



## Invited Commentary

A commentary on: “Cost-effectiveness of a national quality improvement programme to improve survival after emergency abdominal surgery” (Int J Surg 2019; 70: 35–43)



## ARTICLE INFO

## Keywords:

Cost-effectiveness  
Quality improvement program  
Emergency abdominal surgery  
Postoperative mortality

Emergency abdominal surgery (EAS) carries the risk of mortality. Health care providers are constantly searching for measures to improve survival in this group of patients. Attempts at increasing patient safety often requires additional expenses. This cost burden will build up into significant figures when nationwide application is considered. The principal of cost-effectiveness is a main bottleneck at deployment of a reconfigured administration.

The Royal College of Surgeons of England designed a care pathway to improve the quality of care for EAS patients in National Health Service (NHS) hospitals. For this purpose, the evidence-based quality improvement (QI) [1] approach was used to change the practice and culture of care. The effectiveness of the QI programme was evaluated in the Enhanced Peri-Operative Care for High-risk patients (EPOCH) trial [1]. The QI programme was supposed to improve health-related quality of life and reduce healthcare resource utilization.

Fan Yang and colleagues [2] conducted a study to assess the cost-effectiveness of the QI programme for EAS patients. Cost-effectiveness was measured in quality adjusted life years (QALYs) [3] for 180-day trial period and extrapolated over the patients' lifetime. They found that overall trial period costs, mean 180-day, for a patient in the QI group was higher than usual care patient (mean difference: 467, 95% CI: –800 to 1735). The QI programme was associated with incremental costs of £467 but fewer QALYs by –0.002. It was less effective and costlier than usual care. When the lifetime perspective was adopted, the QI programme was associated with incremental costs and more QALYs, with incremental cost-effectiveness ratio (ICER) [4] higher than the considered cost-effectiveness thresholds. Therefore, the QI programme did not appear to be cost-effective over the longer term, either. Analysis showed that, for patients with multiple indications for surgery, the QI programme may be cost-effective over the lifetime, but this is highly uncertain.

Authors mention that lack of cost-effectiveness of the EPOCH QI programme, may be due to failure of full implementation. The programme required an extensive care pathway with 37 components to be

implemented [1], with wide variations of these elements at individual hospitals that required local adaptations.

Studies of quality improvement programmes with more focused, discrete clinical interventions have led to more successful outcomes. Tengberg LT and colleagues [5] reported a prospective single-centre controlled study aimed to evaluate the effect of a standardized multi-disciplinary perioperative protocol in patients undergoing acute high-risk abdominal surgery (AHA). The protocol involved 9 interventions. The primary outcome was 30-day mortality. Introduction of this protocol was associated with a significant reduction in postoperative mortality. This achievement is an evidence that with smaller number of QI interventions and a shorter study period focused in a single center; an intended goal can be achieved. It can probably be attributed to more stringent implementation of the QI program.

It may be deduced that the EPOCH QI programme may be effective if it is put into trial with a limited number of interventions in few centers associated with thorough surveillance on precise implementation.

## Provenance and peer review

Invited Commentary, internally reviewed.

## Declaration of competing interest

No conflict of interest.

## References

- [1] T.J. Stephens, C.J. Peden, R.M. Pearse, S.E. Shaw, T.E.F. Abbott, E.L. Jones, D. Kocman, G. Martinon behalf of the EPOCH trial group, Improving care at scale: process evaluation of a multi-component quality improvement intervention to reduce mortality after emergency abdominal surgery (EPOCH trial), *Implement. Sci.* 13 (2018) 142, <https://doi.org/10.1186/s13012-018-0823-9>.
- [2] Yang Fan, Simon Walker, Gerry Richardson, Tim Stephens, Mandeep Phull, Ann Thompson, Rupert M. Pearse, *Enhanced Peri-Operative Care for High-risk*

DOI of original article: <https://doi.org/10.1016/j.ijisu.2019.10.001>

<https://doi.org/10.1016/j.ijisu.2019.10.048>

Received 22 October 2019; Accepted 28 October 2019

Available online 08 November 2019

1743-9191/ © 2019 IJS Publishing Group Ltd. Published by Elsevier Ltd. All rights reserved.

- patients (EPOCH) trial group, Cost-effectiveness of a national quality improvement programme to improve survival after emergency abdominal surgery, *Int. J. Surg.* 70 (Oct. 2019) 35–43.
- [3] Federico Augustovski, Lisandro D. Colantonio, Julieta Galante, Ariel Bardach, Joaquín E. Caporale, Víctor Zárate, Ling Hsiang Chuang, Andres Pichon-Riviere, Paul Kind, Measuring the benefits of healthcare: DALYs and QALYs – does the choice of measure matter? A case study of two preventive interventions, *Int. J. Health Policy Manag.* 7 (2) (2018) 120–136, <https://doi.org/10.15171/ijhpm.2017.47>.
- [4] Heejung Bang, Hongwei Zhao, Median-based incremental cost-effectiveness ratio (ICER), *J. Stat. Theory Pract.* 6 (3) (2012) 428–442, <https://doi.org/10.1080/15598608.2012.695571>.
- [5] L.T. Tengberg, M. Bay-Nielsen, T. Bisgaard, M. Cihoric, M.L. Lauritsen, N.B. FossAHA study group, Multidisciplinary perioperative protocol in patients undergoing acute high-risk abdominal surgery, *Br. J. Surg.* 104 (4) (2017 Mar) 463–471.

Faramarz Karimian

Tehran University of Medical Science, Tehran, Iran

E-mail address: [faramarz.karimian@gmail.com](mailto:faramarz.karimian@gmail.com).