

Systematica Analysis of Medical Resource Scheduling

Oleksii Dovhaniuk

ORCID: 0009-0003-2247-9323



OLLSCOIL NA hÉIREANN, CORCAIGH
NATIONAL UNIVERSITY OF IRELAND, CORK
School of Computer Science & Information Technology

DRAFT

January 4, 2024

Head of School: Prof. Utz Roedig

Supervisors: Dr. Sabin Tabirca
Prof. Mark Corrigan

I, Oleksii Dovhaniuk, confirm that the work presented in this study is my own. Where information has been derived from other sources, I confirm that this has been indicated in the work.

Acknowledgements

This article was produced with the financial support of the Science Foundation Ireland Centre for Research Training in Artificial Intelligence under Grant No.18/CRT/6223. This literature review has emanated from research conducted with the financial support of Science Foundation Ireland under Grant number 18/CRT/6223. For Open Access, the author has applied a CC BY public copyright license to any Author Accepted Manuscript version arising from this submission.

Contents

1	Introduction	6
1.1	Rationale	6
1.2	Objectives	6
2	Methods	7
2.1	Eligibility Criteria	8
2.2	Information Sources	8
2.3	Search Strategy	8
2.4	Selection Process	8
2.5	Data Collection Process	8
2.6	Data Items	8
2.6.1	Outcomes	8
2.6.2	Other Variables	8
2.7	Study Risk of Bias Assessment	8
2.8	Effect Measures	8
2.9	Synthesis Methods	8
2.9.1	Eligibility for Synthesis	8
2.9.2	Preparing for Synthesis	8
2.9.3	Tabulation and Graphical Methods	8
2.9.4	Statistical Synthesis Methods	8
2.9.5	Methods to Explore Heterogeneity	8
2.9.6	Sensitivity Analyses	8
2.10	Reporting Bias Assessment	8

2.11	Certainty Assessment	8
3	Results	9
3.1	Study Selection	9
3.1.1	Flow of Studies	9
3.1.2	Excluded Studies	9
3.2	Study Characteristics	9
3.3	Risk of Bias in Studies	9
3.4	Results of Individual Studies	9
3.5	Results of Syntheses	9
3.5.1	Characteristics of Contributing Studies	9
3.5.2	Results of Statistical Syntheses	9
3.5.3	Results of Investigation of Heterogeneity	9
3.5.4	Results of Sensitivity Analyses	9
3.6	Reporting Biases	9
3.7	Certainty of Evidence	9
4	Discussion	10
4.1	Interpretation	10
4.2	Limitations of Evidence	10
4.3	Limitations of Review Processes	10
4.4	Implications	10
5	Other Information	11
5.1	Registration	11
5.2	Protocol	11
5.3	Amendments	11
5.4	Support	11
5.5	Competing interests	12
5.6	Availability of Data, Code, and Other Materials	12
	Bibliography	13

Chapter 1

Introduction

1.1 Rationale

1.2 Objectives

Chapter 2

Methods

2.1 Eligibility Criteria

2.2 Information Sources

2.3 Search Strategy

2.4 Selection Process

2.5 Data Collection Process

2.6 Data Items

2.6.1 Outcomes

2.6.2 Other Variables

2.7 Study Risk of Bias Assessment

2.8 Effect Measures

2.9 Synthesis Methods

2.9.1 Eligibility for Synthesis

2.9.2 Preparing for Synthesis

2.9.3 Tabulation and Graphical Methods

2.9.4 Statistical Synthesis Methods

2.9.5 Methods to Explore Heterogeneity

2.9.6 Sensitivity Analyses

2.10 Reporting Bias Assessment

2.11 Certainty Assessment

Chapter 3

Results

3.1 Study Selection

3.1.1 Flow of Studies

3.1.2 Excluded Studies

3.2 Study Characteristics

3.3 Risk of Bias in Studies

3.4 Results of Individual Studies

3.5 Results of Syntheses

3.5.1 Characteristics of Contributing Studies

3.5.2 Results of Statistical Syntheses

3.5.3 Results of Investigation of Heterogeneity

3.5.4 Results of Sensitivity Analyses

3.6 Reporting Biases

3.7 Certainty of Evidence

Chapter 4

Discussion

4.1 Interpretation

4.2 Limitations of Evidence

4.3 Limitations of Review Processes

4.4 Implications

Chapter 5

Other Information

5.1 Registration

This systematic review is not registered in any database.

5.2 Protocol

The current work follows the guidance from established template for systematic literature review in medicine —[LINK/ CITATION/ ETC.](#)—.

5.3 Amendments

So far it is only a draft of the study. It is expected to be numerous changes before the print ready version of the article.

5.4 Support

This literature review was produced with the financial support of the Science Foundation Ireland Centre for Research Training in Artificial Intelligence under Grant No.18/CRT/6223. This literature review has emanated from research conducted with the financial support of Science Foundation Ireland under Grant number 18/CRT/6223. For Open Access, the author has applied a CC BY public copyright license to any Author Accepted Manuscript version arising from this submission.

5.5 Competing interests

Oleksii Dovhaniuk is a PhD researcher at the University College Cork in the School of Computer Science and Information Technology. Dr Sabin Tabirca is a senior lector of the University College Cork in the same department. It is only natural that automated computational methods will get more attention than classical approaches to medical resource scheduling. Furthermore, the Science Foundation Ireland Centre for Research Training in Artificial Intelligence requires progress in advanced computational methods, which narrows the interest even more in the direction of machine learning, neural networks, and meta-heuristics. The authors who represent the medical area of the research are either former workers of the Transformation Theatre Team in Ireland or closely related to this initiative. This aspect makes the research orient into operating theatre as the central aspect of medical resource scheduling. The weaker the connection of medical resources to the surgery operations, the less attention they get during the literature analysis.

5.6 Availability of Data, Code, and Other Materials

List of studies which were read, analysed but rejected in the final manuscript can be accessed by link to the GitHub repository. In the same repository the R code for automatic mining the metadata from the BibTex references is available. The supplementary materials such as preliminary tables, charts as well as final results are published on the separate web page.

Bibliography