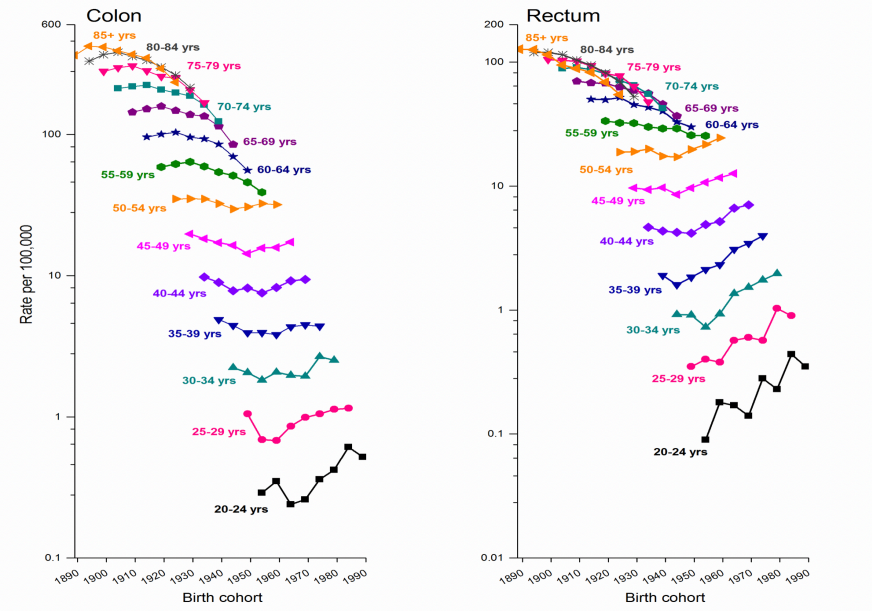
Colorectal Cancer Soaring in Young Adults; Are Smartphones in the Mix?

Epidemiologist De-Kun Li Wants To Know

June 3, 2019
Last updated August 17, 2023

De-Kun Li wants to change the conversation on cell phones and cancer. Li, a senior epidemiologist and veteran EMF researcher, believes that brain tumors have been getting too much attention at the expense of other types of cancer, notably colorectal cancer.

Efforts to reduce colon and rectal cancers have been a striking success story for those over 50 years old. Incidence among older Americans declined 32% between 2000 and 2013, due largely to better screening. But the story for young adults is very different. Those born around 1990 now face *four times* the risk of developing rectal cancer and *twice* the risk of colon cancer in their 20s, compared to those born around 1950, according to the American Cancer Society. (Rates among young adults are still relatively low; see graphs below.)



U.S. Trends in Age-Specific Colon and Rectal Cancer Incidence Rates

Source: R.L. Siegel, et al., *JNCI, Vol.109,* 2017 — Supplementary Figure 4

According to the National Cancer Institute's most recent annual report, released last week, colorectal cancer is the most common cancer among men between the age of 20 and 49.

"No one can explain this apparent contradiction," Li told *Microwave News.* Known risk factors for colorectal cancer include obesity, an unhealthy diet and lack of physical activity, but Li doesn't think they can resolve the paradox. "If anything," he said, "younger generations are more health conscious with better diets."

Li offers an alternative hypothesis: Young people's habit of carrying their cell phones in the front or back pockets of their jeans. "When placed in trouser pockets, the phones are in the vicinity of the rectum and the distal colon and these are the sites of the largest increases in cancer," he says.

RF Exposures from Phones on Standby

Li's hypothesis assumes that phones continue to emit RF radiation when placed in a pocket. They do, especially smartphones, but exposures are difficult to estimate.

When not in use, phones quickly go to standby mode, and RF transmissions are greatly reduced. Yet, the phone stays active because the system must always know its location in order for the network to direct calls or texts to the nearest cell tower for delivery.

A Swedish-Danish study, published in 2012, found that phones on standby were only in touch with the local base station once every two-to-five hours —and then for just a few seconds. "The exposure in standby mode can be considered negligible," concluded Kjell Hansson Mild of Umeå University, the lead author of the study. Jørgen Bach Andersen of Aalborg University was a coathour.

Today, Mild sees things differently because smartphones —which were still relatively new when he was working on his study—

contact the network much more frequently, if only to update their location. Mild wants research. “We need more measurements and dosimetry on how a phone radiates in a pocket,” Mild said in an interview, adding that, “I keep my phone in my briefcase and when I turn it on, I use a hands-free set.”

When a phone is in a pocket, the separation distance from the body is less than that recommended by Om Gandhi, Mild said. Gandhi, a professor emeritus at the University of Utah, has published a stream of papers on cell phone exposures, estimated by measurements and calculations (here’s one from 2002).

In an e-mail exchange, Gandhi noted that, in compliance tests, cell phones are placed about 10 mm away from the body. Without that spacing —for instance, when a phone is in a pocket next to the body— exposure (SAR) would be about twice that cited in safety specifications. The title of Gandhi’s most recent paper, posted in April by the IEEE, the electrical engineering society, spells out the problem: “Microwave Emissions from Cell Phones Exceed Safety Limits in Europe and the U.S. When Touching the Body.”

In his paper, Mild highlighted that exposures go up if a phone on standby is in motion:

> “[W]hen a person carries the phone in a pocket and moves in a city, the phone updates when entering a new base station area, and this can be as often as once every few minutes depending if one is in [a] city center or suburban area. For [those] periodic updates the GSM phones operate at full power.”

A later investigation by Damiano Urbinello and Martin Röösli of the University of Basel showed that exposures are even more significant when a phone is in a moving vehicle, whether a car, train or bus.[1] They predicted that smartphones would likely increase exposures because of their need for “regular location updates.”

There was much more to learn. Urbinello and Röösli wrote:

> “There is an urgent need to evaluate more thoroughly how personal RF-EMF exposure is affected by one’s own phone in standby mode.”

That was six years ago. There’s been little, if any, follow-up since then. “I am not aware of much further research,” Röösli told *Microwave News.*

Exposures are “quite variable and the amount of uplink may depend on the type of mobile phone, the network, the provider and the apps installed,” Röösli said. “In particular, push functions are expected to increase the amount of uplink in standby mode.”

Phones in Pockets Below the Waist

Do young adults keep their phones in their pockets? Li points to a 2017 survey of Australian women, aged 15 to 40, by Mary Redmayne, who found that a majority routinely put their phones in a pocket below the waist. Importantly, the youngest women do this

the most. She also reported that 96% of the women keep their phones on standby during the day; at night it's 83%.

In an e-mail, Redmayne said that she has no information about where young men keep their phones, nor is she aware of anyone who had looked into it.

Colorectal Rates Among the Young Rising in Many Countries

Increases of colorectal cancer among the young are being reported around the world, not just in the U.S. — including many European countries, as well as Australia and New Zealand. Just a few weeks ago, IARC reported that, between 2008 and 2015, the incidence of colon cancer among 20-29-year-olds increased by about 18% per year in Denmark, 8% in Australia and 4% in Ireland. While the risk declined in Canada and Norway, the rate of rectal cancer in those countries rose by 3.5% and 10.6% per year, respectively.

Writing in *The Lancet – Gastroenterology & Hepatology,* the IARC team advises:

> "Although the incidence of colorectal cancer in adults younger than 50 years remains low compared with that in older age groups, our findings are of concern and highlight the need for action to counteract the rising burden of disease in younger cohorts."

Also in May, a second research group reported similar trends across 20 European countries in *Gut, a BMJ* journal. On average, colorectal cancer rose by 7.9% per year among 20-29-year-olds from 2004 to 2016. The effect gets smaller with age: The increase among 30-39-year-olds was 4.9%, and 1.6% for 40-49-year-olds.

In 1990, the rate was 0.8 cases per 100,000 Europeans in their 20s. By 2016, it was 2.3/100,000. The big jump came recently: For 1990-2004, incidence went up by 1.7% per year, but it grew to 7.9% per year from 2004 to 2016.

Li: A Plausible Explanation

"My hypothesis could be proven wrong," Li concedes, "but this potential explanation is more plausible than any other current hypotheses out there." People should be made aware of the possible risks, he said, so that young adults can decide whether to take precautions and colorectal cancer researchers can weigh the merits of the case.

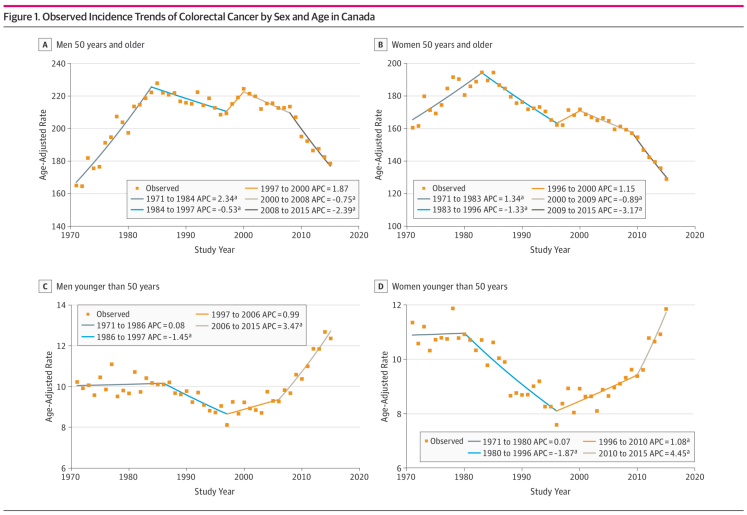
Over the last 20 years, Li, who is with Kaiser Permanente in Oakland, CA, has completed a number of groundbreaking studies on the effects of power-frequency EMFs. In 2001, he reported that women faced up to a sixfold increased risk of miscarriages when exposed to magnetic fields above 16 mG (see *MWN,* M/J01 and J/F02). That early work has been supported by others and there are now at least seven studies that point to an EMF–miscarriage risk.

In other projects, Li has shown that magnetic fields can affect the quality of human sperm and that prenatal EMF exposure can lead to childhood asthma and obesity.

Similar Trends in Canada

July 31, 2019

New data, released today, show the same trend among men and women in Canada. Colorectal cancer rates are going down among those over 50 years old and up among those under 50. See the graphs below:



These findings appear in *JAMA Open Network*. The paper is open access.

Colorectal Cancer Keeps Rising Among the Young

March 2, 2023

The American Cancer Society reports: “Despite continued overall declines, CRC is rapidly shifting to diagnosis at a younger age, at a more advanced stage, and in the left colon/rectum.” ... “reflecting changes in underlying disease risk of unknown etiology.”

The new statistics appear in the Society’s journal *CA: A Cancer Journal for Clinicians*. The paper is open access. Here are the conclusions:

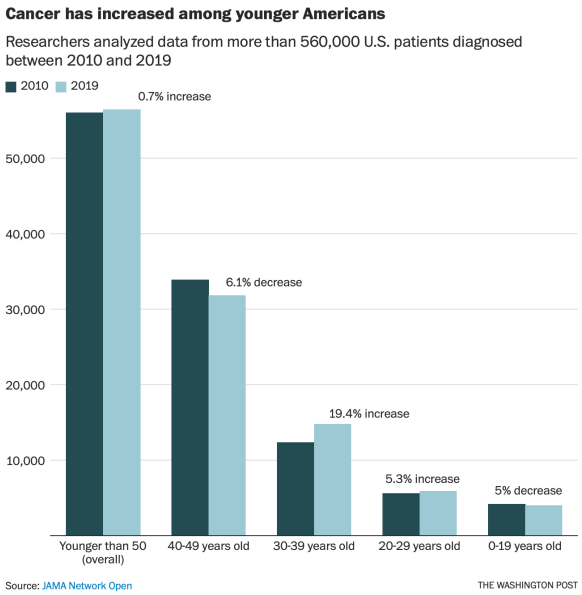
CONCLUSIONS

Although overall CRC mortality continues to decline, this progress is tempered by a rapidly changing landscape of disease that foreshadows less favorable trends ahead. First, the CRC burden is shifting to younger individuals as cohorts born in the last one half of the 20th century who have elevated risk age; one in five new cases now occur in individuals in their early 50s or younger. Second, there is an overall shift to later stage disease, with more individuals now diagnosed at an advanced stage than in the mid-1990s before widespread screening. Finally, there is a shift from right-sided to left-sided tumors, despite higher efficacy for preventing the latter through screening, likely reflecting changes in underlying disease risk of unknown etiology. In addition, striking disparities by race and geography persist, with mortality rates in Alaska Natives almost four times higher than those in non-Hispanic White individuals. Although a substantial proportion of CRC deaths can be prevented through screening, four in 10 Americans aged 45 years and older are not up to date nationally, including one half of Californians. Screening is especially low among younger individuals and those without health insurance. Reducing CRC inequalities and furthering progress could be achieved by incentivizing healthier lifestyles and ensuring equitable access to high-quality health care for all individuals, especially those in rural and other low-resource areas, such as Alaska. In addition, research is needed to elucidate causes for rising CRC incidence and to advance treatment options for tumor subtypes without effective therapies.

GI Cancers Among the Young Continue to Rise

August 17, 2023

Between 2010 and 2019, while cancers among older Americans stayed stable or decreased, those among the young —especially among 30-39-year-olds— went up, according to a new report published in *JAMA Open* (see table below from the *Washington Post*).



From the abstract:

> From 2010 to 2019, gastrointestinal cancers had the fastest-growing incidence rates among all early-onset cancer groups (APC, 2.16%; 95% CI, 1.66%-2.67%; p < 0.001). Among gastrointestinal cancers, those with the fastest-growing incidence rates were in the appendix (APC, 15.61%; 95% CI, 9.21%-22.38%; p <0 .001), intrahepatic bile duct (APC, 8.12%; 95% CI, 4.94%-11.39%; p< 0.001), and pancreas (APC, 2.53%; 95% CI, 1.69%-3.38%; p <0 .001).

The reason for the increases is not known.

“If we don’t understand what’s causing this risk and we can’t do something to change it, we’re afraid that as time goes on, it’s going to become a bigger and bigger challenge,” Paul Oberstein, a cancer specalist at NYU Langone in New York City told the *Washington Post*.

For an update to this story, see: “New Clues on Colorectal Cancer Among Young Adults”

NOTES

1. Another finding: Standby exposures from UMTS (3G) phones were “considerably lower” than those from GSM (2G) phones.

De-Kun Li, Kjell Hansson Mild, Jørgen Bach Andersen, Om Gandhi, Martin Röösli, IARC, colorectal cancer, cell phones cancer, brain cell phones, standby mode, smartphone, American Cancer Society,

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