

NAPA COUNTY CANCER REPORT: SUPPLEMENT B - PESTICIDE EXPOSURE

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**NAPA COUNTY CANCER REPORT
SUPPLEMENT B:**

PESTICIDE EXPOSURE AND CANCER

January 2018



A Tradition of Stewardship
A Commitment to Service

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PESTICIDE EXPOSURE AND CANCER

Key Points

- The direct impact of pesticide exposures on the risk for the more than 100 types of cancer remains unclear due to limitations of human studies on environmental exposures.
- Scientific studies suggest that indoor or home pesticide use may be associated with a higher risk of some childhood cancers; households with pregnant women and children may want to consider alternatives to pesticides for pest control in the home.
- At the County level in California, outdoor (non-residential) use of pesticides labeled as carcinogenic does not appear to be correlated with rates of childhood cancer.



Pesticides

“Pesticide” is a broad term for chemicals, both natural and synthetic, that are used to control or get rid of undesired living organisms, including insects, rodents, and weeds (1). The Environmental Protection Agency (EPA) is responsible for determining which pesticides can be used in the United States and how they can be used. In California, the Department of Pesticide Regulation manages the sale and use of these chemicals for the purpose of minimizing harm to people and the environment (1). California counties are required to submit monthly reports on the type and amount of all agricultural pesticides used; reportable pesticide applications extend outside of farming and can include parks, golf courses, and other outdoor settings, but exclude home-and-garden (residential) use and most industrial/institutional uses.

Scientific studies have suggested a possible association between pesticide exposure and certain cancers (2). However, research on the cancer causing or carcinogenic effects of pesticides has many limitations (3). Studies typically rely on monitoring workers who are regularly exposed to pesticides or individual recollection of exposure, which can introduce bias and potentially lead to inaccurate study findings (3). Additionally, most measures are indirect or involve estimations of exposures, and only a few have examined specific pesticides (e.g., herbicides and breast cancer, carbamate and lung cancer) (3). Because the direct impact of specific pesticides on the development of particular cancers is still largely unknown, pesticide exposure has not been established definitively as an environmental cause of cancer (4-7).

Note: “Carcinogenicity” refers to a substance that can cause cancer. Chemicals labelled “carcinogenic” are classified by the US Environmental Protection Agency to be at least “likely” to cause cancer in humans and/or “known to the State of California to cause cancer” listed under Proposition 65.

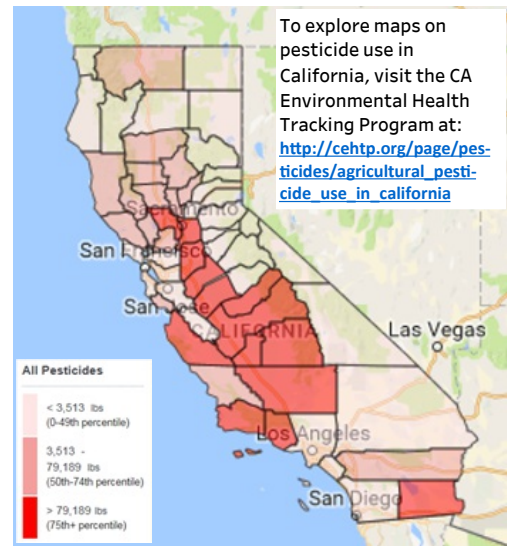
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Childhood Cancer and Pesticide Use

The most common type of cancer diagnosed among children ages 0 to 14 is leukemia, followed by brain and other central nervous system cancers (4). Research on risk factors for childhood cancer has substantial limitations due to the relatively small number of cases of that occur each year and the difficulty of assessing exposures that may have occurred very early in development (4). Aside from the 5% of cancers that can be attributed to inherited genetic mutations, specific causes have not been identified for most childhood cancers (4). Unlike adult cancers, individual lifestyle factors (e.g. obesity and lack of physical activity) do not contribute much to the risk of childhood cancers. Therefore, research on risk factors for childhood cancers often focuses on environmental exposures (e.g., radiation, second hand or perinatal tobacco exposure, pesticides, and traffic pollution) (5-8).

Cancer research on non-occupational pesticide exposures and general public use is scarce (6). Among those that have investigated the topic, results from studies involving outdoor pesticides do not have consistent findings for cancer risk (9). Parental occupational exposure to pesticides and indoor use of pesticides are associated with increased risk of childhood cancer, with the strongest association seen for residential pesticide exposure during pregnancy (6-8). Research on indoor or home pesticide use, such as pest strips, sprays or through professional pest controllers, has identified evidence for an increased risk of developing cancer, specifically leukemia, among children (6-9). One study found that indoor but not outdoor residential use of insecticides was linked to nearly 50% increased risk of childhood leukemia (6). Households with pregnant women and children who are concerned about cancer risk should consider alternatives to pesticides in order to minimize exposures to these chemicals within the home (9).



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County Comparison of Agricultural Pesticide Use

Based on the table to the right, there does not appear to be a positive association between non-residential pesticide use within California counties and rates of childhood leukemia and central nervous system (CNS) cancers. When comparing 15 counties in the North Bay and Central Valley, Kern County ranks first in average use of carcinogenic pesticides at 11.8 pounds per acre, but ranks twelfth for childhood leukemia/CNS incidence at about 8 per 100,000 children 14 years old or younger. Conversely, Marin County has the lowest carcinogenic pesticide use of the 15 counties at 0.1 lbs per acre but has the second highest rate of childhood leukemia/CNS cancers at about 16 per 100,000 children. Similarly, Napa County ranks second to last in carcinogenic pesticide use (1.0 pounds per acre) but has the highest rate of these childhood cancers (about 16 per 100,000 children) among the 15 counties.

To explore more about pesticide use in California, visit: http://cehtp.org/page/pesticides/agricultural_pesticide_use_in_california

Average Carcinogenic Pesticide Application and Childhood Cancer Rates for North Bay and Central Valley Counties in 2009-2013, Sorted by High to Low Pesticide Use

County	Average Use of Carcinogenic Pesticides ^a (lbs/acre)	Pesticide Use Rank (1 = highest, 15 = lowest)	Incidence Rate of Leukemia & CNS Cancer ^b Combined, Ages 0-14 (per 100,000 people)	Cancer Rate Rank (1 = highest, 15 = lowest)
Kern	11.8	1	7.8	12
Stanislaus	9.2	2	8.3	10
Placer	9.2	3	9.8	8
Fresno	7.5	4	8.1	11
Merced	7.0	5	5.8	15
San Joaquin	4.0	6	9.9	7
Tulare	3.7	7	6.1	14
Sutter	3.7	8	10.3	5
Butte	3.2	9	7.5	13
Solano	2.6	10	9.8	9
Sonoma	2.4	11	13.0	3
El Dorado	1.9	12	10.6	4
Sacramento	1.7	13	9.9	6
Napa	1.0	14	15.6	1
Marin	0.1	15	13.6	2

^a Chemicals classified by the US Environmental Protection Agency to be at least "likely" to cause cancer in humans and/or "known to the State of California to cause cancer" listed under Proposition 65.

^b Central nervous system cancers (e.g., brain and spinal cord tumors)

*Counties with low case counts of leukemia or CNS cancer were excluded.

Sources: kidsdata.org, NCI SEER Program (<https://seer.cancer.gov/>), CEHTP Pesticide Mapping Tool (http://www.cehtp.org/page/pesticides/agricultural_pesticide_use_in_california), CDPR PUR Program (<http://calpip.cdpr.ca.gov/main.cfm>)

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