

Sandy's Mold Legacy: The Unmet Need Six Months After the Storm



Mold on the exterior of home in Midland Beach. Photo: Karen Smul

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May 2013

Executive Summary

Just over six months ago, Hurricane Sandy hit the shores of New York, bringing floods and standing water to neighborhoods across the tri-state area. New York City was hit especially hard—with an estimated 70,000 to 80,000 homes affected by water damage¹. But if the destructive capacity of flooding and water damage was bad, it soon became clear homeowners were faced with an even greater threat. Flooded homes not dried out within 24 to 48 hours were at serious risk of developing mold infestations, threatening the health and safety of thousands of New Yorkers.

At the end of January 2013, city administrators created the privately funded *Neighborhood Revitalization NYC* program (“NRNYC” or “the program”) to remediate 2,000 homes, responding to growing reports of mold contamination in the press.

The organizations that drafted this report have engaged with the City and the non-governmental agency administering the *Neighborhood Revitalization NYC* program throughout the several months it has existed, and have been able to provide feedback on the effectiveness of the program. The city and program administrators have been extremely open to feedback, and many obstacles have been improved because of that openness. However, as the results of this study indicate, for a variety of reasons, the city’s current approach to mold remediation post-Sandy needs expansion and improvement. The city has been open in communicating the numbers of families who have registered for the program as it has taken shape. However, the results of this study indicate that the surprisingly low number of families who have registered for the program is not indicative of actual demand and that the reality is one of major unmet need for mold remediation.

First, a huge percentage of families who self-identify as having mold in their homes have not even heard of the program or have been unable to access its support. Second, evidence indicates that many families beyond those who self-identify may have mold in need of remediation. Finally, families who live in buildings with more than four units do not qualify for the program. Even renters in small buildings must rely on their landlords to register for the program—effectively barring many renters if their landlords are absent or unresponsive. These families, at least those who have attempted mold remediation, have largely failed to adequately remediate the problem because of the failures of self-help, low-skill volunteer programs and inexperienced contractors.

Six months later, the acute need for mold remediation across New York City has not abated, and mold’s disproportionate impact on low-income and immigrant communities has resulted in displacement, sickness, and continued crisis in Sandy-affected neighborhoods. Major community-based organizations with roots in those neighborhoods have stepped in to help construct solutions. Members of the Alliance for a Just Rebuilding, a coalition of labor unions and community, faith-based, environmental and policy organizations across New York, have begun to survey residents in order to meaningfully assess the post-Sandy mold crisis across the city. In March and April, Faith in New York (formerly Queens Congregations United for Action), Make the Road NY, and New York Communities for Change conducted phone and door-to-door surveys across the Rockaways and in Staten Island, reaching almost 700 households. Feedback from residents forms the basis for this report’s analysis of the threat of mold in hurricane-ravaged neighborhoods and our recommendations on how city leaders should respond to the crisis.

KEY FINDINGS

Almost two-thirds of households had visible mold at the time of the survey, highlighting the potential extent of the existing mold contamination problem in Sandy-affected areas.

- > In total, 690 surveys were completed.
- > At least 420 (61%) of surveyed homes had visible mold at the time of the survey.
- > The rate of mold infestation is even higher in homes that experienced water damage. Of 541 households that reported flooding, 358 (66%) have already found mold.

More than one-third of households that attempted some form of mold remediation have already seen mold return. One in four of those households report sickness.

- > 425 people reported attempting some form of remediation.
- > 146 (34%) of those reported having visible mold at the time of the survey.
- > 107 (25%) are still experiencing symptoms of mold exposure.

Surveyed homeowners who attempted to remediate mold on their own were overwhelmingly unsuccessful—with 90% reporting returning mold.

- > Our survey reached 446 self-identified homeowners.
- > Of self-identified homeowners, 280, or 63% reported currently having mold at the time of the survey.
- > Of these self-identified homeowners with mold at the time of the survey, 92% had already taken steps to remediate mold in the past, only to have it return.
 - o About 21% paid out of pocket to hire contractors, about 55% cleaned the mold themselves (mostly with bleach), and 8% used volunteers groups.

More than half of renters had already taken steps to remediate mold, although landlords are responsible for repairs.

- > 47% of 151 self-identified renters had mold at some point since the storm, including 31% who still had mold at the time of the survey.
- > Although landlords are responsible for making repairs, 51% of renters who identified mold in their home had taken steps on their own to remediate the mold.

Households with elderly people and children reported much higher rates of mold-related symptoms.

- > 334 households provided information on occupants' vulnerabilities.
- > Of the 168 moldy households that included elderly people or children, 38% had mold-related illness.
- > Of the 166 moldy households without vulnerable people, 23.5% had such illness.

Less than 20% of households reported knowing the City had a mold remediation program.

- > Of the 654 households who answered, only 112 (17%) knew that the City had a mold remediation program.
- > As of last week, officials reported that only 1,300 people had signed up for *Neighborhood Revitalization NYC*.

RECOMMENDATIONS

Given the pressures Sandy victims face as they struggle to make their homes habitable and healthy, we outline the following recommendations:

1

The City of New York should take full responsibility for proactively assessing where mold infestation has gone unrecognized or has been inadequately remediated. The NRNYC has engaged in substantial outreach in partnership with CBOs and otherwise, but the fundamental requirement for families to proactively opt-in to the program limits the efficiency and scope. We recommend an expanded program with systematic outreach that does not rely solely on individual families to opt into the program.

2

The City should specifically appropriate a portion of CDBG home rehabilitation funds to use exclusively for mold remediation. Other structural damage should not be a requirement for accessing these funds, nor should it be bundled with money awarded for other repairs.

3

The City should create a clear pathway to protect tenants' right to a home free from toxic mold In the immediate aftermath of Sandy, city officials proposed sending notices of intent to put a lien on the properties of landlords who had tenants without heat or electricity, and who were not signing up for the Rapid Repairs program. Additionally, the city has programs in place that can serve as models: the Alternative Enforcement Program and emergency repairs programs, for example, allow HPD to proactively make repairs or handle mold remediation where landlords have failed to act, and to collect funding afterwards. Similar approaches should be implemented to gain compliance from landlords who have tenants struggling to get rid of mold.



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Introduction

Just over six months ago, Hurricane Sandy brought floods and standing water to huge swaths of New York City. Many Sandy-struck families did not dry their homes for days or weeks: some residents were forced to seek shelter and stayed away from their houses due to extensive damage and freezing temperatures; some were unable to run equipment to pump out water because of weeks-long interruption of utility service; some lacked access to timely mold-related information coming from an adequate mold emergency response program; and some simply lacked the resources. As experience with similar disasters like Katrina predicted, mold came quickly. Within two weeks of the storm, news stories began reporting thick, toxic green fuzz growing in flooded homes and businesses, and telling of growing respiratory health impacts – including a phenomenon that came to be known as the “Rockaway cough”.² Community-based organizations in Sandy-impacted areas started calling attention to the problem.³

Unfortunately, in the face of an escalating crisis, the City’s response has been lacking. Despite repeated demands by community-based organizations, the City never made mold remediation part of its Rapid Repairs program, which was intended to restore electricity, heat, and hot water to private houses and which launched shortly after waters receded. The City took an important step in the right direction in January when the Mayor’s Fund for the City of New York partnered with other private foundations to create a free program to remediate 2,000 homes — called *Neighborhood Revitalization NYC*. But among other problems, the natural limitations of an opt-in program, the difficulties renters face in accessing the program and the exclusion of those in public housing and large apartment buildings from actual remediation services, has led to underutilization of the program.

More importantly, *Neighborhood Revitalization NYC* only tackles a tiny fraction of the potential problem. According to the Mayor’s own estimate days after the storm, between 70,000 and 80,000 homes were damaged by water during Hurricane Sandy.⁴ All these could be at risk for mold infestation if they were not completely dried out within 24 to 48 hours since contact with water, or if they were improperly remediated since the storm.⁵ But this number is only an estimate, and thousands more homes, apartments and small businesses could remain uncounted. For example, NYC’s Action Plan for CDBG federal recovery funds indicates that over 330,000 housing units are located within the Hurricane Sandy inundation area, from single-family homes to elevator apartment buildings. But to date, the City has not made data available on how many of those units were actually damaged by water, nor how many contain mold, and to what extent.⁶ This inaction is concerning in the face of evidence that mold became a huge problem after Katrina, where a Centers for Disease Control and Prevention study found 46% of homes had mold contamination after the hurricane.⁷

Since the City has not fully assessed the real need for mold remediation, nor mold’s impacts on the displacement, sickness and continued crisis of Sandy-affected neighborhoods, community-based organizations in the Alliance for a Just Rebuilding have begun to survey residents across the Rockaways, intensively in the Far Rockaway neighborhood of Arverne, and in Staten Island. This report outlines our findings of the situation on the ground, and highlights the urgent need for public intervention.

Mold is making homes unsafe and making people increasingly sick. In many cases, mold is keeping displaced residents from going home even as they are pushed out of evacuee hotels,

and splitting up families when parents temporarily send their children to live with friends or relatives to protect them from unhealthy conditions. The onset of warmer weather as the summer months approach only promises that the problem will be exacerbated, as mold spores left in moist places spawn. The City must act now.

The Problem

MOLD: THE HEALTH HAZARD

Molds are microscopic organisms that are present virtually everywhere. In order to reproduce, molds produce spores, which spread through the air. These spores act like seeds and can form new mold colonies if the conditions are right. Mold will grow and multiply under the right conditions, needing only sufficient moisture and organic material (e.g., ceiling tile, drywall, paper, or natural fiber carpet padding).⁸ When mold growth increases significantly beyond the amount that is usually present, it may cause a variety of health problems. Many building materials flooded by Sandy are still sufficiently damp to sustain mold, even if they feel dry to the touch.

Mold is a danger to residents and workers in affected buildings. According to the NYC Department of Health and Mental Hygiene, adverse health effects of mold may include allergic reactions, toxic effects and irritation and infections. The potential for adverse health effects depends on the degree of exposure—which increases with the amount and type of mold-impacted materials and with the amount of time people are exposed to mold—and on susceptibility, like that dictated by underlying health conditions of individuals.⁹ For healthy people, mold's effects can include coughing and wheezing, and eye, throat and skin irritation.¹⁰ For asthma and allergy-sufferers, reactions can be much more severe.¹¹ Mold poses a serious risk of lung infection for people with compromised immune systems, including infants, elderly people and people who are already sick.¹² Mold poisoning, from intensive exposure to the toxins produced by mold, can cause fever, shortness of breath, cancers, and long-term problems with the lungs, brain and immune system.¹³ Mold exposure is especially hazardous for mold remediation workers with occupational exposures, particularly when workers don't use proper protective equipment.

Unaddressed, mold has strong potential to create serious, lasting negative impacts on community health. Louisiana's health care system identified increased respiratory illness, attributed to mold from flooding; and an ongoing study of New Orleans children with asthma found dramatic elevation (to 80%) in the number of children for whom mold triggered asthmatic episodes. By contrast, the next highest rate was 50% in other cities.¹⁴ Other studies of Louisiana residents five years after Hurricane Katrina found tens of thousands of children with emotional and behavioral problems linked to PTSD, resulting from their displacement from communities, families and schools, as well as increased incidence of health problems – all impacts currently affecting families displaced by Sandy-related mold.¹⁵

ADEQUATE AND INADEQUATE MOLD REMEDIATION

In the wake of Hurricane Sandy, thousands of low- and moderate-income people, schools, and businesses identified mold contamination of sheetrock, carpets, and other building materials and furnishings as a hazard, and set out to remediate mold. Contractors, volunteer groups and do-it-yourself homeowners and renters have bleached, dried and in some cases taken out moldy structures. However, remediating mold properly is difficult, potentially expensive, and easy to do incorrectly.

There are no legal requirements that govern who can conduct mold remediation and what adequate and successful remediation looks like. Government agencies generally agree that small jobs (10ft. by 10ft. or smaller) can be done on an intermittent basis by maintenance workers who have received mold training. There is a wide consensus among mold remediation and occupational health experts that larger jobs should be done by professional remediators with more extensive training, qualifications and experience.¹⁶

Lacking legal standards, different governmental entities have released guidelines. The NYC Department of Health and Mental Hygiene itself stresses that the main goal of mold remediation is to “remove or clean mold-damaged materials using work practices that protect occupants by controlling the dispersion of mold from the work area and protect remediation workers from exposure to mold” and that “in all situations, the underlying moisture problem must be corrected to prevent recurrent mold growth.”¹⁷ Experts recommend disposing of sheetrock and other porous materials that have been soaked or that have visible mold growth. In certain cases of small contamination, scrubbing with water and a mild detergent followed by drying is sufficient for hard, non-porous surfaces. In all cases, workers must be equipped with fit-tested respirators, suits, goggles, gloves, and boots to protect them from exposure.

The absence of legal standards or a systematic public mold remediation program, in the early months after the storm has resulted in uneven and often confusing information flow about the risks related to mold and the best practices of remediation. The impact is that residents, volunteers, and workers from contractors without experience in mold remediation seem to have used many ineffective and sometimes dangerous methods. For example, one commonly reported technique is the use of bleach and other chemical products that kill mold (biocides). Because both live mold and dead mold can cause health problems, killing mold does not in fact get rid of the health hazards.¹⁸

Without proper remediation, mold can reoccur and result in ongoing health hazards and extra costs. Remediation is likely to be unsuccessful and mold grows back when do-it-yourself residents, volunteers, and workers don't have the proper safety and technical training and fail to adequately remove the source of dampness and all remnants of mold spores, including those in drywall. There are also many opportunities along the way for residents and workers to be sickened: mold is left behind, spores and toxins are released during home repairs, and chemicals used to stifle mold's growth can pose serious health dangers. Unfortunately, high-quality mold remediation is outside the reach of low-income families. In homes with high levels of contamination, this process can cost up to \$25,000.¹⁹

MOLD: NOBODY'S BUSINESS

Complicating matters, mold is not the particular purview of any city, state or federal agency. In 2005, after Hurricane Katrina's devastating mold crisis and a growing outcry in New York State about mold as a housing quality and public health problem, the New York State legislature created the NYS Toxic Mold Task Force, which ultimately issued advisory guidelines on the remediation of mold in 2010.²⁰ No actual standards or requirements for the adequate treatment of mold exist at any level of government, though. Not HUD nor the EPA at the federal level; not NYSHCR nor the NYS Department of Health; not HPD nor the City's health department; not the NYC Rapid Repairs program – no public program takes responsibility for removing mold, even when mold poses a widespread threat to public health. Sandy's immediate mold crisis, the ongoing mold crisis at the New York City Housing Authority (NYCHA), and mold that will inevitably come from future storms and climate events, remain largely the purview of cobbled-together local programs – if they are treated at all.

Because there is no coordinated and systematic program to ensure that the post-Sandy mold crisis is handled safely, correctly, and to its conclusion, residents in Sandy-affected neighborhoods are getting sick. The arrival of warmer weather will speed the growth of mold and trigger more illness. This risk comes from many directions. It comes from mold that is trapped inside people's homes and that will continue to grow. It also comes from traveling spores that could move from homes that have not been remediated into repaired and non-contaminated homes, possibly creating a second round of contamination. It will also likely bring a new wave of attempts to fix mold, and make other repairs to moldy homes, which will create still more risk for residents and workers. Since there is no current standard requiring that mold workers be trained and mold remediated to evidence-based standards, residents in mold-infested homes are left largely to fend for themselves—not just to remediate mold, but potentially to rebuild for a second time.

In order to stem the economic and public health crisis of mold after the storm, New York needs a sensible program that reaches *all* flooded homeowners and renters with both information and mold services. We need a program that moves quickly enough to ensure that residents are not forced to live with mold, and that mold does not become a force for displacement of homeowners or renters. We need a program that sets standards for expert work, and then follows mold with remediation by expert workers until it's gone. As hotel deadlines loom, weather warms, and residents report escalating illness, mold's crisis becomes increasingly urgent. We need an effective and robust program now.

Iztac's apartment was completely flooded by the storm and she lost everything. Iztac does not qualify for FEMA assistance and her landlord refused to clean the apartment or properly remediate the mold. Iztac and a few friends helped muck out the apartment and tried to clean the mold, because she felt she had nowhere else to go. Afterward she was sick for weeks with skin rashes and pulmonary problems that persist to this day. Finally after weeks of living in a moldy apartment Iztac left, but is now paying higher rent that she can barely afford.

Data snapshots: Mold, illness and little recourse for Sandy-struck neighborhoods

Given the scope and seriousness of the risk, it is surprising that little has been done to systematically study and combat mold in Sandy-affected communities. Since the storm, anecdotal reporting on mold, problems with remediation, and lack of access to support from city or federal sources have circulated among community organizations and relief workers. In meetings with federal officials though, we have heard that although those reports are cause for concern, they are not supported by enough formal data to evaluate or respond to them.

METHODOLOGY

In March and April, three community-based organizations within the Alliance for a Just Rebuilding conducted surveys to begin to measure the prevalence, persistence and impacts of mold. Their purpose was to help families enroll in the city's mold remediation program, formalize community reporting, provide the missing data, and begin to assess the unmet need, and help address obstacles to tackling mold at an adequate scale. Make the Road New York, New York Communities for Change, and Faith in New York all conducted surveys door-to-door and by phone in neighborhoods that experienced widespread flooding and where they were already advocating and organizing with residents for Sandy recovery: across the Rockaways—intensively in the Far Rockaway neighborhood of Arverne—and in Staten Island.

It's important to note that these surveys of a few key neighborhoods—while much more comprehensive than anecdotal reports—do not cover all communities or housing types, and do not constitute a full assessment of the problem. These surveys confirm that there *is* a problem that is not adequately addressed by existing programs. They confirm that homeowners and renters, wealthier and poorer, are experiencing the crisis of mold in very particular ways that require particular thoughtful solutions. They confirm that, as mold goes unaddressed—or unsuccessfully addressed at great cost to residents—New Yorkers are getting sick, driven deeper into post-storm crisis, and increasingly permanently displaced from their homes.

- > In total, **690 surveys were completed.**
- > At least **420 (61%) of surveyed homes had visible mold.**
- > Few of the surveyed houses were spared from flooding in the wet zones; and in homes that experienced water damage, the rate of mold infestation is even higher. About **78% of those surveyed (541) had been flooded** at levels from 1 foot to 18 feet. **Among those flooded, two-thirds (358) have already found mold.**

WHO IS SUFFERING FROM MOLD'S IMPACTS?

It is clear that residents across the city have been struggling with mold. However, our survey reveals that different groups of people face particular challenges, and may require a different approach.

Homeowners

Homeowners whose homes were flooded in the storm bear the responsibility of cleaning and rebuilding their own homes. Many homeowners will be struggling financially to complete the rebuilding process because in many cases FEMA aid and insurance are not enough. This is problematic because homeowners may not prioritize mold remediation when faced with the other extensive repairs they must complete. That leaves homeowners in the tough position of deciding what to leave undone or to go into further debt.

- > Our survey reached 446 self-identified homeowners.
- > Of self-identified homeowners, 280, or **63% reported to currently have mold at the time of the survey.**
- > Of these self-identified homeowners with mold at the time of the survey, **92% had already taken steps to remediate mold in the past**, only to have it return.
 - About 21% paid out of pocket to hire contractors, about 55% cleaned the mold themselves (mostly with bleach), and 8% used volunteers groups.
 - 2% received City (Rapid Repairs) help with mold, despite the fact that Rapid Repairs was not intended to remediate mold.

Before the storm **Cesar** lived with his wife and children on Father Capodanno Blvd in South Beach, Staten Island, in a house owned by his mother-in-law. The home was right on the beach and was badly flooded. Like many others, his father-in-law rushed to complete repairs because the family had nowhere else to go and could not afford to pay rent on another apartment for an extended period of time. Because of these time restraints and lack of training, Cesar's father-in-law did not properly remediate the mold and soon after the family moved back home the mold exploded. It became impossible to stay in the home. The family has spent the past months moving between a series of shelters and hotels while Cesar remediates the mold and rebuilds their home for a second time.



Data reveals a staggering amount of wasted time, effort, and resources for the surveyed homeowners who had attempted to remediate mold. With most people struggling to finance their repairs, New Yorkers simply cannot afford to spend money on remediation that is not effective, or risk double or triple costs that are generated when mold grows back after repairs have already been made to homes. And we cannot afford to put families at risk in mold-infested homes.

Respond & Rebuild, a volunteer non-profit organization carrying out mold remediation in the Rockaways Peninsula with access to approximately 350 intake assessments, reports that one population of homeowners raises particular concerns: low-income owner-occupants who rely on renters. Many of these homeowners reported to Respond & Rebuild that they

were ineligible for repair programs because their rental units were deemed “small businesses” by local and federal aid officials. Officials directed these homeowners to the Small Business Administration only to be turned away there too when they were told they were actually ineligible for small business loans. Without the income normally provided by the rental units, homeowners did not have income high enough to qualify for loans. In Respond & Rebuild’s experience, retirees and low-income single female heads of household have been particularly affected by this issue.

Renters

Renters face particular challenges and hurdles in remediating mold. They cannot authorize work on their own, or complete the intake process for the Neighborhood Revitalization NYC mold remediation program. Although landlords are legally responsible for completing repairs, including mold remediation, we found that renters are making tough choices between remediating their home themselves, and staying in unhealthy homes. It is important to note that for many renters, leaving is not a viable option given the lack of affordable rental options and high rents in Sandy affected areas.

- > 47% of 151 self-identified renters had mold at some point since the storm, including **31% who still had mold at the time of the survey.**
- > Although landlords are responsible for making repairs, **51% of renters who identified mold in their home had taken steps on their own to remediate the mold.**
 - 15 had done it themselves, all with bleach.
 - 5 had help from volunteers.
 - 14 hired contractors at their own expense.

With more than half the renters reporting to have taken their own steps to remediate mold, the need for the City to ensure that landlords have access to adequate resources and are held accountable for repairs in their rental units is clear. Without resources and requirements, there will be no real protection of tenants’ rights to live in healthy homes. The city has programs in place that can serve as models: the Alternative Enforcement Program and emergency repairs programs, for example, allow HPD to proactively make repairs or handle mold remediation where landlords have failed to act, and to collect funding afterwards.

Although survey data does not shed much light on rental units whose low-income owners are occupants, low-income informal renters and immigrant renters likely comprise many renters living with mold, because those renters likely lack the resources to find alternative housing and both renters and owners lack the resources to remediate mold themselves. Low-income informal renters and immigrant renters are likely to have sought shelter with friends and family, or doubled up without the help of disaster supports.

Juana, her husband, and their two children (including a baby born only days after the storm) were displaced from their apartment by Hurricane Sandy. They have been able to find a new apartment that they can barely afford, but at the cost of their health. Their new apartment was also flooded during Sandy and since moving in they learned that the landlord completed the repairs too quickly and did not completely dry the structure. The result is mold that is creeping out from behind the cabinets in the kitchen, putting the whole family at risk. PHOTO:KAREN SMUL



Abandoned Housing

Not included in the survey data are the numbers of homes that have been abandoned and whose owners therefore were not available for a survey. However, it is clear that these homes are prevalent in Sandy-impacted communities. For example, on April 25th on Moreland Street in Midland Beach on Staten Island, a resident showed us four homes that had not been touched since the storm. Inside, the walls and all the remaining belongings were covered in mold. All four of these houses are within sight of her partially-repaired home. These homes present a danger to the surrounding families. Mold spores can spread through the air contaminating nearby homes and sickening people.

Manuel and his family were forced to evacuate their home that was destroyed during the storm. Now they are paying rent and the mortgage on the home while he slowly repairs the damage. While he has taken care of mold in his own home, the neighboring house, only 6 feet away, is unoccupied and has not been remediated. It has visible mold on the foundation and has a nasty smell that is perceptible even from the street. Manuel fears that the mold next door will completely destroy six months of hard work.



DESTROYED HOME IN MIDLAND BEACH.
PHOTO: KAREN SMUL

GETTING SICK

Mold presents a serious health hazard. After the storm, reports in the media of increased respiratory illnesses were common, and doctors are predicting this will be the worst allergy season on record in the area because of elevated levels of mold spores.²¹ However, since mold is not always visible, its occurrence is underreported. As the weather becomes warmer we anticipate not only more mold, but an increased rate of illness. In fact, a few participants reported that although they did not have visible mold, they were experiencing symptoms of mold-induced illness.

Elderly people and children are at higher risk. Not surprisingly, of homes that reported on dwellers' vulnerabilities and had visible mold, those with elderly people and children had a much greater incidence of symptoms.

- > Of the 168 moldy households that included elderly people or children, **38% had mold-related illness.**
- > Of the 166 moldy households without vulnerable people, **24% had such illness.**

It is imperative that the City continue monitoring the health of residents in Sandy affected areas. There is evidence that Sandy-affected neighborhoods might be at particular risk for health hazards of mold. Sandy-affected neighborhoods reported more than 30,000 asthma-related emergency room visits between 2008 and 2010.²² Asthmatics comprise more than 25% of the population of the Sandy-affected neighborhood of Red Hook, Brooklyn.²³

The threat of mold spreading and causing more residents to become ill increases as the weather continues to get warmer, even for people who do not have visible mold in their home. In fact, at least one major article in *Environmental Health Perspectives*, a journal published by the National Institute of Environmental Health Sciences, reports that mold will be the biggest long-term health threat in Sandy affected areas.²⁴

PUBLIC HOUSING PLAGUED BY MOLD, TOO!

While most of the stories about mold that have been elevated in the news focus on residents in private homes (owners and renters), there is also a severe problem faced by many of the residents in public housing in the affected zones. Unattended mold has been a long-standing problem with NYCHA units across the city, but Hurricane Sandy exacerbated it in many locations. The current NRNYC program, not only fails to address the scale of the need, but NYCHA residents aren't even eligible to call on NRNYC for full remediation benefits (NYCHA residents receive training, protective gear, and kits for mold removal that can be handled without expert contractor support). A program like Back Home, Back to Work needs to be expanded—the program could put people to work addressing post-Sandy mold as well as the mold challenges in the NYCHA housing stock across the City.

Testimony: Tenant in public housing in Red Hook

I have lived in Red Hook for over 33 years.

I never had problems like this. Before Hurricane Sandy, I did have mold in my apartment in the bathroom. It was around the tub. It was dark black and ate out the plastic caulking around the tub. NYCHA would always fix the problem.

Now the problem is worse. Since Hurricane Sandy, my walls have cracked. I have mold on my bedroom walls. It was on my carpet in two bedrooms, the window sill, my clothes, shoes and living room. I took more than 30 pictures and sent them to my housing assistant. However, she never gave me an answer back.

I have been suffering with this since Hurricane Sandy. It has been 7 months and nothing is being done. A person came to try and remove the mold. He came, saw the problem, and never returned. I began to handle it myself. I removed everything myself and I am 52 years old. I threw out my carpet, my TV, my beds, my shoes and clothes.

I went to the doctor and found out that my breathing has been harmed by the mold. My doctor says this is bad for my health as an asthmatic and survivor of chronic lung issues. I couldn't let my children remain in my apartment because they were getting sick. I sent them to live with my sister.

I know Far Rockaway apartments are worse, but I don't wish this for anyone because it is terrible for your lungs--when it hurts, it really hurts!

BATTLING MOLD: LITTLE GUIDANCE, LIMITED SUCCESS

Despite repeated calls after the storm for a clear path for mold remediation, there has been little official attention paid to this problem. Remediating mold well can be expensive and labor-intensive – and frankly out of reach for many residents of Sandy-impacted neighborhoods. As the data shows, poor remediation has prevailed overall in the surveyed households.

There were a few major techniques that people used to remediate the mold in their homes. Many people reported using bleach to clean their mold, others used a mold spray (biocide), or a combination of bleach and mold spray. Others reported completely gutting their homes. A few households reported that *Rapid Repairs* remediated their mold. Finally the majority of folks just reported that they had “cleaned” the mold and did not specify how.

- > **Out of 425 people who attempted some form of remediation, 146, or 34% still have visible mold, and 25% are still experiencing symptoms of mold exposure (see chart).**

Method	Total number	Number who still have visible mold		Number who still have symptoms of mold	
Bleach	58	5	8%	17	29%
Mold Spray	17	8	47%	3	18%
Combo	75	13	17%	20	27%
Gutted	34	18	53%	9	36%
Rapid Repairs	6	4	67%	5	83%
Other/Unspecified	235	98	42%	53	23%
Totals	425	146	34%	107	25%

It is of great concern that residents have been wasting limited resources in inadequate remediation and are still getting sick. Notably, because mold does not immediately return and mold is not always easily visible, it is possible that a great number of people who have taken remediation steps still have mold lingering and will have it grow particularly as the summer months approach. People most at risk for having to gut and rebuild again are those who repaired their houses while they were still wet, which *Respond & Rebuild*, a volunteer non-profit organization carrying out mold remediation in the Rockaways Peninsula, reports were likely a great number of people, as well as those who did not dry out wooden support structures, which is difficult to do without proper, and expensive, equipment. These repairs will have to be eventually redone, at great monetary cost, once mold reappears.

Respond & Rebuild also reported an initial uptick in people living with mold and/or escaping moldy homes when residents first got their heat turned on for the first time and after the increased spread of information—particularly through community networks and news reports—about the serious health hazards posed by mold. Additionally, *Respond & Rebuild* has seen some cases of mold contamination in areas not flooded by the storm (first

and second floors rather than basements) in which residents lived for long periods of time without heat and relied on boiling water from the stove for warmth. These additional cases of mold, which are storm related if not flood related, also persist in large apartment buildings that were without heat for many weeks. Unfortunately, these are places where volunteer groups and do-it-yourself residents cannot work, and tenants are beholden to building management to investigate and then remediate the problem.

Jaqueline Rogers has lived in a home with her sister and niece in the Edgemere neighborhood of the Far Rockaways for six years. She fled her home after ten feet of water surged through her neighborhood during the storm. Rogers was without power for three weeks, and without heat for a month and a half. At the end of November, a neighbor referred her to a company called Rapid Dry from Buford, Georgia, who dried out the house, cleaned the crawlspace, removed remaining drywall, and remediated mold in the kitchen, bathroom and pantry using a



SPORICIDAL ENZYME SOLUTION. FOR THE FOUR-DAY PROCESS, FOLLOWED BY REPEATED RETURN VISITS TO THE HOUSE TO 'REMOVE' MORE MOLD, ROGERS WAS CHARGED \$14,000.

BY FEBRUARY, THE MOLD HAD RETURNED AND HAD GROWN WORSE THAN BEFORE, PENETRATING FROM THE EXTERIOR WALL THROUGH THE HOME'S DRYWALL AND INSULATION AND REAPPEARING IN THE CRAWLSPACE

BARE-BONES PUBLIC SUPPORT FOR GOOD REMEDIATION

Mold is both an emerging public health problem and a major driver of displacement, particularly for lower-income Sandy-affected people. The City's response, though, has not met the scale of the problem. The City responded with two components: "awareness and safe practice" trainings and a mold remediation program²⁵.

The goal of the training sessions was to "educate homeowners and volunteers on how to effectively treat mold" and to distribute thousands of mold supply kits. Trainings in mold remediation are a reasonable response, and some residents did have contracting expertise and the resources to conduct their own work. But such training is a capacity-building resource, not a housing repair strategy or a public health strategy. The trainings have not met the post-Sandy emergency need. This is clear from the data above detailing the large numbers of ineffective mold remediation.

On January 31st – a full three months after the storm hit – Mayor Bloomberg announced the creation of *Neighborhood Revitalization NYC*, a \$15 million program to serve 2,000 homes with mold remediation. The program is privately funded by the Mayor's Fund for NYC, the American Red Cross, and the Robin Hood Foundation, and is administered by the Local

Initiatives Support Corporation (LISC). *Neighborhood Revitalization NYC* has partnered with nonprofits, and both unionized and non-unionized contractors to carry out remediation work.

The direct remediation program is a critical response. However *Neighborhood Revitalization NYC* is insufficient to constitute the City's primary and indeed only significant effort to tackle the mold crisis. First, it is important to note that this is *not* a City program. Although organized with the City's involvement, a private program lacks the kind of public accountability, standardized regulations and transparency practices, and other elements that would be present in a truly public program. Additionally, it is a limited program, providing a critical service, but missing the mark if it remains the City's only response to a major housing and health emergency. Only 2,000 homes are slated to be covered by this program, although a much larger number of homes —potentially 70,000 to 80,000 — are at risk. City representatives have indicated an intention to increase the size of the program if need becomes apparent – however, this report's results indicate that not all need for mold remediation is likely to be captured through the *Neighborhood Revitalization NYC* model, and that the program therefore needs to be supplemented as well as expanded in scope. This report has also identified several gaps in program eligibility that limit its ability to achieve maximum impact. In many cases this is not the fault of the NRNYC program administrators, and indeed LISC and other involved entities have made substantial outreach efforts. The problems are actually due to the limited nature of a small privately funded program. For example renters must rely on their landlords to complete the NRNYC intake process. Additionally NRNYC cannot remediate the mold on the exterior of homes because they do not have the resources to immediately replace the exterior walls. A public program would be able to arrange contractors to complete these necessary repairs. As a private program NRNYC cannot repair mold in party walls without neighbor permission, leaving not just one, but two homes at risk. A public program would be able to compel all relevant parties to enroll in the program and complete necessary repairs.

Additionally, *Neighborhood Revitalization NYC* relies on residents to opt into the program. The result is that, rather than a systematic mold remediation that could efficiently work on homes block by block or neighborhood by neighborhood, mold remediation is being done in a piecemeal manner. Substantial efforts at outreach have been added since the program's launch – using ethnic press and outreach via community-based organizations for example. These changes have undoubtedly improved results and certainly demonstrates a real commitment by LISC, the non-governmental organization administering the program, to do its very best to tackle an overwhelming problem with limited resources. Other examples show LISC's responsiveness to feedback. For example, when it was first launched, the hotline did not operate during the weekends. Now the hotline is open four hours on Saturdays—an important improvement but still quite limiting. These restricted hours make it difficult for people, especially low-income New Yorkers that often juggle two jobs and other responsibilities, to register. Initially the program was only available in English, despite the fact that many people affected by Sandy have limited English proficiency, but LISC responded to feedback, and the hotline began to offer interpretation services by mid-March. We mention these issues to demonstrate LISC's responsiveness as an administrator, but also because early difficulties undoubtedly reduced the perceived need for mold remediation as reflected by the number of families who enrolled in the program in the early months.

Indeed, survey results demonstrate that these factors or others have led to underutilization of the program.

- > Our data shows that, of the 654 households who were asked, **only 112 (17%) knew that the City had a mold remediation program.** As of last week, officials reported that only 1,300 people had signed up for NRNYC.

As a result of these gaps, people with limited resources are either attempting to remediate the mold themselves, or are relying on volunteer groups. Volunteer groups have made uneven use of science-based remediation training, and have not always had the resources to follow safety procedures to protect residents and workers during their work. Residents are at pains to distinguish accountable and expert volunteer groups from others.

Jorge Gonzalo lives in his Far Rockaways home of 32 years with his 89-year old mother, his daughter, her husband and two grandchildren. On the day of Superstorm Sandy, Jorge watched 8 feet of water cascade in waves down his street, uprooting fences and cars in its path and leaving pieces of the nearby boardwalk in its wake. While clearing out the destroyed contents of his basement, Jorge and his son, who was visiting home at the time, began to notice the abundant layers of mold growing behind the sheet rock that lined his walls. After repeatedly attempting to treat the mold using bleach, they became sick, and as the mold continued to grow, they realized they were ill-equipped for the task.



Eventually, the city's Rapid Repairs program helped to rehabilitate Jorge's home. Then, professional mold remediation contractors were brought in by *Back Home, Back to Work*, a project of members of the Alliance for a Just Rebuilding, to properly remove mold from Jorge's basement. A local contractor, Synatec Incorporated, thoroughly sealed and ventilated the affected area to prevent air contamination, and used well-paid, well-protected, local union workers to properly remove the mold from Jorge's basement.

Doing it Better

The lack of adequate official response has caused New Yorkers to struggle to recover and remove the mold left in Sandy's wake. New York City must urgently address Sandy's mold remediation needs with a long-term, systemic, comprehensive approach that repairs homes immediately, stops people from getting sick, and prevents the further spread of mold as warmer temperatures approach. Members of the Alliance for a Just Rebuilding have partnered with expert mold remediation workers from Laborers Local 78 to offer a concrete solution to get New York back on its feet, and to transform the tragedy that was Sandy into a chance to create economic opportunity for Sandy-affected New Yorkers.

OUR PROPOSAL: *BACK HOME, BACK TO WORK*

Back Home, Back to Work (BHBW) is an innovative labor-community initiative to provide safe and effective mold assessment and remediation by tapping into hundreds of qualified expert contractors and union workers with the trainings, skills, and protections to properly remove mold from homes and businesses. *BHBW* proposes to handle mold remediation in a systematic and cost-effective way that goes block by block rather than one business or house at a time. The program would create hundreds of family-sustaining jobs for union and non-union workers by providing safety and skills training to local residents and other hard-to-hire populations, including the long-term unemployed, the formerly incarcerated, and public assistance recipients, and placing them into union jobs for the recovery period.

Components of the *Back Home, Back to Work* Initiative

- > **Coordination:** *BHBW* can connect private or government entities with reliable, expert and cost-effective contractors to help determine which homes and businesses should be handled as part of the same remediation project.
- > **Remediation:** *BHBW* contractors will do safe, thorough mold remediation following NYC Department of Health and Mental Hygiene Mold Remediation guidelines, and will guarantee all mold removal work so that homeowners, businesses and taxpayers do not have to pay more than once to restore the safety of Sandy-affected buildings.
- > **Staffing:** *BHBW* will provide a constant and reliable flow of expert, trained mold remediation workers. Hundreds of expert union members are available for immediate placement in residential mold removal. Thousands more are immediately available for commercial mold remediation jobs. *BHBW's* intensive training program has the capacity to prepare thousands more for placement.
- > **Training:** *BHBW* will provide community members with expert training for safe and professional environmental remediation. Expert workforce training contractors will supplement the training fund's work to respond quickly to increased training need. Intensive mold remediation training offered as part of *BHBW* will include modules on OSHA safety rights and regulations, respirator use, and mold remediation skills.
- > **Creating Ladders of Opportunity:** *BHBW* has begun to provide intensive training and job placement for hundreds of local workers from Sandy-impacted communities and other vulnerable groups. Workers will receive temporary union

membership for the life of the program, and develop expert skills, dramatically increasing their long-term employability.

Back Home Back to Work has already been piloted on a small scale. The first class completed a 16-hour mold remediation course offered by Airtek Environmental and recognized by Laborers Local 78. These community members are now working side by side with union members remediating homes that were registered in the Neighborhood Revitalization program.

Jose is originally from Peru and has lived in the United States for 23 years. After Hurricane Sandy hit Jose started doing demolition work in Coney Island Hospital in Brooklyn. However, he was soon a victim of wage theft and poor working conditions. A few months later, Jose was part of the first class of workers who were trained in mold remediation work and then placed in union jobs through the Back Home, Back to Work program. Here is what Jose has to say about the experience:



“This program has benefited me a lot, I am able to work, and help others. The hardest home to fix was one that had mold on the floorboards. We had to take out each floorboard and throw them out because they were full of mold. Everyone that has mold in their home must work with precaution, because the mold can be very hazardous to your health. Every day we are working in these homes, and we are helping other people get back into them, but we also must take care of ourselves and make sure we are not getting sick by the mold. I appreciate the opportunity to get trained and work in these homes.”

Recommendations

1. The City of New York should take full responsibility for proactively assessing where mold infestation has gone unrecognized or has been inadequately remediated.

The NRNYC has engaged in substantial outreach in partnership with CBOs (including some of those participating in the publication of this report) and otherwise, but the fundamental requirement for families to proactively opt-in to the program limits the efficiency and scope. We recommend an expanded program with systematic outreach that does not rely solely on individual families to opt into the program. We call on the City to give an appropriate city agency, accountable to the public, a firm directive to implement a systematic approach like *Back Home, Back to Work*, which creates good jobs for Sandy impacted communities and does thorough, safe and cost-effective mold remediation.

2. New York should specifically appropriate a portion of CDBG home rehabilitation funds to use for mold remediation

On April 23rd, the City of New York submitted their Community Development Block Grant-Disaster Recovery Partial Action Plan A. The City outlines \$720 million in funds for the rehabilitation of homes impacted by Sandy, and allows homeowners to use a portion of CDBG funds for mold remediation. While this is a step in the right direction, it is not enough to ensure that these resources are used to properly remediate mold in our communities.

It is not clear from the City's CDBG-DR Partial Action Plan if the money homeowners receive for mold remediation will be combined with money for repairs. With 70,000 to 80,000 homes potentially damaged in New York, there are not enough funds to meet all rebuilding needs, and if funding is not carved aside and dedicated exclusively for mold remediation, homeowners may not prioritize mold remediation when faced with the other extensive repairs they must complete. Homeowners and renters alike need to have the option of accessing CDBG home rehabilitation funds solely for mold remediation, without having to qualify for the comprehensive home rehabilitation program the City has proposed to HUD.

The City should not distribute CDBG funds for mold to individual homeowners. Instead the City should allocate those funds for a large-scale mold remediation program like *Back Home, Back to Work* so that no New Yorker is left behind in an unhealthy home. The City must also ensure that structural damage is not a prerequisite for accessing funds for mold removal. Many New Yorkers with mold may not have other structural damage, or may have already completed structural repairs, but still have mold in their home. Finally, the City must allow this money to be accessed in order to redo failed mold remediation, even when that means gutting a home and rebuilding for a second time.

3. New York should create a clear pathway to protect tenants' right to a healthy home free of toxic mold.

Renters are particularly vulnerable during rebuilding; they are at the mercy of landlords who often lack the resources or the will to properly remediate mold. In order to protect renters'

right to a healthy home, the City must do three things. First, it must make resources available to landlords to complete mold remediation. Second, the City must clearly advertise these resources and place clear requirements on landlords to access these resources within a given time frame. Finally, the city must step in and ensure that mold remediation occurs where renters are at risk. For example, in the immediate aftermath of Sandy, city officials rightly proposed sending notices of intent to put a lien on the properties of landlords who had tenants without heat, hot water, and / or electricity, who also were not signing up for the Rapid Repairs program. Additionally, the city has programs in place that can serve as models: the Alternative Enforcement Program and emergency repairs programs, for example, allow HPD to proactively make repairs or handle mold remediation where landlords have failed to act, and to collect funding afterwards. Similar approaches should be implemented to gain compliance from landlords who have tenants struggling to get rid of mold.



ACKNOWLEDGEMENTS

The author organizations would like to thank the Pratt Center for Community Development, the New York Committee for Occupational Safety & Health (NYCOSH), and Respond & Rebuild for their feedback and contributions to this report.

¹ Natasha Ghoneim, *City Organizes Day of Service to Help Sandy Recovery*, NY1, Nov. 10, 2012, available at http://www.ny1.com/content/top_stories/172118/city-organizes-day-of-service-to-help-sandy-recovery.

² See earliest stories: Kevin Fasick and Bill Sanderson, *Merchant Battling Growing Mold Menace*, NY Post, Nov. 10, 2012, available at http://www.nypost.com/p/news/local/manhattan/merchants_battling_growing_mold_C9YfFCRUBZ6CTXHqFOSRHO?utm_medium=rss&utm_content=Manhattan; Amanda Mikelberg, *Mold Invades Thousands of Homes Across Flood Zone in Wake of Hurricane Sandy*, NY Daily News, Nov. 19, 2012, available at <http://www.nydailynews.com/new-york/mold-invades-thousands-homes-wake-sandy-article-1.1204881>. For an early report on the 'Rockaway Cough' see: John Huddy, *Far Rockaway Cough*, MyFoxNY, Nov. 14, 2012, available at <http://www.myfoxny.com/story/20101981/far-rockaway-cough>. See also: Josh Dawsey, *Health Care Ails in Rockaways*, Wall Street Journal, Apr. 9, 2013, available at http://online.wsj.com/article/SB10001424127887323550604578412630172040370.html?mod=googlenews_wsj

³ The study *Forgotten: How the City Has Failed Sandy Victims in The Rockaways*, available at <http://bit.ly/NYCCMold>, released at the beginning of January by New York Communities for Change showed that 37% of surveyed residents in the Rockaways had mold in their homes a month after the storm.

⁴ Natasha Ghoneim supra note 1.

⁵ U.S. Environmental Protection Agency, *Mold Remediation in Schools and Commercial Buildings*, Sept. 2008, available at <http://www.epa.gov/mold/pdfs/moldremediation.pdf>, Table 1.

⁶ Other jurisdictions have undertaken a more accurate count of Sandy's impact. The New Jersey Department of Community Affairs carried a field survey to assess the number of residences damaged.

⁷ Centers for Disease Control and Prevention, *Health Concerns Associated with Mold in Water-Damaged Homes After Hurricanes Katrina and Rita*, New Orleans, Louisiana, Oct. 2005, Morbidity and Mortality Weekly Report 2006;55:41-4.

⁸ New York State Department of Health, *Information About Mold*, <http://www.health.ny.gov/publications/7287/>, last updated Jan. 2013.

⁹ New York City Department of Health and Mental Hygiene, *Guidelines of Assessment and Remediation of Fungi in Indoor Environments*, Nov. 2008, available at <http://www.nyc.gov/html/doh/downloads/pdf/epi/epi-mold-guidelines.pdf>.

¹⁰ CDC, *Mold Basic Facts*, <http://www.cdc.gov/mold/faqs.htm#affect>, last updated Sept. 18, 2012; see also: “There [is] sufficient evidence to link indoor exposure to mold with upper respiratory tract symptoms, cough, and wheeze in otherwise healthy people.” CDC, Facts About Mold and Dampness, http://www.cdc.gov/mold/dampness_facts.htm, last updated Sept. 18, 2012.

¹¹ NYC DOHMH supra note 9, pages 16 and 17. According to NYC DOHMH, the IOM has also reported evidence “suggesting an association between damp indoor environments and the development of asthma.”

¹² CDC supra note 10.

¹³ Mold poisoning is an emerging diagnosis. Research documenting mold poisoning is incomplete, and ongoing. See: WJ Rea et. al., *Effects of Toxic Exposure to Molds and Mycotoxins in Building-Related Illnesses*, Archives of Environmental Health, Jul. 2003;58(7):399-405, available at <http://www.ncbi.nlm.nih.gov/pubmed/15143852>; see also: Bob Weinholt, *Trilongins’ Offer Insight into Mold Toxicity*, Environmental Health Perspectives, Feb. 2013;121(2):A44, available at <http://ehp.niehs.nih.gov/121-a44/>.

¹⁴ Rebecca Gruchalla et. al., *Inner City Asthma Study: Relationships Among Sensitivity, Allergen Exposure, and Asthma Morbidity*, The Journal of Allergy and Clinical Immunology, Mar. 2005;115(3):478-485.

¹⁵ FoxNews.com; *Katrina Five Years Later: Hurricane Left a Legacy of Health Concerns*, FoxNews.com, Aug. 27, 2010, available at <http://www.foxnews.com/story/0,2933,600309,00.html>.

¹⁶ New York Committee for Occupational Safety and Health, *Post-Sandy Mold Clean-Up – Do It Once, Do It Right factsheet*, current as of April 11, 2013, available at http://nycosh.org/uploads/Emergency%20Response/Sandy_Mold_FactsheetREV-13.411.pdf

¹⁷ NYC DOHMH supra note 9.

¹⁸ US EPA supra note 5.

¹⁹ Estimates from mold remediation contractors: costs generally vary between \$10,000 and \$25,000 per home. ²⁰ CDC supra note 7.

NYS Department of Health and NYS Department of State, New York State Toxic Mold Task Force Final Report to the Governor and Legislature, Dec. 2010, available at http://www.health.ny.gov/environmental/indoors/air/mold/task_force/docs/final_toxic_mold_task_force_report.pdf.

²¹ Joanna Prisco, *Sandy Mold Brings Allergy Hell to NYC*, Prospect Heights Patch, Apr. 9, 2013, available at <http://prospectheights.patch.com/groups/editors-picks/p/sandy-mold-brings-allergy-hell-to-nyc>.

²² Analysis of NYS DOH, *Asthma Emergency Department Visits – Zip Code Level Data for Counties*, http://www.health.ny.gov/statistics/ny_asthma/ed/zipcode/map.htm, last updated Jun. 2009. Neighborhoods include Far Rockaway, Arverne, Belle Harbor, Breezy Point, Broad Channel, Howard Beach, Canarsie, Bergen Beach/Mill Basin, Sheepshead Bay/Gerritson Beach, Brighton Beach/Manhattan Beach, Coney Island, Gravesend, Red Hook, East Village, LI City, New Dorp, and South Beach Old Town.

²³ Sandy Brockwell, Fiona Kilminster, and Andrew Starr-Bochicchio, *Red Hook Community Health Assessment*, May 22, 2009, available at http://www.brooklyn6.org/_attachments/2009-0522%20RHI%20Red%20Hook%20Houses%20Health%20Assessment.pdf, p1.

²⁴ John Manuel, *The Long Road to Recovery: Environmental Health Impacts of Hurricane Sandy*, *Environmental Health Perspectives*, May 1, 2013;121:a152-a159, available at <http://ehp.niehs.nih.gov/121-a152/>.

²⁵ Office of the Mayor, Mayor Bloomberg Announces New Program to Address Water Damage and Mold in Neighborhoods Hardest Hit by Hurricane Sandy, Press Release PR-046-13, Jan. 31, 2013.