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EFFECTS OF HOSPITAL CONSOLIDATION IN CROATIA ASSESSED BY SAFETY ATTITUDES QUESTIONNAIRE 2006 SHORT FORM

On several occasions hospitals in Croatia have been a subject to consolidation. The purpose of the consolidations was savings gained by merging some of the services, especially in the hospitals which are geographically close to each other.

The available published research results have shown that the smallest hospitals in Croatia achieve highest results for safety measured by the Safety Attitudes Questionnaire 2006 Short Form (SAQ). Further investigation and management of the SAQ data obtained in 2016 has proven that the analyzed independent hospitals with up to 500 beds, compared to the consolidated hospitals, achieve significantly better results with regard to Working Conditions, Management's Attitude, Job Satisfaction and overall SAQ results.

In terms of expenditures expressed as the index change of expenditures from year 2006 (2006 having an index of 100), no significant differences were found. However, the highest rise in the expenditures is found for consolidated hospitals with >500 beds, while the hospitals with <500 beds, either consolidated or not, show the same trend in the change of expenditures during the period 2006-2015.

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These findings should be considered when deciding upon hospitals consolidation in Croatia.

Keywords: Consolidation; Croatia; Expenditures; Hospitals; SAQ 2006 Short Form.

Introduction

Facing the rising costs of healthcare, policymakers worldwide have been attempting to find solutions to cut down the costs. One of the solutions is consolidation, or merging, of hospitals. Despite the research evidence, increasing concentration in hospital services continues to be a major aim of health policy in a number of countries - often through consolidation or mergers (Mc Kee, 2002).

Cost savings may be achieved due to higher volume, better coordination of care, or improved population health. Through consolidation, health system investments in technology, quality improvement, or shared services should be spread across a broader base (Knapp, 2017).

Efficiency, defined as decrease in price, increase in quality and/or output, or increase in innovation is important in justifying hospital consolidation (Blair, 2016). The measurement of efficiency has developed over recent decades (Mateus, 2015). Theoretic definition of the production function as a maximum amount of output given with input bundles and available technology has been accepted for several decades (Aigner, 1977). It looks as if merging or consolidation of the hospitals is interpreted as a way to resolve the challenge of cost-effectiveness of hospitals, despite of data on hospital economies of scale suggesting that the hospitals are fully realized in facilities of 100 to 200 beds (WHO, 2018)

In a private health care market, hospital consolidation may be justified primarily as a means of reducing competition and enhancing profitability (Mc Kee, 2002). Hospital concentration can lead to higher prices — but those gains disappear to a large extent in case of a high degree of consolidation on the insurers' side as well (Nisen, 2017).

In a public system, consolidations may be justified for two reasons. The evidence shows that costs can be reduced by the elimination of duplication and / or excessive capacity through merger and rationalization, although elimination of excess capacity does not have much to do with economies of scale (McKee, 2002).

The second reason is that rationalizing of clinical services is the evidence of the relationship between service organization and patient outcomes (McKee, 2002).

Most of the publicly available data on hospitals consolidation, or merging, are from the US. There has been a growing number of hospital mergers during the last several years - it has doubled during a 5 years period from 2009 – 2015 (Tsai, 2014). The impact of that larger hospital systems, due to their greater market power, would presumably lead to higher prices to be payed from private payers. The arguments of creating high-volume institutions with better outcomes and better financial conditions along with more integrated care need not to be linked to hospital merging (Tsai, 2014). There is a dubious effect of hospital consolidation on health care prices (Tsai, 2014).

Evidence on the international level is rather unclear. Unlike previous studies, a study by Hayford finds that hospital mergers are associated with increased treatment intensity and higher inpatient mortality rates among heart disease patients. The limitation of the study is no access to additional outcome measures such as 30-day mortality and readmission rates, data which may change the causality (Hayford, 2011).

As a prerequisite to a functional health care system, integrated hospitals should allow for networks of coordinated care, transparent prices and quality outcomes (Xu, 2015).

Research on hospitals consolidation is mostly available for the US, as consolidated hospitals as a system have greater power to demand higher prices from insurance companies than a single hospital (Mercer, 2013). Though not appropriate to generalize results, a retrospective study of the largest of any comparable hospital consolidations in California reported increase in prices (Tenn, 2011).

However, one should be aware of the fact that when American sources report savings due to the consolidation, this means savings in running the business, not saving for the patients and / or the insurers. Therefore, one should exercise caution in concluding based on the international research.

In Croatia, Ministry of Health has repeatedly initiated public hospitals' consolidation, with the argument of saving resources and improving quality of care and patient safety, while establishing centers of high competence. According to the publicly available sources, expectations about the financial savings range up to 30 mio HRK per year (Krnić, 2017).

Masterplan, published in national Gazette in 2015, included also merging of the hospitals, although it was not clear whether satisfactory savings would be gained – if any. The savings are described as being dependent on the extent of the consolidations. Yet it is assumed that infrastructure, equipment and human resources would gain benefit, due to no rise in participation in the healthcare costs, additional/ voluntary health insurance costs and payment of above-the-standard services (Krnić, 2017).

The attempt to merge hospitals at the local level was met with the hospital's reluctant reactions at the beginning of 2014. Communication with stakeholders and education of stakeholders was not sufficient for them to accept and fulfill the consolidations. The importance of the communication process and the presumed effectiveness of the 2014 consolidation was planned to be analyzed by the beginning of 2015 (Nacionalni plan, 2016).

The principle of functional integration ensures the co-operation of health institutions at all levels of healthcare, with restructuring on the premises of joint development, improvement and alignment of the management process, diagnostic and therapeutic procedures, good clinical practice, as well as all other forms of operational methodologies aimed at a better quality of health services, outcomes treatment and increased efficacy and long-term rationalization of the healthcare system costs (McKee, 2002).

A study from Norway (Kjekshus, 2011) based on the review of internationally published data concludes that successful consolidation means merging two but not more than two small hospitals with less than 200 beds, hospitals being of the same level/value in an area of high competition and many hospitals. Hospitals should also share their functions, instead of closing down one hospital and building up another, with resources being put aside for big remodeling within a year or two (Kjekshus, 2014).

Hospital mergers have a small, transient positive impact on staff job satisfaction in the year immediately before and after merger approval. Continuous staff support and management throughout a consolidation may help to increase staff job satisfaction (Lim, 2014).

Methods

Among the results of several comprehensive analysis related to the implementation of the SAQ 2006 Short Form in Croatia (Bulajić, 2018; Bulajić, 2017), it was found that the smallest hospitals achieve the best results regarding safety climate. This data was investigated further in the research described in this paper, aiming to connect hospital consolidations impact to the expenditures.

Safety Attitudes Questionnaire 2006 Short Form (SAQ) is a reliable and sensitive tool to assess safety attitudes. It is the most commonly used self-reported psychometric questionnaire measuring safety attitudes in front-line workers and has been used to explore the relationship between safety climate scores and patient outcomes. It has been proven that SAQ possess good psychometric properties also when translated to other languages, Croatian included (Bulajić, 2018).

Safety climate is a measurable part of safety culture, and it is proven that the job satisfaction and the working conditions influence safety and quality in health-care. The results of recent Croatian study performed on the Croatian hospitals management show that the safety climate, job satisfaction and working conditions are associated with the size of the hospital - the smaller hospital, the more satisfied management. It seems that smaller hospitals allow for better communication and thus enable better safety climate. This might be a reasonable explanation for the association between the size of the hospital and the safety climate, job satisfaction and working conditions (Bulajić, 2017).

A comprehensive research was performed in 2016 using SAQ 2006 Short Form, as a part of obtaining data for a doctoral thesis research performed by the first author of this paper (Bulajić, 2018). More than 100 hospital managers were interviewed using a web-based Google platform which allowed for anonymity – when desired.

In order to achieve a maximum objectivity of the responds, the participants were allowed to remain anonymous, and their hospitals not detectable. Therefore, geographical distribution of the sample may be proven only to a certain extent. E.g. managers from each but one of the Croatian university hospitals or university hospital centers responded in a way that they clearly identified their hospitals. Yet, nobody identified working at one university hospital center in East Croatia. According to the data (number of beds being the most reliable here), more than one answer might have been from the manager/managers employed in this particular university hospital center. The same goes for each of the four established size categories for the hospitals. Therefore conclusions about the geographical distribution of those hospitals which may not be identified would be driven with high uncertainty. The identified hospitals were distributed across the country according to the existing distribution of the hospitals. Anyway, the geographical distribution was not within the scope of the particular interest of this research.

Analyses of the results showed that the smallest hospitals achieved best safety attitude results. Considering continuous efforts to merge hospitals, the research challenge was to investigate whether the small hospitals that remained independent differ from those that were merged, or consolidated.

Results

The results of our research speak only for the SAQ 2006 Short Form as a tool for assessing the impact of merging of the Croatian hospitals. It has been confirmed that small hospitals (up to 500 beds) achieve significantly better re-

sults in comparison with the merged/consolidated hospitals in the following areas: Working conditions ($p=0.002$), Management's Attitude ($p=0.007$ and $p=0.006$), Job Satisfaction ($p=0.027$), and Overall SAQ ($p=0.024$) (Table 1).

Table 1.

MEAN SCORES (\pm STANDARD DEVIATION) OF SAFETY FACTORS ON 100-POINT SCALE OF THE STUDY POPULATION AND ACCORDING TO CONSOLIDATION OF HOSPITALS

Safety factors	SAQ Overall	Teamwork Climate	Safety Climate	Job Satisfaction	Stress Recognition	Perception of Management Hospital	Perception of Management Unit	Working Conditions
Mean (100 scale) \pmSD	70.1 \pm 11.8	75.2 \pm 10.6	69.3 \pm 14.6	84.5 \pm 15.1	65.0 \pm 20.5	74.8 \pm 16.3	75.4 \pm 16.1	63.2 \pm 20.5
Hospitals according to consolidation								
Consolidated (n=48)	64.8 \pm 15.1	75.5 \pm 14.0	64.1 \pm 17.7	79.1 \pm 17.9	67.0 \pm 21.7	67.3 \pm 18.9	67.9 \pm 18.1	52.1 \pm 23.5
Non-consolidated (n=30)	73.6 \pm 7.4	75.0 \pm 7.9	72.8 \pm 11.2	88.2 \pm 11.9	63.6 \pm 19.9	79.8 \pm 12.6	80.6 \pm 12.3	70.6 \pm 14.3
<i>p-value</i>	0.024	0.890	0.109	0.027	0.575	0.007	0.006	0.002

Overall expenditures for hospitals were not significantly different according to the consolidation ($F=0.834$, $p=0.647$, repeated measures ANOVA, Table 2 and Figure 1). On the other hand, the highest indexes were found for the consolidated hospitals with >500 beds. The indexes for this group of hospitals became higher in the year of consolidation (130.3 \pm 6.9, year 2010) and stayed on this higher level (>135 from 2011-2015). Opposite to that, both other hospital groups, consolidated with <500 beds and non-consolidated (<500 beds), show almost the same pattern of overall expenditures over the whole time period (2006-2015).

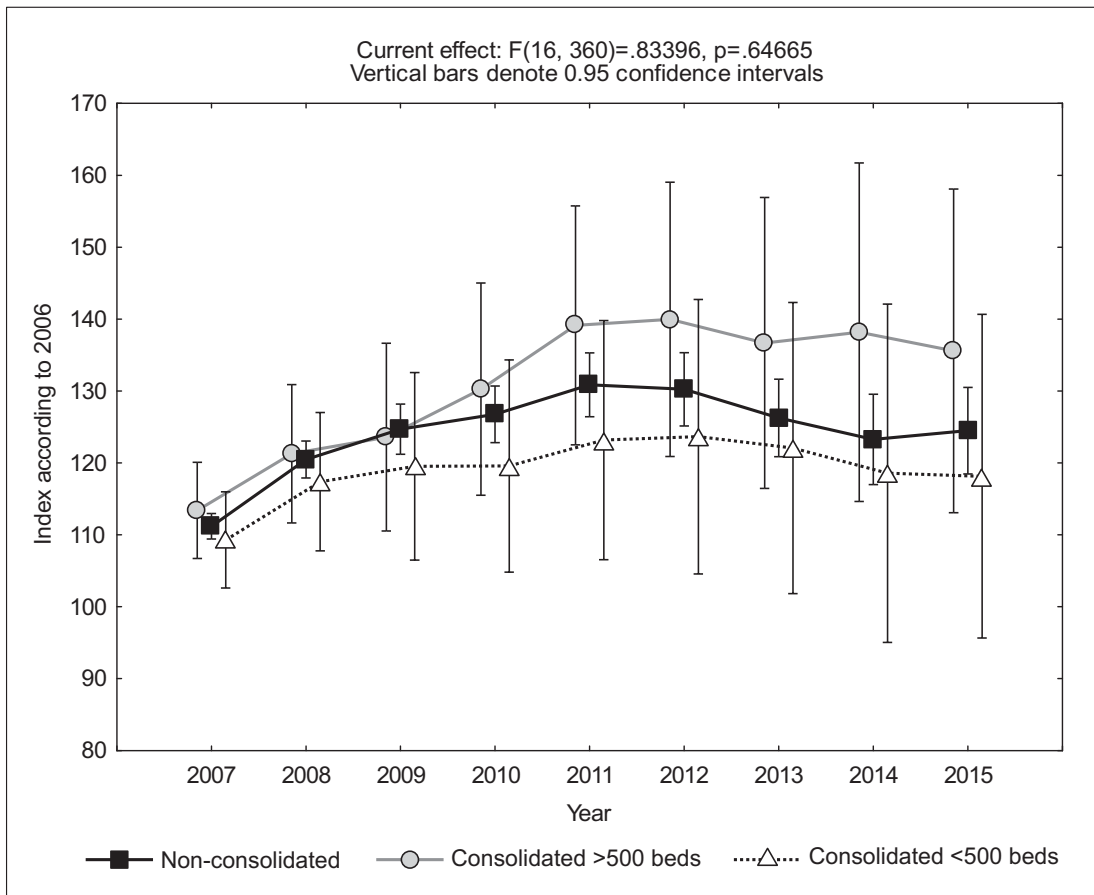
Table 2.

**CALCULATED AVERAGE INDEXES (\pm STANDARD DEVIATIONS)
 OF OVERALL EXPENDITURES FOR HOSPITALS ACCORDING TO
 CONSOLIDATION AND NUMBER OF BEDS FOR THE PERIOD OF 2006 –
 2015 WITH THE INDEX FOR 2006 BEING 100; CONSOLIDATION TOOK
 PLACE IN YEAR 2010**

Year	Non-consolidated			Consolidated >500 beds			Consolidated <500 beds		
	Mean	\pm	SD	Mean	\pm	SD	Mean	\pm	SD
2006	100	\pm	0	100	\pm	0	100	\pm	0
2007	111.0	\pm	6.0	113.4	\pm	0.6	109.3	\pm	1.04
2008	120.1	\pm	8.4	121.3	\pm	0.7	117.4	\pm	0.60
2009	123.6	\pm	11.9	123.6	\pm	3.3	119.5	\pm	1.69
2010	125.5	\pm	12.5	130.3	\pm	6.9	119.6	\pm	5.01
2011	129.9	\pm	14.6	139.1	\pm	11.2	123.2	\pm	5.50
2012	129.4	\pm	17.0	140.0	\pm	7.1	123.7	\pm	6.01
2013	125.4	\pm	17.9	136.7	\pm	10.2	122.1	\pm	5.33
2014	122.2	\pm	20.7	138.2	\pm	10.6	118.6	\pm	3.39
2015	123.0	\pm	19.5	135.6	\pm	8.1	118.1	\pm	1.51

Figure 1

CALCULATED AVERAGE INDEXES OF OVERALL EXPENDITURES FOR HOSPITALS FOR THE PERIOD OF 2006 – 2015 WITH THE INDEX FOR 2006 BEING 100, CONSOLIDATION TOOK PLACE IN YEAR 2010; CIRCLES – CONSOLIDATED HOSPITALS WITH >500 BEDS, TRIANGLES - CONSOLIDATED HOSPITALS WITH <500 BEDS, NON-CONSOLIDATED HOSPITALS WITH <500 BEDS.



Discussion

In a system like the Croatian health care system, it is not appropriate to make conclusions on possible savings based on the data from quite opposite health care system.

When interpreting the evidence on hospital costs, it is important to keep two distinctions clear: “cost savings” means a savings in cost to the hospital. It does

not mean a savings in cost from the point of view of payers (Vogt, 2006). In other word, less operative costs are related to higher profits to the hospital.

If on the market, hospital competition improves quality of care (Gaynor, 2012).

Bigger hospitals do not necessarily score better, and optimal hospital size depends on local health care needs and the availability of complementary services (Mc Kee). Most of the leading quality and safety successes in medicine, such as implementation of the World Health Organization Surgical Safety Checklist and the near elimination of bloodstream infections in hospitals is not related to consolidated hospitals (Wu, 2015). Improved outcomes achieved by concentrating patients in high-volume centers may also occur without consolidation (Cutler, 2013).

The largest savings, as well as quality benefits, that health systems can accomplish often originate from standardization of clinical care patterns, eliminating unnecessary and unproductive utilization, and preventing avoidable adverse events (Noether, 2017).

Conclusion

The views expressed in this article are based on the analysis of the SAQ 2006 Short Form data and the data on hospital expenditures in Croatia as a tool for assessing the impact of merging of the Croatian hospitals.

It has been confirmed that small hospitals (up to 500 beds) achieve significantly better results in comparison with the merged/consolidated hospitals in the areas of Working conditions, Management's Attitude, Job Satisfaction, and Overall SAQ.

Overall expenditures for hospitals were not significantly different according to the consolidation. However, the highest indexes were found for the consolidated hospitals with >500 beds. The indexes for this group of hospitals became higher in the year of consolidation (130.3 ± 6.9 , year 2010) and stayed on this higher level (>135 from 2011-2015). Opposite to that, both the consolidated hospitals with <500 beds and non-consolidated hospitals with <500 beds show almost the same pattern of overall expenditures over the whole time period (2006-2015).

This should serve as valuable data to be considered by the proponents of hospital consolidation, who should be able to quantify the expected benefits of merging, and explain how the benefits would be obtained.

References

1. Aigner D, Lovell C, Schmidt P. Formulation and estimation of stochastic frontier production function models. *J Econometrics* 1977;6:21–37.
2. Blair RD, Durrance CP, Sokol DD. Hospital Mergers and Economic Efficiency. University of Florida. 91 Wash. L. Rev. 1 (2016). Available at <http://scholarship.law.ufl.edu/facultypub/>
3. Bulajić M. Impact of international quality management systems to the health-care system of the Republic of Croatia. Doctoral Thesis. Rijeka, 2018.
4. Bulajić M, Lazibat T, Plavec D. Validation of the Safety Attitudes Questionnaire (short form 2006) in management staff of Croatian hospitals. *Business Excellence* 2018; 12(1):55-70
5. Bulajić M, Bezić H, Plavec D. Factors associated with the differences in the Safety Attitudes Questionnaire 2006 Short Form assessment of the management of Croatian hospitals. *Business Excellence* 2017; 11(2):9-20.
6. Bulajić M. Communication challenges in contemporary healthcare. PILC 2012 – 1st PAR International leadership conference, Opatija, 29.-31.3. 2012. Izlaganje na znanstvenoj konferenciji, rad objavljen u zborniku. Zbornik ISBN 978-953-57258-1-7 UDK 65.012, Rijeka 2012; 205-213
7. Bulajić M. Uloga rukovodstva u kvaliteti skrbi u hitnoj medicini. Predavanje na IX. Hrvatskom kongresu hitne medicine s međunarodnim sudjelovanjem, Zagreb 19.-20.11.2015. Sažetak objavljen u časopisu *Signa Vitae* prosinac 2015.
8. Cutler DM, Scott Morton F. Hospitals, market share, and consolidation. *JAMA*. 2013;310(18):1964-1970
9. Gaynor M, Town R. The impact of hospital consolidation – Update. The Synthesis Project. New Insights from Research Results. Policy Brief No. 9, June 2012.
10. Kjekshus LE. En evidensbasert fusjon? *Tidsskr Nor Legeforen* nr. 24, 2011; 131: 2497- 9.
11. Kjekshus LE, Bernstrøm VH, Dahl E, Lorentzen T. The effect of hospital mergers on long-term sickness absence among hospital employees: a fixed effects multivariate regression analysis using panel data. *BMC Health Services Research* 2014, 14:50. <http://www.biomedcentral.com/1472-6963/14/50>
12. Knapp C, Peterson J, Gundling R, Mulvany C, Gerhardt W. **Hospital M&A: When done well, M&A can achieve valuable outcomes.** 2017. www.deloitte.com/us/hospital-mergers-and-acquisitions

13. Krnić I. Kreće spajanje hrvatskih bolnica, prvo u ovih deset gradova Otkrivamo plan po kojem bi država trebala uštedjeti i do 30 milijuna kuna mjesečno. *Jutarnji list*, 11 January, 2017; posted at 13:43. Assessed 10 August 2018.
14. Lim KK. Impact of hospital mergers on staff job satisfaction: a quantitative study. *Human Resources for Health* 2014 12:70.
15. Mc Kee M, Healey E. (ed.) *Hospitals in a changing Europe*. Open University Press Buckingham – Philadelphia, 20012.
16. Mercer M. *AARP Bulletin*, June 2013. <https://www.aarp.org/health/medicare-insurance/info-06-2013/hospital-mergers.html>. Accessed 14 August 2018.
17. Nisen M. Hospital consolidation is no cure-all. <http://www.chicagobusiness.com/article/20171211/NEWS03/171219988/hospital-consolidation-will-not-cure-all-the-industry-s-woes>. Posted December 11, 2017 06:00 AM. Accessed August 14, 2018
18. Noether HM, May S. Hospital Merger Benefits: Views from Hospital Leaders and Econometric Analysis. Charles River Associates report, January 2017. Downloaded from: <https://www.aha.org/system/files/2018-04/Hospital-Merger-Full-Report-FINAL-1.pdf>
19. Vogt WB, Town R. How has hospital consolidation affected the price and quality of hospital care? The Robert Wood Johnson Foundation, Princeton NJ; Research Synthesis Report No. 9, 2006.
20. Tenn S. The Price Effects of Hospital Mergers: A Case Study of the Sutter–Summit Transaction. *Int. J. of the Economics of Business*; 2011; 18 (1): 65–82.
21. Tsai TC, Jha AK. Hospital Consolidation, Competition, and Quality. Is Bigger Necessarily Better? *JAMA* 2014; 312(1):29-30.
22. World Health Organization. Are bigger hospitals better? Summary of a HEN network member's report. Downloaded from: <http://www.euro.who.int/en/data-and-evidence/evidence-informed-policy-making/publications/hen-summaries-of-network-members-reports/are-bigger-hospitals-better>; 22.10.2018)
23. Xu T, Wu AWW, Makary MA. The Potential Hazards of Hospital Consolidation Implications for Quality, Access, and Price. *JAMA* 2015, August 13, published online. Downloaded From: <http://jama.jamanetwork.com> on 30.5.2018.

UČINAK SPAJANJA BOLNICA U REPUBLICI HRVATSKOJ PROCJENOM POMOĆU UPITNIKA O STAVOVIMA O SIGURNOSTI

Sažetak

U nekoliko navrata bolnice u Hrvatskoj bile su predmetom spajanja, konsolidacije. Svrha konsolidacije bila je ušteda koja se postiže spajanjem nekih usluga, osobito u bolnicama koje su zemljopisno međusobno blizu.

Objavljeni rezultati istraživanja pokazali su da najmanje bolnice u Hrvatskoj postižu najviše rezultate za sigurnost mjerenu upitnikom Safety Attitudes Questionnaire 2006 Short Form (SAQ). Daljnjim istraživanjem i obradom podataka SAQ-a dobivenih 2016. godine pokazalo se da analizirane s do 500 kreveta koje nisu bile spojene, u usporedbi s konsolidiranim bolnicama, ostvaruju znatno bolje rezultate s obzirom na radne uvjete, stavove menadžmenta, zadovoljstvo poslom i ukupne rezultate SAQ-a.

U svezi rashoda izraženih kao promjena indeksa rashoda iz 2006. godine (2006. godina ima indeks 100), nisu utvrđene značajne razlike. Međutim, najveći porast rashoda nalazi se za konsolidirane bolnice s > 500 ležaja, dok bolnice s <500 ležaja, bilo konsolidirane ili ne, pokazuju isti trend promjena rashoda za razdoblje od 2006. do 2015. godine. Prilikom odlučivanja o konsolidaciji bolnica u Hrvatskoj valjalo bi uzeti u obzir i te rezultate.

Ključne riječi: bolnice; spajanje; Republika Hrvatska; SAQ 2006 Short Form.