Using Scanner Data for the Public Good: Monitoring and measuring the US food and nutrition landscape

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## Our Food and Nutrition Landscape

<table>
<thead>
<tr>
<th>Types of foods &amp; beverages</th>
<th>Raw &amp; Perishable</th>
<th>Packaged and processed</th>
<th>Prepared</th>
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‡ Poti & Popkin, JADA, in press
§ Ng, & Popkin, under review
## Locations of purchase and consumption

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<td>Locations of purchase</td>
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<td>Quick service, Full service, grocery stores, cafeteria (school, work)</td>
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<td>Locations of consumption</td>
<td>Home, cafeteria</td>
<td>Grocery stores, cafeteria, on-the-go, school, workplace, home</td>
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### Types of foods & beverages

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# Commercial measurement of our Food Supply

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| Food composition           |                  | USDA SR, FNDDS, MPED  
~7,500 USDA food codes  
> 60 nutrients |          |
| **Commercial data**        |                  |                        |          |
| Sales/purchase             | Household panel until 2006 only | Retail scan & household panels 600,000 UPCs | Consumer panels |
| Nutrition                  | USDA SR          | ~ 200,000 unique formulations § Limited to NFP requirements | NDS-R: >1,800 Fast Food items/meals Limited to NFP requirements |

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## Disconnect between measurements and with our Food Supply

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Why turn to scanner data?

- Other limitations of publically available intake data
  - Sample design issues (e.g., North in summer, South in winter)
  - Does not measure usual intake (typically only 2-3 day recalls)
  - Significant lag time (e.g., 2 years for NHANES)
  - Possible rapid reformulations of the food supply

- Need to enhance our ability to monitor our food and nutrition environment, in order to create effective programs and policies across the areas of agriculture, economic development, welfare and public health.
  - Added information on prices with geographical and time variations
  - Possibly link with other geo-coded data on built environment

- Research groups working with scanner data
  - Marketing & business schools
  - ERS + grantees, CDC, FDA, ARS
  - Many agricultural economics departments in US, Canada and UK
  - UNC Food Research Program
Considerations

• Representativeness
  – of total US
  – of subpopulations (esp. vulnerable subpopulations)
  – of usual intake (rather than snapshots)
  – How about selection and attrition?

• Level of detail
  – Unit of observation (individual, household, store, market, national)
  – Geography (county, state, MSA, US total)
  – Time (weekly, 4-weekly, quarterly, annual)

• Accuracy
  – Response bias / responder burden
  – Updatedness
  – Rounding

• Time to access & longevity

• Cost (will depend on above)
Commercial scanner data

• Point-of-sale store scanner data
  – Sales (volume, dollar) at the UPC level for F&B products with UPC for each week-year collected from food/grocery stores, drug stores, mass merchandisers (F/D/M) and convenience stores; includes promotion & prices; can also get calculated measures on %sales change due to any promotion, price decrease, feature and/or display
  – Nielsen Scantrack & SymphonyIRI Total Store Advantage

• Household panel scanner data
  – Panel data of household purchases at the UPC level for F&B products with UPC for each shopping occasion; includes promotion & price paid
  – Nielsen Homescan (>50,000 households per year)

• Packaged food nutrition data
  – Label information at the UPC level for F&B products including Nutrition Facts Panel data and ingredient list: Gladson Nutrition Database
  – Basic nutritional attributes at the UPC level for newly introduced F&B products: Datamonitor Product Launch Analytics and Mintel GNPD
Major concerns with commercial scanner data (*see handouts*)

- **Sales**
  - Representativeness due to retailers and venues missed
  - Costs

- **Purchase**
  - Representativeness due to AFH foods
  - Bias
  - Costs

- **Nutrition Facts Panel**
  - Updated comprehensively to capture reformulations?
  - Limited to basic nutrient information; rounded values based on Nutrition Labeling Regulations; ±20% allowance
  - Problems will propagate to related UPCs
  - Limited prior data
Current measures of US food supply, consumption, diet and nutrition intake using commercial and public datasets

- **US Food Supply**
  - Raw & Perishable Foods & Beverages
  - Packaged Foods & Beverages (UPCs)
  - Prepared Foods & Beverages
    - Scantrack, *The Nielsen Co.*
    - Total Store Advantage, *Symphony IRI*
    - Consumer Network, *Symphony IRI*
    - Consumer Report on Eating Share Trends (CREST), *NPD*

- **Individual Food Consumption**
  - National Eating Trends (NET), *NPD*
  - What We Eat in America (WWEIA) dietary component of NHANES, *DHHS & USDA*

- **Diet & Nutrition (calories, quality)**
  - Nutrition Facts Panel Data*
    - (e.g., Gladson e-Commerce, Datamonitor, Mintel)
  - Standard Reference
    - Food and Nutrition Database for Dietary Studies (FNDDS)
    - *USDA*
  - Nutrition Data System for Research (NDSR), *University of MN*

*see Handouts for more details on UPC level data*

Legend:
- UPC level data
- Food as Reported level data
- Commercial
Using commercial data in conjunction with public data
Linking scanner sales/purchase with nutrition facts panel data

- Complex task
- 90% match in dollar and volume sales on average
- Ongoing with each additional year of sales, purchase & nutrition data
- After 2010, nutrient changes captured better

Scantrack *sales*
Homescan *purchases*

~400,000 UPCs /year

By UPC

Gladson + PLA nutrition

2007 Gladson: 140,000 UPCs
2010 Gladson: 170,000 UPCs
2009 PLA: added 2,500 UPCs
How to estimate proportion of reported calories from product groups

Scantrack *sales*
Homescan *purchases*

Food Grouping system
- 42 food groups
- 21 beverage groups
- 134 Nutrient-based subgroups

• Allows for comparisons of calorie changes *sold* and *purchased* as compared to reported *consumed*
• Allows us to apply *market share* from sales and purchase data to consumption data

NHANES *consumption*

By UPC

Gladson + PLA nutrition

By USDA Food code

USDA food composition

Legend
- UPC level data
- Food as Reported level data
- Commercial

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How to capture product reformulations, introductions in NHANES

- Scantrack sales
- Homescan purchases

**UPC to USDA Food Code Bridge**

- Allows us to apply nutrition data from commercial sources to update USDA food composition data.
- Allows NHANES consumption to be more representative of changing food supply.

**Legend**
- UPC level data
- Food as Reported level data
- Commercial

- USDA food composition
- NHANES consumption
- Gladson + PLA nutrition
- By UPC
- By USDA Food code
To maintain relevance, needs to be updated annually

Significance and application

- Cross-validations: Constructing multiple years of these datasets will allow for trend analyses to determine whether both kinds of datasets produce consistent findings.

- Improve on existing FCTs to make them more reflective of the rapidly changing food supply using information from the commercial NFP label data sources

- E.g., Gladson NFP label data includes the full ingredient list, whereas the FNDDS recipe file often does not. We used ingredients lists of 68,477 products from the 2007 and 2010 Gladson NFP label data to identify ready-to-eat cereals, bars and cookies reported in NHANES 2007/08 that contain fruit juice concentrate as an added sweetener.
How might the use of scanner data contribute to public health and welfare?

- Monitoring and measuring changes: “What gets measured, gets changed”
- Promote self-regulation by food manufacturers, retailers and food service:
  - Nutritional content of products
  - Marketing or pricing strategies
- Encourage marketing companies to collect information useful for public health research:
  - Typical clientele: food companies, retailers and service; marketing & business schools
  - Public Health is a new market and Nielsen (and perhaps others) are definitely interested
- Measure home, workplace, school food environment
- General public starting to use these (e.g., via iPhone apps)
Limitations still exist

- If using only UPC data, will miss:
  - Away-from-home foods (restaurants, cafeteria, concessions, vending)
  - Foods without UPCs (e.g., random weight items, farmer market purchases)
- Important considerations that are unknown and out of direct control of researchers:
  - Sampling frame of commercial data
  - Comprehensiveness of how updated commercial NFP data is
- Costs can be significant
  - Federal agencies should explore ways to share access to data
Thanks!

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