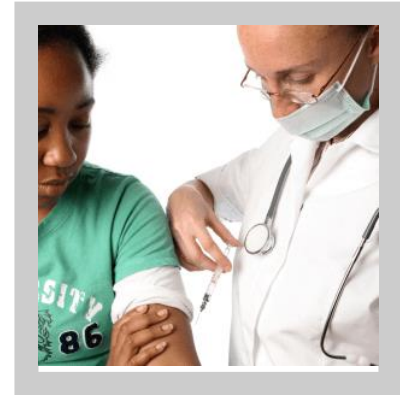


Name _____

Date _____

Autism and Vaccines: No Link

Autism spectrum disorders (ASD) are a range of psychological conditions characterized by abnormalities in social interaction, behavior, interests, and communication. The five forms of ASD include classical autism, Asperger syndrome, Pervasive Developmental Disorder, Rett syndrome, and Childhood Disintegrative Disorder. Although the number of reported cases of ASD has experienced a dramatic increase in the past 25 years, the majority of doctors agree that this increase is due to changes in diagnostic practices and advances in the understanding of psychiatric health.



While there is no general consensus among medical professional about the underlying causes of ASD, theories range from genetic inheritance to environmental factors. One of the most controversial theories to have emerged in recent times is the hypothesis that ASD could be caused by the MMR vaccine, which is an immunization against measles, mumps, and rubella that was first developed in the 1960's. The vaccine is a mixture of three live viruses and is administered via injection to children when they are one year old. By the late 1990's, this vaccination had led to the near-eradication of measles in countries that employed widespread inoculation. However, a combination of spurious scientific data and alarmist media attention led to an entirely preventable resurgence in measles cases in the early 21st century.

The first claims of a connection between the MMR vaccine and autism were made in 1998, when an article in *The Lancet*, a respected British medical journal, reported on eight cases of autism that could possibly be traced back to the administration of an MMR vaccine. The parents of the children in this study contended that the symptoms of autism in their children developed within days of vaccination. During a press conference, Andrew Wakefield, one of the authors of the article, called on British doctors to stop giving combined MMR vaccines, instead advocating for individual inoculations against measles, mumps, and rubella.

Following the publication of this article, Wakefield published several follow-up papers that further questioned the safety of the MMR vaccine. An onslaught of media coverage then began. Parents appeared on television sharing anecdotal evidence linking their child's inoculation to the onset of ASD. The popular press quickly seized upon this story; in 2002, over 1200 articles were written about the link between MMR vaccines and ASD. Less than 30% of these articles mentioned that an overwhelming amount of scientific evidence suggested that these vaccinations were completely safe.

Since the initial panic, fears that MMR vaccines cause ASD have generally subsided. A survey completed in 2004 showed that only 2% of people in the United Kingdom thought that there was a legitimate link between MMR vaccines and ASD. Fears were most likely allayed when, in 2004, an investigative reporter discovered that Andrew Wakefield had received a large sum of money from lawyers seeking evidence to use in cases against vaccine manufacturers. It was then discovered that Wakefield had applied for patents on an alternate MMR vaccine. These severe conflicts of interest damaged the credibility of Wakefield's study beyond repair. In 2010, Wakefield was tried by Britain's General Medical Council under allegations that he had falsified data and manipulated test results. The Council found that Wakefield had acted "dishonestly and irresponsibly," and consequently *The Lancet* officially retracted Wakefield's 1998 article.

The anti-MMR vaccine panic that arose immediately after Wakefield's article was published had a significant negative effect on the health of thousands of children. Once the controversy began, the number of parents in the United Kingdom who inoculated their children with the MMR vaccine experienced a sharp decline. Not surprisingly, the number of reported cases of measles increased; while there were only 56 confirmed cases of measles in the UK in 1998, in 2008 there were over 1300. Between 2002 and 2008, there were outbreaks of measles throughout Europe and North America. These outbreaks cost millions of dollars in health care and resulted in the deaths of dozens of children and adults with compromised immune systems.

Who is to blame for these deaths? It is easy to hold Andrew Wakefield accountable, but the media must also bear some of the responsibility. The media's appetite for a sensational medical story overshadowed the fact that there was very little scientific evidence behind Wakefield's claim.

Although Wakefield is certainly not the first person to publish fraudulent scientific findings in a respected medical journal, the magnitude of this event was anomalous, as most medical hoaxes are discredited before they can reach the popular media. While *The Lancet* should not have published Wakefield's article without checking it thoroughly, the popular media should not have blown the study out of proportion without fully considering the consequences.

- 1) The primary purpose of the passage is to
 - A. warn parents about the dangers of not vaccinating their children against measles
 - B. criticize *The Lancet* for publishing Wakefield's article without vetting it more thoroughly
 - C. provide an overview of the MMR vaccine controversy, including its consequences and responsible parties
 - D. inform readers about the history of the MMR vaccine, especially in the US and the UK
 - E. blame parents who believed alarmist media reports for the measles outbreaks

- 2) As used in paragraph 1, which is the best antonym for **spurious**?
 - A. reassuring
 - B. safe
 - C. clear
 - D. necessary
 - E. legitimate

3) Which of the following statements most accurately summarizes the author's explanation for the increase in reported cases of ASD over the past 25 years?

A. Over the past 25 years, parents have been more likely to have their young children inoculated against MMR.

B. Since the results of Wakefield's study were published, parents have been less likely to have their young children inoculated against MMR.

C. In the past 25 years, doctors have developed a better understanding of genetics, which is thought to be the leading factor in whether or not a child will develop ASD.

D. The drastic changes in our environment that have occurred over the past 25 years have most significantly contributed to an increase in cases of ASD.

E. The increase in reported cases of ASD is mainly the result of an increased understanding of how to recognize ASD.

4) Which of the following pieces of evidence from paragraphs 2 and 3 support(s) the author's claim that popular media is partially responsible for creating unnecessary panic?

I. "An article published in *The Lancet*, a respected British medical journal, reported on eight cases of autism that could possibly be traced back to the administration of an MMR vaccine."

II. "In 2002, over 1200 articles were written about the link between MMR vaccines and ASD. Less than 30% of these articles mentioned that an overwhelming amount of scientific evidence suggested that these vaccinations were completely safe."

III. "Parents appeared on television sharing anecdotal evidence regarding the links between their child's inoculation and the onset of ASD."

A. I only

B. II only

C. I and II only

D. II and III only

E. I, II, and III

5) In paragraph 4, the author cites all of the following as ways that Wakefield's study was discredited EXCEPT

A. investigators discovered that the parents of children in Wakefield's study were litigants in a lawsuit against the pharmaceutical company that made the MMR vaccine

B. The Lancet eventually retracted Wakefield's original article

C. it was discovered that Wakefield accepted money from lawyers who were filing a suit against the pharmaceutical companies responsible for making the MMR vaccine

D. an investigation into Wakefield's research found that he had falsified data in his initial study

E. Wakefield himself had apparently been working on an alternate vaccine to compete with MMR

6) Based on its use in paragraph 4, it can be inferred that the phrase “conflicts of interest” means situations in which people

- A. unethically accept large sums of money
- B. have interests that fail to accord with those of the mainstream media
- C. falsify data and manipulate test results
- D. have personal interests that threaten their official objectivity
- E. stand to gain financially through illegal means

7) As used in the final paragraph, which is the best synonym for **anomalous**?

- A. timely
- B. calamitous
- C. abnormal
- D. unacceptable
- E. coincidental

8) Do you believe parents have a responsibility to vaccinate their children against sicknesses such as the measles? Why or why not?

Answers and Explanations

1) C

Core Standard: **Integration of Knowledge**

An author's purpose is directly related to the content of the passage. In this passage, the author begins in paragraph 1 with background information about ASD and the controversy surrounding a possible link between ASD and the MMR vaccine. In paragraph 2, the author details how the possible link between ASD and the MMR vaccine was established. In paragraph 3, the author describes the media's role in heightening the controversy. In paragraph 4, the author identifies the reasons why the scientist behind the research came to be discredited, and why subsequently most people no longer believed there was a connection between ASD and vaccines. In paragraph 5, the author describes the negative consequences of parents choosing not to vaccinate their children against MMR. In paragraph 6, the author suggests that not only was falsified science to blame, but also the popular media that ran the story without fully checking the facts. Based on this content, we can determine that the author aims to provide an overview of the MMR vaccine controversy, including its consequences and responsible parties. Therefore **(C)** is correct.

The author addresses a general audience, not parents specifically. He or she also uses an informative tone rather than a warning tone. This means **(A)** is incorrect.

Although the author does criticize *The Lancet* for publishing Wakefield's article without checking it more thoroughly, this criticism is not the author's main point. The author's tone throughout the passage is more informative than critical. This means **(B)** is incorrect.

The author focuses specifically on the controversy surrounding a possible link between the MMR vaccine and ASD, not on the more general history of the MMR vaccine. This eliminates **(D)**.

At no point does the author blame parents. This eliminates **(E)**.

2) E

Core Standard: **Craft and Structure**

Spurious (*adjective*): false, counterfeit, or bogus; not valid or well-founded.

The author writes in paragraph 1 that "a combination of spurious scientific data and alarmist media attention led to an entirely preventable resurgence in measles." Later in the passage, in paragraph 4, the author writes that Wakefield, the scientist, testified that "he had falsified data and manipulated test results." Based on this information, we can understand that because the scientific data turned out to be false, *spurious* means fraudulent or illegitimate. This means a good antonym for *spurious* is *legitimate*. Therefore **(E)** is correct.

Reassuring means removing doubts and fears. Although the scientific data did provide doubts and fears, the larger problem with the data was not that it caused fear, but that it was false in the first place. This means **(A)** is incorrect.

Safe means protected from danger. While the scientific data led to dangerous consequences (parents not vaccinating their children), the data itself was false, not dangerous. This makes **(B)** incorrect.

Clear means easy to understand or interpret. The scientific data was false, not confusing. Therefore **(C)** is incorrect.

Necessary means required or essential. The scientific data did turn out not to be essential, but that is because it was false or unreliable. This makes **(D)** incorrect.

3) E

Core Standard: **Integration of Knowledge**

The author writes in paragraph 1: “Although the number of reported cases of autism has experienced a dramatic increase in the past 25 years, the majority of doctors agree that this increase is due to changes in diagnostic practices and advances in the understanding of psychiatric health.” In other words, there has not been any increase in environmental or genetic risks that could contribute to more cases of ASD; rather, doctors have just gotten better at recognizing and diagnosing it, which means more cases are reported. Therefore **(E)** is correct.

The passage ultimately discredits the link between ASD and the MMR vaccine, so the author does not say this could be the explanation for the increase in reported cases of ASD. This makes **(A)** incorrect.

Although it is true that parents have been less likely to have their young children inoculated against MMR since the results of Wakefield’s study were published, the author does not attribute the increase in reported cases of ASD to this fact. This means **(B)** is incorrect.

Although in paragraph 1, the author states there is a theory that “genetic inheritance” contributes to ASD, he or she claims that doctors agree the increase is due to a better “understanding of psychiatric health,” not a better understanding of genetics. Therefore **(C)** is incorrect.

Although in paragraph 1 the author states there is a theory that “environmental factors” contribute to ASD, he or she claims that doctors agree the increase is due to a better “understanding of psychiatric health,” not to environmental changes. Therefore **(D)** is incorrect.

4) D

Core Standard: **Integration of Knowledge**

In paragraph 2, the author identifies *The Lancet* as a scholarly journal, not a popular media outlet. In the final paragraph, the author writes, “While *The Lancet* should not have published Wakefield’s article without checking it thoroughly, the popular media should not have blown the study out of proportion without fully considering the consequences.” From this information we can further determine that the author considers *The Lancet* separate from the popular media. This eliminates **option (I)**.

In paragraph 3, the author implies that by publishing articles that ignore “an overwhelming amount of scientific evidence,” the media is guilty of using sensationalist news to create unfounded mass panic. This supports **option (II)**.

In paragraph 3, the author implies that by broadcasting parents who have only “anecdotal,” or unproven, evidence to share, the media is guilty of using sensationalist news to create unfounded mass panic. This supports **option (III)**.

Therefore **(D)** is correct.

5) A

Core Standard: **Key Ideas and Details**

Although the author claims that Wakefield accepted money from lawyers filing a suit against the companies that manufactured the MMR vaccine, the author does not state that the parents of the children in Wakefield's study were the litigants in the lawsuit. This idea is never mentioned in the article. Therefore **(A)** is correct.

In paragraph 4, the author writes, "*The Lancet* officially retracted Wakefield's 1998 article." This eliminates **(B)**.

In paragraph 4, the author writes: "An investigative reporter discovered that Andrew Wakefield had received a large sum of money from lawyers seeking evidence to use in cases against vaccine manufacturers." This eliminates **(C)**.

In paragraph 4, the author reports that "Wakefield was tried by Britain's General Medical Council under allegations that he had falsified data and manipulated test results." This eliminates **(D)**.

In paragraph 4, the author writes: "Wakefield had applied for patents on an alternate MMR vaccine." This eliminates **(E)**.

6) D

Core Standard: **Integration of Knowledge**

In paragraph 4, the author writes: "Fears were most likely allayed when, in 2004, an investigative reporter discovered that Andrew Wakefield had received a large sum of money from lawyers seeking evidence to use in cases against vaccine manufacturers. It was then discovered that Wakefield had applied for patents on an alternate MMR vaccine. These severe conflicts of interest damaged the credibility of Wakefield's study beyond repair." Based on this information, we can understand that the phrase "conflicts of interest" refers to two incidents: the first is that Wakefield received a large sum of money from lawyers seeking evidence to use against vaccine manufacturers, and the second is that Wakefield had applied for patents on an alternate MMR vaccine.

From this we can infer that Wakefield had a financial incentive (money from the lawyers) to find evidence that something was wrong with the MMR vaccine, and also that he stood to gain financially from an alternate vaccine he had created if the current vaccine could be discredited. We also know from the passage that these conflicts of interest "damaged the results of his study beyond repair," so they had a negative impact. Because Wakefield had personal, financial interests that threatened his ability to be impartial in his official role as a scientist, we can understand that the phrase "conflicts of interest" refers to having personal interests that threaten one's official objectivity. Therefore **(D)** is correct.

Although the author claims that Wakefield did accept a large sum of money from lawyers, this incident represents only one of the conflicts of interest described. This means **(A)** is incorrect.

The passage does not suggest that Wakefield had interests that failed to accord with those of the mainstream media, so **(B)** is incorrect.

Although in paragraph 4 the author does state that Wakefield was tried under allegations that he falsified data and manipulated test results, the phrase “conflicts of interest” does not refer to this trial. Rather, his conflicts of interest led the Britain’s General Medical Council to try him. Therefore **(C)** is incorrect.

Although the author claims that Wakefield stood to gain financially through what some would consider unethical means, he or she does not go so far as to say what Wakefield did was illegal. Indeed, he was not tried in a court of law, but by Britain’s General Medical Council. This means **(E)** is incorrect.

7) C

Core Standard: **Craft and Structure**

Anomalous (*adjective*): deviant from the norm or from expectations.

In the final paragraph, the author argues: “Although Wakefield is certainly not the first person to publish fraudulent scientific findings in a respected medical journal, the magnitude of this event was anomalous, as most medical hoaxes are discredited before they can reach the popular media.” If, as the passage states, the magnitude of this event was larger than usual because the hoax was not discredited before reaching the popular media, then we can infer that *anomalous* means unusual or deviating from the norm. This means that *abnormal* is a good synonym. Therefore **(C)** is correct.

Timely means done at a favorable or appropriate time. This sentence discusses the unusual size of this medical hoax, not the timing of it, so **(A)** is incorrect.

Calamitous means disastrous. Although the event did have disastrous consequences, this sentence is discussing the abnormal size of the event as compared to other medical hoaxes, not the consequences of this specific event. This makes **(B)** incorrect.

Unacceptable means not satisfactory. This sentence does not contain judgment about the medical hoax, but rather objectively compares its unusual magnitude to that of other hoaxes. This means **(D)** is incorrect.

Coincidental means accidental or resulting from a coincidence. We can infer from the passage, however, that the author does not believe that the abnormal magnitude of the hoax was accidental. Rather, he or she blames Wakefield as well as the popular media. This eliminates **(E)**.