

# ST-elevation myocardial infarction (STEMI)

*Network Study*

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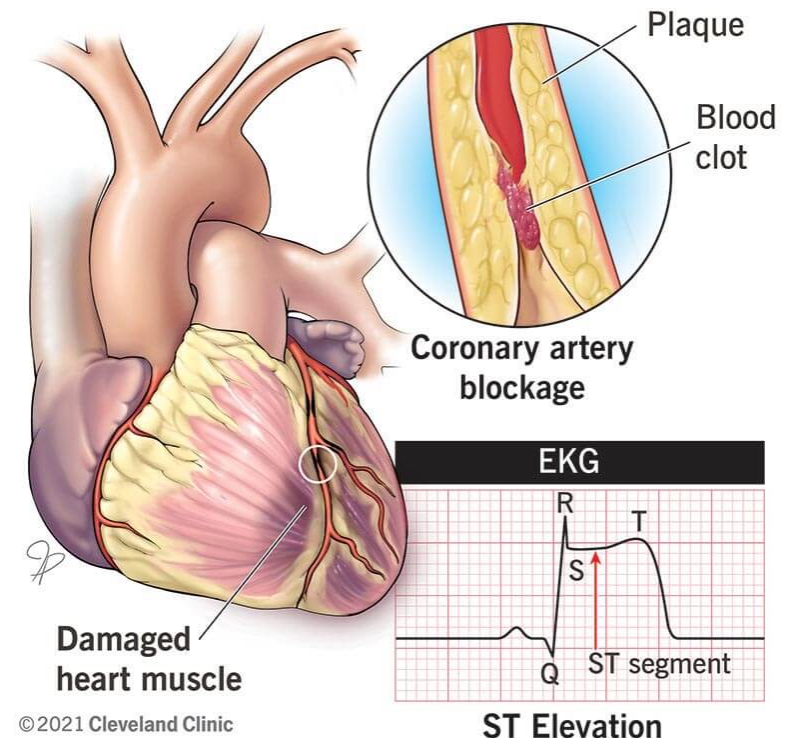
# Background

## ST-elevation myocardial infarction (STEMI)

- ✓ In 2019, an estimated 17.9 million people died from CVDs, which is 32% of all global deaths. Of these deaths, 85% are due to acute myocardial infarction (AMI)
- ✓ In United States alone, 1 American will suffer an AMI every 40 secs: estimated annual incidences of new and recurrent MI events are 550,000 and 200,000 events, respectively (1).

In the 4th Universal Definition of Myocardial Infarction (UDMI) defines acute ST-elevation myocardial infarction (STEMI) requires:

- a rise and/or fall of cardiac troponin (cTn) values and clinical evidence of ischemia (i.e., symptoms, ECG changes, supportive ECG or other imaging findings, or evidence of coronary thrombus). The underlying etiology is plaque disruption with coronary atherothrombosis (2, 3, 4).
- › Acute STEMI can manifest as:
  - » hyperacute T-wave changes
  - » true posterior MI
  - » multi-lead ST depression with coexistent ST elevation in lead aVR
  - » characteristic diagnostic criteria in the setting of left bundle branch block



(1) Mozaffarian D, Benjamin EJ, Go AS, et al. Heart disease and stroke statistics—2016 update: a report from the American Heart Association. *Circulation*. 2016; 133:e38–360.

(2) Asatryan B, Vainora L, Manavifar N. Electrocardiographic Diagnosis of Life-Threatening STEMI Equivalents. *JACC: Case Reports*. 2019;1(4):666-668. doi:10.1016/j.jaccas.2019.10.030

(3) Bergmark, B. A., Mathenge, N., Merlini, P. A., Lawrence-Wright, M. B., & Giugliano, R. P. (2022). Acute coronary syndromes. *The Lancet*, 399(10332), 1347–1358. [https://doi.org/10.1016/S0140-6736\(21\)02391-6](https://doi.org/10.1016/S0140-6736(21)02391-6)

(4) Thygesen K, Alpert JS, Jaffe AS, et al. Fourth Universal Definition of Myocardial Infarction (2018). *Circulation*. 2018;138(20). doi:10.1161/cir.0000000000000617

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# Rationale

## Acute STEMI characterization and incidence rates

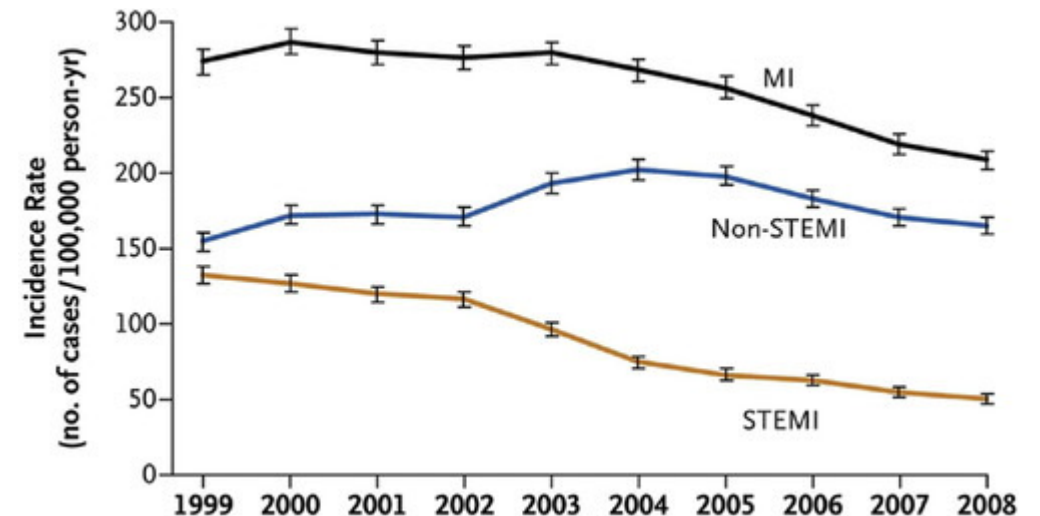
Given the acuity and “need for speed” in treating acute STEMI cases, accurate and scalable generalizable identification, characterization, and current incidence of STEMI in multi-country real-world data has many benefits.

For example, informing on resource allocation, campaigns to improve heart attack recognition, cardiovascular health, and risk factor modification, etc.

**This comprehensive study aims to understand STEMI patients’ characteristics and identify the incidence rates across multiple real-world data datasets.**

### Research questions:

- To understand the patients’ characteristics of acute STEMI patients
- To understand incidence rates of acute STEMI patients

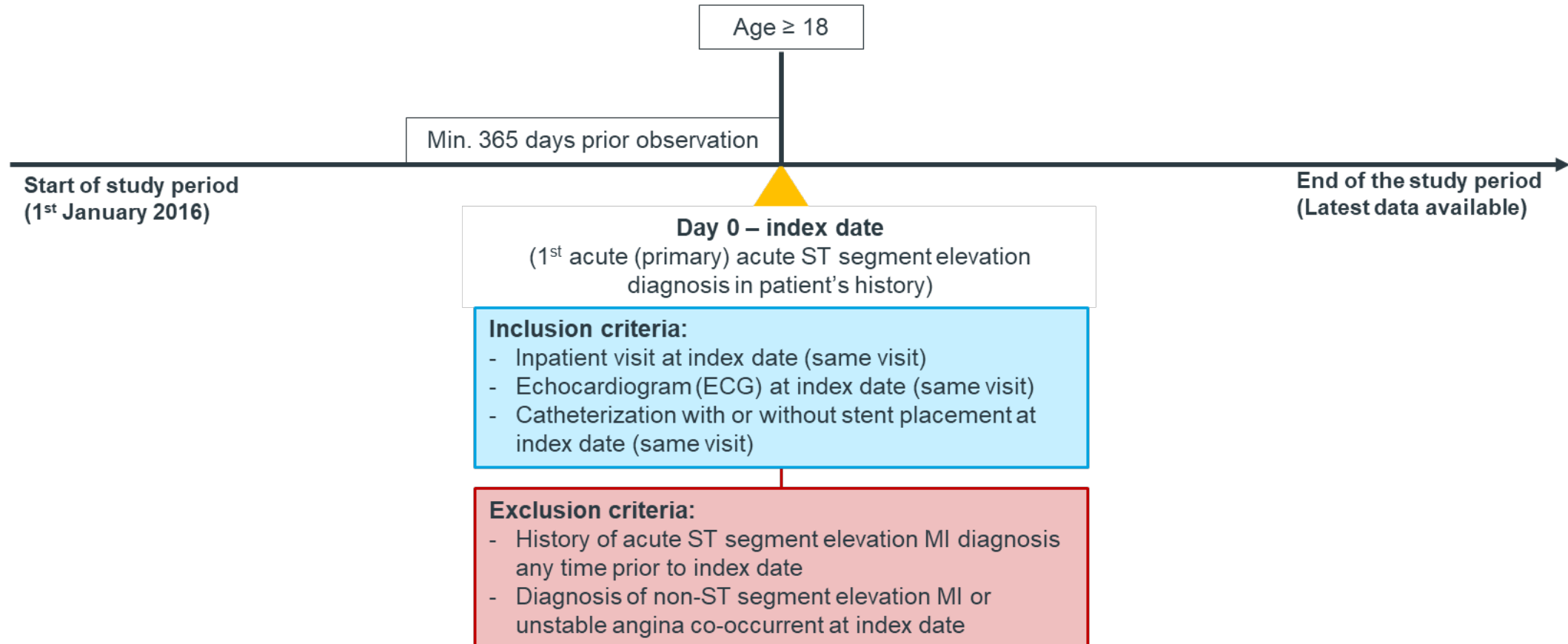


# Study design

- **Design**: This will be a retrospective cohort study of patients diagnosed with acute STEMI.
- **Data sources** can be administrative claims, registry, or electronic health records (EHR) data mapped to the OMOP CDM across the OHDSI network.
- **The primary study population** will consist of adult patients with an acute STEMI diagnosis identified in the data sources.
- **The overall study period** will span from January 1, 2016, up to the most recent data available for the given data sources.

# Outline of cohort design

## Acute STEMI



# Data analysis

## Strategus

- The package uses the OHDSI Strategus framework for execution, previously been used for **HowOften** and **SOS Challenge** within the OHDSI community.
- The Strategus package includes the CohortDiagnostics module:
  - To identify features and calculate the incidence rates of patients in the STEMI cohort.
  - Features will be extracted from the 365-day observation prior to cohort entry and will include variables such as demographic data (sex, age group, race, ethnicity), prior conditions, drug exposures, procedures, measurements, observations, and risk scores (e.g., Charlson comorbidity index, DCSI, CHADS2VASC score).
  - Incidence rates will be calculated for the STEMI cohort. The rate is calculated the number of new STEMI cases per 1,000 person-years (PY) of the total patients at risk of getting exposed each calendar year.



# Current data partners

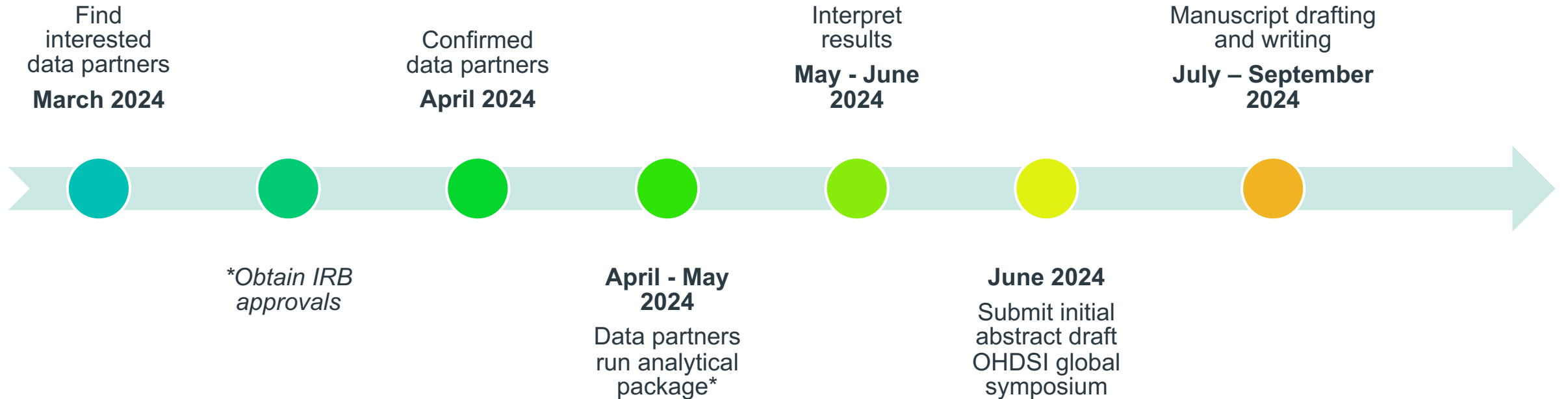
| Country   | Institution                                                                                                          |
|-----------|----------------------------------------------------------------------------------------------------------------------|
| US        | Columbia University                                                                                                  |
| US        | <a href="#">IQVIA Hospital CDM</a><br><a href="#">IQVIA PharMetrics Plus</a><br><a href="#">IQVIA Ambulatory EMR</a> |
| US        | University of Washington                                                                                             |
| Israel    | Kineret                                                                                                              |
| Korea     | Ajou University                                                                                                      |
| Korea     | Keimyung University Dongsan Medical Center (DSMC)                                                                    |
| Singapore | National University of Singapore                                                                                     |
| Korea     | Seoul National University Hospital                                                                                   |

# Preliminary timelines

*Spread the word*

If you are interested to join, please let us know!

<https://forums.ohdsi.org/t/join-our-cvd-ohdsi-network-study-on-acute-stemi/21258>





**Thanks,  
any questions?**