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Trends in calcium supplementation, National Health and Nutrition Examination Survey (NHANES) 1999–2014

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Abstract

BACKGROUND—Long-term outcomes of supplemental calcium are inadequately understood. Recent research suggests that calcium from supplements may not be entirely free from unintended health consequences. Consequently, it is important to understand patterns and trends in use of calcium supplements.

OBJECTIVE—To report trends in supplemental calcium intake between 1999–2014, using NHANES data, overall and stratified by sex, race/ethnicity and age.

METHODS—A total of 42,038 adult NHANES participants were included in this analysis. For each survey period, we calculated the prevalence of calcium supplement use exceeding the Estimated Average Requirement (EAR) and Tolerable Upper Intake Levels (UL), and mean daily supplemental calcium dose among calcium-containing supplement users. Sample weights were applied. Linear regression was used to examine trends.

RESULTS—Overall, the prevalence of calcium supplement use at a dose $\geq$ EAR increased between 1999–2000 and 2013–2014, from 2.5% (95% CI: 1.9–3.3%) to 4.6% (3.8–5.5%). Use $\geq$ EAR peaked in 2003–2004 at 6.7% (5.3–8.5%) (p-quadratic trend<0.001). Mean supplemental calcium intake peaked in 2007–2008, thereafter decreasing (p-quadratic trend<0.001). The overall prevalence of intake $\geq$ UL from supplemental calcium in 2013–2014 was 0.4% (0.2–0.8%). Use of supplemental calcium $\geq$ UL peaked during 2007–2008 at 1.2% (0.7–2.0%). In all time periods, supplemental calcium intake tended to be greater among women, non-Hispanic whites and adults >60 years.

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CONCLUSIONS—We described the prevalence of U.S. adults consuming supplemental calcium UL and EAR. While few were consuming supplemental calcium UL, consumption EAR was not uncommon, especially among women, non-Hispanic whites and older adults.

Keywords

calcium; dietary supplements; trends

1.1 BACKGROUND

Supplemental calcium use is common;¹ albeit controversial because it is unclear whether calcium supplementation prevents fractures^{2,3} and there are concerns that it may potentially increase risk of kidney stones^{4–6} and cardiovascular disease (CVD).^{4,7} Additionally, supplemental calcium can interact with certain medications, including thiazide diuretics, to increase the risk for hypercalcemia.⁸ Calcium supplementation may also have gastrointestinal side effects, such as constipation or discomfort.⁴ In contrast, intake of calcium from food sources tends to be well-tolerated, and greater intake of dietary calcium is associated with lower risk of fractures, colon cancer, kidney stones and hypertension.⁹ Consequently, some experts have advocated for obtaining most (if not all) calcium from food sources rather than supplements.^{10–12}

The Estimated Average Requirement (EAR) for calcium, an intake value used for assessing population-level nutritional adequacy, is 800 mg/day for men aged 70 years (y) and women 50y, and 1,000 mg/day for men >70y and women >50y. The Recommended Dietary Allowance for calcium from all sources, or the daily intake level estimated to meet the calcium requirement for 97.5% of the population, is 1,000 mg/day for men 70y and women 50y, and 1,200 mg/day for men >70y and women >50y. The Tolerable Upper Intake Level (UL) is 2,500 mg/day for adults 50y and 2,000 mg/day for those >50y. Beyond the UL, there are concerns of potential harm, such as soft tissue calcification.⁴

We report trends in supplemental calcium intake from 1999 to 2014, using National Health and Nutrition Examination Survey (NHANES) data, overall and stratified by age, race/ethnicity and sex. For the present analysis, we focus on calcium from dietary supplements, for which the health benefits and long-term consequences remain controversial.

1.2 MATERIALS AND METHODS

NHANES is a repeated cross-sectional survey, which samples non-institutionalized U.S. civilians through a stratified, multi-stage probability design (overall response range 69–80%) with over-representation of certain populations, notably Hispanics and non-Hispanic blacks. Starting in 2011–12, non-Hispanic Asians were also oversampled. The survey protocol is approved annually by the National Center for Health Statistics' Research Ethics Review Board and participants provided written informed consent.¹³

Publicly available NHANES data were used for our analyses. Details of the dietary interview portion have been published previously.¹⁴ Briefly, dietary supplement data was collected during home interviews and, since 2007, in two 24-hour recalls. Participants were asked to

show all containers of vitamins, minerals, herbals or other types of dietary supplements taken in the 30 days prior to the interview and report dose, amount consumed, frequency and duration of use; this information was combined to estimate average daily intake. In the 1999–2000 cycle, though, participants were asked to report how often they took each dietary supplement in regard to the past day, week or month. The NHANES Dietary Label Supplement Database includes approximately 11,000 dietary products.¹⁴ Information on the number of vitamins and minerals in each product are also available. Mean daily supplemental calcium intake was estimated using past 30 day reports, and includes both over-the-counter and clinically prescribed supplementation. The investigation reported herein is limited to supplemental calcium intake and does not consider intake of calcium from dietary sources.

We excluded those younger than 20 years, pregnant or lactating women, and those without dietary supplement data needed to calculate mean daily intake. Sample weights were applied to account for the complex sampling design and to account for survey nonresponse in order to achieve nationally representative estimates. For the 8 survey periods between 1999 and 2014, information was available for an average of 5,255 participants per study period [range=4,551–6,114], resulting in a total of 42,038 participants included in this analysis. We calculated the prevalence of calcium supplement use EAR, as well as mean daily supplemental calcium dose and prevalence of calcium supplement use UL among those who reported use of ≥1 calcium containing supplements. In supplementary analyses, we examined mean daily supplemental calcium intake exclusive of multivitamin/multi-mineral supplements (MVMM, defined by containing ≥10 vitamins and/or minerals^{1,15}). Results were stratified by sex, race/ethnicity and age categories. The Taylor Series Linearization approach was used to generate variance estimates in accordance with NHANES guidelines.¹⁶ Linear regression was used to examine trends. Trends were tested by including survey period in the model as a quadratic continuous variable. STATA version 14.1 was used (StataCorp LP; College Station, TX); all tests were two-sided with a statistical significance threshold of $p < 0.05$.

1.3 RESULTS

The 42,038 NHANES participants were 50.0% female, 46.9% non-Hispanic white, and had a mean age of 50.6y. Calcium supplement use EAR tended to be 3–4-fold greater among women than men. For example, in 2013–2014, the prevalence of supplement use EAR among women was 7.1% (5.8–8.7%) while in men it was 1.9% (1.3–2.9%). Notably, in 2013–2014, 10.4% of those aged 61–70y and 8.5% of those >70y consumed supplemental calcium EAR. Overall, the prevalence of calcium supplement use at a dose EAR increased between 1999–2000 and 2013–2014, from 2.5% (95% CI: 1.9–3.3%) to 4.6% (3.8–5.5%) (Table 1). Use EAR peaked in 2003–2004 at 6.7% (5.3–8.5%) (p-quadratic trend<0.001). This pattern was largely consistent across demographic groups.

Mean daily supplemental calcium intake among calcium-containing supplement users peaked in 2007–2008, thereafter decreasing (Table 2; p-quadratic trend<0.001). A similar pattern was found among women, non-Hispanic whites and older adults. In 2013–2014 supplemental calcium intake averaged 359.7 mg/day (342.1–377.3), up slightly from 1999–

2000 [347.7 (312.8–382.6)], and was highest for women, non-Hispanic whites and older adults.

In 1999–2000, 16.8% of supplemental calcium was consumed as non-MVMM products, while in 2013–2014 19.8% was consumed as non-MVMM products (Supplemental Table 1). The overall p-value for quadratic trend was no longer statistically significant for mean daily intake of supplemental calcium from non-MVMM products. In subgroups, however, a quadratic trend was detected across sexes, race/ethnicities and older age groups (>51y) (Supplemental Table 2).

In 2013–2014, among calcium-containing supplement users, the overall prevalence of intake UL from supplemental calcium alone was 0.3% (0.1–0.9%). Supplemental calcium UL peaked during the 2007–2008 survey period at 1.2% (0.7–2.0%) (Table 3; p-quadratic trend<0.001). Similar to intake EAR, prevalence of supplemental calcium intake UL was slightly higher among women, non-Hispanic whites and older adults.

1.4 CONCLUSIONS

Using data from NHANES, weighted to be representative of the U.S. population, we found that about 5% of U.S. adults obtain a substantial proportion (i.e. EAR) of their daily calcium requirements from supplemental calcium based on the most recent survey in 2013–2014. This was more common among women, non-Hispanic whites, and older adults.

Our findings are important for considering the population level effects of supplemental calcium intake. In observational settings, individuals who consume supplements (including calcium) tend to have more favorable health habits.¹⁷ Prior findings have shown that supplemental calcium users tend to have higher usual mean intake of calcium from the diet than those who do not use supplemental calcium.¹⁷ This is particularly true among women.

Long-term outcomes of supplemental calcium are inadequately understood; consequently, it is important to understand patterns and trends in use of calcium supplements. Supplementation may cause calcium-loading, transiently elevating urinary and serum calcium,¹⁸ and may contribute to kidney stone formation.^{4–6} Elevated serum concentrations have been associated with atherogenesis and CVD in observational settings.^{19,20} Some randomized controlled trials suggest supplemental calcium contributes to elevated CVD risk;^{7,21} however, important methodologic concerns have also been raised that presently limit causal inference.²² Additionally, calcium supplementation can commonly contribute to minor gastrointestinal side effects, however, an increased risk of gastrointestinal-related hospitalizations has been reported with supplemental calcium as compared to placebo.²³

In this analysis of NHANES data, we found that calcium intake EAR fluctuated between 1999 and 2014, increasing until 2007–2010 and subsequently decreasing. These fluctuations could potentially reflect consumer awareness of evolving research reporting mixed effects of calcium supplementation on clinical outcomes,^{2,3,7,22} or developments in dietary supplement marketing.²⁴ Our findings build on previous findings reporting modest declines in use of any calcium-containing supplements among NHANES participants from 1999–2000 to 2011–2012.¹ However, previous research did not report trends important for estimating population

adequacy nor dosage among supplement users. Similar to our findings, a New Zealand study reported that calcium supplement prescriptions increased during 2000–2007, plateaued during 2008–2009, and declined from 2010–2012.²⁵ Interestingly their findings correspond roughly to publications from the Women’s Health Initiative randomized controlled trial in 2008,²¹ reanalysis and meta-analysis in 2011⁷ suggesting calcium supplements modestly elevate CVD risk.²⁵

There are limitations to these analyses. First, these NHANES data are limited in that supplemental calcium intake was self-reported, however, participants were asked to provide their supplement bottles.¹³ Second, our intake estimates determined supplemental calcium intake based on bottle labels. Prior research has noted that the actual amount of calcium in dietary supplements tends to be greater than what is listed on the label.²⁶ Thus, our analysis would tend to underrepresent actual supplemental calcium intake among American adults. Additionally, not all calcium consumed is absorbed in the gastrointestinal tract; in fact, the fractional absorption of oral calcium varies depending on multiple factors, including the amount of elemental calcium consumed at a time, usual calcium intake, age-related life stage, and dietary factors such as intake of other minerals and vitamins,⁴ as well as fiber.²⁷ Last, the question assessing the frequency of dietary supplement use was slightly different in the 1999–2000 survey (how often supplement taken in the prior day, week or month) than in subsequent periods (how often supplement taken in the prior 30 days or month). Strengths of this study include it being a large, population-based examination of calcium supplement use, which provides trends in intake over the course of the recent calcium supplement and CVD controversy.^{7,21,22}

Herein, we have described the prevalence of U.S. adults consuming supplemental calcium UL and EAR for this mineral. This is additional to any calcium intake from food sources. While few are consuming supplemental calcium UL, consumption EAR is not uncommon, especially among older adults, women and non-Hispanic whites. Excess calcium intake may not be entirely free from unintended health consequences, such as gastrointestinal discomfort, transiently increasing serum and urinary calcium, increased risk of kidney stones and, perhaps, CVD.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- Excess calcium intake may not be entirely free from unintended health consequences.
- Supplemental calcium intake fluctuated between 1999 and 2014, increasing until 2007–2010 with subsequent decreases.
- Between 1999–2014, calcium supplement use exceeding the estimated average requirement tended to be 3–4-fold greater among women than men.
- While few are consuming supplemental calcium exceeding the tolerable upper limit, consumption exceeding the estimated average requirement was not uncommon.

Table 1

Trends in the percent of U.S. adults with mean daily supplemental calcium intake at or exceeding the Estimated Average Requirement (EAR) (95% CI): National Health and Nutrition Examination Survey (NHANES) 1999–2014

	1999–2000 N=4,551	2001–2002 N=5,035	2003–2004 N=4,759	2005–2006 N=4,598	2007–2008 N=5,842	2009–2010 N=6,114	2011–2012 N=5,476	2013–2014 N=5,663	p-quadratic trend*
Overall	2.5 (1.9, 3.3)	3.8 (3.1, 4.6)	6.7 (5.3, 8.5)	5.1 (4.4, 5.8)	6.0 (5.1, 7.1)	5.4 (4.7, 6.2)	4.4 (3.6, 5.5)	4.6 (3.8, 5.5)	<0.001
Sex									
Women	3.6 (2.7, 5.1)	6.0 (4.9, 7.3)	9.6 (7.5, 12.1)	8.0 (6.9, 9.1)	9.5 (7.8, 11.5)	8.1 (7.2, 9.2)	6.6 (5.4, 8.1)	7.1 (5.8, 8.7)	<0.001
Men	1.3 (0.9, 1.9)	1.5 (1.0, 2.1)	3.8 (2.7, 5.3)	2.1 (1.6, 2.7)	2.3 (1.8, 3.1)	2.5 (1.8, 3.4)	2.1 (1.5, 2.9)	1.9 (1.3, 2.9)	0.002
Race/Ethnicity[‡]									
Non-Hispanic Whites	3.2 (2.3, 4.4)	4.6 (3.7, 5.7)	8.5 (6.6, 10.9)	6.1 (5.2, 7.1)	7.6 (6.3, 9.3)	6.7 (5.8, 7.7)	5.4 (4.4, 6.6)	5.6 (4.6, 6.9)	<0.001
Non-Hispanic Blacks	1.4 (0.7, 2.9)	1.2 (0.6, 2.5)	1.7 (1.1, 2.6)	2.4 (1.5, 3.8)	1.9 (1.2, 3.1)	2.4 (1.5, 3.8)	2.0 (1.4, 2.8)	1.8 (1.1, 3.2)	0.20
Hispanics	0.3 (0.0, 2.2)	2.2 (1.2, 4.0)	2.9 (1.0, 8.1)	1.1 (0.1, 7.7)	3.1 (1.9, 4.9)	3.0 (2.2, 3.9)	2.0 (1.7, 5.2)	1.7 (0.7, 4.0)	0.02
Mexican Americans	1.0 (0.7, 1.4)	1.1 (0.6, 2.2)	2.1 (1.2, 3.5)	2.1 (1.5, 2.9)	1.5 (1.0, 2.3)	1.6 (1.1, 2.4)	1.0 (0.4, 2.7)	1.3 (0.9, 1.9)	0.01
Asian Americans [‡]	n/a	n/a	n/a	n/a	n/a	n/a	4.6 (2.8, 7.6)	4.6 (2.9, 7.3)	n/a
Age									
20–40y	1.5 (1.0, 2.3)	1.0 (0.5, 1.8)	2.9 (1.7, 4.9)	1.9 (1.3, 2.7)	2.6 (1.6, 4.1)	1.8 (1.3, 2.5)	2.1 (1.5, 2.9)	1.2 (0.8, 1.8)	0.007
41–50y	2.8 (1.7, 4.4)	4.8 (3.1, 7.2)	7.9 (5.1, 12.0)	6.2 (4.3, 8.9)	4.1 (2.8, 6.0)	3.2 (2.1, 4.9)	3.9 (2.5, 6.1)	4.0 (2.7, 5.9)	0.02
51–60y	3.6 (2.2, 5.9)	7.0 (5.3, 9.2)	7.6 (5.5, 10.3)	5.7 (3.8, 8.5)	8.9 (6.4, 12.3)	9.4 (6.8, 12.8)	4.6 (2.5, 8.2)	5.0 (3.3, 7.6)	0.001
61–70y	3.7 (2.4, 5.6)	5.9 (4.2, 8.3)	13.4 (10.5, 16.9)	10.1 (7.5, 13.4)	12.1 (8.4, 17.2)	10.7 (7.8, 14.4)	9.0 (6.2, 12.9)	10.4 (7.6, 13.9)	0.002
>70y	3.5 (1.9, 6.4)	6.0 (4.4, 8.3)	10.5 (8.1, 12.1)	8.1 (6.9, 9.5)	10.5 (8.4, 13.0)	8.9 (7.3, 10.9)	7.5 (5.6, 10.0)	8.5 (6.7, 10.6)	<0.001

* P-value from linear regression by modeling survey period using quadratic term and as a continuous variable (year*year)

[‡] Individuals self-identified their race and whether they were of Hispanic origin (i.e. Mexican American, other Hispanic, non-Hispanic white, non-Hispanic black, other race – including multi-racial). Those who reported other race – including multi-racial are reported in the total population but not separately

[‡] Starting in 2011–12, non-Hispanic Asians were also oversampled and included as a new race/ethnicity response

Table 2

Trends among calcium-containing supplement users of mean supplemental calcium intake (mg/day) (95% CI): National Health and Nutrition Examination Survey (NHANES) 1999–2014

	1999–2000	2001–2002	2003–2004	2005–2006	2007–2008	2009–2010	2011–2012	2013–2014	p-quadratic trend [*]
Overall	N=1,510 (313, 383)	N=1,795 (336, 375)	N=2,139 (343, 418)	N=2,022 (330, 373)	N=2,285 (364, 430)	N=2,393 (358, 395)	N=1,992 (339, 390)	N=2,091 (342, 377)	<0.001
Sex									
Women	417 (375, 460)	448 (424, 472)	466 (419, 513)	450 (422, 477)	503 (445, 561)	478 (453, 504)	442 (412, 473)	461 (428, 495)	0.04
Men	252 (219, 286)	221 (198, 244)	275 (241, 309)	225 (203, 247)	251 (222, 280)	248 (222, 274)	257 (231, 283)	235 (221, 249)	0.69
Race/Ethnicity[†]									
Non-Hispanic Whites	364 (324, 405)	373 (352, 394)	403 (359, 447)	366 (338, 394)	417 (376, 457)	396 (374, 417)	377 (346, 409)	375 (355, 394)	0.08
Non-Hispanic Blacks	273 (212, 334)	248 (210, 287)	266 (218, 314)	285 (225, 344)	295 (241, 349)	339 (284, 393)	307 (266, 348)	304 (257, 351)	0.63
Hispanics	254 (172, 336)	335 (287, 383)	321 (235, 407)	255 (153, 358)	331 (267, 394)	312 (261, 363)	343 (275, 412)	257 (203, 310)	0.15
Mexican Americans	300 (283, 317)	247 (203, 291)	283 (250, 317)	295 (261, 328)	264 (225, 303)	277 (243, 311)	271 (212, 330)	252 (218, 286)	0.49
Asian Americans [‡]	n/a	n/a	n/a	n/a	n/a	n/a	393 (322, 465)	367 (307, 427)	n/a
Age									
20–40y	273 (228, 318)	221 (190, 252)	251 (222, 281)	220 (190, 251)	261 (209, 314)	231 (213, 250)	248 (228, 269)	223 (197, 249)	0.69
41–50y	354 (307, 401)	351 (283, 419)	374 (296, 453)	326 (266, 386)	296 (242, 350)	280 (225, 336)	327 (268, 386)	298 (255, 341)	0.60
51–60y	370 (333, 408)	483 (434, 531)	390 (344, 436)	395 (325, 464)	482 (418, 546)	502 (430, 574)	351 (282, 421)	375 (328, 421)	0.007
61–70y	454 (378, 530)	424 (393, 454)	524 (451, 597)	521 (437, 605)	555 (468, 642)	497 (436, 558)	494 (416, 571)	495 (430, 560)	0.07
>70y	399 (348, 449)	438 (388, 487)	532 (485, 580)	487 (440, 533)	533 (470, 596)	493 (443, 541)	506 (458, 555)	498 (471, 526)	0.003

* P-value from linear regression by modeling survey period using quadratic term and as a continuous variable (year*year)

[†] Individuals self-identified their race and whether they were of Hispanic origin (i.e. Mexican American, other Hispanic, non-Hispanic white, non-Hispanic black, other race – including multi-racial). Those who reported other race – including multi-racial are reported in the total population but not separately

Starting in 2011–12, non-Hispanic Asians were also oversampled and included as a new race/ethnicity response[‡]

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Table 3

Trends among calcium-containing supplement users in the percent of U.S. adult with mean daily supplemental calcium intake at or exceeding the Tolerable Upper Intake Level (UL) (95% CI): National Health and Nutrition Examination Survey (NHANES) 1999–2014^{*}

	1999–2000 N=1,510	2001–2002 N=1,795	2003–2004 N=2,139	2005–2006 N=2,022	2007–2008 N=2,285	2009–2010 N=2,393	2011–2012 N=1,992	2013–2014 N=2,091	p-quadratic trend [†]
Overall	0.3 (0.1, 0.9)	0.6 (0.4, 1.0)	0.7 (0.4, 1.0)	1.1 (0.7, 1.9)	1.2 (0.7, 2.0)	1.1 (0.7, 1.6)	0.3 (0.1, 0.8)	0.4 (0.2, 0.8)	<0.001
Sex									
Women	0.3 (0.1, 1.6)	0.8 (0.4, 1.5)	0.6 (0.4, 1.1)	1.4 (0.7, 2.6)	1.5 (0.9, 2.7)	1.2 (0.7, 2.1)	0.4 (0.1, 1.4)	0.6 (0.3, 1.5)	0.007
Men	0.2 (0.0, 1.3)	0.2 (0.1, 1.0)	0.7 (0.3, 1.6)	0.8 (0.3, 2.0)	0.7 (0.3, 1.5)	0.9 (0.4, 1.9)	0.1 (0.0, 0.5)	0.0 (0.0, 0.3)	0.001
Race/ethnicity[‡]									
Non-Hispanic Whites	0.3 (0.1, 1.1)	0.7 (0.4, 1.2)	0.7 (0.4, 1.2)	1.3 (0.8, 2.3)	1.3 (0.7, 2.3)	1.2 (0.8, 1.8)	0.4 (0.1, 1.0)	0.4 (0.2, 1.0)	<0.001
Non-Hispanic Blacks	n/a	n/a	1.3 (0.3, 5.1)	0.6 (0.2, 2.1)	1.1 (0.3, 3.7)	1.6 (0.7, 3.7)	0.2 (0.0, 1.5)	n/a	n/a
Hispanics	n/a	n/a	0.6 (0.1, 4.2)	n/a	0.2 (0.0, 1.6)	0.6 (0.2, 2.4)	n/a	n/a	n/a
Mexican Americans	0.1 (0.0, 0.6)	n/a	0.4 (0.1, 3.0)	n/a	n/a	0.1 (0.0, 0.08)	n/a	n/a	n/a
Asian Americans [§]	n/a	n/a	n/a	n/a	n/a	n/a	0.3 (0.0, 2.1)	0.6 (0.1, 4.2)	n/a
Age									
20–40y	n/a	n/a	n/a	0.4 (0.1, 1.4)	0.4 (0.1, 2.6)	0.3 (0.1, 1.5)	0.2 (0.0, 0.8)	0.1 (0.0, 0.5)	n/a
41–50y	0.7 (0.1, 5.3)	0.7 (0.1, 3.4)	0.4 (0.1, 3.1)	0.8 (0.2, 3.5)	0.3 (0.1, 1.2)	0.4 (0.1, 2.9)	n/a	0.7 (0.2, 2.5)	n/a
51–60y	n/a	1.4 (0.6, 3.2)	1.5 (0.6, 3.4)	1.6 (0.5, 4.7)	1.7 (0.7, 4.0)	2.4 (1.2, 4.7)	0.2 (0.0, 1.3)	0.5 (0.1, 3.5)	n/a
61–70y	1.0 (0.3, 4.1)	n/a	0.5 (0.1, 2.8)	2.9 (1.6, 5.2)	1.9 (0.9, 3.9)	2.3 (1.1, 4.9)	0.8 (0.1, 5.3)	0.3 (0.0, 2.4)	n/a
>70y	n/a	1.1 (0.6, 2.2)	1.6 (1.2, 2.2)	1.4 (0.6, 3.4)	2.6 (1.5, 4.5)	0.5 (0.1, 1.9)	0.5 (0.1, 1.9)	0.4 (0.1, 1.5)	n/a

^{*} ‘0’ corresponds to cells with no observations during survey period.

[†] P-value from linear regression by modeling survey period using quadratic term and as a continuous variable (year*year).

[‡] Individuals self-identified their race and whether they were of Hispanic ethnicity. Those who reported other race – including multi-racial – are reported in the total population but not separately.

[§] Not applicable (n/a): Oversampling and inclusion of the racial/ethnic group response “Non-Hispanic Asians” began in the 2011–12 cycle. Trend tests were not applicable (n/a) when intake was ‘0’ in any survey period.