Truth and Trust in Health Professionals

UC Center Sacramento

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Truth and Trust in Health Professionals—Premises

Yes,
- Science is the basis of truth-telling by health professionals
- Everyone wants certainty and easy decisions
- The facts should speak for themselves
- The plural of anecdote is not evidence
- The internet amplifies lies and misunderstanding

But,
- If science is the rock we stand upon, it can be slippery and uneven
- Health decisions are often uncertain and difficult
- They seldom do; all messages are framed by messenger, content and context
- People crave stories and find them memorable and convincing
- The internet is not the only problem
Underlying Complexities in Health Communication

- Vagaries of science
- Uncertain and difficult decisions
- Framing and bias
Dr. Melik: This morning for breakfast he requested something called "wheat germ, organic honey and tiger's milk."

Dr. Aragon: [chuckling] Oh, yes. Those are the charmed substances that some years ago were thought to contain life-preserving properties.

Dr. Melik: You mean there was no deep fat? No steak or cream pies or... hot fudge?

Dr. Aragon: Those were thought to be unhealthy... precisely the opposite of what we now know to be true.

Dr. Melik: Incredible.

Dialogue from *Sleeper*, 1973 film by Woody Allen set 200 years into the future.
An Easy Choice

• Suppose you are in a room with a single door, and I tell you that if you walk through the door, you will die, but if you remain in the room, you will live.

• What would you do?
Why Staying Put is an Easy Choice

• Only two options
• No uncertainties
• Stark, immediate outcome with a single valued attribute – your life
• Decision is entirely up to you
• Best choice is obvious if you cherish life and seek to avert immediate death
Decision Space

Single attribute, Certain, Immediate
Decision Space

- Single attribute, Certain, Immediate
- multiple-valued attributes
Decision Space

uncertainty

Single attribute, Certain, Immediate

multiple-valued attributes
Decision Space

- Single attribute, Certain, Immediate
- Multiple-valued attributes
Decision Space

- Single attribute, Certain, Immediate
- Multiple-valued attributes
- Uncertainty
- Time until result
Decision Space

- Uncertainty
- Time until result
- Multiple-valued attributes
- Multi-attribute, uncertain, future
Decision Analysis

- Uncertainty
- Time until result
- Multiple-valued attributes

- Multi-attribute, uncertain, future
- Single-attribute, certain, immediate
• Decision analysis applies when:
  • Decisions must be made
  • Events are uncertain
  • Multiple discrete, differentially valued outcomes exist
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Decision Analysis

Real World
- Multiple Outcomes
- Multiple Uncertainties

Utilities

Simpler Choice
- Best and Worst Outcomes
- Overall Expectation
Decision Analysis

Real World

Multiple Outcomes

Multiple Uncertainties

Simpler Choice

Utilities

Best and Worst Outcomes

Probabilities

Overall Expectation
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Decision Analysis

Real World

- Delays in Time
- Complex Situation

Simpler Choice

- Present Value
- Clearer Evaluation

Discounting
Decision Analysis

Real World

Delays in Time

Complex Situation

Simpler Choice

Discounting

Decision Tree Modeling

Present Value

Clearer Evaluation
“Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

If Program A is adopted, 200 people will be saved.

If Program B is adopted, there is a 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved.

Which of the two programs do you favor?”

Tversky and Kahneman, 1981
“Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

If Program C is adopted, 400 people will die.

If Program D is adopted, there is a 1/3 probability that nobody will die, and 2/3 probability that 600 people will die.

Which of the two programs do you favor?”

Tversky and Kahneman, 1981
Comparison of Scenarios

600 in jeopardy

A: 200 saved (i.e., 400 die)
C: 400 die (i.e., 200 saved)

B: 1/3 probability 600 saved (i.e., nobody will die)
   2/3 probability no people saved (i.e., 600 will die)
D: 1/3 probability nobody will die (i.e., 600 saved)
   2/3 probability 600 will die (i.e., no people saved)

Analytically, A is equivalent to C, and B is equivalent to D.
A and B are framed as gains; C and D are framed as losses.
Comparison of Scenarios

Analytically: \( A = C \), and \( B = D \).
A and B are framed as gains; C and D are framed as losses.

Yet 72% prefer A over B and 78% prefer D over C.

When thinking in terms of acquiring gains, people tend to be risk averse (they take the sure thing).

When thinking in terms of avoiding losses, people tend to be risk seeking (they are willing to gamble).
Which Horizontal Line is Longer?
Framing Effects in Risk Communication

Efficacy data presented as relative risk reduction leads to greater acceptance than when data are presented as differences in absolute risk.

For example, saying “This drug can reduce your risk of malaria by 50%” is more persuasive than saying, “This drug can reduce your risk of malaria from 20 per thousand to 10 per thousand.”

There is an emerging respiratory virus afflicting other countries, and it is moving steadily toward your country.

Everywhere this outbreak has struck, 30% of the population has died.

A new vaccine provides perfect protection against this strain of virus, but also has a 10% mortality from side-effects.

Should this vaccine be deployed in the face of an inevitable spread of the pandemic?
• In prevention among currently well patients, we tend to be biased against errors of commission.

• In diagnosis and treatment among currently ill patients, we tend to be biased against errors of omission.
Overweight errors of commission in public health
Overweight errors of omission in medical care
Overweight your own data
  It is easier to see a pebble in your neighbor’s lawn than a boulder on your own rooftop.
Overconfidence: conviction outpaces evidence
  Epidemic outbreaks: data are sparse, time to think is long
  In my clinical experience...
Overextend your own expertise
Concluding Points

• Science is a dynamic and evolving web of knowledge
• Learn to love and live with probability
• Recognize framing effects and biases
• Hallmarks of sound health communication
  -- Timely -- Consistent
  -- Correct -- Targeted to audience
  -- Clear -- Repeated