Lecture 1 · June 3, 2024

Welcome & Introduction to Research

Instructor: Atalay Demiray, MD, MSc

Yale School of Public Health · Department of Health Policy and Management

Yale Summer Enrichment Medical Academy (YSEMA) · Summer 2024

Welcome YSEMA
Introduction to Research

Atalay Demiray, MD, MSc
Department of Health Policy and Management

June 3, 2024

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Who am I?

Atalay Demiray

PhD student in Health Policy

From Turkiye

MSc in Health Economics, Policy and Law

Erasmus University, Rotterdam, Netherlands

MD & BA in International Relations

Koc University, Istanbul, Turkiye

- First-gen college graduate
- First-gen medical doctor
- First-gen PhD … still loading …

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About this Course

A General Introduction to Research…

- While most healthcare professionals never contribute a single article, all are consumers of the information contained in this vast collection of knowledge.
- Keeping up with the literature is essential for continued success as a professional.
- This course is designed to help you keep up now and in the future.

What is this course about?

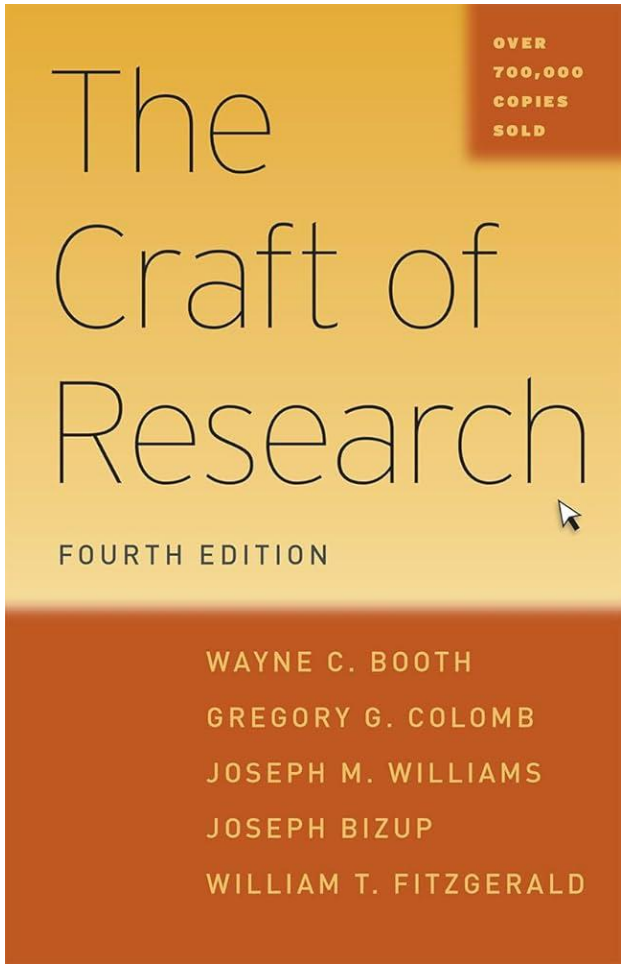
Interpretation of the Literature

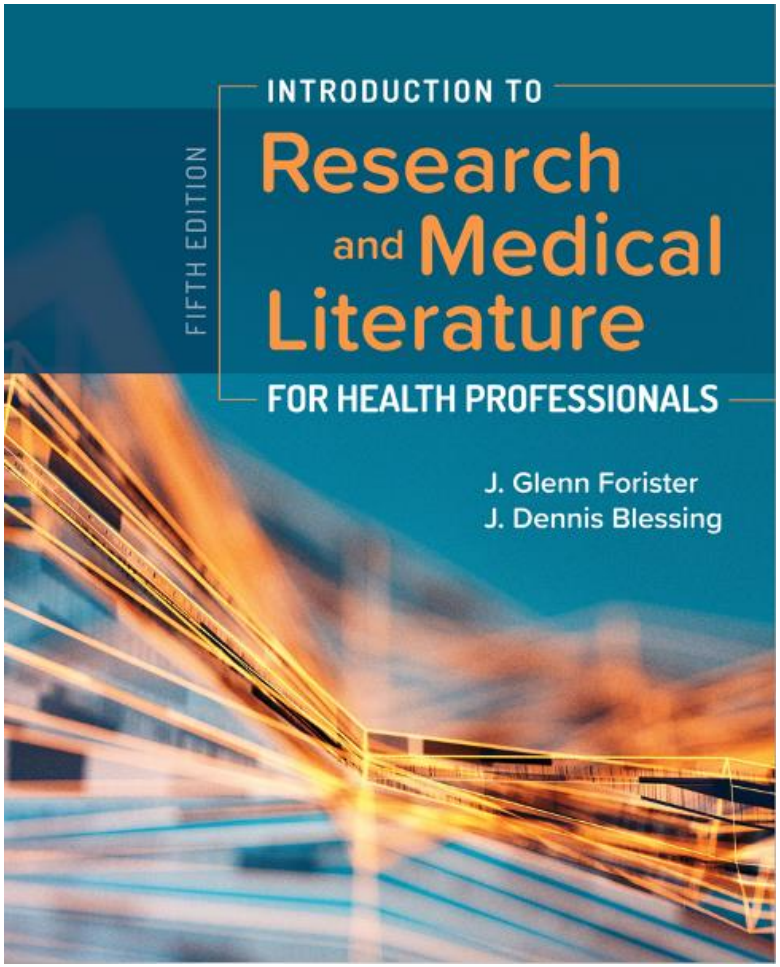
Research Design

Statistical Reasoning

Books

You Read	&	I Teach





Course Goals

On completion of the course, students will be able to:

1. Describe the research process
2. Identify the principal components of ethical research
3. Write an informed consent document
4. Write a focused research question
5. Perform a literature search using online databases
6. Discriminate between high- and low-quality articles in the literature
7. Detect the various sources of bias in articles and materials
8. Compare quantitative and qualitative research methods
9. Identify threats to internal and external validity
10. Demonstrate the ability to discuss articles using research terminology

Course Requirements

- **Participation:** Your level of participation will influence the advancement of your current skills.
- **Group Project:** As a group of randomly selected students, you will present an assigned article (10-minute group presentation) in the second class of 3rd week.
- **Individual Project:** In the final class of this course, you will present your research idea in a 3-minute individual presentation along with your research portfolio. This portfolio should include an introduction to your research subject, a brief literature review, a focused research question, and written informed consent. You may also include planned research methodologies, statistical analysis, or any further details, though these are not required.

Group Project

#	Article	Group Members
1	Does water kill? A call for less casual causal inferences	
2	Parachute use to prevent death and major trauma when jumping from aircraft: randomized controlled trial	
3	State of Disparities in Cardiovascular Health in the United States	
4	Association of Statin Use With All-Cause and Cardiovascular Mortality in US Veterans 75 Years and Older	
5	Association of Daily Step Count and Step Intensity With Mortality Among US Adults	

Questions

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Objectives

- Define research.
- Describe types of research.
- Describe and discuss the importance of research in the health professions.
- Begin to develop a scientific approach to study and practice.

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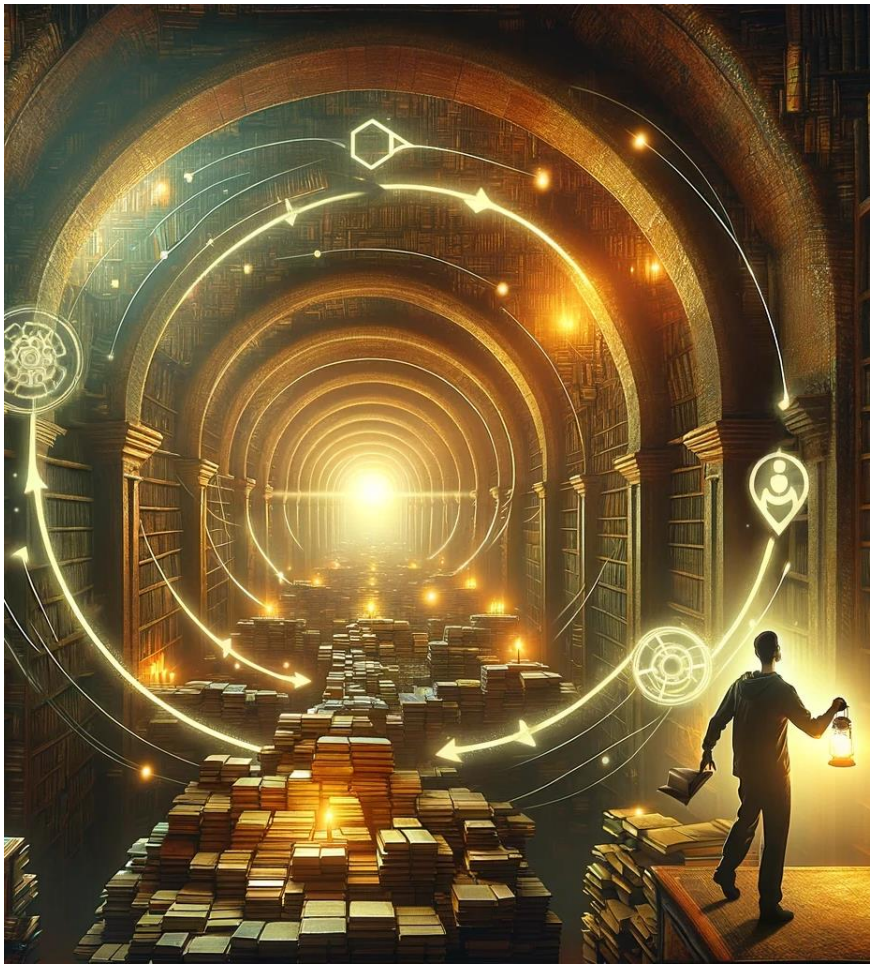
The Etymology of Research: An Endless Quest

The Word "Research", derived from Middle French "recherche"



The Word "Research"

- Meaning: "to go about seeking"
- From Old French "recerchier"
- "Re-" + "cerchier" (or "sercher")

Research as an Endless Process

- Continuously seeking new info
- Repeatedly searching for answers
- An ongoing journey of discovery

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What does “research” mean to you?

Word research conjures up the following images:

- Individuals hidden away in a lab doing something unrelated to everyday life
- Boring work forced on students
- The pursuit of information that has little application in the real world
- Not something a healthcare professional does in clinical practice

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Research Equals **Curiosity**

Research process **difficult for many to understand**

- Often requires use of formulas and language only other researchers comprehend
- Research findings often contradictory

Research provides **basis for practice**

- Will be part of day-to-day job in the future
- Practice can only advance by applying evidence of what works.

Seeking an answer to a question is a form of research.

- Much “research” informal and without systematic constraints

Learning how research works:

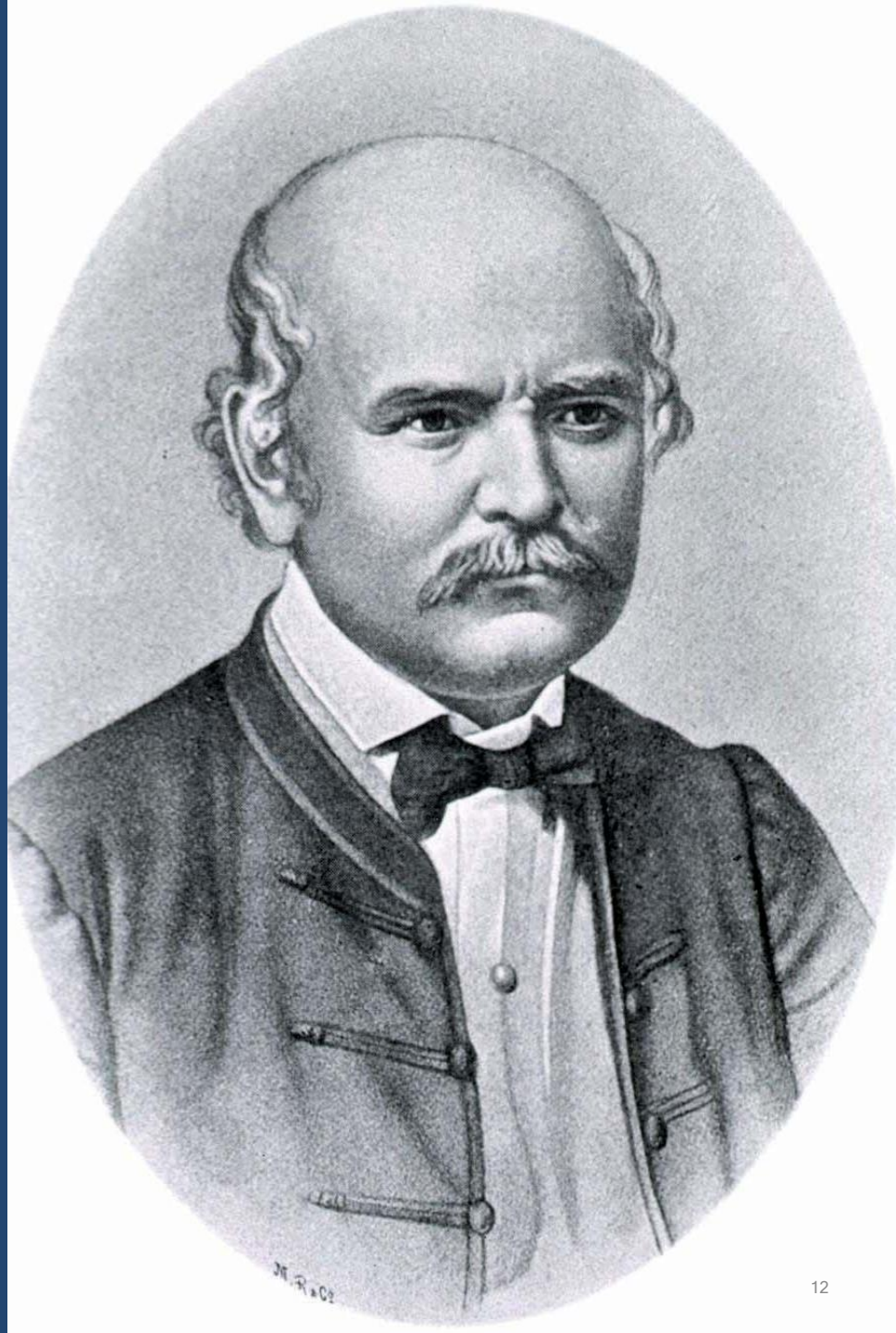
- Helps relieve anxieties
- Increases ability to appreciate and enjoy process

“**Dr. Ignaz Semmelweis**

Father of Infection Control

Savior of Mothers

(1818–1865)



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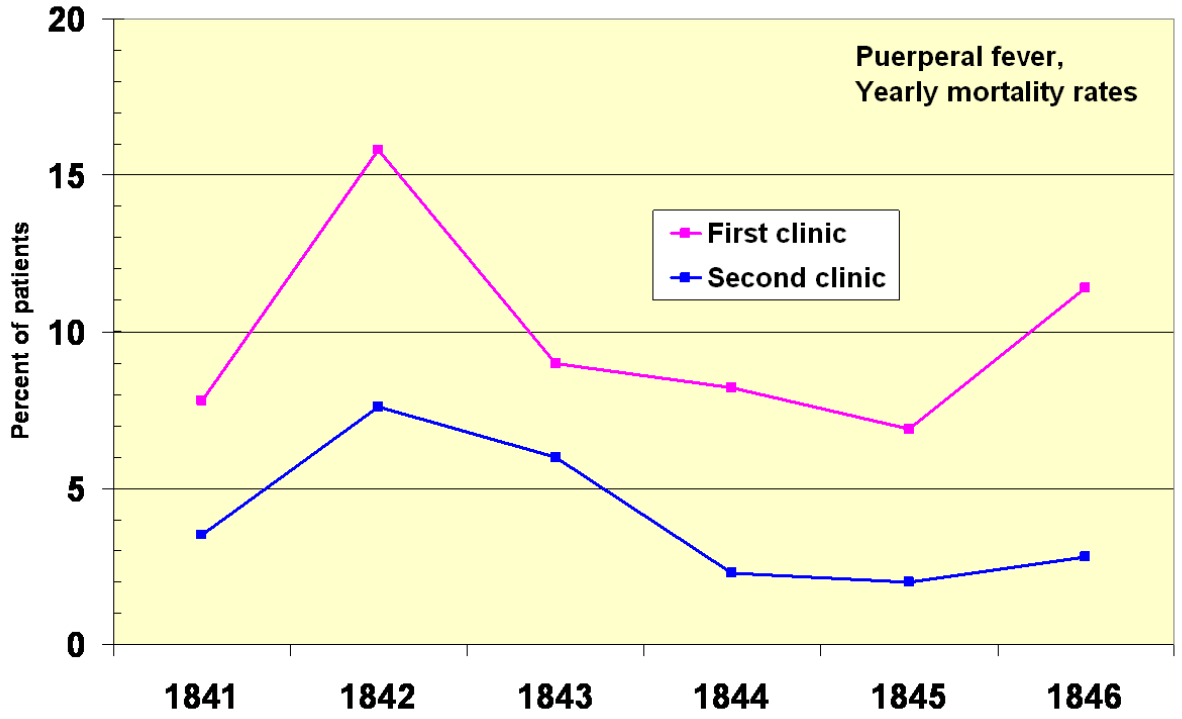
Ignaz Semmelweis and the Birth of Infection Control

Hungarian born physician who received his MD degree in Vienna in 1844.

He **observed** that women delivered by physicians and medical students had a much higher rate (13-18%) of post-delivery mortality than women delivered by midwives (2%).



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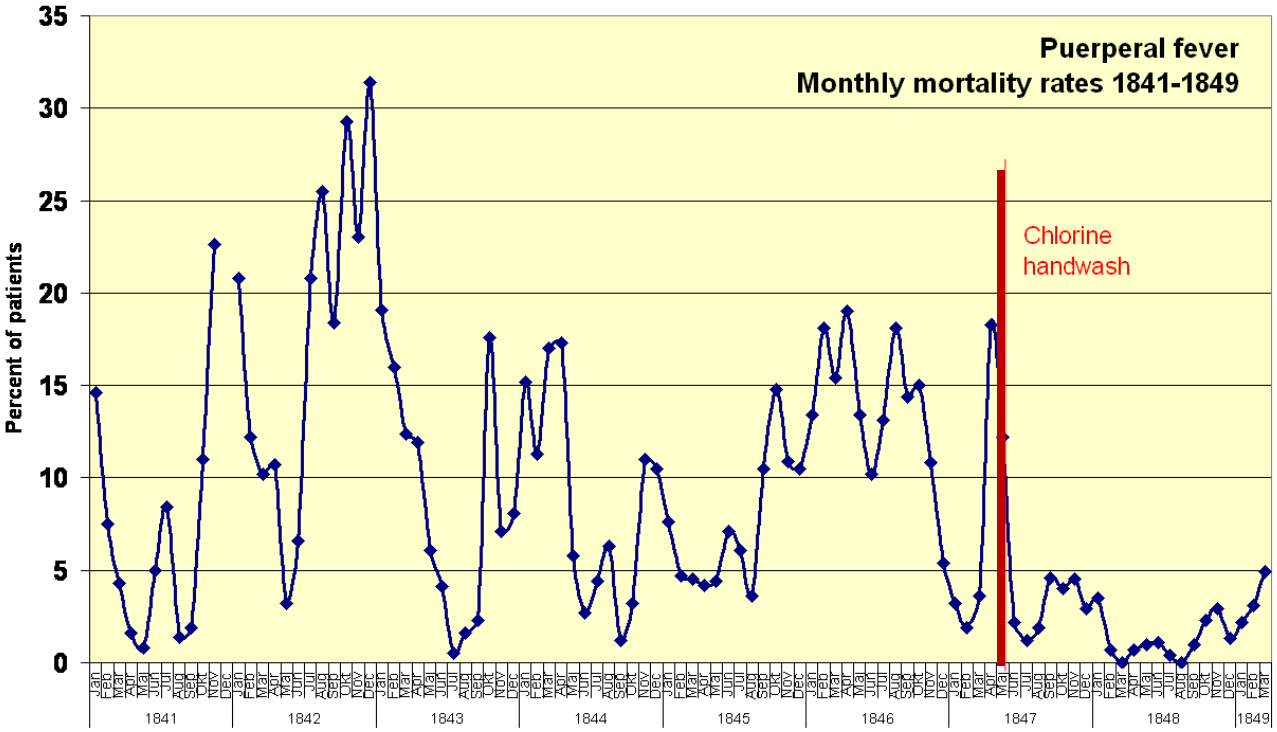
Source: Best M, Neuhauser D. Ignaz Semmelweis and the birth of infection control. *BMJ Quality & Safety* 2004;13:233-234.

Ignaz Semmelweis and the Birth of Infection Control

Observation and Hypothesis: Semmelweis observed that doctors often moved directly from conducting autopsies to delivering babies, without washing their hands. He **hypothesized** that "cadaverous particles" from the autopsies were being transferred to the mothers, causing the infections.



Experiment: To test his hypothesis, Semmelweis instituted a policy requiring all medical staff to **wash their hands with a chlorine solution** before examining any patients. This was based on his belief that the chlorine would remove any putrid particles and odors.

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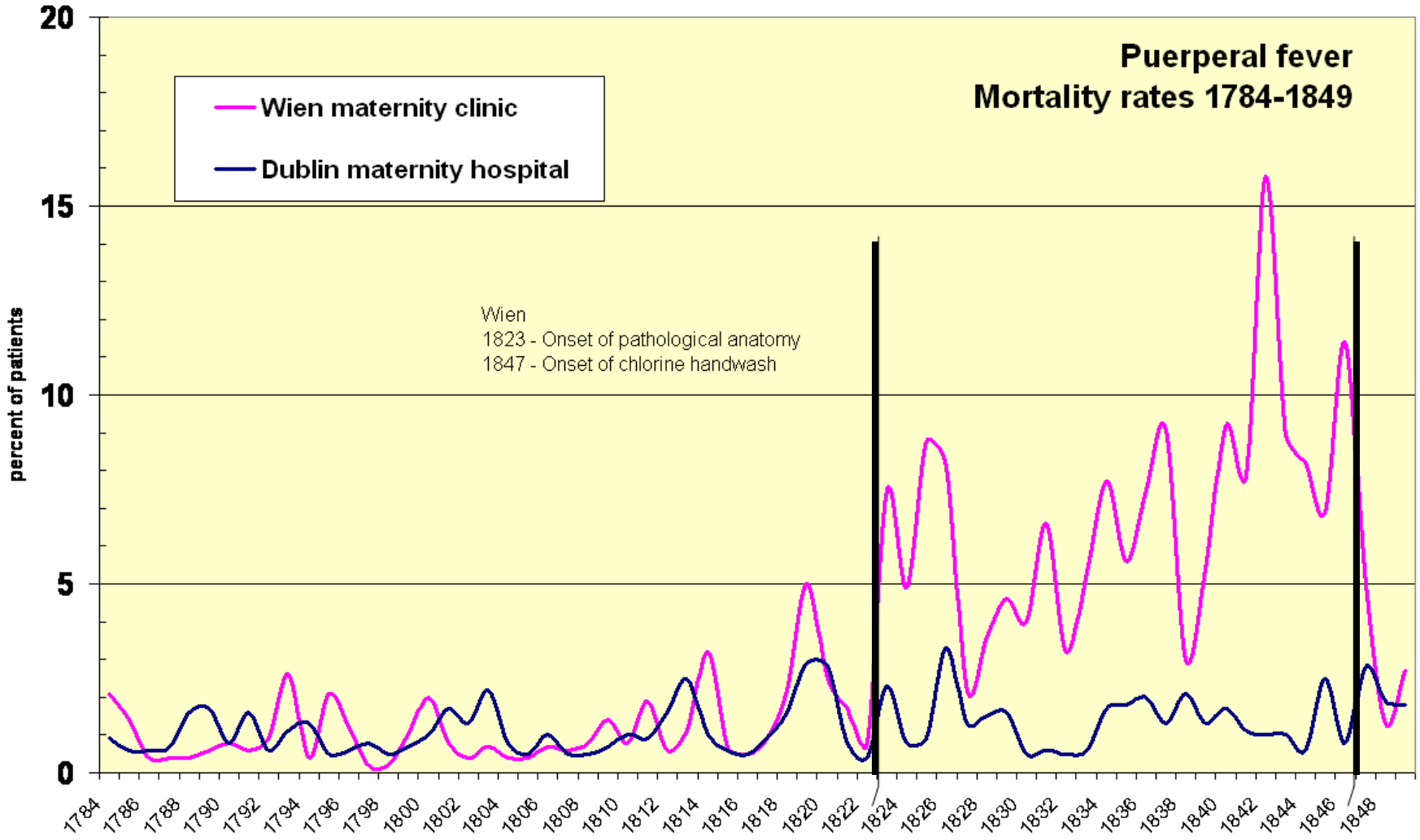
Ignaz Semmelweis and the Birth of Infection Control



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Impact & Publication

- Years later, the advent of germ theory and the work of scientists like Louis Pasteur and Joseph Lister led to the full recognition and acceptance of Semmelweis's findings.
- Semmelweis's research exemplifies **the power of careful observation, hypothesis testing, and the implementation of preventive measures in improving public health.**
- His work laid the foundation for modern antiseptic practices, highlighting the importance of hygiene in medical settings.

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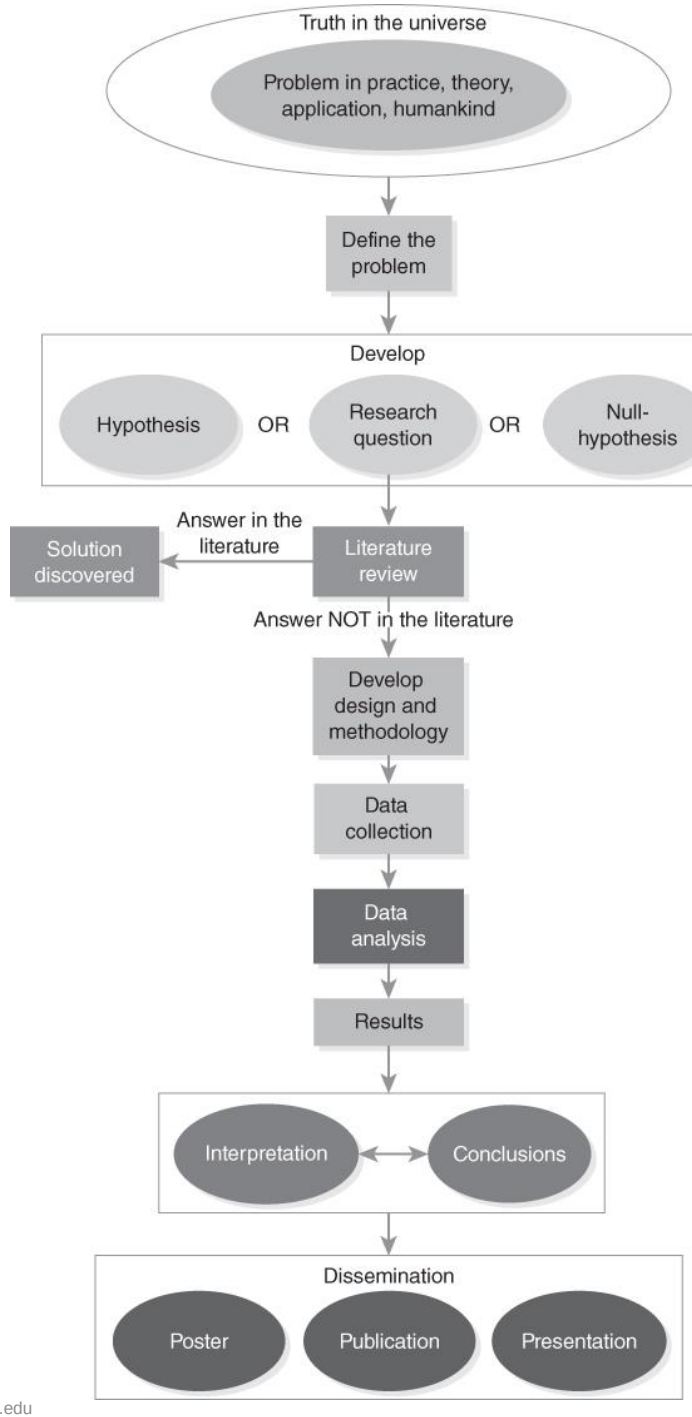

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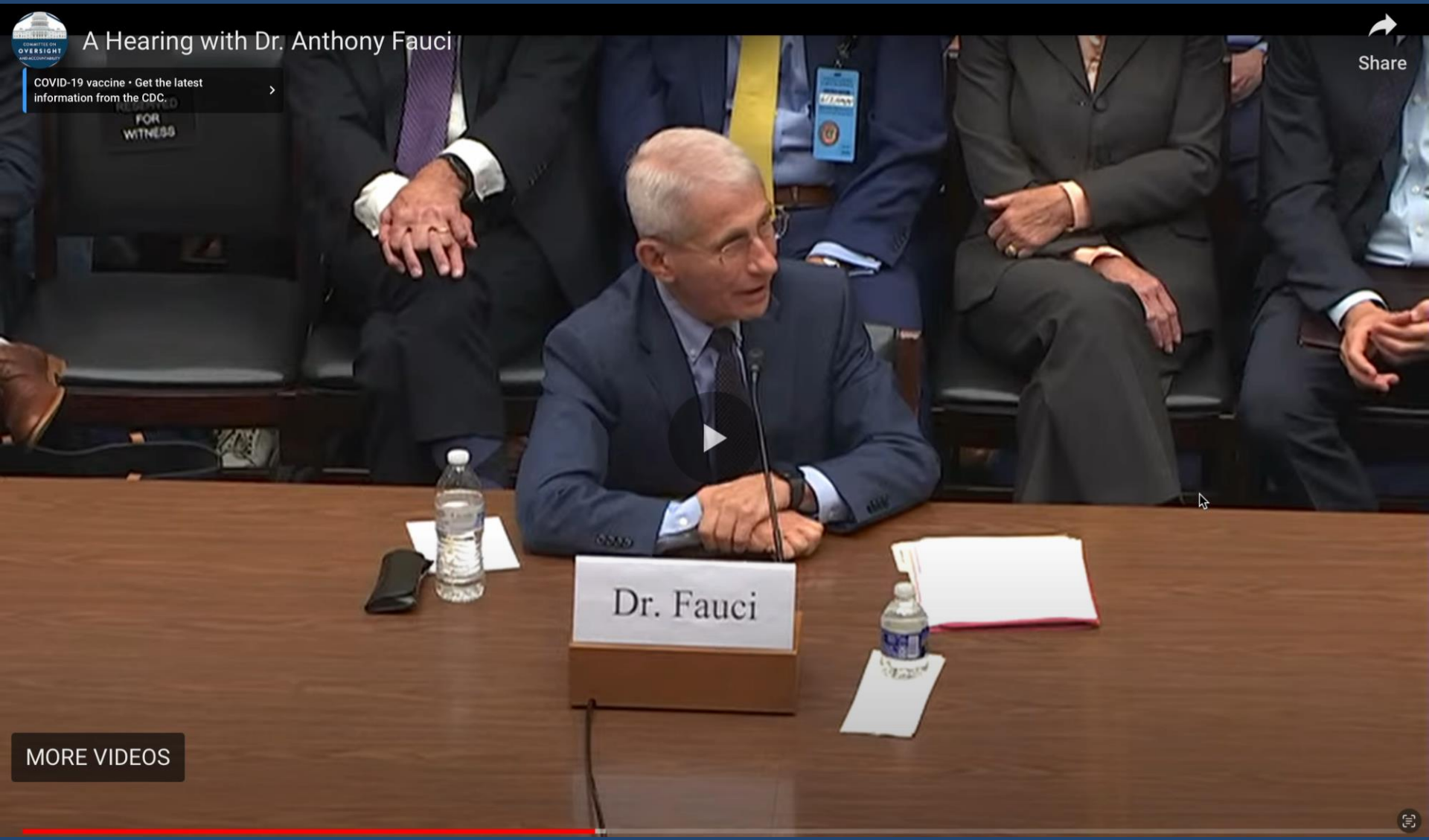
A Hearing with Dr. Anthony Fauci
June 3, 2024
10:00 am



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Types of Research

Type	Description	Example(s)
Pure	Abstract and general, concerned with generating new theory and gaining new knowledge for knowledge sake	Theory development
Experimental	Manipulation of one variable to see its effect on another variable, while controlling for as many other variables as possible and randomly assigning subjects to groups	Double-blind random assignment control groups, response to an intervention
Clinical	Performed in the clinical setting where control over variables is quite difficult	Drug trials, therapeutic results
Applied	Designed to answer a practical question, to help people do their jobs better	Time use studies, evaluation of different types of interventions with the same purpose
Descriptive	Describing a group, a situation, or an individual to gain knowledge that may be applied to further groups or situations, as in case studies or trend analyses	Surveys, qualitative research, measurement of characteristics, response to phenomena
Laboratory	Performed in laboratory surroundings that are controlled	Basic science research

Data from Bailey DM. *Research for the Health Professional: A Practical Guide*, 2nd ed. Philadelphia, PA: FA Davis; 1997, xxii.

Developing a Research Project

1. List interests
2. Prioritize in order of importance/interest
3. Revise list based on your capabilities
4. Revise list based on things important to effort
5. Reprioritize on what is important to society or health
6. Make decisions about what can be accomplished
7. Surviving or central topic is basis of research project
8. Develop timeline for study
9. **Get started**

Questions

Read

Chapter 1: Thinking in Print: The Uses of Research, Public and Private
Chapter 2: Connecting with Your Reader: Creating a Role for Yourself and Your Readers

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"

Research is formalized curiosity.

It is poking and prying with a purpose.

- Zora Neale Hurston