

Dietary Reference Intakes: Applications in Dietary Assessment

Since 1994, the Institute of Medicine's Food and Nutrition Board has been involved in developing an expanded approach to developing dietary reference standards. This approach, the Dietary Reference Intakes (DRIs) provides a set of four nutrient-based reference values designed to replace the Recommended Dietary Allowances (RDAs) in the United States, and the Recommended Nutrient Intakes (RNIs) in Canada. These reference values include Estimated Average Requirement (EAR), Recommended Dietary Intake (RDA), Adequate Intake (AI), and Tolerable Upper Intake Level (UL). In early 1998, the Institute of Medicine appointed an expert subcommittee of the Standing Committee on dietary Reference Intakes to develop the statistical underpinnings and guidance necessary for the appropriate uses of the new DRIs

This report provides guidance to nutrition and health research professionals on the application of the new DRIs in assessment of diets of individuals and groups. Throughout the report, a clear distinction is made between assessing individuals, and assessing groups as the approaches used are quite different.

The report represents both a "how to" manual, and a "why" manual. Specific examples of both appropriate and inappropriate uses of the DRIs in assessing nutrient adequacy of groups and of individuals are provided along with the detailed statistical approaches for the methods described. A quantitative method is proposed for assessment of an individual's observed intake. Inferences about the adequacy of an individual's diet can be made by examining the difference between observed intake and the EAR of the appropriate life stage, and gender group. A statistical approach has been developed to decide, with a predetermined level of confidence, whether an individual's intake is adequate. For dietary assessment of groups, a critically important public health application, a shortened version of the probability approach called the EAR cut-point method is presented and evaluated. The EAR cut-point method is adopted as the preferred outcome measure used to assess prevalence of inadequate nutrient intake. This method is the percentage of the group with usual intake less than the EAR.

Summary of Key Recommendations

For Dietary Assessment of Individuals

- For nutrients with an EAR and RDA, use the EAR of the appropriate life stage and gender group to assess the likelihood of inadequacy for the individual.
- For nutrients with an Adequate Intake (AI), usual intake determined to be at or above the AI can be assessed as adequate. Intakes below the AI cannot be assessed.
- For nutrients with a Tolerable Upper Intake Level (UL), usual intake above this level places an individual at potential risk of adverse effects.

For Dietary Assessment of Groups

- Adjust intake distributions for within individual variation.
- Use the EAR to estimate the prevalence of inadequate intakes.
- For nutrients with an AI, mean intakes at or above this level implies a low prevalence of inadequate intakes. Mean intakes below the AI cannot be assessed.
- For nutrients with a UL, use the UL as a cut-point to estimate the percentage of the group at potential risk of adverse effects.

Needed Research

- Improve Estimates of Requirements, e.g. estimates of requirement distributions; replacement of existing AIs with EARs and RDAs; development of ULs for all nutrients; and estimates of risk curves for the ULs
- Improve Dietary Data, e.g. update food composition databases to reflect nutrient forms and units specified by the DRIs, and current nutrient fortification levels; find better ways to quantify usual supplement intake; reduce bias in intake reporting.
- Improve Statistical Methods, e.g. more accurate estimates of within-person variation in intake; methods to determine standard errors of prevalence estimates; thorough evaluation of the performance of the EAR cut-point method.

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Constitution Avenue, N.W., Box 285, Washington, DC 20055; call (800) 624-6242 or (202) 334-3313 (in the Washington
metropolitan area), or visit the NAP's on-line bookstore at www.nap.edu.

For more information about the Institute of Medicine, visit the IOM home page at www.iom.edu. The full text of *Dietary Reference
Intakes: Applications in Dietary Assessment* is available on line at www.nap.edu/readingroom.

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