Consumer Product Exposure Data and Models in the United States

International Conference on Environmental Epidemiology and Exposure
Paris, France, September 2-6, 2006

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Overview

- Describe the availability of:
  - Consumer product data
  - Consumer time activity pattern data
  - Consumer exposure models
U. S. Consumer Product Information

• Consumer product data bases
  ▪ NLM Household Product Data Base
  ▪ Tox town

• Provide information about:
  ▪ Chemical characteristics and active ingredients
  ▪ Brand and manufacturer
  ▪ Health effects and safe handling

• Contain links to other data bases
  ▪ TOXNET, PubMed
  ▪ IRIS and IRAC
NLM Household Product Database

Health & Safety Information on Household Products

What’s under your kitchen sink, in your garage, in your bathroom, and on the shelves in your laundry room? Learn more about what’s in these products, about potential health effects, and about safety and handling.

Information in the Household Products Database is taken from a variety of publicly available sources, including brand-specific labels and Material Safety Data Sheets (MSDS) prepared by manufacturers.

Find a product...
For advice if someone is poisoned, call your local Poison Center at (1-800-222-1222).
NLM Household Product Data

Organized by

- Product categories
  - Home Maintenance
    - Caulk, Grout, Insulation, Paint, Putty, Stain, and more...
  - Auto Products
    - Brake Fluid, De-icer, Lubricant, Sealant, and more...

- Category, type, brand name for each product

Contains information about

- Product brand and manufacturer
- Acute and chronic health effects
- Ingredients and handling from MSDS
Tox Town Database

Welcome to the City
An introduction to toxic chemicals and environmental health risks you might encounter in everyday life, in everyday places.

- **Neighborhoods**
  Select a view of the Town, City or US-Mexico Border to learn about urban, suburban and border town health risks.

- **Locations**
  Click on a location in the neighborhood, like the school, and find out more about the chemicals that could be in that location. Also learn about health risks that might be in that location.

- **Chemicals**
  Roll your mouse over a chemical name to see where it might be found in the neighborhood. Then click the button for selected Internet information on that chemical.

- **Are these chemicals in MY community?**
**Tox Town Database**

Categorized by size: city, town, US Mexico Border
- Organized by location: factory, farm, homes, schools or stores
- Contains a large list of chemicals by location
- Links to other sites for information
  - Chemical properties and toxicity
  - Exposure issues such as passive smoking
  - Occupational health
  - Poisoning
U.S. Consumer Product Data

Extensive not centralized but linked

But:

• Data describe hazard potential **NOT** exposures

• Does not contain information about:
  ■ Application rates
  ■ Quantities and frequency of use
U.S. Consumer Exposure Databases

Human exposure databases contain some information about consumer exposures eg smoking, pesticide use

- Generally time location and activity information
  - High level activities recorded via questionnaire
  - Trigger to record new event is change in location or major activity
    - What are you doing
    - Where are you doing it
    - How long

- eg watching TV but not where you are sitting could be on the floor or in a chair
Major U.S. Exposure Databases

**HEDS** - Human Exposure Database System
- Contains chemical measurements, questionnaire responses
- Includes documents, and other information related to EPA research exposure studies

**CHAD** - Consolidated Human Activities Database
- Contains data obtained from pre-existing human activity studies
- Collected at city, state, and national levels

**EFH** – Exposure Factors Handbook
- Summary data on exposure factors to assess human exposures to environmental contaminants
**U.S. Consumer Exposure Data**

Limited data for consumer products:
- Smoking, heating appliances, pesticides
- Data compiled from human exposure studies
- Data captured from self reported questionnaires
- Little or no product or brand information

**But:**
- Raw records exist to capture these kind of data
- A system exists to analyze and store consumer exposure data
Consumer Exposure Models Require Knowledge of:

Chemical composition and concentration Pathways

- Inhalation of vapors or particles
- Non-dietary ingestion of residues
- Dermal absorption - surface residue transfer

Duration, frequency intensity of exposure
U.S. Consumer Exposure Models

Consumer Exposure models exist for:

- Indoor air pollutants
- Residential pesticide products
- High volume consumer chemical use
  - General purpose cleaner
  - Hand wash laundry detergent
  - Interior latex paint
  - Bar soap
  - Used motor oil
U.S. Consumer Exposure Models

- PROMISE, American Chemistry Council
- DERM, Stanford University, USA
- (CALENDEX, Novigen Science, Inc., database not available)
- CARES, CropLife America
- LIFELINE, LifeLine Group
U.S. EPA Consumer Exposure Models

- E-FAST (Exposure, Fate, Assessment Screening Tool)
- MCCEPA (Multi-chamber Concentration and Exposure Model)
- SHEDS (Stochastic Human Exposure and Dose Simulation)
- WPEM (Wall Paints Exposure Assessment Model)
Model Parameter Influences

- Chemical state: vapor, liquid, or solid
- Product density
- Other ingredients in the product
- Physical nature of a transfer medium e.g., wet or dry skin or cloth dosimeter
- Physical nature of surface medium e.g., wet or dry carpet, vinyl flooring, or painted surface
Consumer Exposure Model Needs

• Consumer product information
  ▪ List of all key ingredients
  ▪ Recommended application and use rates
  ▪ Chemical fate in the environment
• Exposure information
  ▪ Physical nature of any transfer medium eg wet or dry skin or fabric
  ▪ Physical nature of a surface medium such as wet or dry carpeting, vinyl flooring, or painted surfaces
  ▪ Skin surface area contact
  ▪ Duration and force (pressure) of contact
Summary and Conclusion

- Consumer data exists but the focus is on hazard potential not exposure.

- Exposure models exist to estimate consumer exposures but they tend to be complex and not all model inputs may be available to run them.

- More information is needed about product characteristics and usage to improve our ability to estimate the consumer exposures.