



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 26 – Nov 8, 2023	

Course leader Elizabeth Arkema	Examiner Elizabeth Arkema
Other participating teachers Teaching assistants: Ngoc Nguyen, Marina Dehara	Other participating teachers Lecturers: Love Strandberg, Alessio Crippa

Number of registered students 20	Number who have not completed the course¹ 0	Number passed after regular session² 20
Methods for student influence other than course survey³ 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. Noone contacted me to discuss the exam. I also sent out an anonymous survey halfway through the course to determine if there were topics we needed to cover more.		

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

- *In the previous course evaluation, I noted that the students had improved in their ability to develop a research question but I wasn't sure if it was just that group of students or due to some changes to the schedule (my course now comes after a course in which they work on this skill). This year, the students were also able to develop research questions or had more of an idea of what they'd like to examine with the study protocol compared to 2021 and earlier. It is clear that having the timing of this course later in the semester has made developing a research question easier. There are always some students who struggle but much fewer than before.*
- *The addition to the course of a Frequently Asked Questions document was kept since it was a success.*
- *There were some students who struggled with their protocol because they were trying to answer more non-traditional research questions (ones that are not typically addressed with a systematic review, or ones that have not been extensively studied yet).*
- *We received lower ratings on the course evaluation for the questions on ethics last year, since we did not have much content in the course on ethics.*

- *The Stata workshop was the only teaching activity that was not rated as high as the rest because the leader of the workshop did not cover all the material that was planned.*
- *Students did not feel like the course was long enough and wished for more time to reflect on the content. They wished to go in to some topics in more depth, but we did not have time.*
- *Students have told me that it is challenging to go directly from the course before mine into this course. Before, we started on a Monday so they had a weekend to unwind between courses. Now we start on a Thursday.*

Description of conducted changes since previous course occasion

To address the fact that some students wanted more time or more details on certain aspects of systematic reviews and meta-analysis, I created a “Resources for learning more about SR/MA methods” page on canvas that contains more sources that students can turn to if they want to learn more. This is a living document and I update it regularly. This serves as a resource for people to learn more independently on specialized topics from online and external sources.

The Frequently Asked Questions document was added to with resources for people pursuing “non-traditional” research topics for their protocols.

Last year, the students did not read the example protocol before the group meeting where we would discuss the protocol. This year, I asked them to turn in a grade of the example protocol before the group meeting.

I asked a different person to give the Stata workshop so that we would be sure it was completed the way it was intended and cover more of the material. The Stata workshop was moved to after the sensitivity and subgroup analysis lecture because they are a natural progression in that order (to learn about the content of the dataset and analysis, and then try it yourself in the workshop).

I added a reading to Canvas and a few more minutes and slides in a lecture dedicated to ethics in systematic reviews.

I changed the schedule this year so that there wouldn’t be anything due until Monday and I made it so the 2nd day of class (Friday) was a day when they could work from home and watch video lectures instead of coming in to campus. The hope was to give them some time before the lectures and workshops start which contain a lot of information. This shifted the course’s schedule one day later. To be sure that they did the readings they were supposed to do during this “self-study” day, I asked them to submit a short reflection on Canvas (1: what was one new thing you learned, 2: is there something you don’t understand or that is unclear).

We broke the class into 3 groups instead of 4 like we had last year. Last year the group discussions weren’t 100% attended so it seemed like a waste of time and money to have 4 teachers and 4 rooms.

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 14 answers to the survey out of 20 students (70% 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, here are a few examples:

“I think all of the assignments were helpful and of value.”

“Thank you for a highly dedicated and thought-through course. It was overall a very good atmosphere. The learning materials were easily accessible”

“The professor was excellent, went above and beyond to help students, and was very respectful when students were disruptive.”

“I thought the course was great! I learned a lot and the atmosphere in class was really good! The TAs were also very helpful and everyone was so dedicated. I thought that the voluntary feedback session was particularly helpful and I liked that it was voluntary so that only people that really wanted to participate and were motivated participated.”

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:

“i felt i needed more time to learn from the lectures. probably considering an extension of the time will be great”

“The course is way too short considering its relevance.”

“This course should be longer! These are very valuable skills that we really didn't have much time to absorb”

When I asked about the specific feedback on the different learning activities, there was a range of comments. But there were two comments about the statistics lecture, which could be improved next year:

“the statistics lecture was a bit confusing even if you knew the statistical procedures of a meta-analysis before already. Since we don't have thorough mathematical education before (apart from the biostatistics courses that were a while ago), the explanations were too abstract for most people in class.”

“I had troubles to fully grasp the statistics lecture. After revising the slides everything was clear to me but the lecture was too fast considering that we have not had any statistics lectures for half a year. Most questions and explanations were for the Phd students which should not be the focus in a masters course.”

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. Since the course is so short, we don't have much time to adjust things in response to students and need to help early on before it is too late in the course. The students who came to non-mandatory class meetings (about 11 out of 20) were very engaged, interested and asked good questions. It seemed as though the students who came to lectures learned a lot from them. Some of the students who did not come to lectures did not learn as much, as we could see from their protocols, but they were able to keep up by reading the materials and power point slides. The interaction in group discussions was valuable to allow for people to ask questions who are more shy in the group setting.

The main weakness of the course is that it is only two weeks long, which the students reported in their course evaluation. This is in line with what we hear about the course every year, that the students would like more time on this subject. I think that decreasing the amount of information or the expectations for the assignment would decrease the quality of the course and the students would not meet the learning outcomes. Hopefully those students who wanted more time can go on and use this method in their future careers to dive deeper into the topic. One idea would be if the course was spread out over a few weeks and given in parallel to another course so that some information from lectures could sink in a bit. However, I think if the students are given more time for this course, they will not use it for the course but for other things and still be rushed at the end to finish the final assignment.

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. It is great to see them discuss the potential biases of the studies they will include in their review, and it is clear that they have learned a lot from previous courses. A major strength of this course is that it is about researching research, and allows for a bigger picture view bringing together a lot of what the students have previously learned. It also is a strength that the students can choose their own topic for the final exam (study protocol) and they can use their previous knowledge and experience to develop the research question and 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 makes the students more engaged with their topic. One weakness that I noticed from the final assignment was the students were not so 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 (a bias that may invalidate conducting a systematic review at all).

I have developed this course so that every learning activity is directly related to a learning outcome. I sometimes wonder if the students realize that each activity and assignment is

strategically building towards the final assignment, that I am not wasting anyone's time. I have varied the way we do the activities so that it isn't the same every day. We had workshops on using Stata and on literature searching which were more hands-on. We had group discussions, such as the journal club article discussion. We also had lectures, mostly given in person, with one pre-recorded video. The group discussions also allowed for feedback opportunities from peers and teaching assistants. The students submitted a short reflection about the readings so I could see if there was anything unclear we could discuss in person. I provided "office hours" on zoom where students could book a one-on-one time with me to discuss their projects. Some people learn differently, so a mix of learning at home, in lectures or in group discussions hopefully captures all the learning styles in the group.

The assignment incorporates all of the things learned in the course and they are to justify their decisions for their study plan using the information they learned on each piece (study selection, data collection, etc). Each piece of the final assignment is directly related to a lecture, group discussion or work shop from the course. The assessment criteria for the assignment are clear that a protocol with 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 apply it to a unique topic. A pass with distinction protocol is one that communicates what they are thinking and provides justifications for their decisions.

Course leader's conclusions and suggestions for improvement

It seemed as though adding a day of self-study on day 2 went well, although the students still complained that they were "drained" from the previous course. So it seems that no matter what I do they will be tired or stressed by taking my course directly after the previous one. The addition of the reading on ethics and the increased content in the lecture on ethics sparked a very interesting discussion and I really appreciated this addition this year. The new leader of the Stata workshop did a great job making the workshop efficient and we got through quite a bit of the material. The flow from the lecture on sensitivity analyses to the Stata workshop worked really well and I will keep the same order of activities next year. We did not have many people trying to do "non-traditional" topics this year, so it is unclear whether our attempt to address this challenge succeeded or not. Perhaps we succeeded in deterring them from choosing a topic that would make it difficult to complete the protocol in the short time frame the course allows.

We asked people to submit a grade of the example protocol before we met to talk about it, and this was successful. It made it much clearer what they were expected to do and even though I did not grade this activity, they seemed to react better to a concrete task to complete rather than me just telling them to read and grade the protocol before the group meeting.

I will merge the assignment of submitting a research question, reflecting on reading and submitting the Journal Club Quality Assessment assignment into one submission. It will be due on Sunday night. I will keep the reflections on the readings, since that was a nice addition and I appreciated seeing what the students found was unclear from the readings so I could address it in person or via Canvas.

There were several comments about the statistics lecture from the students. Some years, they want more in depth information about statistics, other years they say it is too much. However, I agree that when we jump into statistics, they don't have the overview about it that would help absorb the information from the lecture. I have assigned them readings on the topic that

they should read beforehand, but they probably don't read them. Next year, I plan to introduce the topic in simpler language and terms before the statistician gives his lecture and point them towards the readings for self-study. The idea with this lecture is not to overwhelm them with formulas but to show them what's "under the hood" so they know there is more to this method than just plugging in code into Stata. They do not need to build the car for this class.

I think I was too easy on them when grading the assignment. We have meetings with the students throughout to give feedback on the assignment, so this is probably why many of them pass the first time. But there were a couple of students who were borderline pass/fail and I decided to give them detailed feedback on the assignment instead of having them edit it and return it. I think they learned through doing and I hope that they read my feedback. However, next year I will have them make edits to be sure they understand and take in the feedback, since I am not sure if they even read it.

A minor comment on content, there was a lack of understanding about influence analysis and publication bias as was evident in several protocols. These topics are only mentioned briefly in the course publication bias is an important issue that affects all research, not just this method, so it would benefit them for their skills as epidemiologists to understand this better. I will improve the content of one of the lectures on these topics.

I will continue to have 3 groups instead of 4 groups since it worked well this year.

One student suggested I put the schedule on canvas rather than have a PDF schedule. I will do this next year to make it easier for the students to import the schedule into their calendars.

The journal club assignment was appreciated by the students. To be able to incorporate more different types of topics in my course, I will use an article that is on air pollution or climate change. Further, we focused on academic applications of systematic reviews but I will try to have a guest lecturer from an agency who uses this method so the students see how it is used outside of academia.

This year there were two people who were sick with the flu for most of the course. About 7 people in addition to those 2 consistently did not show up for class without any explanation. So I had about 11 people in the course in person, and these 11 people were quite engaged which was nice. It was frustrating to put time and energy into lectures and group meetings when people didn't show up. Most of the course occasions were not mandatory, but each activity is directly linked to helping to learn the content needed to complete the final exam. I have provided thorough and excellent information in my power point slides and other documents available on canvas, making it so that the students can do self-study at home. I taught this course for the first time during the first year of the Covid-19 pandemic in 2020 so the idea was to make it so if you were sick you could stay home, not spread anything, and still manage to pass the course, after perhaps having a catch-up meeting with one of the teachers. Now it seems that this idea to make things very transparent has made it so the lectures are unnecessary. I am considering putting one or two lectures online in videos and then having the students come in for discussion. This way we will have more quality time in person to discuss.

Other comments

I would have liked to add to the survey to ask more detailed questions about each aspect/learning activity as I did last year. But I removed those extra questions I had last year due to the criticism from the Educational Board at MedS that the questions I posed in the survey were not clear (“what do you mean by quality?”). I unfortunately do not have time to work with LIME or others to develop the survey, as I am administrating this course and the survey almost entirely myself. This year, I added only one question, an optional write-in question “Could you please provide any additional comments/feedback on the specific course activities - lectures, KIB workshop, Stata workshop, group discussions, journal club, and/or final assignment?”. This is where I received a lot of important feedback, more so than the standard format of the rest of the survey.