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

1. Observe: Make observations
2. Question: Ask a question or identify a problem
3. Research: Search for existing answers or solutions
4. Hypothesize: Formulate Hypothesis
5. Experiment: Design and perform an experiment
6. Test Hypothesis: Accept or reject hypothesis
7. Draw Conclusions: Make conclusions based on hypothesis
8. Report: Share your results
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.

<table>
<thead>
<tr>
<th>Unfocused and too broad</th>
<th>Focused and clear</th>
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<tbody>
<tr>
<td>What are the effects of natural disaster on children in the United States?</td>
<td>How does exposure to natural disaster correlate with academic performance in elementary school children?</td>
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<tr>
<td>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.</td>
<td>This question has a very clear focus for which data can be collected, analyzed, and discussed.</td>
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1. Identify a general area of interest
2. Identify a research question
3. Formulate Null Hypothesis - $H_0$
   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)

### Study Types in Health Science

<table>
<thead>
<tr>
<th>Study Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>Systematic Review &amp; Meta-Analysis</td>
<td>Collects all previous studies on the topic and statistically combines their results</td>
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<tr>
<td>Randomized-Controlled Trial</td>
<td>Randomly selects a group of patients to receive a treatment and another to receive placebo</td>
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<tr>
<td>Quasi-Experiment</td>
<td>Non-randomly assigns groups of patients to receive either a treatment or placebo</td>
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<tr>
<td>Cohort Study</td>
<td>Follows a group of people to track risk factors and outcomes over time</td>
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<tr>
<td>Case-Control Study</td>
<td>Compares histories of a group of people with a condition to a group of people without</td>
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<tr>
<td>Cross-Sectional Survey</td>
<td>Assesses the prevalence of an outcome in a broad population at one point in time</td>
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<tr>
<td>Case Reports</td>
<td>Detailed histories of a small number of individual cases</td>
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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

<table>
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<tr>
<th>What is BRFSS?</th>
<th>Who uses BRFSS?</th>
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<tbody>
<tr>
<td>• Behavior Risk Factor Surveillance System</td>
<td>• State and Local Health Departments</td>
</tr>
<tr>
<td>• Random telephone survey</td>
<td>• Students and Researchers</td>
</tr>
<tr>
<td>• Adults ages 18 and older</td>
<td>• Non-Profit Agencies</td>
</tr>
<tr>
<td>• Measures personal behaviors that put health at risk</td>
<td>• Federal Agencies</td>
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<tr>
<td>• Collaboration between CDC and the United States</td>
<td>• Research Organizations</td>
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<tr>
<td>• Over 400,000 adult interviews per year*</td>
<td>• Insurance Companies</td>
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<td></td>
<td>• Media</td>
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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
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?
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
Contents

About GEH LAB

1. Mission, Goals & Service
2. Team
3. International Collaborators
4. The 2016-2017 Project
5. My “one-pager”

Opportunities & Challenges

1. Collaborating with Local Universities
2. Research Development: Epidemiologic Approach
3. Establishing Relationships with Survey Participants
4. Data Collection and Analysis
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
Dr. Tomoyuki Shibata
Co-Founder & Executive Director, (GEH LAB)
Associate Professor, Northern Illinois University (NIU)

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Maastricht, Netherlands

Lizeth Galarza
Quality Lab Associate II, Baxter Healthcare
Chicago, Illinois

Kristin Ringstad
BScN, RN
BC, Canada
Local Collaborators in Myanmar

Yadanabon University

University of Medicine, Mandalay

University of Magway

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

- Migration and Marginalized Populations
- Maternal Health
- Children's Health
- Healthcare Seeking Behaviors
- Air Quality (i.e. Particulate Matter (PM)) and Community Health
- Gender and Occupational Health
- Impacts of Disasters on First Responders & Healthcare Workers
- Household Water Treatment
- Risk Assessment
- Water Quality
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

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 of 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.