**BACKGROUND**

Micronutrient deficiency persists as major public health nutrition problem affecting a significant proportion of the population. More than two billion people worldwide suffer from micronutrient deficiencies. These deficiencies not only affect an individual’s long term health but can also raise societal and public health care costs and potentially depress a nation’s economic productivity. In year 2000, the Philippines responded to the global call to eradicate all forms of malnutrition by institutionalizing food fortification program through RA 8976.

**CONTRIBUTION OF VITAMIN A-FORTIFICATION OF PROCESSED FOODS TO THE STATUS OF VITAMIN A DEFICIENCY (VAD) IN THE PHILIPPINES**

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**METHODOLOGY**

A pooled cross-sectional study design was utilized using the individual food consumption data of the 6th, 7th, 8th NNSs in 2003, 2008, 2013. Dietary intake of pre-school children, 6 months to 5 years old, pregnant women and lactating mothers obtained from the two non-consecutive days 24-hour food recall were used in the study. It included specific information on the amount of foods actually consumed and the brand, variant, and manufacturer’s name for commercial or processed foods.

**DATA ANALYSIS**

Separate data files were created for all population groups. Each data file created by population groups and by survey year was pooled to generate a final data for each population groups.
### A. Vitamin A Deficiency Status

- **Trends in the Prevalence of Vitamin A deficiency: Philippines, 1993-2013**

  - Year 1993: Deficient
  - Year 2008: Not Deficient
  - Year 2013: Not Deficient

  - Improvement on the status of Vitamin A deficiency among children, (6m-5y), pregnant, lactating mothers was observed during 2003 and 2008.

### B. Vitamin A Fortification

- **Proportion of individuals consuming at least one vitamin A-fortified food product by survey period**

  - Children, 6months-5years
  - Pregnant women
  - Lactating mothers

<table>
<thead>
<tr>
<th>Year</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>35.8</td>
<td>38.1</td>
<td>23.7</td>
</tr>
<tr>
<td>1</td>
<td>40.9</td>
<td>37.9</td>
<td>20.5</td>
</tr>
<tr>
<td>2</td>
<td>38.8</td>
<td>36.7</td>
<td>15.8</td>
</tr>
</tbody>
</table>

Generally, there was a decreasing proportion of individuals consuming fortified foods however intake of vitamin A coming from other non-processed/non-fortified foods increased.

### C. Intake of Vitamin A

#### Percent contribution of vitamin intake from vitamin A-fortified foods to the total vitamin intake

- **Children, 6 months-5 years old**

- **Pregnant women**

- **Lactating mothers**

### D. Logistic Regression Model

- **Multivariate logistic regression predicting the likelihood of being Vitamin A deficient among children, 6 months to 5 years old**

  - **Variables**: Odds Ratio, SE, 95% CI, LL, UL, P-value

  - **Results**:
    - **Constant Term**: 0.00 (0.95, <0.001)
    - **% contribution of Vitamin A intake from fortified foods**: 1.10 (1.00, 1.21, 2.10, 0.038)
    - **Mean Vitamin A intake from OTHER**: 1.40 (1.01, 2.00, 1.33, 0.038)
    - **Sex (Male)**: 1.05 (1.00, 1.10, 1.30, 0.201)
    - **Malaria (Not free)**: 1.06 (1.01, 1.10, 1.03, 0.038)

  - **Conclusion and Recommendation**
    - Among children, having vitamin A intake from fortified foods with less than 6.2% contribution to the total vitamin A intake is 16% more likely to be vitamin A deficient than having intake of higher percent contribution to the total intake.

### RESULTS

- **Proportion of individuals consuming fortified foods**
  - Year 2003: 2008
  - Year 2013: 2008

  - **Intake of Vitamin A**:
    - Year 2003: 2008
    - Year 2013: 2008


### CONCLUSION AND RECOMMENDATION

- **Findings**
  - Proportion of individuals consuming vitamin A-fortified foods decreased in 2013. This might have contributed to the slight increased in VAD in 2013.
  - Increasing proportion of individuals with intake of vitamin A-fortified foods complementing it with increased intake from other foods might have sustained the decreasing trend of VAD.

- **Strengthening of the program’s implementation should be done for total VAD elimination. Regular monitoring and checking of fortification levels should be conducted to ensure that no other serious problems such as on vitamin A toxicity emerge in the country. Moreover, effect of vitamin A supplementation as a complementary program to food fortification particularly among pre-school children and pregnant women should also be considered in the analysis.**