



香港社會醫學學院
HONG KONG COLLEGE OF COMMUNITY MEDICINE
founder College of the Hong Kong Academy of Medicine
Incorporated with limited liability



ADMINISTRATIVE MEDICINE

Part I Examination

Thursday 2 June 2022

14:30 – 16:00 (1½ hours)

Paper IIB

Candidates must answer all parts of this questions

Style, clear grammatical English and legibility will be taken into consideration by the Examiners. Answers should be written in a form appropriate to the audience specified in the question.

Weighting of marks for each part of the question is shown in parenthesis.

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INSTRUCTS YOU TO BEGIN**

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You are working in the Hospital Authority (HA) Chief Executive (CE) Office. CE has heard that in preparation of future pandemic outbreaks, government has decided to look into employing artificial intelligence through a symptoms checker computer chatbot so that those citizens who suspect themselves to have been infected but feeling well can call the system to get some triage and treatment advice 24 hours a day. Part of that was inspired by the experience in United Kingdom, where Babylon Health developed a “COVID-19 Care Assistant” in March 2020 that allowing users to log their symptoms and offers advice to those who may have contracted coronavirus to keep them safe and prevent them from spreading the illness. In Hong Kong during the omicron outbreak, many of the young, fit and healthy adults who were infected were at a loss initially on what they should do. This kind of “Care Assistant” could provide some timely advice and acts as a triage system to advice on hospitalisation if needed.

The attached article “*Baker A, Perov Y, Middleton K, Baxter J, Mullarkey D, Sangar D, Butt M, DoRosario A, Johri S. A Comparison of Artificial Intelligence and Human Doctors for the Purpose of Triage and Diagnosis. Front Artif Intell. 2020 Nov 30;3:543405. doi: 10.3389/frai.2020.543405. PMID: 33733203; PMCID: PMC7861270.*” Is given to you by CE to study. This is a comparison of artificial intelligence against human doctors. The research work was performed by Babylon Health in 2018, before COVID. Please read the article and answer the following questions.

QUESTION CONTINUES

1. Using the diagnosis of COVID as an example, explain what is True Positive, False Positive, True Negative, False Negative and how to calculate Precision (Positive Prediction Value) and Recall (Sensitivity) from these four parameters. (10 marks)

2. The paper mentioned on page 4 that *“The threshold parameters used in the model are selected based on independent training vignettes but may be varied to allow a trade-off to be made between recall and precision.”* Explain what is meant by “allow a trade-off to be made between recall and precision”, and the advantages and disadvantages of doing so. (10 marks)

3. What are the limitations of these types of symptoms checker in real life applications? (20 marks)

4. Justify with reasons whether this type of computer chatbot should be introduced to Hong Kong. (20 marks)

QUESTION CONTINUES

5. A member of the Hospital Authority Board, a technology person by training, is very keen for these types of computer chatbots to be introduced to Hong Kong as soon as possible. He has been approached by Babylon Health before, and has indicated to the Hospital Authority Board Secretariat that he will raise this up as an “Any Other Business” item at the internal Board Meeting in two days’ time. As you are the most knowledgeable person in this area in HA Head Office now, HA CE has asked you to write a one-page summary about the Babylon Triage and Diagnostic System to brief the HA Chairman on what it is, how does it work, the pros and cons and whether it should be introduced. (40 marks)

END OF PAPER

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