Study of Operating characteristic of Bayesian methods that borrow treatment effects

First published: 07/06/2023

Last updated: 24/06/2025

Study Finalised

Administrative details

EU PAS number

EUPAS105257

Study ID

106787

DARWIN EU® study

No

Study countries

- [ ] France
- [ ] United States

Study description

While the appropriateness of Bayesian methods in the paediatric context is largely recognised, most existing methods refer to borrowing control arm data only. From a regulatory perspective, an important issue with Bayesian methods is that they potentially do not control the Type I Error. Many simulation studies have been performed within the last decade in order to evaluate the operating characteristics, e.g. regarding Type I Error inflation and possible gains with respect to power, associated with Bayesian methods. Moreover, these methods are known to be potentially sensitive to small changes in underlying parameters, such as a weight parameter which determines how much information is borrowed from the historical data, and could potentially leads to different conclusions. Considering the limitations associated with these methodologies, an extension towards borrowing treatment effect, instead of historical control data only, is considered. The primary aim of this Tender is to thoroughly evaluate the available Bayesian methods for borrowing information on treatment effects in the context of paediatric evaluations. More specifically, specific objectives of this project include: - Review and evaluate available and published methods for dynamic borrowing via a structured and critical review (not limited to paediatric extrapolation) - Provide a clear mathematical specification of each model identified, articulating the interpretation of underlying parameters, and define the relevant operating characteristics (OCs) and performance metrics to evaluate for a given context - Evaluate and compare (via simulations) performance of such methods along the pre-defined OCs in various common scenarios - Synthesize and disseminate overall conclusions and recommendations

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Study status

Finalised

Research institutions and networks

Institutions

Quinten Health

First published: 01/02/2024

Last updated: 01/02/2024

Institution

Daniel Lee New York, USA

Contact details

Study institution contact

Billy Amzal b.amzal@quinten-health.com

Study contact

b.amzal@quinten-health.com

Primary lead investigator

Billy Amzal

Primary lead investigator

Study timelines

Date when funding contract was signed

Planned: 25/01/2023

Actual: 25/01/2023

Study start date
Planned: 25/01/2023

Actual: 25/01/2023

Date of final study report
Planned: 13/02/2025

Actual: 27/02/2025

Sources of funding

- Other

More details on funding

European Medicines Agency

Study protocol

EMA - ROC02 - D3 - Study Protocol.pdf(352.28 KB)

Regulatory

Was the study required by a regulatory body?

Yes

Is the study required by a Risk Management Plan (RMP)?

Not applicable

Methodological aspects

Study type

Study type:

Not applicable

Scope of the study:

Other

If ‘other’, further details on the scope of the study

Assessment of Bayesian statistical methods

Main study objective:

(1) Review and evaluate methods for dynamic borrowing (2) Provide a clear mathematical specification of each model identified (3) Evaluate and compare (via simulations) performance of such methods along the pre-defined OCs in various common scenarios (4) Synthesize and disseminate overall conclusions and recommendations

Population studied

Age groups

Preterm newborn infants (0 – 27 days)

Term newborn infants (0 – 27 days)

Infants and toddlers (28 days – 23 months)

Children (2 to < 12 years)

Adolescents (12 to < 18 years)

Adults (18 to < 46 years)

Adults (46 to < 65 years)

Adults (65 to < 75 years)

Adults (75 to < 85 years)

Adults (85 years and over)

Estimated number of subjects

0

Study design details

Data analysis plan

Not applicable

Documents

Study report

EMA_Study_Report_D4_final.pdf(2.12 MB)

Study, other information

EMA_preliminary_study_plan_D2_final.pdf(226.57 KB)

Data management

ENCePP Seal

The use of the ENCePP Seal has been discontinued since February 2025. The ENCePP Seal fields are retained in the display mode for transparency but are no longer maintained.

Data sources

Data sources (types)

Other

Published literature

Data sources (types), other

Literature Review: Pubmed. Simulation Study

Use of a Common Data Model (CDM)

CDM mapping

No

Data quality specifications

Check conformance

Unknown

Check completeness

Unknown

Check stability

Unknown

Check logical consistency

Unknown

Data characterisation

Data characterisation conducted

No