East Metro PFC Biomonitoring
Follow-up Project

Community Meeting
December 12, 2011

Jessica Nelson, PhD
Jean Johnson, PhD

Environmental Public Health Tracking and Biomonitoring
Meeting agenda

- Welcome and introductions
- Follow-up project background
- Follow-up project results
- Results – what do they mean?
- MDH’s next steps
- Questions and answers
Introductions

Environmental Public Health Tracking and Biomonitoring Program Staff

Jessica Nelson, PhD, MPH  Epidemiologist/Program Coordinator
Carin Huset, PhD  Public Health Laboratory Chemist
Mary Winnett, MD, MPH  Physician Consultant
Barbara Scott Murdock, MA, MPH  Program Planner
Blair Sevcik, MPH  Epidemiologist
Jean Johnson, PhD  Epidemiologist/Program Director

Environmental Health Division Staff

James Kelly, MPH  Health Risk Assessment
Ginny Yingling, MS  Hydrogeologist
Julie Kadrie, MPH  Health Risk Communications
Mike Convery, PG  Hydrologist
Follow-up project background

• 2007 Minnesota State law created Environmental Health Tracking and Biomonitoring Program

• MDH directed to conduct pilot project in 2 communities “likely to be exposed” to PFCs

• 2008 East Metro PFC Biomonitoring Pilot Project
  – Oakdale (served by municipal water)
  – Cottage Grove/Lake Elmo (contaminated private wells)
  – All age 20+, lived at residence since before 1/1/05
Why was participation limited to adults?

**Ethics:** Drawing a blood sample is invasive. Project wouldn’t provide a direct health benefit to the child.

**Limited resources:** Adults with long residential history in the community are likely to have greatest body burden.

**Interpretation:** No comparison data in children for interpreting the results.
Efforts made to reduce drinking water exposures

• Carbon filtration at City of Oakdale’s water treatment plant
• ~290 homes with private wells in affected area connected to city water or provided with carbon filtration devices
• MDH continues testing to be sure water levels below health-based exposure limits
PFCs measured

PFOS (perfluorooctane sulfonate)
PFOA (perfluorooctanoic acid)
PFHxS (perfluorohexane sulfonate)
PFBA (perfluorobutanoic acid)
PFBS (perfluorobutane sulfonate)
PFHxA (perfluorohexanoic acid)
PFPeA (perfluoropentanoic acid)
Reminder: 2008 project results

- 3 PFCs (PFOS, PFOA, PFHxS) detected in 100% of participants
- Other 4 PFCs less commonly detected
- East Metro levels higher than U.S. population levels from 2003-2004
- Science Advisory Panel recommended a follow-up project
Follow-up project goals

1. Measure 2-year change in PFC blood levels in East Metro residents
   – Have efforts to reduce drinking water exposure to PFCs worked?

2. Investigate sources of exposure to PFCs
   – Do diet, use of consumer products, occupation, etc. help explain PFC blood levels?
How the project worked

- Participants from 2008 re-contacted
- Filled out 14-page questionnaire
- Blood samples taken at HealthEast Oakdale
- MDH Public Health Laboratory analyzed samples for same 7 PFCs
## Project participants

<table>
<thead>
<tr>
<th>Participants from 2008</th>
<th>n = 196</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreed to future contact</td>
<td>n = 186</td>
</tr>
</tbody>
</table>

2010 project participants
n = 164

- Average age = 55.8 yrs
- 84 from Oakdale, 80 from Cottage Grove/Lake Elmo
- 45% male, 55% female
- Average residence in 2008 home = 18.9 yrs
Change since 2008

<table>
<thead>
<tr>
<th>Substance</th>
<th>2008 Average</th>
<th>2010 Average</th>
<th>U.S. Population Average 2007-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFOS</td>
<td>35.1</td>
<td>24.3</td>
<td>13.2</td>
</tr>
<tr>
<td>PFOA</td>
<td>15.1</td>
<td>4.1</td>
<td>11.3</td>
</tr>
<tr>
<td>PFHxS</td>
<td>8.2</td>
<td>6.4</td>
<td>2.0</td>
</tr>
</tbody>
</table>
Average declines since 2008

- PFOS ↓ 26%
- PFOA ↓ 21%
- PFHxS ↓ 13%
- PFBA detected in 21% of participants in 2010, 25% in 2008
Differences by gender, age, residence

Average PFC blood level (Nanograms of PFC per milliliter of blood serum)

- PFOS
- PFOA
- PFHxS

Gender: Women, Men
Age group (yrs): <45, 46-59, >60
Residence length (yrs): <10, 11-25, >26

MINNESOTA DEPARTMENT OF HEALTH
No differences by 2008 community
What do these results mean?

• Because these declines are similar to other exposed communities, results tell us that efforts made to reduce drinking water exposure to PFCs in the East Metro were effective

• We expect that over time levels will continue to go down to “background” general U.S. population levels
Not all participants’ levels went down

Why?

- Variability in lab measurements
- Other exposures to PFCs (diet, products)
- Eating fish from area lakes/Mississippi
- Biological differences
- More for people with lower 2008 levels – drinking water exposure not as important
PFCs and health: an update

• We still don’t fully understand human health effects of PFC exposure
• Animal studies find effects on liver and thyroid function, reproduction, and some tumors – but, often higher exposures, difficult to compare
• Published studies so far do not show clear evidence that PFCs increase risk of human disease
• General population studies currently underway – C8 Study results in 2012
Exposure to PFCs: an update

• In communities with groundwater contamination, drinking water a major source
  – Filtration decreases this exposure

• General population exposures less well understood
  – Diet thought to be major source
  – Household dust, especially toddlers
  – Consumer products – carpeting, textiles, etc.
MDH’s next steps

• Next phase of analysis: project questionnaires
  – More detailed look at drinking water exposures, residential history
  – Other sources of exposure to PFCs
  – Why didn’t some peoples’ levels decline?

• Review studies about possible human health effects, communicate information to community
Staying informed

• MDH East Metro PFC Biomonitoring web site: [www.health.state.mn.us/biomonitoring](http://www.health.state.mn.us/biomonitoring)

• Sign up for email updates:
  1. [www.health.state.mn.us/biomonitoring](http://www.health.state.mn.us/biomonitoring)
  2. [www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/](http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/)
Thank you

- **Project participants**: your willingness to participate helped the community as a whole
- Elected officials
- Local public health officials
- Environmental Public Health Tracking and Biomonitoring Science Advisory Panel
Questions?

Jessica Nelson, PhD
Environmental Public Health Tracking
and Biomonitoring Program

jessica.nelson@state.mn.us
651-201-3610