Slide 1: The Right Tool is What They Need, Not What We Have: A Taxonomy of Appropriate Levels of Precision in Patient Risk Communication

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Slide 2: Imagine Robert

- Goes to an online risk calculator:
  - “Calculate Your Heart Disease Risk Score!”
- Enters risk factor info:
  - BP, weight, height, cholesterol, etc.
- Gets result:
  - Your 10-year risk of cardiovascular disease is: 14.52%

Slide 3: Robert’s Tale

“So, I used this calculator, and it told me what my risk is. But, I’m still confused. Am I at high risk or not?”

Slide 4: Question

Is Robert “informed” about his cardiovascular risk?

Slide 5: Problems

- Excess precision
  - Excess decimal places undermine trust and comprehension of risk calculator outputs
- Unmet information needs

Slide 6: How Can Risk Information Be Over- or Under-Informative?

- Risk statements vary in the types of information they provide
  - Thus, a statement can be “accurate,” yet “uninformative”
- To clarify, I present a taxonomy of risk concepts

Slide 7: A Taxonomy of Risk Concepts

| Risk Concept: | table with 3 columns: “Risk Concept,” “Sample Cognition” and “Distinguishable From.” The latter two columns are empty. |

- Possibility
- Relative Possibility
- Comparative Possibility
- Categorical Possibility
- Relative Probability
- Absolute Probability
- Comparative Probability
- Incremental Probability

**Slide 8: A Taxonomy of Risk Concepts (2)**

table with 3 columns: “Risk Concept,” “Sample Cognition” and “Distinguishable From.”

**Risk Concept:**
- Possibility
- Relative Possibility
- Comparative Possibility
- Categorical Possibility
- Relative Probability
- Absolute Probability
- Comparative Probability
- Incremental Probability

**Sample Cognition:**
- Might happen, might not
- Higher chance
- This is more likely than that
- High chance

**Distinguishable From:**
- Will/Won’t
- Lower/Equal
- They are equally likely
- Normal/Average

**Slide 9: A Taxonomy of Risk Concepts (3)**

table with 3 columns: “Risk Concept,” “Sample Cognition” and “Distinguishable From.”

**Risk Concept:**
- Possibility

Relative Possibility
Comparative Possibility
Categorical Possibility
Relative Probability
Absolute Probability
Comparative Probability
Incremental Probability

Sample Cognition:

- Might happen, might not
- Higher chance
- This is more likely than that
- High chance
- 50% more likely
- 12%
- 12% vs. 8%
- 4% more likely

Distinguishable From:

- Will/Won't
- Lower/Equal
- They are equally likely
- Normal/Average
- Other ratios, e.g., 40% more likely
- Other probabilities, e.g., 13%
- Other combinations, e.g., 15% vs. 10%, 12% vs. 11%
- Other increments, e.g., 5% more likely

Slide 10: How Do Risk Concepts Differ?

- Precision
  - Degree of clarity regarding exact likelihood
- Evaluability
  - Ability to evaluate the goodness or badness of the information
    - Both cognitive and emotional

Slide 11: Precision and Evaluability of Different Risk Concepts

A table with 3 columns: “Risk Concept,” “Level of Precision” and “Evaluability.”

Risk Concept:

- Possibility
- Relative Possibility
- Comparative Possibility
- Categorical Possibility
- Relative Probability
- Absolute Probability
- Comparative Probability
- Incremental Probability

Level of Precision

- Minimal
- Vague
- Defined by categories
- Ratio only
- Level
- Level, with Ratio by calculation
- Change in Level

Evaluability

- Very High
- High
- Depends on categories
- High for ratio, Low for meaning
- Low
- High
- High for difference

**Slide 12: What Does It Mean to Accept Risk Statement?**

<table>
<thead>
<tr>
<th>Risk Concept:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possibility</td>
</tr>
<tr>
<td>Relative Possibility</td>
</tr>
<tr>
<td>Comparative Possibility</td>
</tr>
<tr>
<td>Categorical Possibility</td>
</tr>
<tr>
<td>Relative Probability</td>
</tr>
</tbody>
</table>

• Absolute Probability
• Comparative Probability
• Incremental Probability

Illustrative Statements of Absorption of Risk Message:

• “It could happen to me.”
• “It is more likely to happen to me.”
• “I am more likely to have this happen to me than to have that happen to me.”
• “I am a person who has a higher chance of this happening.”
• “I have a risk that is higher to this degree.”
• “My risk is this.”
• “My (group’s) risk is this, which is higher than another’s (group’s) risk.” OR “My risk is this if I do X, which is higher than my risk if I do Y which is that.”
• “My risk will change that much if I do this.”

**Slide 13: What Emotional Gist Meanings Do They Generate?**

table with 2 columns: “Risk Concept” and “Illustrative Gist Meaning.”

**Risk Concept:**

• Possibility
• Relative Possibility
• Comparative Possibility
• Categorical Possibility
• Relative Probability
• Absolute Probability
• Comparative Probability
• Incremental Probability

**Illustrative Gist Meaning:**

• “I am at risk.” (*Implies negative feelings if for a bad outcome*)
• “I have a worse risk”
• “This is worse risk for me than that is.”
• “I have bad risk.”
• “My risk is worse.”
• Unclear without background knowledge
• “My risk is worse than their risk is.”
• “My risk is bad and worse if I do X.”
• “My risk will change a lot (or a little).” (*Affect depends on comparison to baseline*)

**Slide 14: Patient Needs**

Source: Eisenberg Center Conference Series 2011, Differing Levels of Clinical Evidence: Exploring Communication Challenges in Shared Decisionmaking Effective Health Care Program Website

([http://www.effectivehealthcare.ahrq.gov/index.cfm](http://www.effectivehealthcare.ahrq.gov/index.cfm))
• Patients have varying information needs
  o Sometimes need simpler risk concepts
  o Sometimes need detail
• Main Message: Risk communicators need to consider the congruence of risk format to patients’ needs.

**Slide 15: Need Congruent Types of Risk Knowledge**

Table with 3 columns: “Need” and “What Patients care About,” and Congruent Types of Risk Knowledge.

Need:

• Avoid Surprise and Regret

What Patients Care About:

• Care that this could happen

Congruent Types of Risk Knowledge:

• Possibility

**Slide 16: Need Congruent Types of Risk Knowledge (2)**

Table with 3 columns: “Need” and “What Patients care About,” and Congruent Types of Risk Knowledge.

Need:

• Avoid Surprise and Regret
• Recognize Dominant Options

What Patients Care About:

• Care that this could happen
• Care this this is most/ least

Congruent Types of Risk Knowledge:

• Possibility
• Relative and Comparative Possibility

**Slide 17: Need Congruent Types of Risk Knowledge (3)**

Table with 3 columns: “Need” and “What Patients care About,” and Congruent Types of Risk Knowledge.

Need:

- Avoid Surprise and Regret
- Recognize Dominant Options
- Motive to Act or Not Act

What Patients Care About:

- Care that this could happen
- Care this this is most/ least
- Care that this is good/ bad

Congruent Types of Risk Knowledge:

- Possibility
- Relative and Comparative Possibility
- Categorical Possibility

**Slide 18: Need Congruent Types of Risk Knowledge (4)**

Table with 3 columns: "Need" and "What Patients care About," and Congruent Types of Risk Knowledge.

Need:

- Avoid Surprise and Regret
- Recognize Dominant Options
- Motive to Act or Not Act
- Make Multi-Attribute Tradeoff Decisions

What Patients Care About:

- Care that this could happen
- Care this this is most/ least
- Care that this is good/ bad
- Care about this more than that

Congruent Types of Risk Knowledge:

- Possibility
- Relative and Comparative Possibility
- Categorical Possibility
- Comparative Possibility and/or Probability

**Slide 19: Need Congruent Types of Risk Knowledge (5)**

table with 3 columns: "Need" and "What Patients care About," and Congruent Types of Risk Knowledge.

Need:

- Avoid Surprise and Regret
- Recognize Dominant Options
- Motive to Act or Not Act
- Make Multi-Attribute Tradeoff Decisions
- Make Magnitude-Dependent Decisions

What Patients Care About:

- Care that this could happen
- Care this this is most/ least
- Care that this is good/ bad
- Care about this more than that
- Care that this X% not Y%

Congruent Types of Risk Knowledge:

- Possibility
- Relative and Comparative Possibility
- Categorical Possibility
- Comparative Possibility and/or Probability
- Precise Comparative or Incremental Probabilities

Slide 20: On the Comparative Irrelevance of Absolute Probability and Relative Probability Statements

- To borrow from Annie Get Your Gun!

“Anything [they] can do, [other formats] can do better!”

Slide 21: Non-Meaningful Data

- Most risk data is generated in absolute probability or relative probability forms
  - Epidemiological studies: rates
  - Clinical trials: Odds ratios
- BUT: Original form ≠ Best format
  - “Curse of Knowledge”: Statistics are meaningful to researchers/clinicians, so hard to imagine they are not meaningful for patients

Slide 22: The Risk Communicator’s Task

• Identify patients’ need for information
  o What specific understanding is needed?
• Tailor information formats
  o Use data formats that are congruent with patients’ concrete informational goals

“The Right Tool at the Right Time”