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## TESTIMONY

before

**The United States House of Representatives**

**Committee on Homeland Security**

**Hearing on:**

***“Protecting the Protectors:***

***Ensuring the Health and Safety of our First Responders***

***In the Wake of Catastrophic Disasters”***

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**Presented By**

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Good morning.

Mr. Chairman and Members of the Committee, I thank you for having invited me to present testimony before you today on the issue of “Protecting the Protectors: Ensuring the Health and Safety of our First Responders in the Wake of Catastrophic Disasters”

My name is Philip J. Landrigan, MD. I am Professor and Chairman of the Department of Community and Preventive Medicine of the Mount Sinai School of Medicine in New York City. I am a board certified specialist in Occupational Medicine as well in Preventive Medicine and Pediatrics. My curriculum vitae is attached to this testimony.

In my capacity as Chairman of Community and Preventive Medicine at Mount Sinai, I oversee the World Trade Center (WTC) Medical Monitoring and Treatment Program as well as the World Trade Center Data and Coordination Center, two closely linked programs that are based in my Department and supported by grants from the National Institute for Occupational Safety and Health (NIOSH). It has been the responsibility of our programs at Mount Sinai and of WTC Centers of Excellence in New York, New Jersey and across the United States, with which we collaborate closely, to diagnose, treat and document the illnesses that have developed in the workers and the volunteers who responded to 9/11.

Today, I shall present a summary of our medical findings in the 9/11 responders. I shall comment also on the critical need for continuing support for Centers of Excellence that have the expertise and the hard-won experience that is essential to sustain high-quality medical follow-up and treatment for these brave men and women.

The Diverse Population of 9/11 Responders. In the days, weeks, and months that followed September 11, 2001, more than 50,000 hard-working Americans from across the United States responded selflessly – without concern for their health or well-being – when this nation called upon them to serve. They worked at Ground Zero, the former site of the World Trade Center, and at the Staten Island landfill, the principal depository for WTC wreckage. They worked in the Office of the Chief Medical Examiner. They worked beneath the streets of lower Manhattan to search for bodies, to stabilize buildings, to open tunnels, to turn off gas, and to restore essential services.

These workers and volunteers included traditional first responders such as firefighters, law enforcement officers, paramedics and the National Guard. They also included a large and highly diverse population of operating engineers, laborers, ironworkers, building cleaners, telecommunications workers, sanitation workers, and transit workers. These men and women carried out rescue-and-recovery operations, they sorted through the remains of the dead, they restored water and electricity, they cleaned up massive amounts of debris, and in a time period far shorter than anticipated, they deconstructed and removed the remains of broken buildings. Many had no training in response to civil disaster. The highly diverse nature of this workforce, and the absence in most of the groups who responded of any rosters to document who had been present at the site, posed unprecedented challenges for worker protection and medical follow-up.

The 9/11 workforce came from across America. In addition to tens of thousands of men and women from New York, New Jersey, and Connecticut, responders from every state in the nation stepped forward after this attack on the United States and are currently registered in the WTC Medical Monitoring Programs. Particularly large numbers came from California, Massachusetts, Ohio, Illinois, North Carolina, Georgia, and Florida.

The Exposures of 9/11 Responders. The workers and volunteers at Ground Zero were exposed to an intense, complex and unprecedented mix of toxic chemicals. In the hours immediately after the attacks, the combustion of 90,000 liters of jet fuel created a dense plume of black smoke containing volatile organic compounds -including benzene, metals, and polycyclic aromatic hydrocarbons. The collapse of the twin towers (WTC 1 and WTC 2) and then of a third building (WTC 7) produced an enormous dust cloud. This dust contained pulverized cement (60-65% of the total dust mass), uncounted trillions of microscopic glass fibers and glass shards, asbestos, lead, polycyclic aromatic hydrocarbons, hydrochloric acid, polychlorinated biphenyls (PCBs), organochlorine pesticides, furans and dioxins. Levels of airborne dust were highest immediately after the attack, attaining estimated levels of 1,000 to > 100,000  $\mu\text{g}/\text{m}^3$  according to the US Environmental Protection Agency. Firefighters described walking through dense clouds of dust and smoke in those first hours, in which "the air was thick as soup". The high content of pulverized cement made the dust highly caustic (pH 10–11).

The dust and debris gradually settled, and rains on September 14 further diminished the intensity of outdoor dust exposure in lower Manhattan. However, rubble-removal operations repeatedly reaerosolized the dust, leading to continuing intermittent exposures for many months. Fires burned both above and below ground until December 2001.

Workers and volunteers were exposed also to great psychological trauma. Many had already lost friends and family in the attack. In their work at Ground Zero they commonly came unexpectedly upon human remains. Their stress was compounded further by fatigue. Most seriously affected by this psychological trauma were those not previously trained as responders.

The World Trade Center Medical Monitoring and Treatment Program. Although New York has an extensive hospital network and strong public health system, no existing infrastructure was sufficient to provide unified and appropriate occupational health screening and treatment in the aftermath of September 11. Local labor unions, who made up the majority of responders, became increasingly aware that their members were developing respiratory and psychological problems; they initiated a campaign to educate local elected officials about the importance of establishing an occupational health screening program. In early 2002, Congress directed the Centers for Disease Control and Prevention (CDC) to fund the WTC Worker and Volunteer Medical Screening Program.

In April 2002, the Irving J. Selikoff Center for Occupational and Environmental Medicine of the Mount Sinai School of Medicine was awarded a contract by the National Institute for Occupational Safety and Health (NIOSH), a component of the CDC, to establish and coordinate the WTC medical program. The Bellevue/New York University

Occupational and Environmental Medicine Clinic, the State University of New York Stony Brook/Long Island Occupational and Environmental Health Center, the Center for the Biology of Natural Systems at Queens College in New York, and the Clinical Center of the Environmental & Occupational Health Sciences Institute at UMDNJ-Robert Wood Johnson Medical School in New Jersey were designated as the other members of the regional consortium based at Mount Sinai. The Association of Occupational and Environmental Clinics was designated to coordinate a national examination program for responders who did not live in the New York/New Jersey metropolitan area

In addition to this consortium, there is a parallel program based at the Fire Department of New York (FDNY) Bureau of Health Services, also supported by the federal government through NIOSH. This program has provided medical examinations to over 15,000 New York City firefighters and paramedics. The FDNY and Mount Sinai programs collaborate closely and use closely similar protocols for monitoring the health of 9/11 responders. A great strength of the FDNY program is that it had collected extensive baseline data on the health of each firefighter and paramedic through a periodic medical examination program that long predated September, 2001.

Nearly all of what we know today about the health effects of the attacks on the WTC has been learned through these medical programs that were developed in Centers of Excellence funded by the federal government.

The Centers that comprise the consortium based at Mount Sinai provide free comprehensive medical and mental health examinations for each responder every 18 months. Examinations are undertaken according to a carefully developed uniform protocol, and all of the data obtained on each responder are entered into a computerized database. The goals of the program are two:

1. To document diseases possibly related to exposures sustained at the World Trade Center;
2. To provide medical and mental health treatment for all responders with WTC related illnesses, regardless of ability to pay.

To date, thanks to federal support, over 21,000 WTC responders have received initial comprehensive medical and mental health monitoring evaluations in the Centers of Excellence that comprise this consortium. More than 7,250 of these responders have also received at least one follow-up examination. Demand for the program remains strong. Even now, six years after 9/11, approximately 400 new workers and volunteers register for the program each month. In August 2007, 771 new participants, persons whom we had never previously seen, registered for the program through our telephone bank.

Our WTC Medical Treatment Program has also been active. We launched this program in 2003 with support from philanthropic gifts. Philanthropic support provided the sole financial base for the treatment program from 2003 to 2006. Since September, 2006, we have begun to receive support for this program from the federal government. To date over 6,300 responders have received 47,000 medical and mental treatment services through this program.

Health Effects Among WTC Responders. Documentation of medical and mental health findings in 9/11 responders followed by timely dissemination of this information through the peer-reviewed medical literature are essential components of our work.

Documentation of our findings enables us to examine trends and patterns of disease and to assess the efficacy of proposed treatments. Dissemination of our findings and our recommendations for diagnosis and treatment to physicians across the United States permits us to share our knowledge and to optimize medical care. Such documentation and dissemination would be well nigh impossible in the absence of federally funded Centers of Excellence.

In September 2006, the Centers of Excellence that comprise our consortium published a paper in the highly respected, peer-reviewed medical journal *Environmental Health Perspectives*, a journal published by the National Institutes of Health. This report detailed our medical findings from examinations of 9,442 WTC responders whom we and our partner institutions had assessed between July 2002 and April 2004. I have appended this report to my testimony for your review, and I would like to direct your attention to a few key findings:

- Among these 9,442 responders, 46.5% reported experiencing new or worsened lower respiratory symptoms during or after their work at Ground Zero; 62.5% reported new or worsened upper respiratory symptoms; and overall 68.8% reported new or worsened symptoms of either the lower and/or the upper respiratory tract.
- At the time of examination, up to 2 ½ years after the start of the rescue and recovery effort, 59% of the responders whom we saw were still experiencing a new or worsened lower or upper respiratory symptom, a finding which suggests that these conditions may be chronic and that they will require ongoing treatment.
- One third of responders had abnormal pulmonary function test results. One particular breathing test abnormality – decreased forced vital capacity – was found 5 times more frequently in WTC responders than in the general, non-smoking population of the United States.
- We found that the frequency and severity of respiratory symptoms was greatest in responders who had been trapped in the dust cloud on 9/11; that frequency and severity were next greatest in those who had been at Ground Zero in the first week after 9/11, but who had not been caught in the dust cloud; and that frequency and severity were lower yet in those who had arrived at Ground Zero after the first week. These findings fit well with our understanding of exposures at the site and thus lend internal credibility to our data.
- Findings from our program released in 2004 have attested to the fact that in addition to respiratory problems, there also exist significant mental health consequences among WTC responders.

External Corroboration of our Findings. The peer-reviewed article that we published one year ago in *Environmental Health Perspectives* gains further credibility by virtue of the fact that the findings we report in it are consistent with findings on 9/11 responders that have been reported by highly credible medical investigators outside of our consortium. The FDNY has published extensively on the burden of respiratory disease among New

York firefighters. They have seen a pattern of symptoms that closely resembles what we observed. Forty percent of FDNY firefighter responders had persistent lower respiratory symptoms, and 50% had persistent upper respiratory symptoms more than one year after 9/11. FDNY noted that rates of cough, upper respiratory irritation and gastroesophageal reflux were highest in those firefighters who had been most heavily exposed on 9/11. FDNY physicians have also noted reactive airways disease, and highly accelerated decline in lung function in firefighters as well as in other responders in the year following 9/11.

Our findings receive further corroboration from reports released recently by the New York City Department of Mental Health and Hygiene from the WTC Registry that the health department has established with support from CDC. These reports noted increased rates of asthma and of post-traumatic stress disorder.

Future Health Risks and Unanswered Questions. Two major unanswered questions confront us as we consider the future health outlook for the brave men and women who responded to 9/11:

1. Will the respiratory, gastrointestinal and mental health problems that we are currently observing in responders continue to persist? For how long? And with what degree of severity and associated disability? These questions are especially important in the case of those responders who sustained very heavy exposures in the dust cloud on 9/11, in those who served in the first days after 9/11 when exposures were most intense, and in those who had prolonged exposures in the weeks and months after 9/11?
2. Will new health problems emerge in future years in responders as a consequence of their exposures to the uniquely complex mix of chemical compounds that contaminated the air, soil and dust of New York City in the aftermath of 9/11? Responders were exposed to carcinogens, neurotoxins, and chemicals toxic to the respiratory tract in concentrations and in combinations that never before have been encountered. The long-term consequences of these unique exposures are not yet known.

Concluding Comments. Six years following the attacks on the World Trade Center, thousands of the brave men and women who stood up for America and who worked on rescue, recovery, and clean up at Ground Zero are still suffering. Respiratory illness, psychological distress and financial devastation have become a new way of life for many.

The future health outlook for these responders is uncertain. The possibility is real that illnesses will persist, at least in some, and that new conditions – diseases marked by long latency – will emerge in others.

Only continuing, federally supported medical follow-up of the 9/11 responders through Centers of Excellence that are equipped to comprehensively evaluate responders, to document their medical findings, and to provide compassionate state-of the-art treatment will resolve these unanswered questions.

Thank you. I shall be pleased to take your questions.