SPH3101: Group assignment

Bangladesh Demographic and Health Survey analysis

Task

For this assignment, you will work in groups to analyse data from the 2022 Bangladesh Demographic and Health Survey (BDHS), focusing on children under the age of five.

Your assessment will comprise a group presentation on **3rd November 2025**. The group presentation marks will be weighted with peer review. The total assessment will count 30% towards your final grade for this module. The presentation should be 20 minutes, with an additional 10 minutes for questions. Please also upload the slides repository to the folder on Canvas and the links to your shared code. 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.

Your group allocations will be indicated on Canvas. A brief description is given below, with some suggested background reading.

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.

Your task is to work in groups to analyse the 2022 BDHS. You will need to apply your statistical knowledge and programming skills in R to explore the data, identify trends, and draw meaningful conclusions. The project culminates in a presentation that effectively communicates findings to an audience trained in other fields of public health outside biostatistics.

You are <u>encouraged to formulate your own research question</u>. However, you may also explore one of the following themes:
1. **Child nutrition and stunting**. What household and maternal characteristics are associated with stunting (low height-for-age) in under-5 children?
2. **Subgroup differences in health**. Are there subgroup disparities in health outcomes like stunting or care-seeking?
3. **Maternal education and child health**. How does maternal education affect child nutrition or care-seeking behaviour?
4. **Urban-rural disparities**. Do child health outcomes differ by urban vs. rural residence?
5. **Wealth and access to health**. How does socioeconomic status affect the treatment of diarrhoea/fever or growth outcomes?

During the presentation, please address the following: the methods and results of the relationship between health outcomes and social determinants of health that are associated with those outcomes.

Using the statistical methods, answer the research questions in your analysis and presentation.

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

Project content [25 marks]

1. Describing the background [5 marks]
2. Health outcomes explored and statistical method content knowledge [5 marks]
3. Appropriate data analysis [5 marks]
4. Overall coherency and rationality of methods and results [5 marks]
5. Strengths/limitations/reflections on the project [5 marks]

Presentation [25 marks]

1. Background clearly presented [5 marks]
2. Methods and results clearly presented [5 marks]
3. Public health appropriate language used [5 marks]
4. Clear conclusions [5 marks]
5. Overall slide and presentation quality [5 marks]

Answering questions from the audience and examiners [10 marks]
1. How questions from the audience were responded to [5 marks]
2. How questions from the examiners were responded to [5 marks]

Code quality [40 marks]
1. Code correctness [10 marks]
2. Efficiency [10 marks]
3. Readability [10 marks]
4. Data manipulation [10 marks]

The code repository maintained on GitHub for each group will be evaluated in Week 10.

This will be weighted by peer review. A factor will be computed based on the scores assigned by TEAMMATES, the platform used for peer review. This is multiplied by the score obtained based on the above rubrics to generate an individualised final score. This factor helps to distribute the marks fairly among the group. It is important to ensure that you conduct the peer review objectively and without fear nor favour. We have designed the system to prevent any benefits from attempting to 'game' it. For details of the approach, please see Cook et al. (2017) BMC Med Educ 17:172. The best way to improve your grade is to contribute more to the group work.

Section	Criteria	0–1 mark	2–3 marks	4 marks	5 marks
Project content [25 marks]	**Describing the background**	Limited or inaccurate background information provided.	Adequate background information with some gaps or inaccuracies.	Comprehensive background information provided, demonstrating a clear understanding of the context.	Exceptional depth and clarity in presenting the background, demonstrating a thorough understanding.
	Content knowledge	Demonstrates limited understanding of the chosen health topics, epidemiology, and statistical methods. Interprets findings incorrectly.	Demonstrates basic understanding of health topics, epidemiology, and statistical methods. Interprets findings with some inaccuracies.	Demonstrates good understanding of health topics, epidemiology, and statistical methods. Interprets findings accurately most of the time.	Demonstrates deep understanding of health topics, epidemiology, and statistical methods. Accurately interprets and explains complex findings.
	Data analysis	Shows limited ability to use statistical methods. Presents unclear or irrelevant findings.	Uses statistical methods with some errors. Presents findings with limited clarity.	Uses statistical methods appropriately. Presents relevant findings with some clarity.	Exceptional analysis, effectively uses statistical methods to analyse data. Presents clear and insightful findings.
	Overall coherency and rationality of methods and results	Lack of overall coherency and rationality.	Some coherency, but gaps in overall logical flow.	Overall coherency and rationality demonstrated with a clear and logical progression.	Exceptional coherency and rationality, presenting a compelling case for the analysis.
	Strengths/limitations /reflections on the project	Limited reflection with little insight into strengths and limitations.	Adequate reflection on strengths and limitations with some gaps.	Thoughtful reflection on strengths and limitations, showing a nuanced understanding.	Exceptional reflection, demonstrating profound insights into the strengths and limitations of the project.

Presentation [25 marks]	**Background clearly presented**	Background information poorly presented or not effectively communicated.	Adequate presentation of background information with room for improvement.	Clear and engaging presentation of background information.	Exceptional presentation, capturing the audience's attention with clarity and depth.
	Methods and results clearly presented	Unclear and disorganized presentation of methods and results. Uses ineffective or no visual aids.	Somewhat clear presentation of methods and results with limited use of visual aids.	Clear and organised presentation of methods and results. Uses visual aids appropriately.	Clear, engaging, and well-structured presentation of methods and results. Uses effective visual aids.
	Public health appropriate language used	Frequently uses stigmatising language.	Uses some appropriate language. Occasionally uses stigmatising language.	Uses appropriate language most of the time. Minimizes stigmatising language.	Consistently uses appropriate language. Avoids stigmatising language.
	Clear conclusions	Conclusions lacking or unclear.	Some conclusions were provided but not well-articulated.	Clear and well-articulated findings drawn from the presentation.	Exceptional conclusions demonstrating a deep understanding of the project's implications.
	Overall slide and presentation quality	Poor slide design and overall presentation quality.	Adequate slide design with room for improvement.	Professional and visually appealing slides for the overall presentation.	Exceptional slide design and presentation quality.
Answering questions from the audience and examiners [10 marks]	**How questions from the audience were responded to**	Responses lacked coherence or failed to address the essence of the questions.	Adequate responses with some gaps in addressing the questions.	Clear and coherent responses demonstrating a good understanding of the questions.	Exceptional responses showcasing a deep understanding and ability to engage with questions effectively.
	How questions from the examiners were responded to	Responses lacked coherence or failed to address the essence of the questions.	Adequate responses with some gaps in addressing the questions.	Clear and coherent responses demonstrating a good understanding of the questions.	Exceptional responses showcasing a deep understanding and ability to engage with questions effectively.

Section	Criteria	0–2 mark	3–5 marks	6-8 marks	9-10 marks
Code quality [40 marks]	**Code correctness**	Code produces incorrect or irrelevant results. Shows limited understanding of R functions.	Code produces some incorrect results. Uses incorrect or inappropriate R functions.	Code produces correct results with minor errors. Uses appropriate R functions but with some mistakes.	Code produces accurate and reliable results. Uses appropriate R functions correctly.
	Efficiency	Code is extremely inefficient and slow.	Code is inefficient with redundant calculations or suboptimal data structures.	Uses efficient R code with some opportunities for improvement.	Optimises code for speed and memory efficiency (e.g., using vectorised operations, avoiding unnecessary loops).
	Readability	Code is extremely difficult to read and understand. No comments.	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 naming. Includes some comments.	Uses clear and consistent naming conventions. Indents code properly. Adds meaningful comments to explain code logic.
	Data Manipulation	Shows limited ability to manipulate data.	Struggles with data manipulation. Creates messy and disorganised data.	Uses data manipulation functions effectively but with some errors. Creates mostly clean data structures.	Demonstrates proficiency in data manipulation. Creates clean and organised data structures.