

SECTION

7

# RESEARCH AND DESIGN IN BIOMEDICAL SCIENCE



# BIOMEDICAL INNOVATION

## Research and Design in Biomedical Science

### INTRODUCTION

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Welcome to another captivating section. In this section, you will develop essential skills for evaluating online information relevant to biomedical research. You will focus on navigating reliable health information, beginning with website credibility. You will create a checklist to assess the trustworthiness of online sources by examining factors such as source reputation and publication date. You will also examine the dangers of misinformation and its potential impact on scientific research. You will learn how to search for reliable scientific articles using tools like PubMed. By evaluating peer review and author ability, you will gain confidence in finding credible research. Finally, you will address real-world healthcare challenges in Ghana. You will analyse pressing issues, brainstorm potential solutions, and explore approaches such as technology and education, empowering you to contribute meaningfully to your community. Let us begin this important journey together. Try the activities out!

#### At the end of this section, you will be able to:

- Analyse website content and assess the overall credibility of the information.
- Use online search engines and journal databases to find reliable scientific articles.
- Use different approaches to propose solutions to healthcare problems in the country.
- Make an effective presentation of scientific information on a healthcare issue.

#### Key Ideas

- Credible information is important for trustworthy research because it comes from reliable sources and is based on facts that can be verified.
- Misinformation can cause serious problems, such as wrong conclusions and harm to reputations. Hence, there is a need for fact-checking and peer review to support the quality of scientific research.
- To find reliable scientific articles, use trusted databases like Google Scholar or PubMed, focus on peer-reviewed articles, check the journal's reputation, and review authors' affiliations with respected institutions.
- Universal healthcare coverage and health education help all citizens access quality care and promote healthy lifestyles, preventing diseases and enabling early detection.
- Supporting research and innovation is essential for creating new treatments and improving healthcare access, leading to better health outcomes for everyone.
- Finding a healthcare problem involves gathering data, analysing causes, and



formulating a clear statement to understand its impact.

- Providing solutions requires understanding the problem, reviewing evidence, involving stakeholders, and monitoring progress for effective healthcare interventions.

## ANALYSIS OF WEBSITE CONTENT AND ASSESSMENT OF INFORMATION CREDIBILITY

Though technological advancements make information readily available but not all information can be trusted. Here, you will explore how to access information from websites and evaluate the credibility of the information found. You will also look at the effects of false information on research and science.

**Credible Information:** Credible information is trustworthy, reliable, and based on facts that can be verified. Reliable sources of credible information include government websites, academic journals, reputable institution websites, and books from well-known publishers and publications. Examples of trustworthy organisations are the World Health Organization (WHO), the Ghana Health Service (GHS), and the Ghana Registered Nurses and Midwives Association (GRNMA). However, not everything found online is reliable. Some websites may share false or misleading information, especially on social media and user-generated platforms like Facebook, X, and WhatsApp, and on unverified sites like Wikipedia. How do you evaluate the source of information to decide its credibility?

**To evaluate credible scientific information, one needs to consider these criteria:**

1. The reputation of the author or website
2. The relevance of the information to your topic
3. The publication date—how recent is it?
4. Asking experts in the field
5. Checking information with trusted sources like WHO, PubMed, and GHS
6. Thinking about any personal biases of the authors

Implications of False Information on Research and Science

False information can have grave consequences for research and science. False information, also known as misinformation or false data, is any piece of information or data that is factually incorrect, misleading, or not supported by evidence. When this kind of information gets into scientific research, it can lead to serious problems, such as wrong conclusions, damage to the reputations of researchers and their institutions, ethical issues, loss of trust, and wasted resources.

To reduce the impact of false information on scientific research, it is important to use fact-checking, peer review, transparent data sharing, and data validation.

Magnificent work done! Now explore the activities below. Feel free to ask for help!

### Activity 7.0: How to Evaluate Sources for Reliability

1. Click [here](#) to watch a video on how to get reliable sources of information
2. Write down the sources considered reliable in the video. Share any other thing you learned.

### Activity 7.1: Assessing Credibility Online Information

**Materials needed:** Computer or Google Scholar with internet access and notebook for notes

**Steps to follow:**

- a. Choose a science topic you are curious about (e.g., climate change, vaccines, etc.).
- b. Use a search engine (like Google Scholar, or Wikipedia) to find articles related to your topic. Pick two articles from diverse sources to evaluate. Does each article relate to your topic?
- c. Jot down the author's details and the date of publication. Ask someone knowledgeable what they think. Check if the article cites sources like WHO or PubMed.
- d. Think about whether the authors might have a bias. Do they receive help from a particular viewpoint? Is the tone of the article neutral or biased?
- e. Based on your assessment, decide which article is the more credible. Write a brief justification explaining your choice, using the points you wrote. Share what you learned with friends or family.

### Activity 7.2: Create Your Credibility Checklist

1. Grab a friend or family member and discuss what makes information reliable. Write down ideas about qualities that show credibility (e.g., expert authorship, reputable sources).
2. Search for one credible article and one article that seems questionable. Look for topics like health, science, or current events.

Develop a checklist with at least five criteria. Here is a starter list you can customise:

- a. **Author ability:** Is the author an expert in the field?
- b. **Source reputation:** Is the website well-known and respected?
- c. **Evidence provided:** Does the article include data or references to studies?
- d. **Balanced viewpoint:** Does it present multiple perspectives or just one side?
- f. **Spelling and Grammar:** Is the article well-written and free of errors? Etc.

### Activity 7.3: Exploring with your Checklist

Use your checklist on the articles you found earlier as well as two articles from other websites including WHO, GHS, and social media like Facebook, X, etc.

- a. Mark which criteria each article meets.
- b. Analyse which article is credible, and which one is not. Consider factors like bias, lack of evidence, or sensational language.
- c. Based on the evaluation, adjust your checklist. Add or change criteria as needed to make it more effective.
- d. Present your checklist to others. Explain how it can help them assess information online.

### Self-Reflection

Think about how this checklist can help you in your studies and everyday life. Why is it important to know how to spot false information? Enjoy using your new tool!

## LOCATING RELIABLE SCIENTIFIC ARTICLES USING ONLINE SEARCH ENGINES AND JOURNAL DATABASES

Finding a trustworthy scientific article using online search engines and journal databases is a crucial step in research. Here are some simple steps to help you find reliable articles:

1. **Use trusted databases:** Start with well-known databases like Google Scholar, PubMed, or Scopus.
2. **Look for peer-reviewed articles:** Make sure the articles have been peer-reviewed, meaning they have been checked by experts for quality.
3. **Check journal reputation:** Investigate the reputation of the journals where the articles are published.
4. **Review authors' affiliations:** See which institutions the authors are connected to, as respected institutions often produce good research.

The reputation of a journal depends on many factors, such as its sponsors, the aim, scope, and mission statement, and the publisher. Good journals usually rely on peer review and may have a group of experts as part of their editorial team. These features help ensure the journal is a reliable source for research information.

Fantastic for coming this far! Now, let us embark on a fun and interactive journey to explore further how to assess the credibility of online information while creating an awesome presentation!

### Activity 7.4: Credibility Quest Challenge

**Materials needed:** Computer or smartphone with internet access; notebook for notes,

presentation software (like Google Slides or PowerPoint); Timer (or stopwatch)

#### Steps to follow:

- a. Pick a theme that interests you, from climate change, and COVID-19 vaccines, to nutrition.
- b. Set the Timer: Give yourself 10 minutes to search for credible information about your theme using online search engines like Google. Ready? Set? Go!  
Create another credibility checklist to find at least three credible sources. Evaluate each source based on:
  - a. Author ability: Is the author an expert in the field?
  - b. Source reputation: Is the website well-known and trustworthy?
  - c. Evidence provided: Does the article include data or references to studies?  
Etc.

Well done! Keep your information for the next activity.

### Activity 7.5: Presentation on Credibility Quest Challenge

After gathering your information in **Activity 7.4**, create a short presentation (5-7 slides) that includes:

- a. Introduction, body (main points of your topic) and conclusion
- b. The credible sources you found and reasons why those sources are trustworthy
- c. Any misinformation or biases you encountered

Once your presentation is ready,

- a. practice presenting it to yourself. Imagine you are explaining it to an audience. This will help you build confidence!
- b. Then find a friend or family member and present to them. Ask for feedback from them

## Self-Reflection

After your presentation, take a moment to think about what you learned. Consider these questions: What challenges did you face in finding credible information? How did your checklist help you assess sources? Were you surprised by any information you found?

# PROPOSING SOLUTIONS TO HEALTHCARE PROBLEMS IN THE COUNTRY USING VARIOUS APPROACHES

A country can adopt several tailored approaches to effectively tackle healthcare issues and improve the health of the population depending on its specific needs. Let us explore such approaches in detail.

## Approaches to Address Healthcare Problems in the Country

Here are some examples of approaches that can be used to address healthcare problems:

1. **Universal healthcare coverage:** This ensures that all citizens can access quality healthcare. Programs like the National Health Insurance Scheme (NHIS) and government-funded initiatives, such as nationwide COVID-19 vaccinations and infant immunisations, help promote public health.
2. **Health education and prevention:** Raising awareness about healthy lifestyles, vaccinations, and regular check-ups can prevent diseases and allow for early detection and treatment.
3. **Healthcare infrastructure and resources:** Investing in healthcare facilities—like hospitals, clinics, and Community Health Planning and Services (CHPS) centres—and ensuring there are enough medical equipment and healthcare professionals, such as doctors and nurses, is important for meeting the healthcare needs of the population.
4. **Research and Innovation:** Supporting research in healthcare and medical science can lead to new treatments, better ways to prevent diseases, and improvements in medical technology.
5. **Disaster preparedness and response:** A strong healthcare system must be ready to handle public health emergencies effectively. This includes preparing for disasters, training healthcare workers, and having plans in place, like temporary facilities for patients with infectious diseases.

## How Research and Innovation Can Help Solve Healthcare Problems

In this technological advancement era, research and innovation play important roles in addressing various healthcare problems. Below are some significant roles of research and innovation:

1. **Advancing medical knowledge:** Research enhances our understanding of diseases, including their causes, risk factors, and treatment options. Scientific studies and clinical trials can lead to new medical breakthroughs and therapies, resulting in better health outcomes for patients.
2. **Developing new treatments and therapies:** Innovation in pharmaceuticals and medical technology can produce new drugs, vaccines, medical devices, and therapies. These advancements can help treat conditions that were previously untreatable or poorly managed, improving patients' quality of life.
3. **Preventive healthcare:** Research can show effective ways to prevent diseases. By understanding risk factors and promoting healthy behaviours, healthcare systems can shift their focus from treatment to prevention, reducing the incidence of diseases.
4. **Improving access to healthcare:** Research can uncover barriers that prevent people from accessing healthcare and suggest solutions to make it fairer and more affordable. This can involve using telemedicine, mobile health (mHealth) technologies, and community-based care models, such as CHPS compounds.

Through these efforts, research and innovation can significantly improve healthcare systems and the overall health of the population.

Well done! Get ready to explore more healthcare problems in Ghana and think of solutions on your own while having fun with research and creativity. Enjoy your exploration!

### Activity 7.6: Explore healthcare challenges in Ghana

Materials needed: notebook for notes, access to the internet. Get started!

1. **Pick a Challenge:** choose one healthcare challenge in Ghana to focus on, like COVID-19, malaria, or malnutrition (like Kwashiorkor).
  - a. Spend some time online finding out more about your chosen challenge. Look for interesting facts and information. Write down what you learn!

Find Solutions:

- a. Look up how Ghana is trying to solve this problem. Check out the National Health Insurance Scheme (NHIS) and the cash-and-carry system. Jot down how these ideas help people.
- b. Reflect on these questions:



- i. Why is this health challenge important?
  - ii. Do you think the NHIS works well? Why or why not?
  - iii. What could be a new idea to help solve this problem?
3. Make a colourful poster or drawing that shows the health challenge and your ideas for solutions. Use pictures, drawings, or even cutouts from magazines!
  - a. Show your poster to a friend or family member. Explain what you learned and your cool ideas for solutions!

### Activity 7.7: Solve a healthcare problem in your community

**Materials needed:** notebook for notes, access to the internet or library, art supplies (optional, for presentations).

#### Steps to follow:

- a. Look around your community and pick one healthcare problem that stands out to you. It could be something like a lack of clean water, high rates of malaria, or poor nutrition.
- b. Use online resources, books, or talk to someone knowledgeable (like a teacher or family member) to find workable solutions to the problem you chose. Write down the ideas you discover!
- c. Search online to see how other people are solving similar health problems. Take notes on what you like about their solutions and how they might work in your community.

Create a proposal that includes:

- a. The healthcare problem you found
- b. Your research findings about the healthcare issue
- c. Solutions you think will work best and ideas inspired by others

Create a colourful poster or presentation that summarises your proposal. Use drawings, pictures, or any creative elements to make it engaging. Share with friends or family.

### Activity 7.8: Steps to Achieve Research on Innovative Approaches (1)

1. Choose another specific healthcare problem you want to address.
2. Explore Technological Solutions:
  - a. Search for existing apps or technology that help with your chosen problem. Take notes on features, user feedback, and effectiveness.
  - b. Consider how you might improve or adapt these technologies for your community.

### 3. Investigate Educational Campaigns:

- a. Look for examples of successful community outreach programs. What strategies did they use? What were their goals?
- b. Think about how you could create your campaign. What message would you promote, and how would you reach people?

## Activity 7.9: Steps to Achieve Research on Innovative Approaches (2)

Use the same healthcare problem, you chose to address in **Activity 7.8**, for this activity

1. Research local healthcare policies, challenges in access, and articles on policy changes and advocacy organisations.
2. Organise your notes into categories based on the three approaches: technological solutions, educational campaigns, and policy advocacy.
3. Highlight key points, statistics, and examples that support your ideas.
4. Which solution seems most achievable in your community? Why?

Prepare to propose your solution:

1. Choose one innovative approach that you believe is the best solution for the healthcare problem. Share your proposal with friends or family because you believe it will be effective.

## Self-Reflection

What was the most surprising thing you found? How can your solutions help your community? What skills did you use while researching and creating your proposal?

# MAKING EFFECTIVE PRESENTATION OF SCIENTIFIC INFORMATION ON A HEALTHCARE ISSUE 1

Effective presentation of scientific information on healthcare problems needs to be clear and well-organised, using visuals to help people understand. Including facts, real-life examples, and a strong call to action can make the information more engaging and encourage the audience to take informed steps about the issue. Hence, a need to find the healthcare problem.

Finding a Healthcare Problem: Causes, Effects/Symptoms, And Practical Solutions

Finding a healthcare problem is crucial for improving health in individuals and communities, ensuring everyone has access to the care they need. This process involves

understanding the causes, recognising symptoms and effects, and finding effective solutions. It helps healthcare professionals develop targeted strategies to address health concerns and promote overall well-being. *Let us explore the approach.*

## 1. How to find a healthcare problem in society

Detecting a healthcare problem requires a step-by-step approach to understanding the challenges faced by people. By following this method, healthcare professionals can have a picture of these issues and develop strategies to improve health outcomes for individuals and communities.

*Below are systematic steps for finding a healthcare problem:*

- a. Conduct surveys or interviews: Talk to patients in the affected group to gain insights into the problem and its effects.
- b. Find contributing factors: Look for reasons behind the healthcare problem, *such as socioeconomic status, environmental influences, or lifestyle habits* and how they contribute to the healthcare issue.
- c. Consult existing literature and evidence: Review existing studies and evidence to build on current knowledge and avoid repeating efforts.
- d. Analyse data and trends: Use data analysis to find patterns and understand the scale of the problem.
- e. Formulate a problem statement: Create a clear statement that describes the healthcare problem and its importance based on the information gathered.

## 2. How to find the cause of the healthcare problem

Finding the causes of a healthcare problem is particularly important for developing effective treatments and improving health outcomes. Knowing the root causes helps healthcare professionals to create targeted solutions that address the issue directly.

*To decide the cause of a healthcare problem, use these steps:*

- a. Gather data: collect detailed information from patients or the affected population, including medical history, symptoms, lifestyle factors and any relevant environmental factors.
- b. **Perform physical examination and diagnostic tests:** for individual patients, conduct a thorough physical examination and order relevant diagnostic tests to assess the patient's health status and find any underlying medical conditions.
- c. Conduct medical history interviews: Take a thorough medical history to understand symptom timelines, past conditions, and potential triggers.
- d. Utilise data analysis: Analyse data to show connections and potential causes related to the healthcare issue.
- e. Peer review and validation: Get feedback from experts to confirm your findings and ensure they are robust.

Finding the cause of a healthcare issue is vital because it enables targeted treatments, effective prevention strategies, and better overall health outcomes.

### 3. How to analyse the effects of the healthcare problem

Examining the effects of a healthcare problem involves a step-by-step approach to look at its impact on individuals, communities, and the healthcare system.

*To analyse the impacts of a healthcare problem, follow these steps:*

- a. Find data sources: Find data sources that provide information on the problem's effects, such as medical records and public health reports.
- b. Use quantitative and qualitative analysis: Apply research methods to measure the effects and analyse trends over time and among diverse groups.
- c. Examine health outcomes: Assess the consequences of the healthcare problem, including rates of illness, death, and quality of life.
- d. Consider socio-economic effects: Evaluate how the problem affects individuals and communities economically, including healthcare costs and lost productivity.
- e. Interpret findings: Understand the results in the context of the healthcare issue and its broader implications.
- f. Summarise and communicate results: Present the findings clearly and share them with relevant stakeholders to inform policy and interventions.

By analysing the effects of a healthcare problem, we gain valuable insights for developing targeted solutions or interventions and improving health outcomes.

### 4. How to Provide Solutions to a Healthcare Problem

Solving a healthcare problem requires a careful and organized approach. To solve a healthcare problem, follow these steps:

- a. **Understand the Problem and Causes:** Know the healthcare issue well, including its causes and effects on people.
- b. **Review Existing Evidence:** Look at research and guidelines to find successful solutions used for similar problems.
- c. **Monitor and Evaluate:** After implementing the solution, check its progress and effectiveness regularly, using feedback to improve it.
- d. **Involve Stakeholders:** Get input and support from key people involved in the healthcare system.
- e. **Sustain the Solution:** Plan to keep the solution effective over time by securing funding and integrating it into current practices.

Finding a solution to a healthcare problem requires teamwork, involving different stakeholders, using proven practices, and a focus on ongoing improvement. By following these steps, you can improve the chances of successfully implementing a solution that enhances healthcare outcomes and addresses the issue at hand.

Get ready for intriguing activities. You will become a healthcare detective, finding a healthcare problem, its causes, and effects, and proposing creative solutions! Enjoy exploring



### Activity 7.10: Finding a Healthcare Problem

**Materials needed:** notebook for notes, access to the internet (optional), art supplies (optional for a creative presentation)

1. Think of a healthcare issue that interests you (like obesity, asthma, or mental health). Write it down as your “mystery case.”
2. Create a mind map in your notebook. Start with your chosen problem in the centre and branch out to list potential causes. Think about lifestyle, environment, and education.
3. Make a list of symptoms or effects that arise from this problem. Use bullet points for clarity. How does this issue affect individuals and the community?
4. Surf online for existing solutions to your problem. Write down any community programs, campaigns, or policies that address it.
5. Choose one solution you find most interesting and create a mini-poster or infographic. Include: The healthcare problem, causes, symptoms, and your proposed solution.
  - a. Use drawings, colours, and visuals to make it engaging!
  - b. Share your mini poster with family members or friends. Explain your healthcare problem and walk them through your findings. Encourage them to ask questions!

### Activity 7.11: Presentation for healthcare problem awareness

Choose a different health problem of interest. Focus on

- a. Causes: What factors contribute to the occurrence of this health issue?
- b. Effects/Symptoms: What are the physical, social, and economic impacts of this problem?
- c. Possible Solutions: Brainstorm potential solutions and discuss their feasibility and effectiveness.

Prepare a presentation. It can include elements like infographics, videos, or role-plays to effectively communicate the problem, its causes, effects, and practical solutions to friends or family.

### Self-Reflection

Consider what you have learned so far. Why is it important to find healthcare problems and their solutions?

# MAKING AN EFFECTIVE PRESENTATION OF SCIENTIFIC INFORMATION ON A HEALTHCARE ISSUE 2

Here, you will explore specific strategies to guide you in applying the step-by-step approach to finding a health problem as well as finding the causes, symptoms or effects and proposing potential solutions to that healthcare problem.

Recognising a healthcare problem: causes, effects/symptoms, and practical solutions

In urban Ghana, the local health department and healthcare providers hold a health fair to find health problems and explore solutions. The event takes place in a central park, attracting residents from different neighbourhoods (See Fig. 7.1). Consider the approaches below:

## 1. Finding the healthcare problem

The strategies below are used to find a healthcare problem in the local community.

### Step 1: Health Fair and Community Participation

The fair features booths for health screenings, educational materials, and fun activities. People of all ages, including families and seniors, are encouraged to take part and give feedback.

### Step 2: Data Collection and Health Screenings

Participants fill out health questionnaires about their health, lifestyle, and access to care. They also receive on-site screenings, like blood pressure checks and glucose tests, to spot potential health issues.

## 2. Causes of the healthcare problem

From the information gathered, the causes of the healthcare problem can be seen:

### Step 3: Causes and Risk Factors

The data reveals several health problems and their causes:

- a. High obesity rates due to limited exercise options and unhealthy eating.
- b. Poor access to healthcare in some areas, leading to delays in treatment.
- c. Tobacco use and second-hand smoke exposure from a lack of support to quit.
- d. Mental health issues from high stress, especially among students and workers.
- e. Low awareness of preventive healthcare, resulting in fewer vaccinations and screenings.

### 3. Naming the symptoms or effects of the healthcare problem

Next is to look out for the symptoms of the healthcare problem from the data.

#### Step 4: Symptoms and Effects

The health fair and questionnaires show symptoms related to these problems:

- a. Obesity: Residents report tiredness, joint pain, and difficulty moving.
- b. Limited healthcare access: Many share stories of delayed treatments.
- c. Tobacco use: Some complain of breathing problems and constant coughs.
- d. Mental health: Participants mention anxiety, depression, and trouble sleeping.

### 4. Possible Solutions to the healthcare problems

Once the problem is found, there is a need to propose solutions and implement them through the following series of steps:

#### Step 5: Community validation and feedback

The health department holds meetings to share findings and gather community input, involving local organisations for more insights.

#### Step 6: Developing Solutions

Working with healthcare providers and community leaders, the health department creates solutions:

- a. Start community gardens and promote farmers' markets for fresh food access.
- b. Set up mobile health units and telehealth services in underserved areas.
- c. Launch smoking cessation programs and promote smoke-free spaces.
- d. Organise stress management workshops and mental health campaigns.
- e. Conduct health education workshops to encourage preventive care.

#### Step 7: Implementation and Evaluation

Throughout the year, the health department implements these solutions with local partners. They check progress through data collection and community feedback, evaluating health outcomes to make improvements.



Fig. 7.1: Addressing health challenge in the society

## Health Awareness Fair in a Rural Community

In a rural Ghanaian community, local leaders and health professionals organize a Health Awareness Fair to address common health issues prevalent in their society. The fair is held in the village square, with participation from health experts and volunteers.

### Step 1: Finding healthcare problems

Leaders conduct surveys and interviews to find major health concerns, discovering that malaria, malnutrition, and waterborne diseases are significant issues.

### Step 2: Understanding causes

Volunteers visit homes to interview residents, finding that stagnant water, poor waste disposal, and lack of hygiene education contribute to these problems. Limited access to nutritious food and poor dietary knowledge lead to malnutrition.

### Step 3: Symptoms and effects

Health professionals educate the community about the symptoms. For example, malaria can cause fever and fatigue, while malnutrition can result in stunted growth and weakened immunity.

### Step 4: Practical solutions

The fair promotes preventive measures and solutions, including:

- a. **Malaria prevention:** Distributing mosquito nets and teaching residents how to remove breeding sites.
- b. **Waterborne disease prevention:** Discussing the importance of clean water and showing simple purification methods.
- c. **Nutrition education:** Conducting workshops on balanced diets and cooking with local ingredients.
- d. **Hygiene promotion:** Organising sessions on handwashing and waste disposal, providing soap and sanitisers.



- e. **Community health centre:** Planning to set up a local health centre for basic healthcare services.
- f. **Health monitoring and follow-up:** Setting up a system for local volunteers to check on households and support preventive measures.

By putting these solutions into action, the community aims to improve health, reduce preventable illnesses, and promote a culture of health awareness. The Health Awareness Fair becomes a regular event, encouraging ongoing community engagement.

You are a genius! Now, explore the activities here. You will continue to research some healthcare problems, find their causes, and effects, and propose solutions.

### Activity 7.12: Create a PowerPoint Presentation on a Healthcare Problem (A)

**Materials Needed:** Computer or tablet for creating the PowerPoint, access to the internet for research, notebook for notes, etc.

#### Steps to Follow:

1. Choose a healthcare issue that affects your community or society, such as mental health, obesity, or diabetes.
2. Use online resources, and books, or consult with family and friends to gather information about your chosen problem. Take notes on:
  - Causes: What leads to this health issue?
  - Symptoms: How does this problem impact individuals and the community?
3. Look for existing remedies or solutions that have been recommended, such as community programs, educational campaigns, or policy changes. Critically analyse their effectiveness.

Splendid work! keep this information for the next activity.

### Activity 7.13: Create PowerPoint Presentation on a Healthcare Problem (B)

Use the information you obtained in activity 7.13 to complete this activity.

Create your PowerPoint with the following slides:

- a. Title Slide: Include the title of your presentation and your name.
- b. Introduction Slide: Briefly introduce the healthcare problem.
- c. Causes Slide: List and explain the causes of the problem.
- d. Effects/Symptoms Slide: Describe the effects and symptoms.

- e. Solutions Slide: Present the remedies you researched and your thoughts on their effectiveness.
- f. Conclusion Slide: Summarize your findings and suggest your own solution.
- g. Make It engaging by using visuals, bullet points, and graphs to make your slides interesting. Aim for clarity and creativity! Etc.

Practice your presentation by presenting it to yourself to ensure you can explain each slide confidently. Share your presentation with your class, friends, family members or the community. Engage your audience by encouraging questions after the presentation.

### Self-Reflection

After your presentation, think about what you learned. Consider what was the most surprising finding. How can your proposed solutions help others?

# Review Questions

Multiple Choice Questions.

1. The best example of a credible source of information is...
  - A. government website.
  - B. personal blog site
  - C. social media post
  - D. Wikipedia website article.
2. All the following are benefits of peer review except, that it...
  - A. ensures an expert evaluation of the article's quality
  - B. guarantees the article will be widely cited
  - C. helps support exacting standards in research
  - D. provides a quality check before publication
3. Which of the following criteria is NOT recommended for evaluating the credibility of a source?
  - A. Author's subjective opinions
  - B. Confirming details with trusted sources
  - C. Publication date of the information
  - D. Reputation of the author or website
4. One potential consequence of using false information in scientific research is...
  - A. enhanced reputation for researchers.
  - B. improved research outcomes.
  - C. increased funding for projects.
  - D. loss of trust in research findings.
5. The method that can help reduce the impact of false information in scientific research is...
  - A. Ignoring peer reviews of one's research work.
  - B. Implementing fact-checking and data validation.
  - C. Relying solely on social media for updates.
  - D. Using unverified sources for data.
6. It is important to consider the publication date of information because...
  - A. all information is equally valid regardless of date.
  - B. older information is always more reliable.
  - C. recent information is likely to be more relevant.
  - D. the publication date is irrelevant to credibility.

- 7.** A trustworthy database for scientific articles can be obtained by...
- A. checking if it has a user-friendly interface.
  - B. looking for advertisements on the site.
  - C. seeing if it includes social media links.
  - D. verifying from Google Scholar or PubMed.
- 8.** What does it mean if an article is peer-reviewed? It is...
- A. evaluated by experts in the field.
  - B. freely available online for peers.
  - C. published without any checks.
  - D. written by a well-known author.
- 9.** The importance of checking the reputation of a journal is to
- A. decide if it offers free access to peer review all articles.
  - B. ensure it adheres to standards of quality and reliability.
  - C. find out how many articles it publishes each month.
  - D. see if it has a colourful and user-friendly website.
- 10.** What should one consider when reviewing an author's affiliation?
- A. author's popularity among peers in the field.
  - B. author's subjective opinions on social media.
  - C. institution's contribution to research.
  - D. number of articles the author has written.
- 11.** All the following are characteristics of reputable scientific journals, except
- A. relying on peer review for quality assurance
  - B. having an editorial board of diverse experts.
  - C. publishing articles received without review.
  - D. supporting ethical standards in publishing.
- 12.** One key benefit of universal healthcare coverage is, that it...
- A. drops the need for health education.
  - B. ensures access to quality healthcare
  - C. increases healthcare costs for citizens.
  - D. restricts access to healthcare providers.
- 13.** Who is primarily responsible for implementing programs like the National Health Insurance Scheme (NHIS)?
- A. Private organisations
  - B. Non-governmental organisations
  - C. Government authorities
  - D. Individual citizens
- 14.** One approach that can help prevent diseases through awareness is
- A. disaster preparedness
  - B. health education and prevention



- C. research and innovation
- D. universal healthcare coverage

**15.** How can investing in healthcare infrastructure help a country? By

- A. reducing the number of healthcare professionals.
- B. increasing the availability of hospitals and clinics.
- C. limiting access to medical equipment in healthcare.
- D. promoting healthy lifestyles among professionals.

## Essay Question

**1.** Read the case scenario given below and use it to answer the questions that follow

In Adakope, the rising obesity rates among children have become a significant public health concern. Recent studies show that 30% of children aged 6-12 are classified as obese. This poses risks for various health issues, including diabetes, heart disease, and psychological problems. The Health Department conducted surveys and interviews with parents, teachers, and healthcare providers. They found several contributing factors: Lack of access to healthy food options, limited opportunities for physical activity due to urban design and insufficient health education in schools.

- a. How was the health department able to find the healthcare problem?
  - b. What were some of the potential causes of this healthcare problem
  - c. Discuss any two strategies you will adopt to address the root cause of this childhood obesity.
  - d. Suggest what should be done after implementing the solutions to this healthcare issue.
- 2.** Discuss the systematic steps involved in naming a healthcare problem in society.
- 3.** Analyse the importance of finding the causes of a healthcare problem.

# Answers to Review Questions

1. A	6. C	11. C
2. B	7. D	12. B
3. A	8. A	13. C
4. D	9. B	14. B
5. B	10. C	15. B

## Essay Questions

1.

- a. The Health Department found the healthcare problem through surveys and interviews with key stakeholders, including parents, teachers, and healthcare providers. This helped them gather insights into the challenges faced by children in the community.
- b. Potential causes found include
  - Limited access to healthy food options in the community
  - Urban design that restricts physical activity (e.g., lack of parks)
  - There is a gap in health education within schools about nutrition and exercise
- c. A potential solution could involve a multi-faceted approach
  - Establish community gardens to provide fresh fruits and vegetables.
  - Create after-school programs focused on physical activities and nutrition education.
  - Collaborate with local schools to integrate health education into the curriculum.
  - Improve urban planning to include more recreational spaces and safe walking paths.
  - Launch a public awareness campaign to promote healthy eating and active lifestyles among families.
- d. Monitor and evaluate the progress of the implemented solution or interventions

2. Refer to the note on: *How to find a healthcare problem in society* on **page xxx**.

3. Finding the causes of a healthcare problem is particularly important for developing effective treatments and improving health outcomes. Knowing the root causes helps healthcare professionals to create targeted solutions that address the issue directly.

## Extended Reading

- Click [here](#) to read more on credible sources of information
- Click [here](#) to read more on healthcare interventions

## References

- O’Cathain, A., Croot, L., Duncan, E., & et al. (2019). Guidance on how to develop complex interventions to improve health and healthcare. *BMJ Open*, 9(e029954). <https://doi.org/10.1136/bmjopen-2019-029954>
- Turner, K. M., Rousseau, N., Croot, L., & et al. (2019). Understanding successful development of complex health and healthcare interventions and its drivers from the perspective of developers and wider stakeholders: An international qualitative interview study. *BMJ Open*, 9(e028756). <https://doi.org/10.1136/bmjopen-2018-028756>

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