

Reflection on Statistical Analysis, Research Methods, and Professional Development

This module has offered a valuable opportunity to reflect critically on my analytical competencies, methodological approach, and professional development trajectory. Although I entered with extensive experience in data science, statistical programming in R, and health-related research, revisiting core analytical concepts and exploring new digital tools provided a structured reminder of good research practice and expanded the breadth of my applied skills.

1. Statistical analysis skills

My statistical foundation is strong, having worked extensively with complex datasets in R for predictive modelling, signal classification, and biomedical data exploration. However, the module's activities (particularly those involving statistical hypothesis testing in Excel) served as a helpful reminder of the logic and assumptions underpinning statistical inference. While my usual analytical workflow involves scripting and automation, returning to spreadsheet-based analysis reinforced the importance of transparency in each computational step. Performing these tests more explicitly, rather than through automated R functions, deepened my conceptual understanding of sampling variability, test assumptions, significance thresholds, and effect size interpretation.

This exercise also reminded me how statistical rigour does not depend solely on advanced tools, but on the researcher's critical reasoning and ability to communicate results clearly. I realised that using simple tools like Excel can be an effective teaching and validation environment, especially when explaining analyses to colleagues without a programming background.

In parallel, I explored Power BI for the first time, which broadened my appreciation of interactive data visualisation and dashboard-based reporting. As a data scientist in the pharmaceutical industry, I see clear potential for integrating Power BI into internal pipelines to support real-time monitoring and stakeholder communication. While my current analytical practice is heavily code-based, Power BI's visual storytelling capabilities will allow me to complement statistical outputs with intuitive summaries accessible to non-technical audiences.

2. Research methods process

Having completed both an MD thesis and a PhD in health data science, I was already familiar with quantitative research frameworks and experimental design. However, this module offered valuable exposure to qualitative research methods, an area I had limited prior experience with. Learning about approaches such as interviews, focus groups, and thematic analysis expanded my understanding of how non-numerical data can complement quantitative findings to provide richer, context-specific insights.

I found the exploration of mixed-methods research particularly useful, as it demonstrated how qualitative inquiry can help interpret statistical results by capturing human experiences, motivations, and perspectives that numbers alone may overlook. This broadened my view of evidence generation and reminded me that robust research often relies on methodological triangulation rather than a single analytical lens. I now recognise how incorporating qualitative approaches could add value to my professional work—for example, in evaluating user perceptions of analytical tools or exploring clinician trust in machine learning systems.

3. Personal and professional impact

My *Professional Skills Matrix* confirmed high proficiency in R, data management, and communication, but identified growth areas in Python, Git, and business-oriented analytics. The module reinforced the need to continue expanding my technical versatility, particularly by advancing my Python proficiency for complex modelling and mastering Git for collaborative code control. The introduction to Power BI also created a new professional development path: I am now planning to implement dashboarding solutions within my current role to improve data accessibility and stakeholder engagement.

More broadly, the reflective exercises strengthened my awareness of the balance between technical skill and methodological breadth. I recognised that my professional value lies not only in advanced analytics but also in the ability to integrate multiple forms of evidence and communicate them effectively. Going forward, I aim to continue combining rigorous quantitative reasoning with openness to qualitative insight, ensuring that analytical excellence remains grounded in a holistic understanding of data and context.