AI & PARKINSON

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PARKINSON'S DISEASE

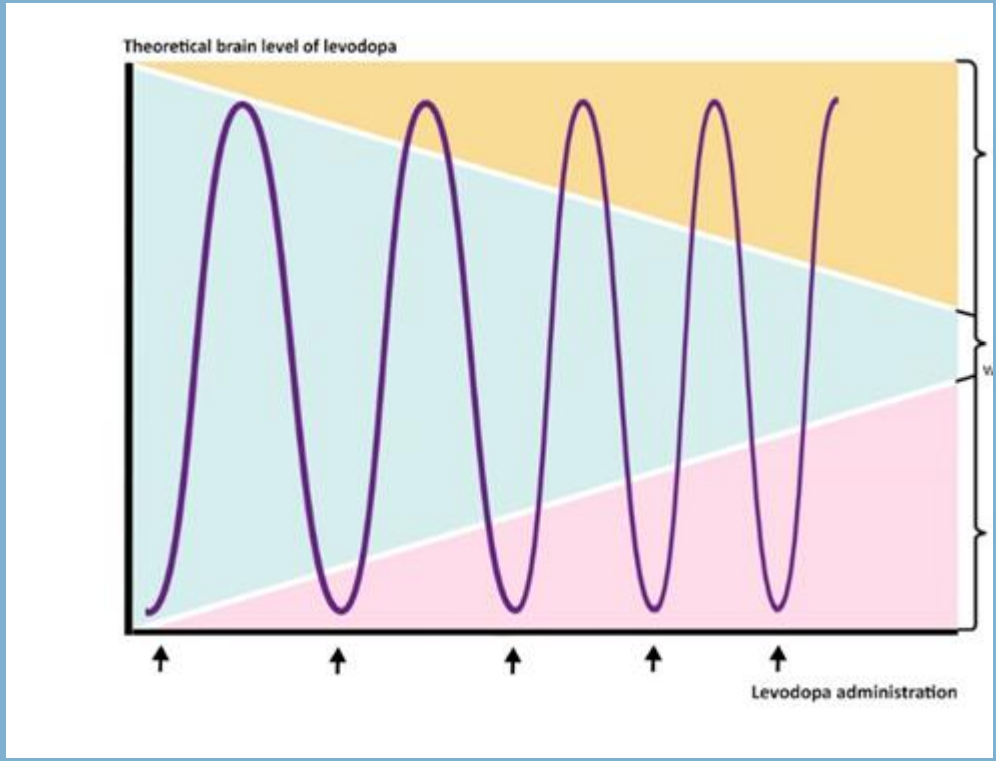
1886

- No neurologists
- No effective treatments
- Survival less than 10 years

Gowers WR (1886) A manual of diseases of the nervous system., J. & A. Churchill, London.

LARGE DIFFERENCES BETWEEN INDIVIDUALS

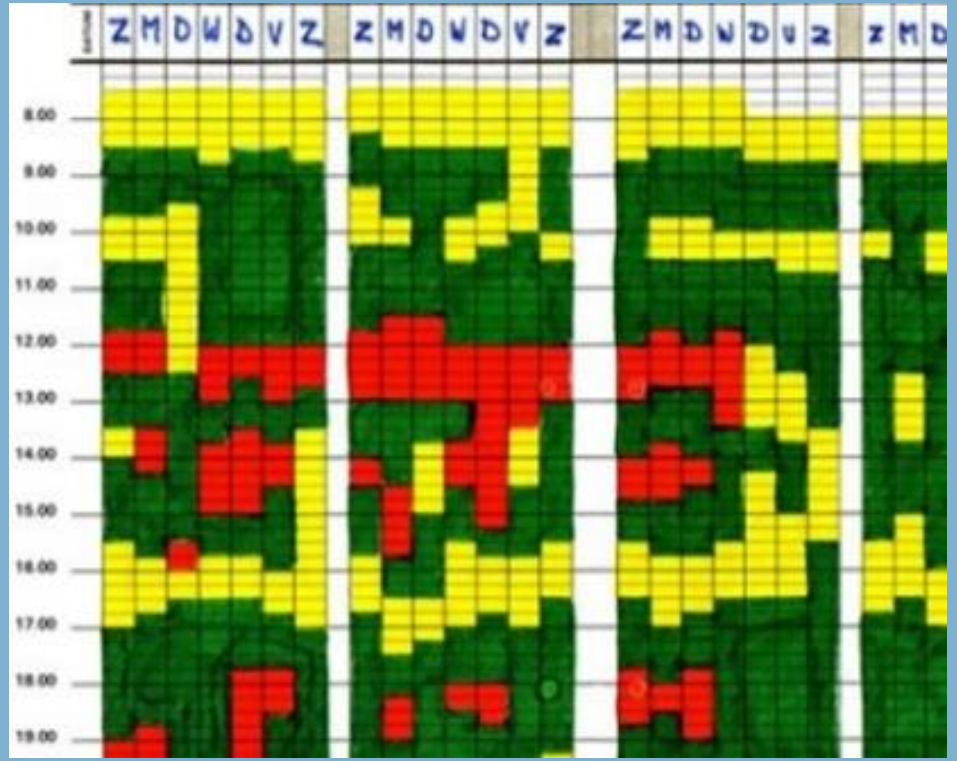
Monitoring response fluctuations



ON with dyskinesias

ON

OFF



personalized
parkinson
project

Radboud umc

verily

Radboud Universiteit

ParkinsonNet

Parkinson Vereniging

umcg

Maastricht UMC+

Health~Holland

Holland

provincie Gelderland

Gemeente Nijmegen

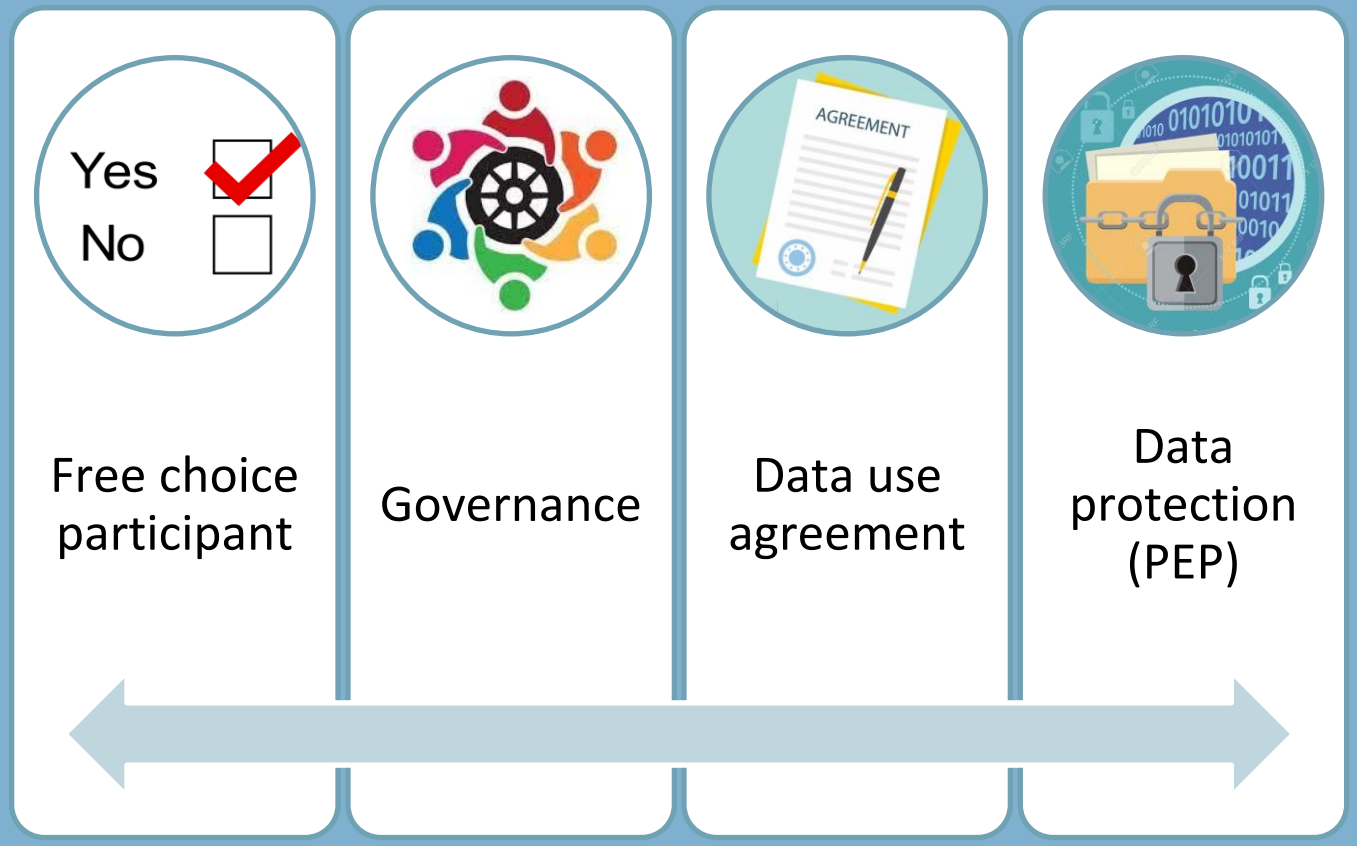
OBJECTIVES

- **Primary objective**: to perform a set of hypothesis-driven analyses
- **Secondary objective:** evaluate the Verily Study Watch
- **Tertiary objective:** create an extensive longitudinal dataset and make this publicly available for researchers

CHALLENGES FOR DATA SHARING

- Protect the privacy and personal data of participants
- Enable the use of data collected for legitimate research
- If data are shared, receiving party obtains controllership over the data
- What about subject's rights?
- What about the obligations of the primary controller?

PPP Program Principle: Privacy by design



STUDY DESIGN

Single Center	520 people with Parkinson's	Recruitment of all 520 persons in 2 years	Longitudinal follow-up 2 years	Total study duration 5 years

Inclusion criteria
- Parkinson's
- Since 0 – 5 years

Exclusion criteria
- Severe co-morbidity
- Is not allowed to or does not want to undergo MRI

DATA COLLECTION SCHEDULE

Stool sampling

ECG and Holter ECG

Neuroimaging

Lumbar puncture

Clinimetrics &
Self-assessments

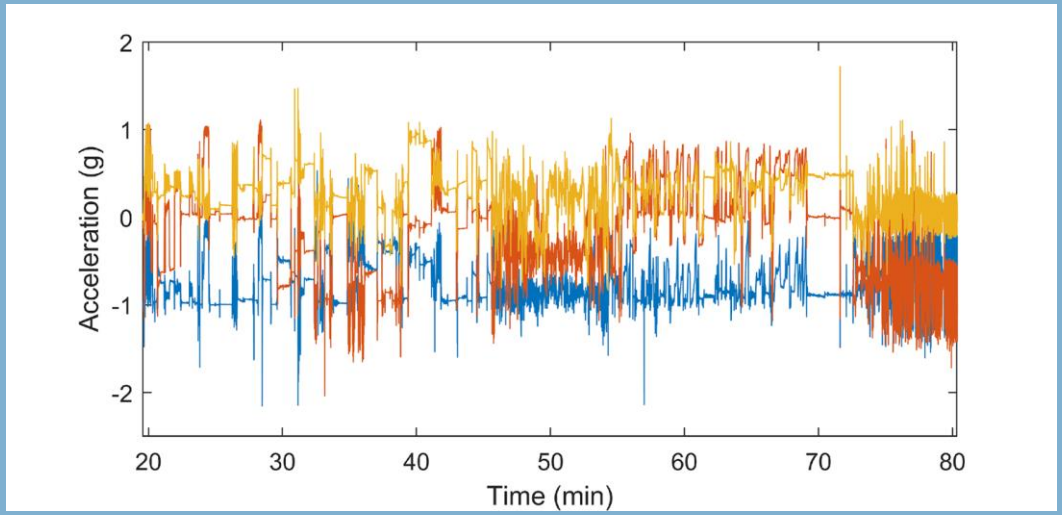
Blood sampling

Sensor data from
smartwatch

> 0,5 PetaByte of data

VERILY STUDY WATCH

- Accelerometer
- Gyroscope
- Continuous heart rate
- Lead 1 ECG
- Ambient Pressure
- Ambient Temperature
- Ambient Humidity
- Ambient Light Sensor



“Raw” sensor data

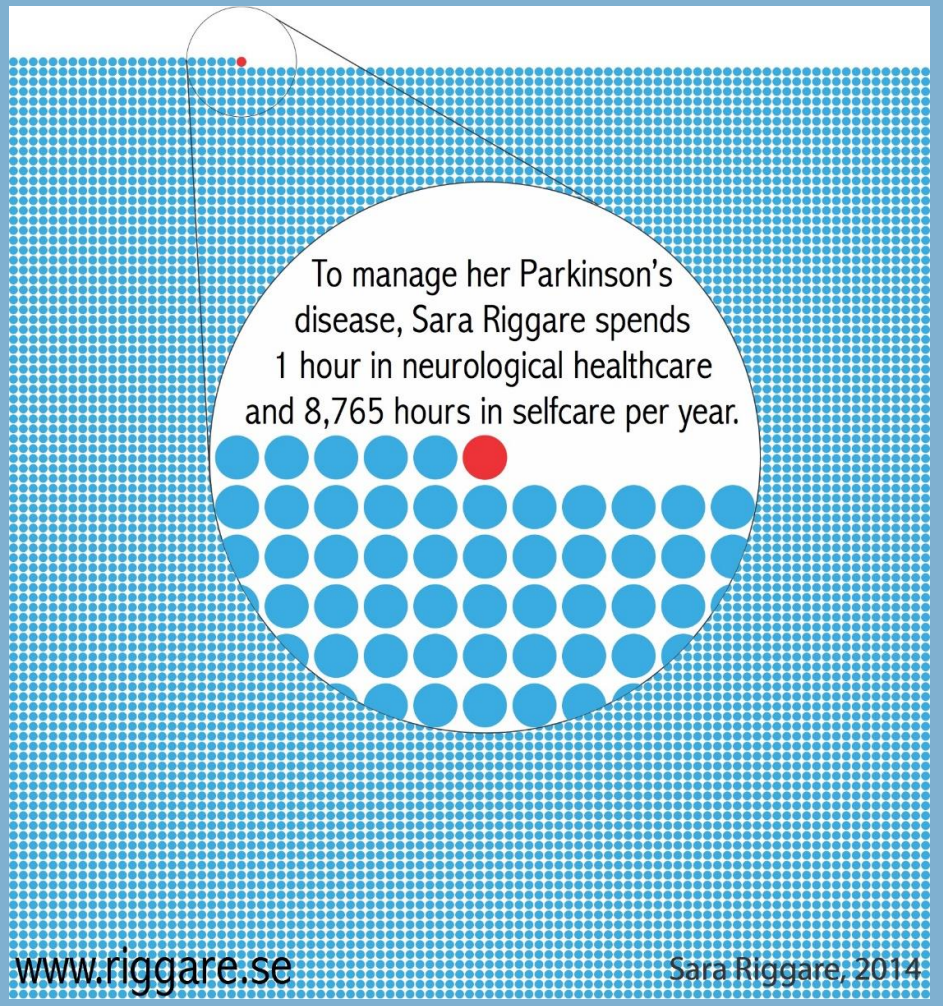
Reliable and clinicaly relevant measure for Parkinson

CHALLENGES FOR IA

- Large variation in daily life signals: small proportion Parkinson-specific
- Difficult to obtain labelled data in natural environments
- We need to be better than current labels
- Need for interpretability and outcomes that are meaningful for patients
- Often interested in causal effects

APPLICATION FOR SELF TRACKING

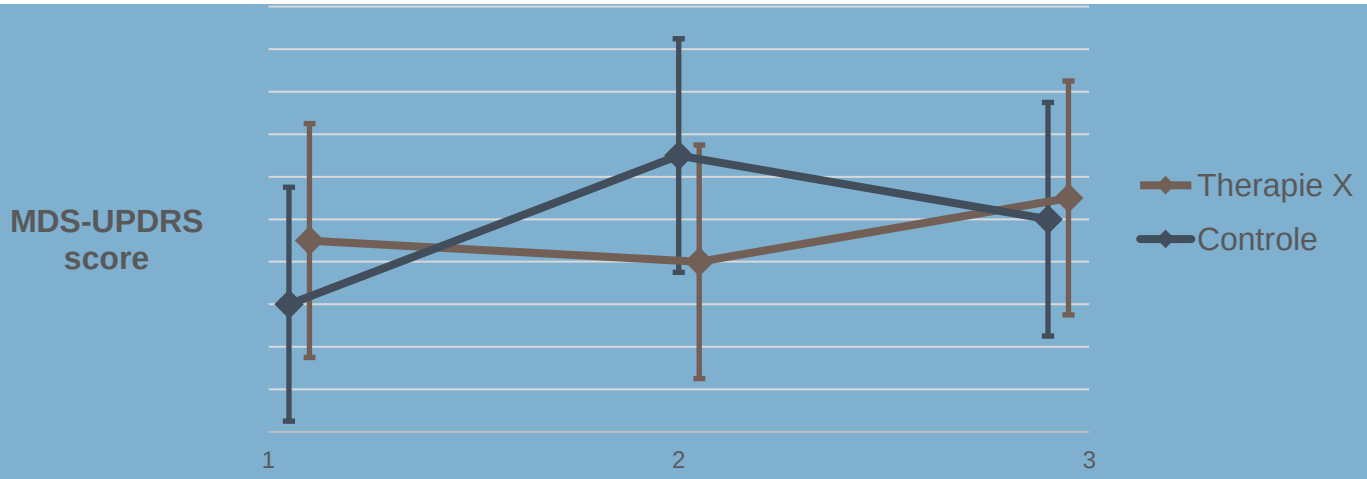
Sara Riggare

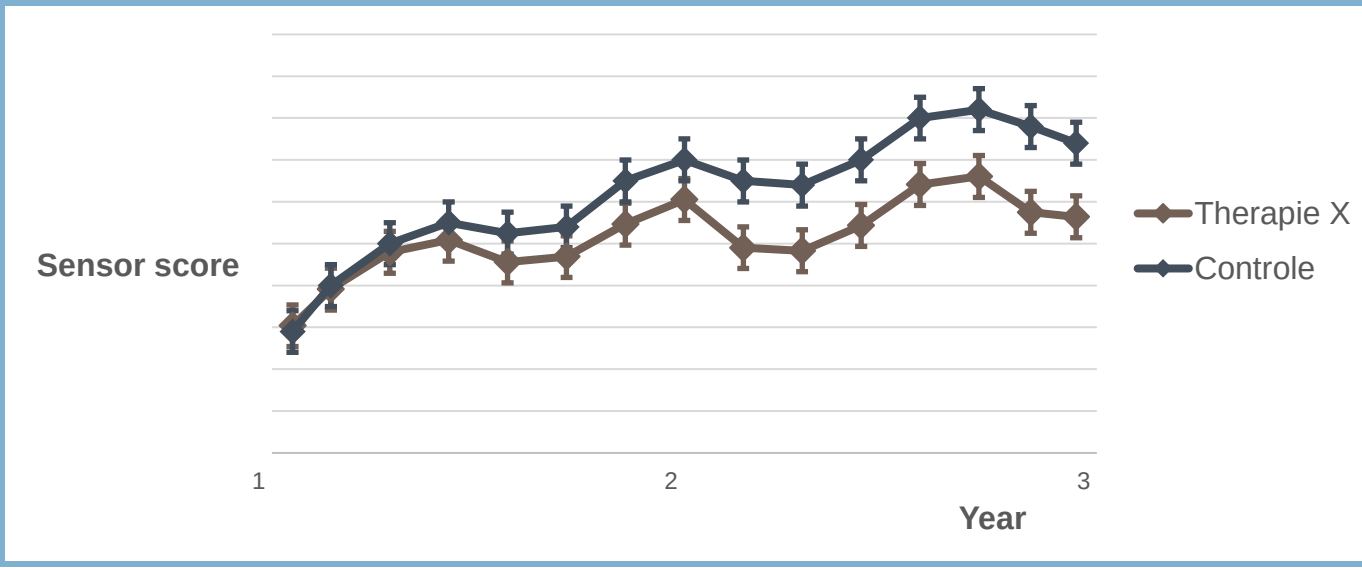


APPLICATION IN HEALTHCARE

- Optimizing medication dosing schedule
- Monitoring fall incidents
- Predict treatment effect

DIGITAL PROGRESSION BIOMARKERS FOR CLINICAL TRIALS





THANK YOU