Conducting High Quality Research for Disaster Nurses: Challenges and Opportunities

Kristin Ringstad & Sue Anne Bell

Format and Objectives

In this interactive workshop, we will discuss challenges related to conducting research in disaster settings and types of research methodology that can be employed relative to disasters.

Objectives:

- Discuss the following:
  - How to formulate a research question
  - Types of research studies
  - Organizing your research idea
  - Specific Aims
  - Case studies

Kristin Ringstad, BScN, RN

Primary Research:

- The Physical and Psychological Impacts of Disaster
- Child Health
- Public Health Nursing and Comprehensive School Health

Other Research Interests:

- Sustainable Development Goals
- Impacts of Migration on Health
- Occupational Health and Safety

Clinical Expertise:

- Medical/Surgical nursing, Public Health nursing, Community Health (Ambulatory Nursing Clinic, Case Manager)
- Evidence Aid volunteer, social media relations
- WADEM, Committee member; EMR and Membership Sections
- World Humanitarian Summit, Digital Advocate

Sue Anne Bell, PhD, FNP-BC

Primary Research:

- Long term effects of natural disaster on health
- Health disparities and vulnerable populations

Other Research Interests:

- Climate and health
- Nursing workforce
- Nurse-led home visits

Clinical expertise:

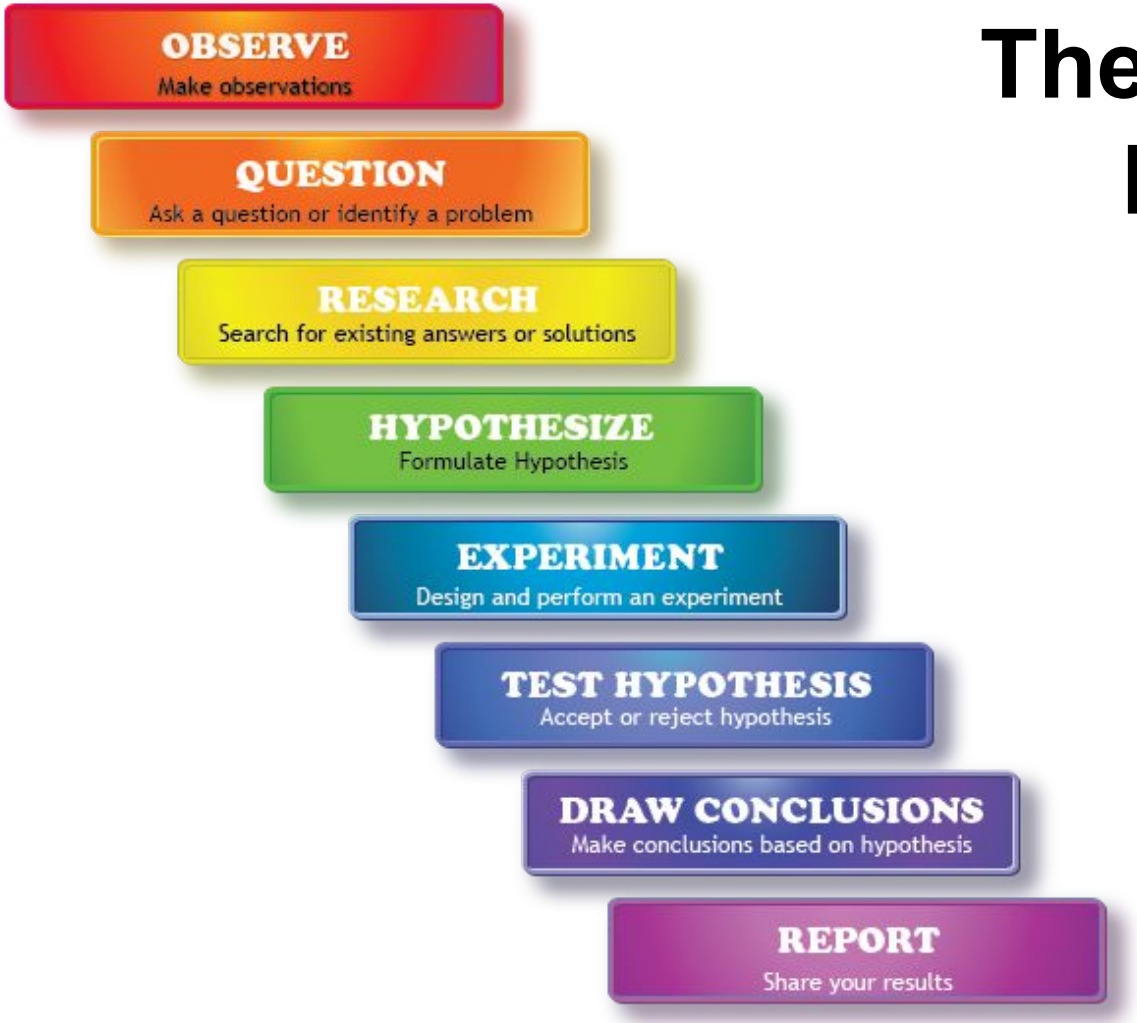
- Family Nurse Practitioner
  - Emergency Nursing
  - Community Health
- Disaster Medical Assistance Team
- WADEM, Nursing committee member, Research lead
- Third time attending WADEM

Response Team: US Presidential Inauguration, 2017

In Ghana with Croc friends and students

Introductions

The Scientific Method



Formulating a Research Question

Inform yourself about your idea- what has already been studied?

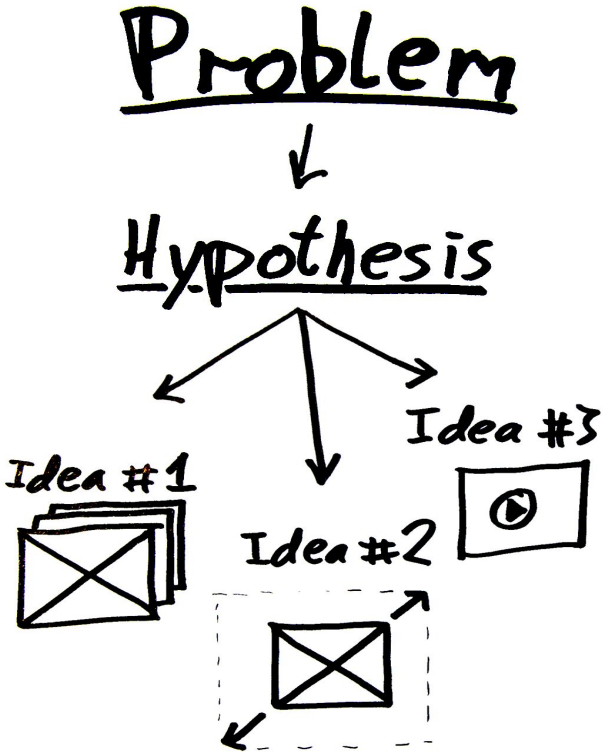
Research questions:

- Are clear, focused, concise, complex and arguable questions around which you center your research.
- Ask a question about an issue that you are genuinely curious about.

Unfocused and too broad	Focused and clear
What are the effects of natural disaster on children in the United States?	How does exposure to natural disaster correlate with academic performance in elementary school children?
This question is so broad that research methodology would be very difficult and the question is too broad to be discussed in a typical research paper.	This question has a very clear focus for which data can be collected, analyzed, and discussed.

Formulating a Hypothesis

1. Identify a general area of interest
2. Identify a research question
3. Formulate Null Hypothesis - H_o
   a. Always predicts that there are no differences between the groups being studied
   b. Often is the common view
4. Formulate Alternative Hypothesis H_a
   a. Explains a phenomenon.
   b. Directional or Nondirectional



Research Type

- Confirmatory - Research tests ***a priori*** hypotheses that are developed before measurement phase begins.
  - Kristin's case study

- Exploratory - Research tests ***a posteriori*** hypotheses by examining a data-set and looking for potential association between variables.
  - Sue Anne's case study

Use Qualitative Research To:

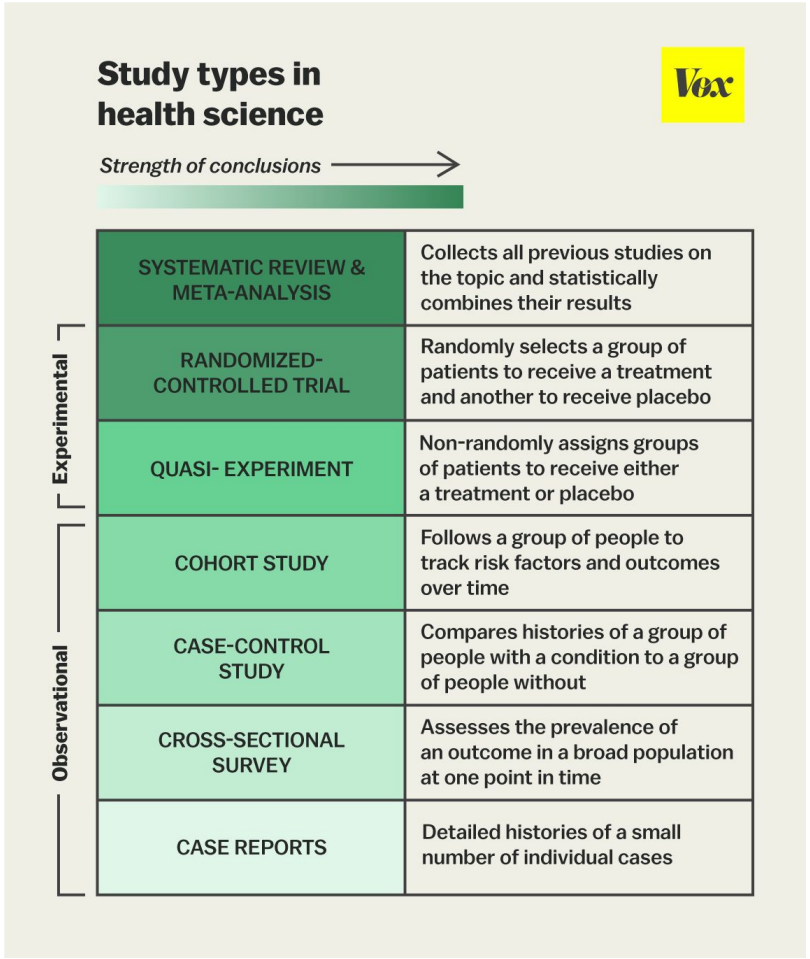
- ✓ Develop an initial understanding of an issue or problem
- ✓Look for a range of ideas and feelings about something
- ✓Understand different perspectives between groups and categories of people
- ✓Uncover underlying motivations and factors that influence decision making and opinions
- ✓Provide information needed to design a quantitative study
- ✓Explain findings from a quantitative study

Use Quantitative Research To:

- ✓Recommend a final course of action
- ✓Find whether there is consensus on a particular issue
- ✓Project results to a larger population
- ✓Identify evidence regarding cause-and-effect relationships
- ✓Describe characteristics of relevant groups of people
- ✓Test specific hypotheses and examine specific relationships
- ✓Identify and size market segments

Study Designs

- Observational
  - Descriptive (e.g., Case study, naturalistic observation, survey)
  - Correlational (e.g., case-control study, observational study)
- Experimental (intervention)
  - Semi-experimental (e.g., field experiment, quasi-experiment)
  - Randomized Control Trial
- Synthesis
  - Review (e.g., literature review, systematic review)
  - Meta-analytic (e.g., meta-analysis)



Specific Aims

Aims are statements of desired outcomes or the general intentions of the research and do the following:

- Emphasize WHAT is to be accomplished, not HOW
- Address the long-term project outcomes
    - Reflect the aspirations and expectations of research topic

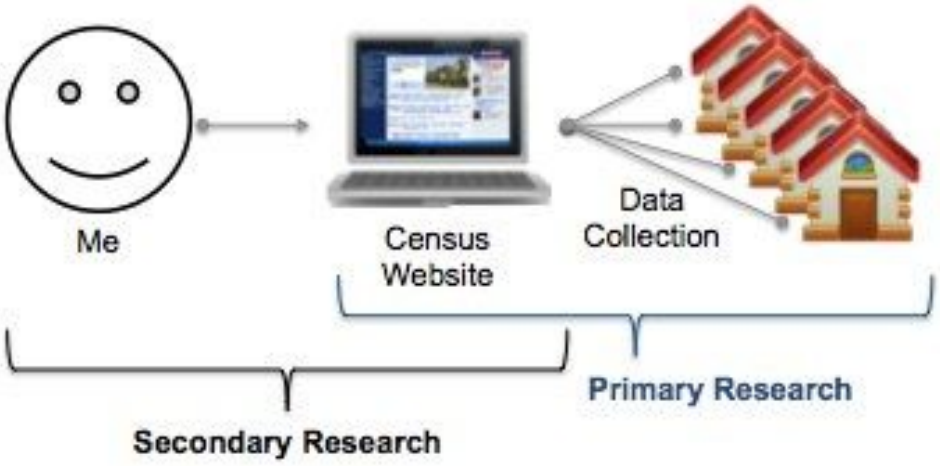
1. The aim of this research is to investigate the role of health risk behaviors on general preparedness for emergencies and disasters.
2. This research project aims to explain the association between modifiable and non modifiable health risk behaviors and disaster preparedness.

Get your thoughts on paper: Writing a “One-pager”

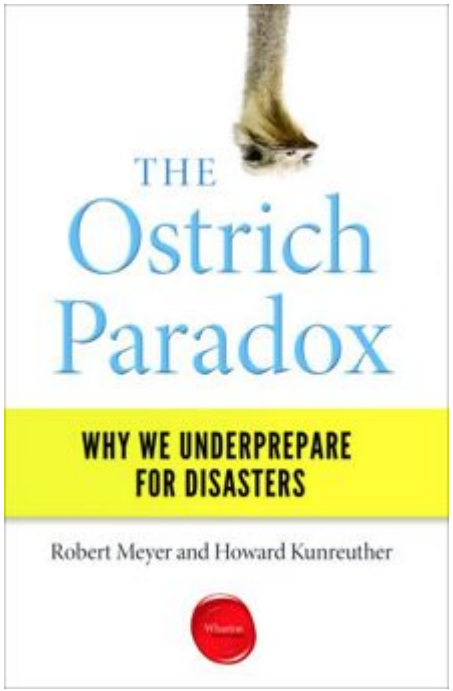
- High level overview of your research study
- Components:
- Working title
- Background/rationale - 1–2 sentences
- Research question(s) - framed as questions with corresponding hypotheses; no more than 3 per project
- Methods ideas
- Key outcomes
- Audience/stakeholders
- Implications for clinical care and/or policy

Sue Anne's Case Study: Secondary Data Analysis

- **Simply put: "Analysis of data collected by someone else"**



Opportunities and Challenges



"We fail to evacuate when advised. We rebuild in flood zones. We don't wear helmets. We fail to purchase insurance. We would rather avoid the risk of "crying wolf" than sound an alarm."

We don't conduct data-driven research to understand the effects of disasters on population health.

Secondary Data: Why use it?

Challenges

- Study was not designed to examine your specific research question
- Outdated data
- Level of observation (e.g.hospital vs patient)
- No control over the quality of collection

Opportunities

- Exploit rigorously collected data
- No cost to you (but not always)
- Saves time-lets you answer your research question quickly
- May be the best option when research project is not possible

EXPLORATORY CASE STUDY: Behavior Risk Factor Surveillance System, General Preparedness Module

What is BRFSS?

- **B**ehavior **R**isk **F**actor **S**urveillance **S**ystem
- Random telephone survey
- Adults ages 18 and older
- Measures personal behaviors that put health at risk
- Collaboration between CDC and the United States
- Over **400,000** adult interviews per year*

Who uses BRFSS?

- State and Local Health Departments
- Students and Researchers
- Non-Profit Agencies
- Federal Agencies
- Research Organizations
- Insurance Companies
- Media

BRFSS Emergency Preparedness

- Allows for study of the association between emergency preparedness, and multiple domains of health
  - Older adults
  - Chronic disease
  - Preparedness by State
  - Veterans vs Non-Veterans
  - Physical and mental health outcomes

- **Eleven core indicators**

BRFSS Survey Questions

1. Level of Preparedness: How well prepared do you feel your household is to handle a large-scale disaster or emergency?

2. Water Supply: Does your household have a 3-day supply of water for everyone who lives there? (1-gallon per person per day)

3. Food Supply: Does your household have a 3-day supply of nonperishable food for everyone who lives there? (Food that does not require refrigeration or cooking)

4. Medication Supply: Does your household have a 3-day supply of prescription medication for each person who takes prescription medications?

5. Battery-operated radio: Does your household have a working battery operated radio and working batteries for your use if the electricity is out?

6. Flashlight with batteries: Does your household have a working flashlight and working batteries for your use if the electricity is out?

BRFSS Survey Questions, cont….

7. Communication with family: In a large-scale disaster, what would be your main method or way of communicating with relatives and friends?

8. Communication with authorities: What would be your main method or way of getting information from authorities in a large-scale disaster or emergency?

9. Written Evacuation Plan: Does your household have a written disaster evacuation plan for how you will leave your home, in case of a large-scale disaster or emergency that requires evacuation?

10. Mandatory Evacuation Compliance: If public authorities announced a mandatory evacuation from your community due to a large-scale disaster or emergency, would you evacuate?

11. Reason if non-compliance: What would be the main reason you might not evacuate if asked to do so?

Opportunities and Challenges in this Study

Opportunities

- Large sample size = generalizable results
- Rare to find a large dataset that has disaster-related variables

Challenges

- CDC stopped collecting this data in 2012
- Using advanced statistical analysis techniques

Open Access Data Sources

- Centers for Disease Control
  - Data.cdc.gov
- Federal Emergency Management Agency
  - fema.gov/openfema
- National Center for Environmental Information
  - www.ncdc.noaa.gov
- United States Census Bureau
  - census.gov/data
- Canada Open Data
  - open.canada.ca/en/open-data
- Australia Open Data
  - data.gov.au

Health Risk Behaviors and Preparedness

Context: Older adults with modifiable health risk behaviors may be more at risk for poor health outcomes after a public health emergency.

Question: Are individuals with health risk behaviors less likely to be prepared for a public health emergency? Does presence of health disparities affect the association?

Methods: Examine the association between household preparedness and health risk behaviors in the CDC's Behavioral Risk Factor Surveillance System (BRFSS) optional preparedness modules, 2006-2012. Logistic regression.

Outcome: Outlines the need for preparedness education and activities in old adults with health risk behaviors.

Part of a larger question:

Challenges/Opportunities for Nurses in Disaster Research

- **Challenges:**
  - Limited disaster-related academic programs or research projects
  - Cost involved with joining organizations that conduct disaster related research
  - Transition from practitioner to research
    - Limited research-related knowledge (e.g. epidemiology and research methods)
    - Limited practical skills and experience (e.g. data collection and statistical analysis)
- **Opportunities:**
  - Pursue research focused training/higher education
  - Non Governmental Organizations/Volunteering
    - Working with a diverse team
  - Networking
    - Conferences, online platforms

Case Study:

Collaborative, Multidisciplinary Research in Myanmar-Opportunities and Challenges

Kristin Ringstad, BScN, RN

GLOBAL ENVIRONMENTAL HEALTH LAB

LEARN | ACT | BUILD

Contents

About GEH LAB

Opportunities & Challenges

GLOBAL ENVIRONMENTAL HEALTH LAB

LEARN | ACT | BUILD

Our Mission Statement:

"We will promote and support safe and healthy environments on a local, regional, and global scale through conducting collaborative public health-related research, scientific engagement, and capacity-building activities."

Our Goals:

To improve the scientific basis of global health decision making and build mechanisms for sustainable scientific practice in low and middle income countries and to contribute to effective and efficient disaster and emergency response and prevention efforts

Our Service:

- Research
- Scientific Engagement
- Capacity Building

The 2016 GEH LAB Team

Dr. Tomoyuki Shibata
Co-Founder & Executive Director,(GEH LAB)

Associate Professor, Northern Illinois University (NIU)

Heidi West
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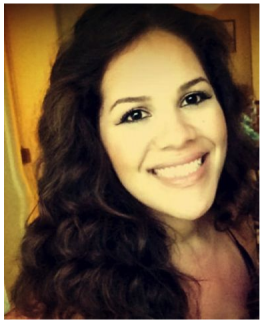
Maastricht, Netherlands



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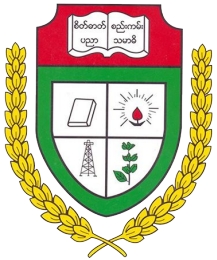
Local Collaborators in Myanmar

Yadanabon University



University of Magway

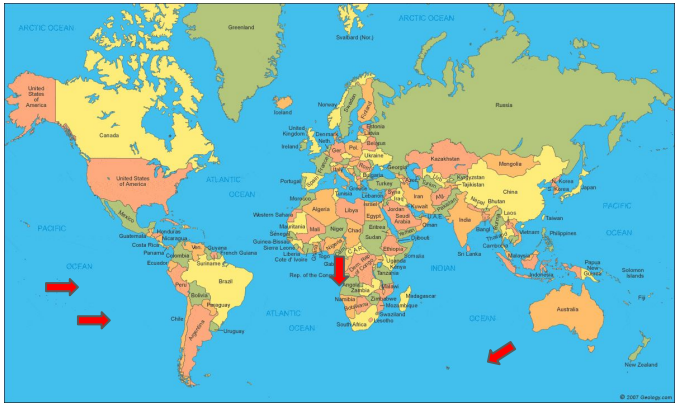
University of Medicine, Mandalay

University of Mandalay

International Team

Challenges:

- Time differences
  - Coordinating meetings
- Creating an agenda and multiple research proposals to be adaptable and/or changed once in the field
- Technical Difficulties
  - Related to internet and phone connections



Opportunities:

- Getting to know people from other parts of the world
- Learning from and building on each other's strengths
- Learning new technologies for communicating and working collaboratively
- Learning about a different culture

2016 Summer Research Program

Theme: Community & Occupational Health Associated with the Sustainable Development Goals (SDGs)

Research Topics

The Impacts of Disasters on First Responders and Health-Care Professionals

Context: According to the UN Risk Model, Myanmar ranks as the ‘most at risk’ country for natural disasters such as floods, cyclones, and earthquakes. There is limited data on the occupational and psychological impacts of disasters among first responders and healthcare professionals in Myanmar.

Question: What is the status of the occupational and psychological health of first responders and healthcare professionals in disaster impacted sites in Myanmar? Is there a difference in the occupational and psychological health among first responders and healthcare professionals during their regular employment and post disaster?

Methods: Descriptive epidemiological survey

Outcome: Improve science knowledge for decision making related to occupational and psychological health of first responders in Myanmar.

Collaborating with Local Universities

Challenges:

- Language barrier
- Adapting to cultural differences in process
- Establishing multidisciplinary collaborations between University departments and different universities (not traditionally done)

Opportunities:

- Learning about local culture and customs
- Building relationships with potential future collaborators (MOU's critical)
- Learning about others experiences and interests

Research Development: Epidemiologic Approach

Challenges:

- Primary data collection
  - Limited knowledge on survey design/implementation
- Global competency
  - Translation
  - Context/content and culture
- Multidisciplinary team for interdisciplinary research
  - Personalities/background, priorities
- Time
  - Cultural differences in the perception of time management

Opportunities:

- Gaining knowledge in designing a study
- Improving global competency
- Learning to adapt and thrive in challenging situations

Establishing Relationships with Survey Participants

Mandalay Fire Department

NGO First Responders

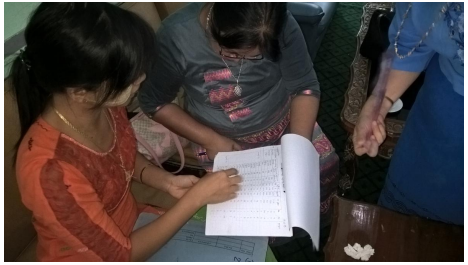
Challenges:

- Governmental approval
  - Process/Timeliness
- Language
  - Translator required
  - Context/content

Opportunities:

- Learning about another culture's governmental processes
- Gaining experience in the field
- Developing a better understanding our our survey demographics

Data Collection and Analysis



Challenges:

- Coordinating survey distribution
  - Who will be responsible, how will it be conducted
- Timelines
  - Busy schedules, differences in perception of time management
- Not being familiar with quantitative data analysis processes

Opportunities:

- Learning methods for quantitative data collection and analysis
  - Excel, SPSS
- Developing an understanding of the results and potential implications
- Gaining experience disseminating results
  - Conference presentations

Bringing it all together

Nurses are frontline providers in disasters, and have a unique opportunity to be leaders in producing high-quality research.