Interfacing Technology and Adolescent Women Nutrition: Occupational Determinants and Local Solutions

Thai Nguyen, January 22, 2022
Adolescence is an especially vulnerable time during the life cycle because:

- They experience rapid physical and psychosocial development
- They have the highest nutrient requirements
- They are starting to solidify their food preferences and define their dietary patterns, which often carry through adulthood.

Diet is closely related to the growing burden of non-communicable diseases (NCDs) and its consequences.

Adolescents are an ideal target group to improve diets before NCDs are a problem and create healthier diets to last a lifetime.
Objectives

➢ To identify nutritional deficiencies at the critical adolescent stage

➢ To gather data on the nutritional and occupational status of adolescent women, providing a starting point for deeper studies on the correlation between these factors

➢ To build networks of adolescent girls who are better informed about their nutritional status and dietary options, as well as empowered to influence change in the unbalanced diets of those around them

➢ To share relevant data and evidence that emerge from the nutrition models with relevant government officials to inform policy, practice, and data-driven decision-making

➢ To interface technology and data analytics with adolescent nutrition in an innovative, transformative, and exciting manner
Program theory and impact pathway

Thai Nguyen (Vietnam) and Medellin (Colombia)

**Inputs**
- Grant funding
- Web platforms (Launchpad)
- Software (Optifood, CotD)
- Staff time
- Participants/mentor time

**Processes**
- Identify:
  - Collaborative network
  - Target participants
  - Mentors
- Train:
  - Mentors
  - Participants in dietary assessment
  - Participants in data analysis

**Outputs**
- Participant/mentor network constituted and activated
- Dietary data collected
- Problem nutrient (PN) identified
- Foods that solve PN identified
- Challenges launched to develop food-based, policy and behavioral solutions
- Data shared with civic authorities and stakeholders
- Broad dissemination of results

**Outcomes**
- Dietary solutions identified
- Consumer groups empowered
- Peer groups activated

**Impacts**
- Adolescent dietary intake sustainably improved
### Main activities

**Program design and planning**
- Engage with local partners to tailor the program and engage adolescents
- Design the dietary and demographic questionnaires
- To test the app platforms

**Data collection and constituent engagement**
- Recruit 1000 adolescents from various backgrounds
- Collect diet data using web-based platform (INDDEX24)
- Collect data on demographic and healthy eating knowledge

**Innovations and solutions**
- Analyze data on three nutrition modeling tools
- Design an Innovation Challenge
- Engage adolescents in identifying innovative food solutions

*Where can adolescents be reached?*
*What are the typical dietary patterns?*
*How does occupational/educational status affect dietary quality and knowledge of healthy diets?*

*What an ideal diet looks like?*
*What nutrients are inadequate or excessive?*
*What is the cost of a healthy diet?*
*How much of the population can afford a healthy diet?*
*What affordable, locally available foods can help fill the nutrient gaps?*
Thai Nguyen province is in the northeast of Vietnam. The total population as of 2019 was ~1.3 million; 420,000 live in Thai Nguyen City. Female population aged 10-24: 30,309. Population density varies greatly: 72 inhabitants/km$^2$ in mountainous regions, 1,260 inhabitants/km$^2$ in Thai Nguyen city. Thai Nguyen is home to various ethnic groups. The largest ethnic groups are Vietnamese (70%), followed by Tây, Nùng, Sán Diu and Sán Chay.
Thai Nguyen city has 32 communes
- 21 urban communes
- 11 peri-urban communes
Each commune is divided by several wards
Most girls <18 years are in school
No existing data on occupation
We selected 8 urban and 4 peri urban communes
We visited all households in 12 communes to list adolescent girls 16-22 years and their occupation
Formative research and sampling list

➢ Collaborate with Census Department of the City Department of Health
➢ Conduct household listing in 12 communes to collect information occupation for all girls 16-22y
➢ Create database for adolescent girls, stratifying by 3 types of occupation
➢ Selected 100 wards to collect maximum number of workers
➢ Selected 1000 participants based on the occupation
➢ Selected all workers in the wards
➢ Randomly selected high school and college students in each ward, balance sample between these two categories
➢ Create of sampling list for survey
Sampling plan

Thai Nguyen city
32 communes

Select 12 communes
(8 urban and 4 peri urban communes)

Select 12 communes
(8 urban and 4 peri urban communes)

Each commune select 8-10 wards
(total 100 wards)

Each commune select 8-10 wards
(total 100 wards)

Each ward select 10 girls
(total 1000 girls)

Each ward select 10 girls
(total 1000 girls)

80,857 households

30,096 households, 4,048 girls 16-22y

2871 girls available in 12 communes

1100 high school students

1358 college students

263 Service worker or sale person/Officer/staff

263 Service worker or sale person/Officer/staff

366 high school students

371 college students

Thai Nguyen city
32 communes

Select 12 communes
(8 urban and 4 peri urban communes)

Select all workers
Systematic random sampling high school or college students

Selection criteria:
• Girls aged 16-22 years
• Not married
• Not pregnant
• Not yet have children

Excluded
• 263 cases married, have children
• 25 cases aged <16 or age >22 y
• 579 cases not currently live in the area
• 310 cases will not available between Nov 2021 – Jan 2022

Excluded
• 150 farmers, housewives, maid, unemployed

Select all communes that has service workers, sale person, office staff

Select all workers
Systematic random sampling high school or college students
Actual sample achieved

1100 high school students
- 366 randomly selected
  - 7 moved out
  - 22 absent
  - 73 refused
  - 1 isolated due to Covid
- 268 agreed to participate
  - 399 high school students

1358 college students
- 371 randomly selected
  - 3 married
  - 50 absent
  - 67 refused
  - 3 isolated due to Covid
- 248 agree to participate
  - 402 college students

263 Service worker or sale person/Officer/staff
- All 263 selected
  - 11 married
  - 25 absent
  - 24 refused
  - 2 isolated due to Covid

Total sample = 1,002. Overall replacement rate: 28.4%
Distribution of sample size by commune

<table>
<thead>
<tr>
<th>Commune/ward</th>
<th>High school student</th>
<th>College student</th>
<th>Service worker or sale person/ Officer/staff</th>
<th>Total sample</th>
<th>Repeated 24-hour recall (10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cam Gia</td>
<td>23</td>
<td>31</td>
<td>25</td>
<td>79</td>
<td>8</td>
</tr>
<tr>
<td>Cao Ngan</td>
<td>36</td>
<td>30</td>
<td>22</td>
<td>88</td>
<td>9</td>
</tr>
<tr>
<td>Dong Quang</td>
<td>37</td>
<td>35</td>
<td>1</td>
<td>73</td>
<td>7</td>
</tr>
<tr>
<td>Hoang Van Thu</td>
<td>41</td>
<td>39</td>
<td>5</td>
<td>85</td>
<td>8</td>
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<tr>
<td>Huong Thuong</td>
<td>30</td>
<td>29</td>
<td>22</td>
<td>81</td>
<td>8</td>
</tr>
<tr>
<td>Linh Son</td>
<td>37</td>
<td>19</td>
<td>42</td>
<td>98</td>
<td>9</td>
</tr>
<tr>
<td>Quan Trieu</td>
<td>29</td>
<td>49</td>
<td>4</td>
<td>82</td>
<td>8</td>
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<tr>
<td>Tuc Duyen</td>
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<tr>
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<tr>
<td>Tan Cuong</td>
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<tr>
<td>Quang Vinh</td>
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<tr>
<td>Quang Trung</td>
<td>37</td>
<td>31</td>
<td>11</td>
<td>79</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>399</strong></td>
<td><strong>402</strong></td>
<td><strong>201</strong></td>
<td><strong>1,002</strong></td>
<td><strong>99</strong></td>
</tr>
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</table>
# Respondents’ age distribution

<table>
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<th>Age in years</th>
<th>Sample (n)</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>15</td>
<td>2</td>
<td>0.2%</td>
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<tr>
<td>16</td>
<td>205</td>
<td>16.5%</td>
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<tr>
<td>17</td>
<td>199</td>
<td>13.7%</td>
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<tr>
<td>18</td>
<td>212</td>
<td>14.9%</td>
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<tr>
<td>19</td>
<td>155</td>
<td>10.2%</td>
</tr>
<tr>
<td>20</td>
<td>123</td>
<td>8.2%</td>
</tr>
<tr>
<td>21</td>
<td>98</td>
<td>6.5%</td>
</tr>
<tr>
<td>22</td>
<td>8</td>
<td>0.5%</td>
</tr>
</tbody>
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## Recalled day

<table>
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<th>Recalled day</th>
<th>Total</th>
<th>1st time</th>
<th>Repeat</th>
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<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Mon</td>
<td>153</td>
<td>13.9</td>
<td>129</td>
</tr>
<tr>
<td>Tue</td>
<td>113</td>
<td>10.3</td>
<td>105</td>
</tr>
<tr>
<td>Wed</td>
<td>121</td>
<td>10.99</td>
<td>102</td>
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<tr>
<td>Thu</td>
<td>105</td>
<td>9.54</td>
<td>88</td>
</tr>
<tr>
<td>Fri</td>
<td>218</td>
<td>19.8</td>
<td>204</td>
</tr>
<tr>
<td>Sat</td>
<td>296</td>
<td>26.88</td>
<td>285</td>
</tr>
<tr>
<td>Sun</td>
<td>95</td>
<td>8.63</td>
<td>89</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1101</td>
<td>100</td>
<td>1,002</td>
</tr>
</tbody>
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