

# **Initial Findings from the Nutrition Services Program Outcomes Evaluation**

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**National Evaluation Results Webinar  
The National Resource Center on Nutrition and Aging**

**September 14, 2017**

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# **Administration for Community Living Team**

**Holly Greuling, RDN  
Heather Menne, Ph.D.**

# **Initial Findings from the Nutrition Services Program Outcomes Evaluation**

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James Mabli, Ph.D.

Liz Gearan, M.S., RDN

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# **AoA Nutrition Programs Evaluation Objectives**

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## **1. Process study**

- Provide information to support program planning
- Analyze program structure, administration, staffing, coordination, processes, and service delivery

## **2. Cost study**

- Estimate the average cost of a congregate and a home-delivered meal
- Assess variation in costs by select characteristics of local providers

## **3. Outcomes evaluation (ongoing)**

- Assess program effectiveness in improving food security, socialization, and diet quality
- Assess program effectiveness in improving longer-term health and delaying or avoiding institutionalization

# Objectives of the Outcomes Evaluation

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- 1. Describe participants' demographic and household characteristics, health status, mobility, eating behaviors, diet quality, food security, and socialization**
- 2. Describe participants' experiences with and impressions of the program and their valuation of meals and supportive services received through the program**
- 3. Determine the impact of meals and related services on participants' nutrition, food security, and diet quality**
- 4. Determine the impact of meals and nutrition services on overall wellness and well-being**

# Study Design of Outcomes Evaluation

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Sample of LSPs from process and cost studies

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graph TD; A[Sample of LSPs from process and cost studies] --> B[Selected congregate meal site for each LSP]; B --> C[Sampled congregate meal program participants]; C --> D[Identified and surveyed nonparticipants with similar demographic and health characteristics];
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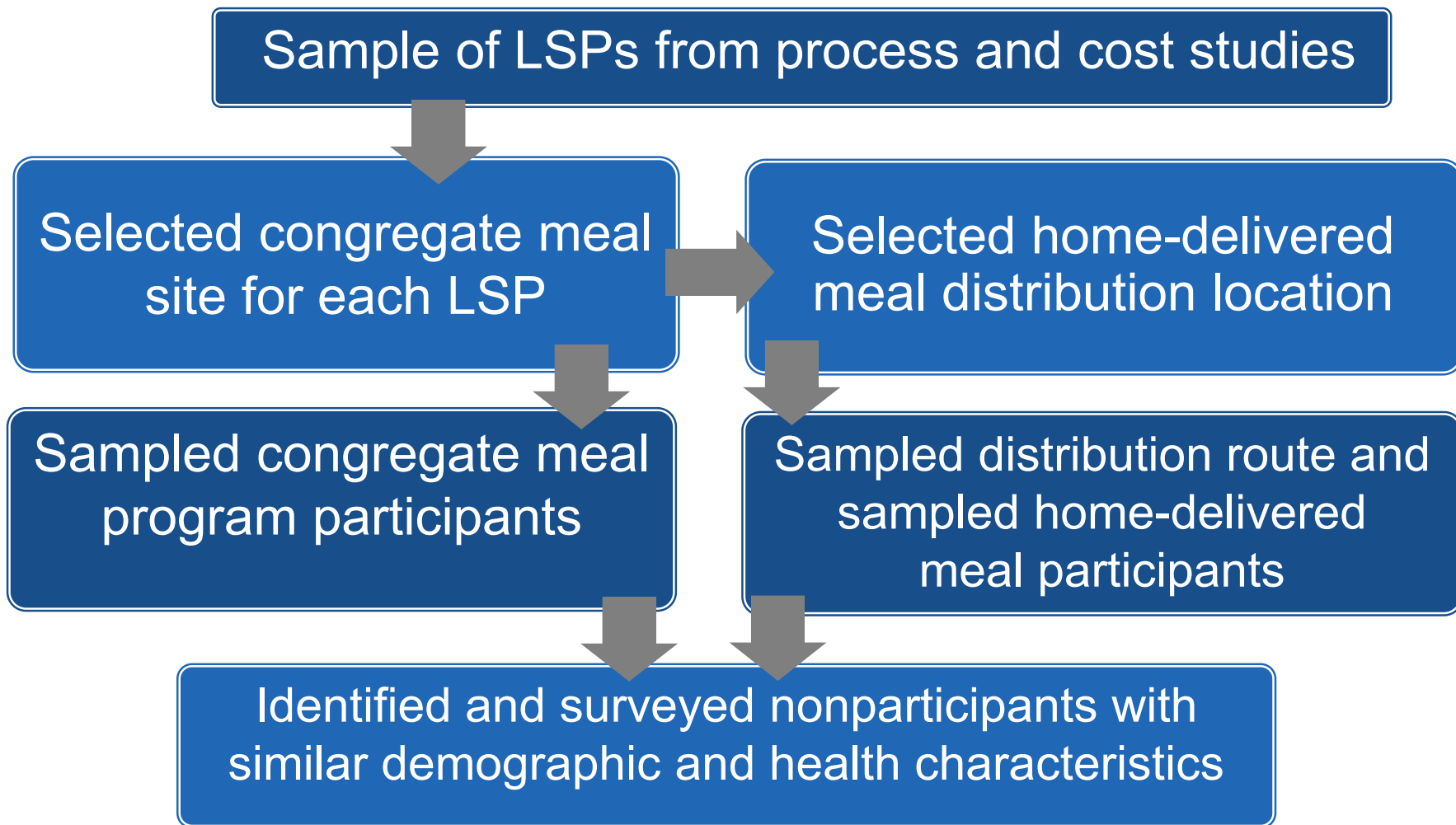
Selected congregate meal site for each LSP

Sampled congregate meal program participants

Identified and surveyed nonparticipants with similar demographic and health characteristics

# Study Design of Outcomes Evaluation

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# Data Collection Instruments

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- **Outcomes survey**

NSP Participation History, Usage, and Frequency	Types of Services Received	Recreational and Social Activities Available	Information and Referrals Available
Impression of Helpfulness of Program	Impressions of NSP Services and Meals	Participants' Monetary Contributions	Eating Behavior, Diet, Food Preparation
Food Security	Health Insurance Health Status, Mobility, Prescriptions	Depression, Loneliness, and Social Isolation	Demographic Characteristics

- **24-hour dietary recall**

- Automated Self-Administered 24-hour dietary recall (ASA-24) module
- Administered in-person by interviewer



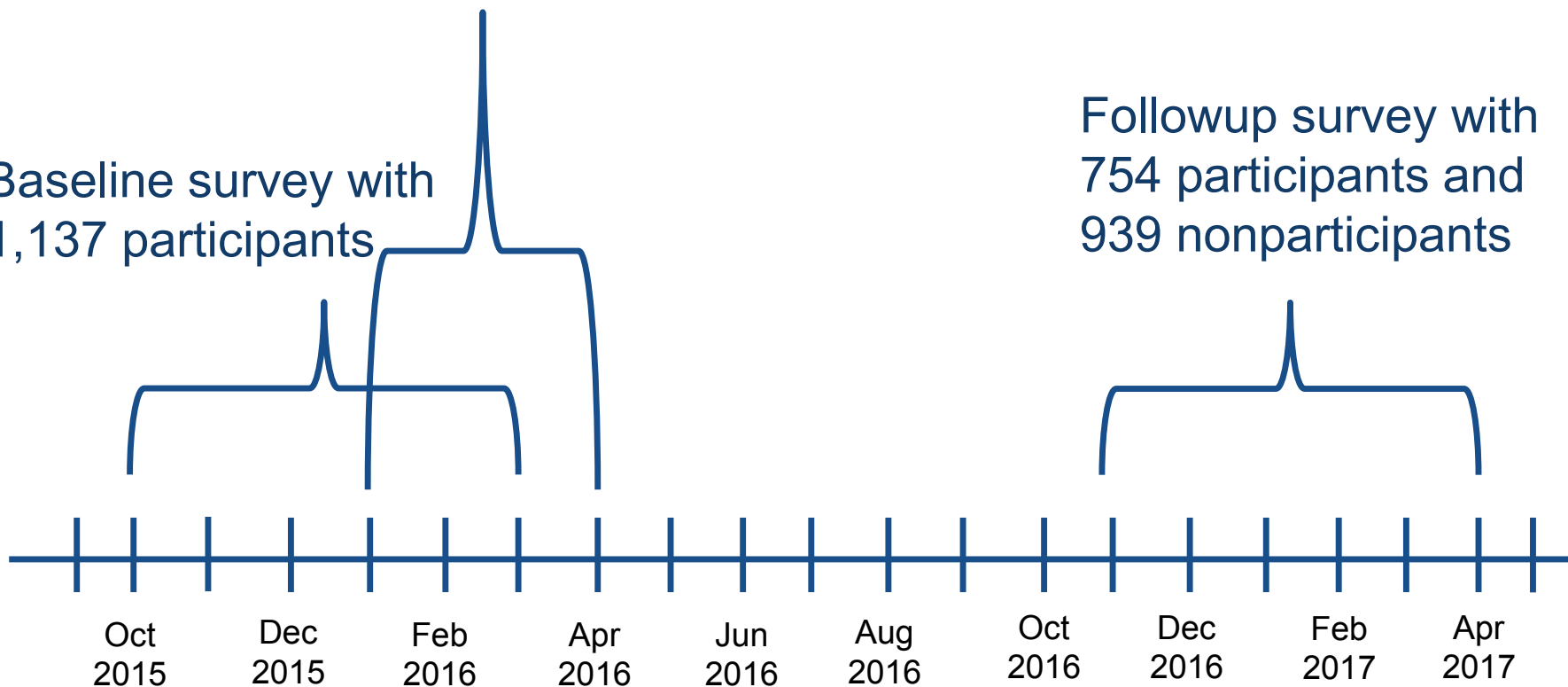
# Survey Timeline and Sample Sizes

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Baseline survey with  
1,164 nonparticipants

Baseline survey with  
1,137 participants

Followup survey with  
754 participants and  
939 nonparticipants



# Outcome Measure: Food Security

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- Having access at all times to enough food for an active, healthy life for all household members
- Based on USDA's six-item food security module based on 30-day recall
- Food insecurity and very low food security



# Outcome Measure: Socialization

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- Revised UCLA Loneliness Scale (R-UCLA) based on responses to three questions related to how often one feels lack of companionship, left out, and isolated from others
- Patient Health Questionnaire 2 (PHQ-2) based on two questions assessing frequency of depressed mood over past two weeks. Used to screen for depression
- Self-reported satisfaction with opportunities to spend time with other people

# Outcome Measure: Diet Quality

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- Percentage contribution program meals made to participants' nutrient intakes
- Usual intakes of vitamins, minerals, and macronutrients relative to recommendations
- Healthy Eating Index 2010 scores (HEI-2010) to assess overall diet quality



# Descriptive Analysis Methods

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- Describe characteristics of older adults, impressions of program, valuation of meals and services
- Use percentages, means, and medians
- Describe characteristics separately for congregate meal (CM) and home-delivered meal (HDM) participants
- Based on weighted data, participant findings are nationally representative of the population of CM and HDM participants

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# **Characteristics of Program Participants and Impressions of Meals and Services**

# Demographic Characteristics

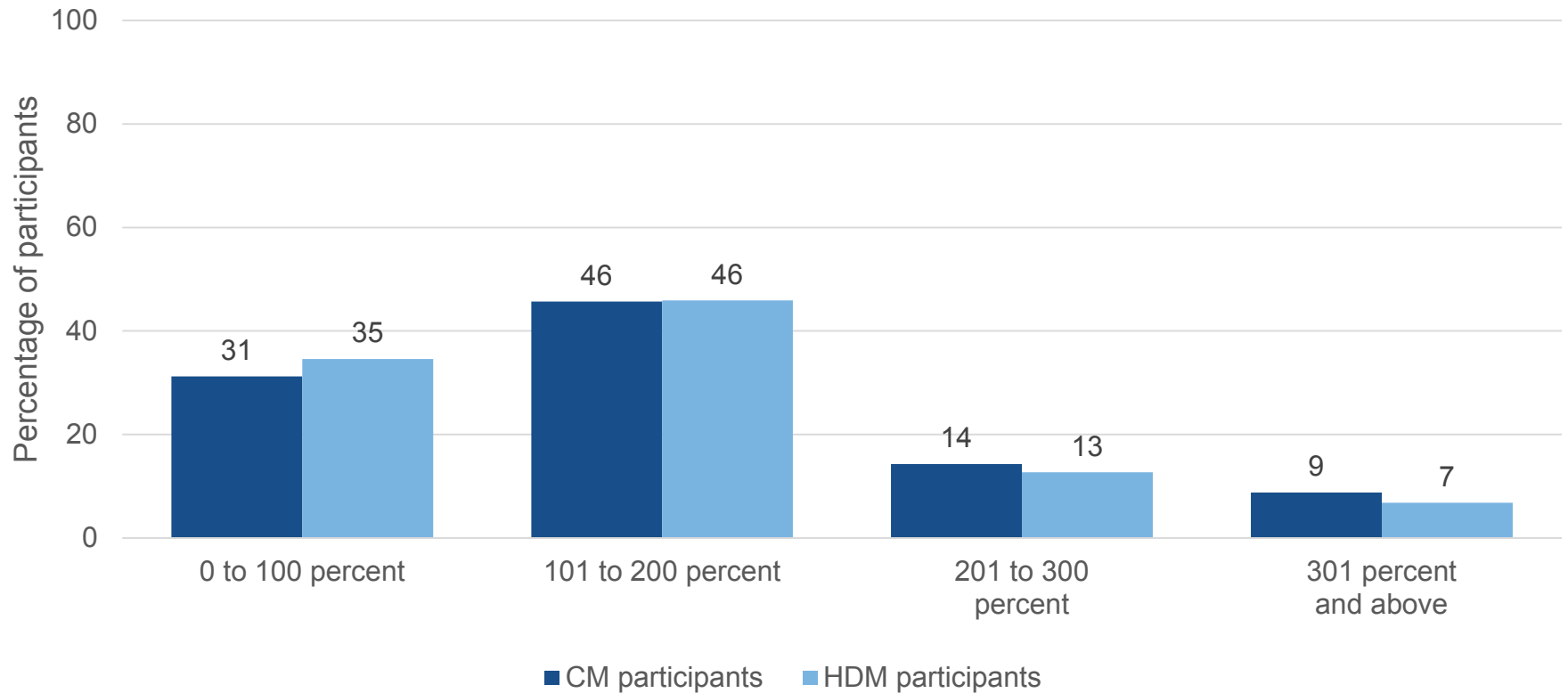
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- **CM and HDM participants similar in terms of gender, veteran status, whether they lived alone, and race and ethnicity**
  - More than 2/3rds were women
  - 15 to 17 percent were veterans
  - About 60 percent lived alone
  - 14 to 18 percent non-Hispanic black; 9 to 13 percent Hispanic
- **Compared with CM participants, HDM participants were older, had less education, and were more likely to be widowed**
  - Average age was 77 (CM) versus 82 (HDM)
  - 24 to 40 percent had not completed high school
  - 47 to 52 percent were widowed

Source: AoA NSP outcomes survey, weighted data, Tables III.1.

# Monthly Income Relative to Poverty Guidelines

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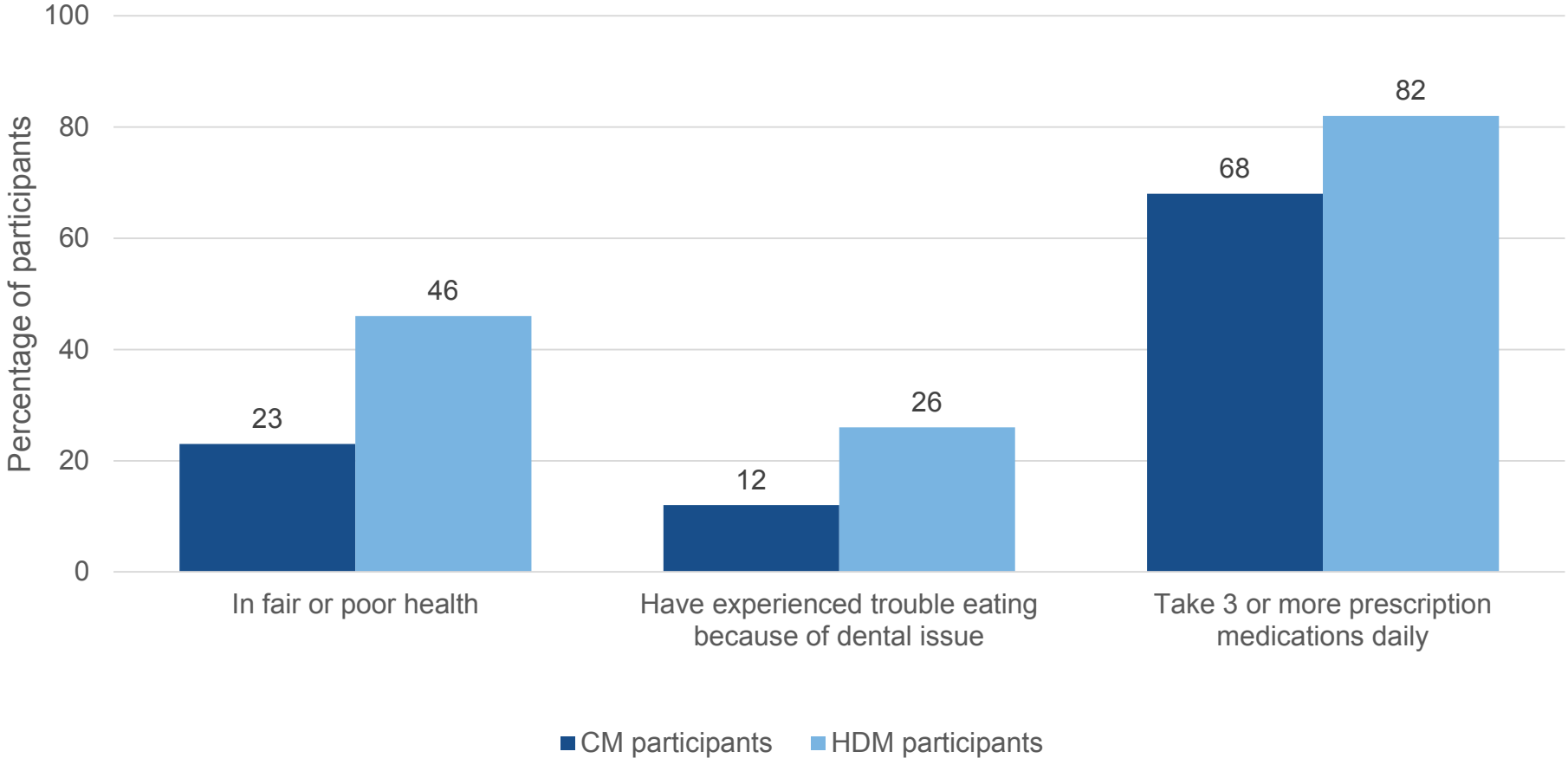


Source: AoA NSP outcomes survey, weighted data, Tables III.2.

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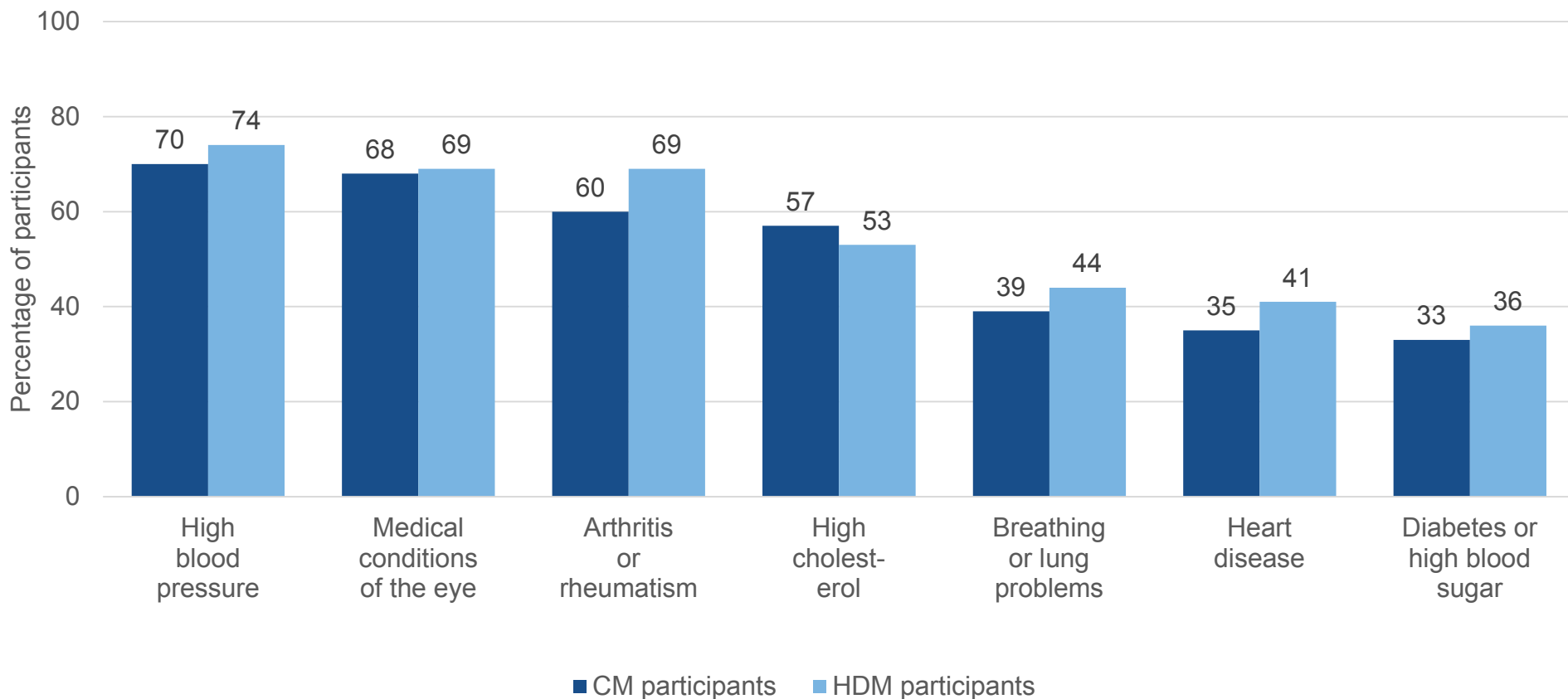


# General Health Status



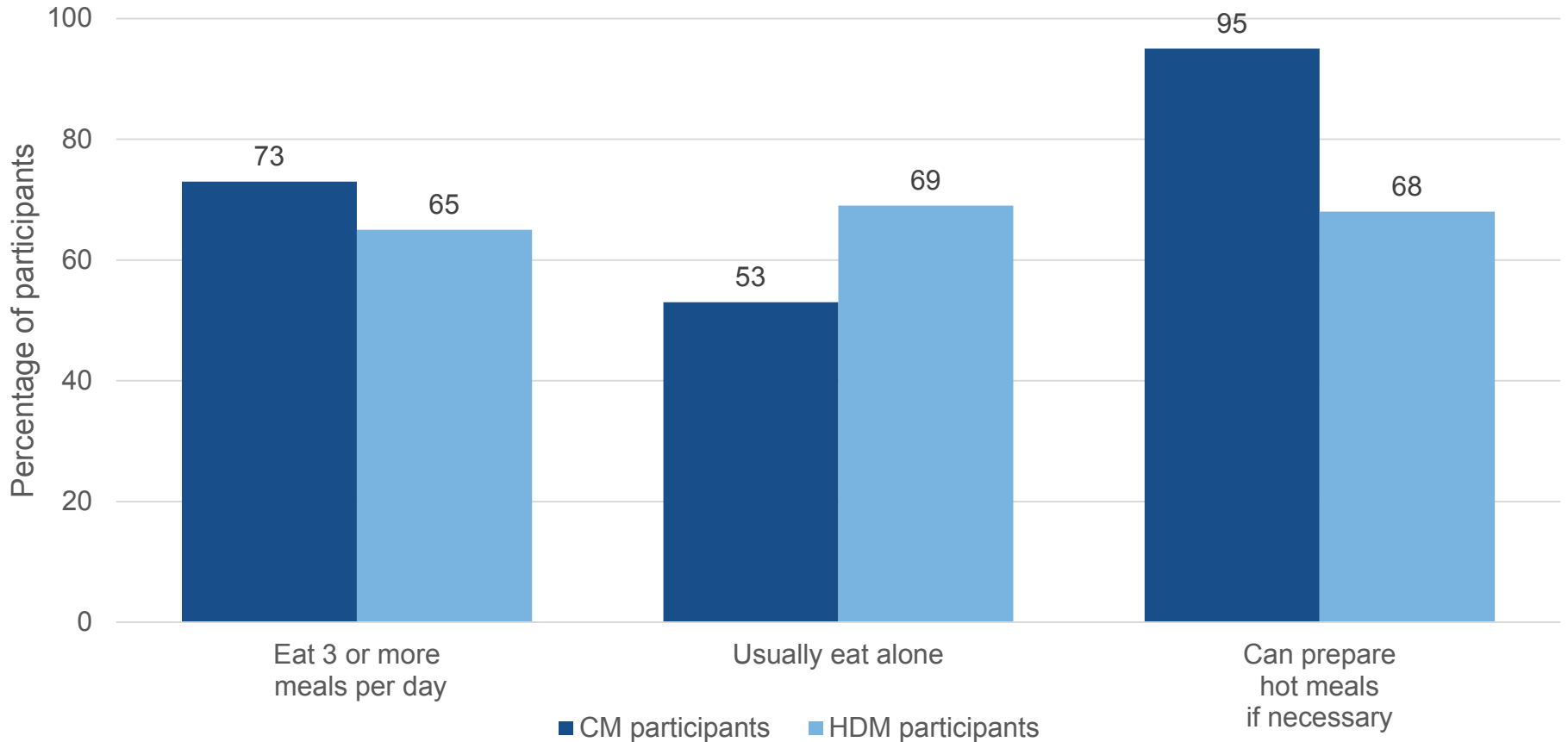
Source: AoA NSP outcomes survey, weighted data, Tables III.3.

# Doctor-Diagnosed Chronic Health Conditions



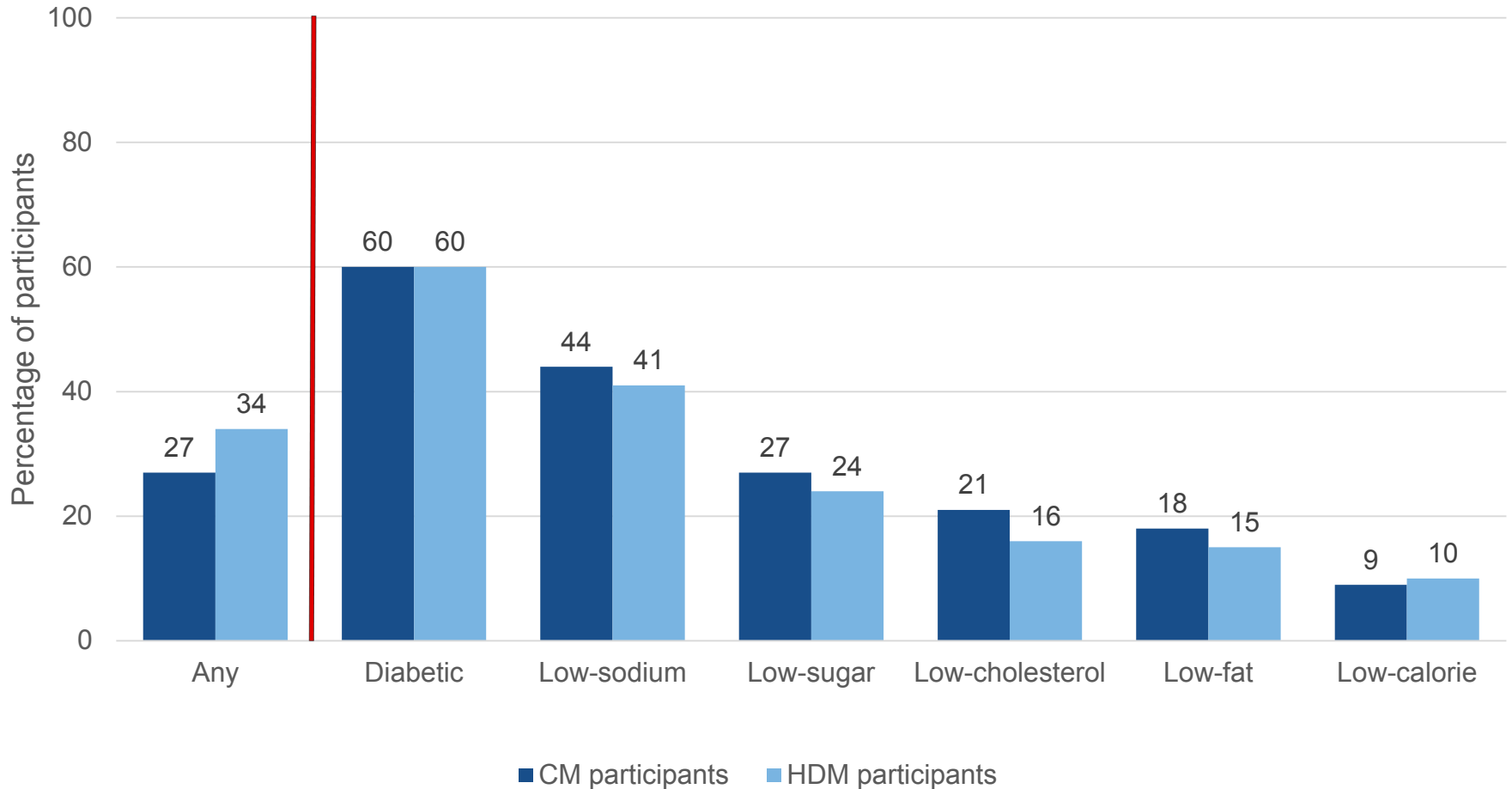
Source: AoA NSP outcomes survey, weighted data, Tables III.4.

# Diet and Eating Behaviors



Source: AoA NSP outcomes survey, weighted data, Tables III.7 and III.8.

# Percentage of Participants on Special or Therapeutic Diets

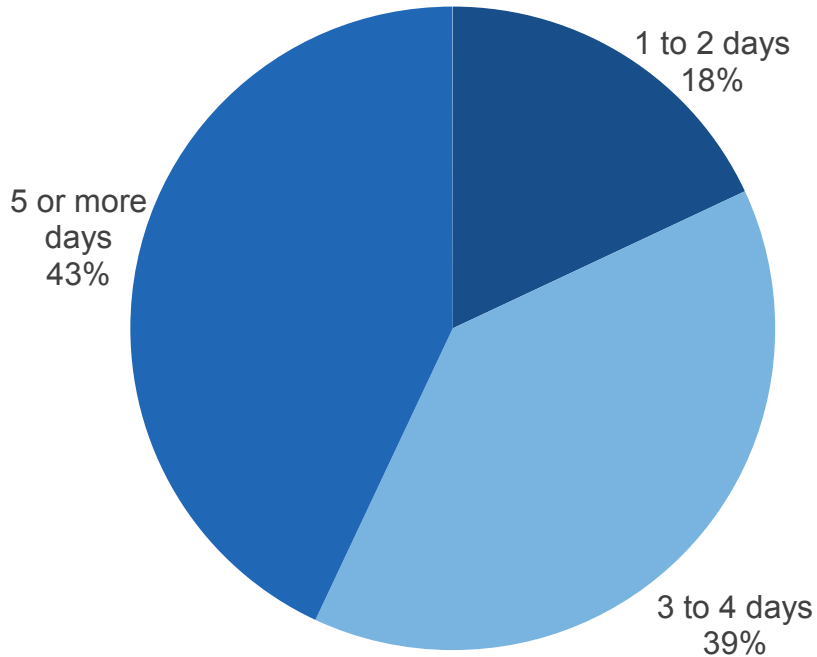


Source: AoA NSP outcomes survey, weighted data, Table III.7.

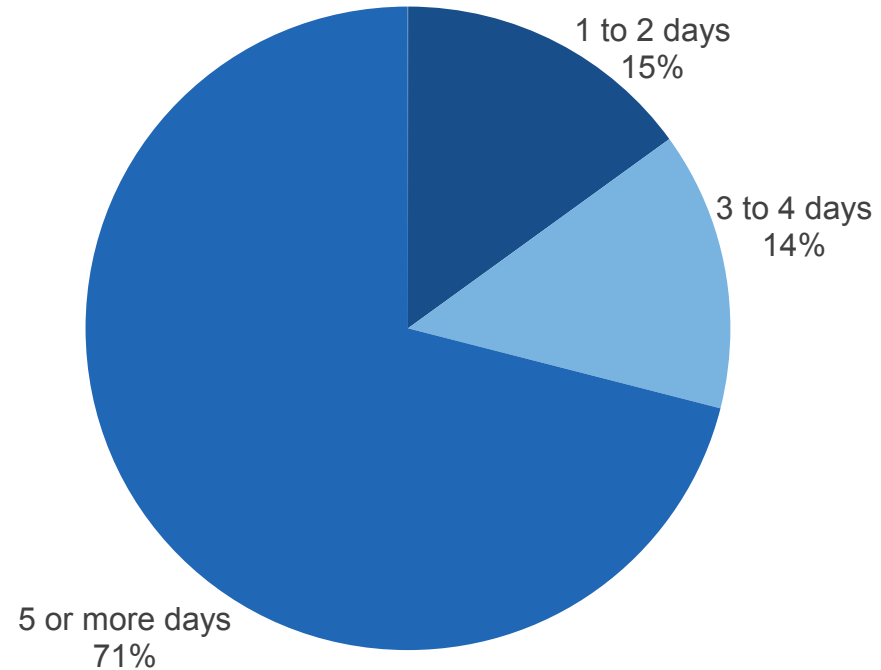
# Frequency of Participation

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CM participants



HDM participants

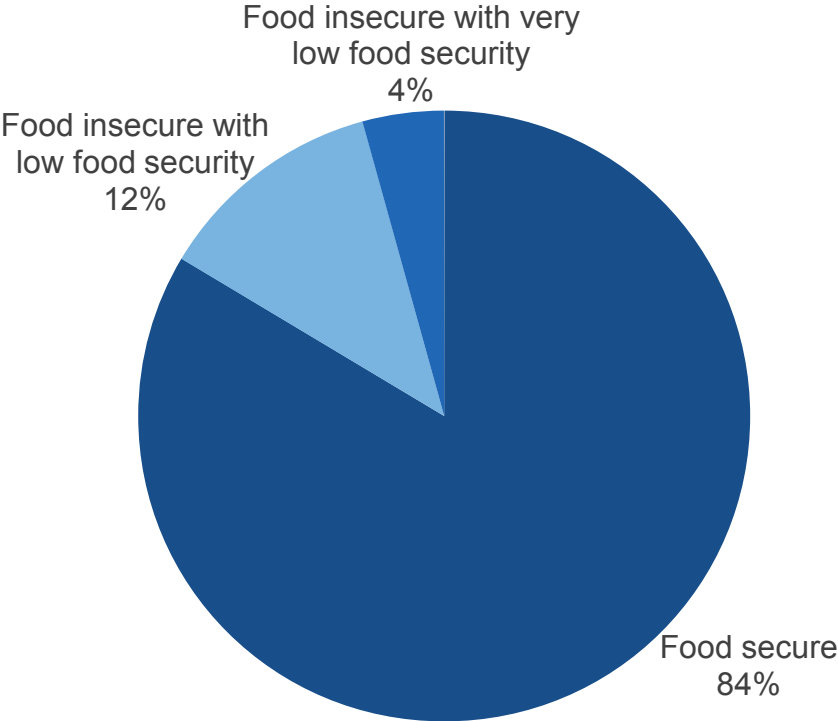


Source: AoA NSP outcomes survey, weighted data, Table III.14.

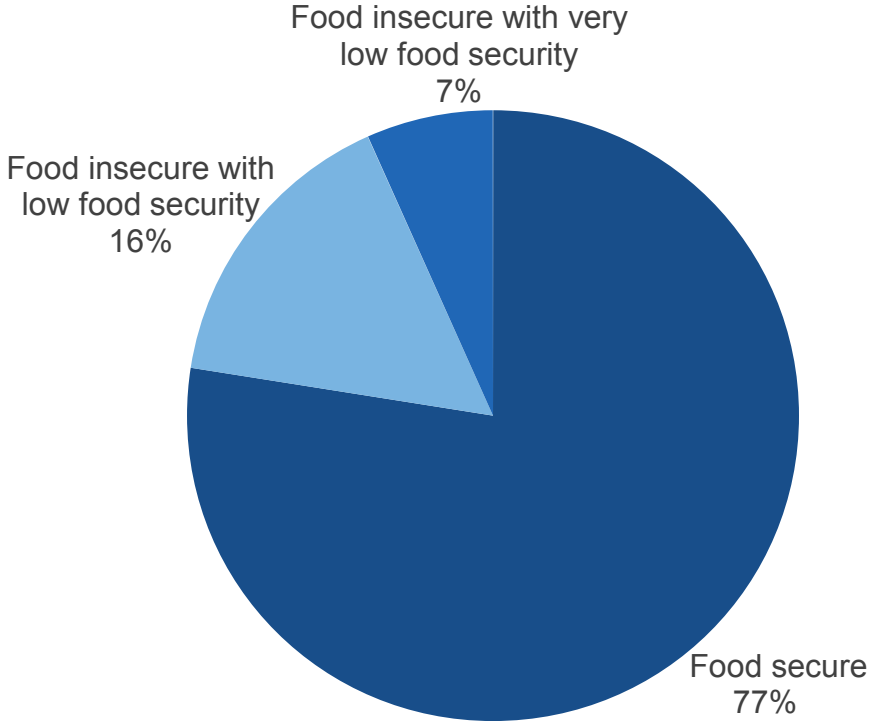
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# Food Security

CM participants

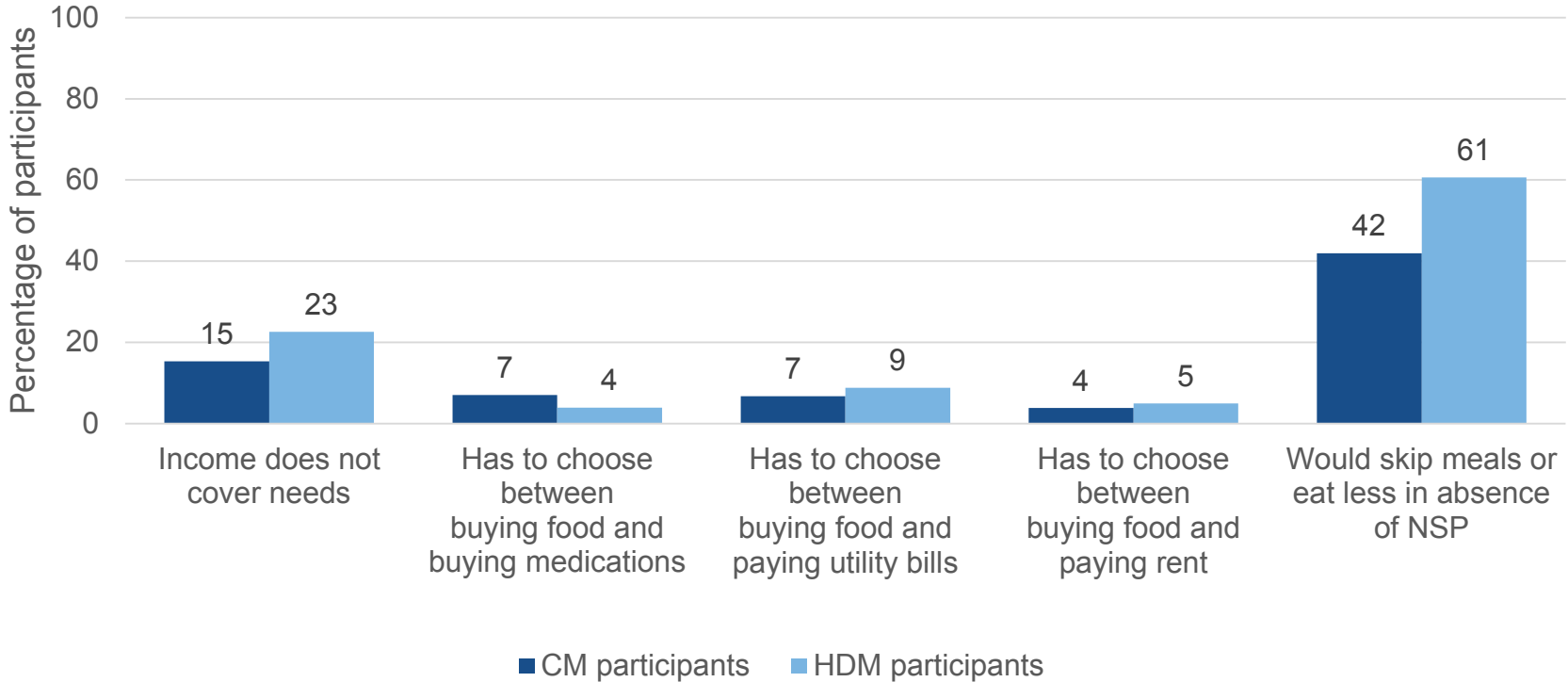


HDM participants



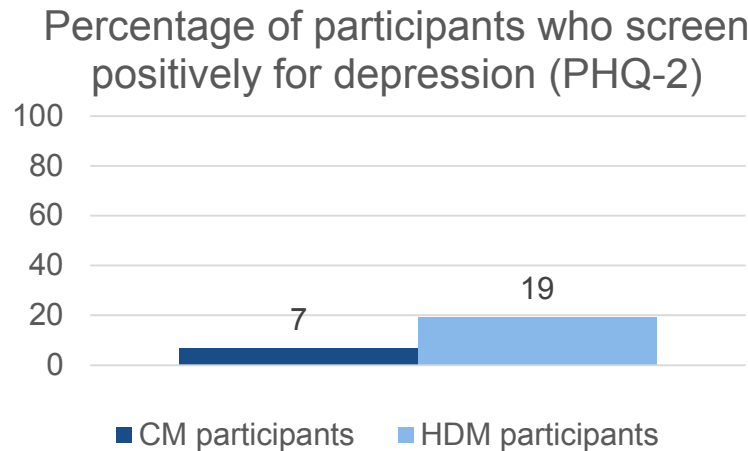
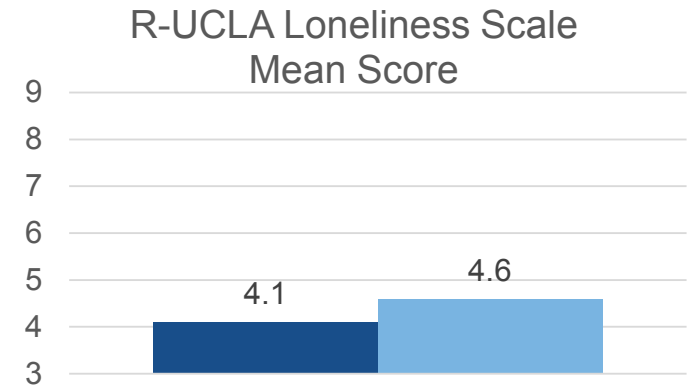
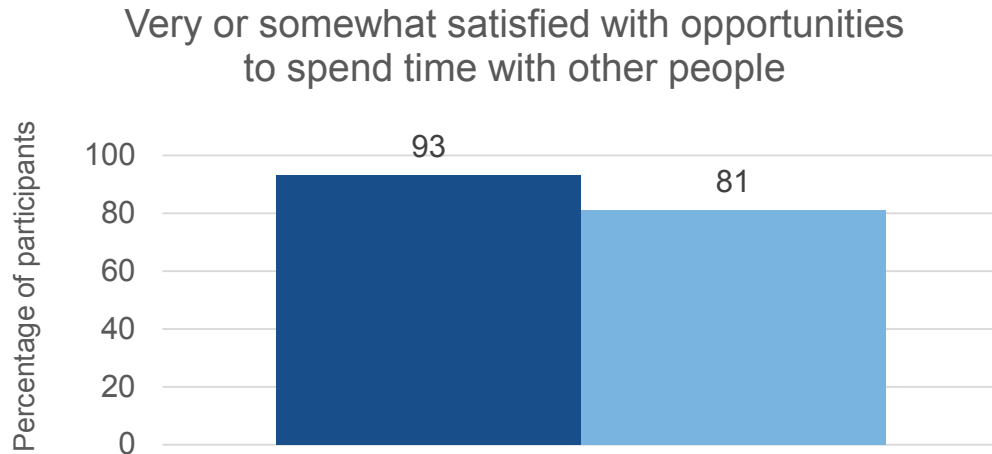
Source: AoA NSP outcomes survey, weighted data, Table III.26.

# Adequacy of Income and Food Coping Strategies



Source: AoA NSP outcomes survey, weighted data, Table III.29.

# Socialization Outcomes

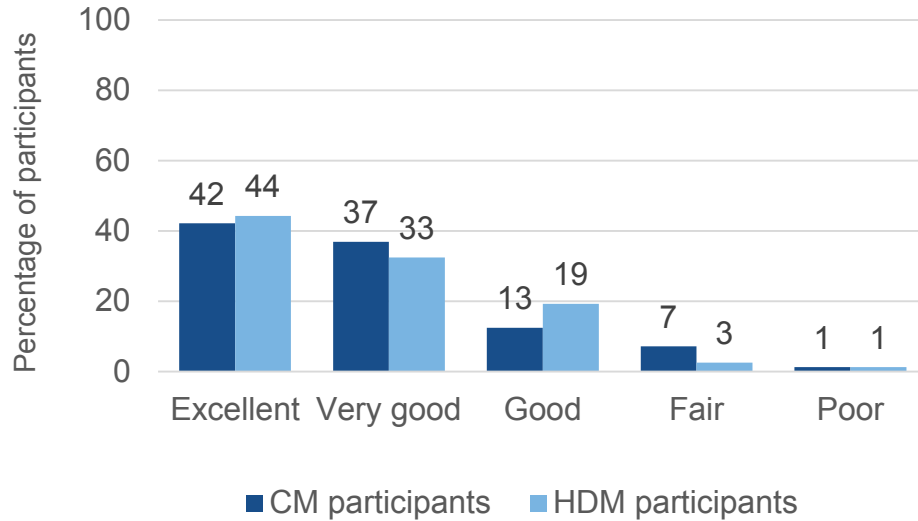


Source: AoA NSP outcomes survey, weighted data, Table III.36.



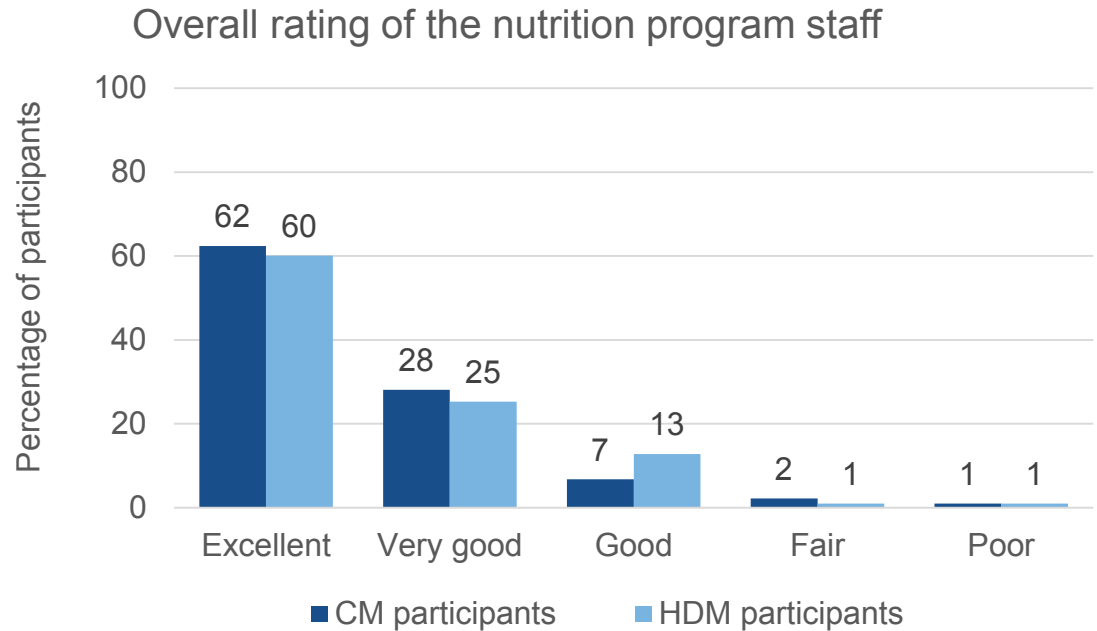
# Impressions of the NSP

Overall rating of the program



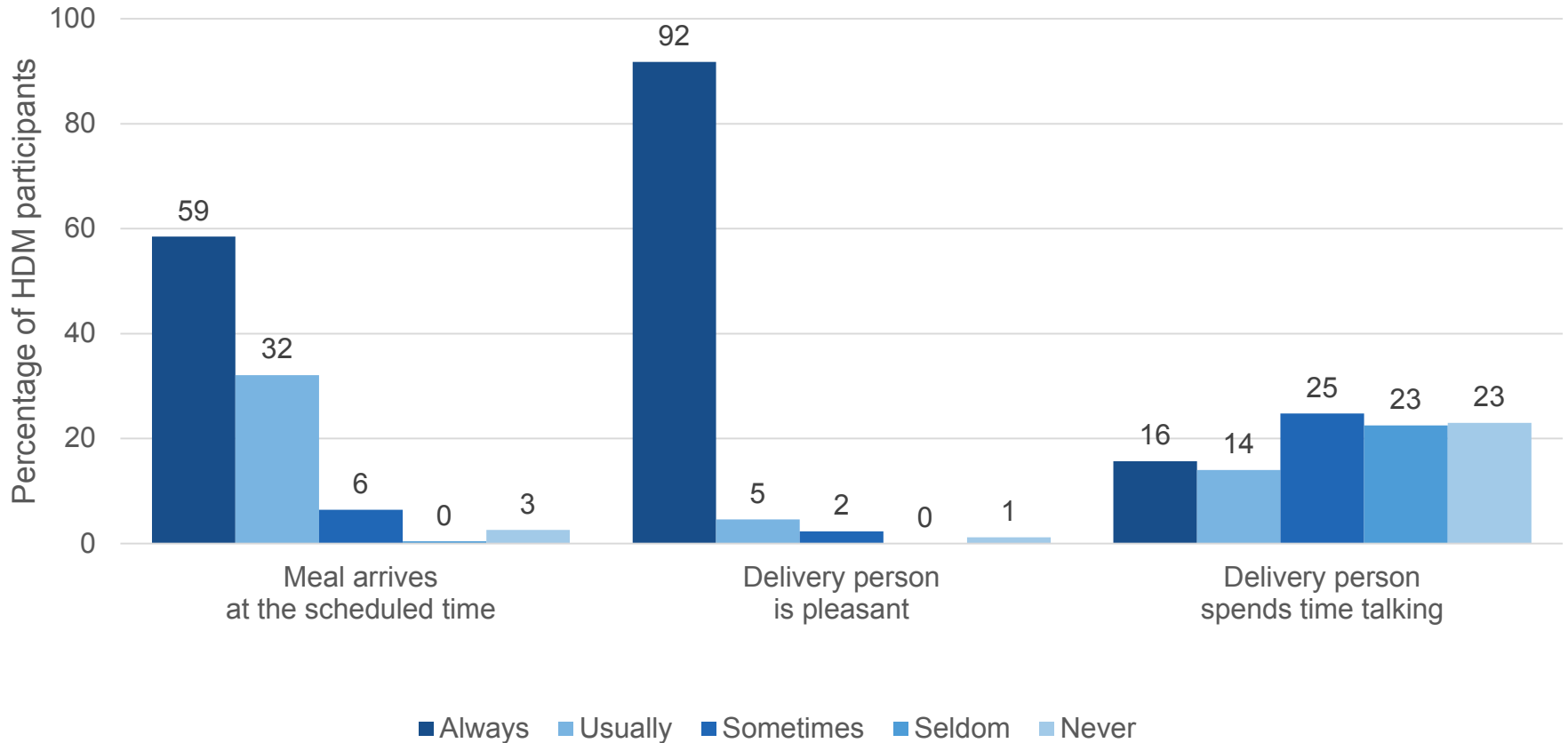
Source: AoA NSP outcomes survey, weighted data, Table III.32.

# Impressions of the NSP Staff



Source: AoA NSP outcomes survey, weighted data, Table III.32.

# Impressions of Meal Delivery



Source: AoA NSP outcomes survey, weighted data, Table III.33.

# Impressions of Meals

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- **Many congregate meal participants were satisfied with:**
  - **Attractiveness of dining area (96 percent)**
  - **Overall meals (95 percent)**
  - **Amount of food (91 percent)**
  - **Proper temperature of food (91 percent)**
  - **Appearance of food (86 percent)**
  - **Way food smells (85 percent)**
  - **Variety of food (84 percent)**
  - **Taste of food (81 percent)**
  - **Foods provided (79 percent)**
  - **Meets special dietary needs or restrictions (73 percent)**
- **Similar findings for home-delivered meal participants**

Source: AoA NSP outcomes survey, weighted data, Table III.35.

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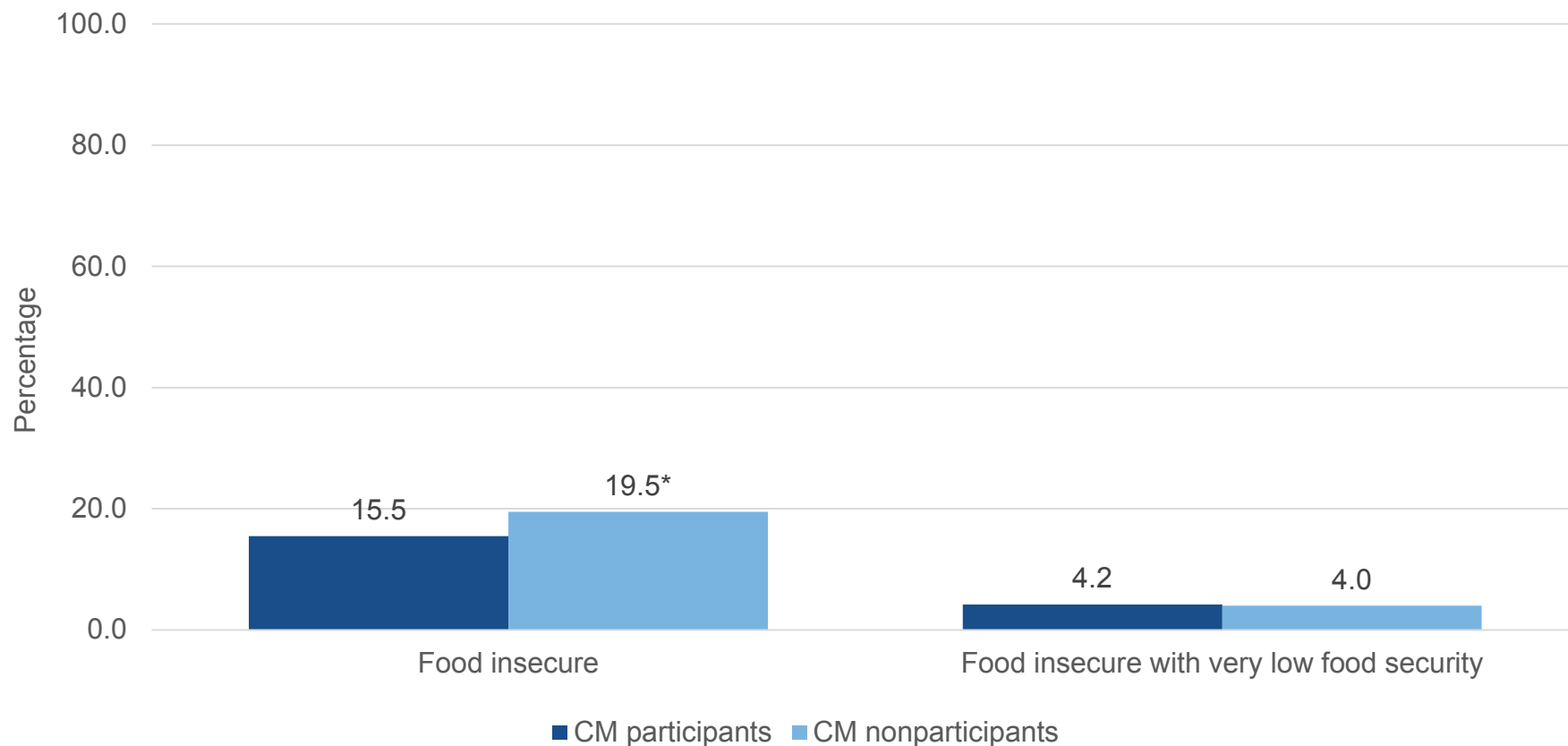
# **Effects of Program Participation on Food Security and Socialization Outcomes**

# Analysis Methods

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- **Selected matched comparison group using Medicare records and geography**
  - Collected participants' SSNs as part of outcomes survey
  - Obtained Medicare records for participants
  - Identified potential nonparticipants in same geographic service area with similar characteristics to participants
  - Screened nonparticipants for eligibility
  - Conducted interview with nonparticipants
- **Multivariate regression analysis to account for observed differences between participants and nonparticipants**
- **Propensity-score matching based on machine-learning algorithm**

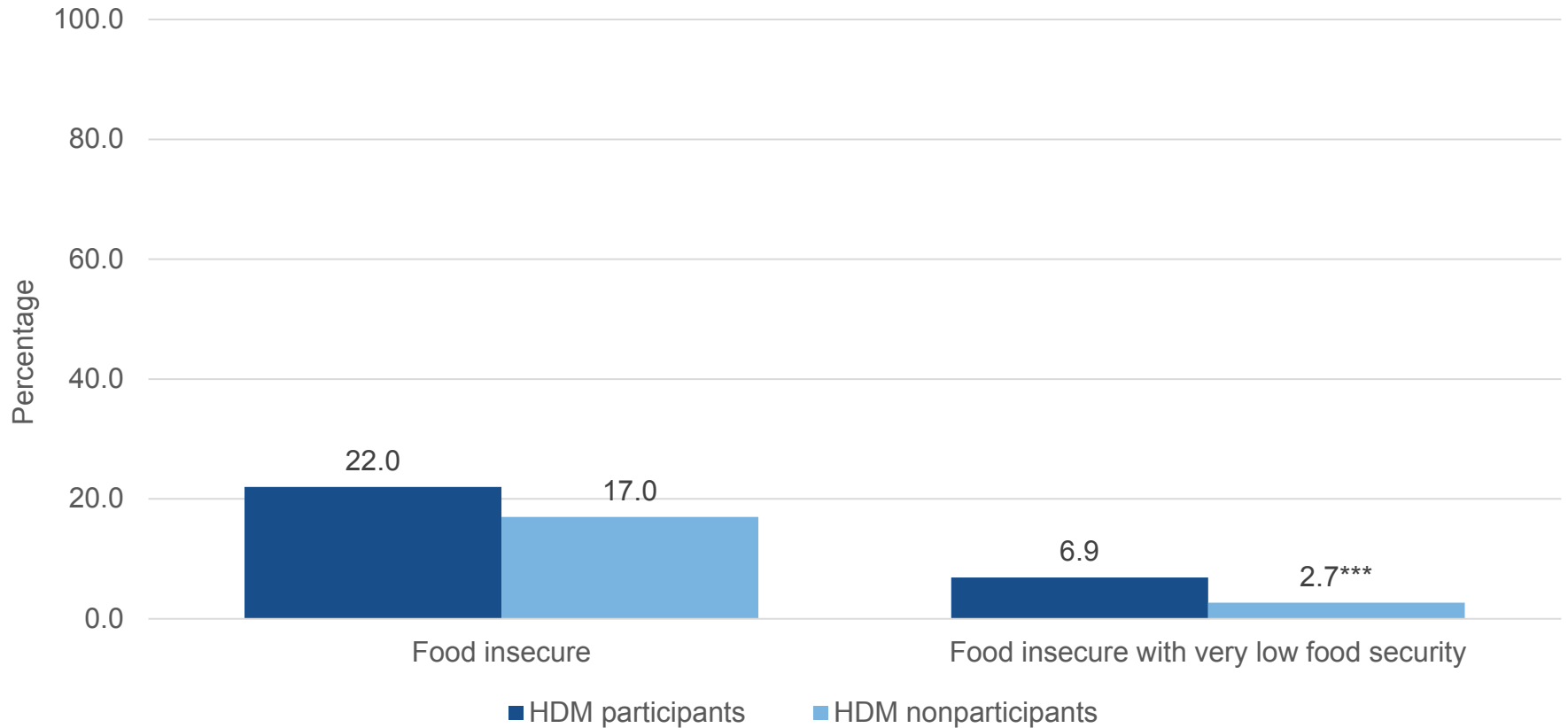
# Effects of CM Program Participation on Being Food Insecure or Having Very Low Food Security



Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.1.

\*\*\*/\*\*/\*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.

# Effects of HDM Program Participation on Being Food Insecure or Having Very Low Food Security



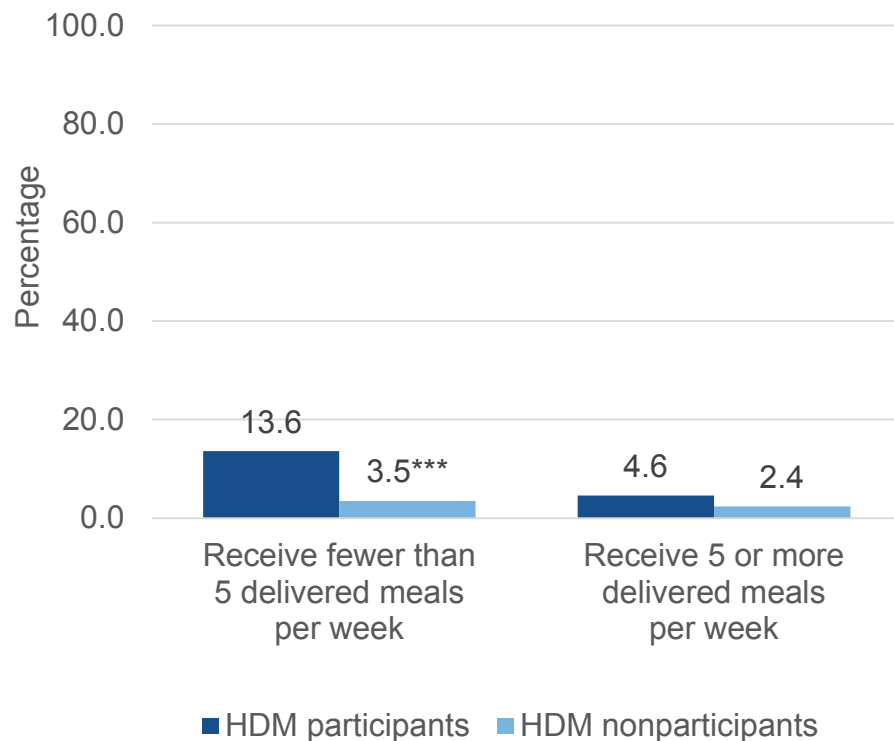
Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.2.

\*\*\*/\*\*/\*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.

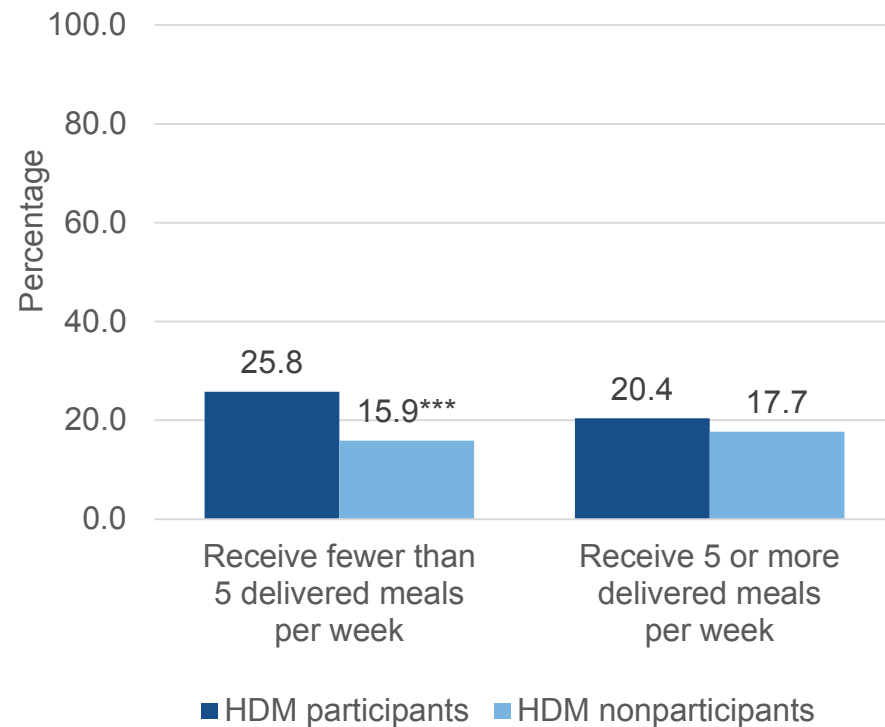


# Effects of HDM Program Participation on Being Food Insecure or Having Very Low Food Security, by Number of Meals Received per Week

## Food insecure



## Food insecure with very low food security



Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.3.

\*\*\*/\*\*/\*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.

# Effects of CM Program Participation on Socialization Outcomes

Outcome	Participants	Nonparticipants	Difference
R-UCLA loneliness score			
Average score	4.1	4.1	0.0
PHQ-2 depression screener questions			
Percentage affirmed 4 out of 6	2.3	6.5	-4.2**
Satisfaction with socialization opportunities			
Percentage that were satisfied	94.0	85.8	8.2***
Percentage that were very satisfied	67.5	55.5	12.0***

Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.4.

\*\*\*/\*\*/\*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.

# Effects of HDM Program Participation on Socialization Outcomes

Outcome	Participants	Nonparticipants	Difference
R-UCLA loneliness score			
Average score	4.5	4.3	0.2*
PHQ-2 depression screener questions			
Percentage affirmed 4 out of 6	11.5	11.6	-0.1
Satisfaction with socialization opportunities			
Percentage that were satisfied	82.3	85.7	-3.3
Percentage that were very satisfied	44.5	53.4	-8.9**

Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.5.

\*\*\*/\*\*/\*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.

# Effects of HDM Program Participation on Socialization Outcomes, by Number of Meals Received per Week

Outcome	Participants	Nonparticipants	Difference
R-UCLA loneliness score (average)			
Receive fewer than five meals	4.6	4.2	0.4*
Receive five or more meals	4.5	4.3	0.2
Percentage satisfied with socialization opportunities			
Receive fewer than five meals	79.7	87.2	-7.6**
Receive five or more meals	84.1	85.2	-1.1
Percentage very satisfied with socialization opportunities			
Receive fewer than five meals	34.5	55.0	-20.5***
Receive five or more meals	49.7	53.0	-3.4

Source: AoA NSP outcomes survey, 2015-2016, weighted data, Table IV.6.

\*\*\*/\*\*/\*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.

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# Diet Quality Analysis

# Background on the Diet Quality Analysis

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- **Objectives of the analysis**
  - Describe the quality of participants' diets
  - Determine the impact of participation on diet quality
- **24-hour dietary recall data**
  - Collected detailed information on all foods and beverages consumed during preceding 24 hours
  - Subset of participants and nonparticipants completed 2nd recall
  - Provide data on the amounts of nutrients and food groups consumed over 24 hours

# Outcome Measure: Diet Quality

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- **Percentage contribution program meals made to participants' nutrient intakes**
- **Usual intakes of vitamins, minerals, and macronutrients relative to recommendations**
- **Healthy Eating Index-2010 scores (HEI-2010) to assess overall diet quality**



# Contribution of Program Meals to Participants' Daily Nutrient Intakes

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- Identified foods consumed from program meals versus other sources
- Both congregate and home-delivered meals contributed substantially to participants' diets

	CM participants	HDM participants
Percentage of daily calories	41	38
Percentage of daily nutrients	39 to 47	35 to 47

- Program meals made largest contributions to participants' intakes of protein, vitamin C, vitamin A, alpha-linolenic acid, and sodium

Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table III.9.

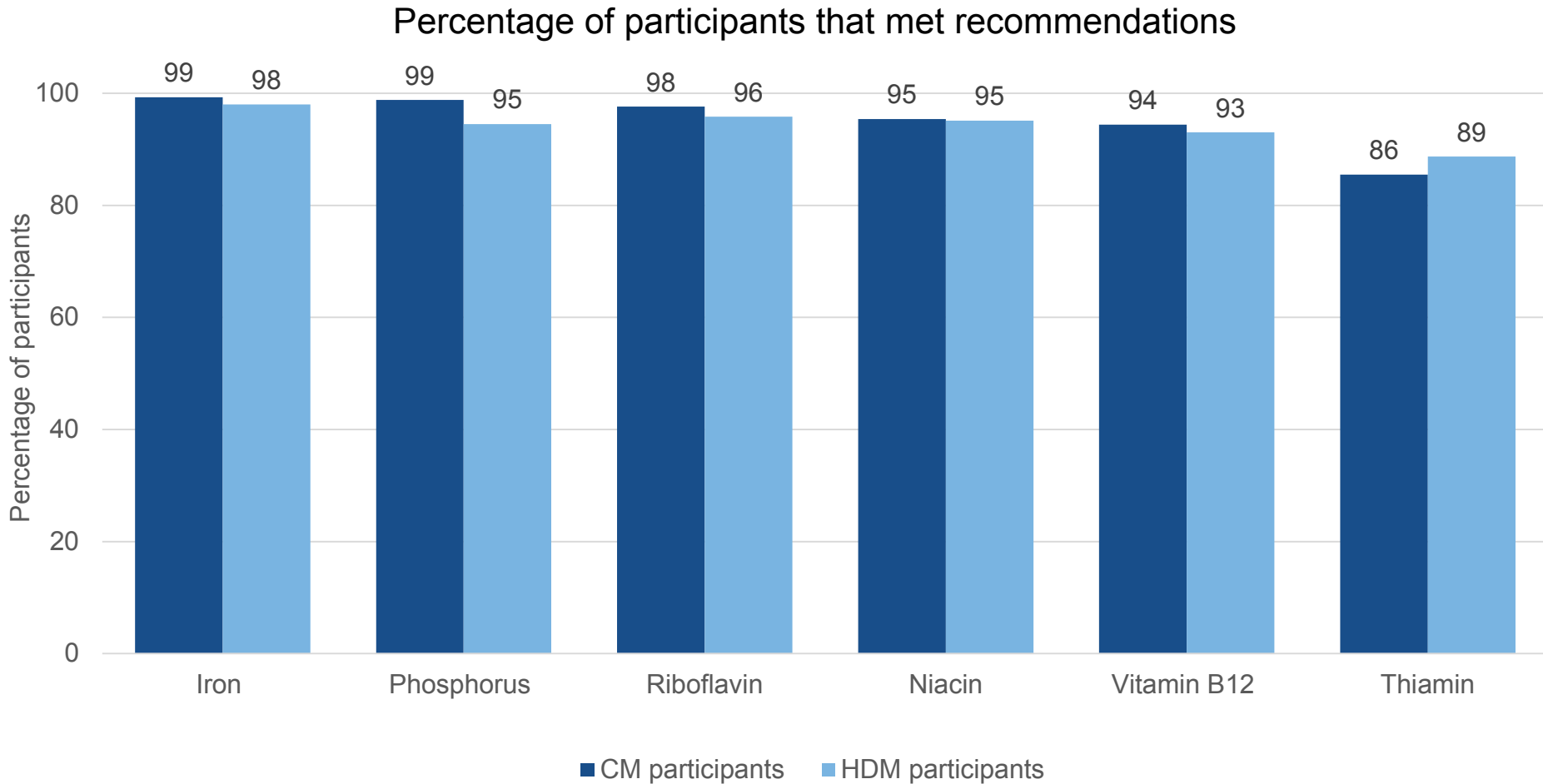


# Assessing Whether Participants' Usual Nutrient Intakes Met Recommendations

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- **Federal nutrition standards provide recommendations for amounts of nutrients to consume**
  - Dietary Reference Intakes
  - Dietary Guidelines for Americans
- **Nutrient recommendations should be met over time and applied to measures of usual intake**
- **Estimated usual nutrient intakes using method developed by the National Cancer Institute**
  - Provides estimates of the percentage of participants with usual nutrient intakes that met recommendations

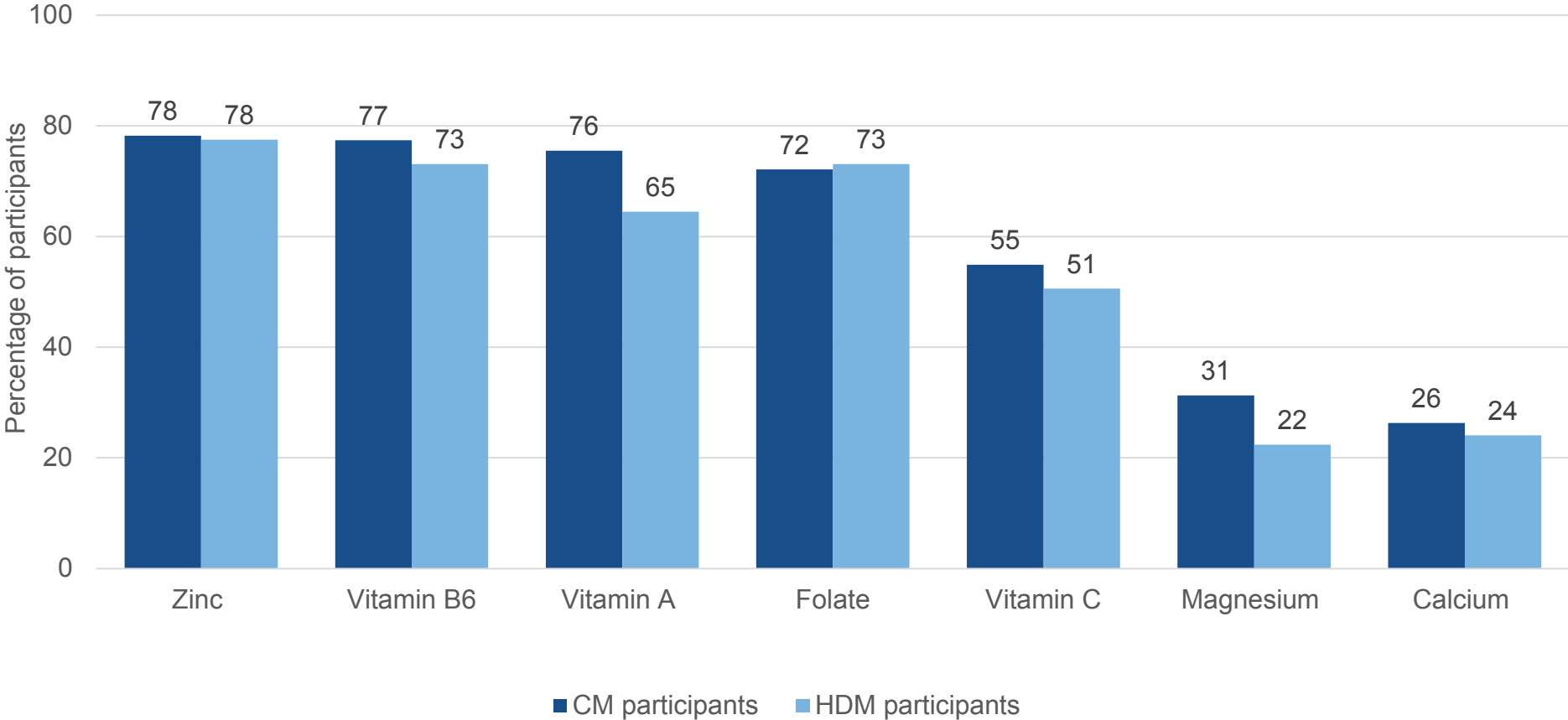
# Usual Intakes of Vitamins and Minerals



Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table III.11.

# Usual Intakes of Vitamins and Minerals (cont.)

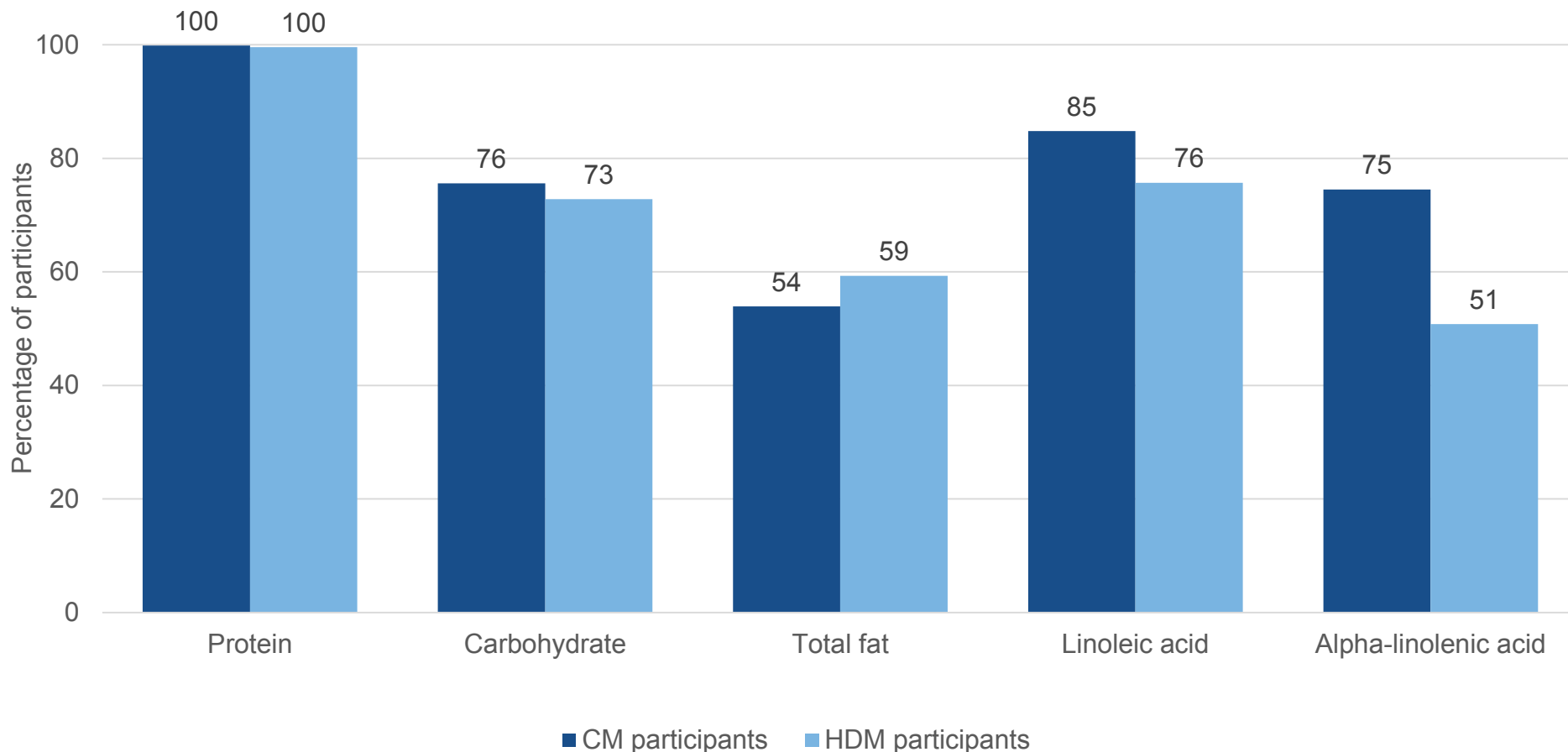
Percentage of participants that met recommendations



Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table III.11.

# Usual Intakes of Macronutrients

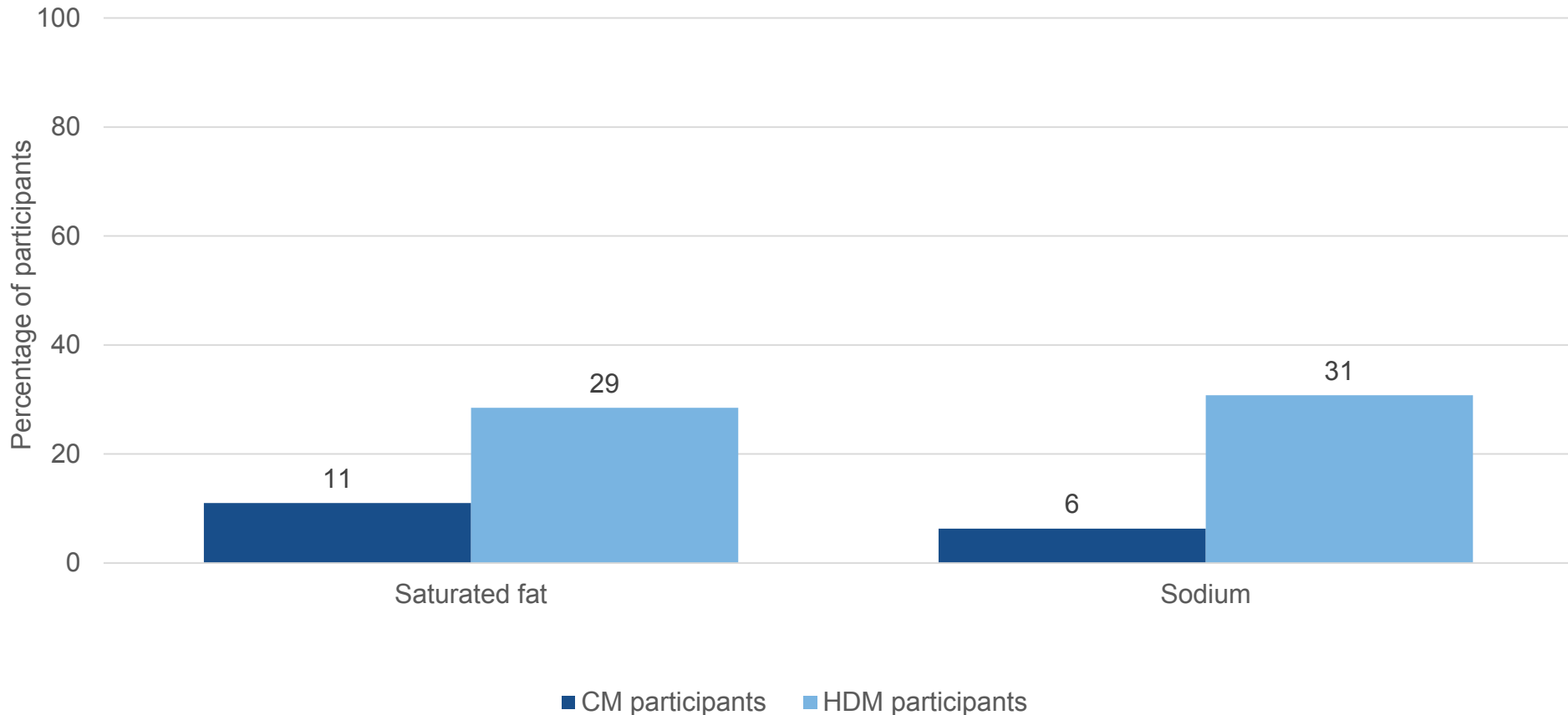
Percentage of participants that met recommendations



Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table III.11.

# Usual Intakes of Saturated Fat and Sodium

Percentage of participants that met recommendations



Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table III.11.

# Healthy Eating Index-2010

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- **Diet quality index that assesses conformance to the 2010 Dietary Guidelines for Americans**
- **Consists of 12 components and a total score**
  - **9 adequacy components**
    - Total fruit
    - Whole fruit
    - Total vegetables
    - Greens and beans
    - Whole grains
    - Dairy
    - Total protein foods
    - Seafood and plant proteins
    - Fatty acids
  - **3 moderation components**
    - Refined grains
    - Sodium
    - Empty calories

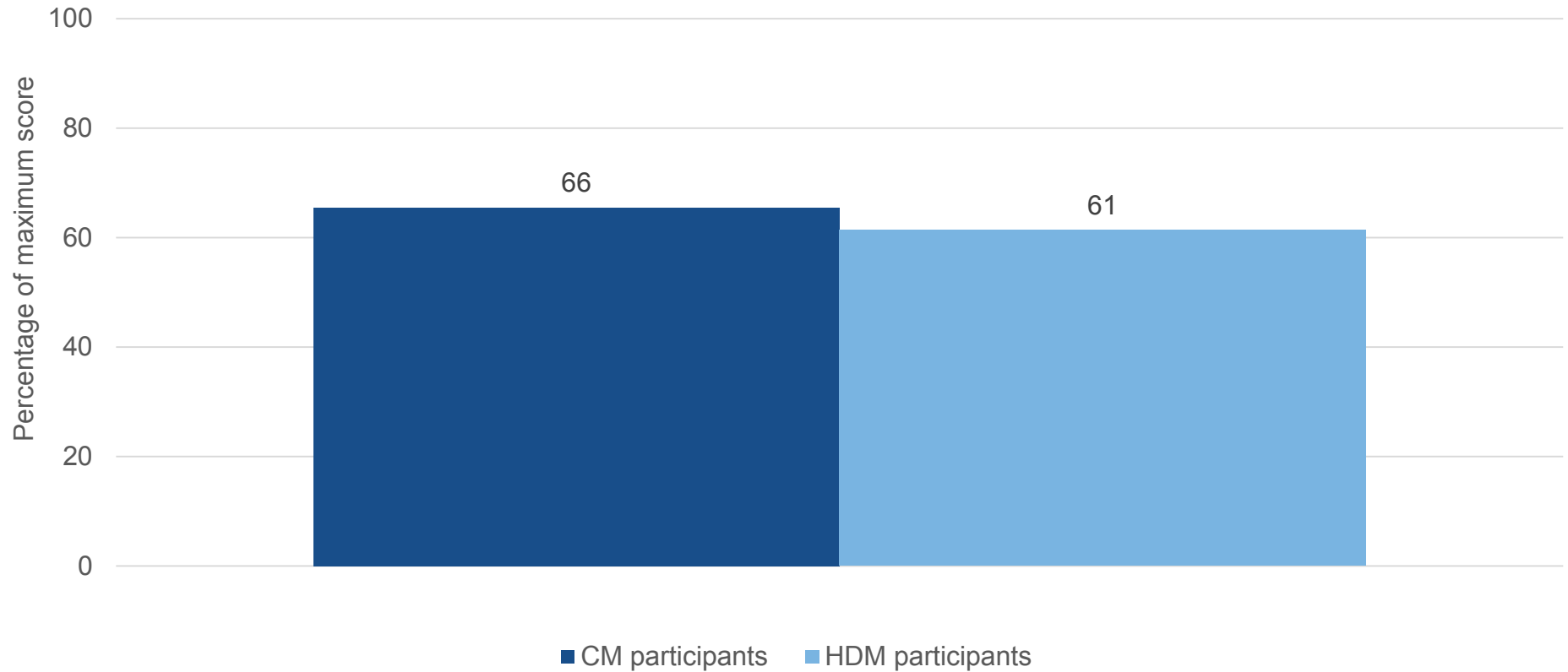
# Healthy Eating Index-2010 (cont.)

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- **HEI-2010 scoring**
  - Each component has a maximum score
  - Scores assigned based on amounts of foods and calories consumed
  - Total score is sum of component scores
- **Higher scores indicate better conformance with Dietary Guidelines recommendations and higher diet quality**
- **Estimated mean HEI-2010 scores using method developed by the National Cancer Institute**
  - Scores are expressed as percentage of maximum possible score

# Total HEI-2010 Scores

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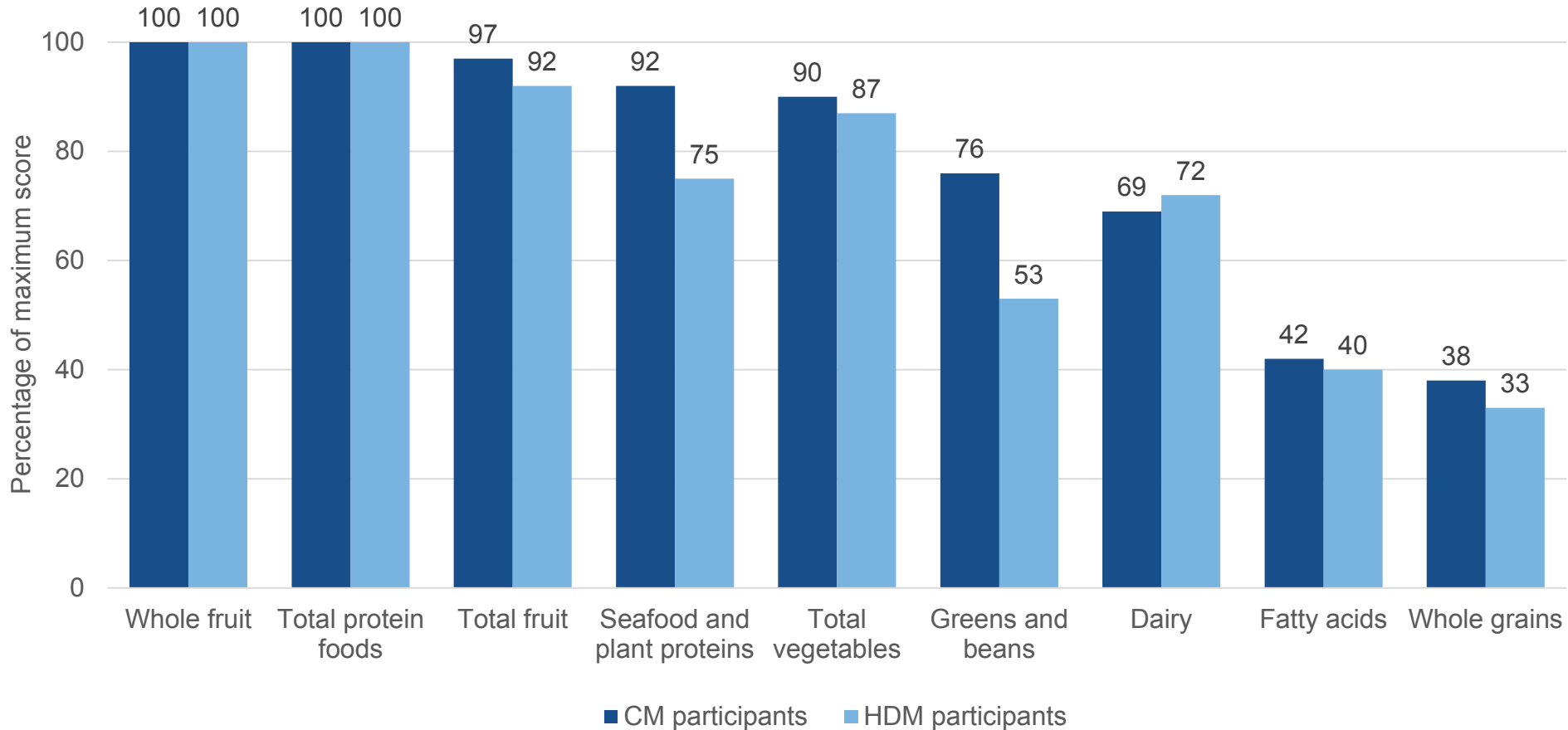
Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table III.13.

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# HEI-2010 Scores for Adequacy Components

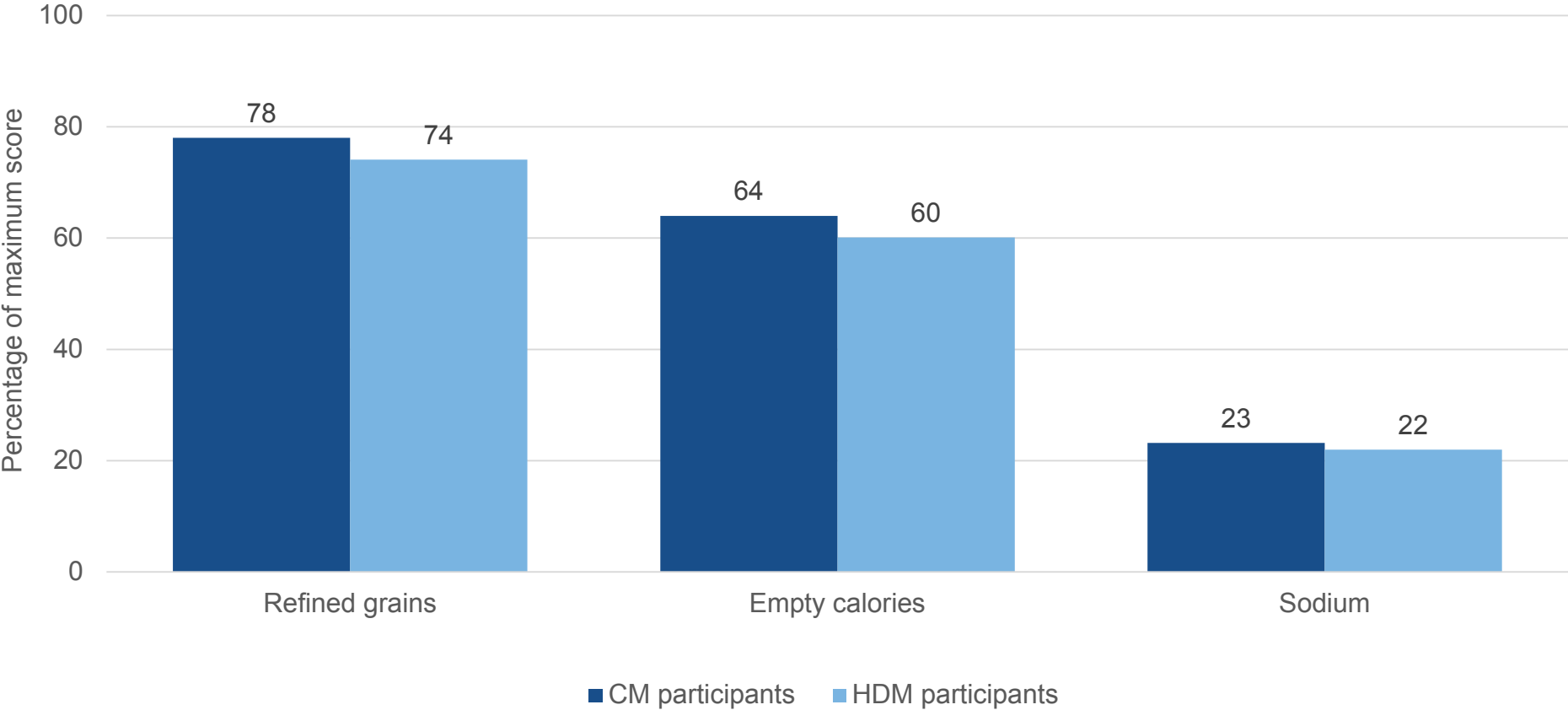
Higher scores reflect higher consumption



Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table III.13.

# HEI-2010 Scores for Moderation Components

Higher score reflects lower consumption (which is desired)



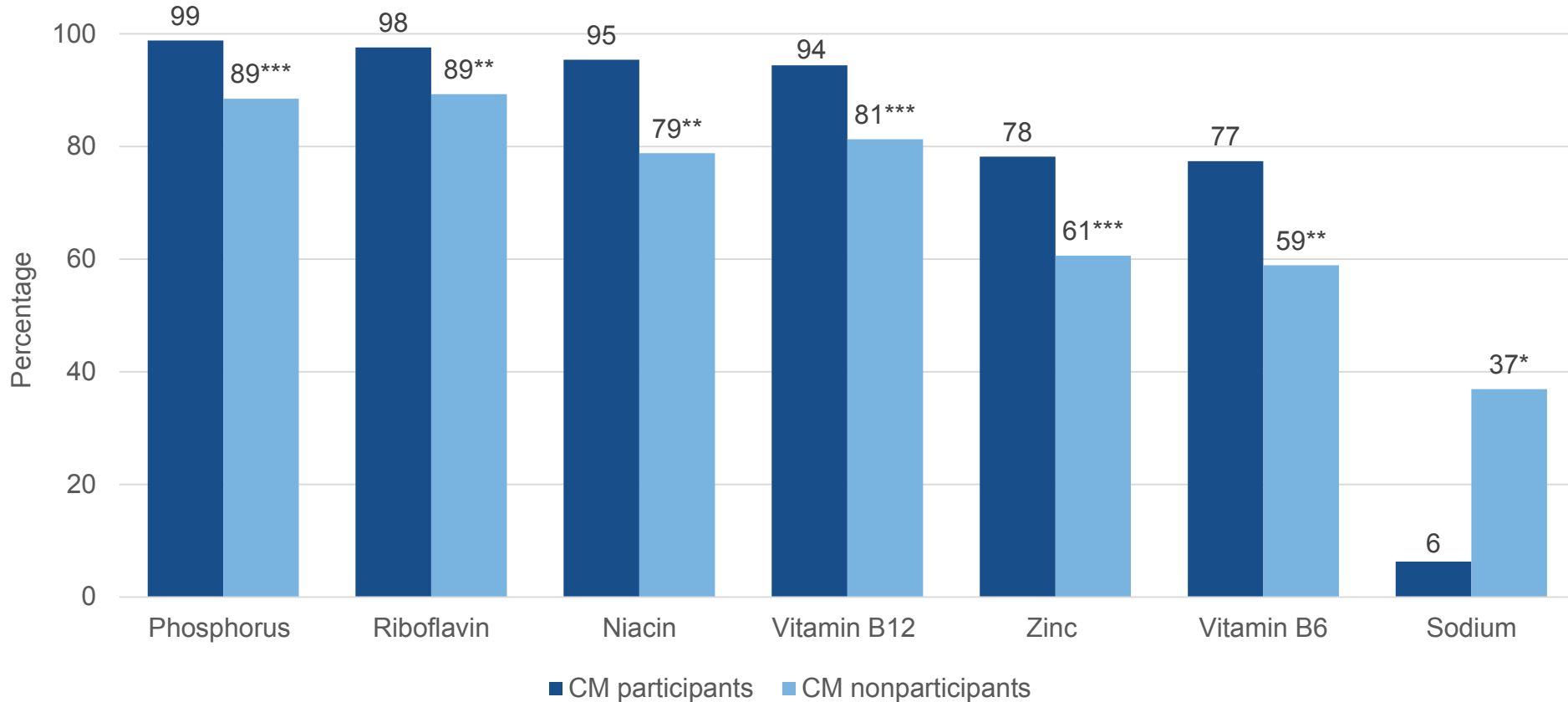
Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table III.13.

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# Effects of Program Participation on Diet Quality Outcomes

# Effects of CM Program Participation on Usual Nutrient Intakes

Percentage of CM participants and nonparticipants that met recommendations

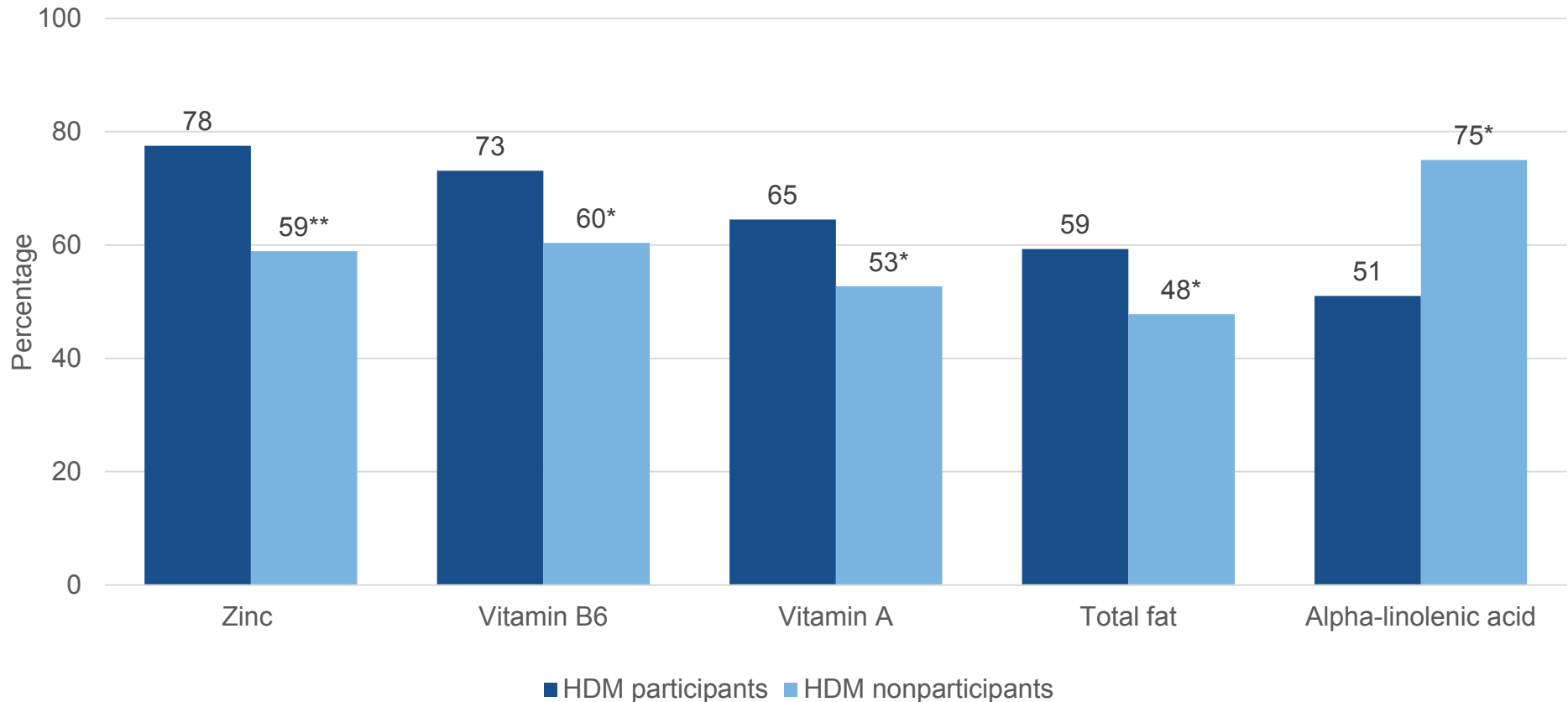


Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table IV.7.

\*\*\*/\*\*/\*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.

# Effects of HDM Program Participation on Usual Nutrient Intakes

Percentage of HDM participants and nonparticipants that met recommendations



Source: AoA NSP 24-hour dietary recall (Day 1 and Day 2), 2015-2016, weighted data, Table IV.7.

\*\*\*/\*\*/\*Difference between participants and nonparticipants is significantly different from zero at the 0.01/0.05/0.10 level.

# Effects of CM and HDM Participation on Overall Diet Quality

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- **CM participants had significantly higher HEI-2010 scores than nonparticipants for:**
  - Total HEI-2010 score (66 versus 59 percent)
  - Total fruit (97 versus 72 percent)
  - Dairy (69 versus 57 percent)
  - Total vegetables (90 versus 78 percent)
  - Refined grains (78 versus 60 percent)
- **HDM participants had significantly higher HEI-2010 scores than nonparticipants for:**
  - Dairy (72 versus 58 percent)
  - Refined grains (74 versus 64 percent)

Source: AoA NSP 24-hour dietary recall (Day 1), 2015-2016, weighted data, Table IV.8.

Note: All differences between participants and nonparticipants were significantly different from zero at the 0.10 level or lower.

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# Conclusion

# Summary of Evaluations' Findings for Key Outcomes

Outcome	2016 Evaluation	1995 Evaluation
<b>Congregate meal program</b>		
Participants had greater food security than nonparticipants	✓	Not measured
Participants had higher levels of socialization than nonparticipants	✓	✓
Participants had higher diet quality than nonparticipants. Program meals made substantial contribution to participants' diets	✓	✓
<b>Home-delivered meal program</b>		
Participants had similar food security as nonparticipants	No effect	Not measured
Participants had similar levels of socialization as nonparticipants	Mixed	✓
Participants had higher diet quality than nonparticipants. Program meals made substantial contribution to participants' diets	✓	✓



# Thank You!

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- **Mathematica extends our sincere thanks to all of the SUA, AAA, and LSP staff who completed study surveys, provided data for the meal cost analysis, and helped facilitate a successful outcomes survey**
- **Holly Greuling (ACL/AoA National Nutritionist)**
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# Evaluation Reports

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- Process study report
  - <http://www.acl.gov/sites/default/files/programs/2017-02/NSP-Process-Evaluation-Report.pdf>
- Cost study report
  - <http://www.acl.gov/sites/default/files/programs/2017-02/NSP-Meal-Cost-Analysis.pdf>
- First outcomes evaluation report
  - [http://www.acl.gov/sites/default/files/programs/2017-07/AoA\\_outcomesevaluation\\_final.pdf](http://www.acl.gov/sites/default/files/programs/2017-07/AoA_outcomesevaluation_final.pdf)
- Nutritional quality of program meals issue brief (anticipated fall 2017)
- Second outcomes evaluation report (anticipated summer 2018)
  - Present participants' healthcare utilization and behavior characteristics
  - Estimate effect of participation on hospital admissions and readmissions, emergency department visits, primary care physician visits, home health episodes, admittance to a skilled nursing facility, admittance to a nursing home, and total Medicare costs