The Guardian

From oximeters to AI, where bias in medical devices may lurk

Level 2: Intermediate

1 Warmer

a. The following abbreviations are found in the text. What are the missing words?

1. NHS – National _____ Service

2. MHRA – _____ and Healthcare products Regulatory Agency

3. BAME – Black, Asian and _____ ethnic

4. PPE – personal _____ equipment

5. AI – _____ intelligence

2 Key words

a. Find the following words in the text. The paragraph numbers are given to help you.

1. a noun meaning *the fact that the results of research or an experiment are not accurate because a particular factor has not been considered when collecting the information*
   _____ (1)

2. a verb meaning *believe that something is true* _____ (1)

3. a noun meaning *a small piece of equipment that does something useful*
   _____ (2)

4. a verb meaning *make a mistake by guessing a number that is too high*
   _____ (4)

5. an adjective meaning *very important* _____ (6)

6. a verb meaning *breathe out* _____ (6)

7. a verb meaning *be different in different situations* _____ (7)

8. a noun meaning *the regular movement of blood as the heart pumps it round the body*
   _____ (10)

9. a noun meaning *a very small number of people* _____ (12)

10. a noun meaning *money a government gives for a specific purpose*
    _____ (13)

11. an adjective meaning *involving all types of people* _____ (13)

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1 The UK Health Secretary, Sajid Javid, has announced a review into systemic racism and gender bias in medical devices. People are worried this could lead to poorer outcomes for women and people of colour. Javid said: "It is easy to look at a machine and assume that everyone's getting the same experience. But people create these technologies so bias can be an issue here too."

2 These are some of the gadgets used in healthcare where there are concerns over racial bias.

Oximeters

3 Oximeters estimate the amount of oxygen in a person's blood and are used to decide which Covid patients may need hospital care – because some can have dangerously low levels of oxygen without realizing.

4 Some people are worried that the devices work less well for patients with darker skin. NHS England and the Medicines and Healthcare products Regulatory Agency (MHRA) say pulse oximeters can overestimate the amount of oxygen in the blood.

5 Javid said recently that the devices were designed for white people. "As a result, you were less likely to end up on oxygen if you were black or brown because the reading was just wrong," he said. Experts believe this could be one of the reasons why death rates are higher among minority ethnic people.

PPE

6 Masks are crucial to help keep healthcare workers safe from Covid because they give protection to the wearer against particles that others exhale. To offer the greatest protection, however, masks must fit properly and research has shown they do not fit as well on people from some ethnic backgrounds.

7 "Protection can only be given by masks that fit properly. Initial fit pass rates vary between 40% and 90% and are especially low in female and in Asian healthcare workers," said one review. Another review found that studies on the fit of this PPE was mainly based on single ethnic populations. "BAME people are under-represented," it said.

Spirometers

8 Spirometers measure lung capacity but experts are worried that there are racial biases in the interpretation of data from such gadgets.

9 Dr Achuta Kadambi, of the University of California, said people assume Black or Asian people have lower lung capacity than white people. As a result, "correction" factors are used to interpret spirometer data – a situation that can affect the order in which patients are treated, with white people having priority.

10 Racial bias may also exist in the technology which measures pulse rates by looking at changes in skin colour captured by video. Kadambi said these visual changes may be biased by subsurface melanin content – in other words, skin colour.

Artificial intelligence systems

11 AI is increasingly being developed for applications in healthcare, including helping professionals to diagnose conditions. There are concerns, however, that biases in data used to develop such systems means they may be less accurate for people of colour.

12 Recently people expressed similar worries about AI systems for diagnosing skin cancers. Researchers revealed that image databases that could be used to develop this AI rarely specify ethnicity or skin type. Some did record this information but only a handful were of people recorded as having dark brown or black skin.

13 Javid agrees this is a problem. He has announced new funding for AI projects to tackle racial inequalities in healthcare, saying that one area of focus would be the development of standards to make sure datasets used in developing AI systems are "diverse and inclusive". "If we only train our AI using mostly data from white patients, it cannot help our population as a whole. We need to make sure the data we collect is representative of our nation," he said.

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3   Comprehension check

a.   **Are these statements True (T) or False (F) according to the article? Correct any that are false.**

1. Oximeters measure the amount of oxygen in the atmosphere

2. Death rates from Covid are higher among white people than ethnic minority people.

3. Masks protect wearers from particles that other people breathe in.

4. Masks do not fit as well on people from some ethnic groups.

5. Masks fit particularly badly on female and Asian healthcare workers.

6. Spirometers measure pulse rate.

7. The use of AI in healthcare is increasing.

8. Doctors can use AI to diagnose conditions.

9. Image databases always specify ethnicity or skin type.

10. Mr Javid wants datasets used in developing AI to be diverse and inclusive.

4   Key language

a.   **Match the verbs in the left-hand column with the nouns or noun phrases in the right-hand column to make expressions from the text.**

1.	give	a.	systems
2.	develop	b.	pulse rate
3.	ethnic	c.	data
4.	measure	d.	protection
5.	interpret	e.	patients
6.	treat	f.	background

5   Discussion

a.   **Discuss these statements.**

• "All healthcare should be free."   • "AI is dangerous for society."

6   In your own words

a.   **Use an internet search engine to find out as much as possible about AI and its uses. Report your findings to the class.**