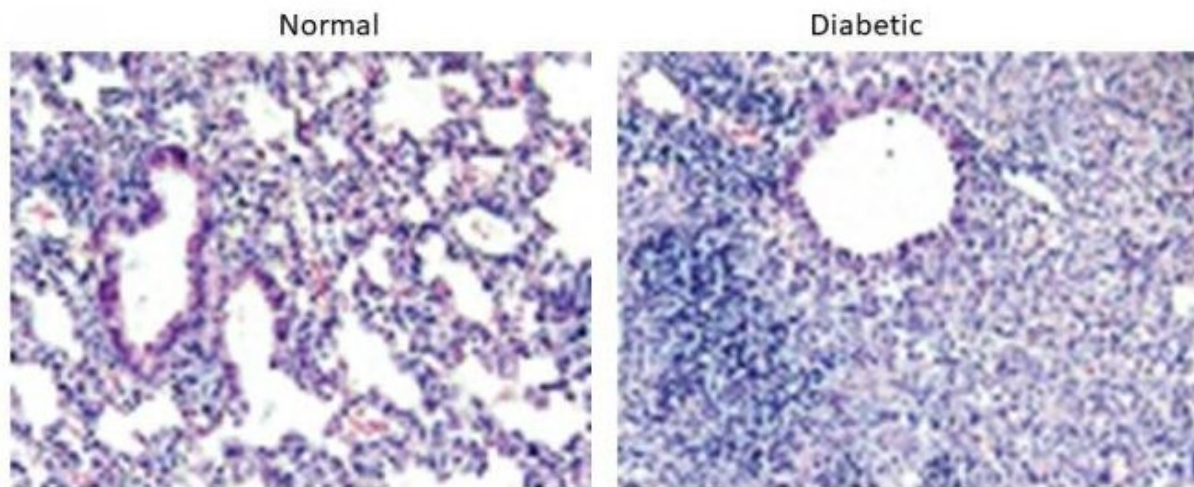


Why respiratory infections are more deadly in those with diabetes

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Lung sections from 21 days after infection with MERS-CoV in normal mice (left) and diabetic mice (right). We find that normal mice resolve the inflammation faster than diabetic mice leading to prolonged weight loss and disease in the diabetic mice. Credit: University of Maryland School of Medicine

Since the Middle East respiratory syndrome coronavirus (MERS-CoV) first emerged in Saudi Arabia in 2012, there have been more than 2,400 confirmed cases of the infection, resulting in greater than 800 deaths—an alarming fatality rate of 35 percent. For this reason, researchers have been eager to identify any risk factors that contribute to the development of severe or lethal disease. Current clinical evidence

points to diabetes as a major risk factor in addition to other comorbidities including kidney disease, heart disease, and lung disease.

Researchers from the University of Maryland School of Medicine (UMSOM) and the Johns Hopkins University School of Medicine have demonstrated in a new study, published earlier this week in the *Journal of Clinical Investigation Insights*, how [diabetes](#) contributes to mortality from MERS-CoV infections, and the finding could shed light on why other respiratory illnesses like the flu or pneumonia might strike those with diabetes more severely.

They investigated the connection between diabetes and MERS-CoV in a [mouse model](#) and discovered that although the virus did not replicate more readily in the diabetic mice compared to the healthy controls, the [diabetic mice](#) exhibited a delayed and prolonged [inflammatory response](#) in the lung. Diabetic mice had lower levels of inflammatory cytokines and fewer inflammatory macrophages and T cells. This indicates that the increased severity of MERS-CoV infection in patients with diabetes was likely due to a malfunction in the body's response to infection.

"Understanding how diabetes contributes to disease severity following MERS-CoV infection in this context is critical," said Matthew Frieman, Ph.D., associate professor of microbiology and immunology who is the corresponding author of the study. "Our next step is to determine what drives the altered [immune response](#) in diabetics and how to reverse those effects with therapeutics for treatment of patients."

Follow up research could also explore whether [health care providers](#) should double their efforts to manage and stabilize glucose levels in patients with diabetes experiencing a dangerous respiratory infection and whether better management would help mitigate the effects of these infections.

"This is an important finding for patients with diabetes and physicians who treat them," said UMSOM Dean E. Albert Reece, MD, Ph.D., MBA, who is also the Executive Vice President for Medical Affairs, University of Maryland and the John Z. and Akiko K. Bowers Distinguished Professor. "We have long known that diabetic patients have worse outcomes when they get a serious infectious disease, but this new insight on immune function could pave the way for better treatments."

More information: Kirsten A. Kulcsar et al, Comorbid diabetes results in immune dysregulation and enhanced disease severity following MERS-CoV infection, *JCI Insight* (2019). [DOI: 10.1172/jci.insight.131774](https://doi.org/10.1172/jci.insight.131774)

Provided by University of Maryland School of Medicine

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