Title: Response to Czarnecki

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To the editor,

It has been proposed by Czarnecki\textsuperscript{1} that the decreasing incidence of invasive melanoma in young age groups in Queensland, Australia, is explained by the effect of immigration by people with darker skin who are at low melanoma risk. This repeats his previous assertions.\textsuperscript{2,3} While we have acknowledged\textsuperscript{4} that immigration will have some effect on melanoma trends, we have previously published a simulation study\textsuperscript{5} to demonstrate specifically that the recent decrease in melanoma incidence rates among younger Australians cannot be fully explained by changes in the ethnic mix of the population.

Czarnecki refuted that simulation\textsuperscript{1,6} on the basis that when we assumed a constant susceptible population, the patterns in his melanoma incidence counts for Australians aged 0-29 years (lower in 1982 than 2009) were not reflected in our melanoma incidence rates (higher in 1982 than 2009). However, the data he quoted to support this argument (438 melanomas in 1982 and 457 in 2009)\textsuperscript{2} are incorrect. Using the Australian Cancer Database\textsuperscript{7} (cited by Czarnecki), there were 434 melanomas diagnosed in 1982 but a lower number of melanomas (417) diagnosed in 2009, consistent with the data used in our simulation.\textsuperscript{5} This presents a very different pattern to the numbers Czarnecki reported. It is true that retrospective cancer registry counts can change with ongoing data verification, however our extract from this same dataset in 2015 had similar estimates to the current version (437 and 416 respectively). Thus, the single argument\textsuperscript{6} provided to suggest our methodology was flawed appears meaningless.

There are at least two additional reasons to question Czarnecki’s analyses\textsuperscript{1-3,6}. First, by focussing only on the single start- and end-points of the period in question, the author has not performed a meaningful trend analysis. Even small fluctuations in those points, or incorrect data, can give widely varying assessments of the trend, and, more importantly, this approach ignores any change in the trend that may occur between the two points. It was for this reason that our trend analyses,\textsuperscript{4,5} including the simulation study, were based on trends in the annual melanoma incidence rates.

Second, Czarnecki continues to focus on the period from 1982 onwards\textsuperscript{1-3,6}. However, as we have shown, the reduction in melanoma incidence among young people in Australia (around 4% per year)\textsuperscript{5} and in the state of Queensland\textsuperscript{4} only started in the mid-1990s. If we assume a constant susceptible population (i.e. no population growth except through immigration), there was still a 3% decrease in melanoma incidence rates among young Australians since that time. Given that Czarnecki stated\textsuperscript{1} the susceptible population of younger Queenslanders increased by 0.5% per year, he acknowledges that the assumption of zero growth in the susceptible population is a lower bound, thus supporting our conclusions.

For these reasons, we reiterate that immigration from countries with low melanoma risk cannot explain our finding of a real decrease, since the mid-1990s, in melanoma incidence in recent birth cohorts in Queensland.\textsuperscript{4}

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References
1. Czarnecki D. Immigration is the most likely reason for the generational change in melanoma incidence in Queensland, Australia. *Int J Cancer* 2018; [in press].