We see it differently:
Gaps in dietary understandings between professionals and lay people in Japan

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Outline

- **Background:** Shokuiku (food & nutrition education) and metabo (metabolic syndrome and obesity) in Japan

- **Research Design:**
  - Freelist
  - Cultural consensus analysis
  - Factor analysis

- **Results: What people think**
  - Top 3 reasons
  - Gaps between Lay people vs. Registered dietitians (RDs)

- **Conclusions and recommendations**
Circles of Shokuiku (Food & Nutrition Education)

- Broad concept
- Many connections
- Many stakeholders
Cabinet Office Guide: Behavioral Recommendations

- 2012
- Image includes:
  - 3 generations
  - Eating Japanese food
  - Together
食育（Shokuiku）& メタボ（Metabo）: Understandings of Causes

Cabinet Office: Shokuiku Promotion Experts & Staff

What they (constituents) can offer/do

Policies: Decrease skipping breakfast; increase eating together; increase awareness of where food comes from; producer-consumer links
食育（Shokuiku）& メタボ（Metabo）: Understandings of Causes

Lay People
What they would like to change but feel they can't and reasons
Lifestyle factors, constraints:
lack of time, resources
食育（Shokuiku）& メタボ（Metabo）: Understandings of Causes

Dietitians
What they have been trained to do/teach
Constituents of balanced diet

Policy Implementers
食育（Shokuiku）& メタボ (Metabo): Understandings of Causes

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Policy Makers

Policy Implementers

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Constituents of balanced diet
Trends in Metabolic Syndrome in Japan and US

PROBLEM: Increasing rates of obesity and metabolic syndrome in Japan

- Cluster of conditions that increase risk of lifestyle diseases (heart disease, stroke, diabetes)
- Complex, incompletely understood etiology
  - Obesity, insulin resistance may be cause

• Prevention
  • Goal: BMI < 25

National Heart, Lung and Blood Institute: http://www.nhlbi.nih.gov/health/health-topics/topics/ms/prevention.html
PROBLEM: ‘metabo’ (Obesity & MetS)
Definitions of Metabolic Syndrome

**U.S. ATP III**

Any 3 of the following 5 features

- Waist circumference (WC)
  - WC ≥ 102 cm in men
  - WC ≥ 88 cm in women

- Lipid
  - TG ≥ 150 mg/dL
  - HDL-C < 40 mg/dL in men
  - HDL-C < 50 mg/dL in women

- Blood pressure
  - BP ≥ 130/85 mmHg

- Glucose
  - G ≥ 110 mg/dL

**Japan**

- Must Have
  - WC ≥ 85 cm in men
  - WC ≥ 90 cm in women

- Plus any 2 of the following
  - TG ≥ 150 mg/dL and/or HDL-C < 40 mg/dL
  - BP ≥ 130/85 mmHg
  - G ≥ 110 mg/dL
‘Metabo’ Exams: Measuring Waist Circumference
CAUSES: What are they? What do people understand and know?

- Lack of energy balance (energy in > energy out)
- Inactive lifestyle
- Environment (physical, time, food - access and portion size, advertising)
- Genes and family history
- Health conditions
- Medicines
- Emotional factors (stress)
- Smoking
- Age
- Pregnancy
- Lack of sleep

National Heart, Lung and Blood Institute: http://www.nhlbi.nih.gov/health/health-topics/topics/obe/causes.html
“If you wish to help a community improve its health, you must learn to think like people of that community. Before asking that community to assume new health habits it is wise to ascertain the existing habits, how these habits are linked to one another, what functions they perform, and what they mean to those who practice them.”

Research Methods & Design

- **Compare freelist responses**
  - Frequency → cultural consensus
  - Recall order → prototypicality

- **Demographic variables**
  - Layperson vs. dietitian
  - Gender (M vs. F)
  - Age (20s-30s, 40s-50s, 60s-70s)
  - Region (Tokyo vs. Kyoto)
### Block Design (N=180)

<table>
<thead>
<tr>
<th>Region</th>
<th>RD</th>
<th>20s-30s</th>
<th>40s-50s</th>
<th>60s-70s</th>
<th>20s-30s</th>
<th>40s-50s</th>
<th>60s-70s</th>
<th>TOTAL</th>
</tr>
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<tr>
<td>Tokyo</td>
<td>30</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
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<td>10</td>
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<td>Kyoto</td>
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<td>20</td>
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</table>

<table>
<thead>
<tr>
<th>Lay</th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD</td>
<td>60 freelist responses</td>
<td>1006 freelist responses</td>
</tr>
<tr>
<td>Females</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Males</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>
Methods: Coding

- 2 independent coders (MM and YI) coded all responses with own codebooks (each conducted about 1/3 of interviews)
  - MM: American female anthropologist
  - YI: Japanese male dietitian
- Codebooks compared, merged, all responses re-coded
- Inter-rater reliability 93.9% on main code level
- Discrepancies were discussed until consensus reached → 99.3% inter-rater agreement. Third coder decided 20 codes, for which consensus could not be reached.
Results

- What did people say?
- What do they think?
- How do lay people and RDs differ?
Pathways to Obesity and Metabolism

Diet (E in) = Exercise (E out)

Work-Life Balance

Info/Media/Knowledge

Behavior

Environment

Physical Space

Environmental Factors

Fast Food
24-hr access

Tobacco
Lack of Sleep
Overwork

Stress
Drinking

Skip Breakfast

Food Choices

Balanced Equation

Genes

Biology

Electronic Lifestyle
Transport (cars)

Work-Life Balance

Fatigue

Std of Living

Environment

Physical Space

Electronic Lifestyle
Transport (cars)
Number of Responses: Lay vs RDs

How ‘expert’ are they?

RDs give more reasons

P<0.001 Mann-Whitney (non-parametric)
All RDs are not equal

Lay people look more like hospital RDs and school and admin RDs

Other RDs (workplace metabo exams): higher responses

P=0.001 Mann-Whitney (non-parametric)
Number of Responses: Lay vs RDs

- Greater # responses and ...
- Greater # of main codes: (P<0.001, Mann-Whitney)
  - Lay: 3.78 ± 1.486 (mean ± SD, range 1-9)
  - RDs: 4.78 ± 1.617 (mean ± SD, range 1-9)

- More detailed/exhaustive knowledge
- Broader understanding
Number of Responses: Significant Differences between Lay vs RDs

- **P < 0.01**
- * P < 0.05
### Results: Factor Analysis (Lay Population)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Components</th>
<th>Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tobacco/Biology/Nut Content</td>
<td>Tobacco</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>Biology</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>Nut content/balance</td>
<td>0.60</td>
</tr>
<tr>
<td>2. Medicalization/Info/Media/Food Env</td>
<td>Medicalization</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>Info/media</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>Food environment</td>
<td>0.63</td>
</tr>
<tr>
<td>3. Dietary Change/Education</td>
<td>Dietary change</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>0.75</td>
</tr>
<tr>
<td>4. Lack of interest/Knowledge</td>
<td>Lack of interest</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>Lack of knowledge</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>Lack of exercise</td>
<td>-0.38</td>
</tr>
<tr>
<td>5. Cooking behavior</td>
<td>Cooking behavior</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>Social eating environment</td>
<td>0.42</td>
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<tr>
<td></td>
<td>Economics</td>
<td>-0.41</td>
</tr>
<tr>
<td>6. Lack of Work-life balance</td>
<td>Lack of work-life balance</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>Living standard</td>
<td>-0.61</td>
</tr>
<tr>
<td></td>
<td>Economics</td>
<td>0.46</td>
</tr>
<tr>
<td>7. Eating behavior</td>
<td>Eating behavior</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>Social eating environment</td>
<td>-0.59</td>
</tr>
<tr>
<td>8. Stress</td>
<td>Stress</td>
<td>0.85</td>
</tr>
<tr>
<td></td>
<td>Societal changes</td>
<td>-0.40</td>
</tr>
</tbody>
</table>
## Results: Factor Analysis (Males vs Females)

### Males

1. Lack of exercise/Nut content
   - Lack of exercise: 0.729
   - Lack of interest: -0.693
   - Nut content/balance: 0.631

2. Social Eating/Cooking behavior
   - Social eating environment: 0.799
   - Cooking behavior: 0.700
   - Societal changes: 0.452

3. Medicalization
   - Medicalization: 0.827
   - Info/media: 0.628
   - Food environment: 0.615

4. Education/Dietary change
   - Education: 0.827
   - Dietary change: 0.773

5. Eating behavior
   - Eating behavior: 0.886
   - Info/media: 0.554

6. Lack of knowledge/WLB
   - Lack of knowledge: 0.672
     - Living standard: -0.626
     - Lack of work-life balance: 0.602

7. Biology
   - Economics: -0.670
     - Biology: 0.665

8. Stress
   - Stress: 0.835

### Females

1. Tobacco and Biology
   - Tobacco: 0.792
   - Biology: 0.684
   - Nut content/balance: 0.637

2. Lack of knowledge
   - Lack of knowledge: 0.828
     - Social eating environment: 0.793
     - Food environment: 0.721

3. Info/media
   - Info/media: 0.729
   - Medicalization: 0.495
   - Eating behavior: 0.654
   - Medicalization: 0.460

4. Dietary change/Education
   - Dietary change: 0.782
     - Education: 0.652

5. Living standard
   - Living standard: 0.780
     - Cooking behavior: 0.568
     - Lack of exercise: 0.481

6. Social eating behavior/WLB
   - Social eating environment: 0.793
     - Lack of work-life balance: 0.770

7. Stress
   - Stress: 0.796
     - Medicalization: 0.417
     - Lack of interest: -0.408

8. Economics
   - Economics: 0.899
### Results: Factor Analysis (RDs)

<table>
<thead>
<tr>
<th>Factor Analysis</th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Economics/Dietary Change/ Societal Changes</strong></td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td>0.737</td>
</tr>
<tr>
<td>Dietary change</td>
<td>0.676</td>
</tr>
<tr>
<td>Societal changes</td>
<td>0.645</td>
</tr>
<tr>
<td><strong>2. Food Env</strong></td>
<td></td>
</tr>
<tr>
<td>Nut content/balance</td>
<td>-0.748</td>
</tr>
<tr>
<td>Food environment</td>
<td>0.713</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>0.532</td>
</tr>
<tr>
<td>Education</td>
<td>0.448</td>
</tr>
<tr>
<td><strong>3. Lack of WLB/Tobacco</strong></td>
<td></td>
</tr>
<tr>
<td>Lack of work-life balance</td>
<td>0.829</td>
</tr>
<tr>
<td>Tobacco</td>
<td>0.792</td>
</tr>
<tr>
<td>Info/media</td>
<td>-0.404</td>
</tr>
<tr>
<td><strong>4. Stress</strong></td>
<td></td>
</tr>
<tr>
<td>Cooking behavior</td>
<td>-0.886</td>
</tr>
<tr>
<td>Stress</td>
<td>0.504</td>
</tr>
<tr>
<td><strong>5. Social Eating Env/ Eating Behavior</strong></td>
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<tr>
<td>Social eating environment</td>
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<tr>
<td>Eating behavior</td>
<td>0.824</td>
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<tr>
<td><strong>6. Biology/Lack of Exercise</strong></td>
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<tr>
<td>Biology</td>
<td>0.693</td>
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<tr>
<td>Lack of exercise</td>
<td>0.664</td>
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<tr>
<td>Lack of interest</td>
<td>-0.436</td>
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<tr>
<td><strong>7. Lack of Interest</strong></td>
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</tr>
<tr>
<td>Living standard</td>
<td>-0.858</td>
</tr>
<tr>
<td>Lack of interest</td>
<td>0.467</td>
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<tr>
<td><strong>8. Medicalization/Info/Media</strong></td>
<td></td>
</tr>
<tr>
<td>Medicalization</td>
<td>0.779</td>
</tr>
<tr>
<td>Info/media</td>
<td>0.551</td>
</tr>
<tr>
<td>Stress</td>
<td>-0.489</td>
</tr>
</tbody>
</table>
Pathways to Metabo

Diet (E in) = Exercise (E out)

Behavior

Overwork
Lack of Sleep
Stress
Tobacco
Drinking

Fatigue
Work-Life Balance

Info/Media/Knowledge

Environment
Fast Food
24-hr access
Physical Space
Electronic lifestyle
Transport (cars)

Biology (genes)

Balanced Equation

Environment

Work-Life Balance

Balanced

Tobacco
Drinking

Stress

Lack of Sleep

Overwork

Fast Food
24-hr access

Physical Space
Electronic lifestyle
Transport (cars)
Factor Analysis Implications: Anthropological Insights

### Lay person education
- Exercise (females)
- Tobacco (males)
- Work-life balance (policies and programs) for everyone

### RD training & education
- Lay vs. RD: no significant difference in WLB response frequency → suggest that dietitians are not more ‘expert’ in this important area.
- Training in social determinants of health and obesity/MetS (focus on WLB: time, access) → increase the effectiveness of RDs
Challenge: To create policies that support better work-life balance (time, family schedules, gender division of labor) so they have **time** to implement nutrition advice and achieve dietary ideals.

- Don’t eat after 8pm.
- Eat breakfast & dinner on time.
- Make breakfast yourself.
Possible Solutions

- Effective Shokuiku requires cultural changes that allow people to achieve dietary ideals
- Politicians and CEOs could leave work at reasonable times or tele-commute, to enable people to cook and eat together
  - Model of “Cool Biz”: not wearing suits in summer to save energy on cooling costs and reduce CO₂, supported by government & companies

PM Abe: Super Cool Biz 2013
Effective Public Health Nutrition Program

Prime Minister Abe

Akio Toyoda, CEO of Toyota
Thank You

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  - National Institute of Health and Nutrition
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  - UD Institute for Global Studies
  - UD College of Arts and Sciences
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