# INSTITUTIONAL ~~POLICIES~~ *Efforts* TO FOSTER RCR:
# THE ROLE OF UNIVERSITIES

Nicholas H. Steneck, PhD
Director, Research Ethics and Integrity Program, MICHR
Professor Emeritus of History
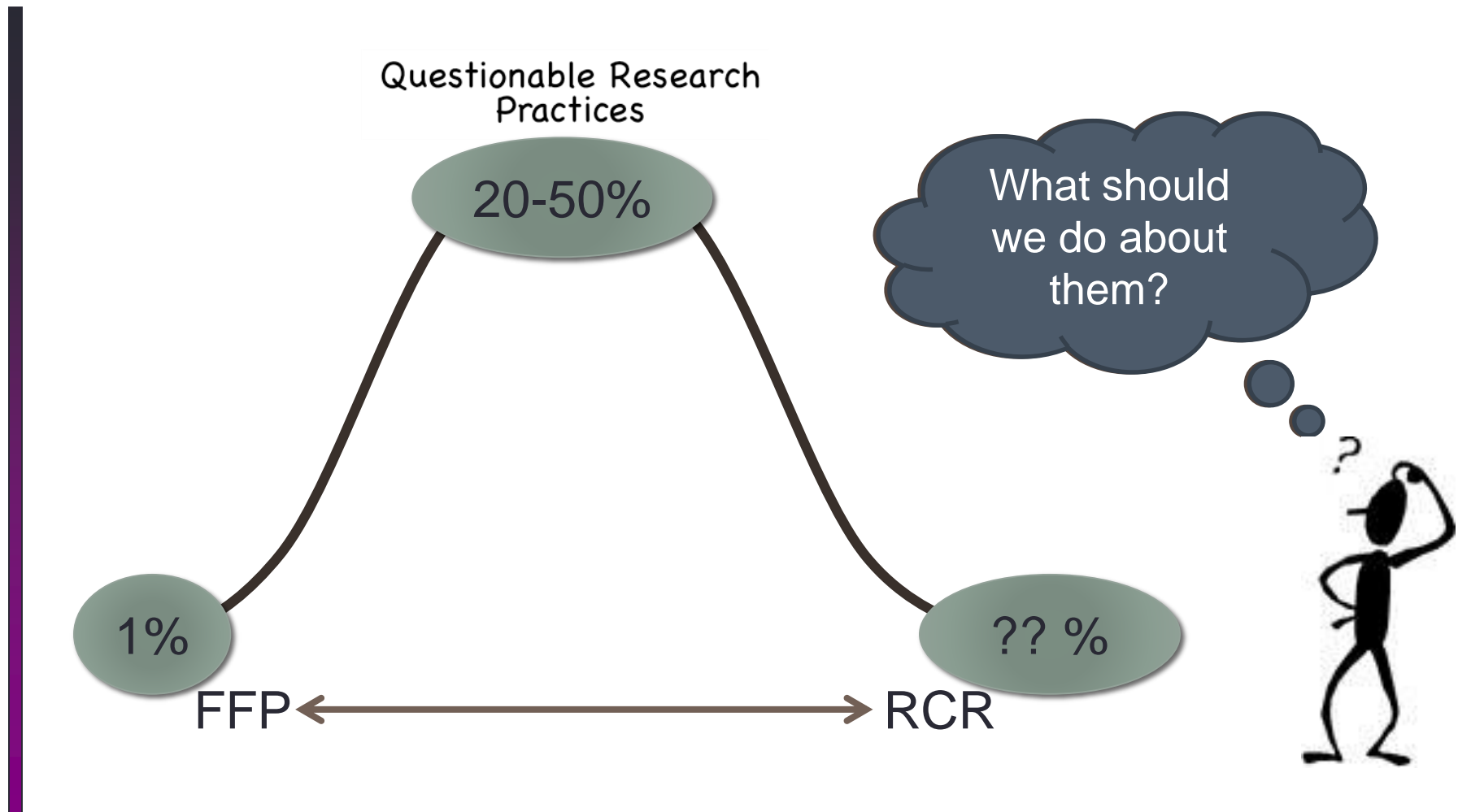University of Michigan

---------

Consultant:  Epigeum, London UK

III BRISPE
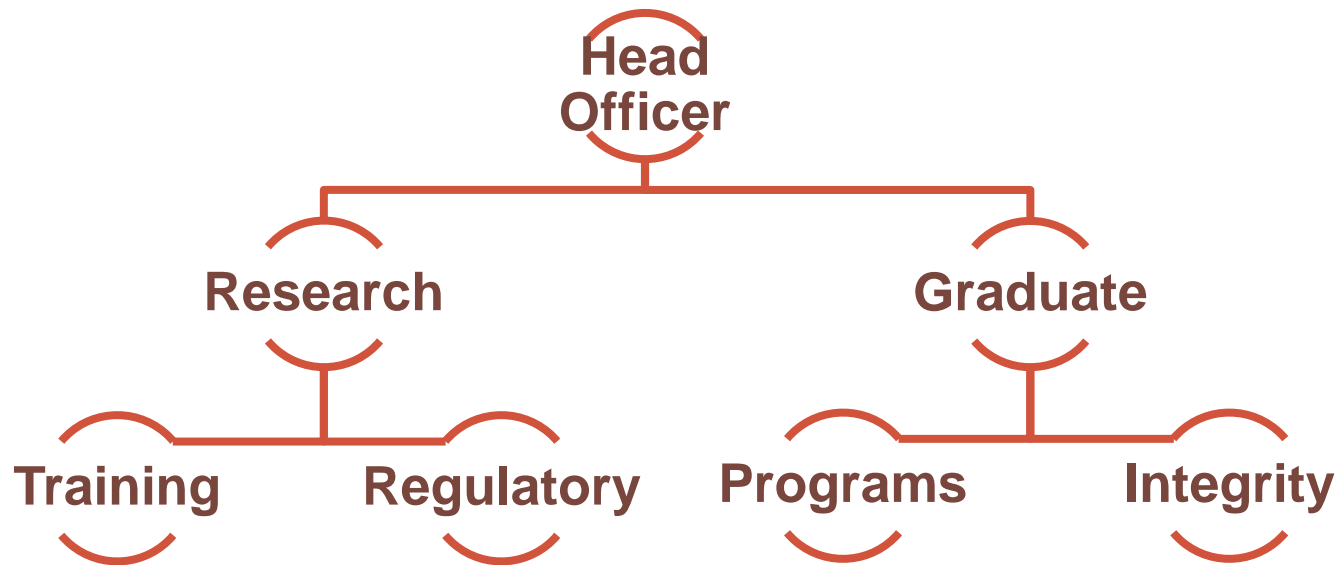São Paulo
15 August 2014

Conflict
Of
Interest

EPIGEUM

# The RCR Dilemma

Questionable Research Practices

20-50%

What should we do about them?

1%

?? %

FFP ←→ RCR

# University structure

- Basic positions similar across universities

```
                    Head
                   Officer
        ┌─────────────┴─────────────┐
    Research                     Graduate
   ┌────┴────┐                  ┌────┴────┐
Training  Regulatory        Programs   Integrity
```

- Differences in the budget, staff, and responsibilities assigned to offices

# Options / Solutions

- Adopt research misconduct policies
  - ✓Usually address only the worst offenses
  - ✓After-the-fact / a response, not a solution

- Adopt codes of ethics
  - ✓Difficult to write simple codes for all fields
  - ✓Will anyone pay attention?

- Improve training
  - ✓Content?
  - ✓Teachers?

- Change environment
  - ✓What's wrong?
  - ✓How to clean up?
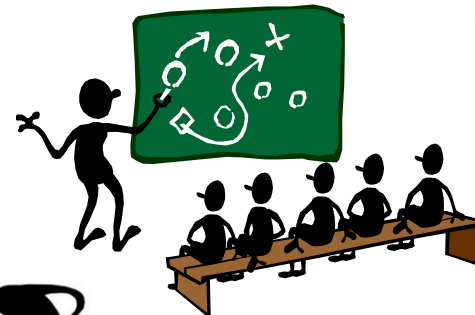
# TRAINING / TEACHING

Two options:
1. Recommend
2. Require

# US requires training

- Major steps:
  - ✓ 1985, first mentioned in an institutional report
  - ✓ 1989, recommended by US Institute of Medicine
  - ✓ 1990, required in US by National Institutes of Health
  - ✓ 1990s, US institutions began teaching
  - ✓ 2009, required by US National Science Foundation
- Results
  - ✓ Most universities now offer some training
  - ✓ Approaches and level of commitment vary significantly
  - ✓ Represents a small, usually insignificant component of research budgets

# NIH requirements

- Linked to funding; part of training applications
- Specific requirements:
  1. Part of and integrated into research program
  2. Appropriate to career stage
  3. Trainees should assume responsibility for planning
  4. Faculty should participate
  5. Include face-to-face, not just online
  6. Evaluated as part of a research grant
- Further clarifications:
  ✓ Recommend 8 hours of face-to-face
  ✓ At least once every four years
- Focus is research integrity not research ethics

**http://grants.nih.gov/grants/guide/notice-files/NOT-OD-10-019.html**

# NSF requirement

- An institutional mandate, not project or individual
    - ✓ The Director shall require that each institution that applies for financial assistance from the Foundation for science and engineering research or education describe in its grant proposal a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate students, graduate students, and postdoctoral researchers participating in the proposed research project (**http://www.nsf.gov/bfa/dias/policy/rcr.jsp**)
    - ✓ Covers integrity AND ethics, broader than NIH
    - ✓ Details are left to institutions
    - ✓ NSF does audit institutional programs

# Elsewhere mostly recommended

- European Science Foundation (2010)
  - ✓ Universities, institutes and all others who employ researchers, as well as agencies and organisations funding their scientific work, have a duty to ensure a prevailing culture of research integrity. This involves clear policies and procedures, training and mentoring of researchers, and robust management methods that ensure awareness and application of high standards as well as early identification and, wherever possible, prevention of any transgression. (ESF, Fostering Integrity in Research in Europe, 2010)
- Global Research Council (2013)
  - ✓ Research funding agencies should promote continual training in research integrity, and develop initiatives to educate all researchers and students on the importance of research integrity.

# Observations

- Who gets training?
  - ✓ Requirements apply primarily to students / trainees
  - ✓ Most US institutions also require training for researchers
- Resources devoted to training vary significantly
  - ✓ Rely heavily on "volunteers"
  - ✓ Some administrative staff to coordinate
  - ✓ Europe & elsewhere mostly volunteers, small budgets
- Growing recognition of the importance of training
  - ✓ Country-wide discussions in Europe
  - ✓ More institutions are requiring
- Major question:  what works?
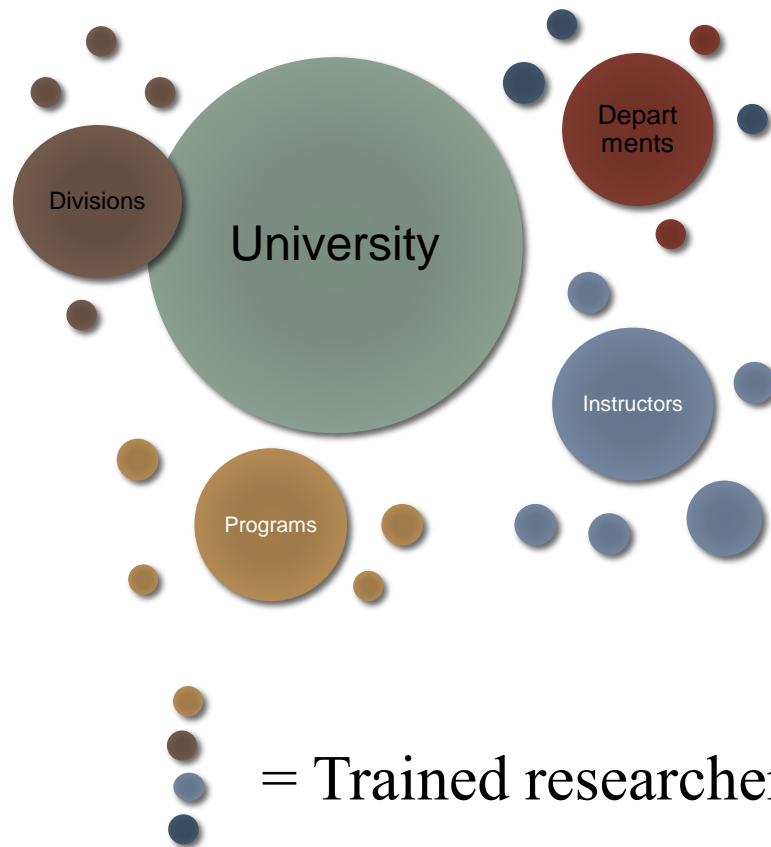
# TRAINING MODELS

As many models as trainers/teachers

# Model 1.  Course
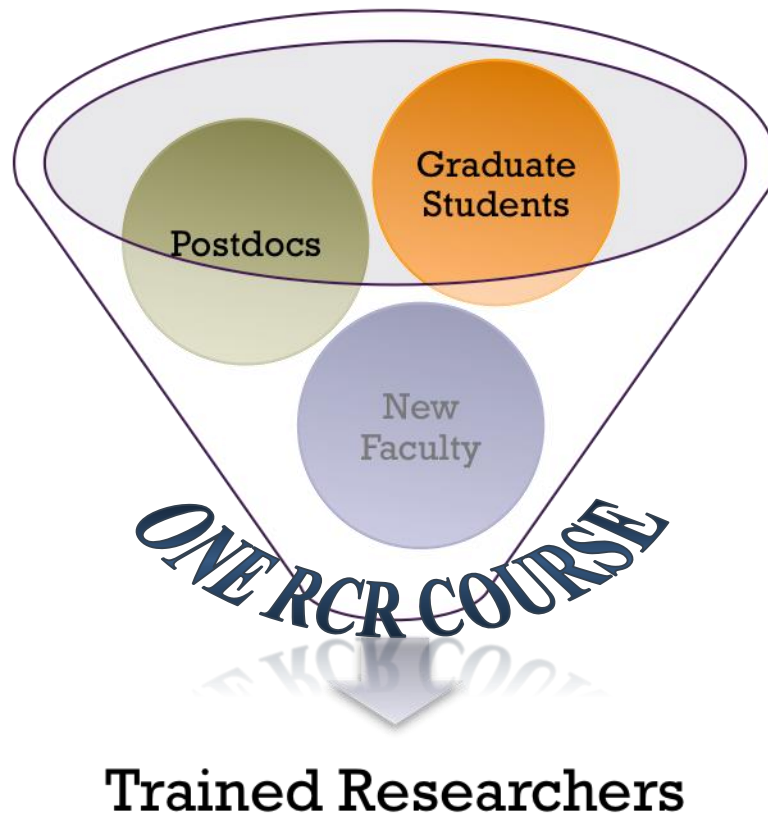


- Familiar university approach
- Assures common content
- May work at small universities
- Too general and detached for large universities

# Model 2:  Decentralized training

Divisions

University

Departments

Instructors

Programs

= Trained researchers

- Closer and more connected to research
- Difficult to organize and control quality
- Need to train trainers

# Model 3:  Mentors

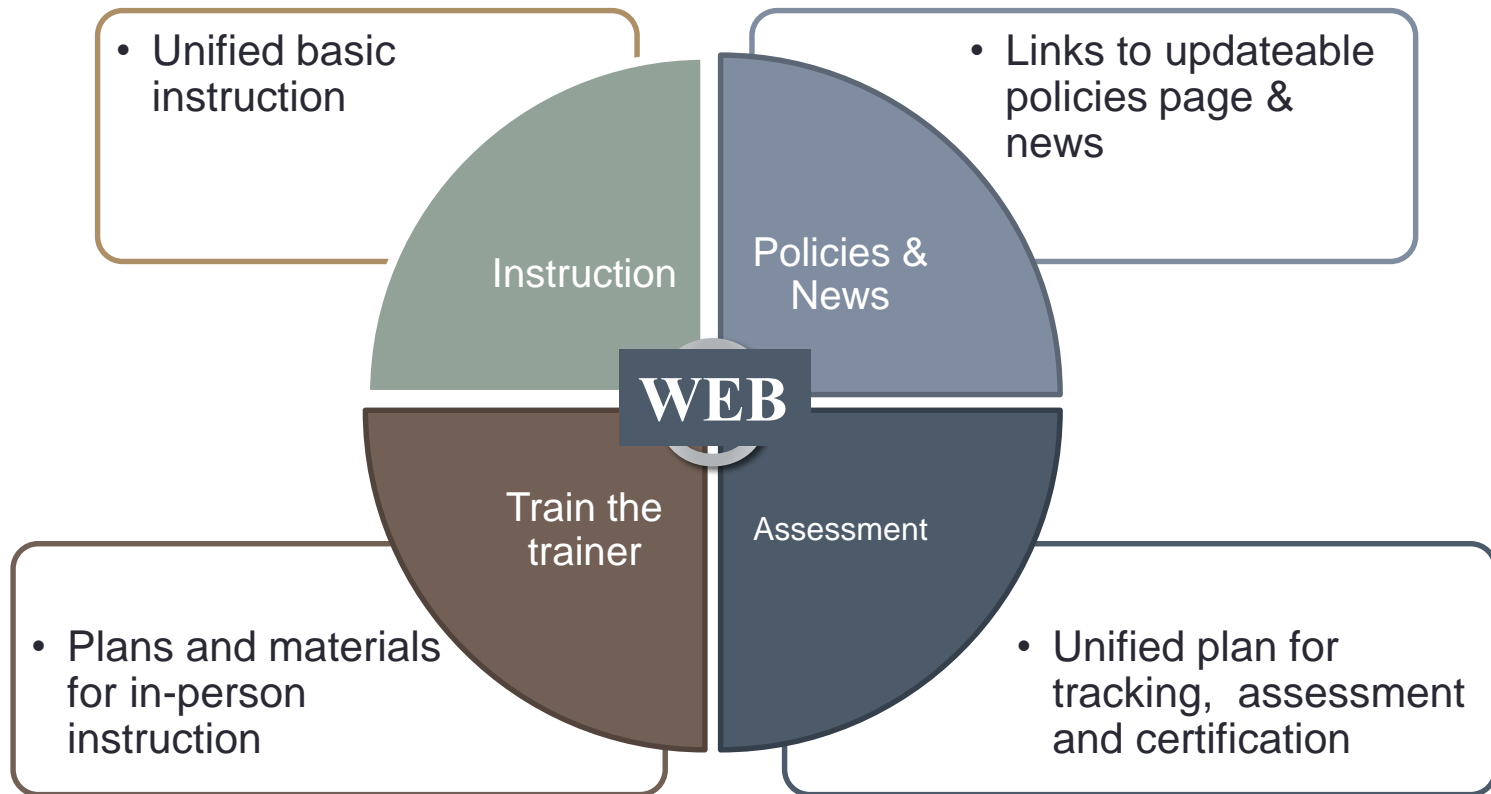| Trainee | → | Mentor | → | Trained researcher |

- Widely seen as ideal model
  - ✓ Directly relevant to research
  - ✓ Training comes from respected person in the field
- Difficult to control content and quality
- Training depends heavily on the quality of the mentor
- Many mentors have not been trained in RCR

# Model 4:  Web

Trainee → Web → Trained researcher

- Uniform content
- Inexpensive
- Easy to document training (i.e. viewed pages, passed test)
- Evidence of university concern (?)
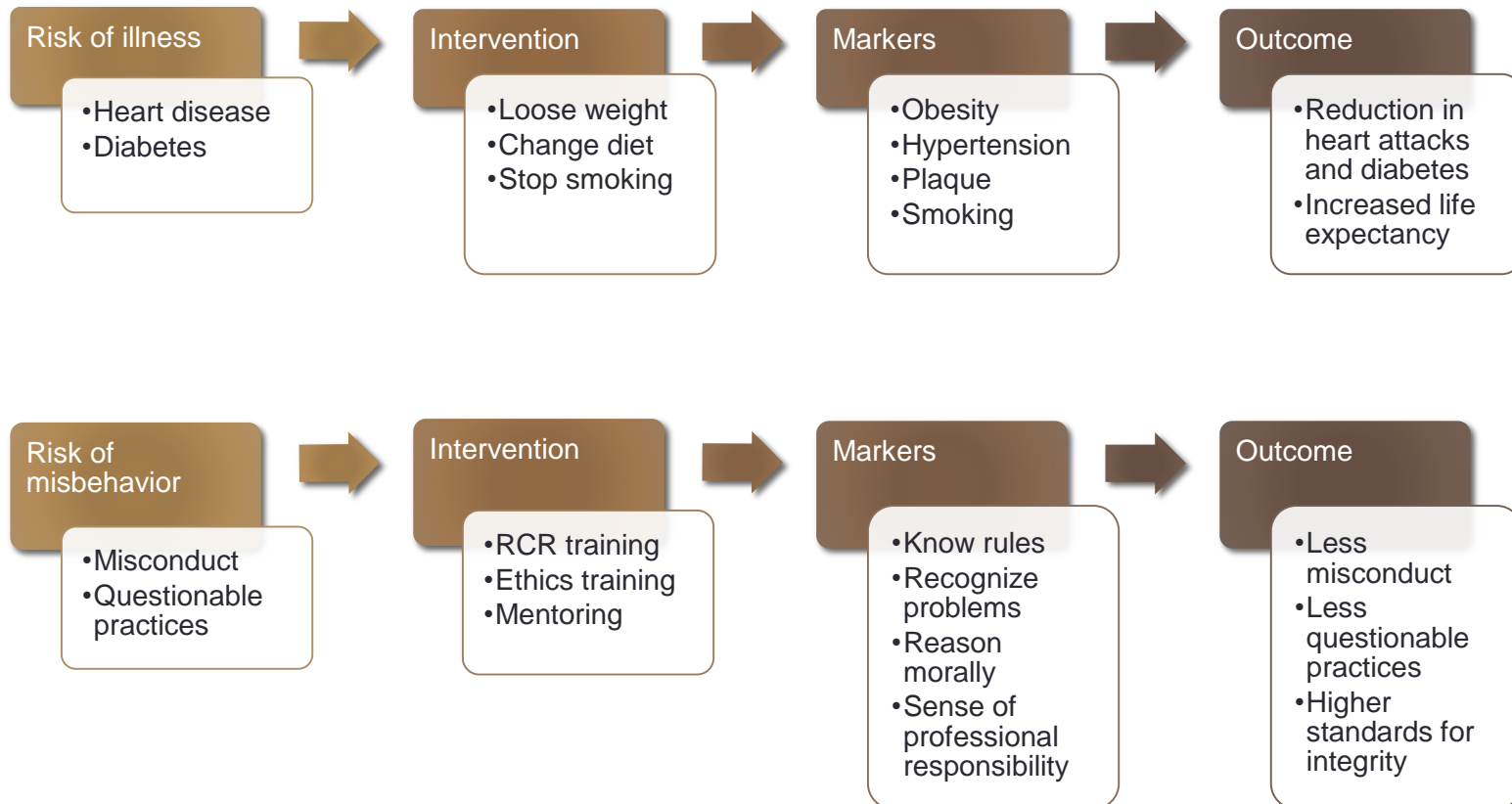- Impact is questionable

# Model 5:  Blended learning

- Unified basic instruction

- Links to updateable policies page & news

Instruction

Policies & News

**WEB**

Train the trainer

Assessment

- Plans and materials for in-person instruction

- Unified plan for tracking,  assessment and certification

# MAJOR CHALLENGE WHAT WORKS?

Question:

- Training seems like a good idea, but is it?
- Does training make any difference?
- Is in-person training better than web-based?
- Are researchers good RCR mentors

- No answers to these questions

# Analogy:  integrity ~ wellness

| Risk of illness | → | Intervention | → | Markers | → | Outcome |
|---|---|---|---|---|---|---|
| • Heart disease<br>• Diabetes | | • Loose weight<br>• Change diet<br>• Stop smoking | | • Obesity<br>• Hypertension<br>• Plaque<br>• Smoking | | • Reduction in heart attacks and diabetes<br>• Increased life expectancy |

| Risk of misbehavior | → | Intervention | → | Markers | → | Outcome |
|---|---|---|---|---|---|---|
| • Misconduct<br>• Questionable practices | | • RCR training<br>• Ethics training<br>• Mentoring | | • Know rules<br>• Recognize problems<br>• Reason morally<br>• Sense of professional responsibility | | • Less misconduct<br>• Less questionable practices<br>• Higher standards for integrity |

# Outcome 1: Provided training

- Tracking and counting numbers:
  - ✓ LMS systems track and record attendance
  - ✓ Tests track and record "learning"
  - ✓ Course evaluations track learners' self-perceptions
  - ✓ Grading provides a measure of quality
- Tracking training program (US, National Science Foundation.)
  - ✓ Document describing plan for training
  - ✓ Should include plans for tracking
  - ✓ Could be asked to provide evidence of training
- Elsewhere, documenting training is less of an issue

# Outcome 2: "I learned a great deal"

- Satisfies regulatory requirements
- Provides evidence that you are doing something
- May lead to changes/improvements in courses and training programs
- Provides no evidence of impact on behavior
- Analogy: handing out a diet plan or a medication
  - ✓ Has the diet plan changed behavior?
  - ✓ Did patients take the medication (read the online course)?
  - ✓ Are they healthier? Did the intervention improve health (integrity)?

# Outcome 3:  Markers

- Characteristics of a well-trained RI professional
  - ✓Knowledge
    - Best practices in field of research
    - Applicable rules and regulations
  - ✓Competencies
    - Broad professional competencies
    - Moral and ethical reasoning
- Why markers?
  - ✓Too difficult to measure outcomes (higher integrity/less FFP)
  - ✓Professional markers are assumed to be linked to or correlate with integrity

# Assessing knowledge

- Available tests:
  - ✓ MCQ
  - ✓ Epigeum Research Integrity Self-Assessment Exercise (RISAE)
    - 50 MMCQ with extensive feedback on correct answers
    - Can be formatted as test rather than self-assessment
  - ✓ Heitman E, Olsen CH, Anestidou L, Bulger RE. New graduate students' baseline knowledge of the responsible conduct of research. Acad Med. Sep 2007;82(9):838-845.

- Evaluation:
  - ✓ Quantitative, easy to administer and track
  - ✓ Difficult to control cheating unless monitored and changed

# Assessing competencies

- First need to define competencies:
  - ✓ Tractenberg RE, FitzGerald KT. A Mastery Rubric for the design and evaluation of an institutional curriculum in the responsible conduct of research. Assessment & Evaluation in Higher Education. 2012/12/01 2012;37(8):1003-1021.
  - ✓ Kalichman MW, Plemmons DK. Reported goals for responsible conduct of research courses. Acad Med. Sep 2007;82(9):846-852.

- Develop test/tools for measuring competency
  - ✓ Online competency tests
  - ✓ Assess as part of in-person training

# Moral reasoning necessary skill?

- Assumptions:
  - ✓ Mature moral reasoning is essential to professional responsibility
  - ✓ Moral reasoning can be taught
  - ✓ Ability to reason morally can be measured
- Teaching moral reasoning:
  - ✓ Elliott D, Stern JE. Evaluating teaching and students' learning of academic research ethics. *Science and Engineering Ethics.* 1996;2(3):345-366
- Measuring moral reasoning:
  - ✓ Rest, Defining Issues Test
  - ✓ Mumford MD, Connelly S, Brown RP, et al. Sensemaking approach to ethics training for scientists: Preliminary evidence of training effectiveness. Ethics and Behavior. 2008;18:315-339.

# Kalichman, Instructors' objectives

- 50 goals, organized in five categories:
  - ✓ Knowledge
    - Misconduct & data management … how to write a grant
  - ✓ Skills
    - Make ethical decisions … manage teams and stress
  - ✓ Attitudes
    - Importance of ethics … open communication and sharing
  - ✓ Behavior
    - Set high standards … follow regulations
  - ✓ Community
    - Encourage peer conversations … reach out to community

# Summary, marker-based assessment

- Focus split between knowledge and professional competencies
- Moral reasoning seen by many as an essential competency
- Knowledge is easiest to assess
- Requires active involvement of well-trained instructors
- Markers predict but do not guarantee outcomes

- Conclusion:  requires significant commitment but uncertain links to behavior/integrity

# BEHAVIOR & CLIMATE

Ideal is to change behavior, but how do we measure?

# Two approaches to assessment

- **Self assessment**
- Provide training
- Administer questionnaire
  - ✓ Did you find the course interesting?
  - ✓ Has this course improved your understanding of RCR?
  - ✓ Will you behave more responsibly in the future?
  - ✓ Would you recommend this course to others?

- **Empirical study**
- Two groups
  - ✓ Training / No training
- Baseline assessment
  - ✓ Attitudes / behavior
  - ✓ Demographics
- Wait 10-15 years
- Compare integrity
  - ✓ Self-reported behavior
  - ✓ Behavioral audit

# Advantages & disadvantages

- **Self-assessment**
- Evidence that students:
  - ✓ Enjoyed the course
  - ✓ Felt they learned
  - ✓ Felt will change behavior
- Could justify continued support
- No evidence that course will impact the future behavior or researchers

- **Empirical study**
- Evidence that course either did or did not change behavior
- Not timely, need assessments in 1-2 years
- Too expensive, unlikely to find anyone to fund

# Compromise ~ climate survey

- Provides different measures, depending on survey
  - ✓ Self-reported behaviors
  - ✓ Self-reported perceptions of training
  - ✓ Self-reported attitudes to climate (pressures)
- Can be used to measure change in response to intervention
  - ✓ Initial survey provides baseline
  - ✓ Follow-up measures changes
- If widely adopted, provides basis for comparison
  - ✓ Efforts now to establish SORC nationally in US

# Survey of Organizational Research Climate

**Instructions**

This survey is designed to assess your perceptions of the organizational climate for responsible research practices at your university and in your department. Please answer each of the following items with respect to your university. Subsequent questions will ask about your specific department.[9]

*Part 1*

*Institutional Items*

1a.    How committed are researchers at your university to maintaining high standards of integrity in their research?

1b.    How consistently does the overall "climate" at your university reflect high values for responsible conduct of research?

https://sites.google.com/site/surveyoforgresearchclimate/

# Summary

- Many ways to provide instruction / training
- Some agreement and some disagreement on what to teach
- Significant disagreement on appropriate outcome measures
- No good instruments for measuring most outcomes
- Climate is thought to have an impact on behavior
- There are tools for assessing climate and climate change

- **Good luck designing your program to foster integrity in research**

# PERSONAL OBSERVATION

- Key challenge is to engage students and researchers in think about and understanding the importance of integrity in research

- Example….Course on collaboration

Big Plans

Reassurance

# Did I make the right decision?

# ESSENTIAL TO ENGAGE

How do you engage busy faculty/researchers and overloaded administrators?

# NSTENECK@UMICH.EDU

For further information