Data Science Ethical Shorts

Resources:

1. https://aiethics.princeton.edu/case-studies/case-study-pdfs/

2. https://cdn.nuffieldbioethics.org/wp-content/uploads/Ethics-and-genomics-summary-of-case-studies-FINAL.pdf

3. https://texastipi.org/case-study-vignettes-surveillance-privacy-and-ethical-governance/

4. https://nces.ed.gov/use-work/resource-library/report/forum-guide/forum-guide-data-ethics

5. https://pmc.ncbi.nlm.nih.gov/articles/PMC6342050/

A. Rosalina, a promising and hard-working law intern is denied a promotion at work that would have given her a livable salary and a stable career path. This recommendation was made by a third-party algorithm that was contracted by her work. Otherwise, her work record made her the objectively best candidate for promotion.

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C What data modeled the recommendation

P not left to biased individuals

B. **John,** a middle-aged father, is diagnosed with an inoperable and advanced brain tumor. Though a decade ago his tumor would probably have been judged untreatable, today he receives a customizable treatment that, based on his gene variant, has a 75% change of leading to full remission.

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A. **Rosalina,** a promising and hard-working law intern is denied a promotion at work that would have given her a livable salary and a stable career path. Her work record made her the objectively best candidate for promotion.

B. **John,** a middle-aged father of four, is diagnosed with an inoperable and advanced brain tumor. Though a decade ago his tumor would probably have been judged untreatable, today he receives a customizable treatment that, based on his gene variant, has a 75% change of leading to full remission.

C. **Peter**, a violent convict who was just paroled, can obtain a large volume of data about the movements of his ex-wife and step-children by purchasing from multiple, unregulated data brokers. He has a history of assaulting his ex-wife and her children, they have a restraining order on him, and they avoid social media and have made every effort to conceal their location from him. He has been able to infer their likely new names, home location from recent purchase information, and the schools that the children attend. They are never notified that he has purchased their information.

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D. **The Patels,** a family who lives in a floodplain in India, receive several days advance warning of an imminent epic storm that will bring life-threatening floodwaters. They and their neighbors now have sufficient time to evacuate.

Which of these hypothetical cases raise ethical issues concerning data? Why?

(Shannon Vallor, 2018)

E. A genetic testing company offers direct-to-consumer DNA tests with limited counselling and education. Customers can learn about their ancestry, health risks, and potential genetic conditions.

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Common Applications:
- *AI-driven hiring platforms screen job applicants based on their resumes and profiles*
- *Mortgage application decisions*

Ethical Issues:
- *Ensuring Fairness and equal opportunity*

Dilemma:
- *Algorithm inadvertently favours certain demographics due to biased training data*

Resolution: ?

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Common Applications:
- Predictive policing algorithms
- Social Impact Analysis

Ethical Issue:
- Balancing public safety with individual rights and privacy

Dilemma:
- Algorithm may target specific neighbourhoods or demographics leading to over-policing
- Proprietary algorithms are not transparent
- Genomic information value is not portable.

Resolution: ?

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Common Applications:
- *Medical Chatbots assists users in self-diagnosing symptoms and recommending appropriate actions*
- *1000 genomes etc. de-anonymization*

Ethical Issue:
- *Avoiding harm*

Dilemma:
- *Misclassification: False negatives, false positives. Unnecessary treatments or delayed treatment.*
- *Using networked nature of data to reveal sensitive information.*

D. The Patels, a family who lives in a floodplain in India, receive several days advance warning of an imminent epic storm that will bring life-threatening floodwaters. They and their neighbors now have sufficient time to evacuate.

Common Applications:
Efficient resources allocation during natural disasters or emergencies

Ethical Issue:
- *Reliability & privacy*

Dilemma:
- *Reliance on an algorithm that may not be accurate (e.g., Earthquakes)*
- *False belief in objectivity and completeness of data*

Resolution: ?

E. Imagine a scenario where a genetic testing company offers direct-to-consumer DNA tests. Customers can learn about their ancestry, health risks, and potential genetic conditions.

Common Applications:
- *Prenatal testing*

Ethical Issue:
- *Privacy*
  - *Not just personal decision, you are also revealing information about your relatives*
  - *Insurance Companies*
- *Balancing Autonomy and informed consent:*
  - *Do you understand the test results?*

Dilemma:
Should companies reveal detailed information about potential health risks, even if it might cause anxiety or distress (especially for non-treatable conditions). How transparent should they be about the limitations of testing?

Resolution: ?

Case Scenario 1:

Imagine a social science researcher conducting an online survey to collect data on mental health experiences. Participants voluntarily provide information about their well-being, coping mechanisms, and access to mental health resources. The researcher aims to use this data to improve mental health interventions and support services.

What are the ethical considerations of this study?