

From: Stephen M Pauley MD FACS
Subj: Connecting light pollution to human breast cancer
Date: March, 2008

All public officials need to know about this recent article (1). On-line abstract:
<http://www.informaworld.com/smpp/content~content=a790773188~db=ai~order=page>

Epidemiologists, including Dr Richard Stevens, whose hypothesis originally suggested that light at night (LAN) could be linked as a cause of breast cancer, correlated the light brightness over 147 communities in Israel to breast cancer rates in those towns and cities.

There was a direct correlation. The brighter the lights as measured by the US Defense Meteorological Satellite Program (DMSP) satellites, the higher the incidence of breast cancer. There was NO correlation with female lung cancer rates. The authors did their very best to control for several variables (1).

Results: When the brightest communities were compared to the darkest communities, the cities with the brightest lights had a 73% higher rate of breast cancer!

This is the first large scale population study to link light pollution with breast cancer. It is a landmark study, and similar studies should follow.

Combine these data with the papers by Schernhammer and others (2,3,) who showed that night shift workers have higher incidences of breast and colorectal cancers, and the evidence for LAN (light pollution) as a public health issue becomes very convincing (4).

Pioneering human blood and rat studies by Blask et al (5) confirm that low melatonin blood from nurses exposed to LAN allows human breast cancer cells to grow faster in rats than high melatonin blood from nurses allowed to sleep in the dark. Melatonin is an anti-cancer (oncostatic) hormone, and we need the darkness at night for melatonin to be produced by the pineal gland.

Europe has already acted. In Dec., '07, The World Health Organization, through the International Agency for Research on Cancer (IARC), listed shift work under Group 2A - as a "probable carcinogen." (6, 7).

<http://monographs.iarc.fr/ENG/Classification/crthallist.php>

Safeguarding public health should become the most compelling reason to control the splay of bad outdoor lighting, and should be priority-one for all civic leaders.

The USA is woefully behind in coming to grips with the LAN- cancer connection. One must assume that the lighting industry wishes it had never heard of these findings. The breast cancer research community has also failed to take these data seriously. It appears they have missed a major environmental cause for breast cancer. We need to do better.

Refs:

1. *Light At Night Co-Distributes With Incident Breast But Not Lung Cancer In The Female Population Of Israel*; Kloog I, Haim A, Stevens RG, Barchana M, Portnov BA; *Chronobiology International*; 25 (1): 65-81; (2008)
2. *Night shift work and risk of colorectal cancer in the Nurses' Health Study*; Schernhammer ES, Laden F, Speizer FE, Willett WC, Hunter DJ Kawachi I, et al; *J Natl Cancer Inst*; 93:1563-8 (2001)
3. *Night-shift work, light at night, and risk of breast cancer*; Davis S, Mirick DK, Stevens RG; *J Natl Cancer Inst*; 93:1557-62 (2001)
4. *Lighting for the human circadian clock: recent research indicates that lighting has become a public health issue*. Pauley, SM *Medical Hypotheses*; 63: 558-596 (2004)
5. *Melatonin-depleted blood from premenopausal women exposed to light at night stimulates growth of human breast cancer xenografts in nude rats*; Blask DE, Brainard GC, Dauchy RT, Hanifin JP, Davidson LK, Krause JA, Sauer LA, River-Bermudez MA, et al; *Cancer Res*. 65:11174-11184 (2005)
6. *Carcinogenicity of shift-work, painting, and fire-fighting*; Straif K, Baan R, Grosse Y, Secretan BE, Ghissassi FE, et al; WHO International Agency for Research on Cancer Monograph Working Group; *Lancet Oncol*; 8:1065-1066 (2007) Ref ID: 4704
7. <http://monographs.iarc.fr/ENG/Classification/crthalllist.php>
Overall Evaluations of Carcinogenicity to Humans; List of all agents evaluated to date; IARC Monographs; Vol 1-98