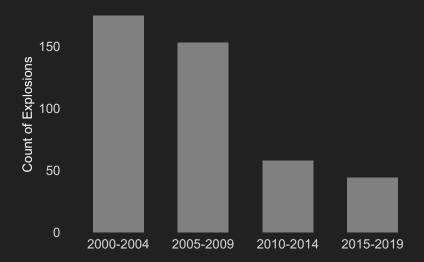


BEIRUT TAKES STOCK
AFTER DEVASTATING
INDUSTRIAL EXPLOSION

Two explosions rattled Beirut, Lebanon on Tuesday evening, August 4. The second, larger blast could be felt as far away as Cyprus, some 145 miles away. Recent reports place the death toll at 157, with dozens still missing, and over 5,000 injured. Government officials expect the financial toll to be more than 3 billion dollars. In terms of affected population and economic damages, this is likely the worst industrial explosion in history. The blast in Beirut is particularly troublesome, given that industrial explosions have decreased systematically over the last 20 years (see Table 1).

TABLE 1: MAJOR INDUSTRIAL EXPLOSIONS FROM 2000 TO 2019



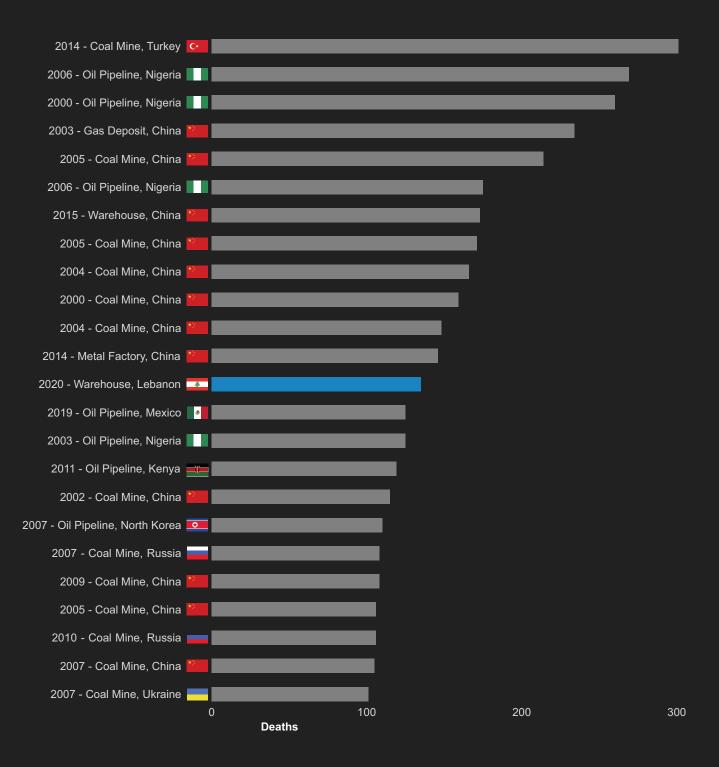
The blasts occurred in Beirut's port, the first explosion and resulting fire are suspected to have started in a warehouse storing fireworks. The resulting fire ignited the second blast; widely believed to be the detonation of 2,750 lbs. of Ammonium Nitrate that had been stored in a port warehouse for the last six years after being confiscated by port officials from a Russian ship in 2013.

The second explosion, which created seismic waves roughly equivalent to a 3.3 magnitude earthquake, shattered glass for miles and spread debris as far as two miles from the site of the explosions. Four hospitals were damaged severely enough to turn away the wounded, with some reports of medical staff killed and wounded.

Over 750,000 people live in the damaged areas of Beirut, and at least 300,000 people have been displaced. Rescue efforts are being stymied by a strain on supplies as well as power outages. The port handled 60% of Beirut's imports. Silos that stored food and medicine were severely damaged and 85% of the country's grain was destroyed, with much of the wheat that survived the fire rendered inedible.

Beirut's government has declared a two-week State of Emergency and pledged a thorough investigation into the explosion. Port officials responsible for the storing of the Ammonium Nitrate have been placed under house arrest. The storing of this specific Ammonium Nitrate has been a source of controversy in Beirut since 2013.

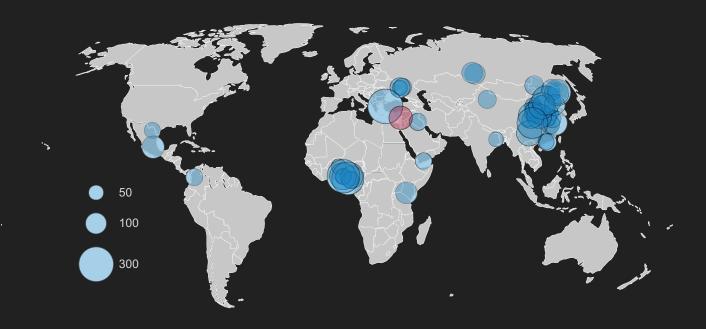
TABLE 2: DEADLIEST INDUSTRIAL EXPLOSIONS FROM 2000 TO 2019



¹ Ammonium Nitrate is a highly volatile chemical compound frequently used as fertilizer. It has been a catalyst in several deadly industrial accidents and has also been detonated intentionally in the past, including in the Oklahoma City Bombing of 1995.

The Beirut incident is among the deadliest industrial explosions in recorded history. Table 2 rank orders all industrial explosions involving more than 100 deaths in the last 20 years. The deadliest industrial explosions in recent history typically occur in oil pipelines and coal mines, primarily in continental Africa, China, and the Middle East (see Figure 1) In 2015, numerous explosions in the Port of Tianjin in China resulted in 173 confirmed deaths and hundreds of injuries, after several smaller fires ignited 800 metric tons of Ammonium Nitrate.

FIGURE 1: THE DISTRIBUTION OF MAJOR INDUSTRIAL EXPLOSIONS (>50 DEATHS) FROM 2000 TO 2019



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