

# Hyponatraemia and mortality in schizophrenic patients: preparing a Bayesian causal prediction study

Benjamin Skov Kaas-Hansen<sup>\*1,2</sup> MD, MSc — Stig Ejdrup Andersen<sup>1</sup> MD, PhD — Niels Graudal<sup>3</sup> MD, MSc — Gesche Jürgen<sup>1</sup> MD, PhD

## Conclusion

Our 10-patient sample suggests sufficient data density and variance to yield useful results. Splines draw forth non-linear effects which are more realistic results than restrictive linear coefficients or dichotomising p-sodium into hypo- and normonatraemia. The causal model allows for coherent covariate selection, unlike most propensity score methods. Bayesian modelling yields intuitive probabilistic estimates. Registries and patient records jointly give richer phenotypic data than often available. This study will hopefully guide clinical decision-making on monitoring intensity and rational use of psychotropics.

### Data and patients

Retrospective cohort study

1 January 2006 through 1 July 2016

Region Zealand and Capital Region

National Danish registries and patient records

Diagnosed in the ICD10 F2 spectrum

Sustained antipsychotic treatment

### Non-linear regression

Multi-variable regression

Age at death ~ mean p-sodium

Bayesian with data-driven priors

Coherent covariate selection based on causal model

Natural cubic splines for realistic, non-linear effects

### Joint survival model

Models jointly temporal p-sodium patterns, fixed covariates and survival

Bayesian with data-driven priors

If data permit

## Background and scope

Hyponatraemia is a well-known and common side effect of serotonergic psychotropics. Schizophrenic patients suffer from greater mortality and are often exposed to polypharmacy regimens with several hyponatraemia-associated agents.

We present preliminary results to inform the crafting of a protocol for a pharmacoepidemiological study seeking to elucidate the causal effect of p-sodium status on the lifespan of schizophrenic patients using antipsychotics, and the role of total dose and number of serotonergic psychotropics.

## Results (10-patient sample)

N (full data set)	414 (all dead)
No. females	8 males (80%)
Avg. age at death	69 years (SD: 15)
P-Na values per patient	22 (IQR: 11.8–43.5)
No. antipsychotics	2.5 (IQR: 2–4)
No. diagnoses	16.5 (IQR: 13.5–19.8)
Cardiovascular disease	10
Pulmonary disease	10
Cancer diagnosis	10
Renal disease	10

Last 5 years of life

\* Corresponding author

1 Clinical Pharmacology Unit, Zealand University Hospital, Denmark

2 NNF Center for Protein Research, University of Copenhagen, Denmark

3 The Lupus and Vasculitis Clinic VRR 4242, Copenhagen University Hospital, Denmark



bskk@regionsjaelland.dk



REGION ZEALAND  
ZEALAND UNIVERSITY HOSPITAL