



# **Modifying U.S. Risk Assessment Model for Relevance to Unique Tribal Scenarios**

**A Project by The LifeLine Group**

**Funded by US EPA/OPPTS**

**Brief Overview**

**February 2004**

# The LifeLine Group

---

**A 501(3)c not-for-profit corporation**

**dedicated to creating technically excellent,  
relevant exposure and risk assessment tools,**

**AND**

**to make those tools equally available to all  
interested parties without political or financial  
barrier.**

- **Not commercial--No equity** from any parts of the models or subsequent derivatives are accrued **to any authors or modelers.**

# The Existing LifeLine™ Software

---

Built over 5 year-period with ~\$ 3 million support from USDA, USEPA, Canada, industry, private \$

Calculates the possible chemical exposures/risks to individuals described as typical of the “general US population”

Used by US EPA Office of Pesticide Programs and Office of Research and Development, many State Agencies, universities, consultants, industries, other countries, research groups.

Relevant for pesticides, toxics, metals, etc.

**Demography/Physiology**

**OUR BODIES**

Ethnicity, age,  
size, health

**Exposure Opportunities**

**OUR ACTIVITIES**

Occupation,  
Recreation, Traditions,  
Daily activity patterns

**Residues and  
Transfer Factors**

**OUR ENVIRONMENT**

Water source, air,  
building materials,  
chemicals in these

**Chemical Hazard**

**CHEMICAL HAZARDS**

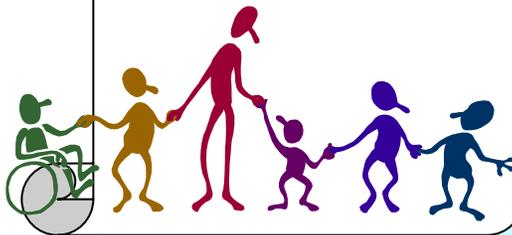
Potency of chemicals  
to cause cancer, kidney  
disease, reproductive  
problems, etc.

# Data Sources for the Model

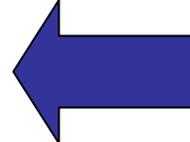
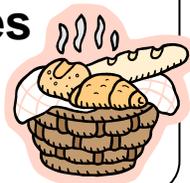
---

## Data Included in LifeLine™ Exposure and Risk Assessment Software

Age related height, weight/ population demographics, birth statistics etc.



Dietary profile:  
Who eats what, how much, from where / recipes, food sources Etc.

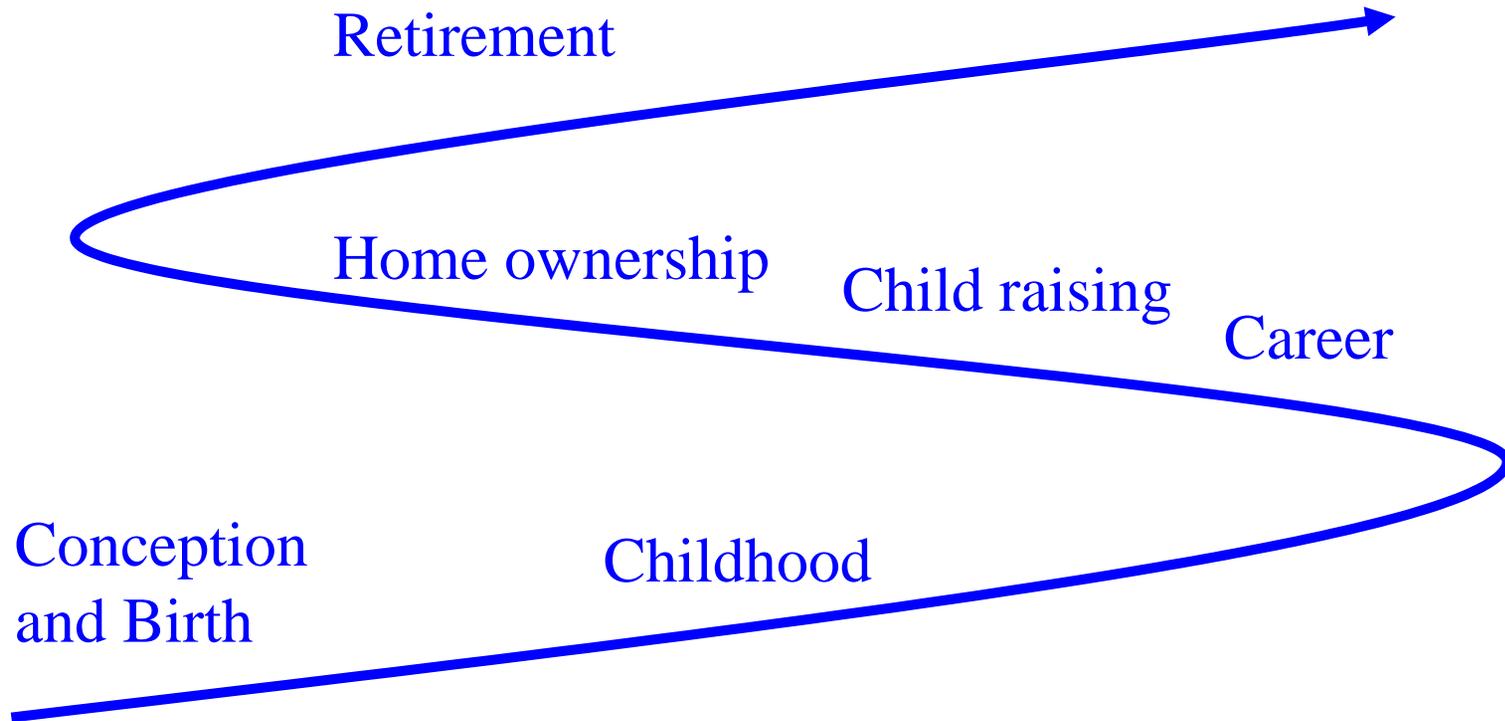


## Data Supplied by Risk Assessor

- Resides of chemical in food/water
- \*Health hazard info.
- \*Chemical use Info.
- Etc.

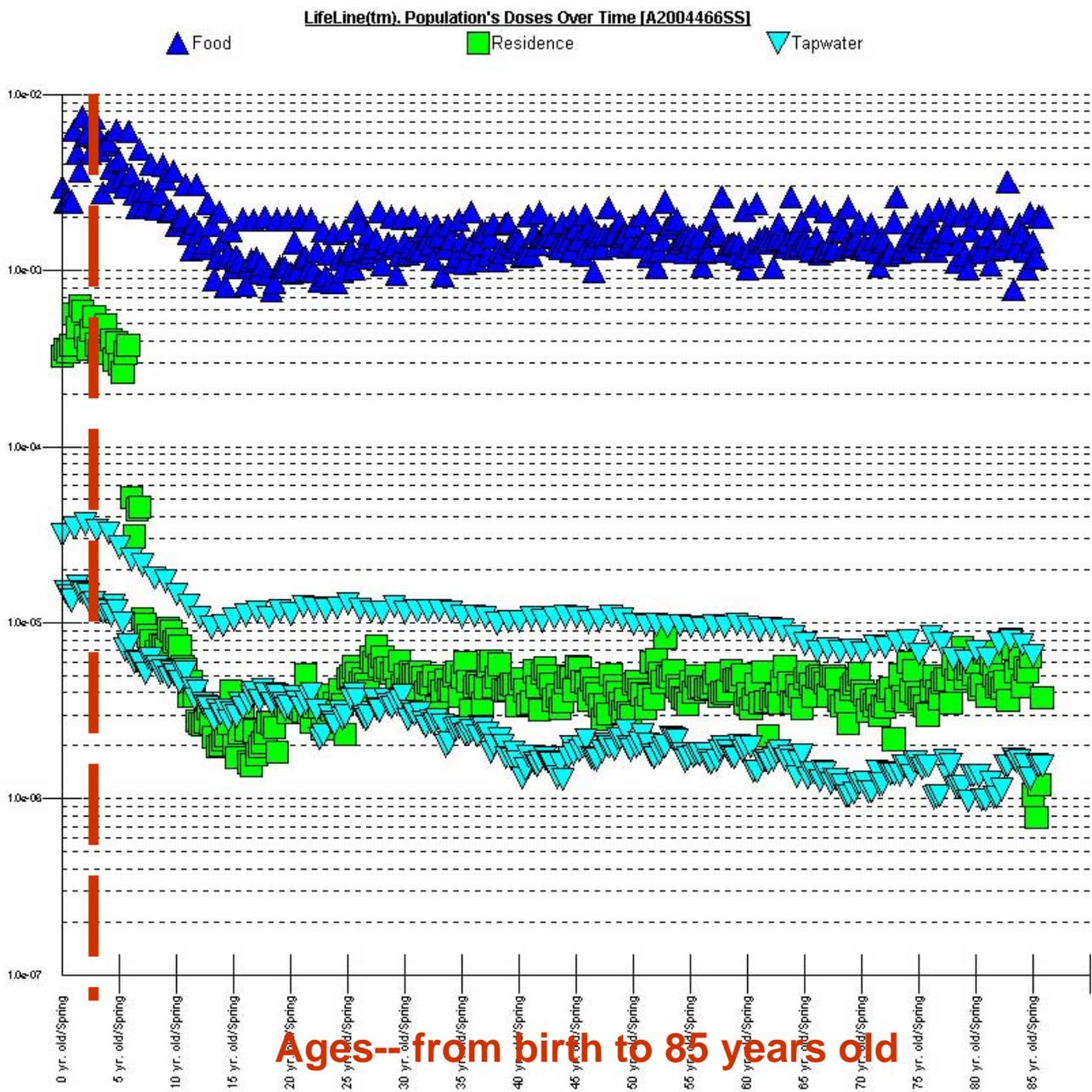
# Modeling A Person's Life

---



# TKS - Risk Assessment

1 DAY AVERAGE DURING PERIOD OF EXPOSURE (E<sub>1</sub>) (M.G./D.)

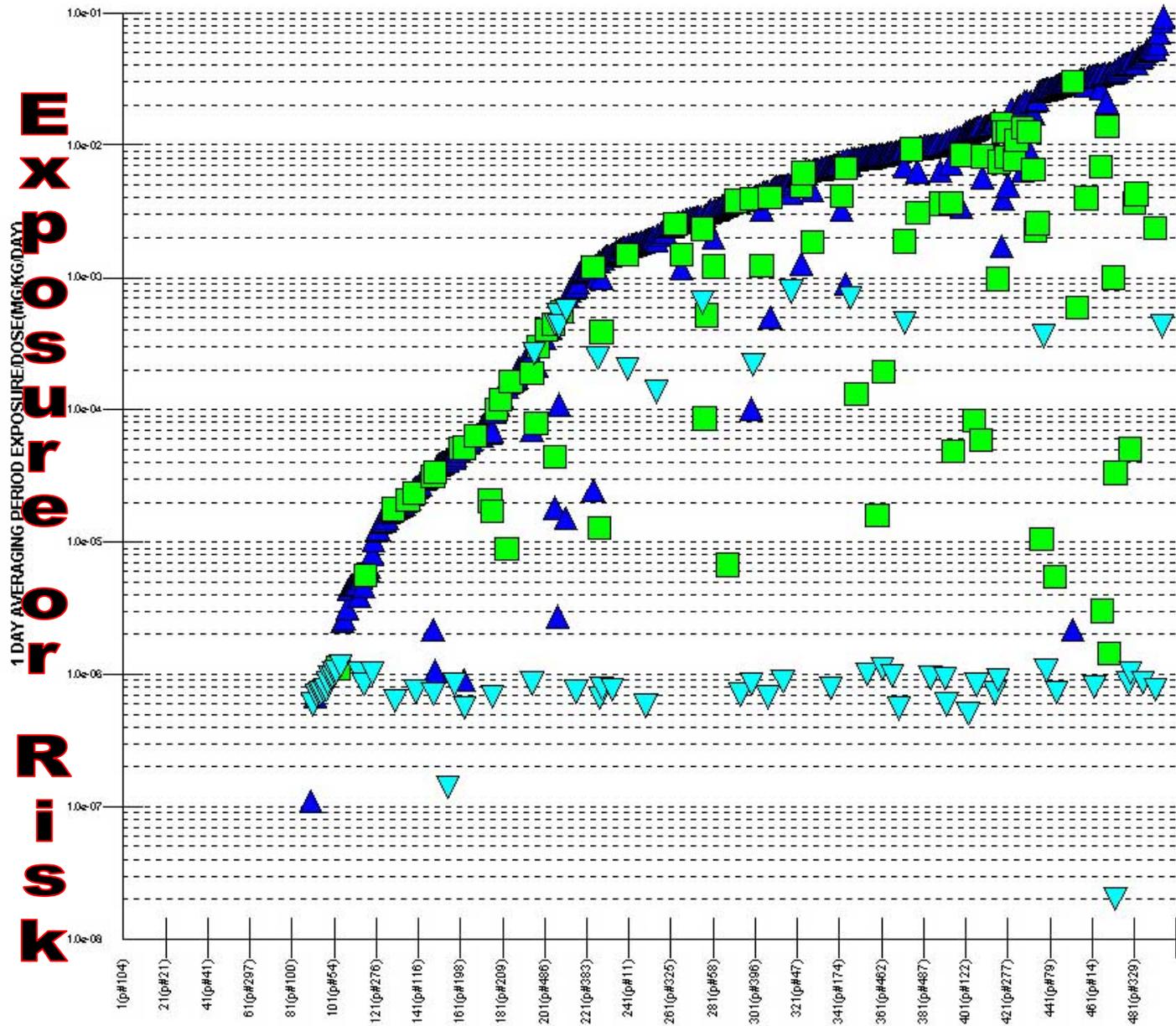


Ages-- from birth to 85 years old

SOURCE CONTRIBUTIONS - SEASONAL AVERAGE

Lifeline(tm). Dist. of Doses at a Season and Age (Ranked by Total) [A2004466SS]

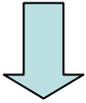
▲ Food      ■ Residence      ▼ Tapwater



SOURCE CONTRIBUTIONS - SEASONAL AVERAGE

All 2-year olds in the community (NOT Real People)

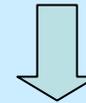
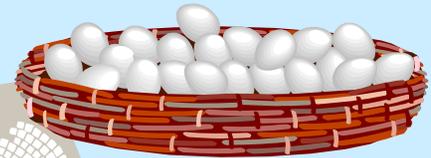
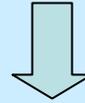
# Farm gate or Port



## Processing Industries



## Retail



**Seasonality, Age-related mix  
with commercial foods,  
storage, preparation**

# Phase 1:Pilot Project

---



Two **Biogeographical Areas (BGA's)** selected for initial work. Objectives:

- Modify LifeLine for these groups
  - Test project approaches and evaluate technical limitations/opportunities.
1. Subartic, freshwater perimeter villages (Alaska)
  2. Northern Plains (Montana)

# Summary of Modifications from Phase 1 Sites

---

## Changes in underlying data sets:

- Activity Profiles (indoor / outdoor activity)
- Housing descriptions
- Socioeconomic distributions

## Addition of exposure scenarios:

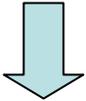
- Sweat Lodges
- Ambient indoor/outdoor air
- Traditional Diet and Ingredient files
- Seasonal community relocation options

# Summary of Modifications (cont.)

---

- Ability for “**cultural mixing**” of traditional diets and commercial diets. Percent of mixing determined by assessor. (age dependent)
- Modification of activity profiles and physiological parameters for “**health compromised activity scenarios**” (e.g. asthma). Percent of individuals in age groups considered to be compromised set by assessor.

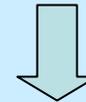
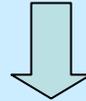
# Farm gate or Port



**Processing  
Industries**



**Retail**



**Seasonality, Age-related mix  
with commercial foods,  
Age, preparation**

**0 to 100 %**

# Phase 2: Anticipated to begin Summer 2004

## Two New Biogeographical Areas (BGA's)

### Probable choices...

- Artic coastal (**Alaska**)
- Pacific Northwest, river and coastal

Determined by agreement between tribes and EPA project officer: Karen Rudek, OPP (703) 305-6005

# Utility of Exposure/Risk Assessment Software

---

- “What is the possible exposure profile and health consequence of X levels of toxic chemical in food or air or water, etc?”
  - Considering or making regulation.
- “Who in the community is most affected? What sources the most exposure?”
  - Priorities for further research and monitoring projects—also for setting priorities on the foods or media to be monitored,
- Teaching risk assessment methodologies,
- Communicating risk situations and mediation options.

# The LifeLine™ Software

---

**All versions** available upon request  
(no fee, no commercial components)

Aggregate/Cumulative Exposure and Risk Assessment  
Version 2.0 (current)

[www.TheLifeLineGroup.org](http://www.TheLifeLineGroup.org)

Updates, technical documentation also  
available at the web site

