Fundamental Epidemiological Study Designs

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3/20/25

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Preface

I am on a journey to pursue my master's degree. I started writing this notes as a way to summarize what I have learned from the course. It will be basic and may contain some errors or mistakes. If you have time to go through it, I would be grateful for your feedback. Most of the content here is taken from the Distant Learning Epidemiology Master's Programme provided by London School of Hygene and Tropical Medicine (LSHTM), with some modifications taken from the book Modern Epidemiology, 4th edition (Lash et al. 2021) and the Introduction to Biostatistics course provided by Prof. Ronald Geskus and his team at Oxford University Clinical Research Unit, Ho Chi Minh.

Special thanks to Dr. Thinh Ong for motivating me to work on this.

Introduction

Epidemiology is a young science that has developed particularly rapidly over the last 50 years, as new techniques of analysis have been developed. Much progress has been made, particularly in understanding the causes of "non-communicable" diseases (for example, the links between H.pylori and gastric ulcer, and between EBV (Epstein-Barr virus) and Burkitts lymphoma).

However new challenges continue to emerge. In recent decades, severe acute respiratory syndrome (SARS), drug resistant tuberculosis and methicillin-resistant *staphylococcus aureus* (MRSA) have all emerged as challenges to the public health. As an epidemiologist, you are unlikely to become bored!

Source: EPM 101 LSHTM

Part I

Basic concepts

1 Fundamental epidemiology

> "The study of the occurrence and distribution of health-related events, states, and processes in specified populations, including the study of the determinants influencing such processes, and the application of this knowledge to control relevant health problems." (Porta 2014)

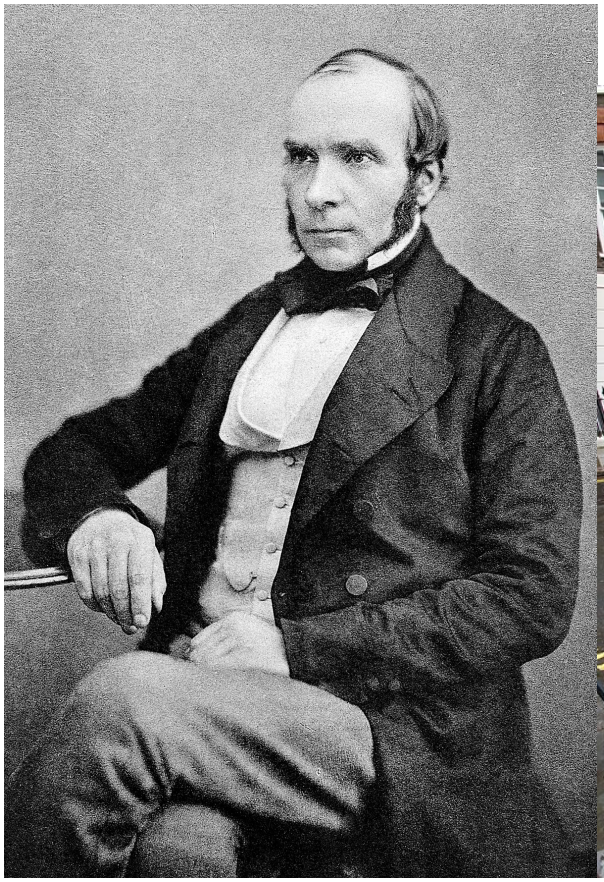

Figure 1.1: John Snow

Figure 1.2: His study pump

Jhon Snow example: For short, in 19th century, cholera expand all over Europe and UK. Estimated 15,000 recorded deaths in London in 1848-9. Snow (an anaesthetist) came up with some hypothesis: