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Mean Serum Magnesium and Prevalence of CLMD in U.S. Adults >19 years.

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Purpose: A recent scoping review employing the Magnesium Depletion Score (MDS) documented the high prevalence of magnesium deficiency in the US population over multiple NHANES survey cycles.

We used cross-sectional data from nonpregnant and nonlactating civilian participants in the 2021–2023 NHANES data cycles to estimate the prevalence of chronic latent magnesium deficiency (CLMD) in the adult population. Current literature suggests the risk of CLMD increases with serum magnesium levels <2.06 mg/dL; <0.85 mmol/L.

Materials and Methods: Presented are analyses categorized U.S. adults (≥19 y) by sex, age, and metabolic health status (total population, metabolically healthy, hypertension, diabetes, and chronic kidney disease [CKD]). Metabolically healthy adults were defined as participants who had optimal levels of all metabolic syndrome risk factor variables and were not taking any medications related to these conditions. Linear regression models were used to compare subgroups, and sensitivity analyses were conducted to assess robustness of primary findings. The final analytic sample included 5474 adults aged 19+years.

Results: The serum magnesium reference interval based on metabolically healthy participants was 1.7-2.3 mg/dL (0.7-0.95 mmol/L).

g/dL (0.7-0.95 mmol/L).

Women (n=2973)		Serum Magnesium (mg/dL)		
	2.5 th Percentile	Mean	97.5 Percentile	% CLMD (<2.06 mg/dL)
All Women	1.53	1.96	2.23	69.8
Metabolically Healthy	1.70	1.98	2.21	69.8
Diabetes	1.29	1.86	2.24	80.9
Hypertension	1.46	1.94	2.23	70.2
CKD	1.33	1.91	2.28	72.4

Men (n=2501)		Serum Magnesium (mg/dL)		
	2.5 th Percentile	Mean	97.5 Percentile	% CLMD (<2.06 mg/dL)
All Men	1.58	1.98	2.27	65.8
Metabolically Healthy	1.72	2.01	2.26	65.8
Diabetes	1.39	1.91	2.28	75.9
Hypertension	1.52	1.97	2.27	66.9
CKD	1.38	1.94	2.27	69.6

Conclusion: In this first estimate of a population-based prevalence of CLMD in U.S. adults, two-thirds of the population would be classified as having CLMD. This contemporary NHANES data highlight that a significant percentage of "healthy" adults are at risk for developing a chronic disease.

Biographical sketch:

Rebecca Costello, Ph.D., FACN, is a Senior Research Fellow with CMER Center for Magnesium Education and Research as well as an independent consultant. At CMER, she helped file an FDA Qualified Health Claim petition for magnesium and hypertension, helped to develop and pilot an electronic magnesium intake questionnaire (MagQuest) to assess the risk of magnesium deficiency, and has authored a number of publications and book chapters. She retired from the NIH Office of Dietary Supplements in September 2011 after 13 years of federal service where she served in various capacities as a Program Officer and as Director of Grants and Extramural Activities. She continued with ODS as a consultant until 2025. Dr. Costello also has an adjunct appointment in the Department of Military and Emergency Medicine at the Uniformed Services University in Bethesda, MD. She holds a Master's degree in Biology from American University and a Ph.D. in Clinical Nutrition from the University of Maryland. She is a Fellow of the American Society of Nutrition.