

Preventing melanoma and skin cancer with sunscreen

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Abstract. We present evidence that regular use of sunscreen is effective in preventing melanoma.

Introduction

Ultraviolet radiation (UVR) causes cutaneous melanoma and keratinocyte cancer. We know that sunscreen not only prevents sunburn, but also protects epidermal cells against UVR-induced mutations and other sequelae of exposure. Cohort studies and trials also indicate that people who regularly use sunscreen have lower risks of melanoma and squamous cell carcinomas than people who only use sunscreen on a discretionary basis. However, the prevalence of regular (daily) sunscreen use is far from universal, even in high-incidence populations. We sought to measure the potential impact on melanoma incidence of raising the population prevalence of sunscreen use.

Method

We calculated the population impact fraction (PIF), which is the proportional difference between the observed number of melanomas arising under current levels of sunscreen use compared with the number expected under alternative scenarios.

Results

We found that a plausible public health campaign scenario involving modest increases in sunscreen use over a 10-year horizon would likely reduce the cumulative incidence of melanoma by 11% and 10% respectively in the US and Australia. Under the “theoretical maximum model” of sunscreen use, we estimated that melanoma incidence between 2012-2031 would be reduced by 38% and 34% respectively in the US and Australia. The paper essentially summarises the findings in two recent publications (Olsen et al., 2017, 2018). See Fig 1 and Table 1 (next page).

Conclusion

We conclude that countries with high melanoma incidence should monitor levels of sunscreen use in the community, and encourage greater use.

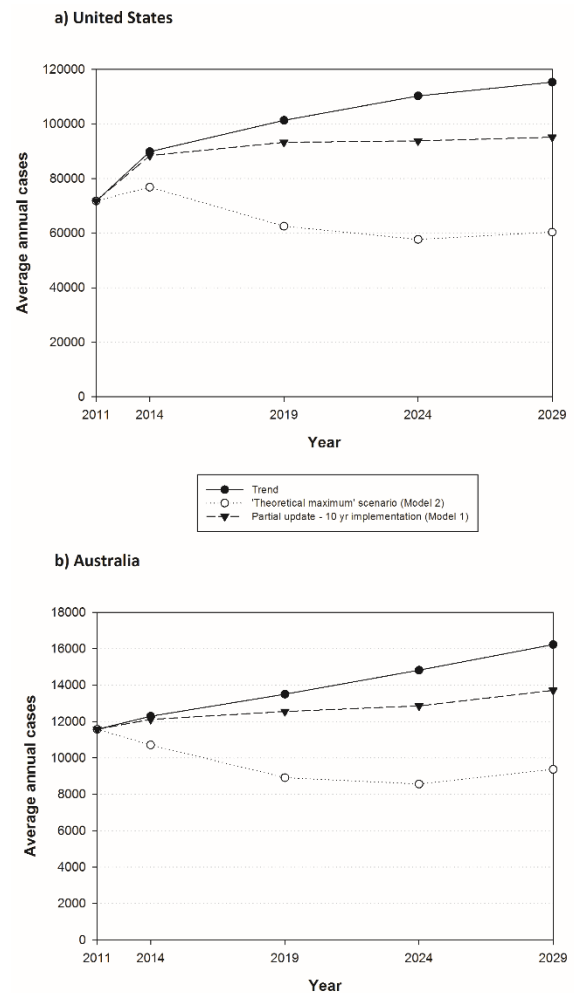


Figure 1. Calculated cases for United States and Australia.

References

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- Olsen, C.M., Wilson, L.F., Green, A.C., Biswas, N., Loyalka, J., Whiteman, D.C. 2018. How many melanomas might be prevented if more people applied sunscreen regularly? *BJD* 178: 140-147;doi:10.1111/bjd.16079.
- Whiteman DC, Green AC, Olsen CM. The Growing Burden of Invasive Melanoma: Projections of Incidence Rates and Numbers of New Cases in Six Susceptible Populations through 2031. *J Invest Dermatol* 2016; **136**: 1161-71.

Table 1. Number of cases of melanoma by country and sex in base year (2011), total estimated expected cases 2012-2031 with and without interventions.

Intervention		USA (persons)	Australia (persons)
	Base year - 2011 (cases)	71,766	11,570
	Trend only 2012-2031 (cases)	2,083,053	284,220
<u>Model 1:</u> Partial Uptake - 10 year implementation	Intervention 2012-2031 (cases)	1,852,000	256,149
	Preventable cases (%)	11.1%	9.9%
<u>Model 2:</u> <i>Theoretical maximum intervention</i> Full Uptake - immediate implementation	Intervention 2012-2031 (cases)	1,286,181	187,803
	Preventable cases (%)	38.3%	33.9%

Numbers (except for base year 2011) represent the cumulative total number of cases projected over the 20 year interval 2011-2031 based on prior published evidence (Whiteman et al., 2016)