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Public Health Consequences of Acute Hydrofluoric Acid Releases, 2002-2010

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ABSTRACT

Hydrofluoric acid (HF) is one of the strongest and most corrosive acids. HF is used in oil refining, fluoride and fluorocarbon production, glass etching, electronics manufacturing, and as a cleaning agent. We examined data from the Agency for Toxic Substances and Disease Registry's Hazardous Substance Emergency Events Surveillance system (2002-2009) and the National Toxic Substance Incidents Program (2010) to describe public health consequences of acute HF releases.

From 2002-2010, 176 HF releases were reported. In over half (62.5%) of the incidents, HF was released by a spill and in 29.5% of the incidents it was released as a vapor. Eleven incidents resulted in the evacuation of 140 people. Fifty-three incidents resulted in injuries to 90 persons, including one fatality. Of those injured, 65.5% were treated at the hospital but not admitted. A majority of the injured persons were employees (53.3%) or members of the general public (38.9%). The most commonly reported injuries/symptoms were chemical and thermal burns, respiratory irritation, and skin irritation. Most of the HF incidents occurred in two major industry categories: manufacturing of paper, printing, chemicals, petroleum, leather, lumber, and stone (26.9%), and transportation and warehousing (32.0%). Transportation and warehousing industries includes air, rail, water, truck, transit and ground passenger, pipeline, scenic and sightseeing, and transportation support. The most commonly reported contributing factors to HF releases were human error (54.9%) and equipment failure (35.4%).

Acute HF releases can result in death or morbidity. To prevent serious adverse outcomes, it is important to understand the potential causes and public health consequences of HF releases. Educational prevention initiatives should target the industries that have the most reported releases and responders likely to encounter HF releases.