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# Introduction

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The aim of this report is to compile existing health data from our community to identify trends for comparison between the health profiles of Staten Island residents and those of residents of other boroughs in New York City. The proximity of the Fresh Kills Landfill to dense residential areas has been of particular concern to me, and the higher-than-average rates of certain cancers, respiratory illnesses, and developmental disorders that have been concentrated in this area were the impetus for putting together a comprehensive report on the state of physical health of Staten Islanders.

As any resident of Staten Island and most of the medical community are already aware, the overwhelming anecdotal evidence over the last several generations has suggested a causal relationship between the Fresh Kills landfill and adverse health effects on the surrounding residents. Over the years, some studies have vindicated the anecdotal evidence and others have downplayed it. Much of the research that we have seen has produced results that are nothing short of alarming. As you'll see in this report, even since the early 1980's, a comprehensive study indicated that there had been "massive amounts of chemical waste" dumped at Fresh Kills. Similarly disconcerting was a study almost two decades old which raised many red flags about the incidents of respiratory illness in the surrounding areas. 16 years later, we're still seeing reports on a regular basis about the health hazards that those who worked at Ground Zero were exposed to; it's of great concern to Staten Islanders particularly, considering that the World Trade Center debris was dumped at the landfill site.

None of the publicly released studies have taken a holistic view of the potential health effects of the Fresh Kills landfill on the surrounding residential population, including the ancillary activities, such as trucking debris to and from the site, that have been studied and identified in other locales as having contributed to local environmental pollution,

resulting in adverse health effects on residents of the surrounding communities.

For more than a decade, the methane gas that continues to be vented from the now-closed Fresh Kills landfill has been sold to energy companies and has generated tens of millions of dollars in revenue for the City of New York. The revenue is not specifically earmarked and tracked, but is instead funneled into a general fund and spent across the city. As reported by the Department of Sanitation in 2011, the methane gas was generating \$1 million each month. Of the tens of millions of dollars that have been generated by the vented gas: zero have been allocated to study the health effects of the Fresh Kills landfill on the local population; zero have been allocated to invest in air quality monitoring stations at the site and surrounding residential areas; zero have been allocated to fund screenings for certain types of cancers, birth defects, respiratory disorders, or developmental disorders, all of which manifest in higher concentrations on Staten Island than they do in any other borough of New York City.

It is my position that the revenue generated by the gas emissions at the former Fresh Kills landfill should be remitted to a fund created specifically for research, monitoring, health screenings, and health initiatives related to the potential effects the landfill has had on the local population over the more than half a century that it was in full operation, and the more recent years, leading up through the present time, during which gases have continued to be vented and sold from the site. This research will then serve as a follow-up to the preliminary study that was done in the 1990s.



Respectfully yours,  
**Joseph C. Borelli**  
**Council Member**  
**51<sup>st</sup> District**

# Fresh Kills Landfill History

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The City of New York established the Fresh Kills Landfill in 1948, before there was any large-scale development on the west shore of Staten Island. The Fresh Kills site, naturally, was primarily tidal creeks and coastal marsh. By 1955, Fresh Kills Landfill was the largest landfill in the world, serving as the principal landfill for household herbage collected in New York City.

In the mid-1980's, at its peak of operation, Fresh Kills Landfill received as much as 29,000 tons of trash per day. The landfill's four mounds on the site are made up of approximately 150 million tons of solid waste.

Although New York City had a large number of operating landfills in the latter half of the 20<sup>th</sup> century throughout the five boroughs, many were closed as new landfill and environmental regulations came into effect, but Fresh Kills Landfill remained open. This was the result of an agreement between the State of New York and the City of New York, in which Fresh Kills site was retrofitted to meet the new regulations.

By 1991, Fresh Kills Landfill was New York City's only operating landfill receiving residential garbage.

As a result of strong community pressure, a state law was passed in 1996 requiring that the landfill cease accepting solid waste by the end of 2001. By 1997, two of the four landfill mounds were closed and covered with a thick, impermeable cap. The landfill received its last barge of garbage on March 22, 2001.

After the World Trade Center attack on September 11, 2001, the State of New York temporarily suspended the closing of the landfill to allow for the handling of materials from the World Trade Center site.

Dumping was only conducted on the West Mound, and no other materials were brought to the site during this period.

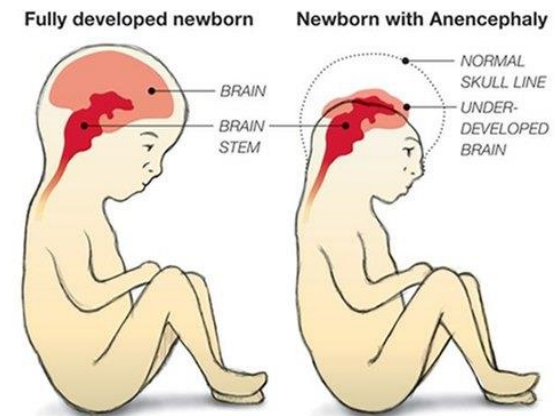
During the ten-month recovery effort, rescue workers carefully screened and sifted the 1.2 million tons of material that came from the World Trade Center site to the Fresh Kills site. The search effort did not end until all discernible remains and effects were removed and taken to the New York City Medical Examiner's office for identification and safekeeping. After officials determined the process of retrieval had been exhaustive and complete, the screened and sifted World Trade Center materials remaining at the Fresh Kills site were placed in a 48-acre area immediately adjacent to the recovery site on the West Mound. A layer of clean soil, at least one foot deep, was placed in this area prior to placement of the screened materials, and afterward it was covered with additional clean soil to protect the site and control erosion.



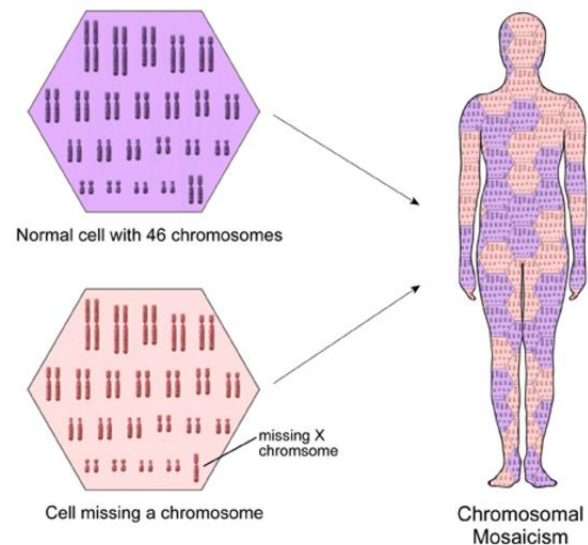
# Birth Defects: Section Overview

## Types of birth defects identified in this report: Anencephaly, Cleft Palate, Down syndrome, and Hypospadias

- A study by Geshwind et al., which investigated the risk of congenital malformations in the vicinity of 590 hazardous waste sites in New York State, found a **12% increase in congenital malformations in people living within 1 mile of a site**. Higher risks were also found for malformations of the nervous system, musculoskeletal system, and integument (skin, hair, and nails).
- Additionally, a **dose-response relationship (higher risks with higher exposure)** was reported between estimated hazard potential of the site and risk of malformation, adding support to a possible causal relationship. (61) (Environmental Health Perspectives: Vol 108, Supplement 1, pg. 109)



Anencephaly | Credit: American Assoc. of Neurological Surgeons



Down syndrome | Credit: US National Library of Medicine

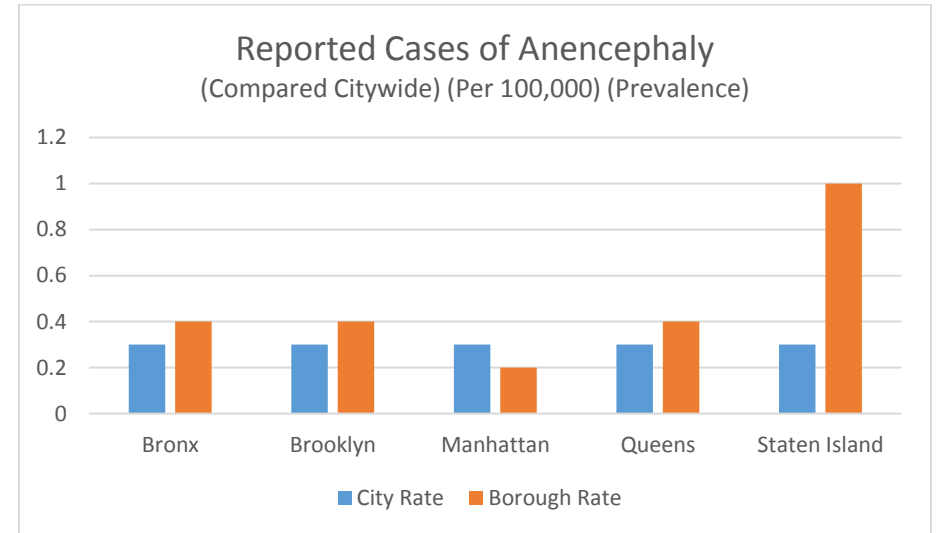
# Birth Defects: Anencephaly

## What is Anencephaly?

Anencephaly is a condition that prevents the normal development of the brain and the bones of the skull. This condition results when a structure called the neural tube fails to close during the first few weeks of embryonic development. The neural tube is a layer of cells that ultimately develops into the brain and spinal cord. Because anencephaly is caused by abnormalities of the neural tube, it is classified as a neural tube defect.

Because the neural tube fails to close properly, the developing brain and spinal cord are exposed to the amniotic fluid that surrounds the fetus in the womb. This exposure causes the nervous system tissue to break down (degenerate). As a result, people with anencephaly are missing large parts of the brain called the cerebrum and cerebellum. These brain regions are necessary for thinking, hearing, vision, emotion, and coordinating movement. The bones of the skull are also missing or incompletely formed.

Because these nervous system abnormalities are so severe, almost all babies with anencephaly die before birth or within a few hours or days after birth.



Source: NYS DOH Community Health Portal

- Case-control studying 590 waste sites in New York State. **Found increased risk for all malformations (12%), integument system, nervous system, musculoskeletal.**
- Case-control study of 21 sites in 5 European countries. **Study found an increased risk for all malformations (33%), NTD, cardiac defects.**

# Birth Defects: Cleft Palate

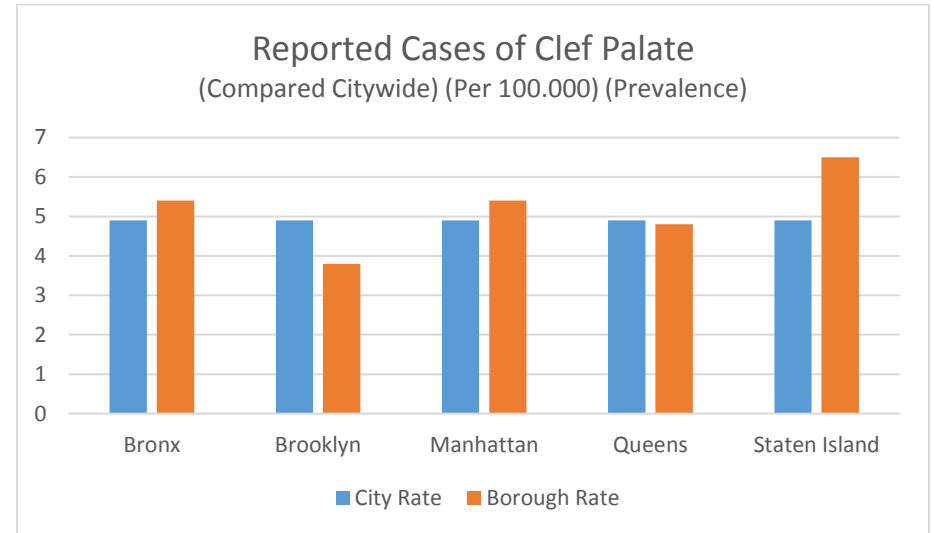
## What is Cleft Palate?

The roof of the mouth (palate) is formed between the sixth and ninth weeks of pregnancy. A cleft palate happens if the tissue that makes up the roof of the mouth does not join completely during pregnancy. For some babies, both the front and back parts of the palate are open. For other babies, only part of the palate is open.

Children with a cleft lip with or without a cleft palate or a cleft palate alone often have problems with feeding and speaking clearly and can have ear infections. They also might have hearing problems and problems with their teeth.



Cleft Palate



Source: NYC DOH Community Health Portal

- Case-control studying exposure index based on fraction of water supply in household from contaminated wells. **Study found an increase in eye/ear anomalies, CNS/chromosomal/cleft anomalies; perinatal deaths; kidney/urinary tract disorders, lung/respiratory disorders.**
- Case-control studying 590 waste sites in New York State. **Found increased risk for all malformations (12%), integument system, nervous system, musculoskeletal.**
- Case-control study of 21 sites in 5 European countries. **Study found an increased risk for all malformations (33%), NTD, cardiac defects.**

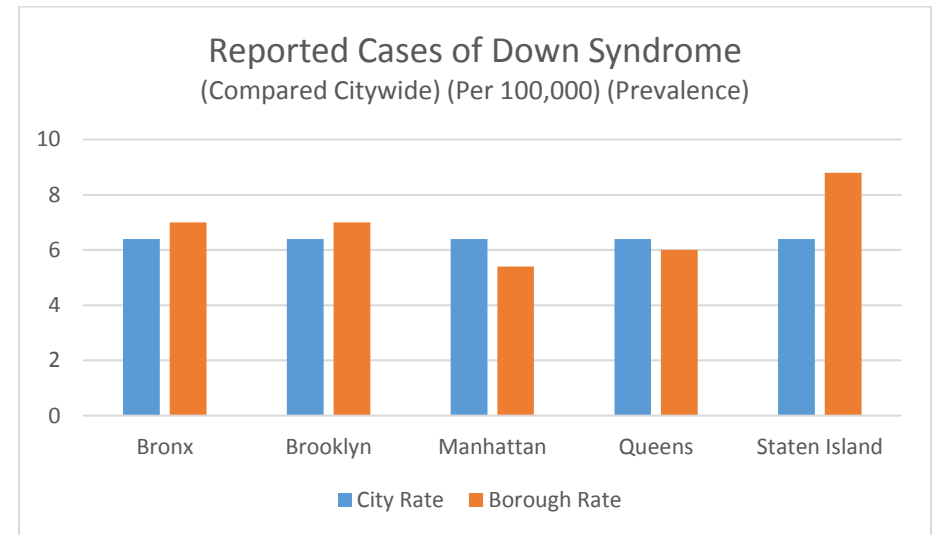
# Birth Defects: Down syndrome

## What is Down syndrome?

Down syndrome is a chromosomal condition that is associated with intellectual disability, a characteristic facial appearance, and weak muscle tone (hypotonia) in infancy. All affected individuals experience cognitive delays, but the intellectual disability is usually mild to moderate.

People with Down syndrome may have a variety of birth defects. About half of all affected children are born with a heart defect. Digestive abnormalities, such as a blockage of the intestine, are less common. They also have an increased risk of developing several medical conditions. These include gastroesophageal reflux, which is a backflow of acidic stomach contents into the esophagus, and celiac disease, which is an intolerance of a wheat protein called gluten. About 15 percent of people with Down syndrome have an underactive thyroid gland (hypothyroidism). Individuals with Down syndrome also have an increased risk of hearing and vision problems.

Delayed development and behavioral problems are often reported in children with Down syndrome. Affected individuals' speech and language develop later and more slowly than in children without Down syndrome, and affected individuals' speech may be more difficult to understand. Behavioral issues can include attention problems, obsessive/compulsive behavior, and stubbornness or tantrums.



Source: NYC DOH Community Health Portal

- Case-control studying exposure index based on fraction of water supply in household from contaminated wells. **Study found an increase in eye/ear anomalies, CNS/chromosomal/cleft anomalies; perinatal deaths; kidney/urinary tract disorders, lung/respiratory disorders.**
- Case-control studying 590 waste sites in New York State. **Found increased risk for all malformations (12%), integument system, nervous system, musculoskeletal.**
- Case-control study of 21 sites in 5 European countries. **Study found an increased risk for all malformations (33%), NTD, cardiac defects.**



# Birth Defects: Hypospadias

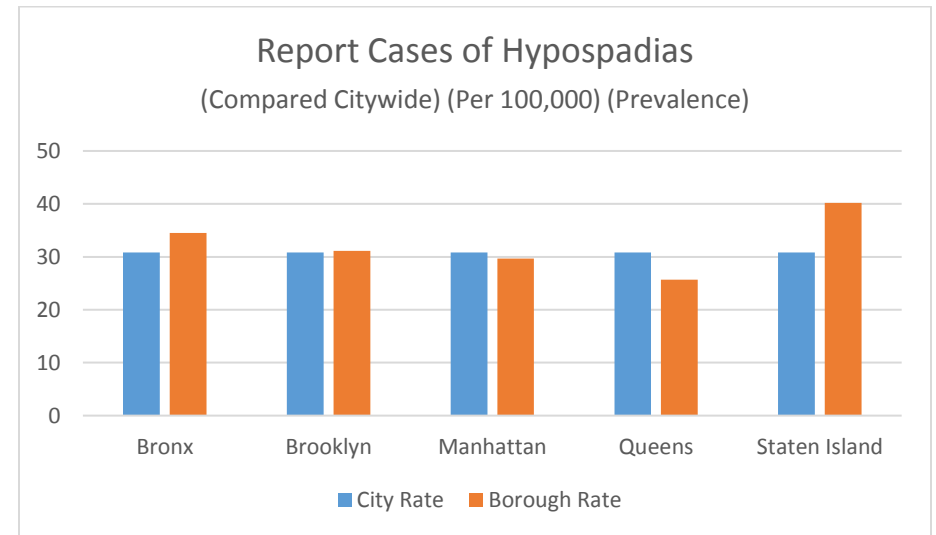
## What is Hypospadias?

Hypospadias is a birth defect in boys in which the opening of the urethra is not located at the tip of the penis. In boys with hypospadias, the urethra forms abnormally during weeks 8–14 of pregnancy. The abnormal opening can form anywhere from just below the end of the penis to the scrotum. There are different degrees of hypospadias; some can be minor and some more severe.

The type of hypospadias a boy has depends on the location of the opening of the urethra:

- **Subcoronal:** The opening of the urethra is located somewhere near the head of the penis.
- 
- **Midshaft:** The opening of the urethra is located along the shaft of the penis.
- 
- **Penoscrotal:** The opening of the urethra is located where the penis and scrotum meet.

Boys with hypospadias can sometimes have a curved penis. They could have problems with abnormal spraying of urine and might have to sit to urinate. In some boys with hypospadias, the testicle has not fully descended into the scrotum. If hypospadias is not treated, it can lead to problems later in life, such as difficulty performing sexual intercourse or difficulty urinating while standing.



Source: NYC DOH Community Health Portal

- Case-control studying exposure index based on fraction of water supply in household from contaminated wells. **Study found an increase in eye/ear anomalies, CNS/chromosomal/cleft anomalies; perinatal deaths; kidney/urinary tract disorders, lung/respiratory disorders.**
- Case-control studying 590 waste sites in New York State. **Found increased risk for all malformations (12%), integument system, nervous system, musculoskeletal.**
- Case-control study of 21 sites in 5 European countries. **Study found an increased risk for all malformations (33%), NTD, cardiac defects.**

# Cancer and Leukemia: Section Overview

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**Types of cancer identified in this report:** Bladder Cancer, Breast Cancer in Females Over 50, Lung and Bronchus Cancer, Pancreatic Cancer, and Thyroid Cancer; Additionally, two forms of Leukemia were identified: Acute Myeloid Leukemia and Chronic Lymphocytic Leukemia

## **Increased Prevalence of Cancer as a Result of Groundwater Contamination**

Although landfills are designed to contain wastes in confined areas, chemicals in landfills can contaminate groundwater through a process called "leaching." By this process, chemicals in waste gradually dissolve into the rain water and snow-melt that flows through landfills. The resulting contaminated water, commonly referred to as "leachate," can then enter local surface waters and groundwater. Like most landfills constructed in the 1940s, **the Fresh Kills Landfill was not designed with a liner or any other form of leachate control. Thus, for many years, untreated leachate from the landfill flowed directly into local surface waters and groundwater.**

A leachate treatment plant at the Fresh Kills Landfill currently treats most of the leachate generated on site and is capable of treating more than 1,000,000 gallons of leachate a day (Nabovi, 1999).

**Before this treatment plant operated, a study estimated that at least 85 % of the leachate generated in the landfill eventually discharged into local surface waters and less than 15 % of the leachate leaked into deeper groundwater layers (IT, 1993b).**

Although Staten Island residents clearly do not drink contaminated groundwater, a small number of residents who live near the Fresh Kills Landfill might come into contact with site-related contaminants through the use of groundwater for non-drinking purposes. According

to a private well survey done in the 1990s, only five private wells within 1 mile of the Fresh Kills Landfill property boundary appeared to be viable sources of non-potable groundwater (IT, 1991a). One well (actually, a system of wells) was used to fill a pond at the South Shore Country Club, another well is used to wash trucks at the Fresh Kills Landfill, and the owner of the other well could not be located.

For two private wells, non-drinking use of groundwater seems possible, but usage data for these wells are either limited or conflicting. First, the Great Kills Swim Club, located southeast of the Fresh Kills Landfill and the Brookfield Avenue Landfill, has a groundwater well. One study reported the well had been abandoned (IT, 1991a), but another study reported the well was being used to fill a pool (NYCDEP, 1998). Second, a private well at a residence near the Great Kills Swim Club has reportedly been used for irrigation purposes, but the frequency of well use is not known. An environmental consulting company recently sampled both of these wells. As detailed in the Public Health Assessment (PHA) for the Brookfield Avenue Landfill (ATSDR, 1999a), a small number of contaminants were found in both wells, but not at levels that would pose health hazards for non-drinking purposes.

A common finding among the various monitoring efforts is that **many pollutants have elevated concentrations in the surface waters and sediment near the Fresh Kills Landfill**. For a sense of the levels of contamination, Tables 8 and 9 summarize the results of a recent sampling study of **surface waters and sediments, respectively**.

**According to the tables, surface waters and sediment near the Fresh Kills Landfill are contaminated with elevated levels of inorganics (e.g., ammonia and sulfates) and numerous metals (e.g., arsenic, barium, cadmium, chromium, lead, and nickel).**

Even though certain stretches of local surface waters and sediments clearly contain elevated levels of contamination, residents rarely, if ever, come into contact with these contaminants. According to site

documents and site personnel, **recreational use of onsite surface waters (i.e., Fresh Kills and the sections of Main Creek and Richmond Creek within the landfill property boundary) is prohibited** (Nabovi, 1999; NYCDOS, 1995).

In addition to concerns regarding chemicals in the ambient environment, near some landfills landfill gases (the gases that form as wastes decompose) have been known to migrate through soil and into homes. Large quantities of landfill gas, which is primarily composed of methane, are generated within the Fresh Kills Landfill daily, but several measures prevent this gas from migrating to offsite locations. In the late 1990s, former borough environmental engineer, Nick Dmytryszyn, went on record acknowledging that methane emissions from Fresh Kills represented 5.7 percent of all **methane in the country and 1.8 percent of emissions in the world**.

The fence that surrounds the Fresh Kills Landfill greatly reduces the possibility that local residents will encounter physical hazards on site. However, due to the steep terrain of certain landfill sections and the presence of flares and other potentially dangerous equipment on site, **ATSDR recommends that NYCDOS routinely verify that access to the Fresh Kills Landfill continues to be restricted**.

Polycyclic aromatic hydrocarbons (PAHs) are a large group of structurally similar chemicals which are ubiquitous in the environment as both gases and associated particulates. They are emitted from landfills as a product of the combustion of landfill gas. **Studies in humans and experimental animals have found an association between exposures to mixtures of certain PAHs and tumors of the lung, skin and possibly other sites in the body. Certain PAH compounds are considered to have potential genotoxic carcinogenic properties\* and these are the main compounds of concern in relation to landfill emissions.** (*Impact on Health of Emissions from Landfill Sites; Advice from the Health Protection Agency; Documents of the Health Protection Agency Radiation, Chemical and Environmental Hazards July 2011*)

“It is theoretically possible that **one ‘hit’ on DNA may produce a mutation that can eventually develop into a tumor. The assumption is thus made for genotoxic carcinogens that they do not have a threshold and that any exposure is associated with an increase in risk**, albeit this may be very small.” - (*Impact on Health of Emissions from Landfill Sites; Advice from the Health Protection Agency; Documents of the Health Protection Agency Radiation, Chemical and Environmental Hazards July 2011*)

**Landfilling activities with the potential to generate particulates include:**

- movement of waste on- and off-site
- handling storage and processing of waste
- plant traffic both on- and off-site
- plant used to burn landfill gas, including gas flares or engines
- dust generated from the surface of the landfill

**Exposure to particles that can enter the respiratory system is known to be associated with a range of adverse effects on health.**

Particulate matter dispersed into the air by the aforementioned landfilling activities can cause a range of adverse health effects as fine particles are deposited efficiently in the deeper parts of the lung. “Dust” emitted from landfill sites will include both coarse and fine particles, with myriad potential health effects including damage to the respiratory system, and an exacerbation of pre-existing lung and heart conditions.

Acid gases may be emitted from landfill gas flares and engines as a result of the landfill gas combustion process. Examples of acid gases which can be emitted are nitrogen dioxide, Sulphur dioxide and halides, such as hydrogen chloride and hydrogen fluoride. Emissions from landfill sites can contribute to existing background levels of these pollutants in the local area. **At high concentrations, nitrogen dioxide (NO<sub>2</sub>) acts as an irritant of the airways and exposure can**

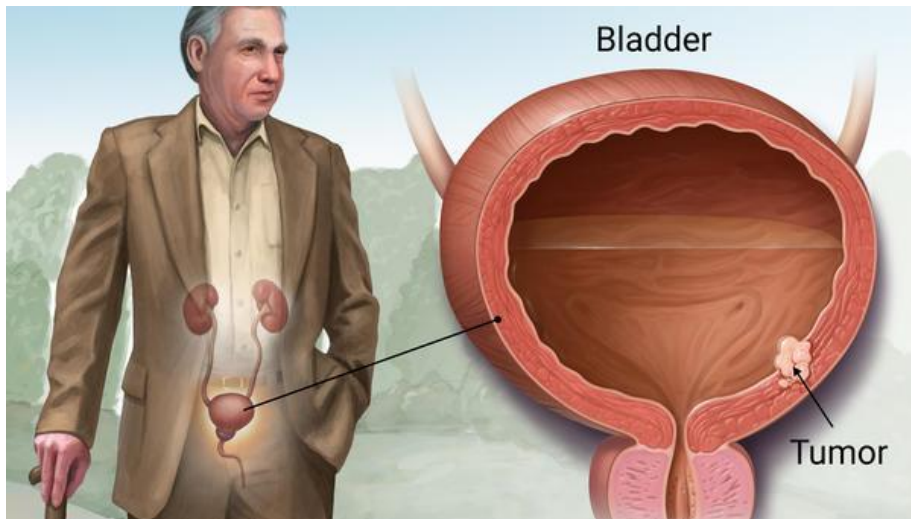
**produce inflammation and bronchoconstriction (narrowing of the lungs) and can affect the immune cells in the lungs, increasing susceptibility to respiratory infections. Asthmatics are most susceptible, although high levels of NO<sub>2</sub> may also produce effects on the lung function of non-asthmatics.** (*Impact on Health of Emissions from Landfill Sites; Advice from the Health Protection Agency; Documents of the Health Protection Agency Radiation, Chemical and Environmental Hazards July 2011*)

# Cancer and Leukemia: Bladder Cancer

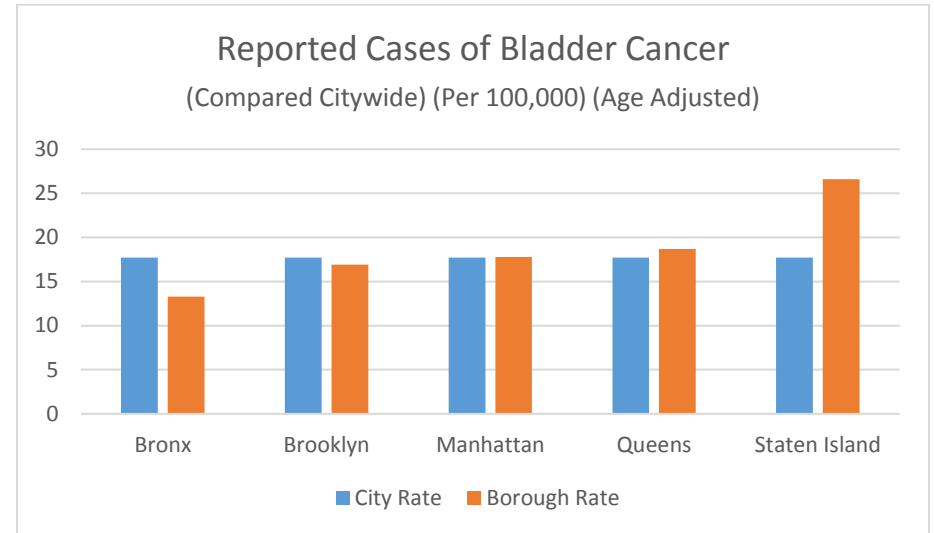
## What is Bladder Cancer?

There are several types of cancer which can start in the bladder, however, Urothelial carcinoma, also known as transitional cell carcinoma (TCC), is by far the most common type of bladder cancer. In fact, if you are told you have bladder cancer it is almost certain to be an urothelial carcinoma. These cancers start in the urothelial cells that line the inside of the bladder.

Urothelial cells also line other parts of the urinary tract, such as the part of the kidney that connects to the ureter (called the renal pelvis), the ureters, and the urethra. Patients with bladder cancer sometimes have other tumors in these places, so the entire urinary tract needs to be checked for tumors.



Bladder Cancer | Credit: Google



Source: NYC DOH Community Health Portal

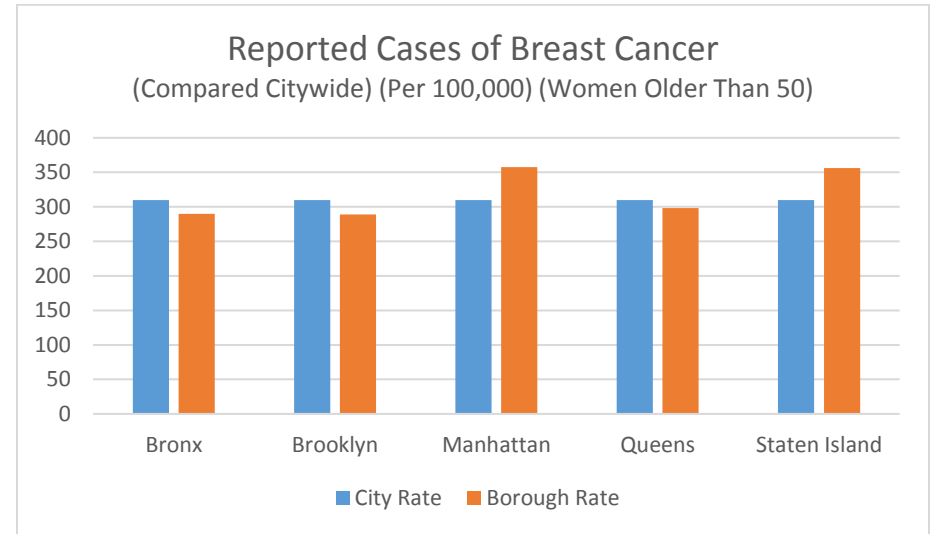
- Geographical comparison studying cancer deaths and birth defects in Clinton County, PA (home to landfill) compared to PA and US. **Found an increase in bladder cancer deaths in Clinton; increase in number of other cancers in Clinton and 3 surrounding counties.**
- Geographical comparison studying cancer rates in 8 counties in Illinois containing towns with contaminated wells compared to national rates. Study **found an excess in bladder cancer in town with contaminated wells.**
- Geographical comparison of 593 NPL waste sites in US. **Study found increased rates of cancer of the lung, bladder, stomach, and rectum.**
- Case-control studying 38 sites with likely landfill gas migration in New York State. **Study found an excess of female bladder cancer and female leukemia.**

# Cancer and Leukemia: Breast Cancer

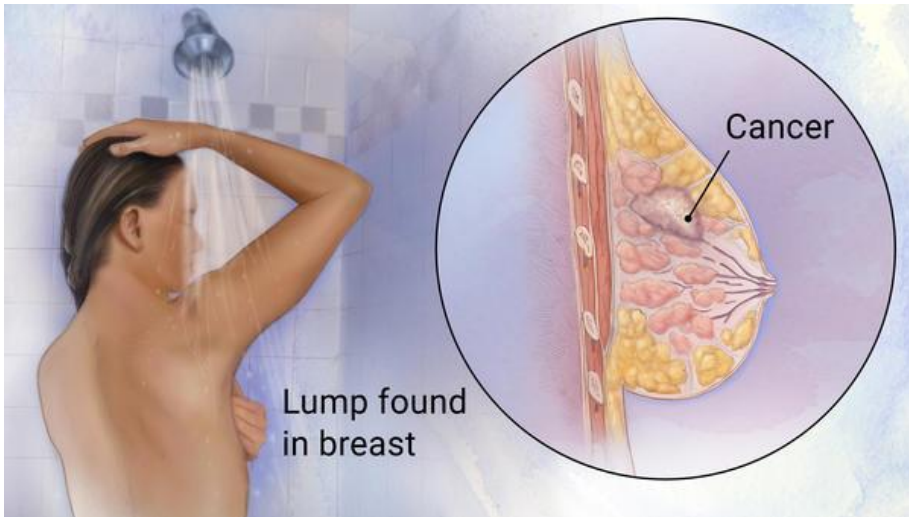
## What is Breast Cancer?

Breast cancer starts when cells in the breast begin to grow out of control. These cells usually form a tumor that can often be seen on an x-ray or felt as a lump. The tumor is malignant (cancerous) if the cells can grow into (invade) surrounding tissues or spread (metastasize) to distant areas of the body. Breast cancer occurs almost entirely in women, but men can get it, too.

Breast cancers can start from different parts of the breast. Most breast cancers begin in the ducts that carry milk to the nipple (ductal cancers). Some begin in the glands that make breast milk (lobular cancers). There are also other types of breast cancer that are less common.



Source: NYC DOH Community Health Portal



Breast Cancer | Credit: Google

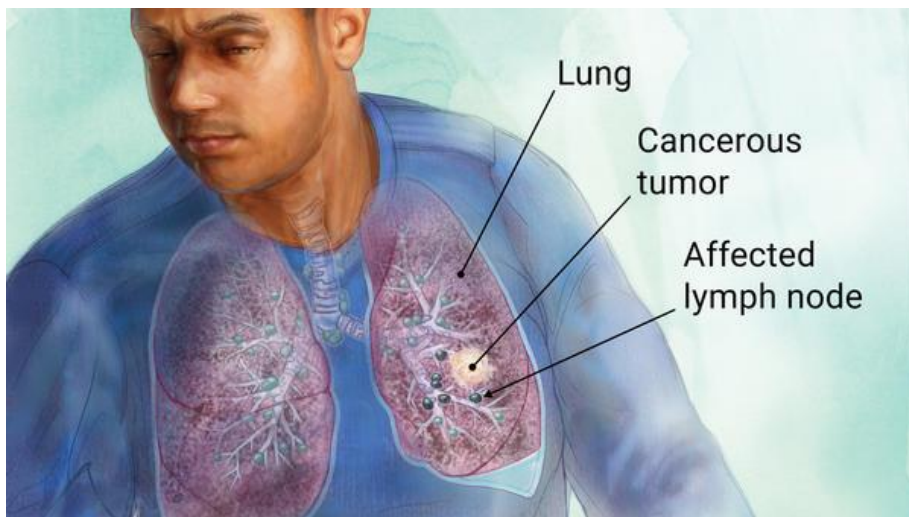


# Cancer and Leukemia: Lung and Bronchus Cancer

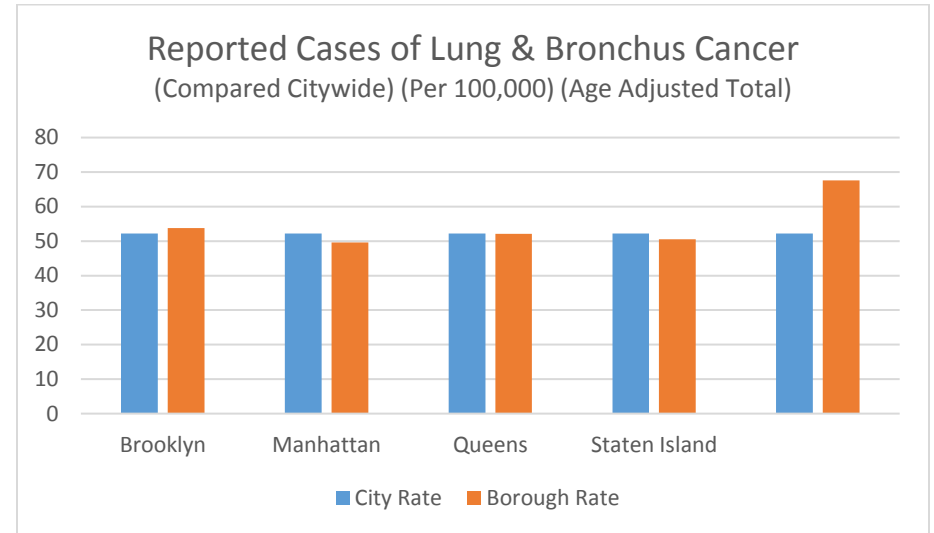
## What is Lung and Bronchus Cancer?

Lung cancer is the uncontrolled growth of abnormal cells in one or both lungs. These abnormal cells do not carry out the functions of normal lung cells and do not develop into healthy lung tissue. As they grow, the abnormal cells can form tumors and interfere with the functioning of the lung, which provides oxygen to the body via the blood.

There are two major types of lung cancer, non-small cell lung cancer and small cell lung cancer. Staging lung cancer is based on whether the cancer is local or has spread from the lungs to the lymph nodes or other organs. Because the lungs are large, tumors can grow in them for a long time before they are found. Even when symptoms, such as coughing and fatigue, do occur, people think they are due to other causes. For this reason, early-stage lung cancer (stages I and II) is difficult to detect.



Lung Cancer | Credit: Google



Source: NYC DOH Community Health Portal

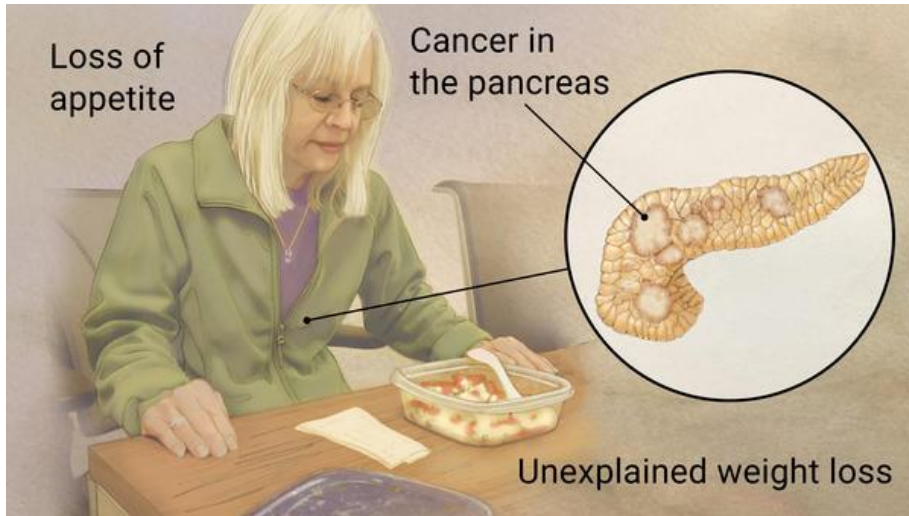
- Geographical comparison studying residents of Montreal Island in areas adjacent to landfill and estimated exposure to landfill gas found an increase in incidence of stomach, liver, lung and prostate cancer for men, stomach and cervix-uteri cancer for women.
- Geographical comparison of 593 NPL waste sites in US. Study found increased rates of cancer of the lung, bladder, stomach, and rectum.

# Cancer and Leukemia: Pancreatic Cancer

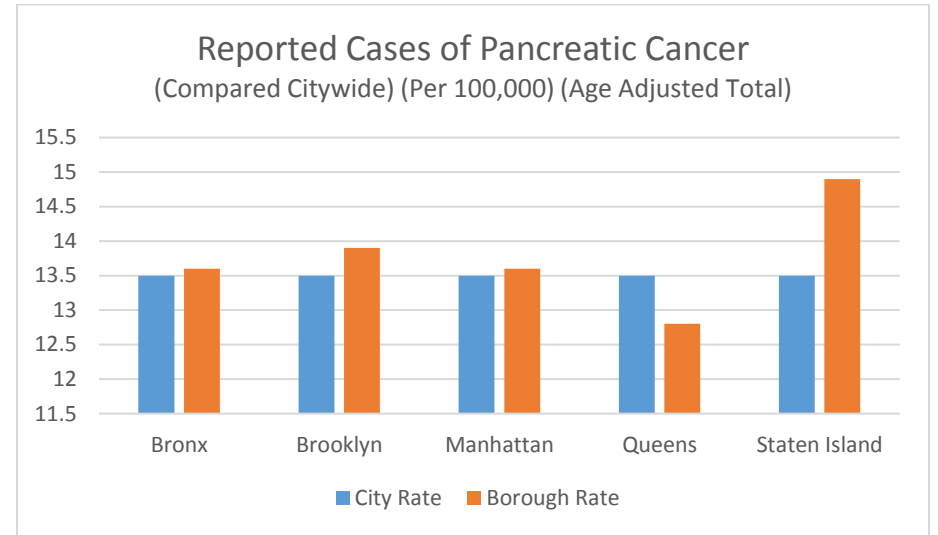
## What is Pancreatic Cancer?

Pancreatic cancer begins when cells in the pancreas start to grow uncontrollably. The pancreas is an organ located behind the stomach. It is shaped a bit like a fish with a wide head, a tapering body, and a narrow, pointed tail. In adults it is about 6 inches long but less than 2 inches wide.

The head of the pancreas is on the right side of the abdomen (belly), behind where the stomach meets the duodenum (the first part of the small intestine). The body of the pancreas is behind the stomach, and the tail of the pancreas is on the left side of the abdomen next to the spleen.



Pancreatic Cancer | Credit: Google



Source: NYC DOH Community Health Portal



# Cancer and Leukemia: Thyroid Cancer

## What is Thyroid Cancer?

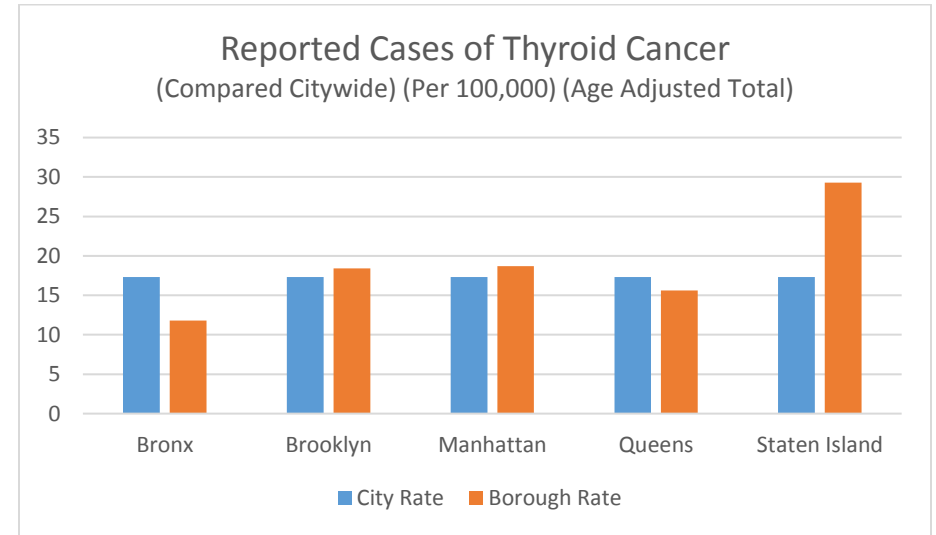
Thyroid cancer starts in the thyroid gland. To understand thyroid cancer, it helps to know about the normal structure and function of the thyroid gland.

The thyroid gland is below the thyroid cartilage (Adam's apple) in the front part of the neck. In most people, the thyroid cannot be seen or felt. It is butterfly shaped, with 2 lobes — the right lobe and the left lobe — joined by a narrow isthmus.

The thyroid gland has 2 main types of cells. Follicular cells use iodine from the blood to make thyroid hormones, which help regulate a person's metabolism. The amount of thyroid hormone released by the thyroid is regulated by the pituitary gland at the base of the brain, which makes a substance called thyroid-stimulating hormone (TSH). C cells (also called perifollicular cells) make calcitonin, a hormone that helps control how the body uses calcium.

Other, less common cells in the thyroid gland include immune system cells (lymphocytes) and supportive (stromal) cells. Different cancers develop from each kind of cell. The differences are important because they affect how serious the cancer is and what type of treatment is needed.

Many types of growths and tumors can develop in the thyroid gland. Most of these are benign (non-cancerous) but others are malignant (cancerous), which means they can spread into nearby tissues and to other parts of the body.



Source: NYC DOH Community Health Portal



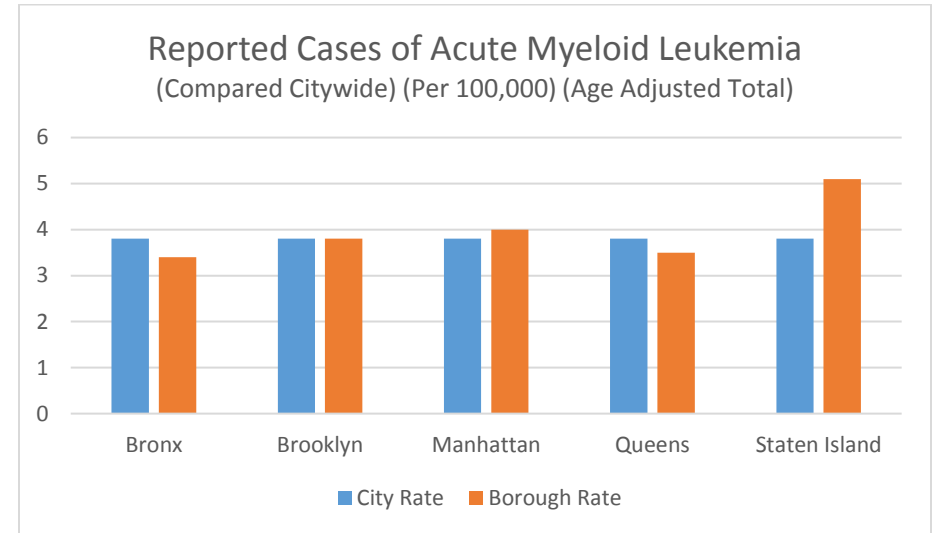
# Cancer and Leukemia: Acute Myeloid Leukemia

## What is Acute Myeloid Leukemia?

Acute myeloid leukemia (AML) has many other names, including acute myelocytic leukemia, acute myelogenous leukemia, acute granulocytic leukemia, and acute non-lymphocytic leukemia.

“Acute” means that this leukemia can progress quickly if not treated, and would probably be fatal in a few months. “Myeloid” refers to the type of cell this leukemia starts from. Most cases of AML develop from cells that would turn into white blood cells (other than lymphocytes), but some cases of AML develop in other types of blood-forming cells.

AML starts in the bone marrow (the soft inner part of certain bones, where new blood cells are made), but in most cases it quickly moves into the blood. It can sometimes spread to other parts of the body including the lymph nodes, liver, spleen, central nervous system (brain and spinal cord), and testicles.



Source: NYC DOH Community Health Portal

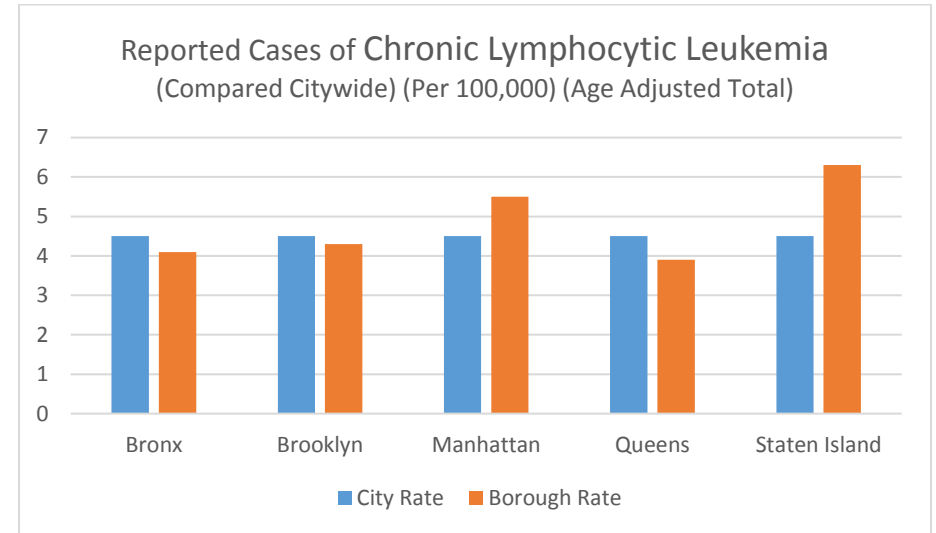
- Geographical comparison studying three counties adjacent to a waste dump compared to the whole region. **Study found an excess in leukemia incidence.**
- Geographical comparison studying cancer rates in Woburn (home to landfill) compared to national rates. **More than 2-fold excess in childhood leukemia.**
- Case-control studying exposure index based on fraction of water supply in household from contaminated wells. **Study found an increase in eye/ear anomalies, CNS/chromosomal/cleft anomalies; perinatal deaths; kidney/urinary tract disorders, lung/respiratory disorders.**
- Case-control studying 38 sites with likely landfill gas migration in New York State. **Study found an excess of female bladder cancer and female leukemia.**

# Cancer and Leukemia: Chronic Lymphocytic Leukemia

## What is Chronic Lymphocytic Leukemia?

Chronic Lymphocytic Leukemia (CLL) is a type of cancer that starts from cells that become certain white blood cells (called lymphocytes) in the bone marrow. The cancer (leukemia) cells start in the bone marrow but then go into the blood.

In CLL, the leukemia cells often build up slowly over time, and many people don't have any symptoms for at least a few years. In time, the cells can spread to other parts of the body, including the lymph nodes, liver, and spleen.



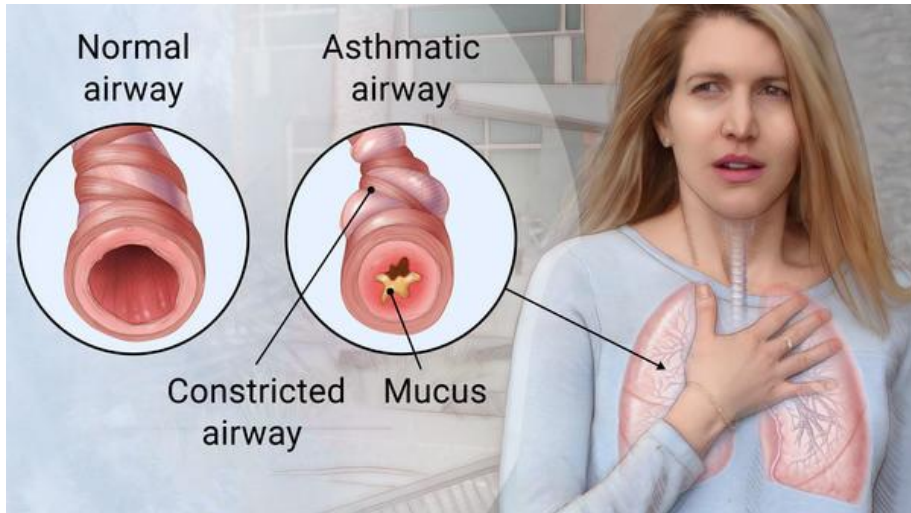
Source: NYC DOH Community Health Portal

- Geographical comparison studying three counties adjacent to a waste dump compared to the whole region. **Study found an excess in leukemia incidence.**
- Case-control studying 38 sites with likely landfill gas migration in New York State. **Study found an excess of female bladder cancer and female leukemia.**

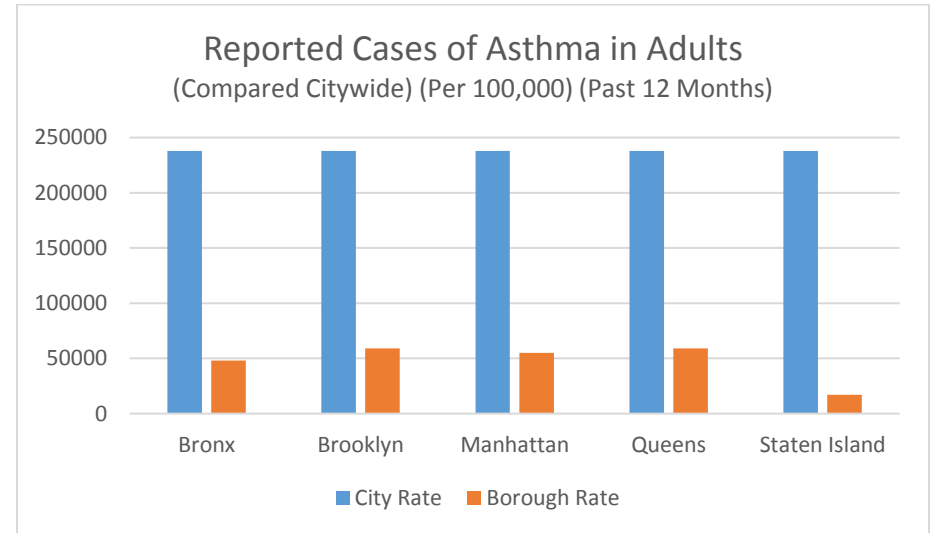
# Respiratory Illness: Asthma in Adults

## What is Asthma?

Asthma is a chronic (long-term) lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing (a whistling sound when you breathe), chest tightness, shortness of breath, and coughing. The coughing often occurs at night or early in the morning.



Asthma | Credit: Google



Source: NYC DOH Community Health Portal

- Case-control study measuring individual exposure index based on concentration of pollutants and daily activity of study subjects. The study **identified a relationship between exposure level and existing cases of respiratory and psychological issues.**

# Conclusion

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Dear Reader,

Whether it's a myriad of environmental hazards, respiratory illness, a greater prevalence of autism spectrum disorder, birth defects, cancer or a variety of other very real ailments that are not yet known, Staten Islanders have borne the brunt (and continue to bear the brunt) of the ecological disaster that was the Fresh Kills Landfill. As the data compiled in this report makes clear, there's a very real correlation between the landfill and the enormous human and monetary costs that Staten Islanders have been forced to shoulder. To say, that Staten Islanders should be uniquely burdened by something they were forced to endure and had virtually no say in opening, but that the only clear monetary benefit (the proceeds of methane sales) should be denied to them defies logic. Let's use that money (retroactive to the time the sale of methane from the site began) to ameliorate some of the tragic costs Staten Island has had to endure. Further, so that New York City as a whole (and every community for that matter) has a full and comprehensive understanding of what doing this does to communities, we really need to make arrangements for a comprehensive study to be done forthwith on all of the aspects in which life on Staten Island continues to be effected by this what will go down as one of New York City's greatest mistakes. To do anything less, would be insulting to Staten Islanders and all taxpayers.



Respectfully yours,  
**Joseph C. Borelli**  
**Council Member**  
**51<sup>st</sup> District**



Joe Borelli was elected to serve the constituents of the 51st Council District in a special election held on November 3, 2015. His district includes the South Shore of Staten Island.

Joe previously represented his South Shore constituents in the New York State Assembly. He was the ranking minority member of the Assembly Cities Committee.

Dedicated to improving the quality of life on Staten Island, Joe was successful in coordinating the development of several Park and Rides here on Staten Island, securing funds to outfit nearly every classroom on the South Shore with a Smartboard and has worked with the Parks Department on the renovation and construction of several parks on Staten Island. Joe has been involved in the Staten Island Growth Management Task Force, the Brookfield Landfill Citizens Advisory Committee, and he was also instrumental in the successful fight to eradicate polychlorinated biphenyls (PCBs) from public school buildings. Throughout his career in state and city government, Joe has proven himself to be a leader.

Joe is a native Staten Islander and lives in the Annadale section of Staten Island with his wife, Rachel, their son, Joseph, and his English Bulldog, Luna. He holds a B.A. from Marist College and an M.A. from the College of Staten Island, where he is also an Adjunct Professor of Political Science.