Utilization of the USEPA High Production Volume Information System (HPVIS) to Prioritize Chemicals for Additional Public Health Follow-up

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Background

- **NJDHSS Occupational Health Unit**
  - Responds to inquiries from employers and workers
  - Responds to inquiries from the public
  - Conducts surveillance of specific hazards encountered at work
  - Conducts surveillance for occupationally related diseases in human populations

- **Questions typically focus on human health impacts from:**
  - chemicals
  - infectious disease
  - Injuries
Methods

- Reviewed phone log and professional records for last two years
- Summarized specific High Production Volume (HPV) chemicals that were the subject of inquiry
- Linked HPVIS, Section 313, Community Right-to-Know (CRTK), and AOEC Asthma Registry database chemical lists
- Selected chemicals that were in HPVIS and at least one other database list
Methods

- Summarized acute mammalian toxicity and reproductive toxicity data endpoints from HPVIS for the selected chemicals
  - determined high, medium, and low priority for follow-up
- Utilized Section 313, CRTK, and AOEC/asthma registry to identify NJ companies using the selected chemical
- Mailed Chemical use survey to companies
Results

- Total 16 HPV chemicals in phone log/professional records
- Nine of these had data submitted to HPVIS
- Six chemicals were of high or medium priority
- Four of these high or medium priority chemicals have industrial users in New Jersey
- Phosgene, acrylamide, phthalic anhydride, and hydrogen sulfide
## Results – Chemical Selection

<table>
<thead>
<tr>
<th>Chemical name and CAS #</th>
<th>Mammalian acute toxicity</th>
<th>Reproductive effects noted</th>
<th>Priority</th>
<th>notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>phosgene (75-44-5)</td>
<td>LC50 = 0.049 mg/L</td>
<td>No</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>acrylamide (79-06-1)</td>
<td>LD50 = 203 mg/kg</td>
<td>No</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>acetic acid (64-19-7)</td>
<td>LD50 = 4960 mg/kg</td>
<td>No</td>
<td>low</td>
<td></td>
</tr>
<tr>
<td>phthalic anhydride (85-44-9)</td>
<td>LOEL = 25, 000 ppm</td>
<td>Yes</td>
<td>Moderate</td>
<td>0.001 mg/L subtle repro effects noted (sperm motility decrease)</td>
</tr>
<tr>
<td>tetrachlorophthalic anhydride (117-08-8)</td>
<td>LDzero = 15, 800 mg/kg</td>
<td>Yes</td>
<td>Moderate</td>
<td>1500 mg/kg subtle repro noted (sperm motility)</td>
</tr>
<tr>
<td>triethanolamine (102-71-6)</td>
<td>LD50 = 7390</td>
<td>No</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>MMT (12108-13-3)</td>
<td>LC50 = 0.247 mg/L</td>
<td>No</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD50 = 58 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen Sulfide (7783-06-4)</td>
<td>LC50 = 370 mg/L</td>
<td>No</td>
<td>Moderate</td>
<td></td>
</tr>
</tbody>
</table>
Results

- Chemical handling and use survey mailed to a total of 46 New Jersey Companies
  - nine for acrylamide
  - 10 for hydrogen sulfide
  - three for phosgene
  - 23 for phthalic anhydride
  - one for phosgene and phthalic anhydride
Results

- 28 HPV Chemical Handling Surveys returned
  - 61% response rate
    - Phthalic anhydride 16 surveys (1 lab, 3 storage/transfer, 2 no longer use, 8 reactant, 1 impurity, 1 mix/blending)
    - Acrylamide 7 surveys (3 impurity, 3 reactant, 1 storage)
    - Hydrogen sulfide 4 surveys (2 reactant, 1 byproduct, 1 lab)
    - Phosgene 1 survey (reactant)
- Some releases reported; workers often used protective equipment
- Variable interpretation of what it means to “use” a chemical was noted
Results

- Report findings to stakeholders maintaining company confidentiality
- Follow-up on phthalic anhydride use, an occupational asthmagen
  - Provide free industrial hygiene consultation services and evaluation
- Follow-up with all companies regarding controlling and reducing exposures to workers
  - send education and outreach materials
Conclusions

- HPVIS data is useful for public health
- Data within HPVIS requires background in toxicology and animal testing protocols to interpret
  - Toxicology summaries for the “non-toxicologist” would be useful
- Various animal test protocols and studies utilized within HPVIS make professional judgment a necessary component of chemical comparisons for priority ranking
  - Toxicology contacts at USEPA should be available to provide technical assistance for making these judgments