



Big Data and Human Health

Core Concepts:

- Big data has the potential to improve medical care related to prevention, treatment, and potential cures for complex diseases.
- Big data can be used to analyze both the risks and benefits of prevention and treatment strategies.
- The use of big data to solve human health problems is in its infancy.

Class Time Required:

1 - 3 forty-minute class period

Teacher Provides:

- Internet access for each student or pair of students
- One or two **Search Term Assignment Cards** for each for each student or pair of students (page iv)
- Student handout entitled **Big Data and Human Health** for each student or pair of students
- Optional: **Research Report Form** may be used if students will be submitting handwritten work (page iii)

Teacher Resources:

- **Medical Big Data: Promises and Challenges**
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5331970/>
- **Big Data Shows Big Promise in Medicine**
<https://www.bloomberg.com/view/articles/2017-07-28/big-data-shows-big-promise-in-medicine>
- **The Power of Big Data Must be Harnessed for Medical Progress**
<http://www.nature.com/news/the-power-of-big-data-must-be-harnessed-for-medical-progress-1.21026>

Suggested Class Procedure:

1. Consider using the introductory lesson entitled **Big Data: A Different Kind of Science** to provide background information.
2. Distribute a copy of student handout entitled **Big Data and Human Health** to each student or pair of students.
3. Read the “Memo” aloud to the class. Consider playing the role of the head of the research department at the healthcare communications company.
4. Distribute one (or two) of the **Search Term Assignment Cards** to each student or pair of students. Using the assigned search term reduces the chance that researchers will report on the same examples.
5. Distribute the **Research Report Form** in printed or electronic form. Explain that the campaign developers should be able to read the description of the example and why it is interesting and important.
6. Give students a hint that they should save time by reading at least several websites to be certain that they have found an example that they understand and interesting. This will avoid the frustration of writing a description of an example only to find out that they have difficulty explaining why it is interesting or important.

Note: The student instructions do not indicate the number of website reports they need to do. You will need to identify how many website reports each student is expected to write to meet with class time constraints and/or student literacy levels. Consider having students do ONE report then having a “research team meeting” where students read their reports to the class before they write additional reports. This allows students to learn from others and apply that learning to additional reports.

7. Emphasize that students will be asked to read at least one of their reports to the entire class.

Literacy Strategy: Tell students they must read what they have written. They will not be allowed to simply talk or provide additional explanation. To get students used to doing this, consider having students exchange papers so that one student reads what another student has written.

8. Be sure to allow time for one report from each student (or one report from each pair) to be read aloud to the class.
9. If class time constraints permit, student teams could use the examples found by their class to create a campaign to make patients and their families aware of big data research in health care.

Name _____

Research Report Form

1. The URL for the website _____

2. The title of the website _____

3. A description of an example of how big data is being used to solve human health problems.

4. An explanation of why you think the example is interesting.

Search Term Assignment Cards

Cut along dotted lines to create cards. Make additional sets if needed for large class sizes.

“big data health”	“big data medicine”
“big data chronic disease”	“big data complex disease”
“big data genetic disease”	“big data infectious disease”
“big data ethics”	“big data environmental health”
“big data wearable devices”	“big data privacy”
“big data healthcare”	“big data epidemiology”

Big Data and Human Health

Healthcare Communications Company

Memo

To: Research Department

Our company has been hired by a large university hospital to develop a public relations campaign to make community members aware of the ways big data science is being used to improve human health.

To get started with this project, we need your research team to find and describe examples of ways in which big data is being used to improve medical research or medical care. These examples should be interesting to the general public.

Your team members should complete a research report form for each example.

Use the search term assigned to you. Spend some time finding websites that show **interesting examples** of ways that big data is being used to solve human health problems.

Complete a research report that includes:

1. The URL for the website
2. The title of the website
3. A description of an example of how big data is being used to solve human health problems
4. An explanation of why you think the example is interesting