Health Research Article: Neuro-developmental and neurological effects of chemicals associated with unconventional oil and natural gas operations and their potential effects on infants and children

Published Online: 2017-10-25 | DOI: https://doi.org/10.1515/reveh-2017-0008

Peer Reviewed Article Abstract

Heavy metals (arsenic and manganese), particulate matter (PM), benzene, toluene, ethylbenzene, xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs) and endocrine disrupting chemicals (EDCs) have been linked to significant neurodevelopmental health problems in infants, children and young adults.

These substances are widely used in, or become by-products of unconventional oil and natural gas (UOG) development and operations.

Every stage of the UOG lifecycle, from well construction to extraction, operations, transportation and distribution can lead to air and water contamination.

Residents near UOG operations can suffer from increased exposure to elevated concentrations of air and water pollutants.

Here we focus on five air and water pollutants that have been associated with potentially permanent learning and neuropsychological deficits, neurodevelopmental disorders and neurological birth defects.

Given the profound sensitivity of the developing brain and central nervous system, it is reasonable to conclude that young children who experience frequent exposure to these pollutants are at particularly high risk for chronic neurological disease.

More research is needed to understand the extent of these concerns in the context of UOG development, but since UOG development rapidly in recent years the need for public health prevention techniques, well designed studies and stronger state and national regulatory standards is becoming increasingly apparent.