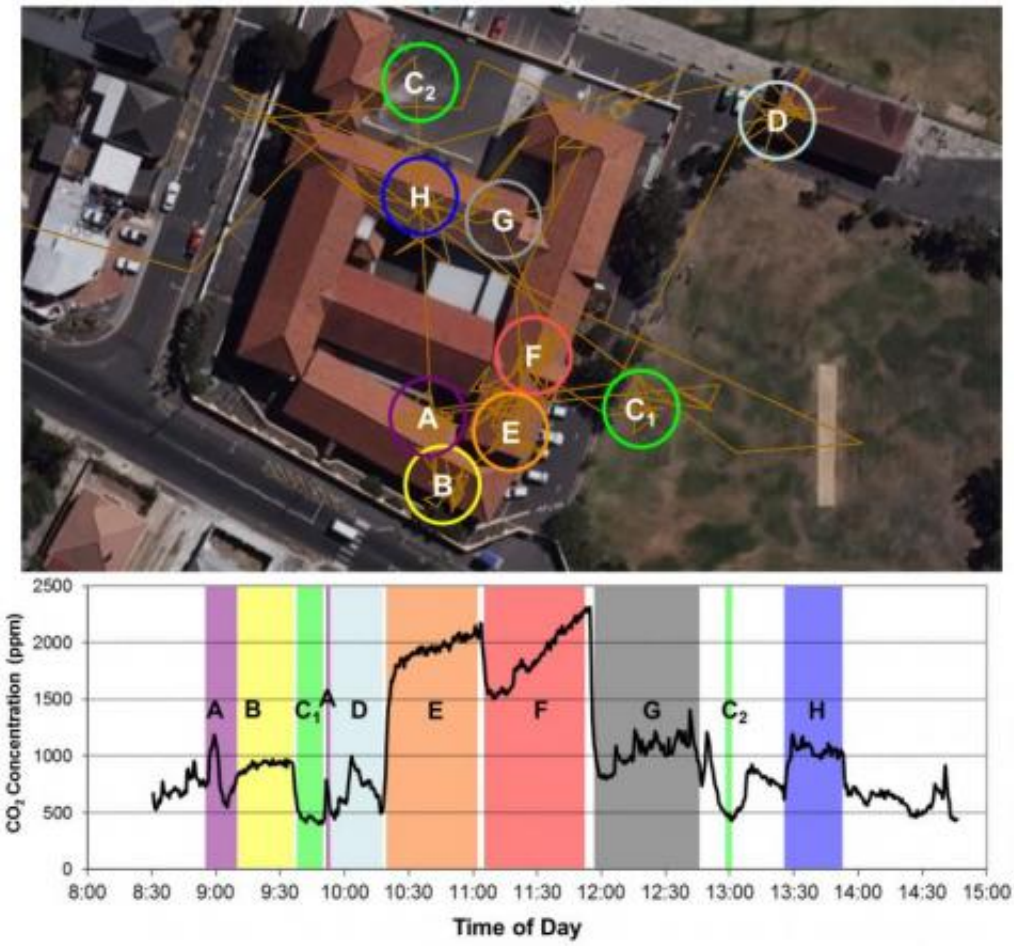
Medical Xpress

Scientists focus on role of ventilation in preventing tuberculosis transmission

May 7 2014



Sample student day with measured CO_2 concentrations and GPS locations (A-H). Credit: Richardson et al.:10.1371/journal.pone.0096334.g004

Scientists studying the role of room ventilation in tuberculosis

transmission found that students in Cape Town, South Africa, spend almost 60 percent of their day in poorly ventilated rooms, at risk of transmission, according to results published May 7, 2014, in the open access journal *PLOS ONE* by Eugene Richardson from Stanford University School of Medicine and colleagues. The researchers propose an increase in low-cost, WHO-compliant natural ventilation to facilitate healthy indoor environments and reduce risks.

Despite biomedical improvements to treat tuberculosis (TB), the incidence in South Africa continues to increase. TB spreads through the air, and children attending school may be particularly vulnerable to the disease because they are required to spend large amounts of time indoors in classrooms. Over one school year in a high school in Cape Town, South Africa, scientists assessed the role of schools and 'air hygiene' in TB spread or prevention by monitoring CO_2 in classrooms—using sensors carried around by students.

In the study, the authors first calculated 1000ppm as the indoor CO_2 concentration threshold above which indicates a high amount of rebreathed air and increased risk of TB transmission. This level falls in line with regulations in other industrialized nations.

During the monitoring study, the authors found that students may spend up to 60% of their time in classrooms with CO_2 levels above the 1000 ppm threshold, at risk for TB transmission. The classrooms with the highest levels of CO_2 had windows on only one side of the room. Although calculating the CO_2 threshold may differ depending on the variables used, given the high instances of TB-positive high school adolescents in South Africa, the authors recommend increasing natural ventilation, which will lower CO_2 concentrations and reduce the risk of spreading TB in schools. This recommendation may be one low-cost intervention for helping control the TB epidemic in areas of high prevalence.

Eugene Richardson added, "It seems that—in an era of effective treatment—current TB prevention programs have become complacent in promoting the prevention benefits of ventilation."

More information: Richardson ET, Morrow CD, Kalil DB, Bekker L-G, Wood R (2014) Shared Air: A Renewed Focus on Ventilation for the Prevention of Tuberculosis Transmission. PLoS ONE 9(5): e96334. DOI: 10.1371/journal.pone.0096334

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