

Why did some Danish counties introduce breast cancer screening and others not? An exploratory study of four selected counties

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Objectives: Of the fourteen counties and two municipalities that until recently were responsible for healthcare provision in Denmark, five introduced mammography screening (MS) programs. The objective of this research is to explain this decision-making variation and to gain insight into priority setting processes in health-care provision at the county level in Denmark.

Methods: Literature on priority setting in health care was used to derive seven explanatory factors for comparing decision making on MS between four selected counties, of which two had implemented MS. The relative importance of each explanatory factor in each county was determined by analyzing policy documents, supplemented with interviews of selected stakeholders. The results were combined and compared at the county level.

Results: Evidence of effectiveness of MS was considered satisfactory and ethical issues related to MS were perceived relatively unproblematic only in those counties that introduced MS. Lack of resources, that is, radiologists, was an additional important factor for counties not implementing MS. Local opinion leaders have played a stimulating role, whereas advisory policy documents at the central government level and even legislation have had a minor impact.

Conclusions: The four counties have based their decision making on the introduction of MS on different combinations of a limited number of factors that have been differentially weighted. The pattern of relevant factors in both counties not introducing MS is rather similar. The study elucidates the role of complementary factors to evidence in decision making. Of interest, recent public sector reforms have resulted in the decision to have MS implemented nationwide.

Keywords: Mammography screening, Priority setting, Health policy, Denmark

Since 1970, funding of health care in Denmark has been achieved through taxation at the county level, and it has been the responsibility of elected county politicians to provide health services to their citizens. However, in an era of rapid progress in the development of new health technology and increasing public demand for health services, publicly financed healthcare systems, such as the Danish, increasingly face the challenge of determining what services to include in the benefit package (1). As a consequence, priority setting in health

care is becoming a growing dilemma. Nevertheless, systematic studies of priority setting processes at a decentralized level in Denmark have been sparse (18).

With this background, the introduction of routine mammography screening (MS) for breast cancer may serve as an excellent case to gain insight into preventive services policy making and the associated priority setting processes at the decentralized level in this country. Mammography screening for breast cancer, defined as biannual screening of women 50–69 years of age, was introduced in Copenhagen municipality in 1991. In 2006, 15 years later, only five of a total of

No external funding was provided.

fourteen counties and two municipalities (with county-level authority) had introduced routine MS. So by 2006, the vast majority of counties had not introduced MS, resulting in MS programs only covering 24 percent of eligible women on a national basis.

The specific objective of this study is to try and explain why some counties introduced MS and others not. The analysis focuses on four selected counties, covering the time period between 1991 and 2006, when five regions substituted the existing county structure as part of the health sector reform in 2007 (17).

It is important to notice that decision making at the county level can be steered by the central level, for example, the Minister of the Interior and Health (MOH), on the basis of laws passed by the Danish Parliament. The National Board of Health (NBH), among other roles, advises the MOH in policy development. The NBH has addressed MS three times, in 1989, 1994, and 1997, and only the 1997 recommendations were unambiguously positive toward the introduction of the program. Recommendations of the NBH are not legally binding for the counties. In 1999, legislation was passed in the Danish Parliament in favor of the introduction of MS, allowing the counties an 11-year time horizon for implementation (until 2010). In 2005, this deadline was revised and set at ultimo 2007 (11). Two municipalities and one county had decided to implement MS before positive recommendations on the issue by the NBH in 1997, while two other counties introduced MS after both the positive NBH recommendations were issued and legislation on MS was passed in 1999 (see Figure 1 for more detailed information).

METHODS

Development of a Theoretical Framework

Published literature on priority setting in health care (6–9;14;18) was used to develop a theoretical framework, consisting of seven variables, that seemed most promising in explaining decision-making variation between counties. In our choice of literature, we were guided by high-quality textbooks and reviews by both international and Danish authors in the field. Information on the structure and function of the Danish health-care system provided a context for the study (10;18). The resulting explanatory factors included (i) interpretation and use of the scientific evidence on the safety and (cost) -effectiveness of MS; (ii) ethical issues and values related to MS, for example, the implications of false-positives and false-negatives; (iii) the role of the NBH's recommendations on MS at different points in time, varying from rather neutral advice to a straightforward recommendation to introduce the program; (iv) implementation considerations, such as the availability of both financial and personnel resources, in particular radiologists; (v) the presence of local political factors, focusing on the level of agreement or disagreement at the political level; (vi) the role of county bureaucrats and physicians; and (vii) other factors, especially the absence or presence of opinion leaders and specific interest groups.

Study Design

The study was designed as a comparative case study (2;23), with each case representing a county. In principle, all sixteen decision-making units, that is, fourteen counties and two

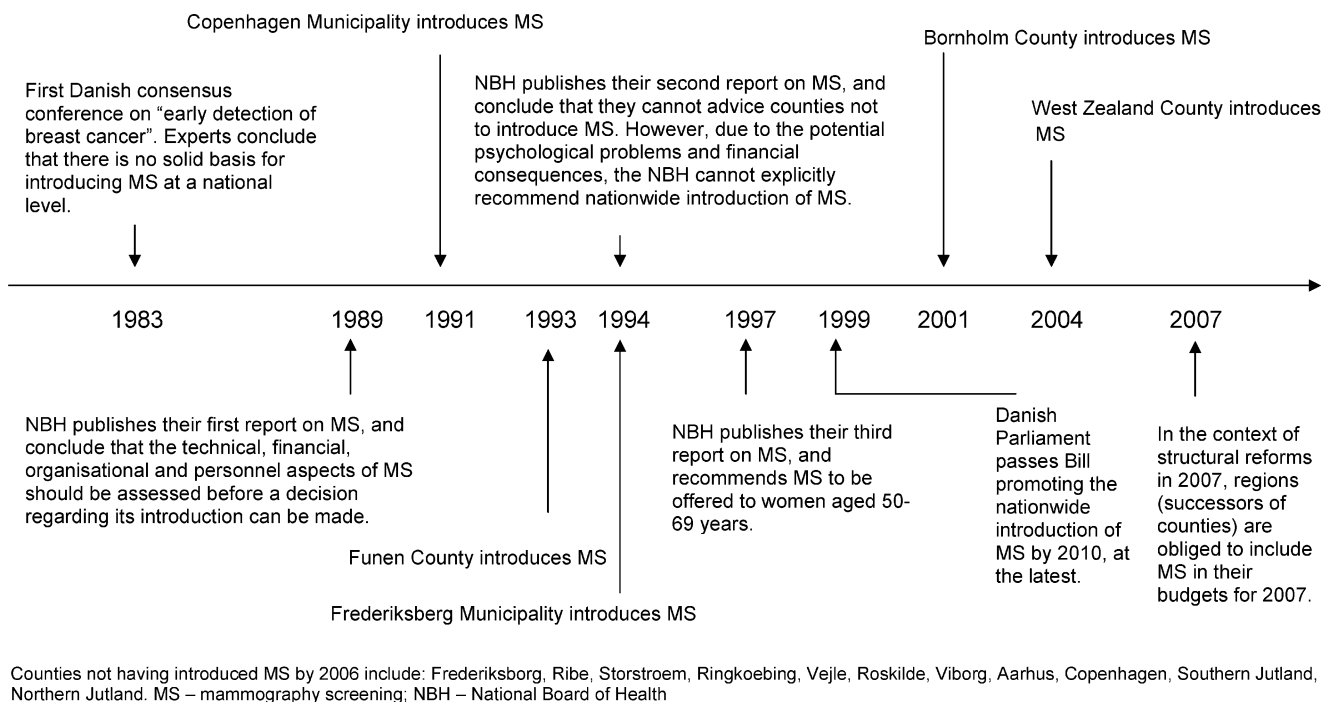


Figure 1. Timeline of Danish policy on mammography screening.

municipalities, deserved to be analyzed, but to allow for more detailed analysis, four cases were included. While adhering to the recommendations made by Maxwell (15) for the purposeful selection of cases, two counties that had introduced MS (Funen County and West Zealand County), and two counties that had not introduced MS (Aarhus County and Vejle County) were included, respectively. More information on the sampling procedure is available on request with the corresponding author.

First Stage of Data Collection and Analysis

Background information on MS at the county level in Denmark was retrieved by means of searches in bibliotek.dk, which is a central database covering all library databases in Denmark. Relevant articles were ordered, and references in these articles were tracked. In each of the selected counties, the health secretariat was contacted for relevant information, including background reports and minutes from political meetings on MS. Additionally, national level Danish sources included documents posted at the Web site of the Ministry of Health, the National Board of Health, and the Web sites of the counties, as well as archives of newspapers and personal archives. This information was used for a comprehensive analysis for each county, using qualitative content analysis (4).

Second Stage of Data Collection and Analysis

As an additional, supplementary step, guided by the identification of limited or missing information on one or a combination of factors, semistructured interviews were organized with selected stakeholders in each of the counties (13;21). An important criterion for inclusion was that the interviewee had participated in the actual decision-making process studied. In total, two county health directors, seven members of county councils, and two consultant physicians were interviewed (four from Aarhus, three from West Zealand, and two from Funen and Vejle, respectively). An interview guide was produced taking into account the role and interests of each type of interviewee. Interviews were recorded, transcribed, and analyzed according to the explanatory factors outlined earlier (21). The results from the interviews were integrated in the main analysis.

Final Stage of Data Analysis

As a final step, for each of the four counties the importance of each of the seven explanatory factors was judged qualitatively, first whether a factor had either positively or negatively influenced the decision to introduce MS, and then the relevance of each factor was judged as either very important, important, of minor importance, or neutral. Subsequently, summary statements for each county were formulated and tentative comparisons between (combinations of) counties made.

RESULTS

Table 1 provides an overview of the findings.

The Decision not to Introduce Mammography Screening in Aarhus County

All but political factors have played a role in the process. Three very important factors negatively affecting the decision to introduce MS stand out: the role of evidence, ethics, and the recommendations of the NBH.

With regard to clinical evidence, the general consensus seemed to be that the available scientific evidence did not justify the introduction of MS. In fact, it was suggested that politicians may have used the uncertainty associated with the scientific evidence in a tactical manner:

'Scholars disagreed. There was uncertainty associated with the scientific evidence saying that MS has a positive effect, and there still is today . . . I think that the politicians have used this uncertainty tactically. Instead of spending a lot of money, they could simply refer to the inadequate scientific basis of MS' (former county health director, Aarhus, July 3rd 2006)

Similarly, Aarhus county justified not introducing MS from an ethics perspective, that is, potentially introducing an intervention that may do more harm than good. A similar consideration was that introducing MS would take scarce personnel resources away from treating the sick to examining otherwise healthy women.

Also the NBH was perceived as an important negative factor as it was judged to add to the confusion regarding the introduction of MS:

'We didn't feel that the recommendations coming from the NBH is something to be proud of. There has been a lack of clarity. It is not worthy of a NBH to say, if you want it you should do this and that. Their advisory role should be to say, you should or you should not introduce MS. I miss some professional authority.' (former county health director, Aarhus, July 3rd 2006)

The remainder of factors were only of minor importance.

The Decision not to Introduce Mammography Screening in Vejle County

The findings for Vejle are very similar to those in Aarhus, both in terms of the evidence-base, the ethics of MS, shortage of personnel and the recommendations of the NBH. All contributed heavily to a decision not to introduce MS. Similar to the case of Aarhus, MS has been discussed on several occasions in Vejle County, and there has been a consistent and negative political position toward MS:

'The general position on MS has not changed throughout. There has been a negative attitude, and if you asked around now people would still not want the introduction of MS in Vejle County.' (county politician, Vejle, June 29th 2006)

Table 1. Comparison of the Decision-Making Process in Four Danish Counties Regarding the Introduction of Mammography Screening

County decision factor	Aarhus County (no MS)	Vejle County (no MS)	Funen County (MS introduced)	West Zealand County (MS introduced)
Scientific evidence	+++ Scientific evidence inadequate	+++ Scientific evidence inadequate	++ Evidence satisfactory; a belief in positive aspects of evidence	+ Politicians divided on evidence, but legislation in 1999 made discussions superfluous
Ethics/values	++ Too many ethical problems associated with MS	++ Disadvantages of MS outweigh the advantages	++ In making MS voluntary, politicians disregarded ethical responsibility	++ Little political resistance from this perspective, but legislation made discussions superfluous
National Board of Health	+++ Critical of NBH; lack of clarity and professional authority	+++ Little confidence in NBH and their recommendations	+ NBH not decisive, although it was noted that the NBH was generally positive toward MS	++ Positive toward NBH and their recommendations
Resources	++ Shortage of radiologists a major problem	++ Shortage of personnel a major problem	++ No major problems with either human or financial resources	+++ Necessary personnel available; central funds following legislation formed an important incentive
Political factors	0 No political conflict; political parties agree on not introducing MS	0 Agreement across parties not to introduce MS	+ There seems to have been political agreement to introduce MS	++ Somehow also a "random political decision"; introducing MS in order to prevent a local hospital from closing
Doctors & county officials	+ Doctors positive toward MS, but county officials clarified controversial issues in the debate	+ Apparently (some) doctors were against MS	+++ Doctors and officials both agree on introduction of MS; resulting in smooth decision process	0 Doctors divided, but it appears they had little say in the decision process
Other factors	+ Interest group pressure not to introduce MS; opinion leaders; influences from neighboring counties	+ MS low priority compared to other cancer interventions; earlier screening interventions not very successful; opinion leaders important	+ Opinion leaders emphasized; women at forefront of debate	++ Keeping a hospital in Ringsted; collaboration with Funen county; availability of central funds and treatment capacity major motivators

+++ = Very important factor; ++ = Moderately important factor; + = Factor of minor importance; 0 = Neutral factor.

'It is probably one of those cases, where ethical considerations have been most important.' (county politician, Vejle, June 29th 2006)

A specific argument against MS put forward in Vejle was the risk of overtreatment. This may explain why even clinicians in Vejle were not in favor of introducing MS. Moreover, little success with previous screening interventions (e.g., low participation rates in a colon cancer screening program) may

have added to the skeptical political attitude toward MS in Vejle County.

The Decision to Introduce Mammography Screening in Funen County

In contrast to Aarhus and Vejle, virtually all actors on Funen were positive toward the introduction of MS from the

onset, which made the decision process relatively smooth and resulted in a positive decision on MS in 1992 and actual introduction in 1993. The single most important factor was that both clinicians and county officials played an active role in promoting the introduction of MS. Factors of moderate importance, all favoring the introduction of MS, included the evidence-base, ethical considerations, and the availability of sufficient personnel and financial resources. The evidence-base was regarded as satisfactory and supportive of a positive decision:

'It seems that there still are people that say that it's a good thing, while others say that there is no evidence showing that this is sensible. There is no doubt that it played a part, and the proposition amongst people on Funen at the time was that the evidence saying that this was good and that it worked; that was the evidence which was correct.' (former county health director, Funen, July 5th 2006)

In a similar way, opinion leaders in favor of MS somewhat disregarded discussions of major ethical dilemmas, and there seems to have been little significant ethical debate on Funen. In 1992, only the first (rather neutral) of three NBH publications on MS had been published; however, the NBH recommendations, just as some of the other remaining factors, were only of minor importance in the decision-making process.

The Decision to Introduce Mammography Screening in West Zealand County

The introduction of MS has been discussed in West Zealand County since the early 1990's. Initially, it was decided not to introduce MS due to controversies on the quality of the evidence, and ethical considerations. However, the 1999 legislation changed things. The single most important factor was that the county had sufficient financial and personnel resources at its disposal and, as a consequence of legislation, additional funds from the government for the introduction of MS were expected to become available. Moderately important factors included ethical considerations, which seemed to change from being regarded as unfavorable to favorable over time, perhaps inspired by the latest edition of the NBH recommendations (1997), which were received favorably in the county. An additional political factor contributing to a positive decision was that it was thought that introducing MS would contribute to maintaining a regional hospital in the county, which was threatened to be closed.

'I am willing to admit that the introduction of MS had something to do with preserving a hospital in Ringsted.' (county politician, West Zealand, June 19th 2006)

A final political factor was the possibility for this county to offer MS in collaboration with the county of Funen, an arrangement attributed to personal ties between the directors in both counties.

DISCUSSION

Of the explanatory factors derived from the theoretical framework, the counties' position on the scientific evidence on MS (focusing on evidence of its safety and effectiveness), ethics, the recommendations of the NBH, and the availability of resources seem to be of most importance. A sometimes very negative position on each of these factors appears to have prevented the counties of Aarhus and Vejle from introducing MS, and the findings for both counties are very similar. The County of Funen introduced MS with all factors in favor of this decision, with supportive clinicians and county officials in a leading role and apparently dominating the debate, resulting in a smooth decision-making process relatively unhindered by considerations of personnel or financial resources. The combination of available resources and the promise of additional resources from the central government seems to have been most important for the County of West Zealand to introduce MS, while regional hospital politics played a stimulating role as well. The two counties introducing MS share the availability of resources, but also show marked differences in the combination of factors of importance. In addition, it appears that opinion leaders have had a marked impact on the decision-making process in all four counties, whereas advisory policy documents at the central government level and even legislation have played minor roles. Overall, we believe that by using a combination of documentary sources, the study provides a valid description of the decision-making process on the introduction of MS in four counties, and the study thus contributes to the body of knowledge on priority setting in health care at the decentralized level. However, we are aware of the fact that some of the decisions studied were made a long time ago, so where we relied on interviews we cannot exclude recall bias and response bias. On the other hand, most of the interviewees had moved on to new jobs or were retired, making them more reliable as informants as they have had time to reflect on issues and because they did not need to be afraid to face repercussions when telling the truth (3). Finally, we would like to stress that interviews were carried out to supplement the main analysis, which was based on often high quality documentary sources including, for example, background reports on MS produced for the county councils studied and minutes of the county meeting covering the actual decision-making deliberations.

Can the findings of the study be generalized to other counties and other countries? Generalizability to other Danish counties may not be straightforward, given regional differences in, for example, wealth and demography, so we would rather hypothesize that this exploratory study of four preselected counties provides a good start for carrying out analogous analyses in different settings. Of the countries having implemented MS, perhaps the Swedish experience comes closest to the Danish, as in Sweden decision making on MS was also made at the county level (12). In Sweden, five counties (of twenty-six) were offering MS to part

of or the whole female population before the Swedish National Board of Health published its positive guidelines (12). After publication of the guidelines in 1986, an increase in establishing programs was seen. In 1992, active screening was performed in twenty-two counties. In 1997, all counties offered screening, albeit with varying age limits and time intervals. It appears that the NBH has had a more limited role in Denmark than its Swedish counterpart, but the case also shows that it may take more than a decade to implement MS nationwide in a decentralized healthcare system.

Worldwide, at least twenty-two countries had implemented regional or national MS programs by the mid-1990s (22). This number must have increased markedly, as at present at least twenty-three European countries have already implemented or are currently establishing nationwide MS programs (19). There is marked variability among these programs in terms of age-groups included, frequency and method of screening, and, when mammography is selected, the number of views taken (20). Rennert (20) explained these differences in decision making by inherent differences between the countries in structure of the health-care system, in the commitment to public health activities, and in opinions and health habits of the relevant population. It is important to add that the evidence on the safety and effectiveness on MS has become controversial after 2000 (5;16) but most of the international research- and policy environment has always been in favor of MS, claiming mortality reductions between 25 and 30 percent (19).

POLICY IMPLICATIONS

In theory, the policy implications of the findings would be highly dependent on two factors: a judgment on the safety and effectiveness of MS and a definition of the most important value to be pursued in health care or society at large. More specifically, if MS is interpreted as doing more good than harm and, as often has been claimed, when equity in access is the main value to be pursued by the Danish health-care system than clearly decision-making variation at the county level on implementation of MS is not justified, and every county should have implemented this program. Another judgment may follow from the situation where MS is interpreted as doing more good than harm and the main judgment criterion for the appropriateness of decision-making variation is related to the legitimacy of the decision-making process, that is, respecting the decision-making power allocated to the decentralized (county level) and the associated right to determine regional priorities. In that case, decision-making variation on implementation of MS at the county level may be fully acceptable. Then there is the situation where MS is interpreted as doing more harm than good. In that case, decision-making variation on implementation of MS at the county level is fully unacceptable, and obviously none of the counties should have implemented MS. More generally we speculate that, while the case of MS stands out for its contro-

versality and high media attention, the policy mechanisms illustrated by this case study may also be representative of the decision-making process associated with the introduction of other preventive health-care technologies at the decentralized level in Denmark. In practice, as a consequence of the Danish health-care reform in 2007 in which the counties were replaced by five regions, that is, fewer decision-making "units," decision-making variation is likely to decrease.

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REFERENCES

1. Bilde N, Ankaer-Jensen A, Danneskiold-Samsøe B. The "Health Benefit Basket" in Denmark: A description of entitlements, actors, and decision-making processes in the curative health sector. *Euro J Health Econ*. 2005;6:S11-S17.
2. Blomquist W. The policy process and large-N comparative studies. In: Sabatier PA, ed. *Theories of the policy process*. Colorado: Westview Press; 1999:201-230.
3. Buse K, Mays N, Walt G. *Making health policy*. Published in the series: Understanding public health. Maidenhead: Open University Press; 2005.
4. Grbich C. *Qualitative research in health: An introduction*. London: Sage Publications; 1999.
5. Gøtzsche P, Olsen O. Is screening for breast cancer with mammography justifiable? *Lancet*. 2000;55:129-134.
6. Ham C. Priority setting in health care: Learning from international experience. *Health Policy*. 1997;42:49-66.
7. Ham C, Coulter A. International experience of rationing (or priority setting). In Coulter A, Ham C, eds. *The global challenge of health care rationing*. Buckingham: Open University Press; 2000:1-12.
8. Ham C, Robert G. *Reasonable rationing: International experience of priority setting in health care*. Maidenhead: Open University Press; 2003.
9. Holm S. Developments in the Nordic countries – goodbye to the simple solutions. In Coulter A, Ham C, eds. *The global challenge of health care rationing*. Buckingham: Open University Press; 2000:29-37.
10. Indenrigs – og sundhedsministerens rådgivende udvalg. *Sundhedsvæsenets organisering – sygehuse, incitament, amter og alternativer*. Indenrigs – og sundhedsministeriet: København; 2003. (In English: Advisory committee of the Minister of Interior and Health. *The organization of the health care sector – hospitals, incentives, counties and alternatives*. Ministry of Interior and Health: Copenhagen; 2003)
11. Indenrigs- og sundhedsministeriet. *Aftale mellem regeringen og Dansk Folkeparti om forbedring af behandling af kræft*; 2005. <http://www.fm.dk/1024/visPublikation.asp?artikelID=7370&soegningID=137121>. (In English: Ministry of Interior and

- Health. *Agreement between the Government and Danish Peoples Party regarding improvements of cancer treatment; 2005.* <http://www.fm.dk/1024/visPublikation.asp?artikelID=7370&soegningID=137121>.
12. Jonsson E, Banta HD, Schersten T. Health technology assessment and screening in Sweden. *Int J Technol Assess Health Care.* 2001;17:380-388.
 13. Kvale S. *InterViews: An introduction to qualitative research interviewing.* Thousand Oaks: Sage Publications; 1996.
 14. Martin DK, Giacomini M, Singer PA. Fairness, accountability for reasonableness, and the views of priority setting decision-makers. *Health Policy.* 2002;61:279-290.
 15. Maxwell JA. *Qualitative research design: An interactive approach.* 2nd ed. Thousand Oaks: Sage Publications; 2005.
 16. Olsen O, Gøtzsche PC. Cochrane review on screening for breast cancer with mammography. *Lancet.* 2001;358:1340-1342.
 17. Pedersen KM, Christiansen T, Bech M. The Danish health care system: Evolution – not revolution in a decentralized system. *Health Econ.* 2005;S1:S41-S57.
 18. Pedersen KM. *Sundhedspolitik: Beslutningsgrundlag, beslutningstagen og beslutninger i sundhedsvæsenet.* Odense: Syddansk Universitetsforlag; 2005.
 19. Perry N, Broeders M, de Wolf C, et al. *European guidelines for quality assurance in breast cancer screening and diagnosis.* 4th ed. – summary document. *Annals of Oncology* (published online on November 17th 2007. <http://annonc.oxfordjournals.org/cgi/content/full/mdm481v1>).
 20. Rennert G. Political interpretation of scientific evidence – case study of breast cancer screening policies around the world. *Recent Results Cancer Res.* 2003;163:140-148
 21. Rubin HJ, Rubin IS. *Qualitative interviewing: The art of hearing data.* 2nd ed. Thousand Oaks: Sage Publications; 2005.
 22. Shapiro S, Coleman CA, Broeders M, et al. Breast Cancer screening programmes in 22 countries: Current policies, administration and guidelines. *Int J Epidemiol.* 1998;27:735-742.
 23. Yin RK. *Case study research: Design and methods.* 3rd ed. Thousand Oaks: Sage Publications; 2003.