CHEERS checklist—Items to include when reporting economic evaluations of health interventions

Section/item	Item No	Recommendation	Reported on page No/ line No
Title and abstract			
Title	1	Identify the study as an economic evaluation or use more specific terms such as "cost-effectiveness analysis", and describe the interventions compared.	page 1, line 1
Abstract	2	Provide a structured summary of objectives, perspective, setting, methods (including study design and inputs), results (including base case and uncertainty analyses), and conclusions.	page 2, line 32 to 60
Introduction			
Background and objectives	3	Provide an explicit statement of the broader context for the study.	page 4, line 87 to page 5, line 135
		Present the study question and its relevance for health policy or practice decisions.	page 5, line 126 to 135
Methods			
Target population and subgroups	4	Describe characteristics of the base case population and subgroups analysed, including why they were chosen.	page 6, line 158 to 160 A surgical robotic system has many different applications. As it can be used for multiple indications, we aimed to develop a generic model that can be applied to different indications. Depending on for what procedure the tool is being used, the target population can differ. We used a general hypothetical example to explain how the tool can be used.
Setting and location	5	State relevant aspects of the system(s) in which the decision(s) need(s) to be made.	page 5, line 132 to 135; page The relevant aspects of the system are dependent on how the model is used. As the model can be used in different ways, one should specify the aspects that are relevant for that specific system.
Study perspective	6	Describe the perspective of the study and relate this to the costs being evaluated.	page 5, line 145 to 147; page 9, line 251 to 253; page 15, line 380 to 384
Comparators	7	Describe the interventions or strategies being compared and state why they were chosen.	page 5, line 144 to 145 In order to make the model flexible, robotic surgery can be compared to either endoscopic or open surgery. The user of the model can choose which comparator is relevant for the procedure of interest.
Time horizon	8	State the time horizon(s) over which costs and consequences are being evaluated and say why appropriate.	page 5, line 141 to 143 The benefits are calculated over the life-course of an individual. We included lasting complications and QALYs in the model, which both have impact over a patient's

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			lifetime. These consequences were also included in the hypothetical example.
Discount rate	9	Report the choice of discount rate(s) used for costs and outcomes and say why appropriate.	Most consequences included in the model are short term consequences for which discounting is not relevant. Long term consequences, i.e. lasting complications and QALYs, should be discounted. In our example these are hypothetical, loosely based on discounted numbers from previous studies.
Choice of health outcomes	10	Describe what outcomes were used as the measure(s) of benefit in the evaluation and their relevance for the type of analysis performed.	page 5, line 140 to 143; page 6, line 164 to 167 In the tool the costs of health effects are compared to the extra costs of a robotic procedure, to provide insight in the value for money of robotic surgery. The outcome is the trade-off between the costs and the effects.
Measurement of effectiveness	11a	*Single study-based estimates:* Describe fully the design features of the single effectiveness study and why the single study was a sufficient source of clinical effectiveness data.	Not applicable, as this section refers to single study-based economic evaluation.
	11b	*Synthesis-based estimates*: Describe fully the methods used for identification of included studies and synthesis of clinical effectiveness data.	Page 5, line 147 to 152 The aim of this study was to develop a tool that can be used to provide insight in the benefits needed compared to the costs of robotic surgery. To illustrate how the tool works we used a hypothetical example, as we did not aim to assess whether the current robot is cost-effective. The numbers in the hypothetical example were loosely based on three studies from literature.
Measurement and valuation of preference based outcomes	12	If applicable, describe the population and methods used to elicit preferences for outcomes.	Not applicable
Estimating resources and costs	13a	*Single study-based economic evaluation:* Describe approaches used to estimate resource use associated with the alternative interventions. Describe primary or secondary research methods for valuing each resource item in terms of its unit cost. Describe any adjustments made to approximate to opportunity costs.	Not applicable, as this section refers to single study-based economic evaluation.
	13b	*Model-based economic evaluation:* Describe approaches and data sources used to estimate resource use associated with model health states. Describe primary or secondary research methods for valuing each resource item in terms of its unit cost. Describe any adjustments made to approximate to opportunity costs.	This paper illustrates a tool using a hypothetical example, therefore the resources are not relevant. We aimed to focus on how the tool can be used and not use real numbers. We did not aim to assess whether the robot is cost-effective. When the model is used for that purpose, it is important to state the information mentioned in this section of the CHEERS guidelines.

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Currency, price date, and conversion	14	Report the dates of the estimated resource quantities and unit costs. Describe methods for adjusting estimated unit costs to the year of reported costs if necessary. Describe methods for converting costs into a common currency base and the exchange rate.	page 7, line 181 to 182; The costs are presented in Euros. Nevertheless, all costs in the model can be adjusted. As we used a hypothethical example for illustration purposes only, we did not convert costs.
Choice of model	15	Describe and give reasons for the specific type of decision-analytical model used. Providing a figure to show model structure is strongly recommended.	page 5, line 140 to 169; See also our nline tool (https://sejal.shinyapps.io/supplement_robot-assisted_surgery_article/)
Assumptions	16	Describe all structural or other assumptions underpinning the decision-analytical model.	page 8, line 225 to 231; page 9, line 251 to 264; page 9, table 1 The model is flexible and therefore all assumptions can be changed.
Analytical methods	17	Describe all analytical methods supporting the evaluation. This could include methods for dealing with skewed, missing, or censored data; extrapolation methods; methods for pooling data; approaches to validate or make adjustments (such as half cycle corrections) to a model; and methods for handling population heterogeneity and uncertainty.	Equations are provided in the appendix.
Results			
Study parameters	18	Report the values, ranges, references, and, if used, probability distributions for all parameters. Report reasons or sources for distributions used to represent uncertainty where appropriate. Providing a table to show the input values is strongly recommended.	Page 9, line 251 to 264; page 9, table 1;
Incremental costs and outcomes	19	For each intervention, report mean values for the main categories of estimated costs and outcomes of interest, as well as mean differences between the comparator groups. If applicable, report incremental cost-effectiveness ratios.	Page 10, line 272 to 281; page 11, table 2; page 12, line 288 to 302; page 12, table 3, page 13, line 310 to 232; page 13, table 4 and 5
Characterising uncertainty	20a	*Single study-based economic evaluation:*Describe the effects of sampling uncertainty for the estimated incremental cost and incremental effectiveness parameters, together with the impact of methodological assumptions (such as discount rate, study perspective).	Not applicable, as this section refers to single study-based economic evaluation.
	20b	*Model-based economic evaluation:* Describe the effects on the results of uncertainty for all input	Not applicable. This paper illustrates a tool using a hypothetical example, therefore the resources are not relevant. We aimed to focus on how the tool can be used and

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		parameters, and uncertainty related to the structure of the model and assumptions.	not use real numbers. We did not aim to assess whether the robot is cost-effective. When the model is used for that purpose, it is important to state the information mentioned in this section of the CHEERS guidelines.
Characterising heterogeneity	21	If applicable, report differences in costs, outcomes, or cost-effectiveness that can be explained by variations between subgroups of patients with different baseline characteristics or other observed variability in effects that are not reducible by more information.	Not applicable
Discussion			
Study findings, limitations, generalisability, and current knowledge	22	Summarise key study findings and describe how they support the conclusions reached. Discuss limitations and the generalisability of the findings and how the findings fit with current knowledge.	page 14, line 336 to page 17, line 427
Other			
Source of funding	23	Describe how the study was funded and the role of the funder in the identification, design, conduct, and reporting of the analysis. Describe other non-monetary sources of support.	Page 1, line 24; Information provided via the submission system
Conflicts of interest	24	Describe any potential for conflict of interest of study contributors in accordance with journal policy. In the absence of a journal policy, we recommend authors comply with International Committee of Medical Journal Editors recommendations.	Page 17, line 429 to 433; Information provided via the submission system

For consistency, the CHEERS statement checklist format is based on the format of the CONSORT statement checklist