EXECUTIVE SUMMARY

Madison and Dane County
Environmental Health Report Card - 2014

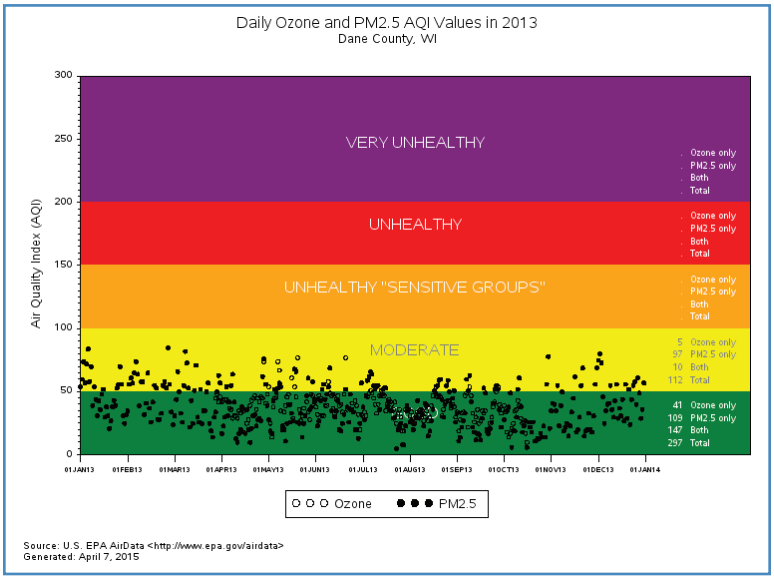
May 31, 2016

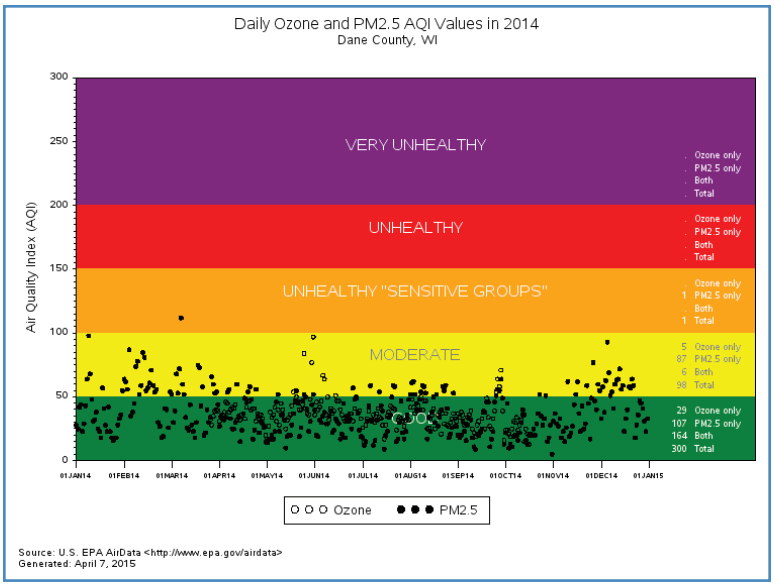
The 2014 edition of the Madison and Dane County Environmental Health Report Card was delivered in a series of independent reports to improve the availability of this information to the residents of our communities. The information in this report series provides the most recent data analysis of environmental issues impacting Dane County. Issues discussed in the reports include ozone and fine particulates in the air, nitrates and chloride levels in municipal drinking and surface waters, lead paint in homes, waste disposal and recycling, and the sustainable usage of water resources. Each of the full reports is available from the Public Health Madison & Dane County (PHMDC) website at **www.publichealthmdc.com**.

A brief summary of some of the more important findings of the report are provided below.

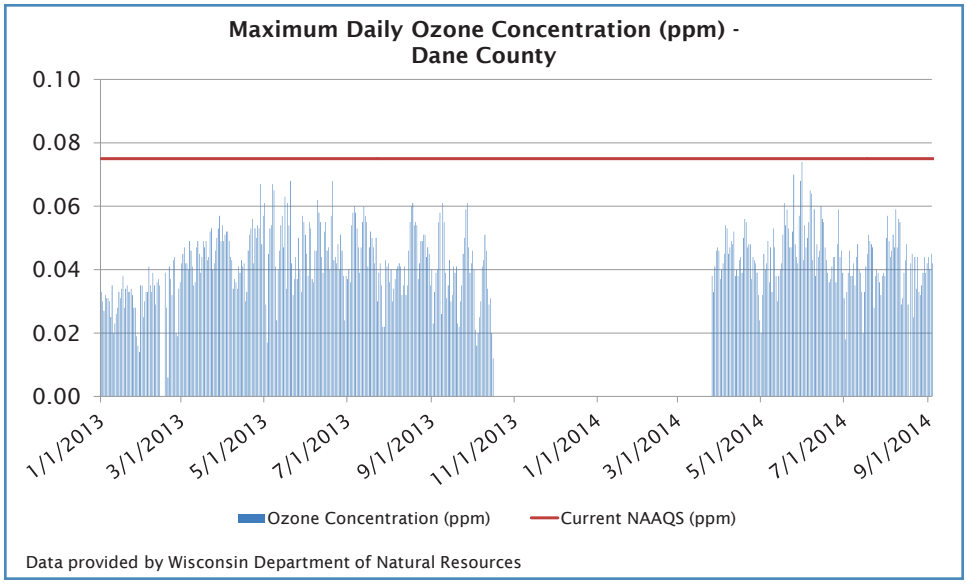
AIR QUALITY

The assessment of air quality was based on measured levels of ozone, fine particulate matter (PM 2.5), and Air Quality Index (AQI) values. As shown in the accompanying figures, the vast majority of days reported during 2013 and 2014 had "good" air quality; all other measurements were "moderate" with the exception of one measurement considered "unhealthy for sensitive groups" reported in 2014 due to elevated levels of particulate matter. Similar results have been reported throughout the past decade (2005-2014) that further demonstrates the consistency of Dane County air quality.

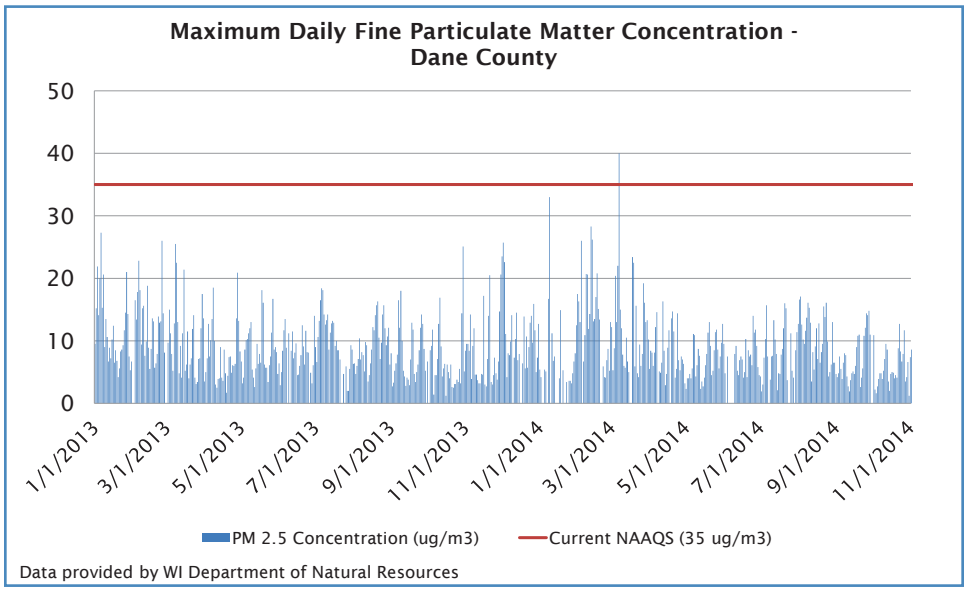




During the 2013 and 2014 time periods, the reported maximum concentration of daily ozone never reached or exceeded the federal daily standard of 0.075 parts per million (ppm). Including the current data, the maximum concentration of daily ozone reached or exceeded the current NAAQS during a total of 3 days in the past 5 years (2010-2014). All three of these reported exceedances occurred in 2012.



In addition to ground level ozone, the surveillance of fine particulate matter (PM 2.5) is an essential component to the evaluation of Dane County air quality. During the current evaluation period the maximum daily concentration of PM 2.5 exceeded the current guideline of 35 $\mu g/m^3$ during a 24 hour period of exposure only during one day in 2014. No exceedances were reported in 2013. Including the data from 2013 and 2014, the concentration of PM 2.5 exceeded current standards during the past 5 years (2010-2014) a total of 6 days; four of these reported exceedances occurred in 2010 and another in 2012.

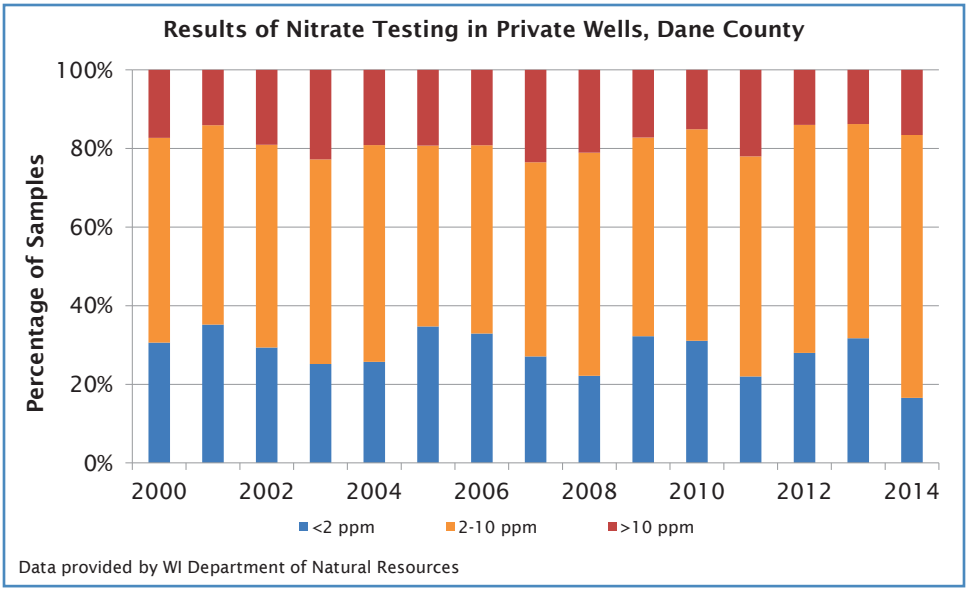


The air quality in Dane County is heavily dependent upon the emissions of vehicular traffic; a significant mobile source of contaminants including nitrogen oxides, PM 2.5, volatile organic compounds, and sulfur dioxide. Individual use trends of state highways and arterial roads indicate differences in use patterns. In 2014, the reported increase in weekday traffic volumes since 2000 was approximately 25%; annual increases ranged from 0% to 6% (2008 and 2004, respectively) with only four years reporting annual decreases (2005, 2006, 2011, and 2014). Industrial emissions are also an important source of pollutants impacting Dane County air quality. During the last decade, the reported emissions of hazardous air pollutants (HAPs) by Dane County industries have declined approximately 83%; since 2004 and have remained relatively consistent since 2009.

Individual and community action is essential to the improvement of Dane County air quality. Individual actions include walking, biking, carpooling, and using mass transit options to reduce vehicular emissions. In addition, individuals and businesses can improve energy conservation buy the purchase of and the promotion of more energy and fuel efficient products and using green building techniques when building or remodeling your home or business. Actions at the community level to improve ambient air quality include the use of Air Quality Notices, the promotion and/or sponsorship of voluntary organizations, and the support, improvement, and expansion of mass transit and other alternative modes of transportation.

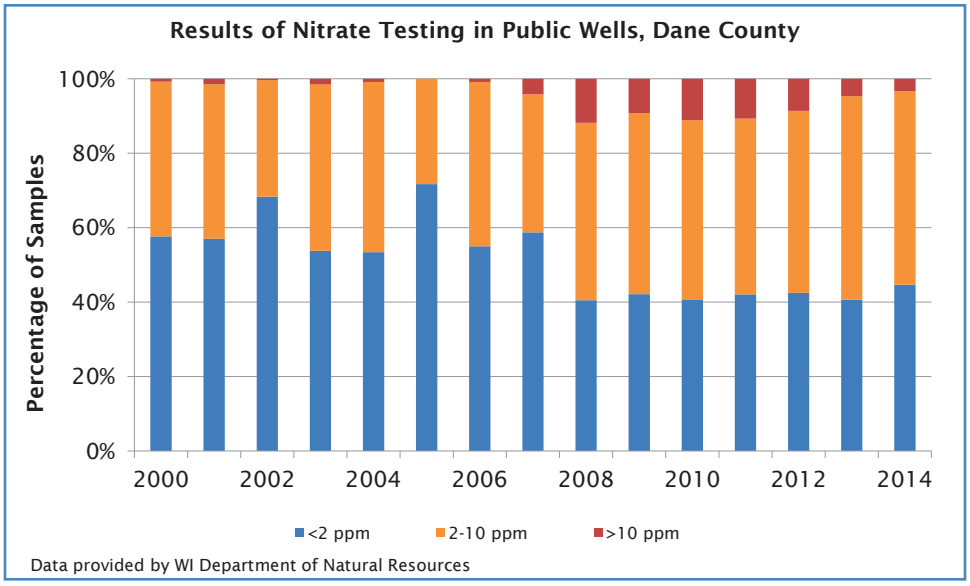
WATER QUALITY

Surface and ground water resources are susceptible to contamination that can greatly influence the health of Dane County residents. For example, approximately 18% of annual reported private well sample results over the past fifteen years (2000-2014) have exceeded the 10 ppm water quality standard for nitrate established for public water systems; approximately 54% had nitrate levels between 2 to 10 ppm. All other samples had nitrate levels below 2 ppm. The sampling years since the publication of the previous version of this report (2013 and 2014) displayed similar results to the previous years in the timeframe.

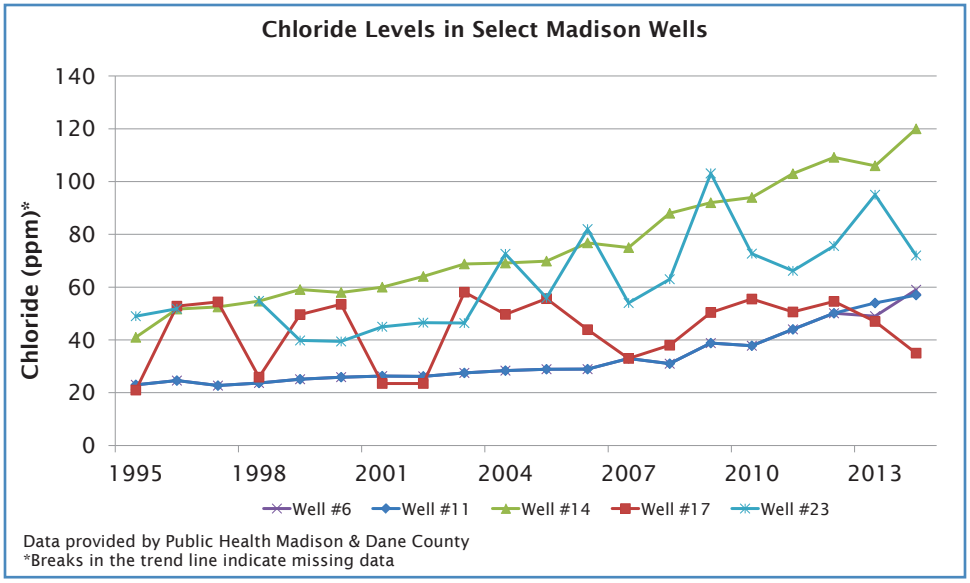


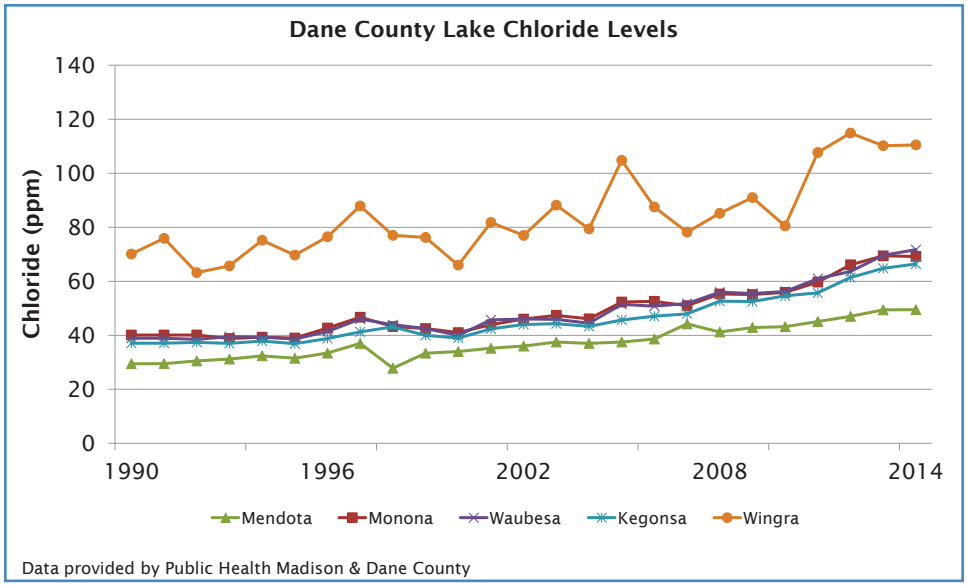
Public wells tested during the same fifteen year period demonstrated slightly better results with approximately 6% of the reported samples had nitrate levels greater than 10 ppm. All other samples were within acceptable levels; approximately 45% had levels between 2 to 10 ppm and 48% below 2 ppm. However, since 2007 there have been notable increases in the annual percentage of samples with concentrations of nitrate greater than 10 ppm and decreases in the percentage of samples lower than 2 ppm. Samples reported from 2013 and 2014 showed improvement.

Although public water systems are tested regularly, many of the private wells in Dane County are not routinely tested. The lack of consistent testing may hide a potential health risk because private wells are usually more vulnerable to contamination than deeper municipal drinking water wells. High nitrate levels are less prevalent in municipal wells.



Chloride levels in municipal wells and Dane County surface waters have continued to increase over the past decade; routine application of road salt with subsequent run-off from snow melt during the winter months is the primary driver of this noted increase. However, salt used in water softeners and salt applications to parking lots, sidewalks, and private property also contribute to the levels of chloride reported in surface and ground water resources; currently there is no data available to evaluate the amount of salt used in these situations.





Additional areas of concern for surface water quality include weed and algae growth, bacteria, mercury and polychlorinated biphenyls (PCB) contamination, and phosphorus levels.

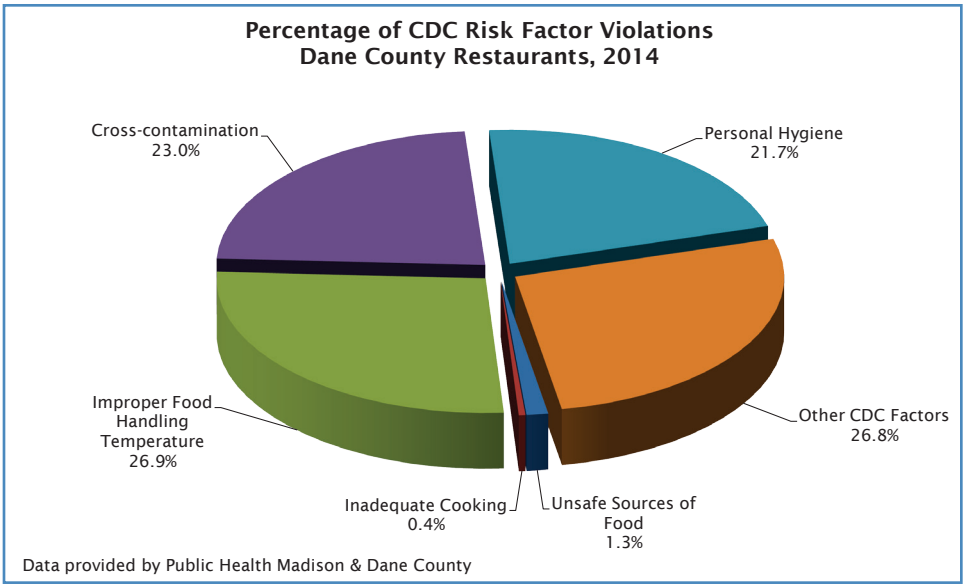
Appropriate use and disposal of chemicals and other contaminants is essential to prevent or reduce their potential impact to the quality of ground and surface water resources. Mercury and PCBs are long-lasting examples; both of these contaminants tend to accumulate in the aquatic environment and are difficult and costly to remove. In addition, a continued effort to limit the amount of storm water entry into Dane County surface waters is necessary; increases in chloride concentrations is a testament to this necessity

FOOD PROTECTION

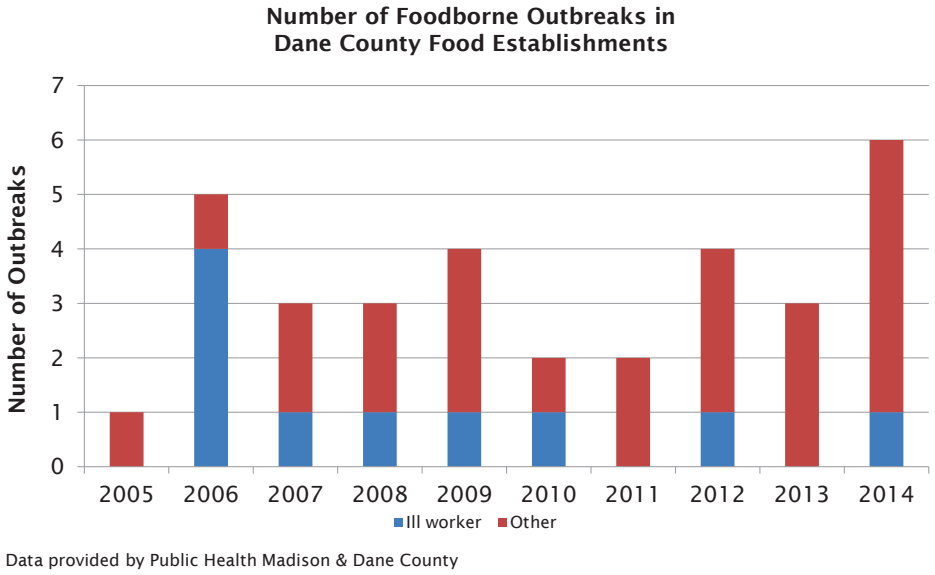
The City of Madison and Dane County benefit from safe, high quality food establishments and vendors. However, improper food handling and the presence of ill workers in a food establishment can result in the illness of many people. Therefore, continued safe food handling training and efforts are essential to prevent and control foodborne illness. Foodborne illness is not just limited to food establishment but can also occur in the home without the use of safe food handling practices when preparing or storing food products.

Food contaminated with bacteria, viruses, parasites, or harmful chemicals can occur at multiple points along the food supply chain including, but not limited to, processing, transportation, storage, or preparation. At these points of risk food supplies are the most vulnerable and may result in foodborne illness among consumers of contaminated products. To reduce this risk, food safety inspections of local restaurants and food vendors are conducted to prevent and/or control foodborne illness.

The results of nearly 1500 inspections conducted annually during both 2013 and 2014 showed that improper food temperature, cross contamination, and poor hygiene were the most common risk factors in Dane County food establishments during both years. This was similar to previous years. Data from the inspections conducted in 2014 are shown below as a typical demonstration of the type and frequency of violations recorded during an inspection.



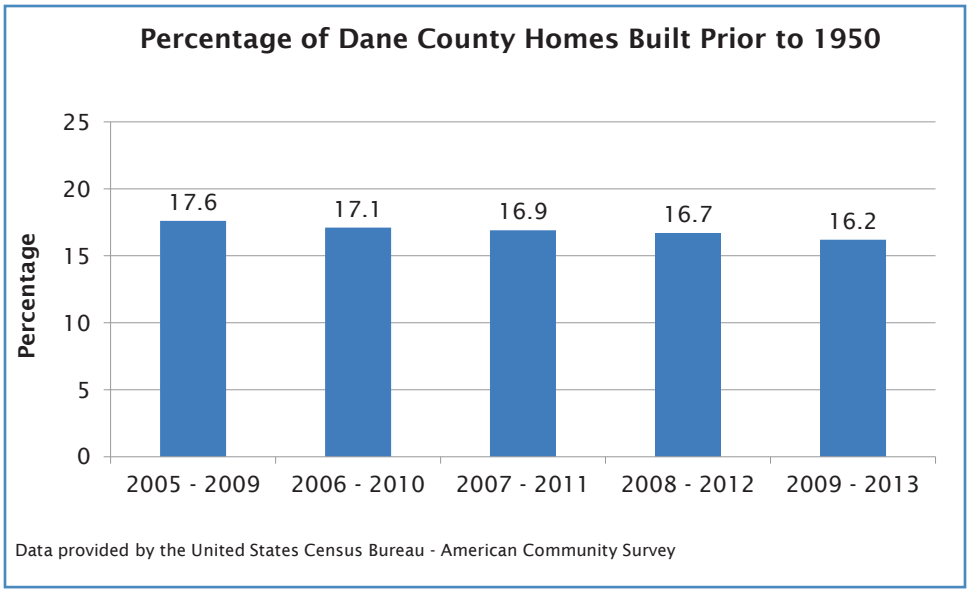
In addition to the risk factors above, the handling of food products or eating utensils by ill workers is another potential source of foodborne illness in Dane County. The following figure shows the number of foodborne illness outbreaks in Dane County over the past several years and demonstrates the necessity of safe food handling and preparation practices.



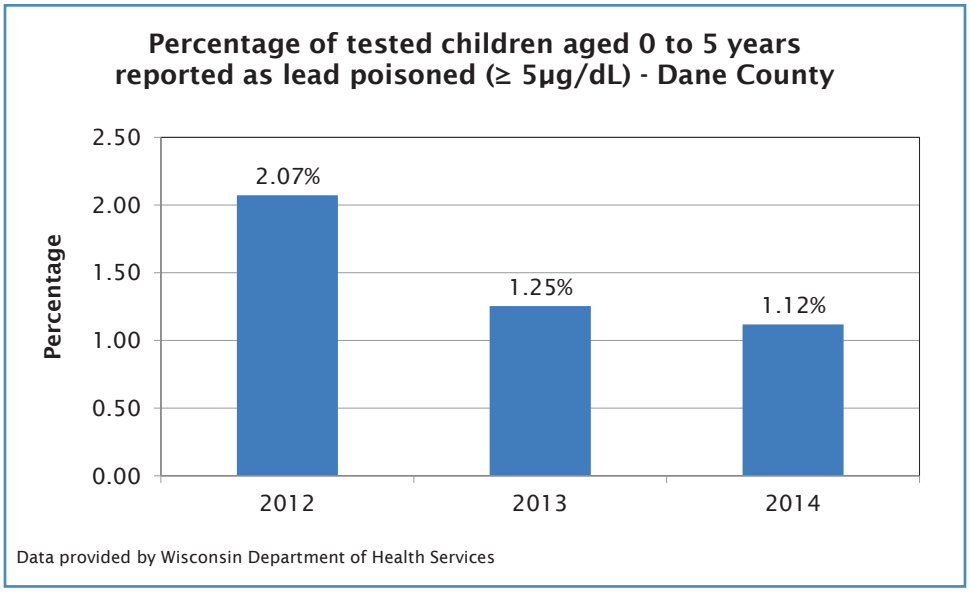
HEALTHY HOMES AND COMMUNITIES

Environmental hazards found in the home and the surrounding community continues to influence human illness and disease. Childhood lead poisoning is one prominent example. Despite notable progress over the past decade to diminish this risk of exposure and improve the identification and treatment of impacted children, childhood lead poisoning continues to pose a persistent and preventable public health challenge.

The risk of childhood lead poisoning in Dane County is primarily due to residence in or exposure to homes built before 1978 due to the potential presence of lead-based paints and other potential lead hazards; this is especially true for homes built prior to 1950. The highest concentration of these homes is located in the City of Madison; however, many older homes are also located in rural areas and other cities and villages throughout the county. County-wide approximately 16% of Dane County homes were built prior to 1950 and may pose a potential source of lead exposure; a modest and consistent reduction has been noted over the past decade further reducing possible exposures to Dane County children.

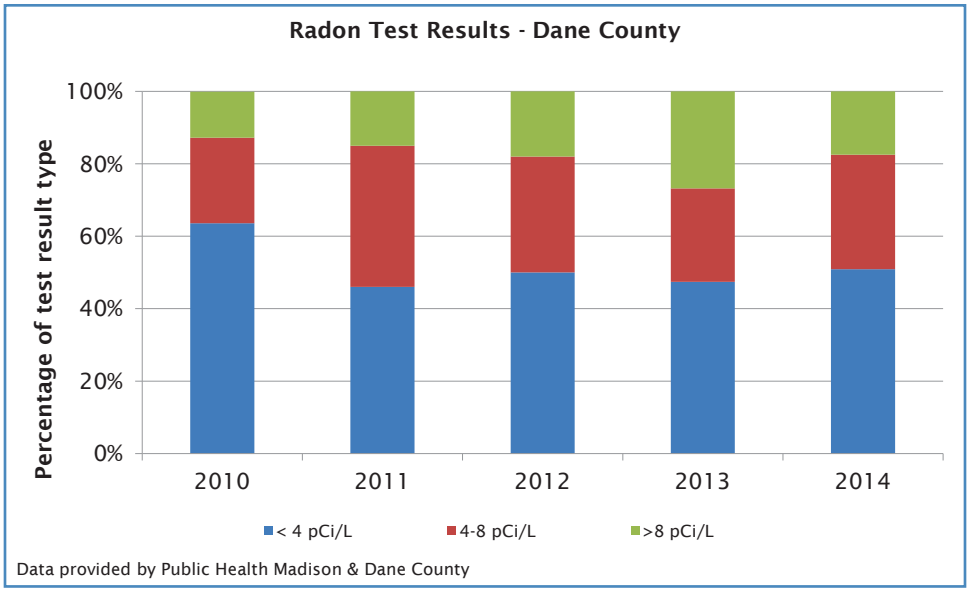


Prior to 2012, childhood lead poisoning standards were based upon blood lead levels (BLLs) equal to or above 10 micrograms of lead per deciliter of blood.(µg/dL); this level has been reduced to the new reference standard of 5 µg/dL and allows the introduction of childhood lead intervention services to a broader population of at-risk children. The percentage of lead poisonings in children aged 0 to 5 years tested for elevated blood lead levels since 2012 has continued to decrease while the number of children tested has steadily increased. In 2012, approximately 2% of over 4600 Dane County children tested for lead reported levels greater than or equal to 5 µg/dL; this percentage decreased to 1.25% in 2013 and again to 1.1% in 2014 following an increase in the number of children tested (4945 and 5186, respectively) during these two years.



Mold and radon have also been found in homes and businesses throughout Dane County. Excessive moisture due to roof leaks, flooding, uncontrolled humidity, and/or areas of high condensation in the structure can lead to the growth of mold; prolonged exposure to mold can result in allergic and/or asthmatic reactions and/or irritation of the eyes, skin, nose, throat, and lungs in sensitive individuals. More serious illness is also possible.

Exposure to elevated levels of radon can be much more serious. In fact, indoor exposure to radon is considered one of the leading causes of lung cancer in the United States; second only to cigarette smoking. In Wisconsin, including homes in Dane County communities, an estimated 5 to 10% of homes have elevated levels of radon; despite this risk not all homes have been tested. In 2013, approximately 47% of the radon test reported to PHMDC were less than or equal to the US EPA guideline of 4 picocuries of radon per liter of air (pCi/L); the remainder of the measurement exceeded the guideline. Similar results were observed in 2014. Both of the two most recent years of reported radon tests (2013 and 2014) were relatively consistent, albeit with annual variation, with other reported annual results over the past 5 years.



SUSTAINABILITY

Sustainability creates and maintains conditions that allow the needs of the present to be met without compromising future growth, success, and health of the county and its residents. Some of the current challenges to sustainability efforts in Dane County and the City of Madison include greenhouse gas emission, waste production and recycling, and water use and conservation.

Carbon dioxide (CO_2) is the most common greenhouse gas released into the atmosphere by human activity and is often the primary target in current strategies to reduce greenhouse gas emissions. In Dane County, the estimated point source emissions have been significantly reduced over the past decade. Continued modification of energy use behavior, increased use of energy-efficient products, and expanded production and purchase of renewable-source electricity will facilitate the continued reduction of CO_2 and other greenhouse gases and improve individual and community level contributions toward sustainability.

Over the past decade, the amount waste landfilled per person in the City of Madison has remained relatively consistent, albeit with annual variation, with the exception of the past two years (2013 and 2014) where minor increases were noted compared to previous years. Both years demonstrated increases compared to both 2012 and the former peak year of 2005. The increases from 2012 and 2005 were 15.1% and 6.0% when compared to 2013, respectively; a similar pattern was reported in comparison of these years to 2014 (19.7% increase from 2012 and 10.2% from 2005). Additional data is needed to evaluate if these increases are an emerging trend. However, much of this waste production is offset by notable increases in the amount of material recycled or composted per capita; approximately 69% in 2013 and 65% in 2014 of the total waste stream produced (landfilled tons + recovered tons).

Appropriate water use is also essential to the sustainability efforts of Dane County and the City of Madison. Strategies to improve water conservation include, but are not limited to, improved availability and financial incentive to purchase and use water efficient products, and education and behavior change efforts. Over the past decade, these and similar strategies have led to reductions in residential water use at both the city and county level but continuous effort is necessary to further protect our drinking water resources.