

Turning the tide? Changes in treatment rates for keratinocyte cancers in Australia 2000 through 2011

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Background: Keratinocyte cancers (basal cell carcinoma, squamous cell carcinoma) are the commonest cancers in human beings. Population data on incidence trends are scant because few jurisdictions reliably record diagnoses or treatments.

Objective: We sought to examine temporal trends of treating keratinocyte cancers in Australia.

Methods: We analyzed Medicare Australia data relating to the diagnosis and treatment of keratinocyte skin cancer between 2000 and 2011. We examined counts and rates for each procedure, and the average annual percentage rate of change.

Results: There were significant increases in excision rates for keratinocyte cancers (3.3% per annum for men and 2.2% per annum for women), however temporal trends differed significantly by age group. Although annual increases in excision rates were highest for men aged 75 to 84 years (8.6% per annum), they declined significantly for men and women younger than 45 years. Skin biopsy rates increased substantially in all age groups over the study period, suggesting no lessening in skin cancer surveillance in any age group.

Limitations: The Medicare data do not include services provided in public hospitals, however fewer than 2% of skin cancers are treated in these settings.

Conclusions: Although overall treatment rates for keratinocyte cancers have increased substantially during the past decade, excision rates are declining in younger Australians. (J Am Acad Dermatol 2014;71:21-6.)

Key words: basal cell carcinoma; skin cancer; squamous cell carcinoma.

Australia has the highest incidence of keratinocyte cancers (basal cell carcinoma [BCC], squamous cell carcinoma [SCC]) in the world.¹ Each year, almost 2% of the population is estimated to develop BCC or SCC,² and the costs of treating these cancers are higher than for any other cancer in Australia.^{3,4} In response, campaigns to reduce population sun exposure have been implemented with the goal of reducing the incidence of keratinocyte cancers.⁵ Commencing in the 1980s with the Slip! Slop! Slap! Campaign in Queensland,⁶

Abbreviations used:

AAPC: average annual percentage rate of change
 BCC: basal cell carcinoma
 SCC: squamous cell carcinoma

these strategies evolved into the comprehensive SunSmart program in the 1990s,⁷ which has continued to the present day. Primary prevention programs with similar intent have been enacted in other populations around the world.⁸⁻¹⁰

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Dr Whiteman is a Future Fellow of the Australian Research Council.

Dr Williams was supported by the Virginia Commonwealth University School of Medicine.

Conflicts of interest: None declared.

Accepted for publication February 5, 2014.

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Published online March 31, 2014.

0190-9622/\$36.00

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<http://dx.doi.org/10.1016/j.jaad.2014.02.011>

To gauge the impact of prevention programs, it is necessary to monitor incidence rates over time. Population-based data for keratinocyte cancers are scarce,^{11,12} but the available data suggest that incidence rates have been increasing in all populations where reliable records exist,¹³ including in Sweden,¹⁴ the United States,¹⁵ The Netherlands,¹⁶ and Australia.²

Medicare is Australia's universal health care system, which subsidizes virtually all medical services outside of the public hospital system for all citizens and permanent residents, regardless of age or other factors; the total Medicare-registered population closely approximates the total estimated resident population.¹⁷ The near complete uptake of Medicare services, coupled with site-, size-, and histology-specific item codes for skin conditions, makes it possible to estimate the national incidence of procedures for diagnosing and treating keratinocyte cancers in the Australian population, and to examine trends over time.

By analyzing these data,¹⁸ we sought to describe the trends in clinical diagnosis and treatment of BCC and SCC in Australia during the period 2000 through 2011.

METHODS

We obtained all data from the Medicare Australia World Wide Web site (<http://www.medicareaustralia.gov.au>; accessed between May-June, 2012). We identified all item numbers representing procedures for the diagnosis and treatment of skin cancers using the Medicare Benefits Schedule Book of Therapeutic Procedures, Category 3, operating from May 1, 2012¹⁸ (item numbers are summarized in [Appendix I](http://www.jaad.org) at <http://www.jaad.org>). Surgical excision is the recommended treatment for all primary melanoma and most keratinocyte skin cancers, although various nonsurgical treatments are appropriate for some lesions.¹⁹ For the item codes relating to cryotherapy, curettage, and excision, Medicare Australia requires that the diagnosis of malignancy is proven by histopathology or confirmed by specialist opinion before benefits are claimed. All of the item numbers analyzed in this report were unchanged for the entire study period 2000 through 2011, except for the 24 items relating to "surgical removal of a BCC or SCC that was initially treated surgically," which were

introduced in 2005 and thus for which the relevant period was 2006 through 2011.

For each item number, we obtained the number of procedures performed for each Australian state and territory for every year of the past decade from the statistics page of the Medicare World Wide Web site (https://www.medicareaustralia.gov.au/statistics/mbs_item.shtml). We queried "counts," and "counts per capita" of services, stratified by calendar year from January 2000 to December 2011. All data were imported into Microsoft Excel (Microsoft, Redmond, WA) for analysis. For first surgical treatment of keratinocyte cancer, cryotherapy and serial curettage or excision of histologically confirmed malignant lesions and also diagnostic biopsy procedures, we examined the

data stratified by sex and age group (5-year age groups).

To assess whether trends identified in treatment services were specific for keratinocyte cancers or reflected broader trends in dermatologic practice, we also collected data on the surgical and nonsurgical treatment of benign skin lesions and melanomas, and the nonsurgical treatment of premalignant skin lesions. We plotted the counts and counts per capita of services by year to identify trends. We calculated the average annual percentage rate of change (AAPC) for counts per capita for the period 2000 through 2011 using the Joinpoint Regression Program, Version 4.0.4. May 2013 (Statistical Research and Applications Branch, National Cancer Institute, Bethesda, MD).²⁰ All but 1 of the 25 item numbers relating to residual and recurrent disease were first designated in 2005. Upon review, we excluded data for these 24 items for the year 2005 as unreliable, as indicated by very low procedure counts in this first year of implementation, and there were insufficient time points to calculate the AAPC for this group of items. To test for differences in AAPC by sex, we used the pairwise comparison option in the Joinpoint Regression Program (Statistical Research and Applications Branch, National Cancer Institute), which uses a classic approximate *F*-test to compare 2 sets of trend data.²¹

RESULTS

The past decade has seen substantial increases in the number of services to diagnose and treat keratinocyte cancers in Australia. [Table I](#) presents the

CAPSULE SUMMARY

- Population data to monitor performance of prevention programs for keratinocyte cancers are scant.
- In Australia, between 2009 through 2011, there was a significant decline in excision rates for keratinocyte cancers among those younger than 45 years.
- Continued monitoring will determine whether these declines are sustained into the future.

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