Perceptions of the roles of behavior and genetics in disease risk: Are they associated with behavioral change?

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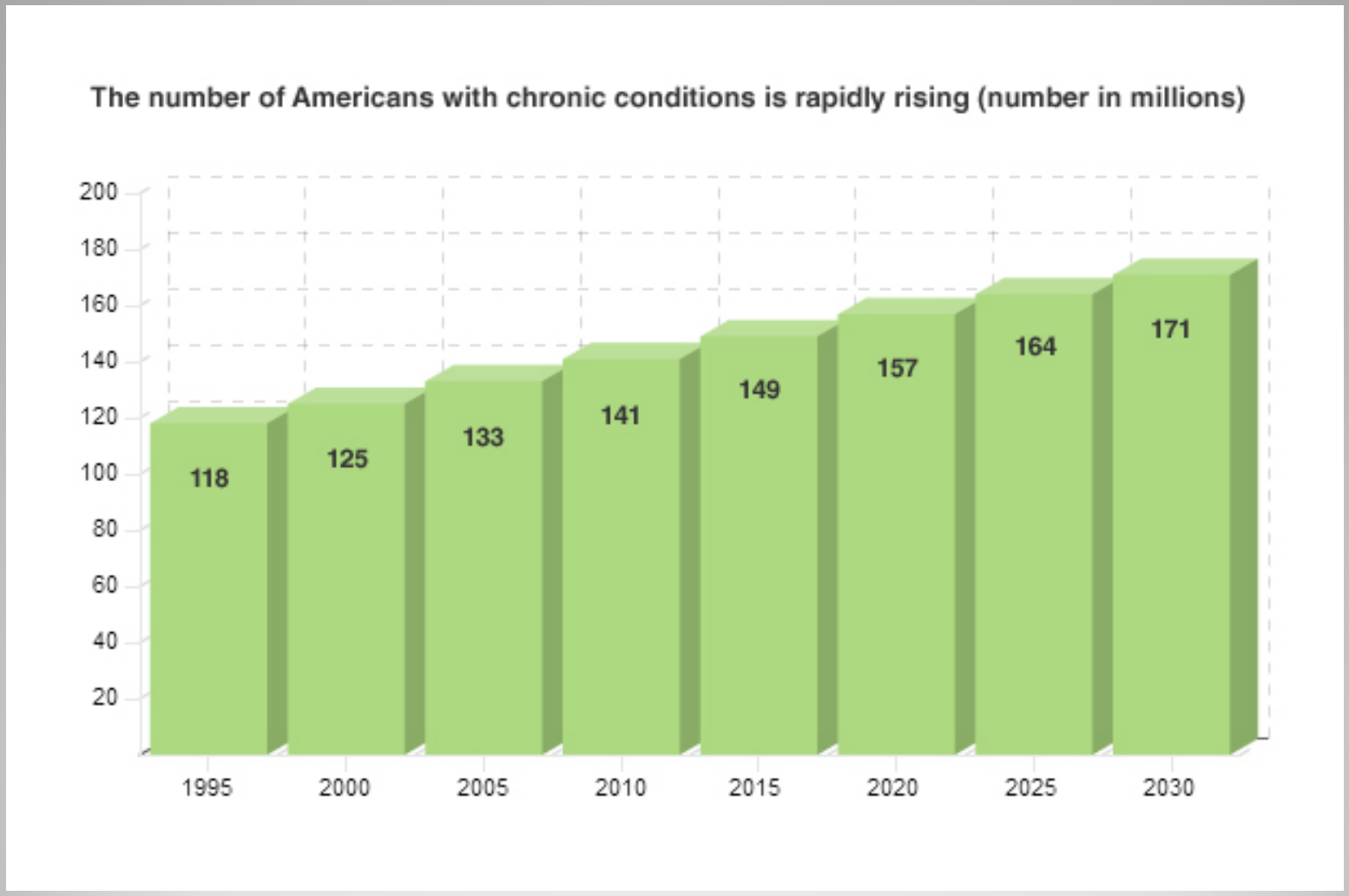
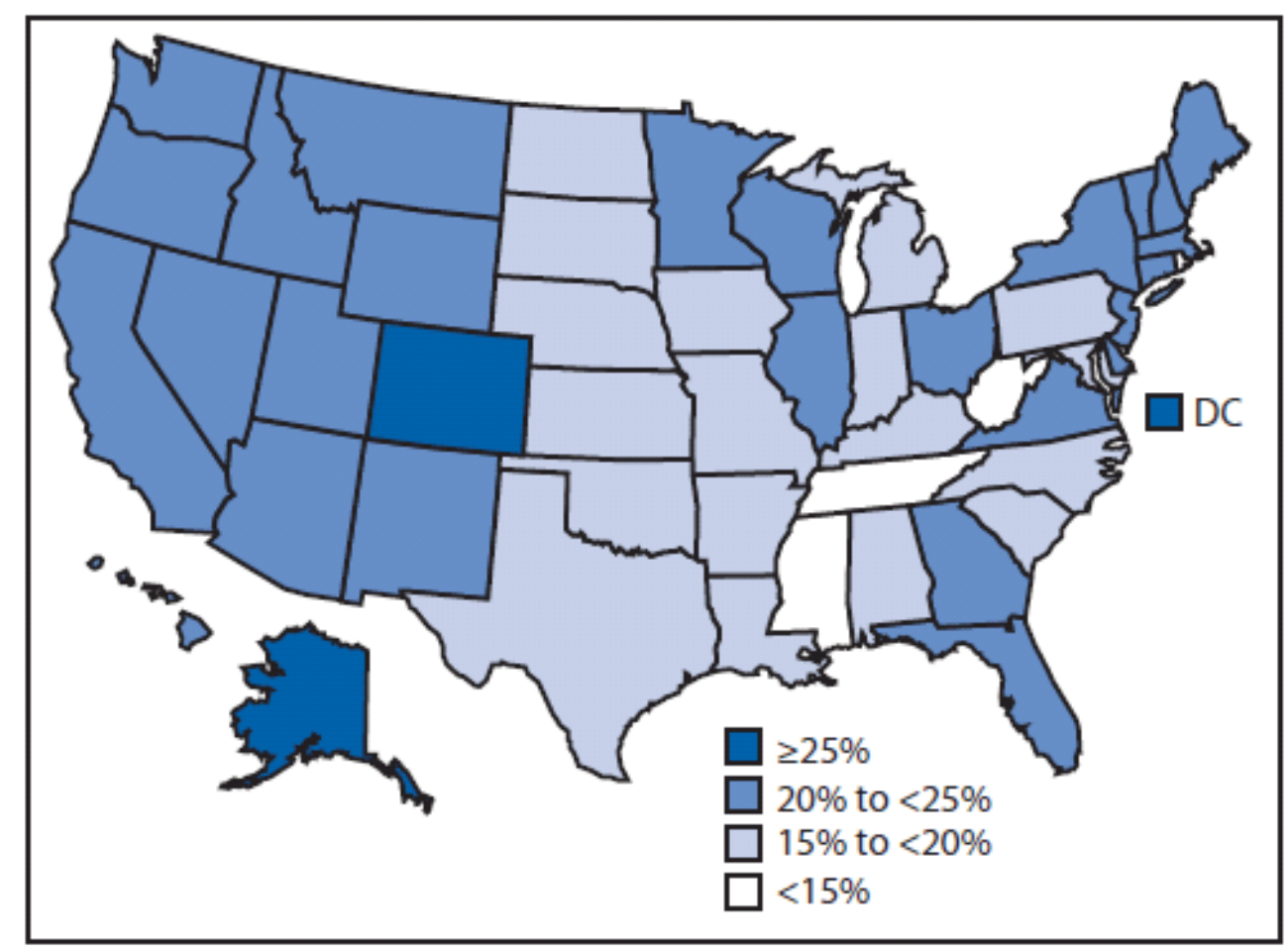


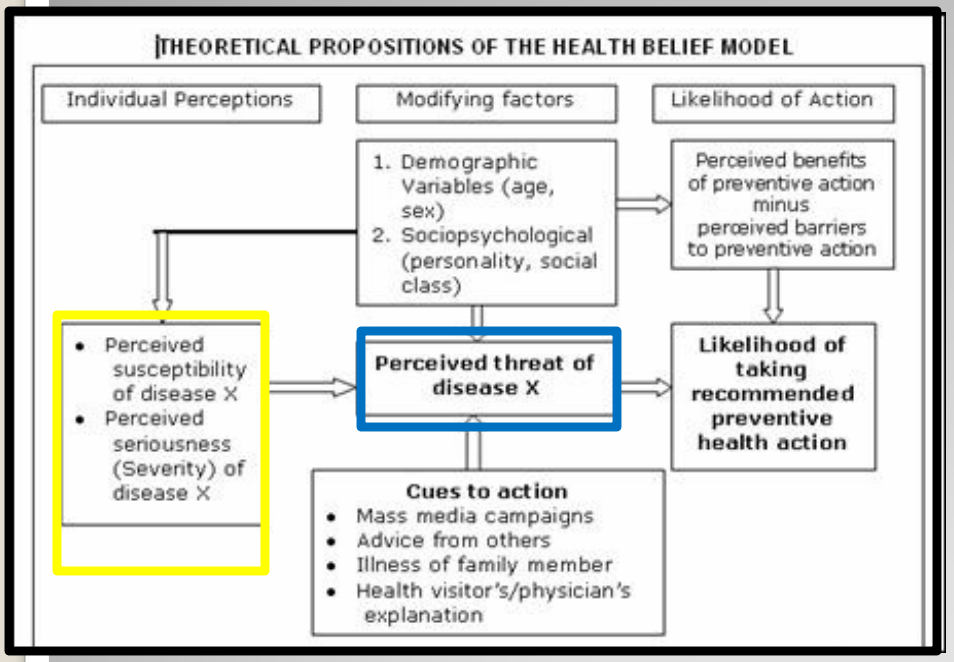
Source: Robert Woods Johnson Foundation. Chronic care: making the case for ongoing care. February 2010. http://www.rwjf.org/content/dam/web-assets/2010/01/chronic-care

Proportion of U.S. adults meeting both aerobic and muscle-strengthening physical activity guidelines by state

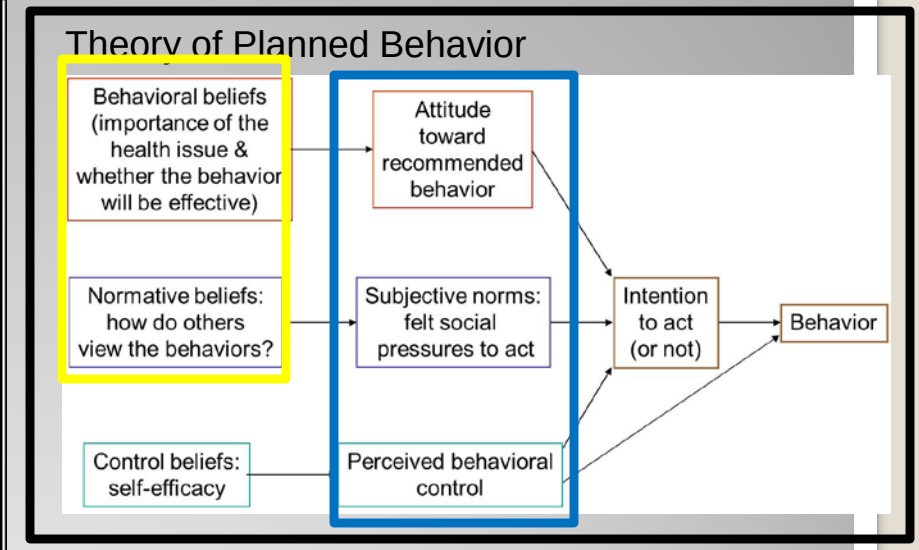


Source: Behavioral Risk Factor Surveillance System, United States, 2011

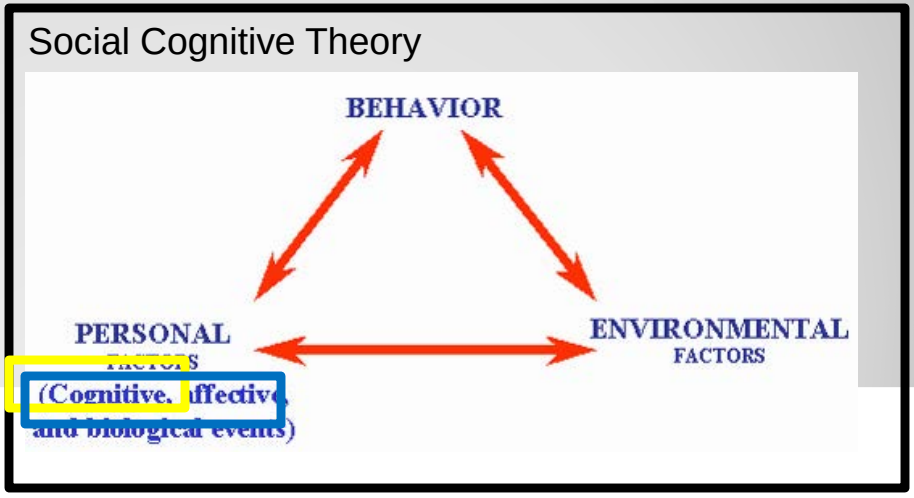
Behavioral Theories



Rosenstock et al. (1988)



Ajzen (1999)



Bandura (2001)

Causal beliefs about Chronic Conditions

Behavioral causal beliefs **vs.** **Genetic** causal beliefs?

Study from Multiplex Initiative: causal beliefs for chronic conditions (i.e., diabetes, osteoporosis, heart disease, high cholesterol, hypertension, lung, colon, and skin cancer)

-participants placed emphasis on the role of both health behaviors and genetics in influencing disease outcomes (O'Neill et al., 2010).

2007 HINTS respondents endorsed both causal attributions for behaviors and genetics to obesity (Wang et al., 2010)

Genetic Causal Beliefs and Prevention

Do beliefs about genetic factors of illness reduce prevention behaviors?

Genetic causal beliefs for heart disease reduced the perceived effectiveness of non-pharmacological treatments but had no effect on perceived medication effectiveness (Wright et al., 2012)

--genetic causal beliefs for obesity did not appear to influence pharm nor non-pharm treatment.

The Study's Aims

The aims of the present study are to:

(1) examine the prevalence of perceived behavioral and genetic causal beliefs for chronic conditions (i.e., obesity, heart disease, diabetes, and cancer);

(2) examine the association between these causal beliefs and attempts at behavior change (i.e., physical activity, weight management, fruit and vegetable intake and soda intake).

Methods

Health Information National Trends Survey (HINTS)

- nationally representative survey of the U.S. non-institutionalized adult population, aged 18 +
- health-related information and communication and health-related behaviors, perceptions, and knowledge
- HINTS 2003, -2005, -2007 with ongoing fourth iteration (HINTS 4)
- HINTS 4 is comprised of four separate data collection cycles that began in 2011 and will extend into 2014, using self-administered mail questionnaires

All analyses are conducted on the HINTS 4 (Cycle 2) data which were collected from July 2012 to October 2012.

- response rate: 39.97%

Outcome variables: Behavioral change

"At any time in the past year, have you intentionally tried to…"

Behavior	Health Promotion	Health Maintenance	Didn't Pay Attention
1. Exercise	Increase amt of exercise in typical week	Maintain amt of exercise in typical week	Haven't really paid attention
2. Weight	Lose weight	Maintain weight	Haven't really paid attention
3. Vegetable intake	Increase amt of veg. you eat or drink	Maintain amt of veg. you eat or drink	Haven't really paid attention
4. Fruit intake	Increase amt of fruit you eat or drink	Maintain amt of fruit you eat or drink	Haven't really paid attention
5. Soda intake	Decrease amt of regular soda you drink	Maintain amt of soda you drink	Haven't really paid attention

Measures: *Covariates*

- age (measured in years)
- body mass index (BMI)
- gender (1 = male, 0 = female)
- race/ethnicity (1 = non-Hispanic White, 2= Black, 3= Asian and Pacific Islander, 4 = Native American, and 5 = Hispanic)
- Current moderate-intensity weekly exercise (in minutes)
- educational attainment (1 = less than a high school diploma, 2 = high school diploma or GED equivalent, 3 = some college, and 4 = college graduate and beyond)
- Daily fruit and vegetable intake:
"About how many cups of fruit/vegetables (including 100% pure fruit/vegetable juice) do you eat or drink each day?"
- Weekly soda intake

Causal Beliefs for Behaviors

"How much do you think health behaviors like diet, exercise and smoking determine whether or not a person will develop each of the following conditions?"

Response options:

not at all, a little, somewhat, and *a lot*

four chronic conditions:

- obesity
- heart disease
- diabetes
- cancer

Causal Beliefs for Genetics

"How much do you think genetics, that is characteristics passed from one generation to the next, determine whether or not a person will develop each of the following conditions?"

Response options:
not at all, a little, somewhat, and *a lot*.

<u>four chronic conditions:</u>

- obesity
- heart disease
- diabetes
- cancer

Analyses

SAS 9.3 and SAS-callable SUDAAN 10.0 statistical software

Survey weights were used to obtain population-level point estimates and accurate variance estimates

Weighted multinomial logistic regression models were conducted to examine whether perceptions surrounding the roles of behaviors and genetics for obesity, heart disease, diabetes, and cancer were associated with behavioral change

-“haven’t paid attention…” = REF group

HINTS 4 Cycle 2 Adult Sample

Trait		N (%)
Gender	Male Female	1384 (50.16%) 2023 (49.83%)
Race/ Ethnicity	NH White NH Black Asian AI/AN Hispanics	2183 (68.42%) 614 (12.75%) 132 (5.40%) 27 (1.02%) 456 (12.4%)
Education	<HS HS / GED Some college College degree +	329 (13.51%) 775 (20.29%) 1057 (37.57%) 1380 (28.64%)

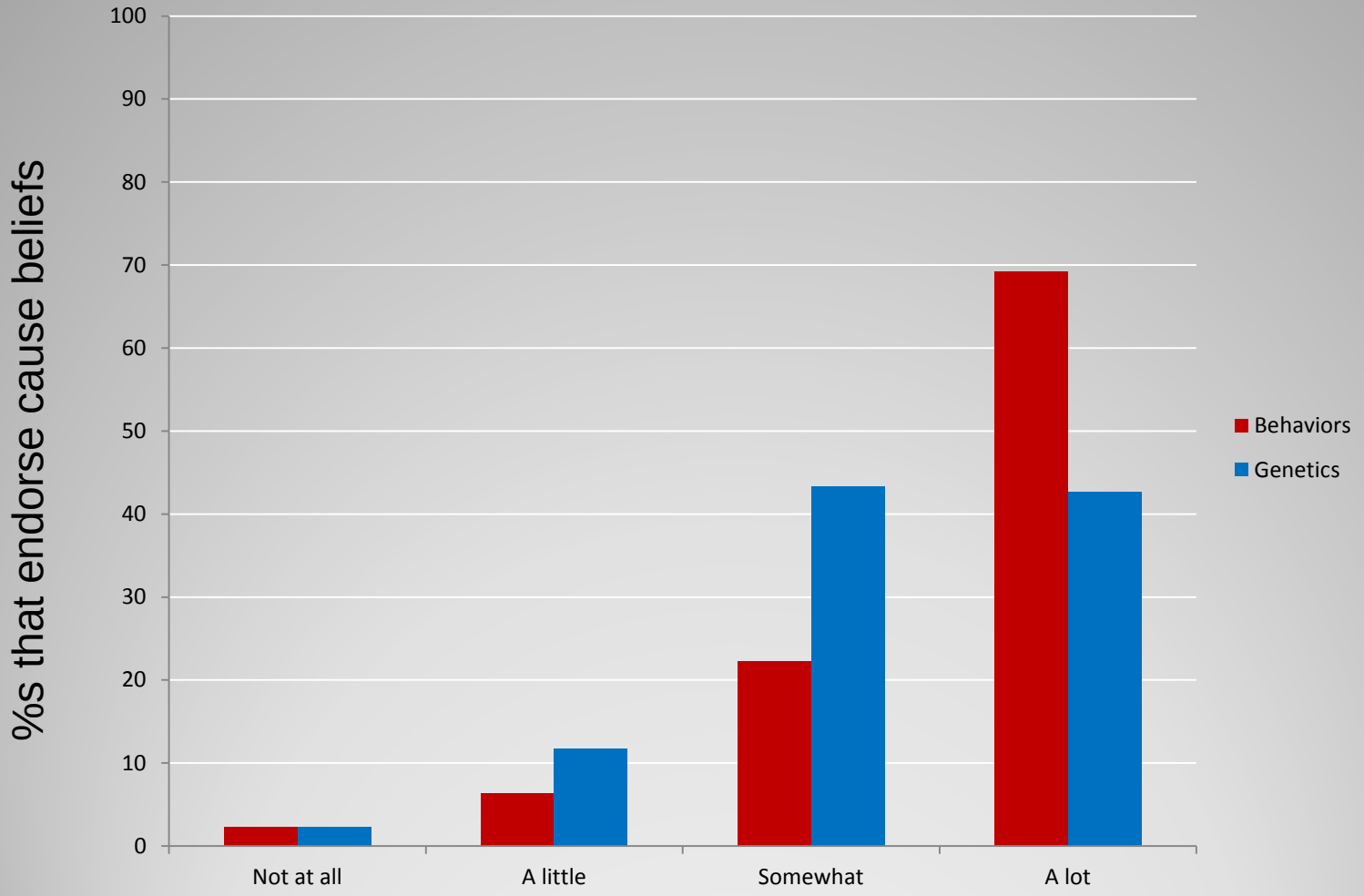
HINTS 4 Cycle 2 Adult Sample

Trait		N (%)
Age (years)	18-24 25-34 35-39 50+	105 (12.91%) 424 (17.63%) 845 (26.44%) 2138 (43.01%)
Marital Status	Married/Living with partner Divorced/separated/widowed Never married/single	1857 (57.2%) 1043 (15.7%) 628 (27.2%)
Annual Household Income	<$15,000 $15,000-34,999 $35,000 – 74,999 $75,000-99,999 $100,000-199,999 $200,000+	536 (16.38%) 705 (20.39%) 983 (32.25%) 376 (12.13%) 427 (15%) 123 (3.84%)

Research Aim 1

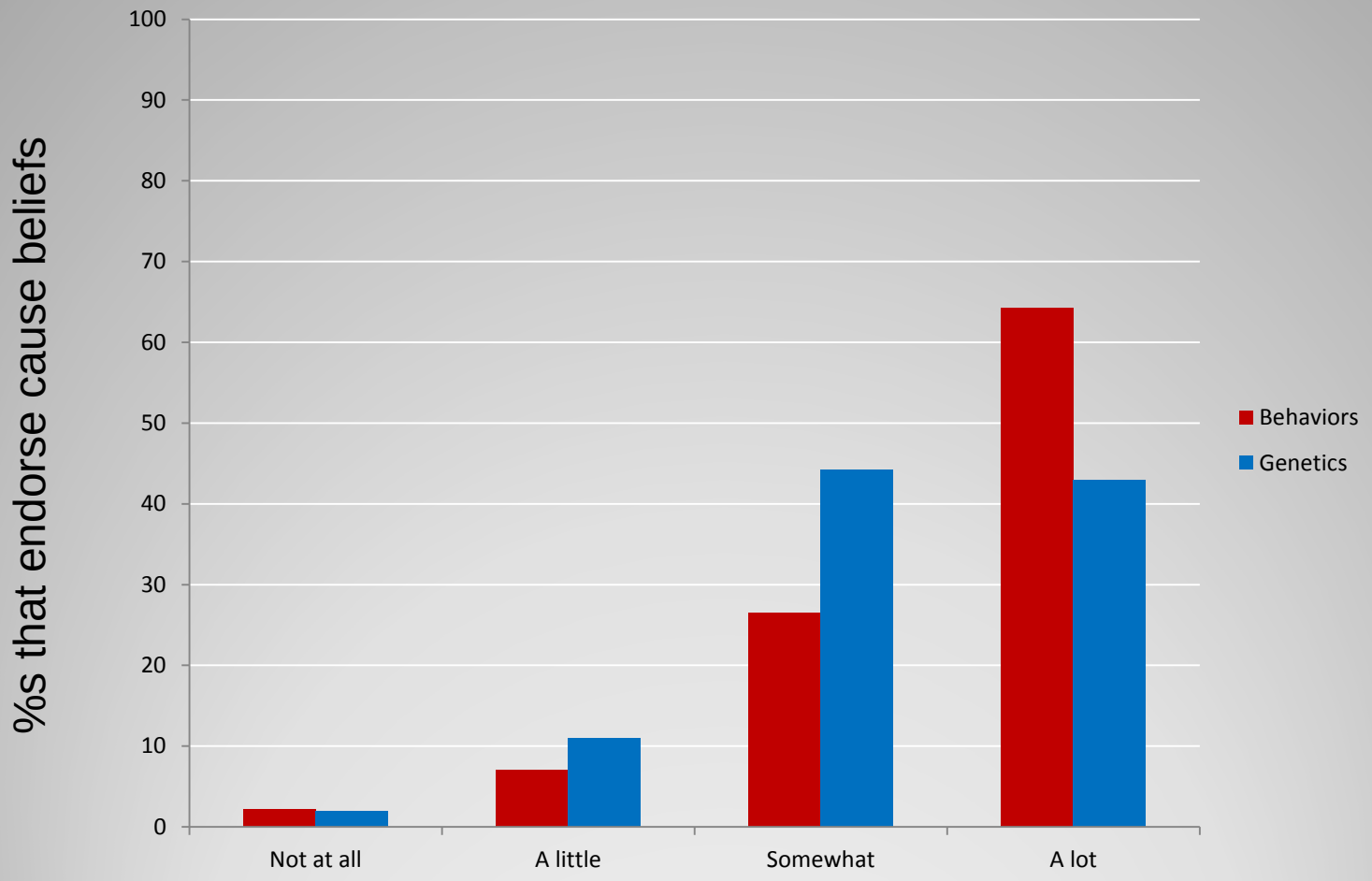
To examine the prevalence of perceived behavioral and genetic causal beliefs for chronic conditions (i.e., obesity, heart disease, diabetes, and cancer)

Causal Beliefs for Diabetes



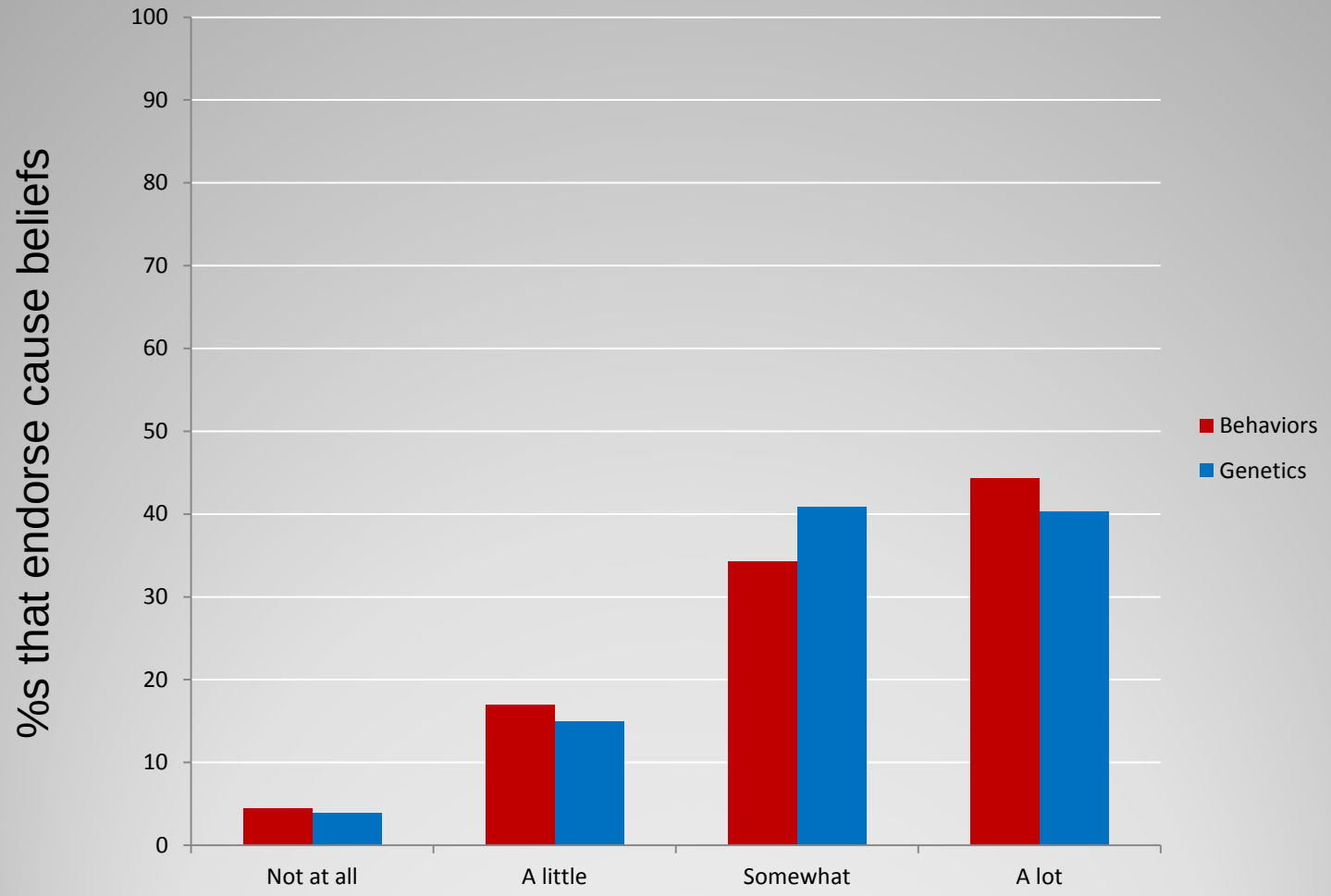
	Mean
Behavior	3.58
Genetics	3.26

Causal Beliefs for Heart Disease



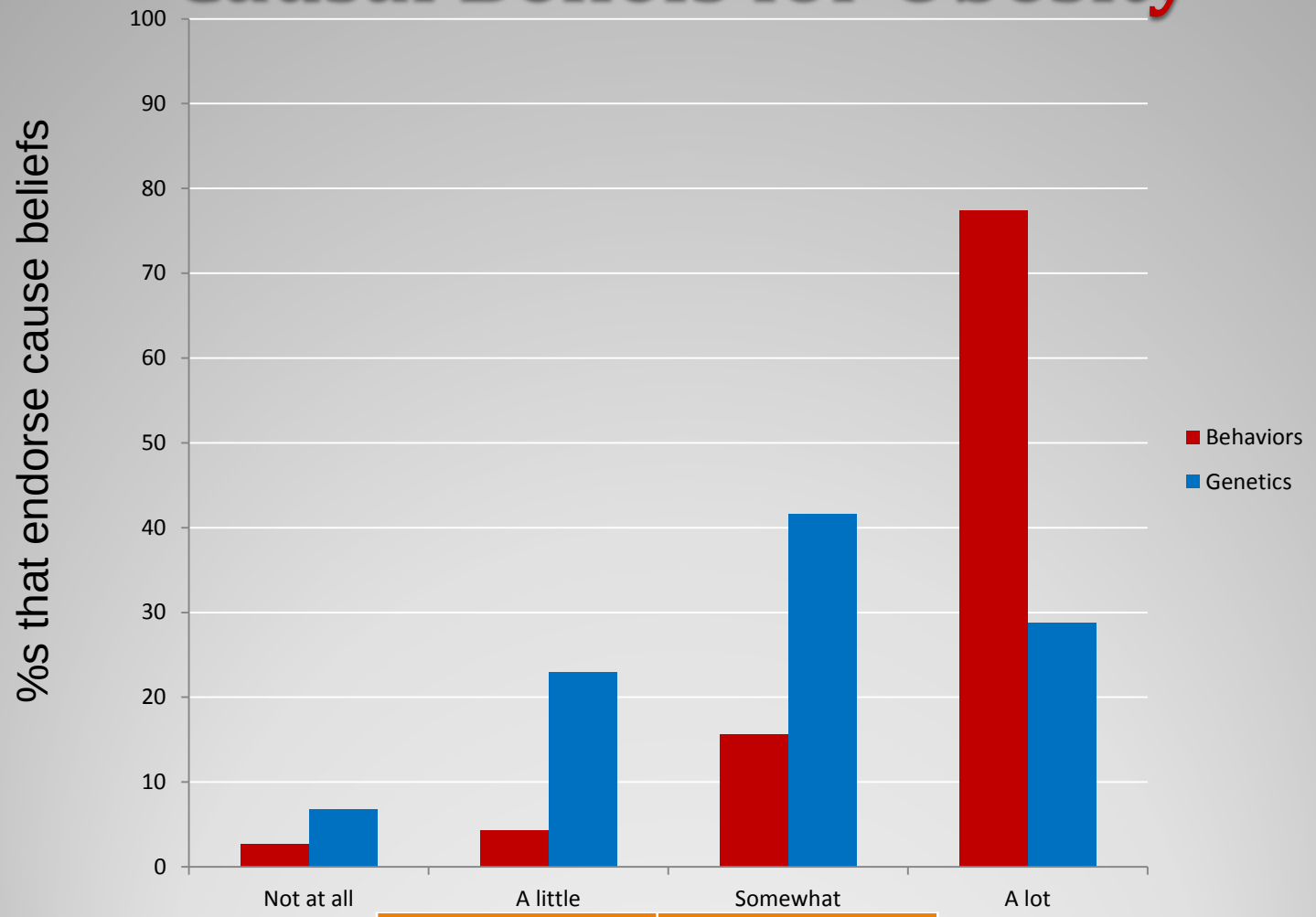
	Mean
Behavior	3.53
Genetics	3.28

Causal Beliefs for Cancer



	Mean
Behavior	3.18
Genetics	3.18

Causal Beliefs for Obesity



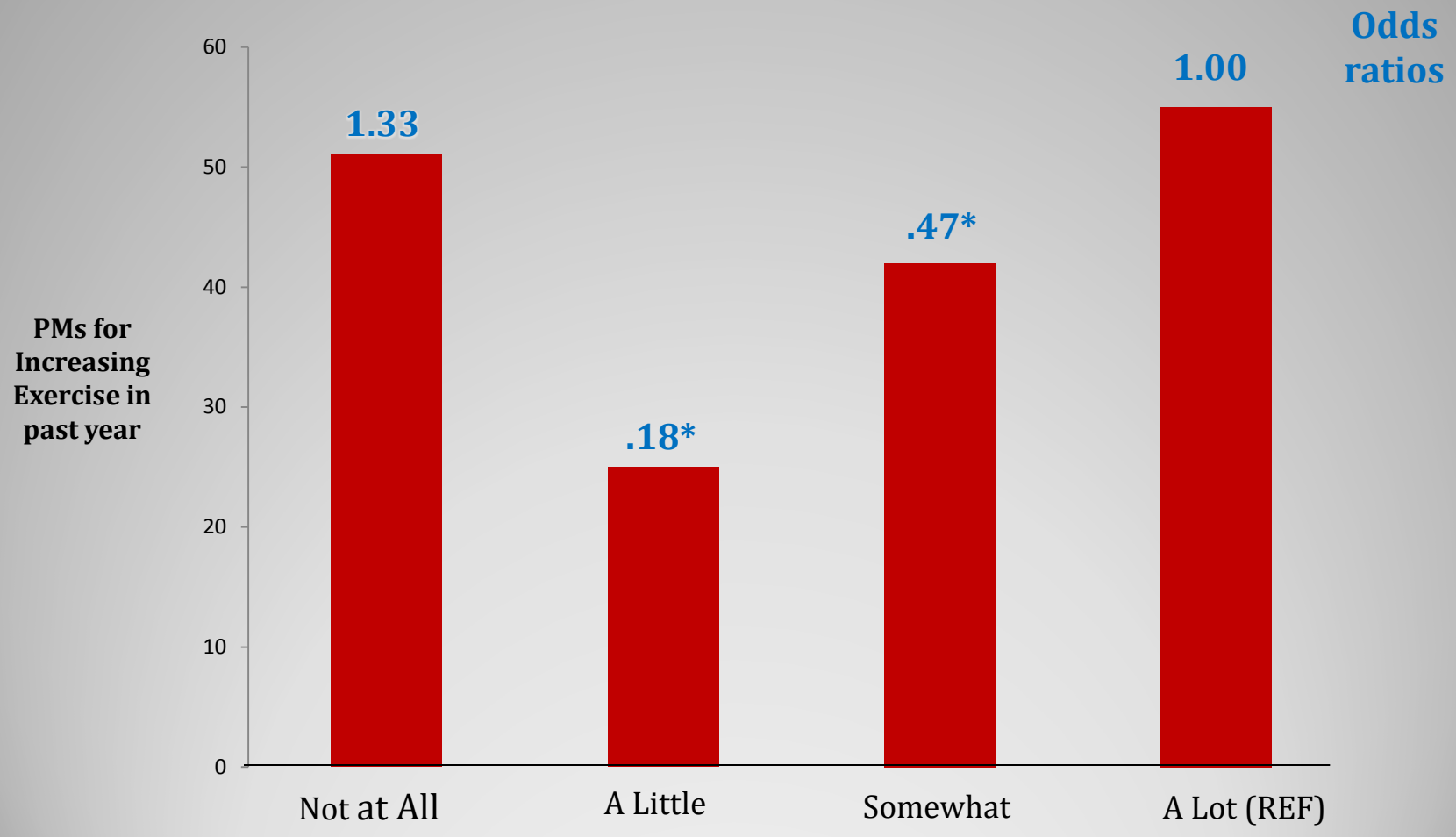
	Mean
Behavior	3.68
Genetics	2.92

Research Aim 2

To examine the association between these causal beliefs and attempts at behavior change

(i.e., physical activity, weight management, fruit and vegetable intake and soda intake).

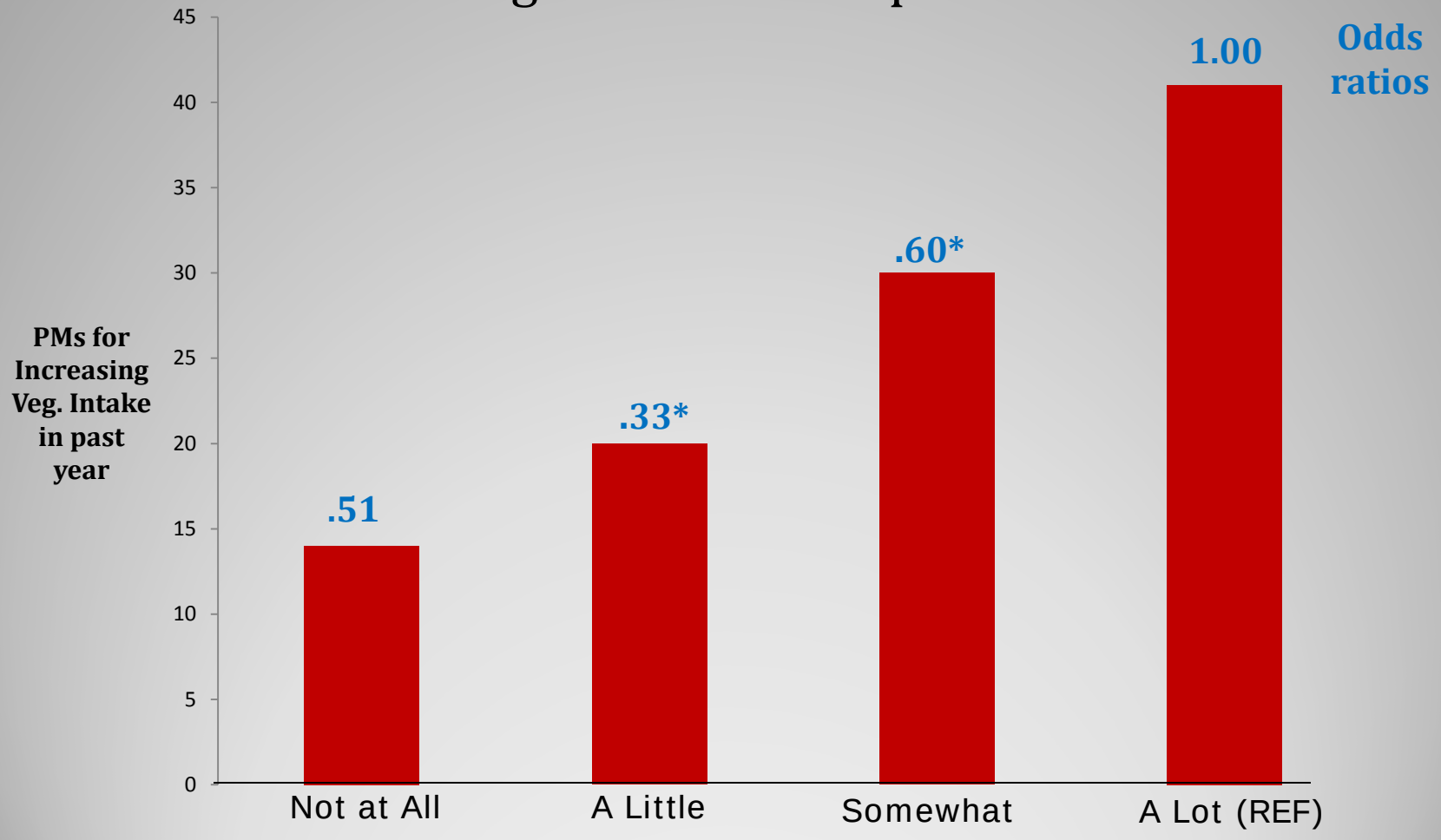
Role of Behavior in Determining Obesity: Exercise



Role of Behavior in Determining Obesity

*significantly lower odds than REF at .05

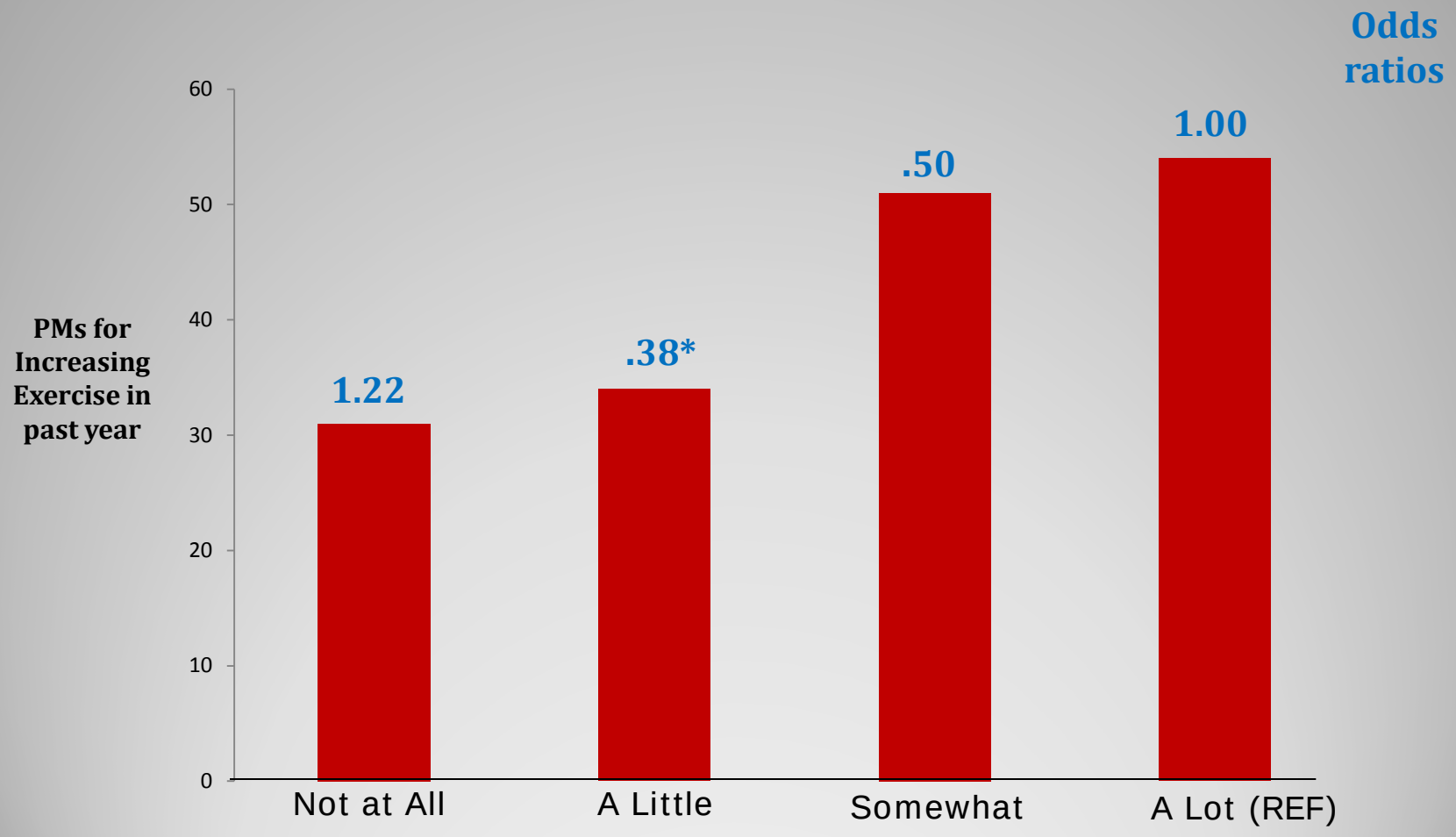
Role of Behavior in Determining Obesity: Vegetable Consumption



Role of Behavior in Determining Obesity

*significantly lower odds than REF at .05

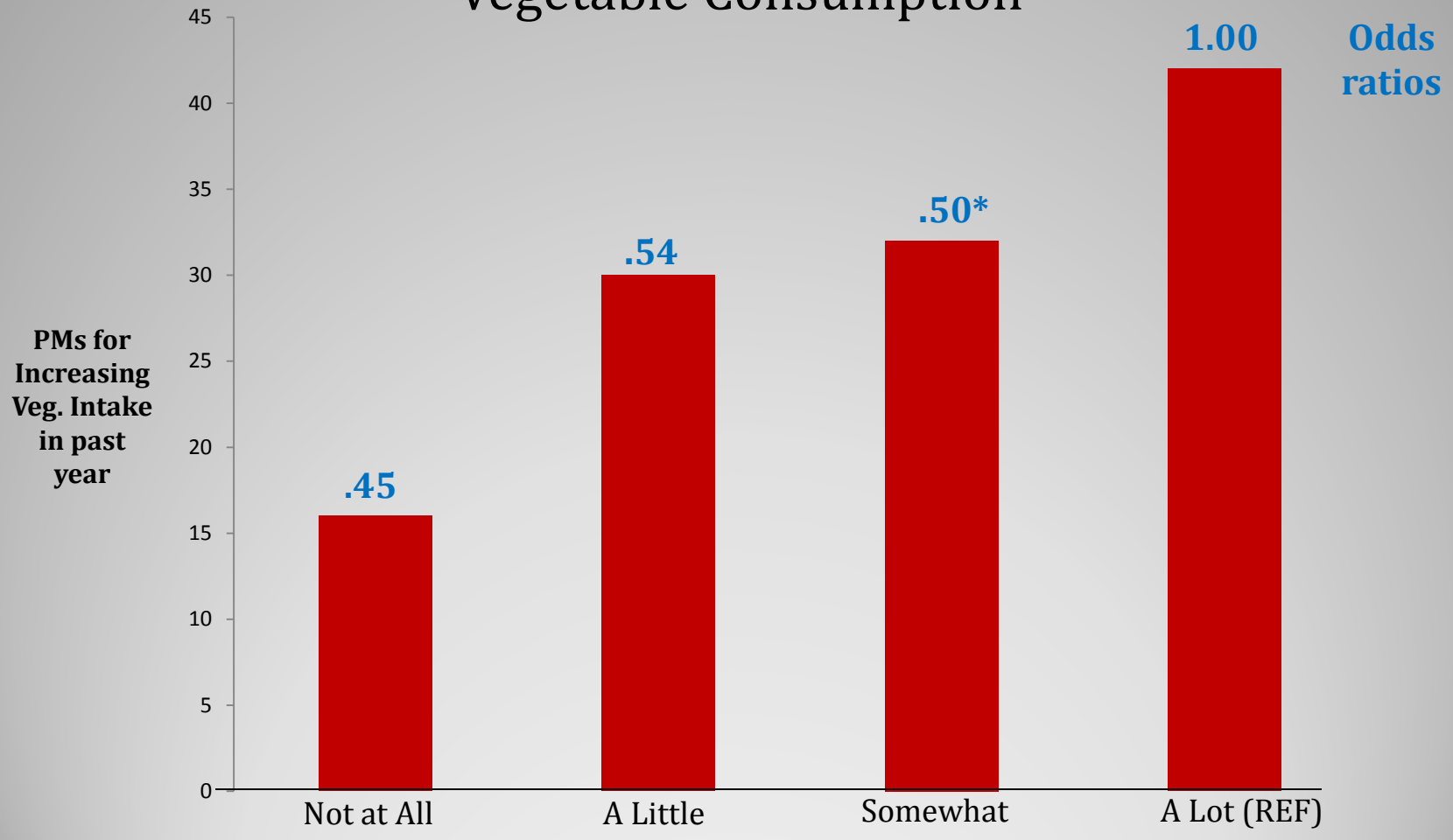
Role of Behavior in Determining Heart Disease: Exercise



Role of Behavior in Determining Heart Disease

*significantly lower odds than REF at .05

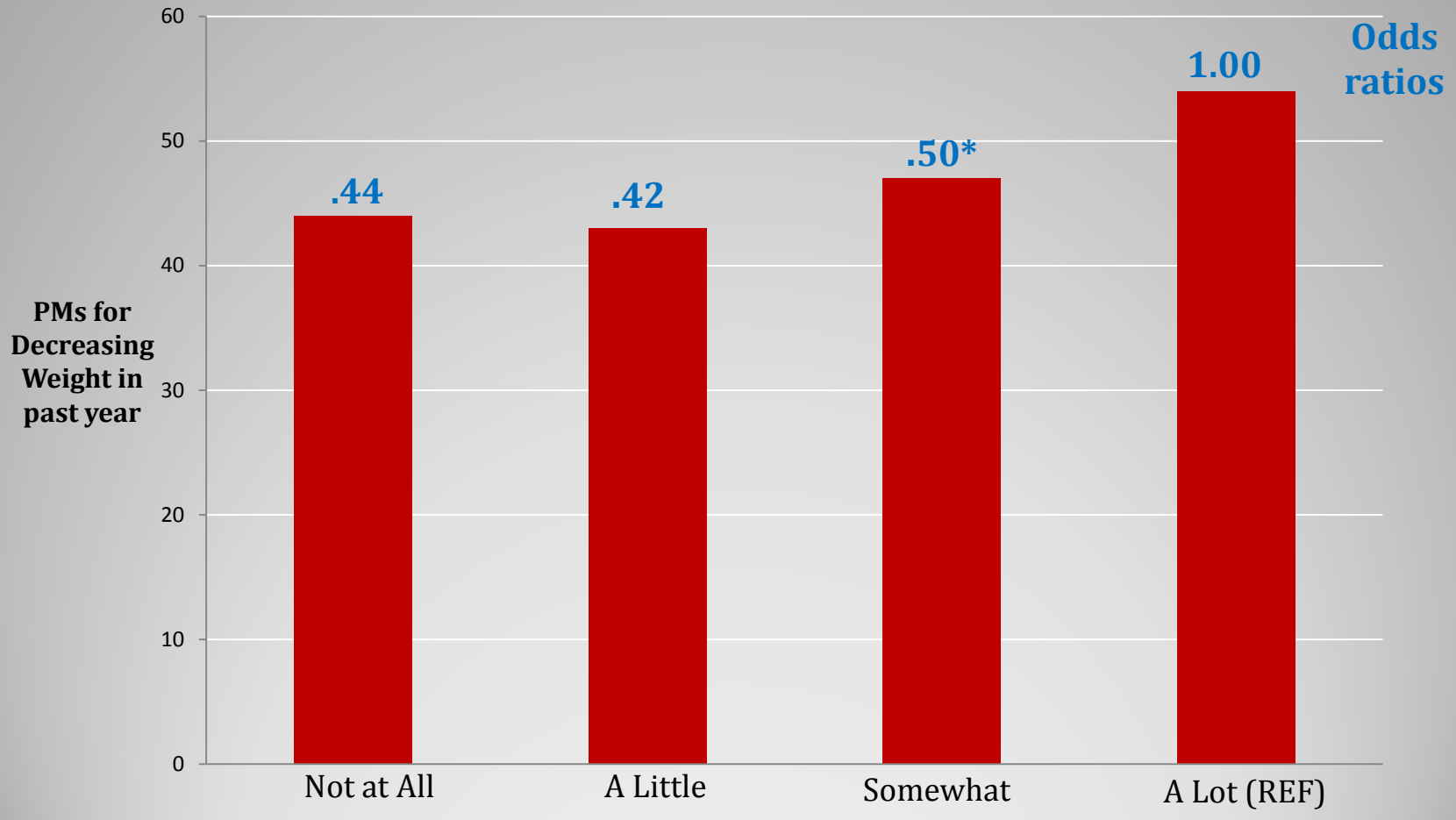
Role of Behavior in Determining Heart Disease: Vegetable Consumption



Role of Behavior in Determining Heart Disease

*significantly lower odds than REF at .05

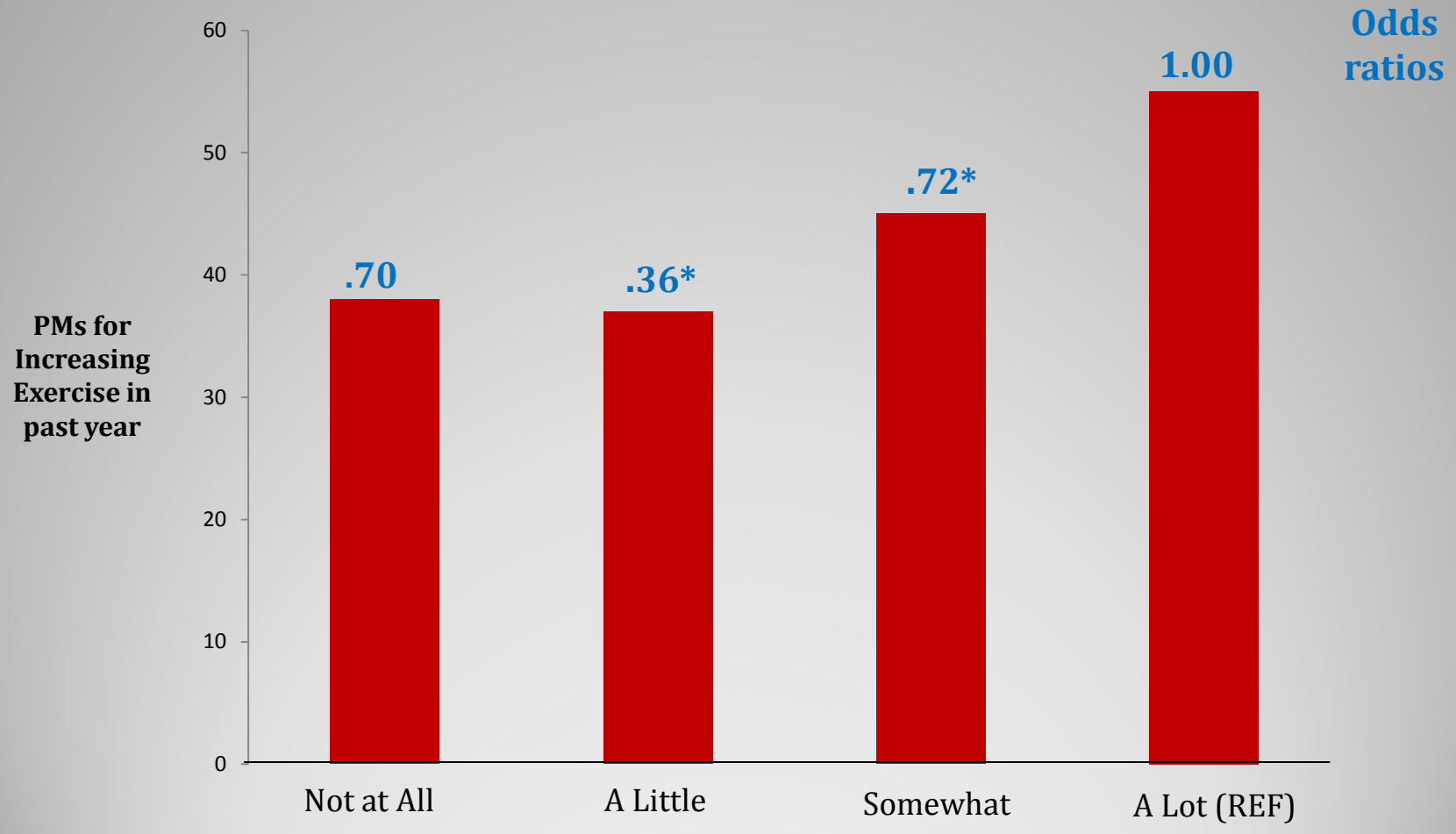
Role of Behavior in Determining Diabetes: Weight Change



Role of Behavior in Determining Diabetes

*significantly lower odds than REF at .05

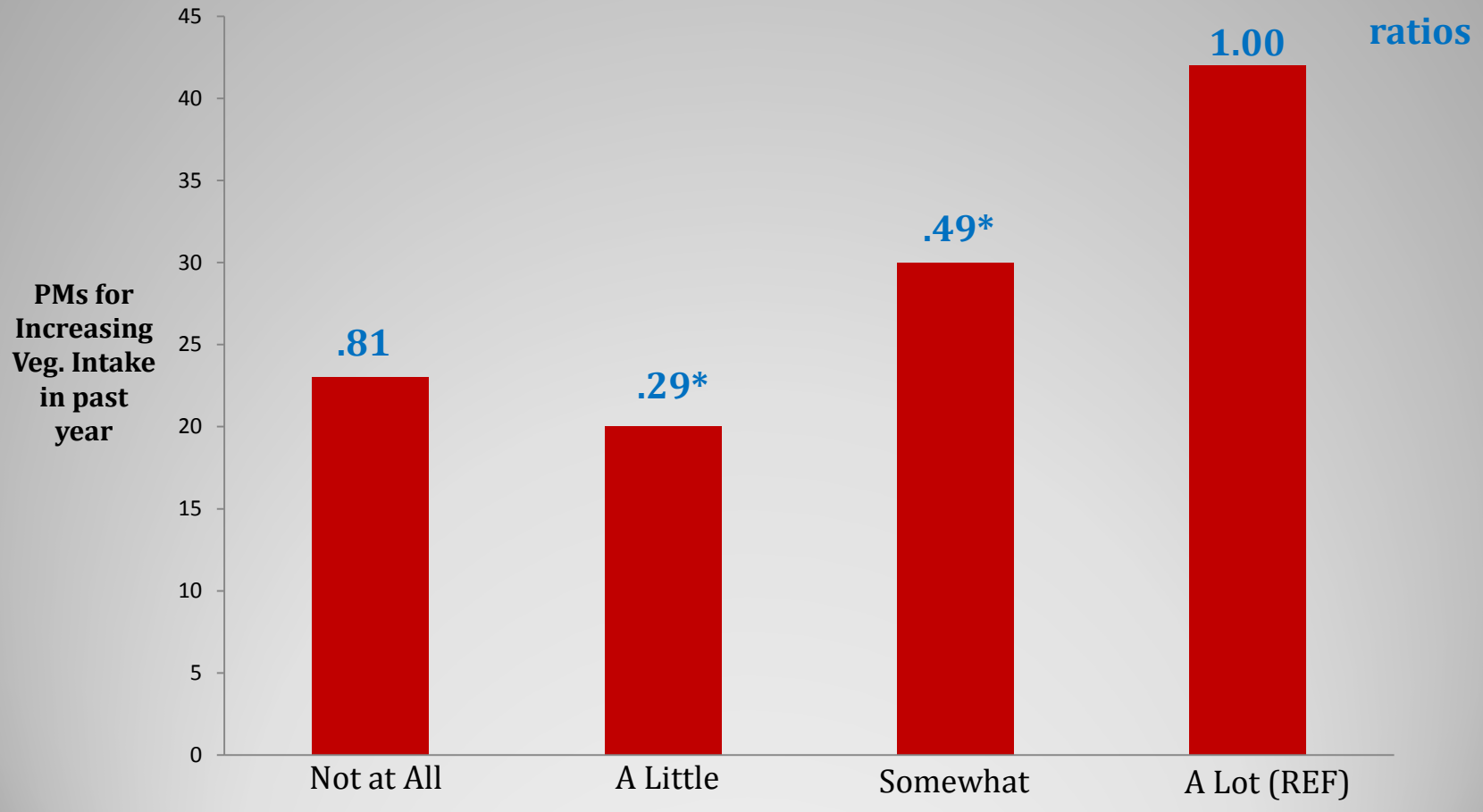
Role of Behavior in Determining Diabetes: Exercise



Role of Behavior in Determining Diabetes

*significantly lower odds than REF at .05

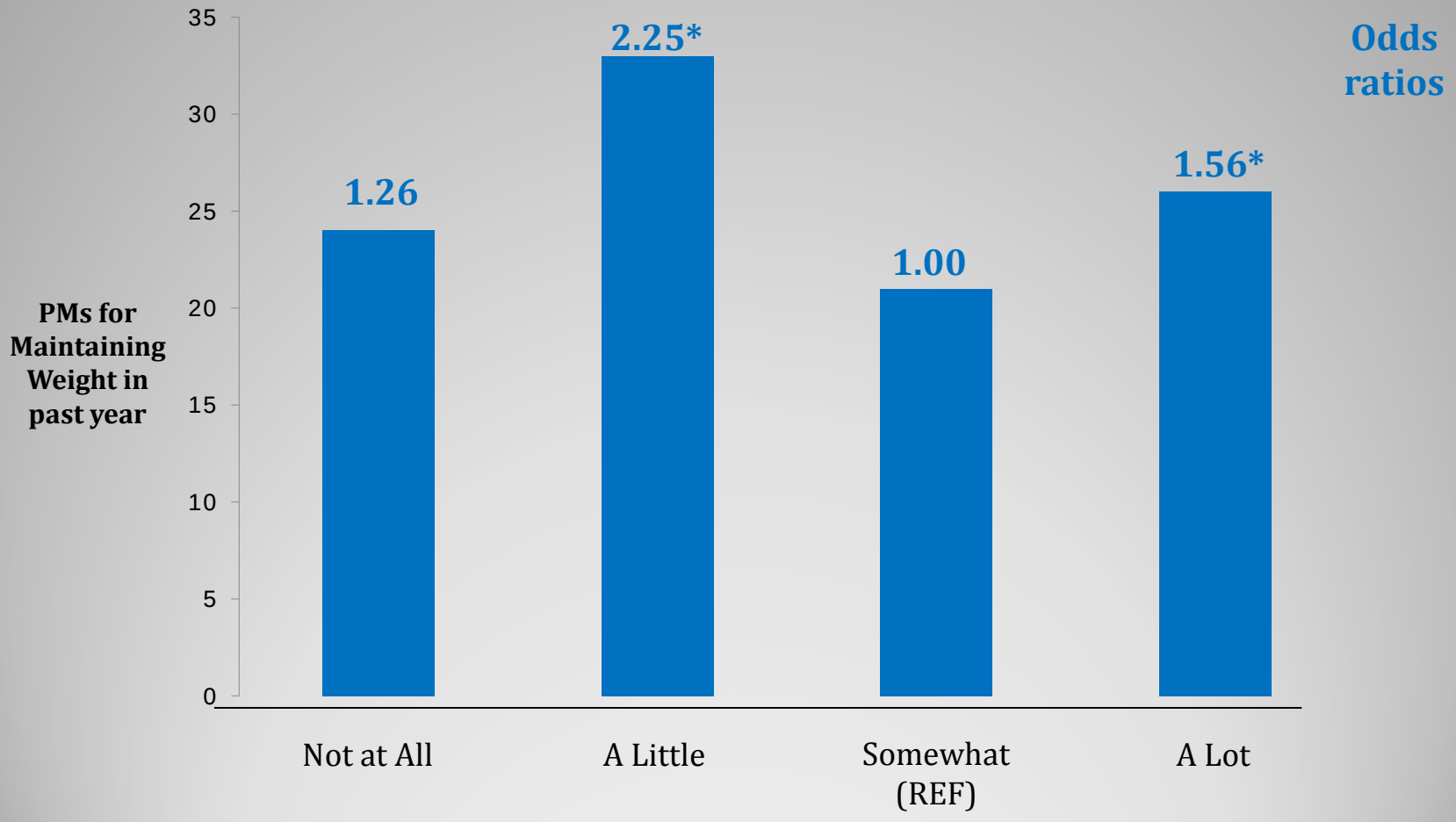
Role of Behavior in Determining Diabetes: Vegetable Consumption



Role of Behavior in Determining Diabetes

*significantly lower odds than REF at .05

Role of Genetics in Determining Cancer: Weight Change



Role of Genetics in Determining Cancer

*significantly lower odds than REF at .05

Fruit intake/soda intake

Behavioral and genetic causal beliefs were not significantly associated with behaviors involving fruit or soda intake.

Discussion

Aims of the study:

(1) examining the prevalence of perceived behavioral and genetic causal beliefs across different chronic conditions (i.e., obesity, heart disease, diabetes, and cancer)

(2) studying the association between these causal beliefs and attempts at behavior change in across multiple domains (i.e., physical activity, weight management, fruit and vegetable intake and soda intake)

<u>Aim 1 Findings</u>

Respondents placed high emphasis on both the role of behaviors and genetics for chronic diseases

Findings suggest that behavioral and genetic causal beliefs are orthogonal

Aim 2 Findings:

Behavioral causal beliefs are associated with attempts at behavioral change

e.g., behavioral causal beliefs for obesity, heart disease, and diabetes were related to behavioral changes in exercise and vegetable intake

Failure to reproduce the same association for behavioral causal beliefs for cancer

Emphasizes importance of specificity in the measurement of health cognitions and risk perception!

Behavioral causal beliefs for obesity, heart disease, and diabetes were related to some behavioral domains (i.e., exercise and vegetable intake) but not others (i.e., fruit or soda consumption).

-suggest that causal beliefs are important to consider when communicating messages about disease risk factors as causal beliefs appear to vary across diseases

Causal attributions about behavioral and genetic factors are disease-specific

–important implications for how individuals process and react to the behavioral/genetic risk information

Our findings indicated that genetic causal beliefs for cancer were significantly associated with attempts to maintain weight but not to lose weight

Exercise caution in over-interpreting these results

cancer = heterogeneous disease

the existence of various cancer subtypes may be masking differences

Future research should follow up disaggregated analyses for specific cancer subtypes

Limitations

The HINTS is cross-sectional

Reliance on single-item measures for both behavior and genetic causal beliefs for chronic conditions

Self-report measures

Future research

Findings indicate that behavioral and genetic causal attributions are orthogonal, future research should investigate their potential interaction effects on preventive behaviors.

--unclear whether individuals who endorse both behavioral and genetic causal beliefs are more or less likely to engage in preventive behaviors

Future research should examine the role of causal beliefs on other types of prevention behaviors (e.g., sun protection or smoking cessation)

Future studies should examine the role of other health cognitions such as the perceived risk or fatalism as effect modifiers on the relationship between causal beliefs and health behaviors

Conclusions

The public possesses a multi-factorial understanding of the etiology of chronic illness.

Behavioral causal beliefs are associated with behavioral change; however, measurement must capture disease-specific behavioral causal beliefs as they are associated with different health behaviors.

Additional research is needed to examine the potential interaction between behavioral and genetic causal beliefs for chronic diseases and how they may impact preventive behaviors.

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Questions? Comments?