

Question about the prevalence, death rates, and locations for Blue Baby Syndrome cases in Minnesota and the metropolitan area:

Blue Baby Syndrome (BBS or methemoglobinemia) is not a “reportable” disease in MN. A reportable disease is one where a diagnosis is legally required to be reported to MDH. MDH does not have data on the number of cases or deaths in Minnesota.

Historically, there was a landmark study in 1945 by Dr. H. H. Comley of the University of Iowa. He described two infants with diarrhea and cyanosis which was eliminated with the administration of methylene blue, suggesting that BBS was the cause. The infants’ families’ well water samples had nitrate levels of 90 and 140 mg/L.

There was a follow up study in Minnesota conducted by the Minnesota Department of Health (Rosenfeld and Huston) in 1950 that verified the findings in Iowa. Between January 1947 and July 1949, there were 146 cases of BBS in infants, including 14 deaths, reported to the department. Local physicians were alarmed by the number of cases and voluntarily called on MDH for assistance.

The vast majority of cases occurred in southwest Minnesota, in dug or tile wells that would never be permitted under our current well code. Of the 133 wells associated with the cases, 51 had nitrate above 100 mg/L. The current public drinking water standard is 10 mg/L. All but two wells had concentrations above 20 mg/L. Parents were mixing well water with evaporated milk, powdered milk, or cow’s milk. There were no cases for breast fed infants. Since that time, many homes in southwest Minnesota have been connected to rural water supply systems which are regulated for nitrate.

In recent years, MDH is only aware of two cases because we were asked to investigate the sources of nitrate to the family’s well. In both cases, there was a nearby source (manure and discharge from a washing machine used to wash clothing covered with manure) rather than widespread nitrate in the aquifer used for drinking water.

Question on MDH’s role with pesticides:

MDH is charged with making sure drinking water is safe for everyone, everywhere in Minnesota. MDH takes a lead role in managing health risks from contaminants in drinking water, including pesticides. Some pesticides in drinking water are regulated in public water systems by the federal Safe Drinking Water Act which MDH administers in Minnesota. There are no regulations for pesticides in private wells, however both MDH and the Minnesota Department of Agriculture (MDA) are taking proactive steps to understand where pesticides are found in drinking water aquifers and whether the levels found are a concern for people’s health.

For the many pesticides that do not have any federal drinking water standard, MDH toxicologists are able to review the scientific literature and conduct a health risk assessment. Depending on the amount of research available, MDH is able to develop guidance values that are protective for most Minnesotans, including sensitive populations and those who are highly exposed. Without these guidance values, MDH and sister agencies would not know when a water sample result should trigger actions to protect people’s health.

In collaboration with our colleagues at MDA, we are looking for a wide range of pesticides and their degradates in public water systems and private wells.

For community water systems, we completed two studies in 2010 and 2015 on pesticides in community water systems – very little was detected. Even if one took every result from every well tested and put those results together in one imaginary well, the sum total would not exceed any health guidance. Since then, we have completed another assessment through our Unregulated Contaminants Monitoring Project and now are transitioning to periodic, scheduled surveillance through our Drinking Water Ambient Monitoring Program (DWAMP) supported by Clean Water Fund dollars.

In private wells, as part of their Township Testing Program, MDA conducted testing for a large group of pesticides when nitrate was detected in that well. At the request of MDA, MDH reviews the results from each well and determines if the water is safe to drink. If the water is not safe, MDH issues a “Well Advisory letter.” MDA sends that Well Advisory together with a cover letter to the well owner advising the well owner to consider treatment. MDH worked with MDA on the wording of that letter to make sure the risk communication was clear and understandable. MDH also collaborated with MDA on determining what treatment systems should be recommended for reducing or removing the pesticides from the drinking water.

As far as other cancer-causing contaminants in drinking water, many are already regulated for public water supplies through the Safe Drinking Water Act. MDH has a new initiative funded through the Clean Water Fund that will be testing public systems and a limited number of private wells for unregulated or emerging contaminants, some of which are associated with cancer health effects. This Drinking Water Ambient Monitoring Program will be sampling source waters, both groundwater and surface water, for a list of contaminants to learn more about where they are found and at what levels. MDH will then compare the levels that are found with the health guidance values that MDH develops to determine if action is needed.

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