WHY IS REAL-WORLD EVIDENCE (RWE) IMPORTANT?

Randomized Controlled Trials (RCTs)

RCTs establish the **safety and efficacy** of a treatment in a well-defined population[1]

RWE studies

RWE studies provide **additional insights** into the effectiveness and safety profile of treatment in routine clinical practice[2]

Why conduct RWE studies?

- **Complement and support findings** from RCTs[1,3]
- Provide **evidence on usage, effectiveness and safety** during routine clinical care from a broad population[3]
- **Answer questions** which RCTs are not typically designed to address[3]

RATIONALE FOR EMPRISE

EMPA-REG OUTCOME® trial demonstrated that empagliflozin **reduced the risk of cardiovascular (CV) death, hospitalization for heart failure and all-cause mortality** in patients with type 2 diabetes and CV disease (CVD)[4]

Additional analyses indicate that these effects are **consistent across the CV risk continuum** within the EMPA-REG OUTCOME® population[5]

Implications of these findings in routine clinical care across a broad CV risk continuum had not been investigated

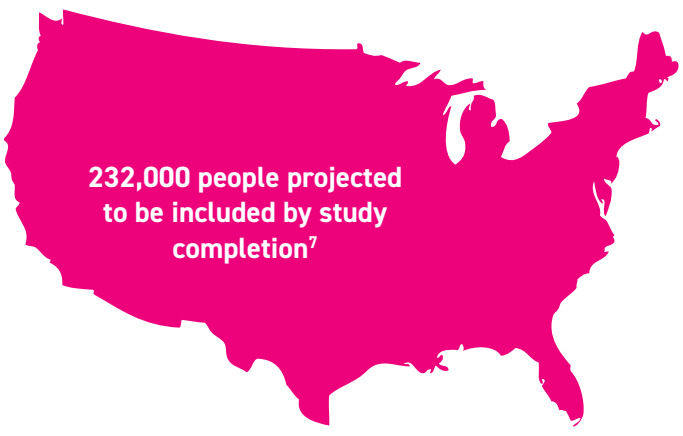
INTRODUCING EMPRISE

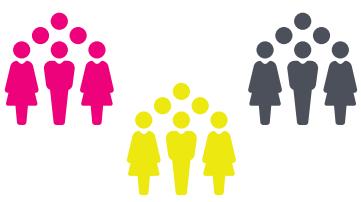
Sources:
Three large databases in the U.S.: Optum, Marketscan and Medicare[6]

Duration of study:
First 5 years of empagliflozin use in the U.S. (2014–2019)[6]

Design:
1:1 propensity score matching of over 140 covariates improving comparisons between patients matched by known baseline variables[6]

Comparison:
Empagliflozin versus DPP-4 inhibitors[6]





EMPRISE initiated and led by:
Division of Pharmacoepidemiology at Brigham and Women's Hospital (BWH) and Harvard Medical School

Built upon an academic collaboration between BWH and Boehringer Ingelheim

EFFECTIVENESS OUTCOMES[8]

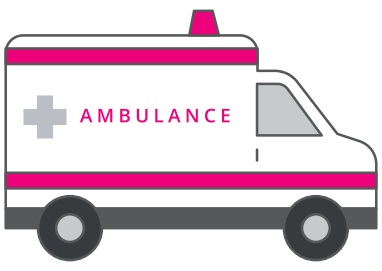
- Hospitalization for heart failure
- All-cause mortality
- CV death
- Non-fatal myocardial infarction, non-fatal stroke
- 3P MACE†
- Coronary revascularization procedure
- End-stage renal disease
- Treatment of retinopathy

SAFETY OUTCOMES[8]

- Lower-limb amputation
- Diabetic ketoacidosis
- Acute kidney injury requiring dialysis
- Severe hypoglycemia
- Urinary tract cancers
- Bone fracture

Why compare to a DPP-4 inhibitor?
DPP-4 inhibitors represent an optimal comparator with similar treatment algorithm position, similar glycemic efficacy, similar hypoglycemia risk and largely neutral CV outcomes[7]

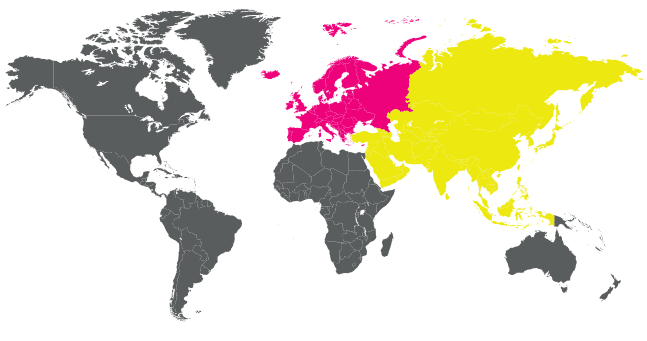
HEALTHCARE RESOURCE UTILIZATION AND COSTS OUTCOMES[9]



- Time to any hospitalization
- Number of hospital admissions
- Length of hospital stay
- Time to any emergency department visit
- Number of emergency department visits
- Number of office visits
- Number of distinct medication prescriptions

WHAT IS NEXT FOR EMPRISE

Started in 2019, additional EMPRISE studies in **Asia and Europe**, will provide insights from different regions of the world with an international perspective on the use of empagliflozin in routine clinical care



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†3-Point Major Adverse Cardiovascular Event (CV death, hospital admission for myocardial infarction, hospital admission for stroke)

Boehringer Ingelheim

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