



<http://www.diva-portal.org>

## Postprint

This is the accepted version of a paper presented at *8th NOVO symposium, Sustainable Health Care Production Systems, Copenhagen, Denmark, 6-7 november 2014.*

Citation for the original published paper:

Kaltenbrunner Nykvist, M., Bengtsson, L., Mathiassen, S., Engström, M. (2014)

Towards a Questionnaire to Measure Lean in Health Care.

In: Kasper Edwards och Jørgen Winkel (ed.), *8th NOVO Symposium, Sustainable health care production systems - Abstract book* (pp. 19-20). Lyngby: Danmarks Tekniske Universitet, DTU  
<http://dx.doi.org/10.11581/DTU:00000008>

N.B. When citing this work, cite the original published paper.

Permanent link to this version:

<http://urn.kb.se/resolve?urn=urn:nbn:se:hig:diva-18571>

# Towards a Questionnaire to Measure Lean in Health Care

Monica Kaltenbrunner Nykvist, RN, MSc<sup>1</sup>, Lars Bengtsson, professor.<sup>2</sup>, Svend Erik Mathiassen, professor.<sup>1</sup>, Maria Engström PhD<sup>1</sup>.

<sup>1</sup>University of Gävle, Gävle, Sweden. Department of occupational and public health science.

<sup>2</sup>University of Gävle, Gävle, Sweden. Department of Industrial Engineering and Management.

Correspondence: [moakat@hig.se](mailto:moakat@hig.se)

**Introduction:** The rapid spread of Lean implementation within the health care sector has made it urgent to evaluate the effects of Lean on productivity, working conditions and health. Therefore an instrument is needed to measure Lean in primary care.

**Aim:** The aim with this research is to find an instrument that captures the character of Lean.

## **Method:**

### *Literature search*

A literature search was conducted in Academic Search Elite, WileyOnlineLibrary, PubMed, Cinahl, PsycInfo, JSTOR, ScienceDirect, Emerald and Scopus. Keywords used were reflecting Lean and measurement and the search resulted in 7933 hits. Included were articles that presented an instrument that had the possibilities to distinguish between high or low Lean adoption. It was desired that the instrument was as like Likers (2004) description of Lean as possible. Malmbrandt and Åhlstöm's (2014) instrument fulfilled criteria and was chosen.

### *The instrument*

Three questions were added to achieve Likers description of Lean, the questions included were linked to the principles about technology, partners and decision making. The resulting questionnaire thus consisted of 31 items with the dimensions Lean enablers and Lean practices and measure both form and level of Lean, each with five response alternatives (in terms of statements) expressing the extent of Lean adoption in terms of that particular item.

### *Translation process*

The original instrument was firstly translated to Swedish. A back translation was made by a bilingual authorized translator. The current status of the process is to adjust the Swedish version due to any discrepancies between the versions.

### *Testing the instrument and participants*

The prototype will be tested among health care professions in Sweden using the think aloud method (TA) with the aim to explore how the participants perceive and interpret the Swedish version (Collins 2003). Five to 15 participants per round will be audio taped while they complete the questionnaire thinking aloud (Beatty & Willis 2007). Immediately afterwards, they will be interviewed about how they interpret specific expressions in the questionnaire.

After every round the prototype will be adjusted and when saturation is reached the TA will terminate.

After psychometric tests the finalized instrument is to be used in a longitudinal study to describe status of Lean and how Lean correlate with the health of primary health care staff, there working conditions and productivity over time.

#### References

Beatty, P.C. & Willis, G.B. (2007). Research synthesis: The practice of cognitive interviewing, *Public opinion Quarterly*, Vol 71, (2), pp. 287-311.

Collins, D. (2003). Pretesting survey instruments: An overview of cognitive methods, *Quality of Life Research*, Vol 12, pp. 229-238.

Liker, J. K. (2004). *The Toyota Way*, McGraw-Hill, New York.

Malmbrandt, M. & Åhlström, P. (2013). An instrument for assessing lean service adoption, *International Journal of Operations & Production Management*, Vol 33 (9), pp. 1131-1165.