

Tribal Fish Consumption, Toxics and Tribal Children

Based upon the Lower Elwha Klallam Tribe Fish
Consumption and Tribal Health Study

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Dioxin/ PCBs

- Dioxin is considered to be carcinogenic and thought to promote rather than initiate cancer.
- Four large occupational cohort studies found a statistically significant increase in all-cancer risk from high levels of exposure to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD).

- The International Agency for Research on Cancer has classified TCDD as a Group 1 human carcinogen based on an overall increased risk of cancer but found insufficient evidence to reach conclusions about causality for specific cancer sites.
- It is currently not possible to accurately predict the lowest levels at which any given individual is likely to adversely respond to dioxin exposure.

Fetal / New Born Effects

- The developing fetus is most sensitive to dioxin exposure. The newborn, with rapidly developing organ systems, may also be more vulnerable to certain effects. Some individuals or groups of individuals may be exposed to higher levels of dioxins because of their diets (e.g., high consumers of fish such as Native Americans, and other populations around the world) or occupations with high exposure.

EPA

- Fish consumption data for Native American children are very limited, and fish consumption rates, habits, and patterns can vary among tribes and other subpopulations.
- Therefore, fish intake data for a particular tribe may not be representative of other tribes.

EPA *Child-Specific Exposure Factors Handbook*
Chapter 10 - Intake of Fish and Shellfish

PCBs

- Despite the fact that PCB levels in the environment have generally continued to decline over the past 10 years, Some regulatory and scientific bodies have concluded that evidence suggesting that prenatal PCB exposure may lead to neurodevelopmental deficits is one of the major public health concerns surrounding PCBs.

Jacobson Cohort

- The researchers studying these children followed them from birth to 11 years of age, the principal basis for concern was that low-level in utero exposure to PCBs causes neurodevelopmental deficits in children is a series of reports on a cohort of Michigan children, known as the Jacobson cohort.
- The study concluded that researchers had shown persistent neurodevelopmental effects attributable solely to PCBs.

Native Populations

- **Brain, behavior, intelligence**
Certain chemicals - namely pesticides, PCBs, and dioxins - may affect human memory, intelligence, attention, and play behavior, ... (Clotfelter et al. 2004; Zala and Penn 2004). The evidence is pronounced in children. Mexican 4- and 5-year-old children living in valleys surrounded by modern chemical-laden agriculture had lower age appropriate drawing, memory, and physical coordination skills than their mountain dwelling counterparts... (Guillette 1998).
- **Immunity**
Chemicals, some of them known EDCs, contaminate native Inuit populations living in Canada's frozen Arctic Circle. Ongoing studies of these traditional people – who eat mainly seal, whale, and other meat heavily laden with synthetic, persistent chemicals – paint a picture of altered health, increased cancers, and immune problems. One example shows infants exposed prenatally to the hormone-active compounds more susceptible to ear infections. (Dewailly et al. 2000). **No differences were found between breast fed and bottle fed babies suggesting a role for prebirth exposure.**

Swinomish Tribal Community's Bioaccumulative Toxics in Native American Shellfish project 2002-2006

- In this study; risk assessments were performed by evaluating consumption of individual species, as well as a combined "seafood basket", of clams, crab, and salmon. The primary risk drivers were PCBs, arsenic, and dioxins / furans, with lesser contributions from mercury, other heavy metals, pesticides and PAHs.
- Risks from eating 300gms of fish per day / for life, the current consumption rate for the tribe, are above the non cancer reference guideline of 1.

- The lifetime cancer risk for tribal members is in the range of 1 in 1000 people, well above the 1 in 1,000,000 that EPA prefers.
- The risks of eating at the preferred subsistence consumption level sought by many Tribal members and guaranteed by treaty, would be much higher. (Sound and Strait tribes have maintained the same level of fish consumption for centuries, fish being the primary source of food.)

Options to Eating Fish

- Advisories are an option for non-tribal persons and in areas of significant uncontaminated fish stocks.
- But in the Puget Sound and Straits of Juan de Fuca, for subsistence fishers, this is not really an option, because no fish means no meal. Not eating is not an option.

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- Fish consumption leads us to a further conundrum, what to tell pregnant mothers to eat, or
 - what to feed hungry children when fish is the accessible food source, and it may be contaminated.

Mortality

- The mortality rates for Native Americans are the highest in Washington. Both men and women die younger than all other ethnic groups. The life expectancy for Native American men is the lowest of all.
- Infant mortality rates among Native children are the highest in the state at a rate of 9.8 deaths per 1000 births.

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- While the death rates for infants of all other ethnic groups continue to fall the death rate for Native American infants is still rising.

What to Do?

- Switch to commodities? Those high fat, heavy in simple carbohydrate, subsidized replacement foods supplied by the government.
- With the consumption of commodities comes obesity, heart disease, diabetes, hypertension and other health issues. (7% of the Lower Elwha children are clinically obese)

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- Buying better foods, Native Americans living on the Lower Elwha reservation have an unemployment rate of 17% and 47% receive economic assistance.
 - Recent evidence indicates the lack of Omega 3 fatty acids in the diet results in increased depression and diabetes, the Elwha are suffering an increase in health issues including an increase in diagnosed depression.

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- Native American women like all women are encouraged to breastfeed.
 - Studies have shown that there is a significant transfer of bioaccumulative toxins in breast milk.
 - But more importantly, recent studies have indicated that the transfer of those toxins is even greater to the fetus during pregnancy.
(Guillette 1998) (Dewailly et al. 2000)

Again, the question, What to Do??

- The only sure solution is to clean the environment upon which the Tribes rely for food and make the fish safe to eat at the traditionally high levels to which the Native Americans have adapted over millennia.