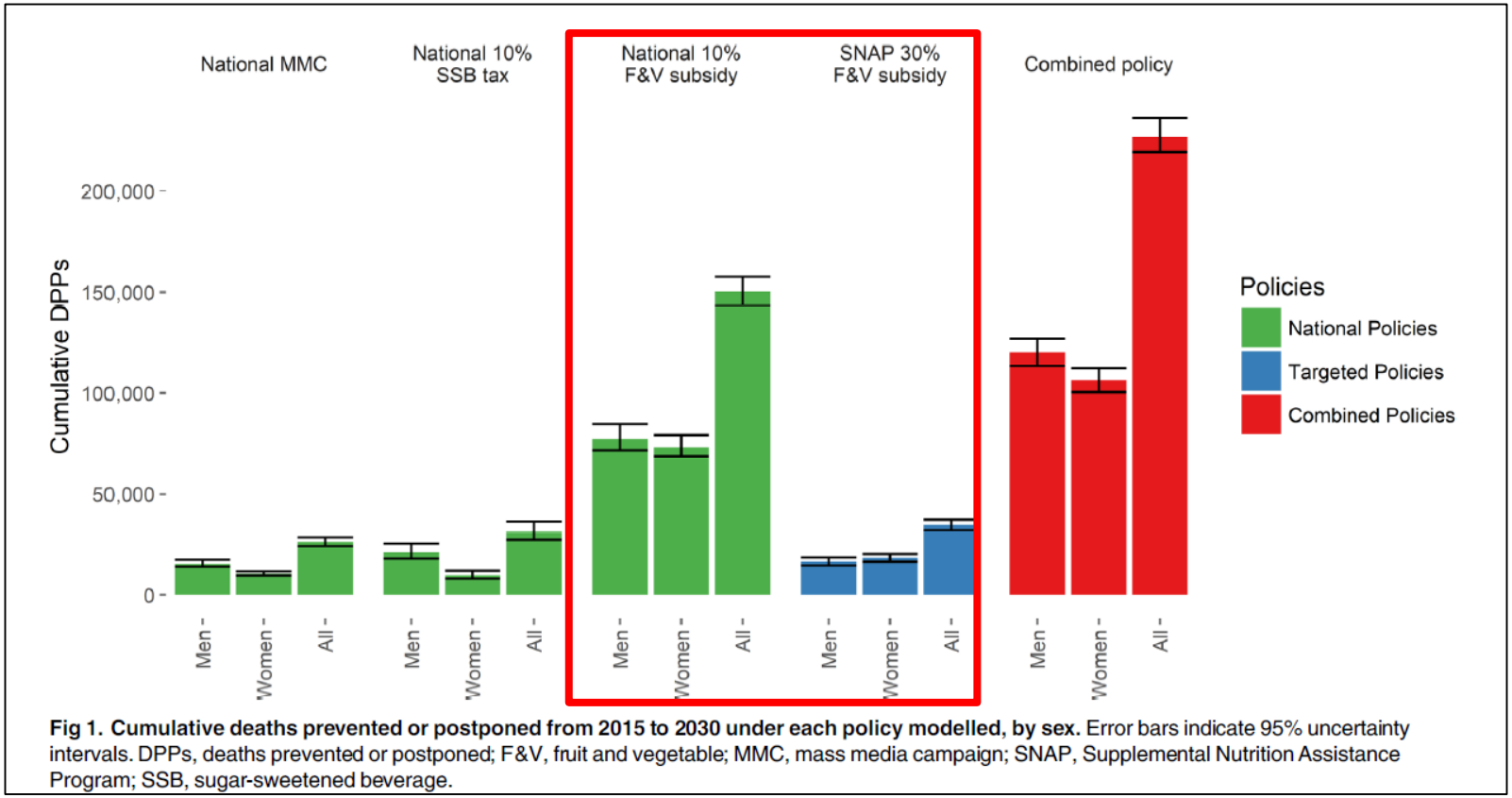


Fig 1. Cumulative deaths prevented or postponed from 2015 to 2030 under each policy modelled, by sex. Error bars indicate 95% uncertainty intervals. DPPs, deaths prevented or postponed; F&V, fruit and vegetable; MMC, mass media campaign; SNAP, Supplemental Nutrition Assistance Program; SSB, sugar-sweetened beverage.