

Night-time exposure to blue light associated with increased risk of colorectal cancer

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International Space Station night image of Barcelona, courtesy of the Earth Science and Remote Sensing Unit, NASA. 18 April 2013. Time: 22:10:46 GMT (local time 00:10:46)(ISS035-E-23385). Credit: Earth Science and Remote Sensing Unit, NASA.

Blue light has become an increasingly common component of urban

outdoor lighting. But how does it impact our health? A team led by the Barcelona Institute for Global Health (ISGlobal), a center supported by the "la Caixa" Foundation, has conducted the first study of the association between night-time exposure to outdoor artificial light and colorectal cancer. The findings, published in *Epidemiology*, show that exposure to the blue light spectrum may increase the risk of this type of cancer.

Previous studies have found associations between night-time exposure to artificial [light](#)—especially blue light—and various adverse health effects, including sleep disorders, obesity and increased risk of various types of [cancer](#), especially in night-shift workers. Blue light is a range of the visible light spectrum emitted by most white LEDs and many tablet and phone screens. An earlier study by ISGlobal found a link between exposure to blue light at night and increased risk of breast and prostate cancer.

"Using the same methodology as the previous study, we decided to analyze the relationship between exposure to artificial light and [colorectal cancer](#), the third most common type of cancer worldwide after lung and breast cancer," explained Manolis Kogevinas, scientific director of the Severo Ochoa Distinction at ISGlobal and coordinator of the new study. The World Health Organization's International Agency for Research on Cancer (IARC) classifies night-shift work as probably carcinogenic to humans; breast, prostate and colorectal cancer are associated with the highest risk.

The authors analyzed data obtained through the MCC-Spain project on approximately 2,000 adults in Barcelona and Madrid, of whom 660 had colorectal cancer and the rest were randomly selected from the local population. Individuals with a history of working night shifts were excluded. Night-time levels of outdoor artificial light were determined using images from the International Space Station (ISS).



International Space Station night image of Madrid, courtesy of the Earth Science and Remote Sensing Unit, NASA. 12 February 2012. Time: 02:22:46 GMT (local time 03:22:46)(ISS030-E-82052). Credit: Earth Science and Remote Sensing Unit, NASA.

Results from both cities showed that participants with the highest exposures to [blue light](#) had a 60% higher risk of developing colorectal cancer than the less exposed population. No association was found with full-spectrum light.

"Night-time exposure to light, especially blue-spectrum light, can decrease the production and secretion of melatonin, depending on the intensity and wavelength of the light," explains Kogevinas.

Because exposure to light was estimated using [satellite images](#), this calculation did not take into account individual behaviors such as the use of rolling shutters, which is common in Spain and other Mediterranean countries. The estimate of exposure can therefore be interpreted as the amount of light people are exposed to when they are outside their homes—a common pattern in Spain—and inside their homes before closing the shutters and going to bed.

"There is growing concern about the effects of light on ecosystems and human health," commented Kogevinas. "Research on the potential effects of light exposure is still in its infancy, so more work is needed to provide sound, evidence-based recommendations to prevent adverse outcomes."

More information: Garcia-Saenz et al., Association between outdoor light-at-night exposure and colorectal cancer in Spain (MCC-Spain study). *Epidemiology*. July 2020. [DOI: 10.1097/EDE.0000000000001226](#)

Provided by Barcelona Institute for Global Health

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