Reviewer's report

Title: Ethnic differences in timely adjuvant chemotherapy and radiation therapy for breast cancer in New Zealand: A cohort study

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Reviewer: J. Mark Elwood

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General comments

1. This is an interesting paper. Its findings are of direct relevance to New Zealand but also relevant to variations in quality of care in other countries.

2. The concentration is on delay in the initiation of adjuvant therapies, defined as the time from surgery to the first chemotherapy or radiation treatment, considering thresholds of 60 days or 90 days for chemotherapy and 90 days for radiation therapy, which are consistent with other analyses of this topic. Delays in radiation therapy and in chemotherapy are considered separately, but also combined as a delay in adjuvant therapy. This can be confusing as of course this is not independent, but is a combination of the radiotherapy, and chemotherapy effects, and for one variable they show different patterns. Analysis uses conventional multivariate methods and the presentation is appropriate.

3. Survival analysis shows increased mortality hazards with increased delay, confirming other studies.

Minor revisions

4. The study population are women with breast cancer from a registry since 1999. The implication is that this is a population-based registry or close to that, but this is not made explicit: comments on the completeness of the registry would be helpful. (There is a comment late in the discussion, and ref 39: this would be good earlier.)

5. Single factor analysis shows longer delay intervals in the three other ethnic groups compared to the majority ‘Europeans’, and longer intervals with greater distance from the residence to the hospital, public rather than private sector care, and re-excision. This last variable is not clear; if the patient has had two or surgical procedures, is it more relevant clinically to consider the interval from the final surgical procedure to adjuvant therapy rather than the interval from first?

6. The variable showing a different pattern is year of diagnosis, as over time there has been a substantial decrease in intervals for radiation therapy, but an increase (followed by a decrease in the last time period) for delay in chemotherapy. These different patterns may reflect local issues of service capacity compared with demand.

7. Multivariate analysis confirms variation by ethnicity, re-excision, private vs. public status, and distance from hospital (the latter only for radiotherapy), but
Table 2 could be improved by making clear the test and reference categories. This is particularly true as it includes year of diagnosis, where both groups show significant effects, but in opposite directions.

8. The discussion is generally relevant. However, in regard to trend over time it simply says that ‘the number of women requiring adjuvant chemotherapy or radiotherapy has increased by more than 50%’. The delay time for radiotherapy has shown a reduction over time, whereas delays for chemotherapy increased at least until 2009. Does this reflect different trends either in the number of women requiring each of these therapies, or different trends in service provision?

9. The emphasis is on ethnic variations. For international readers, some brief explanation of the ethnicity categories would be valuable, as their meeting is not clear e.g. ‘Pacific’. Adequate numbers are available only for New Zealand Europeans and Maori, but the other results are still of interest.

10. It’s interesting, and would be worth more mention in the discussion, that intervals to adjuvant therapy do not show significant variation by age or socio-economic status, variables which are associated with quality of care in other contexts.

11. Figure 2 is probably unnecessary, as the data could be added to Fig 1b.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

'I declare that I have no competing interests'