



Rotterdam Brain Imaging Banks EPI2

Aad van der Lugt

Department of Radiology

Erasmus MC, Rotterdam, the Netherlands

a.vanderlugt@erasmusmc.nl



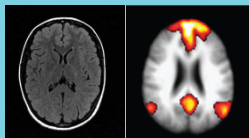
Design Rotterdam Study



| | | | | | | | |
|-----|---------------------------|--------------|--------------|---------------------------|--------------|---------------------------|--------------|
| 55+ | 1990-1993 7,983 | 1994 1995 | 1997 1999 | 2002 2004 | 2009 2011 | | |
| | | | 55+ | 2000-2002 3,011 | 2004 2005 | 2011 2013 | |
| | | | | | 45+ | 2006-2008 4,000 | 2013 2014 |

Neuroepidemiology

-Rotterdam Brain Scan Study (Monique Breteler, Arfan Ikram, Meike Vernooij)



'95-'96
MRI (1000)

'99-'00
MRI (800)

'05-'10
MRI (>5,000)

'11-
MRI (>6,000)

Design GenR study



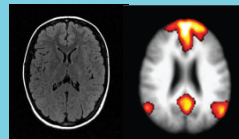
-0 2002-2006
9778

2006
2011

2012
2015

2016
2019

-Gen R Scan Study (3.0T) (White, Tiemeier, Verhulst, Jaddoe, Vernooij)

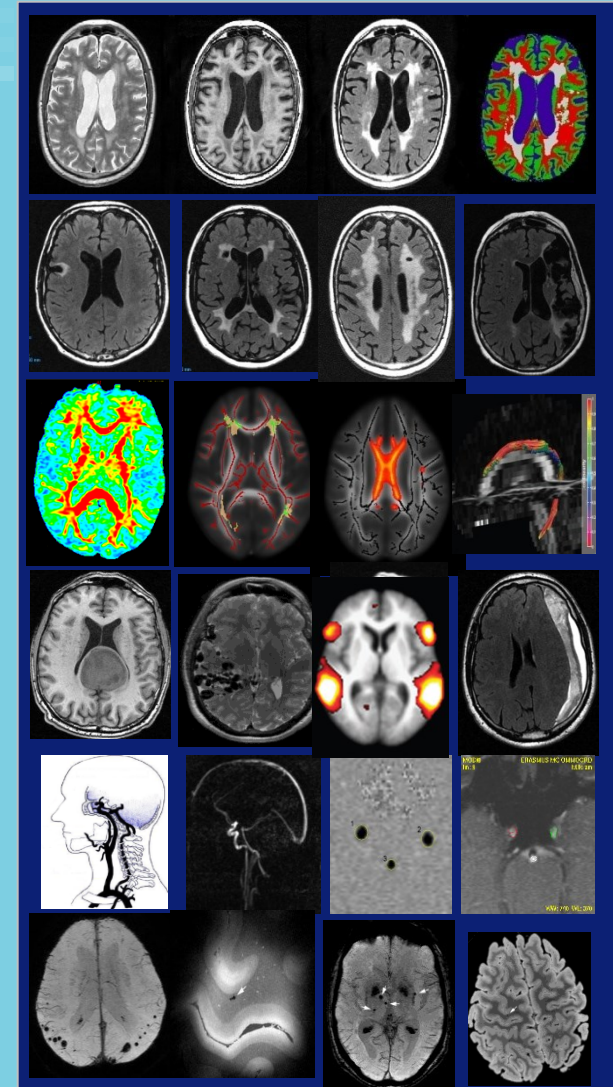


'13-'15
MRI (>2000)

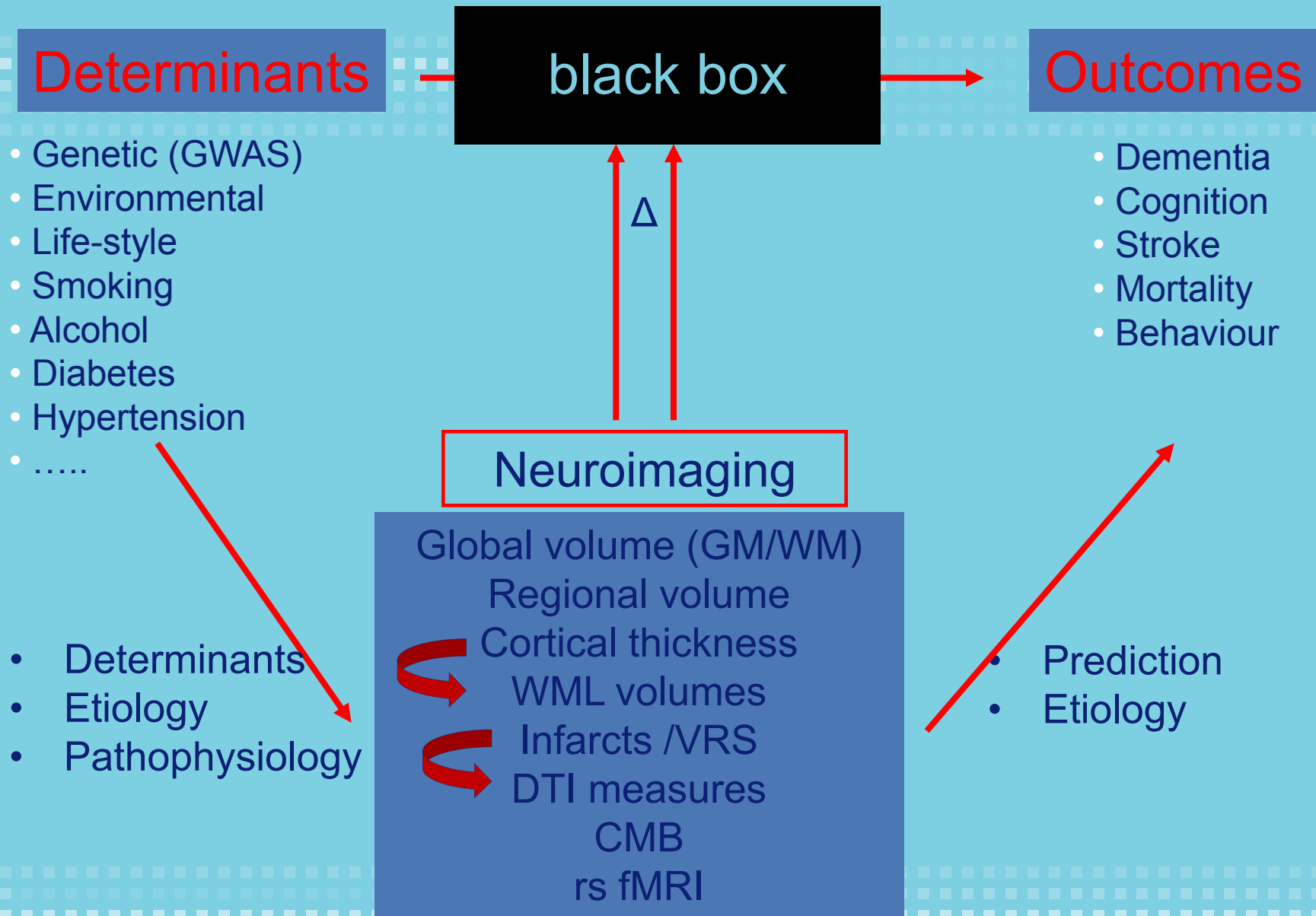
'16-'19)
MRI ()

The Rotterdam Brain Scan Studies

| | ERGO 1.5T | GenR 3.0T |
|-----------------------------|--------------|--------------|
| ➤ Tissue quantification | | |
| ➤ 3D-T1w FSPGR | + | + |
| ➤ Lesion assessment | | |
| ➤ FLAIR | + | |
| ➤ Microstructural integrity | | |
| ➤ DTI | + | + |
| ➤ Function | | |
| ➤ rs FMRI | + | + |
| ➤ Blood flow quantification | | |
| ➤ 2D-PC | + | |
| ➤ Cerebral microbleeds | | |
| ➤ SWI | + | |

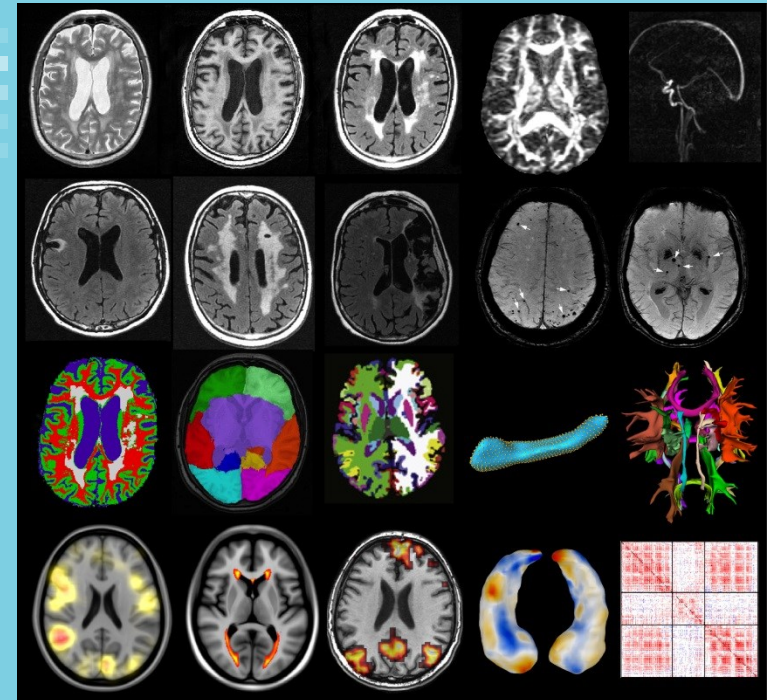


Use of Imaging biobanks



Challenges

- Quantitative imaging biomarkers
 - Image analysis (BGIR)
- Reproducibility
 - No upgrades / updates
 - Quality assurance program
- Large scale analysis (>5000 data sets)
 - Automated analysis pipelines



Future opportunities

Opportunities

- Reference database
- Pooling data (e.g. GWAS, predictive studies)
- Imaging Genetics
- Case - Control studies

Problems

- Number of image datasets
- Harmonisation of acquisition/analysis

European Population Imaging Infrastructure (EPI2)

