Epidemiological studies are conducted by observing human populations to evaluate whether there is a relationship between an exposure and a health impact. With continuing community exposure to shale gas development (sometimes called fracking), being aware of the epidemiological associations between shale gas development and health outcomes is crucial to protecting public health.

The table below presents findings of epidemiological studies that have found statistically significant associations between exposure to shale gas development and adverse health outcomes. This information was compiled from more than 50 peer-reviewed, published research articles featured in four literature reviews.1-4 Exposure to shale gas development in these studies was evaluated using a variety of metrics. All health outcomes were confirmed by a medical provider unless noted as self-reported. This table does not represent all the research on the topic.

### TOP CONCERNS OF LIVING NEAR SHALE GAS DEVELOPMENT (SGD)

<table>
<thead>
<tr>
<th>Air Quality</th>
<th>Water Quality</th>
<th>Noise &amp; Light</th>
<th>Soil</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGD emits toxic substances into the air that we breathe and absorb into our skin</td>
<td>Wastewater and chemical spills release toxic pollutants into our drinking water</td>
<td>Unnatural noise, light, and vibration from SGD can be disturbing and harmful</td>
<td>Hazardous pollutants associated with SGD can settle to the ground and contaminate soil</td>
<td>Health effects and disturbances can cause uncertainty and stress</td>
</tr>
</tbody>
</table>

### BIRTH IMPACTS
- Congenital heart defects, neural tube defects\(^5\)
- Small for gestational age,\(^6,8\) lower mean birth weight,\(^6,8\) low birth weight\(^7,8\)
- Lower 5-minute APGAR score\(^8\)
- Preterm delivery,\(^9,12\) high-risk pregnancy\(^9\)
- Infant mortalities\(^10\)
- Congenital heart defects\(^11\)
CARDIOVASCULAR
- Systolic blood pressure (augmentation index)\(^{13}\)
- Cardiology hospitalizations\(^{14}\)
- Blood/immune system hospitalizations\(^{15}\)
- All-cause hospitalizations and blood/immune hospitalizations in females\(^{16}\)
- Systolic and diastolic blood pressure, changes in heart rate, release of stress hormones\(^{17,19}\)
- Elevated blood pressure, hypertension, ischemic heart disease, stroke\(^{20}\)

RESPIRATORY
- Self-reported respiratory symptoms\(^{21}\)
- Mild, moderate, and severe asthma exacerbations\(^{22}\)
- Pediatric asthma-related hospitalizations\(^{23}\)

NEUROLOGICAL
- Self-reported chronic rhinosinusitis, fatigue, migraine\(^{24}\)

DERMAL
- Self-reported dermal symptoms, including rashes, dermatitis, irritation, burning, itching, hair loss\(^{21}\)
- Skin hospitalizations\(^{25}\)

CANCER
- Urinary bladder cancer\(^{26}\)
- Acute lymphocytic leukemia (ages 5-24)\(^{27}\)
- Neoplasm hospitalizations\(^{15}\)
If you have health concerns related to shale gas development, you should speak with a trusted health or mental health professional. For additional resources, visit our website.
