

# Rising Skin Cancer Rates are a Global Reality

One group of researchers questions the skin cancer epidemic, but the overwhelming evidence suggests that rates are rising.

By Jonathan Wolfe, MD

About one million Americans have non-melanoma skin cancer (NMSC), and nearly 70,000 have melanoma, according to statistics from NIH and Surveillance Epidemiology and End Results (SEER). While these figures are concerning in themselves, more alarming is the reality that skin cancer rates have been rising consistently in the US and around the world. Data suggest the rate of increase may be slowing—perhaps a sign that improved education and wider adoption of UV protection strategies are working—but upward trends persist.

Recognition by the medical community, public health officials, and researchers of rising skin cancer rates has been helpful in stimulating support for patient education, research into prevention and cure, and better awareness and detection strategies. Nonetheless, some observers argue that the skin cancer “epidemic,” as it has been labeled, is simply an apparent concern and not a marker of a real increase in skin cancer incidence. They argue that changes in reporting and/or diagnosis account for the increase.

## Worldwide Trends

One group suspicious of the notion of a skin cancer epidemic is a team out of the UK. They looked at all cases of melanomas reported in East Anglia, UK between 1991 and 2004, analyzing incidence, histological diagnosis, and mortality.<sup>1</sup> They identified a total of 3,971 melanomas diagnosed in that time and determined an increase in annual incidence from 9.39 to 13.91 cases per 100,000 per year dur-

ing the study period. However, the increase was largely in diagnosis of stage 1 disease with no change in the combined incidence of other stages of disease. Additionally, the team determined that a majority of these early melanomas were located on anatomic sites that did not correspond to sites of lesions caused by UV exposure. Taking these findings together, they concluded that there has been a “diagnostic drift”: benign lesions being classified as melanoma. They advocate a comparison of contemporary to historical histological samples for confirmation. Their conclusions have been reported in the lay press. These reports failed to address the possibility that there are two different types of melanoma: slow-growing and fast-growing.<sup>2</sup> It's likely that dermatologists are identifying slower-growing tumors and following these patients for longer periods of time, creating statistical anomalies.

This publication is not sufficient evidence to refute the realities of rising skin cancer trends. Even if a “diagnostic drift” is confirmed to exist in East Anglia, it does not prove or even support the existence of a drift universally. More importantly, cogent arguments have already been made to refute the notion that rising reported skin cancer rates are simply evidence of earlier and more accurate detection.

The issues of lead time and length time bias may be relevant. Lead time bias occurs when two or more different detection methods are compared, producing some changes in apparent progression or survival rates over time. In recent decades dermatologists, perhaps aided by clinical tools such as the dermoscope as well as improved patient self-surveil-

lance, may be identifying melanoma at its earliest stages. Lead time bias does not suggest that physicians are simply finding cases that would have been otherwise over-looked (i.e., more cases overall); they are identifying cases *earlier*. Lesions that eventually would be discovered anyway are being discovered earlier, producing a statistical anomaly defined as "lead time bias." Lead time bias may produce a slight surge in new diagnoses for a certain period following the introduction of a new diagnostic tool/approach: Clinicians would be identifying all the cases they otherwise would have diagnosed *plus* making earlier diagnoses (otherwise delayed for months or years) with the new tool. However, within a few years, as diagnosis is skewed toward more early cases and fewer advanced cases, the rate of diagnosis would level off. As such, with a consistent increase in incidence seen over several decades and a failure to see a significant drop in the frequency of thick melanomas, lead time bias doesn't seem to explain the current "melanoma epidemic."

Length time bias refers to a selection bias that can become evident when data are followed for an arbitrarily defined period of time. Increased surveillance of a given population results in detection and excision of increasingly less aggressive lesions. This leads to a shift, where increasingly earlier lesions of questionable biologic significance are detected. Length time may be particularly problematic in the study of cancers, as variable rates of progression may lead to misrepresentation of certain cancers or types of cancers in prevalence studies. We would expect to see increased diagnosis of primarily thin melanomas, which, in fact, has been suggested worldwide.

The UK researchers found an increase only in detection of stage 1 but not more advanced disease stages, and there were no changes in mortality over the studied period. They suggest that a true increase in melanoma incidence would be reflected in an increase of diagnosis of all stages of disease. Length time bias shows that this is not necessarily the case, especially if there are, indeed, slow- and fast-growing tumors. With the variable progression of melanoma, analysis of data from a different or

### Melanoma by the Numbers

- Melanoma incidence has risen three to seven percent on average over several decades.<sup>2</sup>
- Melanoma incidence in American men is higher than in women after age 40.<sup>2</sup>
- Rates have increased by 7.7 percent per year from 2003 to 2005 among men, by 2.9 percent per year from 1993 to 2005 among women.
- Survival has increased from approximately 60 percent in the 1960s to about 89 percent.<sup>2</sup>
- Deaths have remained level from 1990 to 2005 among men.<sup>8</sup>

longer time period may have shown a different distribution of diagnoses.

Beddingfield outlined some of the primary arguments in favor of a skin cancer epidemic in 2003.<sup>3</sup> He noted that the incidence of melanoma has risen three to seven percent on average over several decades and even more rapidly among Caucasian men and the elderly. Although the incidence in the US has risen most rapidly for *in situ* and localized lesions, distant and regional disease increased, as well. Furthermore, from 1988-1997 increases in all stages of diagnosis of localized disease were comparable. This strongly argues against the increase in incidence of melanoma as only due to early detection of thin lesions or biologically benign lesions. Given that the incidence of melanoma has risen faster than the mortality, there is evidence of improved or earlier diagnosis of melanoma.

As further evidence that skin cancer is on the rise, multiple other countries report increases in the rates of both melanoma and NMSCs. As examples, an analysis of data from the Italian Network of Cancer Registries from 1986 to 1997 found that the estimated annual percent change of the standardized incidence rates for NMSC increased by 7.5 percent/year among males and by 5.2 percent/year among females, while melanoma increased by 6.2 percent/year among males and 5.8 percent/year among females.<sup>4</sup> Data from Australia, where skin cancer is a recognized problem, show that NMSC rates increased from 1985 to 2002 and that the inci-

dence of treated NMSC in 2002 was more than five times the incidence of all other cancers combined.<sup>5</sup> Data from the Slovakian National Cancer Registry revealed that from 1978 to 1995, age standardized rates of NMSC increased by 59.1 percent in males and 58.5 percent in females.<sup>6</sup>

### Promise and Pitfalls

The apparent leveling out of the annual increase in cancer incidence and the trend toward improved survival is promising. The latter may be attributed to patients more actively seeking evaluation of new lesions as well as better diagnostic efforts by physicians. The evident "decrease in the increase" of skin cancer prevalence suggests that education efforts to this point may be affecting patient behaviors and translating to healthier behaviors that will diminish skin cancer risks long-term. As a consequence of increased surveillance and new diagnostic tools, the incidence of early melanoma is rising, and data may be suggesting now that the incidence of thick lesions and mortality rates are beginning to level. At some point, the dermatologic community may find that the incidence of melanoma is rising due to a consequence of our surveillance. [n](#)

*Dr. Wolfe has no relevant disclosures.*

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