Reviewer's report

Title: For patients with breast cancer, geographic and social disparities are independent determinants of access to specialized surgeons. A 1998-2008 population-based multilevel analysis.

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Reviewer: cyrille delpierre

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This paper aims to evaluate two major points: first, the impact on survival of being operated on by a specialized breast cancer surgeon and then, the socioeconomic and clinical determinants of being treated by one of the specialized breast cancer surgeons.

Analysing socioeconomic determinants of cancer survival is of main interest for reducing social inequalities which constitute a priority in public health, particularly when we look at disparities at ecological level that can be a more relevant level for interventions than individuals.

However I have some comments and suggestions which should be answered for improving the quality of the paper:

Major compulsory revisions

Methods: The main point is the threshold chosen by authors. Why 100 breast cancer operations? And during the study period (11 years if I well understood)? Do 10 operations constitute a relevant threshold? In literature, it seems that the threshold is bigger (cf Chen et al. 2008). Why do authors use a binary variable and not a continuous one or a qualitative variable with more than 2 categories?

Regarding the choice of variables, why do authors choose aggregate variables? It is needed to explain why they use ecological variables: is it because of a lack of individual data? Is it to characterise the context? Why do they choose several variables which are correlated with index of deprivation that is a more global variable? Why Townsend index, which is an English index known to be not so well adapted with French data because of major difference regarding rural/urban area (a ref is needed to justify the definition of this variable)? I think that explanations and assumptions made by authors need to be clarified.

Regarding statistical analysis, how do authors check proportional hazard assumption of the Cox regression model? Why do they use overall survival and not for example relative survival? It is possible that people are different in the two groups regarding comorbidity. This variable could influence care management and overall survival. And as it seems that high-volume surgeon have patients with a more favourable profile, it is likely that patients with comorbidities are likely not to be operated by high volume surgeons. Moreover why do authors not include care centres in their analyse? Maybe survival is explained by centers and not by surgeons? Same remark regarding circumstance of diagnosis.
Regarding multilevel analysis, why do they decide to consider rural/urban area (as distance) as an individual variable?

Discussion: Limitations of this study have to be discussed. In particular, the fact that some variables of confusion may potentially explain the association found between high volume surgeon and overall survival, as the threshold used for defining high volume surgeon.

Minor essential revisions

Introduction: I think that authors should talk first on studies on health disparities before talking about the potential role of surgeons “quality” to explain social disparities. And I would insist more on the French situation regarding studies on health disparities in cancer management and survival, and on the potential influence of surgeons “quality” on that. Many references studying health disparities in cancer management are actually from others countries than France. It is not sure than the situation is the same in France (authors explain a difference regarding urban/rural distribution for example). Maybe French studies are rare. In this case it is important to say that this study is one of the first to study the influence of surgeons experience on survival and the link between social determinants and access to specialized surgeons.

Result: I think that the proportion of operations by year in the two groups is useful, as the proportion of high volume surgeons according to care centre. In table 1, missing values for circumstance of diagnosis are missing. In table 3, multivariate logistic regression analysis should be replaced by multilevel logistic regression analysis. “level 2 variance” and the variance partition coefficient are needed.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

'I declare that I have no competing interests'