**INTRODUCTION**

**PROBLEM**
Countries with significant vitamin A (VA) deficiency problem implement large-scale intervention programs to reduce child morbidity and mortality. However, overlapping program exposure may result in excessive VA intake and toxicity.

**HYPOTHESIS**
Breastfed children are likely to receive adequate VA from breast milk if their mothers have adequate VA status. Any excessive VA intake caused by exposure to multiple VA programs may be most likely among breastfed children.

**OBJECTIVE**
To assess whether breastfed children exposed to multiple VA programs are at risk of having excessive VA intakes, their breast milk intake, breast milk VA concentration, and VA intake from other food sources must be known. The study aimed to determine the breast milk intake among children (12 to 18 months) living in a community where multiple VA interventions are in place.

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**MATERIALS AND METHODS**

**DOSE-TO-MOTHER ISOTOPE DILUTION TECHNIQUE**

- Mother drinks deuterium oxide ($^2$H$_2$O)
- Baby gets $^2$H$_2$O from breast milk
- Saliva enriched with $^2$H$_2$O is collected

**STUDY PARTICIPANTS**

Breastfeeding young children aged 12–18 months and their mothers:

- **Superkid Group 1** (n=12): Exposed to VA programs for 1 month after VAS
- **Superkid Group 2** (n=16): Exposed to VA programs for 3–4 mos after VAS
- **Superkid Group 3** (n=24): Not exposed to VA programs

**STUDY SITE**

Mandaluyong City (9 barangays)

**PILOT STUDY**

Baesa Compound, Tondo, Manila

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Deuterium enrichment of mother-child pairs

The stable isotope dilution technique—the most non-invasive, accurate, and sensitive way to determine breastfeeding practices—was successfully applied to estimate the breast milk intake of young children exposed to multiple VA programs.

The estimated breast milk intake of urban Filipino children (12–18 months) is 531 ± 208 g, which is equivalent to almost 18 ounces, or more than 2 cups, per day.

The information on breast milk intake will be combined with the data collected by Hellen Keller International and University of California Davis on VA concentration of breast milk and VA intake from complementary foods to calculate the total VA intake of the children. The analysis of breast milk VA concentration and dietary assessment are ongoing.

The study findings will provide guidance to program managers and policymakers to optimize the evaluation of their VA programs, especially in the Philippines where multiple VA interventions are in place, and to enable them to improve national nutrition plans and strategies.

Data on breast milk volume can also help inform the formulation of recommendations for nutrient intake for children, which are based on extrapolated adult data from developed countries.

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RESULTS

CONCLUSION AND RECOMMENDATIONS

Conclusion and recommendations

Breast milk intake among breastfed toddlers

Mean (± SD) breast milk intake of 637 ± 205 g among urban Filipino children (12–18 months) who did not receive VA intervention was significantly higher (p<0.05) than the intakes of 451 ± 173 g and 413 ± 151 g reported among Groups 1 and 2, respectively, who were exposed to multiple VA programs.

Mean breast milk intake among toddlers was 531 ± 208 g, which is close to the usual milk intake for this age group from pooled studies in developing countries, i.e., 526 ± 214 g (Brown et al., 1998).

Figure 1. $^2$H enrichment in saliva collected from mother (▲) and child (●)

Breast milk intake among breastfed toddlers

Figure 2. Breast milk intakes of Superkid groups

Figure 3. FTIR analysis