

## Persistent Environmental Toxicants in Breast Milk and Infant Growth

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**Background:** Many environmental toxicants are passed to infants through breast milk, and exposure to toxicants during the perinatal period can alter growth patterns, impairing growth or increasing obesity risk. Most previous studies have evaluated toxicant levels in maternal serum or cord blood, whereas breast milk is a better measure of postnatal exposure. Further, previous studies have focused on only a few toxicants at a time. We explored levels of 27 toxicants in breast milk and their association with rapid infant growth, a marker for later obesity.

**Methods:** We utilized the Norwegian HUMIS cohort, a multi-center cohort of 2,606 mothers and newborns enrolled between 2002–2006. Milk samples from a subset of women were analyzed for toxicants including persistent organic pollutants, heavy metals, and pesticides; overweight women were oversampled. Growth was defined as change in weight-for-age z-score between 0–6 months. We used a Bayesian variable selection method to determine exposures that most explained variation in outcome. These were included in adjusted logistic and linear regression models to determine associations with growth, controlling for appropriate confounders.

**Findings:** Of 789 infants, 19.2% displayed rapid growth. The median maternal age was 29.6 years (SD +/- 4.76), and the median pre-pregnancy BMI was 24.0 kg/m<sup>2</sup> (IQR 21.6, 27.5). 45.3% of mothers were overweight or obese. Rapid growers were more likely to be firstborn. Hexachlorobenzene (HCB), β-hexachlorocyclohexane (β-HCH), and polychlorinated biphenyl (PCB)-74 were most strongly associated with growth. Of these, β-HCH showed a significant inverse association with rapid growth, with an odds ratio of 0.87 (CI: 0.77 – 0.98, p = 0.025) and of 0.63 (CI: 0.42 – 0.94, p = 0.025) when adjusted for the inter-quartile range. We found a significant inverse relationship between increasing β-HCH exposure and growth as a continuous outcome with a β-coefficient of -0.0091 (CI: -0.016 – -0.0023, p = 0.009).

**Interpretation:** Exposure to β-HCH in breast milk is associated with a decreased odds of rapid growth and possibly stunting in this Norwegian cohort. Further research is warranted on the longer-term metabolic effects of perinatal β-HCH exposure.

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## A Sustainable Departure: Examining Exit Strategies of a Multi-sector NGO in Zambia

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**Background:** Living and working alongside the people of Zambia in the summer of 2016, the author was exposed to the efforts,

struggles, and rewards of a sub-Saharan NGO endeavoring to make an impact in the region. In particular, he noticed the exit strategies as critical components of the international development agenda.

An exit refers to the complete withdrawal of all NGO resources from a target area. An Exit Strategy is a plan describing how the organization intends to withdraw while ensuring that the fruits of its labor do not suffer or deteriorate. Exit Strategies, when planned carefully and deliberately can result in continued community involvement and ensure sustainable program outcomes [1].

Yet the topic of Exit Strategy continues to confound and elude development and aid practitioners alike. To date, little has been written on Exit Strategies, specifically as to methods that work. International NGOs can stand to learn tremendously on how to ensure their aid and efforts remain upon their withdrawal from the communities they serve. In the dynamic context of sub-Saharan Africa, the mere mention of ‘an exit’ when discussing food and water programming can cause panic among communities, NGO staff, government and other stakeholders.

**Methods:** Therefore, this paper focuses on the various exit strategies employed by World Vision in Zambia. Their methods are examined analytically and presented as a case study in order to promote a greater understanding of exit strategies. The goal of this investigation is to offer insight into an aspect of organizational planning critical to nearly all foreign aid projects.

**Findings:** World Vision Zambia employs a comprehensive and practical approach to Exit Strategy in Zambia. Its strengths lie in its inclusiveness and multidimensional scope. However, it stands to benefit from earlier implementation and retroactive validation.

**Interpretation:** As a result, the author would recommend assessment of transitioning potential of activities and PMCs throughout lifetime of ADPs as well as some method of following CBOs down the line after withdrawing to properly ensure transition.

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## The Water Use of Diets in India

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**Background:** India’s fresh water use is dominated by agriculture, but diminishing groundwater supply and potential changes to rainfall threaten future food production. Quantifying the water use of food can inform policy makers and help plan for future water scenarios. This includes investigating water use of food types, diets and differences between socio-demographic groups. This research aims to provide an initial insight into the water use of diets in India using the water footprint (WF) assessment method.

**Methods:** Dietary data from the Indian Migration Study were linked to state level WF data in India to quantify the water use of diets. Variations in the WFs of food items were explored, and