

# **Guidelines Take-home exam HEVAL5130 – Fall 2021**

## **General requirements**

A take-home exam gives the student an opportunity to show his/her analytical skills, and ability to synthesize information and marshal facts for a clearly articulated argument. Furthermore, a take-home exam tests if the student knows where and how to look up information and what to do with it. A take-home exam requires that references to literature and materials used in the text are correct and consistent.

## **Assessment guidelines**

The take-home exam will be assessed on the following guidelines:

- The take-home exam addresses the problem stated in a clear and consistent manner. Choices and delimitations made are clarified and substantiated, and the method chosen is presented, justified and discussed.
- The application of methods meets scientific criteria (is methodologically correct).
- Discussion and analysis: Relevant empirical evidence is presented and critically discussed against the theoretical framework.
- The take-home exam should include reference to relevant literature, not only included in the Syllabus for the course
- Format: the take-home exam fulfill format requirements, is written in English and meets the academic standards with regard to style, structure and deepening of the subject.

What determines the grade?

- Structure and length of the take-home exam must meet the formal requirements;
- The application of methods must be methodologically sound;
- Concepts, theories and empirical knowledge are presented correctly, and used in the discussion of the problem stated;
- The student must be capable of arguing in a logical and clear manner;
- There must be originality and critical reflection: the student must be able to indicate what he or she has learned or what he or she would do differently in a next study (note: this is not a matter of personal experiences but of academic insights);
- The student uses an approved reference style, without any errors
- Layout of exam in academic style (appropriated titled figures and tables)
- Result tables should not be copied output files from STATA or other statistical programs.

## **Special requirements and evaluation criteria:**

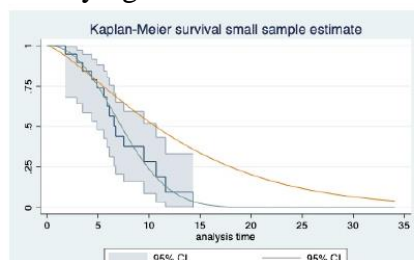
All reports need to include the following sections (sub-sections may vary by exam topic):

- Introduction/Background
  - Motivate need for analysis (why is it important to conduct this specific analysis); define objective and the relevance (in addition, relevant background information that would be important for understanding of the home exam topic). Analysis methods (such as model structure) should not be described in this section.

- Topic 1: The objective needed to integrate the student's selection of sub-part 1.1 or 1.2. Students were expected to motivate the need for stratified analysis or VOI.
- Topic 2: The objective needs to capture at least two dimension of the take-home exam, sample size and comparative analysis (CRC versus Cervix). Including epidemiology/background on CRC and Cervix cancer is valued, but not essential. The students were expected to include a motivation based on the need for extrapolate findings from clinical trials in HTAs.
- Theory (presentation of the theory relevant for the chosen topic)
  - Methods should not be presented here (no sentences such as, "in this analysis I assumed...").
  - All methods/approaches used in the analysis should be explained in this section from a theoretical perspective.
  - Both topics: Survival analysis or time-to-event. Require a presentation of survival- and hazard function, censoring, time-dependency, functions could be defined non-parametric versus parametric. Could also include a Cox specification. Approach for choice of preferred specification is expected to be addressed explicitly, with a reference and explanation from, for example, Latimer et al (2013). The student should include the importance of smoothed hazard plots, test for proportional hazard assumption, visual inspection and goodness of fit (AIC and BIC). In addition, external validation could be addressed. For Topic 2, this section is especially important for the take-home exam and would be expected to be more extensive than for Topic 1.
  - Topic 1: Theory on economic evaluation (and ICERs) and decision modeling to estimate outcomes should also be included, including validation of decision-analytic models. If topic 1.1 is selected, theory on heterogeneity and LUC. If topic 1.2 selected, theory on value of information, define and explain the theory (EVPI, popEVPI and EVPPI), distinguish between the method in Briggs and that of Strong. Theory on how to scale to population level.
- Methods (depends on the topic)
  - Theory and results should not be in this section (equations should generally be in the theory section). Definitions of concepts should be in theory, not generally in methods.
  - Both topics: In this section it is required that the candidate present the data used for the analysis, define the variables used in the analysis and statistical analysis performed to solve the tasks. For Topic 2, this consists of 3 datasets, and the variables used in the analysis could be different for the Cervix sample versus CRC (sex).
  - Topic 1: State that the analysis needed to convert monthly health outcomes from the model, i.e., 30 monthly cycles, in to years in order to estimate quality-adjusted life years; otherwise, the "ICER" for a yearly WTP will not be in the same units. Needs to describe approach to decision-analytic modeling validation (Small bug should be detected in calculation of discounted QALYs (present finding here or in results)). Methods should include a brief presentation of the model and the input parameters. If topic 1.1, important to present data inputs/assumptions for stratified analysis (sub-population proportions/size). If Topic 1.2, important to present the data for EVPI, popEVPI and EVPPI (what was assumed). Explain the sub-analysis steps with and without the full dataset.
  - Topic 2: Brief presentation of the analyses conducted to address each task in the take-home exam. For candidates that have a thorough presentation of the

choice of optimal specification in the Theory section, would typically have a shorter presentation in the method section.

- Results
  - Both topics: Clear presentation of the findings in a logical order, and according to questions asked in the home-exam (if statistical analysis were defined in this section, it is a negative with regard to structure, but not to content).
  - Topic 1: Needed to adjust incident death calculations (upon which costs were calculated based on) for the new survival analysis estimation, rather than leaving the default constant transition probability.
  - Topic 1.1: For each ECOG group baseline survival, you needed to estimate the expected costs and benefits for Treatment A (since unlike the in-class HIV example, the baseline ECOG-specific survival was affecting both treatment groups). It is incorrect to compare your ECOG-specific Treatment B model estimates with a general 'all-population' Treatment group A that was not adjusted for ECOG-specific survival.
  - Topic 1.2: Emphasize comparison between estimated survival curves for the small and large datasets. For example, the below figure shows two estimated parametric survival functions (either fit to the small or large dataset) then overlaid onto the small dataset KM curve. Comparison such as these get at the underlying differences from the small and full datasets.



- Topic 2: Application of the method for choosing the optimal specification is important to include while presenting the results. For instance, understand that the exponential distribution is not a relevant alternative when the smoothed hazards are not constant is important even though the AIC/BIC have the lowest values. Reporting the difference in findings/extrapolation based on the small sample versus the full sample was an important finding. Reporting the impact of how adding covariates in the regressions reduced the AIC/BIC. For students, who included the regression analysis with covariates in the take-home exam, interpretation of the coefficients were important both for each analysis and when comparing between samples.
- Discussion
  - Discuss the results, refer to other literature when relevant was a bonus, how general are the findings, etc. Limitations.
- Conclusion
  - Should be in line with the objective, defined in the introduction of the home exam
- References
  - Consistently referenced and styled
- Appendix
  - Must include do file code (both topics), and if topic 1, completed model must be attached.

**The report should be no more than 3000 words** (not including tables, figures and reference list)

The grading will be based on two main categories (40%/60% valuation split):

1. Structure (understand what should be included in each section) **(40%)**
  - Follow the recommended structure
  - Content within each section was correct (For example, introduction did not include methods, results did not methods or theory, discussion did not present new results)
  - Nice tables and figures with legends that include necessary information
  - Include ref. category in tables for regression analysis
2. Content and interpretation (show understanding of the theory and application of methods) **(60%)**