Development of a Supplement Composition Database for the SURE Study

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Overview

- The SURE Study
- The Cancer Research Center of Hawaii’s dietary supplement database
- Creating a dietary supplement database for the SURE Study
The SUpplement REporting Study (SURE Study)
The SURE Study

- Goal is to quantify measurement errors in reporting dietary supplement use
- Funded by grant # R01 CA 106744
  - NIH/National Cancer Institute
  - NIH/Office of Dietary Supplements
The SURE Study Sample

- Drawn from supplement users in the Hawaii-Los Angeles Multi-Ethnic Cohort (MEC)
- Men and women, aged 53-87
- Taking at least one dietary supplement a week (FDA definition)
SURE Study Sample

- Mean age 68 ± 7 years
- 6 ethnic groups
  - African American (18%)
  - Caucasian (19%)
  - Japanese American (17%)
  - Latino - US born (18%)
  - Latino - Non-US born (13%)
  - Native Hawaiian (15%)
SURE Study Methods

- “Control” group filled out a short self-administered supplement frequency questionnaire (SFQ) at the beginning and end of one year
- 689 participants returned the 1st qx (59%)
- 640 participants returned the 2nd qx (93%)
SURE Study Methods

- “Inventory” group asked to complete 5 home visits
  - Participants saved empty containers; recorded new purchases; recorded use by others; filled out different forms
  - Conducted quarterly inventory of supplements
- 401 participants completed the study (34% of total contacted)
SURE Study Methods

- 3 other methods were used to collect supplement information from the inventory group:
  - SFQ
  - Recall of supplement use
  - Daily diary
# SURE Study Methods

## Inventory Group Data Collection Schedule

<table>
<thead>
<tr>
<th>Activity</th>
<th>Visit 1</th>
<th>Visit 2</th>
<th>Visit 3</th>
<th>Visit 4</th>
<th>Visit 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFQ (past year)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>SFQ (past 3 mo)</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recall (24 hr)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Recall (2 wk or 1 mo)</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Daily Diary (2 wk or 1 mo)</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inventory</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
SURE Study Methods

- All SURE Study methods rely on a dietary supplement database to estimate nutrient and other component intakes
Cancer Research Center of Hawaii’s Dietary Supplement Database
Cancer Research Center of Hawaii’s Dietary Supplement Database

- Currently houses 6700+ supplements
  - 2880 multivitamin with minerals products
  - 1222 defaults
  - 545 multivitamin products
  - 307 multiminerals products
  - 726 single nutrient/component products
  - 884 non-vitamin, non-mineral products
  - 142 generic supplement codes

- 1425 discontinued supplements
Cancer Research Center of Hawaii’s Dietary Supplement Database

- Up to 1000 components
  - Examples:
    - 12 different entries for ginseng
    - Goji fruit, watermelon fruit extract, green tea powder, pumpkin seed oil

- Components entered as listed on the label
Supplement Data Sources

- Supplement facts label
- Internet
- Manufacturers/distributors
- PDR/catalogs
Dietary Supplement Database for the SURE Study
Dietary Supplement Database for the SURE Study

- Subset of the CRCH database
- Over 1800 different supplements reported (27% of the CRCH database)
- 262 default codes created specifically for SURE
SURE Study Defaults

- Default codes were developed to assign nutrients/components to supplements with insufficient information
- Defaults were linked to appropriate supplements based on description
- Nutrient values calculated using a weighted average of the most commonly reported supplements
SURE Study Defaults

## SURE Study Defaults

<table>
<thead>
<tr>
<th>Default Type</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product default</td>
<td>Default glucosamine</td>
</tr>
<tr>
<td></td>
<td>Default multivitamin</td>
</tr>
<tr>
<td></td>
<td>Default vitamin E</td>
</tr>
<tr>
<td>Manufacturer/brand default</td>
<td>Longs default</td>
</tr>
<tr>
<td></td>
<td>Nature Made default</td>
</tr>
<tr>
<td></td>
<td>Target default</td>
</tr>
<tr>
<td>Combination manufacturer/brand and product default</td>
<td>Bayer Corporation default One-A-Day</td>
</tr>
<tr>
<td></td>
<td>Rexall default Osteo Bi-Flex</td>
</tr>
<tr>
<td></td>
<td>Safeway Select Default One Tablet Daily</td>
</tr>
</tbody>
</table>
SURE Study Defaults

- Example:
  Safeway Select Default One Tablet Daily
Most Commonly Reported Supplements by Inventory Participants

- **Multivitamin/Multimineral Combinations**
  - Centrum Silver (22%)
  - Kirkland Signature Daily Multi (12%)
  - Kirkland Signature Mature Adults Daily Multi (8%)

- **Single Vitamins or Minerals**
  - Vitamin E 400 IU (28%)
  - Vitamin C 500 mg (22%)
  - Vitamin B-12 500 mcg (9%)

- **Herbals/Non-nutrient Supplements**
  - Fish Oil 1000 mg (20%)
  - Kirkland Signature Glucosamine Chondroitin (6%)
  - Flaxseed Oil 1000 mg (6%)
## Most Commonly Reported Supplement Types on the SFQ*

<table>
<thead>
<tr>
<th>Supplement</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi</td>
<td>78%</td>
<td>73%</td>
</tr>
<tr>
<td>Calcium</td>
<td>37%</td>
<td>72%</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>44%</td>
<td>41%</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>40%</td>
<td>37%</td>
</tr>
<tr>
<td>Fish oil/ ω3</td>
<td>26%</td>
<td>26%</td>
</tr>
</tbody>
</table>

*among 1109 supplement users in the SURE Study*
## Least Commonly Reported Supplement Types on the SFQ*

<table>
<thead>
<tr>
<th>Supplement</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>13%</td>
<td>9%</td>
</tr>
<tr>
<td>β-carotene</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Iron</td>
<td>7%</td>
<td>9%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Selenium</td>
<td>10%</td>
<td>6%</td>
</tr>
</tbody>
</table>

*among 1109 supplement users in the SURE Study*
Supplements Reported by SURE Participants

- Some of the more unique supplements reported include:
  - Body Mint® (n=13)
  - Joint Juice® (n=4)
  - Noni Fruit Leather (n=1)
Challenges

- Still dependent on labels
  - Not always available
  - Incomplete info
Challenges

- 262 default codes were created and assigned nutrients
  - Needed to distinguish between SURE defaults and those from other studies
- Our current database has exceeded the limit for new components (n=999)
  - We capture different forms of the same component (e.g. Vitamin E)
Significance

- Dietary supplement use is of increasing interest in studies of diet and health
- A comprehensive dietary supplement database is needed to accurately quantify intakes from supplements
- Future improvements include:
  - Conversion to a new combined food and supplement database
  - Incorporation of analytic values from USDA to replace data taken from supplement labels
Thank you!