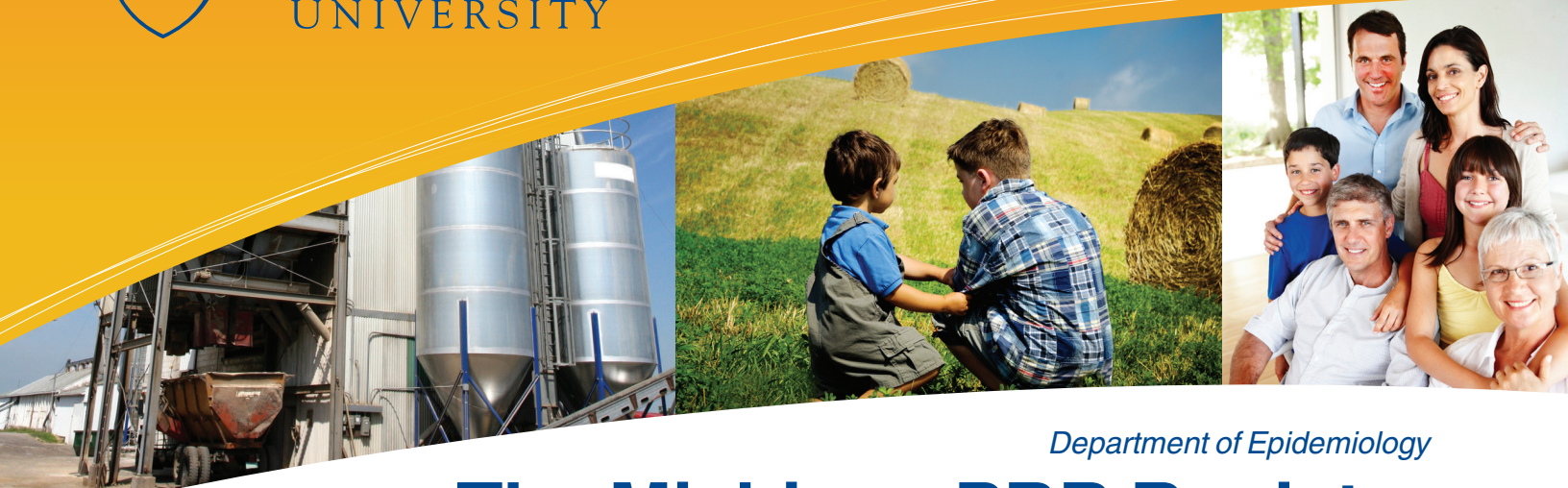




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Department of Epidemiology

The Michigan PBB Registry

PBB and Michigan Residents: Information for Clinicians

In early 1973, the Michigan Chemical Company accidentally shipped polybrominated biphenyls (PBB), a fire-retardant chemical used in the manufacture of electrical appliances, to the Farm Bureau instead of magnesium oxide. The PBB was mixed into livestock feed and consumed by cattle, pigs, and chickens. Contaminated milk, beef, and other farm products were sold throughout the state until the accident was discovered about a year later. The major acute health effects reported were skin rashes, hair loss, and memory problems, though these effects were mainly transient. However, PBB is stored in adipose tissue and remains in the body for many years. PBB has endocrine modifying properties and has been shown it to mimic estrogen, to block androgens, and interfere with thyroid function.

To study the long-term health effects of the PBB exposure, the Michigan Health Department created a registry of more than 4,000 people who consumed the contaminated farm products. The Michigan PBB Registry now also includes many of their children who may have been exposed to PBB in the womb and through breast milk. The health effects of PBB are still being investigated but research has identified several notable findings among the exposed population.

Most of the findings are based on studies that compared PBB registry members with high blood levels of PBB to those with low (or non-detectable) levels of PBB. Other risk factors for the health outcomes were considered in analyses and adjusted for, when possible. It is important to keep in mind that although researchers used modern statistical and epidemiologic methods to isolate the effects of PBB exposure, unmeasured factors such as genetic susceptibility or lifestyle may be related to PBB exposure and therefore influence the results.

Health Effects and Research Findings related to the Michigan PBB Contamination

- Men with high PBB exposure were more likely to report thyroid disease compared to those with low PBB exposure, with an odds ratio of 1.8.¹
- Women with high PBB exposure and recent weight loss had shorter menstrual cycle lengths and longer bleed lengths than women with low exposure. Notably, the recent weight loss is likely to have released more PBB from adipose tissue into circulation.²
- Among women with high exposure to PBB there were a few more cases of breast cancer than expected (9 vs. 4 expected in a population this size), with an odds ratio of 3.1, compared to women with low PBB exposure levels.³
- PBB can cross the placenta and has been detected in the breast milk of highly exposed mothers. Children born to highly exposed mothers were more likely to have PBB detected in their blood than children of mothers with lower exposure. Those who were breastfed for more than 5 months were six times more likely to have PBB detected in their blood than children who were not breastfed.⁴
- Breastfed daughters exposed to high levels of PBB in utero had an average age at menarche of 11.6 years, approximately one year earlier than breastfed daughters exposed to low levels of PBB in utero or daughters who were not breastfed, with hazard ratios of 3.4 and 3.7 respectively.⁵
- Daughters, now of reproductive age, exposed to mid- and high levels of PBB in utero were more likely to experience miscarriage, when compared to women with the lowest exposure to PBB in utero, with an odds ratio of 2.8. Exposure during infancy to PBB-contaminated breast milk further increased this risk.⁶
- Sons of women highly exposed to PBB were more likely (odds ratio of 2.0) to report any genitourinary condition (hernia, hydrocele, cryptorchidism, hypospadias, or varicocele), than sons of the least exposed women.⁷

For more information please visit the PBB Research website at <http://www.PBBregistry.emory.edu>

References

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