

PSA screening: correlating noise with noise?

Linda Perron and colleagues¹ conclude that the fall in prostate cancer mortality observed since 1995 is not the result of increased screening activity. They base this on a comparison of the size of the change in prostate cancer incidence rates in 1993 with the size of the change in prostate cancer mortality rates in 1999. Although there clearly is a relation between the overall provincial numbers for the 2 (see Figure 1 in their article), when examined within 2-year birth cohorts, or within regions, none can be found. Accordingly, they conclude that the increase in diagnosis could not have led to the subsequent fall in mortality.

However, examination of their figures suggests that (presumably due to the small numbers in each cohort or region) the differences in incidence and mortality are more likely due to noise than to any biologically meaningful phenomenon. To test this possibility, they could look for any relation between the incidence, or mortality, in any relevant cohort or region in the preceding or subsequent year. In its absence, any variation observed can be presumed to be noise, and because noise is unlikely to correlate with noise, any conclusion based on the absence of correlation is unjustified.

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Reference

1. Perron L, Moore L, Bairati I, Bernard PM, Meyer F. PSA screening and prostate cancer mortality. *CMAJ* 2002;166(5):586-91.

[The authors respond:]

We looked separately at the age cohorts and the geographic regions.¹ For the 15 age cohorts, the correlation coefficients between rates of any adjacent years were greater than 0.90 for both incidence and mortality. Random variations can therefore not explain the lack of association observed. For the 15 geographic regions, by using the mean

rates from 4 consecutive years (1986–1989 for incidence and 1992–1995 for mortality) in the calculation of baseline rates, we accounted for the random variation that could have blurred the data at the baseline end of the rate difference equations. Moreover, relying on a single year (1993) for incidence increase, at the other end of the incidence rate difference equation, should have been fairly reliable. The correlation coefficients between the incidence rates of any adjacent years during the period where we measured incidence increase (1990–1995) ranged from 0.55 to 0.68 and were all statistically significant.

However, since the correlation coefficients between mortality rates of any adjacent years of the period where we measured mortality reduction (1995–1999) were weaker (–0.09 to 0.54), relying on a single year (1999) for mortality reduction in the mortality rate differences equation was a limitation. As we mentioned in our Discussion, the change in incidence should be reflected downstream on mortality rates over several years.

Nevertheless, while awaiting a more definitive answer that might come from randomized control trials, we believe that our study produced useful information. When the data become available, the study could be replicated using rates from several years at baseline and after the presumed lead-time period. This will measure the mortality rate differences with greater precision.

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1. Perron L, Moore L, Bairati I, Bernard PM, Meyer F. PSA screening and prostate cancer mortality. *CMAJ* 2002;166(5):586-91.

Interpreting the Quebec prostate cancer study

We feel that it is important to correct serious misinterpretations brought forward by André N. Vis¹ in his commentary on the article by Linda Perron and colleagues.²

First, it is wrong to say that the Quebec prostate cancer study had low statistical power without pooling groups. Contrary to this statement, the first analysis performed at 8 years of follow-up showed a 69% decrease in the death rate from prostate cancer ($p < 0.03$) in the screened versus the unscreened groups of men.³ Thus, in complete contradiction to Vis, the statistically significant difference mentioned above was obtained without any pooling of data.

It is also false to say that men in the unscreened group were at risk for a longer period. Deaths were expressed per 100 000 person-years of exposure, thus avoiding such bias.

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References

1. Vis AN. Does PSA screening reduce prostate cancer mortality? [editorial]. *CMAJ* 2002;166(5):600-1.
2. Perron L, Moore L, Bairati I, Bernard PM, Meyer F. PSA screening and prostate cancer mortality. *CMAJ* 2002;166(5):586-91.
3. Labrie F, Candas B, Dupont A, Cusan L, Gomez JL, Suburu RE, et al. Screening decreases prostate cancer death: first analysis of the 1988 Quebec prospective randomized controlled trial. *Prostate* 1999;38(2):83-91.

Correction

In a recent letter to the editor,¹ M. IGavan McAlinden's middle name was incorrectly spelled as McGavan.

Reference

1. McAlinden MM. Fracture healing using low-intensity pulsed ultrasound [letter]. *CMAJ* 2002;167(2):128.