Course evaluation template

After the course has ended, the course leader must fill in this template. The program director and education management will use your reflections to make adaptations to the program and/or the next time the course is given. The reflections will also be posted on the program web for students to read.

Course code **4FH099**	**Course title** **Systematic Review and Meta-Analysis**	**Credits** 3.0
Semester HT	**Period** **Oct 31 – Nov 13, 2024**	

Course leader **Elizabeth Arkema**	**Examiner** **Elizabeth Arkema**
Other participating teachers **Teaching assistants: Ngoc Nguyen, Kyla McKay**	**Other participating teachers** **Lecturers: Ingrid Andersson, Andreas Jacobson, Alessio Crippa**

Number of registered students 23	**Number who have not completed the course**[1] 0	**Number passed after regular session**[2] 21
Methods for student influence other than course survey[3] I asked the students throughout the course to provide feedback to me or to the other participating teachers. I received feedback and comments from students in person and via email and also via the other teachers. After sending out the grades I asked if anyone would like to meet to discuss the exam or the course in general to contact me. No one contacted me to discuss the exam.		

[1] *At the time of completed grading and mandatory assignments/revisions.*
[2] After first summative examination.
[3] State: how the students were given the opportunity to participate in the preparation and decisions at course level, how the students were given the opportunity to provide feedback on the course and how this forms the basis of the analysis and proposals below, response frequency (for example, concluding survey 70 % response frequency, post-it notes – improvement suggestions after the second course week 90 % response frequency, course council 85 % attendance).

Conclusions from the previous course evaluation

- *A day of self-study on day 2 of the course helped the students have time to read the materials and transition to my course from the previous one.*
- *We need to ensure that the Stata workshop uses time efficiently.*
- *The order of the course's activities should be kept the same.*
- *The submission of a grade for the example protocol was successful.*
- *The first assignments should be due at the same time rather than having multiple due dates.*
- *Time should be dedicated to summarize and revisit the statistics lecture.*
- *Protocols should be graded harder since I was too easy on them last year.*
- *Send the students calendar invitations for the course activities and locations.*
- *Include a guest lecturer from outside academia.*
- *Consider putting more content into online videos and then coming into the course to discuss.*

Description of conducted changes since previous course occasion

This year, we used the time in the Stata workshop efficiently. It was successful and highly appreciated. My teaching assistant Ngoc did a great job.

Having the assignments in the beginning of the course all due at the same time worked well, there were no complaints.

It was more difficult to receive a PWD this year, with 39% receiving PWD. I added some time to one lecture to revisit the statistics lecture's contents. It was hard to tell if people appreciated this since the students were very quiet this year. We sent the students calendar invitations to the course occasions, there was no problem with the course taking place in different rooms on different days. We had a guest lecturer from SBU who was very good and appreciated by the students.

Summary of the students' response to the course evaluation

- *Graphs and selected quotes from course surveys and any other instruments can be added as appendices if required.*

We received 19 answers to the survey out of 23 students (83% response rate) after sending the survey out 3 times. The survey results are attached. The students rated the course highly – the majority felt that they developed valuable expertise/skills during the course and that they achieved all the intended learning outcomes (to a large or very large extent). The majority felt that their ability to communicate around the subject improved, that the course promoted a scientific way of thinking, the atmosphere was good, there was a theme running through the course, and the teachers were open to ideas and opinions from the students about the course. The majority also felt that all students were provided with the same learning opportunities. There were a few very positive quotes from the comments section about the course overall, the environment and appreciation for the feedback students received. Here are a few examples:

"I really enjoyed this course! One of my favourite courses of the program, and extremely interesting and relevant to students in the epidemiology track."

"This was a great course, well-organized and thought through"

About the environment:

"Very helpful in learning about SR/MA with a great/open/welcoming learning environment with Elizabeth and Ngoc. I feel I really learned a lot."

"The course fosters a very open and supportive atmosphere, encouraging me to ask questions and share my thoughts during the journal club."

About feedback:

"The individual feedback was very nice!"

"… I really appreciated that we had the opportunity to revise our assignment during the course and ask questions through both office hours and peer review. I found that to be extremely helpful and also very conducive to a collaborative and constructive learning environment. We do not have many opportunities to receive feedback/revise before the final is due, nor do we often receive thorough feedback after final submission."

The response from students that showed a weakness in the course was lower ratings given to the statement "I have had enough time to reflect on what I have learned" where half of the

respondents answered that it was to some extent, a small extent or a very small extent. However, the majority reported that the demands of the course were reasonable in relation to the learning outcomes. Some less positive comments from students regarding time limitations:

"It was a lot to learn in a short period of time and I feel we could have learned/delved into even more, if the course was allotted the time."

"This course should be prioritized by the department by increasing the credits and course days so that there is enough time to process, understand and learn the major concepts. I think there was a lot to learn in this course at a very short time and no time to reflect at all."

One student commented on a way to make this better:
"… having limited topics we could choose from, may be useful as we really don't get much time for the final assignment. This can guide the first lectures and workshops better and also motivate more people to participate."

There was one comment about the statistics lecture:
"The statistics parts were too advanced for the short time of digestion and therefore contributed to stress."

The course leader's reflections on the implementation and results of the course

Reflections on the course's strengths, weaknesses, opportunities, limitations within, for example, the following areas:

- *How have the students' previous knowledge, experiences and prerequisites been used as a basis during the course?*
- *In what way the work methods used during the course contribute to the students' attaining the learning outcomes? (Reflect on the selected learning activities and the students' type of engagement and presence in class)*
- *How has the course worked with -constructive alignment - from learning outcomes to examination form and examination content?*
- *How do examinations and assessment criteria ensure that students achieve the learning outcomes of the course? (Reflect on the choice of examination form and formative assessments.)*

The course was overall successful. After reading their final assignments, it was clear that there were no major misunderstandings and students reached the learning goals for the course. During the course we offer several opportunities to meet with the teachers in groups and also one opportunity to sign up for a meeting with the course leader. This helps to detect early on if there are people who are struggling with the content or the assignment. This group of students was not very interactive in a big group so it was hard to know if they were understanding the content. However, they were active in group discussions, and the group meetings were very successful and well-attended.

We gave feedback in person to students for their protocols a couple of days before they are due and it is very apparent that this is the opportunity where many students learn the most. They learn from each other, but also from having an experienced teacher in the room to make sure that they are on the right track and explain things further. This session was well-attended and very much appreciated.

The students' previous knowledge from all previous coursework is used in this course since it gives the opportunity for students to discuss and evaluate research on a specific topic, including study designs, analysis methods and sources of bias. The students develop a

research question and protocol for this course and this builds on the work they have done in previous courses. Furthermore, they are asked to weigh the potential for bias and many of them seemed to be able to do this to some extent. However, many of them were very non-committal when discussing bias – saying something might over or underestimate the risk ratio, for example, instead of really thinking it through and explaining which direction the bias would cause the observed association to go in, when appropriate.

A major strength of this course is that it allows for a bigger picture view of research in general, bringing together a lot of what the students have previously learned. It is also a strength that the students can choose their own topic for the final exam and they can use their previous knowledge to dive into a topic of their choice more in depth. Many students used the same topic that they will study for their master's thesis, which ties this course in to the following semester and increases engagement. One weakness that I noticed from the final assignment was the students were not very good at being self-reflective. They were very good at criticizing the studies they were going to include in the review, but few of them fully reflected on how they could also introduce bias in their method of review (meta-bias) or discuss the issue of publication bias with fluency.

Every learning activity in the course is directly related to a learning outcome. I have varied the way we do the activities so that it isn't the same every day with a mix of learning at home, in lectures, in hands-on workshops or in group discussions. The assignment incorporates all of the things learned in the course and a "pass" shows that they have learned all of the pieces and have not gotten anything wrong. A "pass with distinction" protocol is one that takes it a step further – shows they not only understand the pieces needed to conduct a systematic review but can justify their decisions and can reflect on the effect of meta-bias. Many students left this out of their discussion/reflection which was the main reason for not getting a PWD. Otherwise the students' protocols were on average better than last year.

The statistics lecture is supposed to provide students with information for the data analysis section of their protocols, but the length of the lecture and the amount of readings are disproportionate to what they need to know about statistics for this course. The Karolinska Institute's librarians did a great job with new content this year but they were not able to get through the entire workshop that was planned. They were supposed to help more with doing a literature search.

A major limitation of the course is how short it is. It has a quick pace and the content is packed into two weeks. The students have just come from a previous course which is longer and with a slower pace, so the transition is a little tough. It is hard to know whether I should cut some content to ease the burden on the students, but this will decrease the quality of the course and perhaps not all learning outcomes will be achieved.

Course leader's conclusions and suggestions for improvement

It was apparent that the statistics lecture was too dry and too long. I suggest that we introduce the statistics for meta-analysis methods in a more interactive way. A lot of students read the readings, and they might connect more with the material if we do some analyses or talk more about the bigger picture issues with meta-analysis models, rather than have slides with equations. I would like to keep the same take-home message about how to choose your model, but perhaps get that message out to them in a better way.

There should be dedicated time to discuss meta-bias. I will add some slides on this to one of my lectures. During the journal club discussions, we all discussed different aspects of the article using AMSTAR2 checklist as a guide. However we will develop some main questions to ask the students to be sure we go over certain topics equally in all groups, and meta-bias is one topic that deserves special attention.

I am concerned that students will be able to use ChatGPT and other AI tools to completely write a protocol in the future. I would like to develop a new way to examine them, one in which they can use critical thinking and reflect on the aspects and quality of systematic reviews but I can be sure it is their own work. An additional issue is that the students all address different topics, which I see as a strength so they can really dig in to their topics (many chose the one for their master's thesis). However, it also means that they are all different and some people have a hard time coming up with a new topic and some topics are more challenging than others. To keep the good aspects of the protocol but standardize the exam more to be about one topic, my suggestion is to split the exam into two pieces. Do a "half" a protocol (aim/research question, inclusion/exclusion, data items, pub med search) which will be graded as pass or fail, and can be on any research question of their choice. Then on the last day, we have an in-person exam where they will read a systematic review and meta-analysis (the topic will be provided ahead of time with some background information) and the students will be asked to answer some questions about it, and reflect on its quality. This will replace the discussion section of the protocol that we currently have.

I will develop more specific questions to guide the discussion in the journal club group meetings to standardize what we discuss across groups and make sure that all key topics are covered.

Next year I will work together with the Karolinska librarians to define which parts of the workshop should be prioritized and which parts should be removed so that all of the most important content is covered.