



**Thursday 26 October 2023**

## Educational Session Program

# Target Trial Emulation Framework and Clone-Censor-Weight Approach

(Level: Intermediate/Advance) (Language: English)

### Instructors:

**Dr Hiraku Kumamaru**, University of Tokyo

**Dr Edward Lai**, National Cheng Kung University

**Albert Chuang**, National Cheng Kung University

**Daniel Tsai**, National Cheng Kung University

**Dr Mary Beth Ritchey**, Rutgers University

Time (IST)	Topic
09:30 (90 mins)	<b>Introduction to Target Trial Emulation</b> <b>Instructor:</b> Dr Hiraku Kumamaru
11:00 (30 mins)	<b>TEA BREAK</b>
11:30 (90 mins)	<b>Workshop: Design a Target Trial Emulation</b> <b>Instructor:</b> Dr Edward Lai <b>Facilitators:</b> Dr Hiraku Kumamaru, Albert Chung, Daniel Tsai
13:00 (60 mins)	<b>LUNCH BREAK</b>
14:00 (90 mins)	<b>Define Time Zero and Immortal Time Bias</b> <b>Instructor:</b> Dr Mary Beth Ritchey
15:30 (30 mins)	<b>BREAK</b>
16:00 (90 mins)	<b>The Clone-Censor-Weight Approach and Simulated Data</b> <b>Instructor:</b> Daniel Tsai, Albert Chuang
17:30	<b>CLOSE</b>

## Introduction

The target trial emulation framework is an emerging method to enhance the causal inference and robustness of observational studies. This framework emulates the design and analysis of a hypothetical randomized trial using observational data. Understanding the key components of this framework is the first step in implementing this method. Moreover, defining the "time zero" is crucial to prevent the potential pitfalls of immortal time bias. A novel method, the clone-censor-weight approach, can be employed especially for the target trial emulation to minimize this bias.

## Requisites Statement

A foundational understanding of pharmacoepidemiology is advisable, encompassing topics like cohort studies and the propensity score method.

## Objective

1. Understand the fundamental principles of the Target trial emulation framework.
2. To learn how to implement Target trial emulation using real-world data appropriately
3. Recognize the significance of defining time-zero and its influence on the result estimates.
4. Understand the strategies to address immortal time bias.
5. To learn when and how to implement the clone-censoring-weighting approach

## Description

### 9:30-11:00 Class 1: Introduction to Target Trial Emulation (**Dr. Hiraku Kumamaru**)

Key learning points:

- Definition of target trial emulation.
- Difference between randomized clinical trials and target trial emulation.
- Why and when do we need target trial emulation
- Designing a target trial (components): casual question, specifying eligibility criteria, assignment procedures, casual contrast, etc.
- Advantages and limitations of target trial emulation.
- Example study.

### 11:30-13:00 Class 2: Workshop- Design a Target Trial Emulation (**Dr. Edward Lai**) (**Facilitators:** Dr. Hiraku Kumamaru, Albert Chung, Daniel Tsai)

- Group discussion (design a study using target trial emulation framework; 30 mins)
- Group presentation (4 groups, each 10 mins presentations + 5 mins feedback)

### 13:00-14:00 Lunch Time

### 14:00-15:30 Class 3: Define time zero and immortal time bias (**Dr. Mary Beth Ritchey**)

Key learning points:

- What and why defining time zero is important?
- What is immortal time bias?
- How to deal with immortal time bias? (Time-varying exposure vs. Cloning Censoring Weighting Approach or others)
- Examples studies.

### 16:00-17:30 Class 4: The clone-censor-weight approach and Simulated Data (**Daniel Tsai and Albert Chuang**)

Key learning points:

- Why and when do we need a clone-censor-weight approach
- Implementation skills for clone-censor-weight
- How to interpret the results from the clone-censor-weight approach.
- Example studies
- Simulated data demonstration (Albert Chuang)