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Landscape Maintenance Equipment Emissions and Children's Health

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BACKGROUND: A variety of gasoline-powered lawn and garden equipment (GLME) is now used for performing all tasks once done manually (mowers, leaf blowers, edgers, trimmers, cutters, saws). Compared with vehicles, GLME emit high levels of toxic and carcinogenic exhaust known to increase the risks of asthma, heart disease and cancer. Regular use of GLME in the vicinity of childcare centers, schools, parks, playgrounds, and neighborhoods raise concerns over the health effects on children.

GOALS: To estimate the volume of harmful exhaust emissions from GLME and discuss potential health risks to children. **METHODS:** Emissions data from the Environmental Protection Agency's nonroad model (2011 and 2018 modeling platform, version 6) were extracted, sorted, and analyzed by equipment type and characteristics.

Annual GLME emission levels for 2011 and 2018 (projected) of volatile organic compounds (VOC) and criteria pollutants (carbon monoxide [CO], nitrogen oxides [NOx], and fine particulate matter <2.5 microns [PM2.5]) were estimated on a national level using descriptive statistics. The potential impact on children's health is discussed. **RESULTS:** In 2011, GLME emitted approximately 268,000 tons of VOCs; 1.9 million tons of CO; 22,000 tons of NOx; and 18,000 tons of PM2.5.

Two-stroke engines were responsible for 92% of PM2.5. By 2018, VOC and NOx emissions are projected to decrease by 16% and 76% from 2011 levels, respectively, while PM2.5 emissions are projected to increase by 9%. **CONCLUSIONS:** GLME is an important source of localized toxic and carcinogenic air pollution linked to many childhood disorders. Two-stroke engines, including leaf blowers, chain saws, trimmers and cutters are especially concerning because of their high levels of PM2.5 emissions. Clinicians and public health personnel should be aware of these risks, inform the public, and advocate for regulatory changes.

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