SPH3101: Individual assignment

Bangladesh Demographic and Health Survey analysis

Task

For this individual assignment, you will write a data analysis report. The report is due on **10th November 2025 at 11:59 PM** and must be submitted as a Word or PDF file to the designated Canvas submission folder. This assignment constitutes **30% of your final grade** for this course.

Address all questions comprehensively within the report, and submit the document in a Word or PDF format named according to your matriculation number. The report should not exceed five A4 pages (single-spaced, Arial font size 11), excluding the cover page, appendices, and references. When using GenAI tools, it is important to properly cite and reference them. Additionally, you should provide an explanation detailing the specific purpose for which the tool was used. This explanation should be included in a dedicated section of the presentation slides or report and will not count toward the word limit.

Include a link to your GitHub folder containing all R scripts used for analysis on the cover page of your report. Please round numerical answers to three decimal places when applicable. The questions align with lecture and practical session content and build upon your group presentation. However, do review and reflect on your analysis based on the comments provided to your group and other groups.

Please post your questions on the course forum to inquire about the assignment. Emails will only be addressed for personal matters.

Bangladesh Demographic and Health Survey analysis

The 2022 Bangladesh Demographic and Health Survey (BDHS) marks a milestone in their public health trajectory. As the ninth iteration in a long-standing survey series, it offers a comprehensive and nationally representative assessment of health, demographic, and nutrition indicators. Conducted by the National Institute of Population Research and Training with support from other development partners, the survey adheres to internationally recognised standards while remaining deeply grounded in the national context. The BDHS is central to evaluating progress under Bangladesh's 4th Health, Population, and Nutrition Sector Programme and tracking health-related Sustainable Development Goals. It not only provides essential benchmarks for service coverage and outcomes but also highlights new challenges requiring urgent policy attention, including gaps in care quality, the over-medicalisation of childbirth, and stagnation in family planning progress.

Among the most pressing insights from the 2022 BDHS are those concerning child health and nutrition. While the under-five mortality rate has declined to 31 deaths per 1,000 live births—a major public health success—worrying trends have emerged in other domains. Chronic malnutrition (stunting) has decreased to 24%, yet acute malnutrition (wasting) has risen to 11%, indicating a

deterioration in recent child nutritional status. Compounding this is a sharp drop in exclusive breastfeeding rates, reversing earlier gains in optimal infant feeding practices. Healthcare-seeking behaviour for common childhood illnesses like diarrhoea and fever shows inequalities linked to wealth, maternal education, and urban-rural status. These findings suggest that while child survival has improved, new forms of vulnerability are taking shape, driven by both social determinants and shifting health behaviours. The BDHS highlights the importance of multisectoral, equity-focused interventions to promote early childhood development, particularly in nutrition, maternal care, and health education. The survey collected comprehensive data on the health and nutritional status of children aged 0-5 years (or 59 months) living in the selected households.

During your **group work**, you were encouraged to formulate your own research question. Depending on your chosen topic, explore:

1. What factors are significantly associated with your chosen outcome?
2. Are there interactions between maternal and household factors?
3. How does the outcome vary by region, wealth, education, or sex?
4. Are there implications for health equity and programme targeting?

Your task is to write a report on the analysis of the 2022 Bangladesh Demographic and Health Survey to be read by a *public health researcher*. **You will only need to write about your predetermined group research question.** You will need to apply your statistical knowledge and programming skills in R to explore the data, identify trends, and draw meaningful conclusions.

For your report you may consider the following structure:

1. **Introduction** *(keep the Introduction section brief)*
   - 1.1. Provide context for the analysis, including the problem or question being addressed.
   - 1.2. Clearly state the specific goals and research objectives of the analysis.
   - 1.3. Briefly describe the data used.
2. **Methodology**
   - 2.1. Briefly explain how the data was cleaned, transformed, and prepared for analysis.
   - 2.2. Describe the statistical methods/techniques used for analysis (e.g., descriptive statistics, hypothesis testing, regression).
   - 2.3. Specify the software used for analysis (e.g., R version XX).
3. **Results**
   - 3.1. Summarise the main characteristics of the data using tables, graphs, and numerical summaries.
   - 3.2. Present the results of hypothesis tests or model fitting. Use appropriate graphs to illustrate key findings, and ensure they are legible.
   - 3.3. Please present no more than five tables and/or figures in your main report.
4. **Discussion** (and conclusion)
   - 4.1. Explain the meaning of the findings in relation to the research objectives.
   - 4.2. Acknowledge the limitations of the study and data.
   - 4.3. Discuss the implications of the findings for the field or practical applications.

4.4. Conclude by summarising the key findings of the analysis.
4.5. Provide a final perspective on the significance of the study.

Background reading

1. National Institute of Population Research and Training (NIPORT) and ICF. 2024. *Bangladesh Demographic and Health Survey 2022: Final Report*. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT and ICF. https://dhsprogram.com/pubs/pdf/PR148/PR148.pdf
2. Bangladesh Demographic and Health Survey 2017–18, accessed on July 1, 2025, National Institute of Population Research and Training (NIPORT), and ICF. 2019. *Bangladesh Demographic and Health Survey 2017-18: Key Indicators.* Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT and ICF. https://niport.portal.gov.bd/sites/default/files/files/niport.portal.gov.bd/miscellaneous_info/d0ad2ea3_b7f9_4b60_a5f5_f91116e941ee/91a3ead5e08efd2385d37c2919595c83.pdf
3. Daniel J Corsi, Melissa Neuman, Jocelyn E Finlay, SV Subramanian, Demographic and health surveys: a profile, *International Journal of Epidemiology*, Volume 41, Issue 6, December 2012, Pages 1602–1613, https://doi.org/10.1093/ije/dys184
4. DHS, *Survey Types* https://dhsprogram.com/Methodology/Survey-Types/DHS.cfm

Assessment rubric 100 marks in total

Analysis report writing [80 marks]

1. Content [10 marks]
2. Data analysis [10 marks]
3. Methods [10 marks]
4. Data visualisation [10 marks]
5. Interpretation [10 marks]
6. Critical thinking [10 marks]
7. Writing and organisation [10 marks]
8. Structure [10 marks]

Code quality [20 marks]

1. Code readability [10 marks]
2. Code and GitHub [10 marks]

The code repository maintained on GitHub for each group will be evaluated in Week 12.

Section	Criteria	0–2 mark	3–5 marks	6-8 marks	9-10 marks
Analysis report writing [80 marks]	**Content**	Demonstrates limited understanding of the data and research question. Analysis is irrelevant or missing.	Demonstrates a basic understanding of the data and research question. Analysis is somewhat relevant.	Demonstrates a good understanding of the data and research question. Provides a relevant analysis.	Demonstrates a comprehensive understanding of the data and research question. Provides a clear and focused analysis.
	Data analysis	Applies incorrect or inappropriate statistical methods. Fails to interpret results.	Applies some appropriate statistical methods with errors. Provides limited interpretations of results.	Applies appropriate statistical methods with minor errors. Provides reasonable interpretations of results.	Accurately applies appropriate statistical methods. Provides insightful interpretations of results.
	Methods	Provides an inadequate description of data sources, variables, and methods.	Provides a basic description of data sources and variables. Limited justification for statistical methods.	Provides a clear description of data sources and variables. Justifies the choice of statistical methods with some detail.	Provides a clear and detailed description of data sources, variables, and data cleaning procedures. Justifies the choice of statistical methods.
	Data visualisation	Creates unclear or misleading tables/visualisations. Uses incorrect chart types.	Creates basic tables/visualisations with limited clarity. Uses some inappropriate chart types.	Creates clear tables/visualisations with some minor issues. Uses appropriate chart types most of the time.	Creates clear, effective, and informative tables/visualisations. Uses appropriate chart types to convey information.
	Interpretation	Provides inaccurate or irrelevant interpretations of the results. Fails to draw meaningful conclusions.	Provides basic interpretations of the results. Lacks depth in explaining implications.	Provides accurate interpretations of the results. Offers some insights into the findings.	Provides insightful and comprehensive interpretations of the results. Clearly explains the implications of the findings.
	Critical thinking	Lacks critical thinking and fails to engage with the implications of the findings.	Shows limited critical thinking. Fails to identify limitations or suggest future research.	Demonstrates some critical thinking by identifying potential limitations. Offers limited suggestions for future research.	Demonstrates critical thinking by considering alternative explanations and limitations of the study. Offers suggestions for future research.
	Writing and organisation	Presents a disorganized and unclear discussion. Fails to connect findings to research questions.	Presents the discussion with some disorganization. Limited connections to research questions.	Presents the discussion in a generally clear and organized manner. Makes some connections to research questions.	Presents the discussion in a clear and logical manner. Effectively connects findings to the research questions.
	Structure	Significantly deviates from assignment guidelines. Missing key sections.	Does not fully adhere to assignment guidelines. Some sections are missing or incomplete.	Adheres to most assignment guidelines with minor deviations. Includes most required sections, generally clear and organized manner.	Adheres to the assignment guidelines for length, formatting, and referencing. Includes all required sections, presented in a logical and coherent manner.
Code quality [20 marks]	**Code readability**	Code is extremely difficult to read and understand.	Code is difficult to read due to poor formatting and unclear variable names. Lacks comments.	Code is generally readable with some inconsistencies in formatting and variable names. Includes some comments.	Code is well-formatted, with clear and meaningful variable names. Includes comments to explain code logic. Adheres to coding style guidelines.
	Code and GitHub	Fails to submit code or code is unusable.	Provides code on GitHub with limited comments. Shows basic R skills.	Provides code on GitHub with some comments. Demonstrates adequate use of GitHub for R in the data analysis.	Provides clear and well-commented code on GitHub. Demonstrates effective use of GitHub for R in the data analysis.