

# MESA Messenger

## MESA Turns Twenty!

By MESA Project Office, NHLBI

Sometime between 2000 and 2002, you and over 6,800 other individuals from diverse backgrounds participated in your first MESA examination. Since then, five more MESA exams have taken place. These exams have included blood tests; measures of your blood pressure, height, and weight; CT scans of your heart and lungs; and various other components such as MRI scans, ultrasound scans, breathing tests, and sleep studies. You have also responded to hundreds of questions, both in person and through telephone calls, about such topics as your medical history, diet, physical activity, and smoking habits. You have contributed so much!

**Thanks to your dedication to MESA over the past 20 years, we have learned a lot about how heart disease develops and about maintaining heart health.** MESA also made new discoveries about lung health, stroke, heart failure, kidney function, diabetes, and other health conditions. If you gave consent, researchers have also used your DNA to discover genes related to blood pressure, blood sugar levels, and many other factors related to cardiovascular disease. Measures collected more recently from you may help to discover ways to prevent or treat declines in brain function that may occur as people get older. All of this was made possible by you!

So far, MESA researchers have published more than 1,700 scientific articles reporting findings based on information gathered in MESA. In this edition of the MESA Messenger, you will find articles about recent MESA discoveries concerning air pollution and lung health and about links between heart health and brain health. Links to all 1,700+ articles are available on the MESA website's Publications page. You may access the sites from the MESA website home page at:

[www.mesa-nhlbi.org](http://www.mesa-nhlbi.org).

The recent spread of the COVID-19 or "coronavirus" disease caused in-person MESA visits to go on hold until it is safe to continue. However, MESA is contributing to research about COVID-19 already! MESA field center staff will be calling you to ask you whether you have had any symptoms or been diagnosed with COVID-19. Your safety and health are our number one priority. We will continue to monitor the COVID-19 situation and will be in touch with you as we know more about its impact on MESA and when we can see you again in person. We know this is a scary time for many of us, and MESA is here for you. Please contact your field center office (*phone numbers on page 3*) with any questions.

On this 20th anniversary of MESA, the MESA staff and researchers wish to express again how honored and thankful we are for your partnership with us. Together we are moving toward our shared goal of better health for all. We greatly value your ongoing commitment. Happy Twenty Years of MESA! **We hope you are healthy and well and hope to see you soon.**



# MESA Shows Air Pollution Harms Lungs Like Smoking

*By Meng Wang, PhD and Joel Kaufman, MD, MPH, University of Washington*

MESA participants have contributed to new discoveries in cardiovascular disease, and also to groundbreaking research of both lung disease and air pollution health effects. This newsletter has previously described how air pollution impacts cardiovascular health, and more recent research from the MESA Air and MESA Lung studies also highlights the health hazards of air pollution on the lungs.

According to the American Lung Association, more than 40 percent of people in the U.S. live in areas with unhealthy air quality. Even though overall air pollution levels are cleaner now than 40 years ago, research in MESA shows that the levels are still high enough to contribute to chronic lung changes. A new MESA study suggests that current levels of air pollution can cause an increase in emphysema-like changes (holes in the lung). Tobacco smoke remains the most important and best-recognized cause of emphysema.

Air pollution is a mixture of gases and tiny particles in the air we breathe. Most air pollution, such as fine particles, comes from energy production and motor vehicles. These particles are small enough for humans to inhale deep into our lungs. Another type of air pollution, called ozone, is formed when pollution gases combine with sunlight. While particle air pollution levels have come down steeply since MESA started in 2000, ozone levels have actually been going up a bit—and may continue to rise with changes in the climate.

The new research combines data from both the MESA Air and MESA Lung studies. The MESA Air study monitored air pollution at participant homes and neighborhoods and can assess the levels of air pollution at each MESA residence starting in January 1999 and through March 2018. The MESA Lung study analyzed more than 15,000 CT scans of the chest and was able to measure the amount of emphysema-like changes in MESA participants. MESA participants also had lung function measured, to see the speed and amount of air breathed out.



**Image: Breathing in air pollution appears to cause similar damage to lungs as smoking cigarettes.**

We put this information together over an 18-year period and looked at whether long-term exposure to air pollutants was associated with development or worsening of lung changes. **Air pollution, especially ozone air pollution, was strongly linked to increases in changes in the lung similar to the holes in the lung seen in emphysema.** Surprisingly, we found that 10 years of living in a high ozone pollution area (compared with a low ozone pollution area) caused about the same amount of lung damage as smoking a pack of cigarettes a day for over 20 years! We don't know what level of these air pollutants, if any, is safe. This research may help explain why some people who never smoked develop chronic lung disease. It may also help efforts to assess the effectiveness of strategies to control air pollutants on lung health.

This study was published in one of the world's top medical journals, JAMA (the Journal of the American Medical Association), and was highlighted among the top ten most-read papers on JAMA in 2019. Thanks to all MESA participants for their important contribution to this research! ❤️

## MESA MIND and Life's Simple 7

By Timothy Hughes, PhD and Kathleen Hayden, PhD, Wake Forest

“Life’s Simple 7”, first introduced by the American Heart Association in 2010, identified the top seven health factors we can all use to lower our risk for cardiovascular disease. These include quitting smoking, eating a healthier diet, increasing physical activity, maintaining a healthy weight, and maintaining normal blood sugar, blood pressure, and cholesterol levels. Together, these factors explain how well a person meets ideal cardiovascular health (Go to [heart.org](http://heart.org) and search “Simple 7” to learn more and see how you’re doing.). Recent studies have shown Simple 7 criteria can also be used to estimate a person’s risk for heart attack, stroke, and problems with brain health.

One study looked at brain health using magnetic resonance imaging (MRI) together with Simple 7 scores. The study found people with better scores were also more likely to show signs of healthier brains on MRI. In an MRI, healthier brains are generally larger and have fewer signs of silent stroke. These tests help us understand how different parts of the brain function as we age. Another study went back in time and compared Simple 7 scores in young adulthood to a person’s brain health in middle age. The findings suggest that our long-term brain health is linked to better vascular health in middle-age and later in life.

The new MESA-MIND project gives us the chance to investigate further what factors predict brain health in late life. We will look at Simple 7 scores and other important cardiovascular risk profiles in MESA-MIND participants. MESA-MIND could show how cardiovascular risk contributes to poorer brain health and problems with thinking and memory in a diverse population.



**Image:** This infographic shows the “Life’s Simple 7” criteria for lowering our risk for cardiovascular disease: managing blood pressure, controlling cholesterol, reducing blood sugar, getting active, eating better, losing weight, and quitting smoking.

Although MESA-MIND originally planned face-to-face visits, the health and safety of participants and staff is our top priority. Therefore, we will administer some of our planned cognitive assessments over the telephone until it is safe for participants to come back into the clinic. We will ask you to come in for a brain MRI when it is safe for you to do so. Please remember that the cognitive assessments are not tests of intelligence and they are specifically designed to be very hard. It may make you feel uncomfortable if you think you are doing ‘badly’ on the test, so please remember that the test is assessing how different parts of the brain are handling new information, and not how ‘smart’ you are! After you complete these tests and the MRI, you will get feedback on your performance as well as pictures of your own brain. We thank you for helping us make discoveries like this that will help us all age better, with **healthy hearts and healthy brains.** ❤️

*Questions? Contact your MESA Field Center at:*

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# Managing Stress and Anxiety During a Pandemic

By the Centers for Disease Control and Prevention (CDC)

The outbreak of coronavirus disease 2019 (COVID-19) may be stressful for people. Fear and anxiety about a disease can be overwhelming and cause strong emotions. Coping with stress will make you, the people you care about, and your community stronger. How you respond to the outbreak can depend on your background, the things that make you different from other people, and the community you live in. Here are some tips from the Center for Disease Control for coping with stress:

- \* Take breaks from watching, reading, or listening to news stories, including social media. Hearing about the pandemic repeatedly can be upsetting.
- \* Take care of your body.
- \* Take deep breaths, stretch, or meditate.
- \* Try to eat healthy, well-balanced meals.
- \* Exercise regularly, get plenty of sleep.
- \* Avoid alcohol and drugs.
- \* Make time to unwind. Try to do some other activities you enjoy.
- \* Connect with others. Talk with people you trust about your concerns and how you are feeling.



Image: Stay informed, take breaks, and connect with others to help cope during disasters.

Visit [cdc.gov/coronavirus](https://www.cdc.gov/coronavirus) for more information about the virus and how to stay well.

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