THE UNIVERSITY of EDINBURGH | usher institute

Introduction to data science in health and social care

Datathon Assessment Specifications
2023-2024

Course Code
HEIN11037

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1. Introduction

Learning, teaching, and assessment

The 'Introduction to Data Science in Health and Social Care' course aims to equip you with the fundamental foundations and data skills needed for data-driven innovation in health and social care. This course will also provide you with an opportunity to demonstrate originality and creativity in the application of tools from data science. By the end of this course, you will have a critical understanding of the current issues, key concepts, and methods in data science used to improve health and well-being and manage systems in the health and social care services sectors.

The course assessment will involve a datathon focused on storytelling with data from health and social care. You will work individually with the option of participating in a peer support group. The assignment will culminate in a presentation and a written project report at the end of the course. The datathon assessment will teach you the data science and communications skills necessary to be an effective data storyteller. You will learn how to locate and download datasets, extract insights from that data, and present your findings in various formats in R and R Markdown. You will learn how to communicate information through data visualisation and compelling narrative and how to tailor your data stories for different audiences and stakeholders.

From the outset, you will engage with the subject matter and one another through a series of individual and collaborative tasks that feed into the assessed work described in more detail in the following sections.

Learning Outcomes

By the end of this course, students will be able to:

1) Demonstrate a critical awareness of health and social service systems and the key concepts, issues and methods related to data science.

2) Effectively communicate about data-related issues in health and social services to a wide range of audiences.

3) Apply a range of specialized data science techniques and tools to different health and social service scenarios.

2. Overview and general guidance

There are no exams for this course, but students MUST submit all parts of the assessment. The final mark will be based on the following:

LO2 and LO3: Datathon presentation – 40%
LO1, LO2, and LO3: Datathon project report – 50%
LO1: Mini-weekly reports – 10%

Formal summative assessment will include a presentation, which will constitute 40% and a project report (1,800 words) that will make up 50% of your final grade. The final 10% of your grade will be made up of weekly mini-reports (3 stars and a wish) posted on the course discussion boards. There are 10 weeks of the course, meaning each post is worth 1% of your final mark, resulting in 10% overall. These are graded in terms of completion, so if you complete all 10 posts for the 10 weeks of the course, you will receive full marks.

You will also have the opportunity to receive formative (non-assessed) feedback on your datathon story during weeks 5 and 6 of the course. This will be in the form of an optional, non-assessed discussion board post in which both members of the teaching team and your peers will be able to give you feedback on your data story.

The submission deadlines for each assessment are as follows:

Assessment	Submission deadline
Graded discussion boards, in the form of mini-weekly reports	04/12/2023 17:00 GMT
Datathon presentation	04/12/2023 17:00 GMT
Datathon report	11/12/2023 17:00 GMT

Feedback turnaround time for assessment is 15 working days.

Please note:

- Should you experience technical problems that prevent you from submitting your assignment to Turnitin on the due date, **please notify the teaching team immediately** in an email (pgt.dshsc@ed.ac.uk), including a screenshot of the error message and copy of your assignment as an attachment before the submission time/date.
- Remember to KEEP A COPY of your work at all times.
- **The word count must be adhered to** (There is a +10% allowance). The word count does not include the title page, reference list or appendices. There is no lower limit as long as the assignment criteria have been met in full. Brevity and clarity of written material are important in data science. The assignment word limits are enforced to help you improve your academic writing.
- See the **MSc Data Science for Health and Social Care Programme Handbook** for more information on extensions and special circumstances.
- All assessments must be completed and passed to progress to the next course.

3. Grading Criteria

For each component of the course assessment, please be aware that the mark awarded is provisional. Please take note of the following information:

- The marks awarded for each component of the assessment are provisional and are provided to give you an indication of your progress before the course ends.
- At the end of the course, the quality of all your coursework will be assessed to provide a final grade on the scale provided below. This final grade remains provisional until after the exam boards in January of the current Academic Year.

University Common Marking scheme

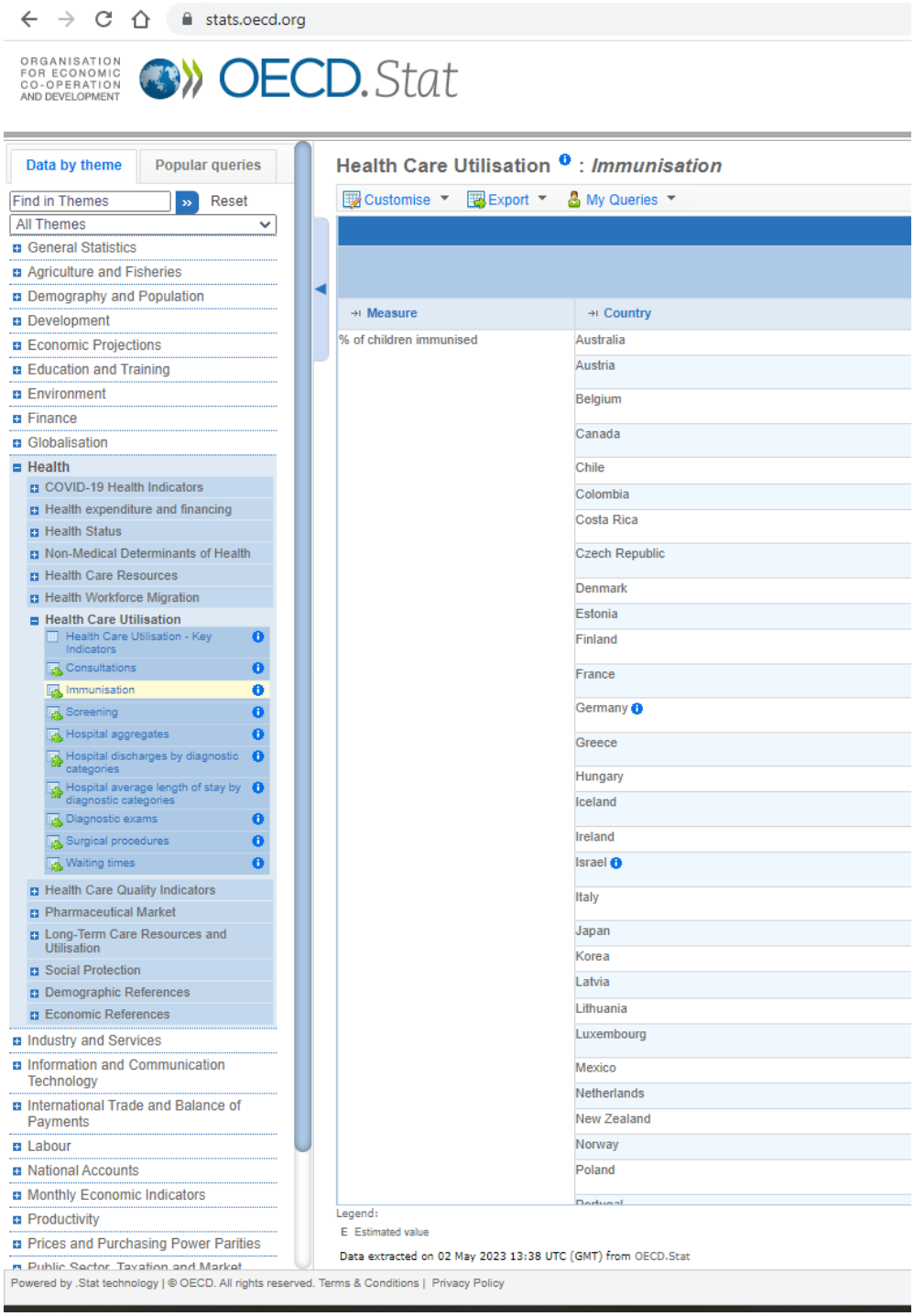
Mark (%)	Grade	Description
90-100	A1	An excellent performance, satisfactory for a distinction
80-89	A2	An excellent performance, satisfactory for a distinction
70-79	A3	An excellent performance, satisfactory for a distinction
60-69	B	A very good performance, satisfactory for a merit
50-59	C	A good performance, satisfactory for a master's degree
40-49	D	A satisfactory performance for the diploma, but inadequate for a master's degree
30-39	E	Marginal fail
20-29	F	Clear fail
10-19	G	Bad fail
0-9	H	Bad fail

https://www.ed.ac.uk/timetabling-examinations/exams/regulations/common-marking-scheme

4. Datathon

Over the ten-week course, you will work to compose a data story around healthcare utilization data from the Organisation for Economic Co-operation and Development (OECD) using R that demonstrates your data science and storytelling skills. Data stories must also serve one of two goals: to help the intended audience make data-driven decisions or to convey the impact of your findings to service users or stakeholders. There are many different variables relating to health and social care in the health care utilization dataset – it is not expected (or indeed possible) to analyse all of them. Rather, you are to decide on a data story or research question that you would like to explore using some of the variables within the dataset. You will then decide on one audience for the presentation and a different audience for your report, using the same data story and updating the context and figures as necessary for the new audience.

The University of Edinburgh has a subscription to the OECD iLibrary, which you are invited to explore. You are welcome to decide to include other datasets from the OECD Health Statistics repository or other OECD data (e.g., population data, income distribution, social expenditure, etc.) as well if it will help develop your data story. The https://stats.oecd.org/ interface is another way of looking through the various OECD data sets. If you select the "Health" theme you will be able to see the various health-related data sets as well as the key themes/indicators included in that dataset (see the screenshot below).



See the Learn pages (Assessment > Datathon-data storytelling) for a step-by-step guide on how to access the datasets as well as for the starter code.

Getting started

The first task you must complete is to read through the current document.

Next, you should spend some time familiarising yourself with the OECD Health data website. You may find it helpful to produce a provisional timeline for the project. Here is a suggestion of key tasks for the datathon project:

- Explore the available datasets, focusing first on healthcare utilisation
- Identify and select key variables and data set(s)
- Decide on the intended audience for the presentation and the audience for the report
- Exploratory data analysis
- Compose a narrative for each audience
- Produce visuals for each audience
- Prepare slides for the presentation
- Record presentation
- Write project report

Optional group working and communication

Once you have decided on your data story, or at least your key variables of interest from the OECD Healthcare utilisation dataset, you can join the discussion group including students interested in the same theme within the data. There are 9 key indicators/themes as outlined by the https://stats.oecd.org/ interface:

- Consultations
- Immunizations
- Screening
- Hospital aggregates
- Hospital discharges by diagnostic categories
- Hospital average length of stay by diagnostic categories
- Diagnostic exams
- Surgical procedures
- Waiting times

You are welcome to include variables from across these themes, but they will function as a basis for grouping the data. This will form an optional peer support group with whom you can discuss various aspects of the datathon project as you progress. You are not required to work as a team, but you will find the experience much more rewarding with the support of your peers. For example, you could organize co-working sessions or have online meetings to discuss different things you have found in the data.

5. Presentation

This is what we are looking for, overall.

You have free rein on content and execution. However, all data stories must contain two visualisations created using R. Data stories must also serve one of two goals: to help the intended audience make data-driven decisions or convey the impact of your findings to service users or stakeholders. Your presentation should not just be an account of everything you tried ("then I did this, then I did this, etc."). Instead, it should convey what choices you made, why, and what you found.

You have 5 minutes for your presentation, any recorded presentations that go over time will be deducted 2 percent for every 30 seconds over the time limit.

You will be assessed through a presentation at the end of the course. The presentation will be evaluated based on three aspects: narrative and effective storytelling (40%), data visualisation (35%), and professionalism and slides (25%).

Slides

You will produce a short presentation (in PowerPoint or another software of your choosing) explaining some key findings from your data and a clear recommendation about what action should be taken as a result of your findings. Your presentation should include:

- Up to 8 content slides.
- Your first slide, which will appear on the screen before your narration begins, should identify who the audience for your presentation is. In most cases, you may envision your audience as the head of an organisation you work for (i.e., health or social care organisation) that needs to decide a course of action based on your findings.
- Your second slide should include the most exciting insight you have discovered in your dataset, much like the "lead" of a news story. This "lead" statement should intrigue your audience and make them want to learn more.
- Your presentation should include at least two static visualisations that you created in R based on your data, though you can include more visuals if you wish. At least one of your two visualisations should support the statement made in your lead sentence.
- Your slides should include some visual elements other than static data visualisations that help illustrate your points and maintain viewer interest (i.e., photographs, clip art, etc.)
- If you wish to use transitions or reveals on your slides (i.e., bullet points appearing one after the other, one image superimposed on top of another, things sliding in from the side), they should contribute to the presentation rather than distract from the overall data story.

Presentation Specifications

You will submit a presentation (5 minutes) in week ten of the course. Your presentation should be more than just reading your slides. Instead, your slides should be relatively minimalist in terms of text, showing key images, ideas, or visuals that you use to enrich your narrative. Your lead sentence and visuals should be accompanied by an "elevator pitch" explaining why the insights you have discovered can help your intended audience make data-driven decisions or convey the impact of your findings to service users or stakeholders.

Your presentations will be recorded and submitted via the Learn submission box. You will find further information on how to do this, including a step-by-step video on the Learn pages. You can record your presentation using the “Record” button on any of the following platforms:

- Zoom
- MS Teams
- Media Hopper Create
- a recording platform of your choosing

Remember this is a recorded presentation, you can practice! The great thing about recording in advance is you can have a few attempts to get comfortable and check your timing before deciding on a video you are happy with for your submission.

Helpful resources to produce an effective presentation

The IAD Institute for Academic Development (IAD) has a webpage on the StudyHub with various useful tips and resources for academic presentations and preparing slides, which you can find here

6. Project report

At the end of the course, you will submit a 1,800-word written project R Markdown report that demonstrates a clear understanding of your data story and illustrates the necessary adjustments to the data story context and visualisations given the new audience (as compared to the presentation). The project report will be evaluated based on four aspects, narrative/data storytelling (30%), critical thinking/analysis (35%), data wrangling and coding (20%), and reflective practice (15%).

Your project report will be submitted through Turnitin as a knitted PDF or Word document (.pdf, .doc or .docx) R Markdown document.

All R code must be shown **(echo = TRUE)** and will not count towards your word limit. You do not need to show all of the code you have written throughout the datathon project, but rather the importing of the data into R, data wrangling used to prepare the data for visualisation, and the code to produce the 2 data visualisations. When you come to writing reports on your own data outwith this course, you will often choose not to show your code but just the final text and figures. For the purpose of this assessment all code is required, and it needs to appear in your Knitted report, not submitted separately.

Your narrative report should:

- Demonstrate a clear understanding of the data story, context, and selected audience.
- Describe the dataset and the limitations of the dataset.
- Include a clear recommendation for your audience of what steps they should take in response to your findings.
- Include at least one or two elements that may be missing from the data story and explain how you would improve the data story.
- Describe anything about the data you do not understand and how you would go about sourcing information that might help you understand these aspects of the data.
- Outline any additional questions that you could see could be answered with the data. You do not need to answer the questions; just state them and the variables in the data that could be used to answer them.
- Include and describe the data visuals that you chose to tell your data story and why.
- Discuss what changes you made (or did not make) from your presentation due to the new audience for your data story and why (or why not). Did you change some of the context? Or did you make any changes to your data visualizations? Did your lead statement or call to action need to be altered in any way?
- Demonstrate you have reflected on your learning across the datathon project and in the course more generally.
- Report on the skills you have developed, and areas that you have noticed that need development while working on the project and learning throughout the course.

Your report should include an informative title and clear heading separating the narrative from your reflective practice. Other sections or headings may be included if you wish to organise your report.

7. Reflective writing guidance

The purpose of this section is to provide some further guidance on reflective writing about your engagement in the online discussions and how this contributed to your learning and professional development and your achieving the course learning outcomes.

Essentially, you are trying to demonstrate how you monitor and enhance your learning as an active online course participant on the course.

Reflective writing

Reflective writing is challenging and can feel uncomfortable at times as you will be writing about anxieties, flaws, and successes. However, by reflecting, you will understand yourself better, which should help you carry out your studies more successfully by making you aware of assumptions or misconceptions about your learning. In addition, the reflective practice narrative should provide a reflective overview of your personal academic and professional development as a result of active participation in and collaboration with your peers and tutors in the group datathon project.

Reflection and learning

Reflection on your learning requires you to be self-aware in the critical examination of yourself and your actions. You should be open about your weaknesses (what didn't go well, how you are going to improve it next time around) and candid about your strengths.
Reflection constitutes the path by which to move forward.

There are many forms of reflection. However, whatever form reflection takes, it should initially involve examining feelings about an experience, then identifying areas to develop and starting to think about ways to do this. Gibbs' (1988) model of reflection offers a structured approach to reflection, which some of you may be aware of already.

Part of your narrative will necessarily involve describing what you have undertaken, what you are trying to achieve, and how this has developed over time.

Gibbs' reflective cycle

When writing your narratives, try to think along the lines of Gibbs (1988) and ask yourself the following questions at each of Gibbs' 6 stages.

1. **Description**: What happened? Give a concise, factual account of the question asked and the ensuing discourse. This section should set the scene for the reader.
2. **Feelings**: What were you thinking and feeling at the time of the discussion? What was affecting your feelings? Looking back, has your understanding of your feelings changed your view of the situation?
3. **Evaluation**: What was good/bad? Why? Be specific! How do you feel about the discussion experience now?
4. **Analysis**: What sense can you make of the situation/experience? What reflective cycle aspects (e.g., time management, preparedness, prior learning) contributed to the outcome? How does this compare to your other learning experiences online/offline? How does this compare to learning theory? Has this experience changed how you learn in general (academically/professionally)?
5. **Conclusion**: Summarise what have you learned through reflection, including the main factors that contributed to the situation.
6. **Action plan**: Summarise the practical steps you need to take/resources/skills you need to improve for the next time.

Adapted Gibbs' Reflective Cycle

Make your writing explanatory, not descriptive (i.e., *why*, not just what). Remember, simply reviewing what happened does not constitute reflective writing. Reflection is the process of interrogating the experience with searching questions.

Note

It is appropriate to use the first person singular ('I'), but you may need to also write in the third person when comparing your observations/experiences with theory or further academic evidence. While reflective writing is personal, try to step back and be as rigorous and thorough in the objective examination of your experience as possible. Remember, this is still an academic piece of writing

8. Help with writing and referencing

Academic writing resources

There is writing help available online for non-native English speakers, which might also prove useful for those course participants who have not had a recent opportunity to write an academic paper. Please have a look at the resources held at:

- https://www.ed.ac.uk/studying/international/student-life/language-support
- https://www.ed.ac.uk/institute-academic-development/study-hub/learning-resources/english
- ALLIS (Academic language and Literacies for In-Sessional Study) courses: https://www.ed.ac.uk/english-language-teaching/insession-courses/elsis/elsis-courses-pgt

For more general tips and resources on academic writing, see the Institute for Academic Development (IAD)'s website:

- https://www.ed.ac.uk/institute-academic-development/study-hub/learning-resources/writing

You may find the open-access academic writing course useful, which you can register for here:

- http://ewriting.org.uk/.

The University has recently subscribed to Cite Them Right, which describes the referencing styles, Vancouver and Harvard, in much detail, including many relevant examples.

Further help and support

For many resources to help you improve your referencing skills and avoid plagiarism, have a look at the IAD's website:

- Good academic practice

For English language support for non-native English speakers, including a proofreading service, please consult

- The University of Edinburgh English Language Support Centre

The University of Edinburgh Prepare for Success website offers an Academic writing support site, which includes a quiz to assess your writing skills.