INCORPORATING DATA SCIENCE EDUCATION IN MEDICAL CURRICULA: WHAT AND HOW?

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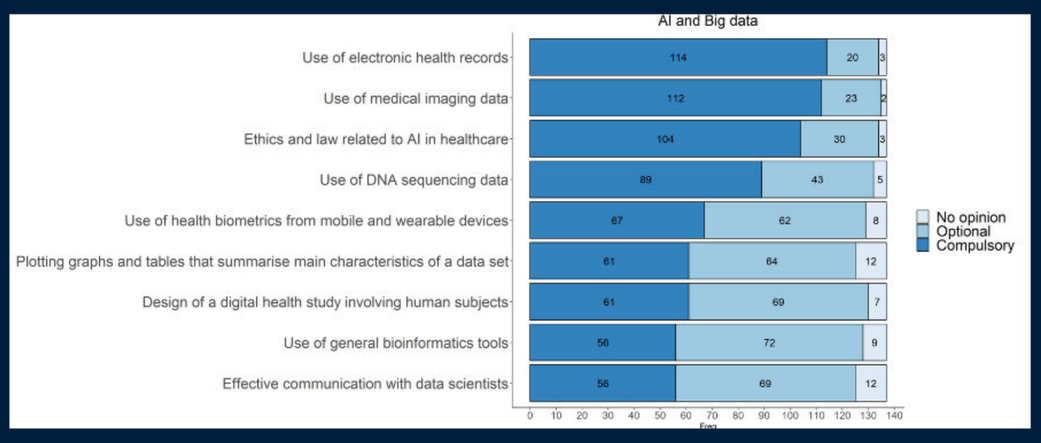
LITERATURE REVIEW

- Opinion and review papers call for an overhaul of medical education to include data science topics
- These topics include programming, handling EHR data, various statistical knowledge & medical applications and ethics surrounding big data in medicine.
- There is a marked lack of consensus as to what skills should be taught, and at what depth they should be taught.
- There is also a lack of consensus on how these skills should be taught, such as a year-long course vs incorporation into existing curriculum

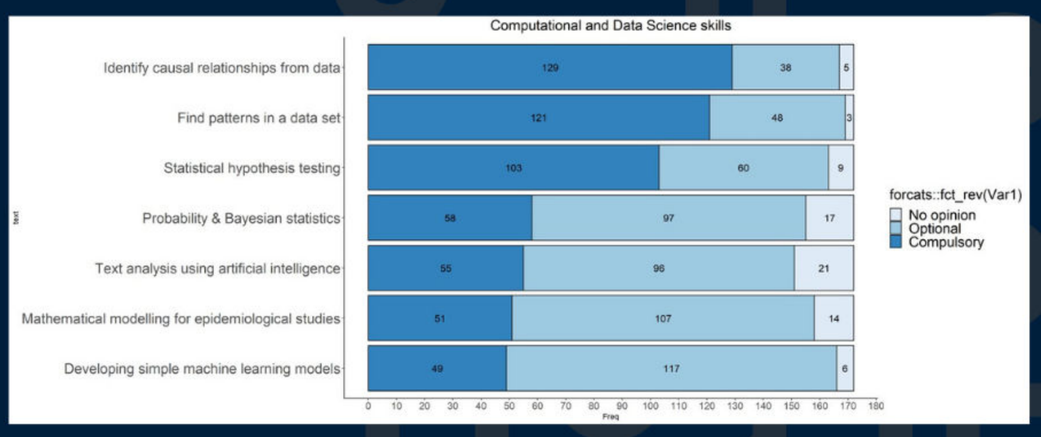
DEFINING THE PROBLEM

- Split in opinion on what should and should not be taught
- Further split in term of teaching methodology
- Assessment method is unknown

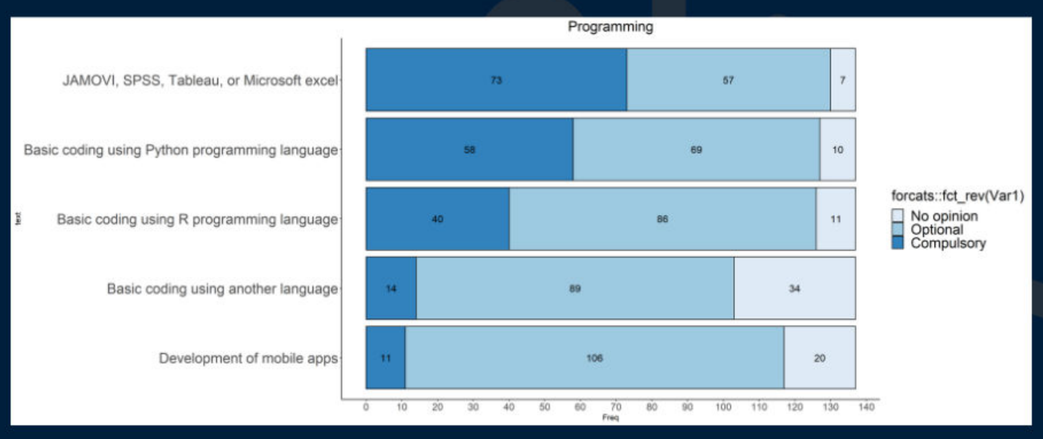
RESULTS



- Participants chose identifying use of electronic health records, use of medical imaging data and ethics and law related to AI in health care to be compulsory topics that should be learnt. Less chosen topics include effective communication with data scientists, use of general bioinformatics tools and design of digital health study involving human subjects.



- Participants chose identifying causal relationships, finding patterns in a data set and statistical hypothesis testing to be compulsory topics to be added in the curriculum. Optional topics include topics Developing simple ML models, Mathematical modelling for epidemiological studies and text analysis using AI.



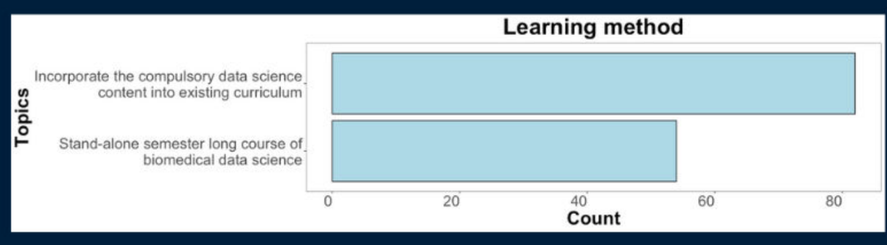
- Participants chose GUI based analysis softwares, such as Jamovi and Excel and learning the python programming language to be compulsory topics that should be taught. Less selected topics include coding in a different language and development of mobile apps.

METHOD

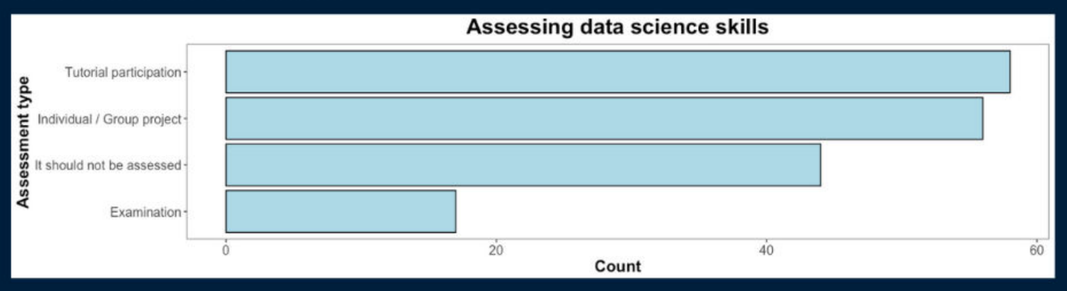
Interview
- Questionnaire design

Topics Surveyed
1. Application of Big data and AI in healthcare
2. Computational and data science skills
3. Programming
4. Teaching and assessment

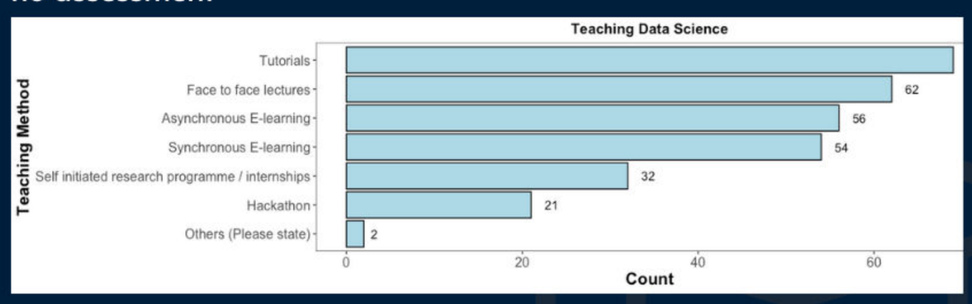
Responses
138 students responded, 70% of responses are form year 1 students.



Participants preferred incorporating data science topics in to the curriculum instead of a stand-alone course

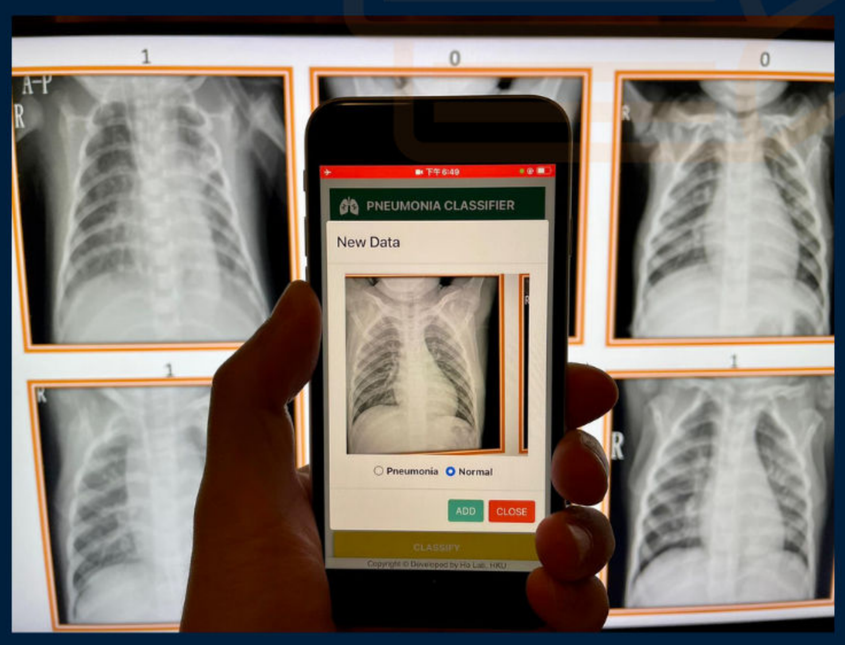


Participants preferred tutorials and individual / group project over examination and no assessment



Participants preferred attending tutorials, face to face lectures and asynchronous E-learning over hackathons and self-initiated research programme and internships

A PRACTICAL APPROACH TO TEACH MACHINE LEARNING TO MEDICAL STUDENTS



- Workshops for medical and k-12 students were conducted
- The workshop taught the process of collecting, labelling training data to train their CNN-based pneumonia detectors
- Students at the end of the workshop understood the concept of supervised learning
- Observations revealed that students enjoyed the workshop
- Students could learn ML anywhere and anytime without coding experience or the need for centralised computing resources.

SCAN ME

Stables ENE, Yeo VA, Ho JWK. Incorporating Data Science Education in Medical Curricula: What and How?. Paper presented at International Conference for Teaching and Learning; Hong Kong;2021 Dec 8

Ma SC, Zhong WZ, Stables ENE, Yeo VA, Mun KH, Ho JWK. A smartphone-enabled progressive web application that supports machine learning education. Paper will be presented at Colloquium on Bioinformatics Learning, Education and Training; Turkey; 2022 Oct 11-14