

## EXPOSURE SCIENCE

# BPA in Canadian Population Highest Among Teens

For the first time, estimated bisphenol A (BPA) concentrations in the general Canadian population are available, and teenagers are leading the way in terms of exposure.<sup>1</sup> Data collected during 2007–2009 show that 91% of Canadians tested had detectable levels of BPA in their urine, indicating widespread exposure to the chemical among the general population. Among age groups, teenagers (12–19 years old) had the highest geometric mean level, 1.50 µg/L, compared with the overall geometric mean for 6- to 79-year-olds of 1.16 µg/L.

The August 2010 report from Statistics Canada is based on the Canadian Health Measures Survey, an ongoing effort to collect biomonitoring data from a nationally representative sample—comparable to the U.S. National Health and Nutrition Examination Survey (NHANES). “A definitive answer as to why we observed higher concentrations among teenagers would be useful,” says Tracey Bushnik of Statistics Canada and lead author of the report. “Beyond making some general hypotheses, however, we can’t really speak to what may be driving these differences.”

BPA is a high-volume industrial chemical with many applications. Food and beverage packaging represents the largest source of human exposure due to the compound leaching into packaged contents from container linings.<sup>2</sup> Animal studies of low-level BPA exposure suggest negative effects on the reproductive system and neurodevelopment, increased risks of prostate and mammary cancers, and possibly higher risk of obesity and diabetes.<sup>2–5</sup> Although exposure levels have been established in humans, definitive data for related health effects are not available. Similarly, data establishing a link between BPA intake and biomonitoring results are also lacking.

A recent study based on 2005–2006 NHANES data took a preliminary look at potential sources of BPA exposure.<sup>6</sup> This analysis supported an association between urinary BPA

concentrations and consumption of soda, school lunches, and meals prepared outside the home, all of which likely involve packaged foods, including canned goods. Eventually other sources and routes of exposure may be identified as well, as suggested by the recently publicized case of BPA found on cash register receipts and thermal papers.<sup>7</sup>

Such findings need to be viewed with caution though. “These results are best considered as hypothesis-generating,” says Judy LaKind, president of LaKind Associates in Catonsville, Maryland, and lead author of the NHANES analysis. She adds, “Further research is needed—preferably research that includes actual measurements of BPA in [sources of exposure]—to substantiate these results.” LaKind stresses that the value of biomonitoring studies lies in providing reference ranges, trend data, and the bases for research hypotheses; they do not establish causal relationships.<sup>8</sup>

With the Canadian study in mind, Bushnik agrees that biomonitoring studies are important for creating a foundation for more in-depth study. “With these data we have baseline information against which we can compare future data,” she says. Once more data are available, it will be possible to examine BPA exposure in greater detail and possibly also consider interrelationships of personal variables and sources of exposure.

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## The Beat | by Erin E. Dooley

### NIH Launches Gulf Oil Worker Study

This fall the NIH will launch a multiyear study to assess potential health effects from the *Deepwater Horizon* oil spill.<sup>1</sup> So far, \$20 million in funding has been announced, half of that from BP. The research will focus on exposure of cleanup workers to oil and dispersant chemicals, addressing a broad range of potential neurobehavioral,



Near Pass a Loutre, Louisiana, 19 May 2010

carcinogenic, and immunologic end points. Mental health effects also are expected to be evaluated. The NIH is hosting webinars and other activities to obtain input on the study design and implementation from the most affected Gulf Coast communities.

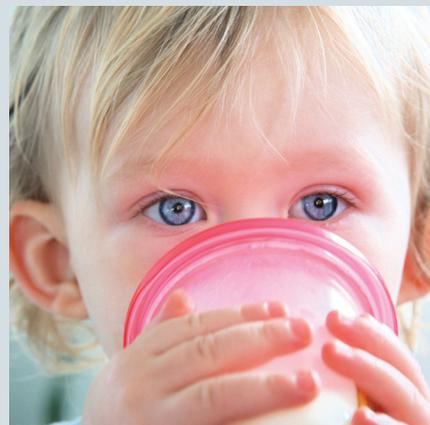
### Asthma Drug Efficacy in SHS-Exposed Children

New research suggests that among children with mild to moderate asthma, those who were exposed prenatally to secondhand smoke (SHS) had less of a response to the asthma medication budesonide than those who had no prenatal SHS exposure.<sup>2</sup> Although all the children’s symptoms improved with treatment, the SHS-exposed group had on average 26% less of an improvement in airway responsiveness than children who were not exposed. Although inhaled corticosteroids remain first-line therapy for children with persistent asthma, these findings offer a potential explanation as to why children exposed prenatally to SHS may not respond to inhaled steroids as

well as hoped. The authors point out the importance of preventing SHS exposure by encouraging pregnant women not to smoke.

### California Senate Defeats BPA Ban

Amid heavy lobbying from the chemical and pharmaceutical industries California’s Senate in late August defeated a bill introduced by Sen. Fran Pavley (D) that would have banned more than trace amounts of bisphenol A



Left to right: Photo courtesy of the Office of the Governor, Louisiana; © Adam Loeuwen

## CHILDREN'S HEALTH

## AAP Publishes Oil Protection Guidelines for Children

Sparked by requests from anxious parents throughout the U.S. Gulf Coast region after the *Deepwater Horizon* oil rig exploded on 20 April 2010, the American Academy of Pediatrics (AAP) worked with the Pediatric Environmental Health Specialty Units (PEHSU)<sup>1</sup> to develop fact sheets for clinicians and parents that pulled together the best available information on protecting children against oil exposures.<sup>2</sup> The recommendations, which have been endorsed by the American College of Medical Toxicology and the American Academy of Clinical Toxicology, cover a wide range of measures addressing air, water, beach, and food issues, and they can be applied in any oil-exposure situation.<sup>3</sup>

The recommendations are only professional best estimates based on the limited information about health effects of oil spills on adults, acknowledges Katherine Kirkland, executive director of the Association of Occupational and Environmental Clinics, which runs PEHSU. "There really isn't any research done on children," she says. The fact sheets will be updated as more information becomes available, says Scott Needle, a Florida pediatrician and member of the AAP Disaster Preparedness Advisory Council.

Along with physical health concerns, the fact sheets address psychological problems that may develop in children because of worries about their own health or that of their parents. Needle says it's essential for parents to try to head off problems by talking with their children and to reassure them that people are working to clean up the oil and keep this from happening again.

"We are also concerned about the potential long-term community effects, particularly economic and psychological, and especially affecting areas that have already been battered by severe hurricanes and other stressors in recent years," Needle says. "The majority of our experience in long-term effects comes from studying the *Exxon Valdez* spill in Alaska, and affected communities there are still dealing

with the mental health effects." Even if children do not exhibit health symptoms directly, he says, their overall health and sense of well-being may continue to be impacted on a long-term basis.

John Lanza, director of the Escambia County Health Department in Pensacola, Florida, had not heard of the PEHSU guidelines,<sup>4</sup> but he says his county adopted similar recommendations based on research conducted by a consortium of Florida panhandle counties after the spill began. The county also conducted an extensive community education effort that parents and children seem to have heeded.

The number of acute health problems reported so far has been minimal.<sup>5</sup> Data on longer-term effects on children may be hard to come by, however—of the four Gulf states tracking self-reported spill-related health complaints, only Louisiana is breaking out exposure and health effect data by age,<sup>5</sup> and no definitive plans for researching health effects on children have surfaced. Moreover, as recently as mid-September new sightings of oil were being reported for several Louisiana beaches, marshes, and offshore areas,<sup>6</sup> and there are widespread concerns that oil will continue to resurface in still other areas when storms pass through. It's extremely difficult to predict how soon after any given storm that it will be safe to visit shoreline areas, says Stephen West, a Coast Guard spokesman working with the Unified Area Command.

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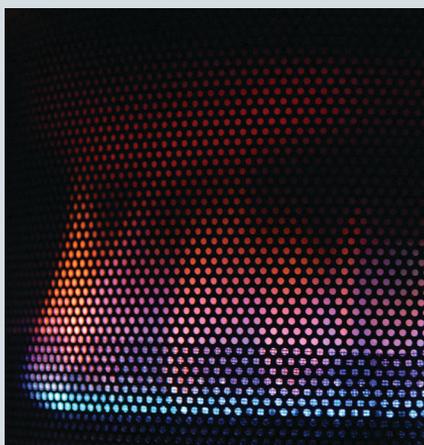
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1. PEHSU is a North American network of children's health experts who provide information on various children's health issues. PEHSU is funded by the U.S. Agency for Toxic Substances and Disease Registry and the U.S. Environmental Protection Agency.
2. PEHSU. Fact sheets [website]. Available: <http://tinyurl.com/285dn29> [accessed 15 Sep 2010].
3. For instance, on 26 July 2010 Enbridge Energy Partners informed officials that a 30-inch oil pipeline it owns near Marshall, Michigan, had burst, spewing roughly 1 million gallons into nearby watersheds (see <http://tinyurl.com/28wvxy8b> [accessed 15 Sep 2010]).
4. The AAP is assessing the effectiveness of its fact sheets and outreach efforts, but has few data so far, other than its Aug 9–Sep 16 tally of 439 hits on the health providers' fact sheet and 261 hits on the community fact sheet, according to Kirkland.
5. CDC. Gulf Oil Spill 2010, Health Surveillance. Atlanta, GA: U.S. Centers for Disease Control and Prevention. Available: <http://tinyurl.com/2erhxdl> [accessed 15 Sep 2010].
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(BPA) in children's products such as baby bottles, drinking cups, and infant formula containers.<sup>3</sup> The vote on the decision was two votes short of passage; it must now be reintroduced in the next legislative session. Sen. Dianne Feinstein (CA–D) has announced plans to include an amendment to the upcoming FDA Food Safety Bill that would ban BPA in a range of children's products.<sup>4</sup>

### Atrazine and Rat Puberty

In one of the first studies to show low-dose effects of atrazine metabolite mixtures, levels of the herbicide similar to those found in drinking water sources have been associated with a higher incidence of prostate inflammation and delayed puberty in prenatally exposed male rats.<sup>5</sup> The EPA has begun a comprehensive evaluation of atrazine to help assess its effects on human health, a process that could lead to a revision of the current risk assessment and new regulations.<sup>6</sup> Atrazine is mainly used for weed control and on crops such as corn and sugarcane.



### Classroom Stoves Up in the Air

Research in this month's issue of *EHP* links classroom exposure to "low NO<sub>x</sub>" unflued gas heater emissions with increased respiratory symptoms.<sup>7</sup> In July 2010, in response to the initial publication of this paper, the education minister of New South Wales announced that all low NO<sub>x</sub> unflued gas heaters in the state's public schools would be replaced with

cleaner heating sources at an estimated cost of AUD\$400 million. Afterward, the state government retracted the offer, saying the promise had not gone through the proper governmental channels. The government is now trying to come up with support for the funding to go forward with the replacement, which will involve 50,000 heaters.<sup>8</sup>

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