The Chemicals in our Bodies Project
A Joint Project of

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• Biomonitoring California  
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• University of California Berkeley  
  – PI Rachel Morello-Frosch
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Project Goals

1. To measure and compare levels of about 100 chemicals in 75-100 maternal-infant pairs;

2. To identify leading sources of exposure to a subset of these chemicals;

3. To develop and test an approach to provide chemical biomonitoring results to participants; and

4. To evaluate the association of chemical exposure and pregnancy and birth outcomes.
Research Design and Methods

• Recruit and enroll 75-100 maternal-infant pairs at San Francisco General Hospital
• Interview women on potential sources of exposure to chemicals (diet, home environment, workplace, etc)
• Collect biological specimens (urine, maternal and umbilical cord blood)
• Develop report back materials for participants to understand their chemical biomonitoring results (Rachel Morello-Frosch previously presented)
Recruitment

Eligibility:
1. English and Spanish-speaking
2. 18 and older
3. Due Date within Recruitment Timeline
4. Delivering at SFGH
5. No high risk pregnancy

Recruitment Sites:
1. Centering Groups (Homeless Prenatal, Good Samaritan)
2. OB Continuity Clinic (SFGH)
3. Nurse Practitioner Clinic (SFGH)
4. Midwives Clinic (SFGH)
5. Family Planning Center (SFGH)
Questionnaire Chemical Focus Areas

- Pesticides
- Perfluorinated Chemicals
- BPA
Interview- Administered Survey

Sections:

- Food, Water and Cooking
- Home (e.g. nail polish, dyes, paint, installation, furniture)
- Pesticides
- Occupation
- Reproductive History
- Tooth Fillings
- Demographics

Typical Questions:

- How many times a day, week, month or year do you eat (Red Meat)?
- Since you became pregnant have you used any (nail polish or nail polish remover)?
- In the past 30 days, did you or anyone else in your home use chemicals or pesticides....
- For birth control have you ever used (Mirena or other type of hormone-releasing Intrauterine Device)?
At-Home Survey

Sections:
• Personal Care Products
• Hair Care Products
• Make-up
• Body or Face Products
• Cleaning
• Bedroom, Closet, Home, Electronics

Typical Questions:
• Is your mattress treated for stain protection or water resistance?
• Do you usually sleep with a regular foam or memory foam pillow?
• Do you own any clothing that is labeled wrinkle-resistant or stain-resistant (e.g. shirts or blouses, pants, suit jackets)?
Chart Abstraction

- **Prenatal Charts**: (age; ethnicity; medical history; previous pregnancies; pregnancy dating; emotional status; education/employment/finances; prenatal nutrition; weight history)
- **Labor and Delivery Charts**: (past obstetric history; medications; psychosocial history; past medical history; health history; initial newborn exam)
- **Birth Center Charts**: (newborn care; admission assessment; biophysical baseline)
Biological Specimen Collection

• Maternal Urine: collected at time of exposure assessment interview (Creatinine, Phthalates, Perchlorate, Bisphenol A, Triclosan, Mercury, Pyrethroids (3-PBA), Chlorpyrifos metabolite (TCP), OH-PAHs (3 Phen), Metals (Pb, Cd, As, U), Speciated Arsenic

• Maternal and Umbilical Cord Blood: collected at delivery (Metals (mercury, lead, cadmium), Perfluorinated chemicals, PCBs, Brominated Flame Retardants (PBDEs, PBBs and FireMaster 550, etc.), DDT/DDE (pesticide), Hexachlorocyclohexane (HCH, a pesticide – ex: Lindane)
Educational Materials

Each Participant Received an End of Study Packet:

- Healthy Everyday
- Green Cleaning Recipes
- Instructions on the safe removal of ants, cockroaches, mice
- Lead Brochure
- EWG’s Guide on PFCs and Triclosan
- Dirty Dozen
- NRDC’s Fish Guide
Recruitment Statistics

• Started July 2010 - ended June 2011
• Recruited ~ 5 participants/week
• Enrolled 92 participants
• ~ 65% of eligible participants are approached by our study team*
• ~ 50.1% of approached participants enrolled*
• Some reasons for not enrolling:
  • Disinterest in subject matter
  • Not enough time to participate and/or interview
  • No childcare, no transportation, etc.

*calculated for days in which there were eligible appointments
Specimen Collection Success Rates

• We collected
  – 83% of participant’s maternal blood
  – 98% of participant’s maternal urine
  – 67% of umbilical cord blood

• Some reasons for missed collection:
  – Women delivered before able to interview i.e. urine
  – Delivered before being able to “flag” charts i.e. blood
  – Emergency or scheduled c-section i.e. cord blood.
Preliminary Results

• Blood lead levels
  – Reported to SFDPH for additional follow-up
  – Letter and brochure sent to participants

• Elevated mercury
  – Conducted home assessment with SFDPH, US EPA Region 9 to determine sources of exposure
  – Provided health education to participant
Next Steps

• Data validation and analysis
• Presenting and publishing results
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