



Published in final edited form as:

Thyroid. 2019 January ; 29(1): 153–154. doi:10.1089/thy.2018.0345.

Iodine Status of Pregnant Women and Women of Reproductive Age in the United States

Cria G. Perrine^{1,2}, Kirsten A. Herrick³, Priya M. Gupta¹, Kathleen L. Caldwell⁴

¹Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion ²U.S. Public Health Service Commissioned Corps., Rockland, Maryland ³Division of Health and Nutrition Examination Surveys, National Center for Health Statistics, Centers for Disease Control and Prevention, Hyattsville, Maryland ⁴Division of Laboratory Sciences, National Center for Environmental Health; Centers for Disease Control and Prevention, Atlanta, Georgia

Dear Editor:

In the United States, the iodine status of populations is determined from the median urinary iodine concentration (UIC) of spot urine samples collected in the National Health and Nutrition Examination Survey (NHANES). Because of the critical role of iodine in fetal growth and development, pregnant women and women who may enter pregnancy are key groups for ensuring adequate iodine nutrition (1). The World Health Organization (WHO) categorizes population median UIC <150 $\mu\text{g/L}$ and <100 $\mu\text{g/L}$ as iodine insufficiency for pregnant and nonpregnant women, respectively (1). In NHANES 2001–2006, the median UIC was 153 $\mu\text{g/L}$ [confidence interval (CI) 105–196] for pregnant women and 130 $\mu\text{g/L}$ [CI 117–140] for nonpregnant women (2). In NHANES 2005–2010, these estimates were 129 $\mu\text{g/L}$ [CI 101–173] and 129 $\mu\text{g/L}$ [CI 119–136], respectively (3). We used NHANES 2007–2014 data to provide an update of the iodine status of pregnant and nonpregnant women, aged 15–44 years, in the United States.

In NHANES, UIC is usually measured on one-third of participants 6 years. However, in 2007–2008, UIC was assessed for all eligible participants. Without oversampling of pregnant women, which ceased with the 2005–2006 cycle, the number of pregnant women in NHANES is small, roughly 17–20 per survey cycle in the one-third urine sample. To increase sample size, we analyzed the stored urine samples from pregnant women in the two-thirds sample not originally selected for a UIC measurement in NHANES 2009–2010 and 2011–2012 (4). The 2013–2014 UIC data had not been released at the time the stored urine samples from prior cycles were requested and analyzed. Thus, only the one-third sample was included in this analysis. To produce nationally representative estimates for 2007–2014, first we calculated new weights for all women in 2009–2010 and 2011–2012, thus creating weights for pregnant women in the two-thirds sample who were not originally

Address correspondence to: Cria G. Perrine, PhD, 4770 Buford Hwy NE, Mailstop F-77, Atlanta, GA 30341, cperrine@cdc.gov.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

selected for UIC measurement. We used SUDAAN's WTAD-JUST procedure and the mobile exam center (MEC) weights to create new weights, accounting for the unequal probability of selection between pregnant and nonpregnant women adjusting for age and race/ethnicity and Hispanic origin. The analysis used MEC weights for 2007–2008, the new weights for 2009–2010 and 2011–2012 described above, and urine sample weights for 2013–2014, which were scaled across the eight years. Our final sample included 223 pregnant and 2918 nonpregnant women from NHANES 2007–2014.

Among this nationally representative sample, median UIC was 144 $\mu\text{g/L}$ [CI 120–190] among pregnant women and 119 $\mu\text{g/L}$ [95% CI 111–127] among nonpregnant women. The distribution of UIC among nonpregnant women is shown in Table 1; the sample size for pregnant women is too small to categorize the distribution.

These data indicate that the iodine status of pregnant women in the United States remains slightly below the WHO cutoff for adequacy and that the status of nonpregnant women is adequate. These findings highlight the importance of continuing to monitor the iodine status of pregnant women and women who may become pregnant. While NHANES is useful for monitoring the iodine status of nonpregnant women, our ability to monitor the iodine status among pregnant women in the United States using NHANES is limited. The number of pregnant women with UIC data in each survey cycle is small, requiring several survey cycles to be combined to obtain an overall estimate, and we are unable to examine status by other characteristics.

References

1. World Health Organization. Urinary iodine concentrations for determining iodine status deficiency in populations. Available at: http://apps.who.int/iris/bitstream/handle/10665/85972/WHO_NMH_NHD_EPG_13.1_eng.pdf (accessed December 4, 2018).
2. Perrine CG, Herrick K, Serdula MK, Sullivan KM 2010 Some subgroups of reproductive age women in the United States may be at risk for iodine deficiency. *J Nutr* 140:1489–1494. [PubMed: 20554903]
3. Caldwell KL, Pan Y, Mortensen ME, Makhmudov A, Merrill L, Moyer J 2013 Iodine status in pregnant women in the National Children's Study and in U.S. women (15–44 years), National Health and Nutrition Examination Survey 2005–2010. *Thyroid* 23:927–937. [PubMed: 23488982]
4. National Center for Health Statistics. 2009–2012 Data documentation, codebook, and frequencies: iodine—urine—pregnant women (surplus) (SSUIFG_R). Available at: https://wwwn.cdc.gov/Nchs/Nhanes/limited_access/SSUIFG_R.htm (accessed June 10, 2018).

Table 1.

Distribution of Urinary Iodine Concentration Among Nonpregnant Women 15–44 Years, NHANES 2007–2014 ($N=2918$)

UIC (µg/L)	%	CI
<50	17.7	[15.3–20.3]
50–99	24.6	[22.5–26.8]
100–199	30.6	[28.3–33.1]
200	27.1	[24.7–29.6]

Weighted estimates are the percent [CI] of nonpregnant women categorized by spot UIC ($\mu\text{g/L}$).

NHANES, National Health and Nutrition Examination Survey; UIC, urinary iodine concentration; CI, confidence interval.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript