How I Spend my FLARE Fellowship (2008-2010)

An Integrated Investigation of Vascular Cognitive Impairment (VCI) in Europe

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Spain 2011

Future Leaders flare of Ageing Research

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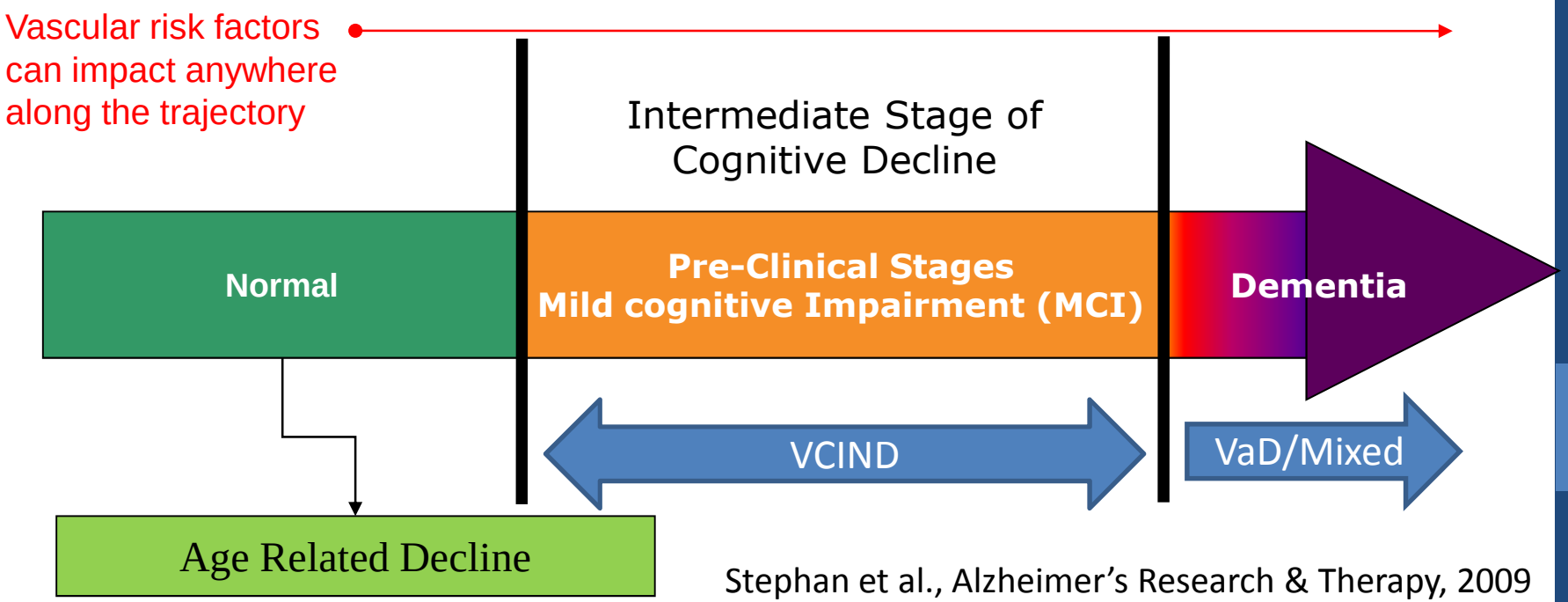
Overview

1. Background
2. Research Outcomes
3. Operational Arrangements for Mobility
4. Next Steps

Background: What is VCI?

- Group of cognitive disorders that share a presumed vascular cause
  - Vascular Disease Factors (e.g., diabetes, hypertension & obesity)
  - Lifestyle Factors (e.g., tobacco use, dietary factors, physical inactivity)
  - Stroke Factors (e.g., site and extent of lesion)



Stephan et al., Alzheimer's Research & Therapy, 2009

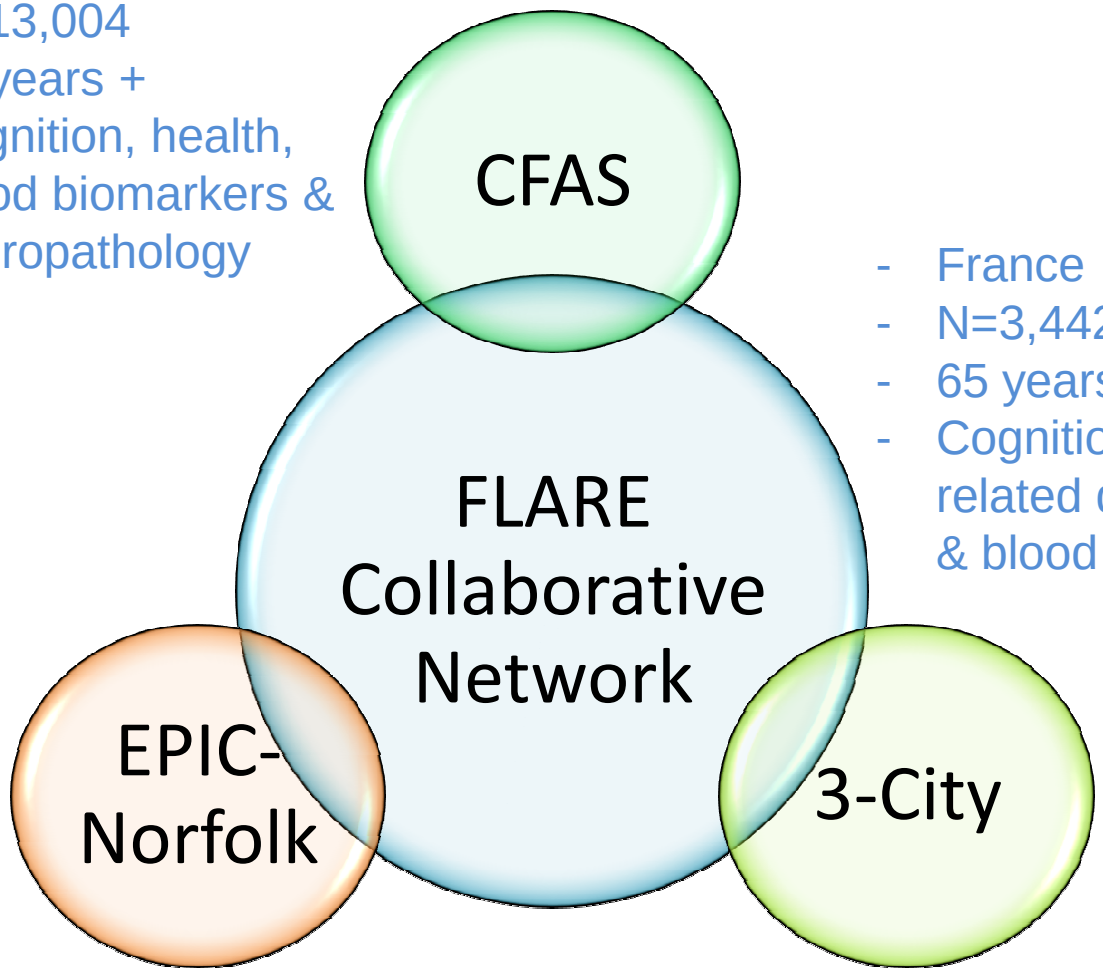
Research Objectives

- Explore the interrelationships between vascular factors, cognitive decline and dementia using a population based approach

- Develop a predictive model (incorporating vascular markers) for identifying individuals at high risk of future dementia

Data Resources

- UK
- N=13,004
- 65 years +
- Cognition, health, blood biomarkers & neuropathology

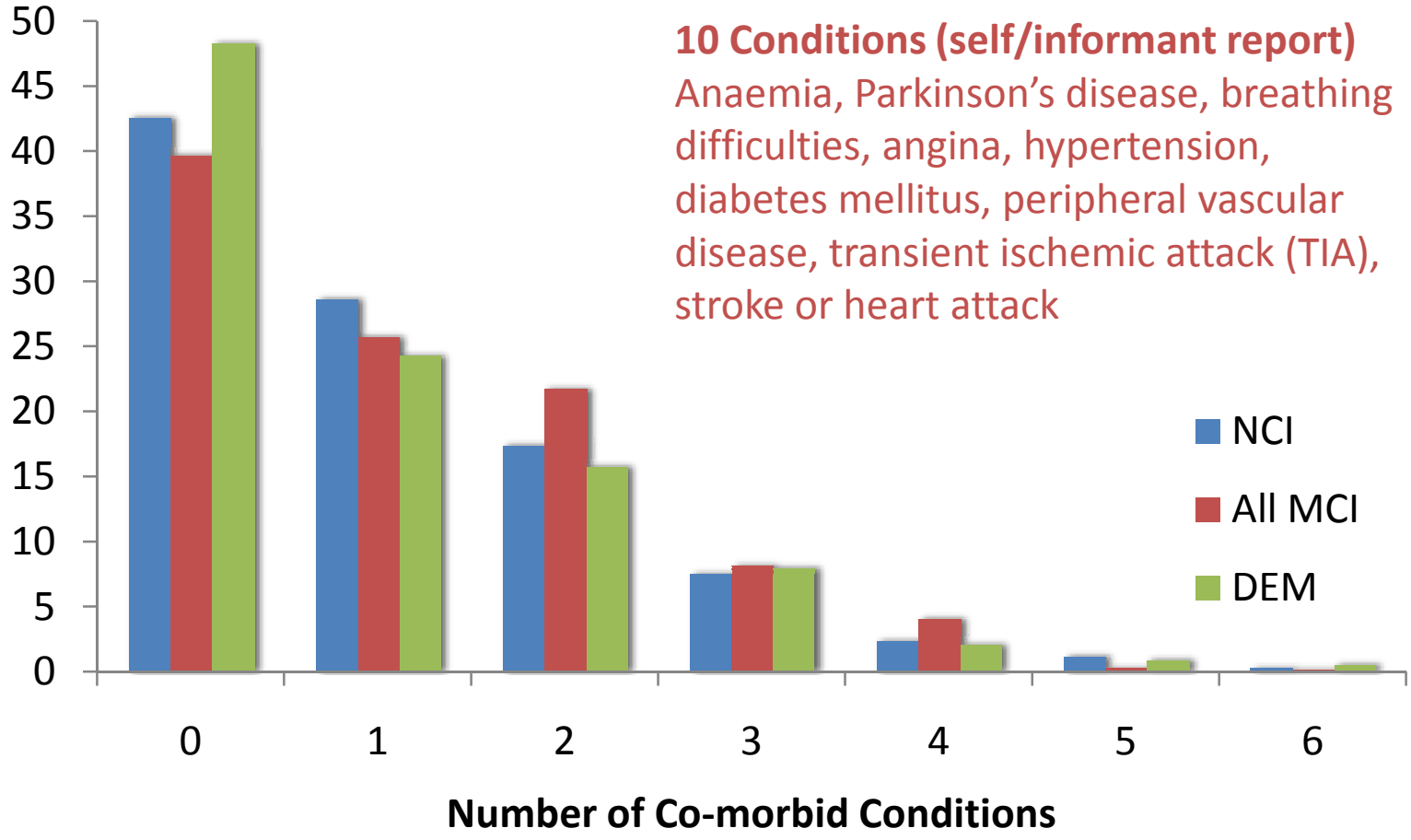


- France
- N=3,442
- 65 years +
- Cognition, vascular related disease, MRI & blood biomarkers

Health Co-morbidity in Individuals with Mild Cognitive Impairment

Findings From MRC CFAS

- Most individuals with MCI have medical co-morbidity



10 Conditions (self/informant report)
Anaemia, Parkinson's disease, breathing difficulties, angina, hypertension, diabetes mellitus, peripheral vascular disease, transient ischemic attack (TIA), stroke or heart attack

Risk Factors for Progression

- Does disease co-morbidity increase risk of dementia in MCI?

Risk Factor	Unadjusted OR	Adjusted* OR
Anaemia	13.5 (2.6-71.3)	10.6 (2.3-48.7)

*Adjusted for age, sex and education (years)

- Overall, medical co-morbidity does not appear to help identify individuals with MCI who are a high risk of future dementia

Stephan et al., Age and Aging, 2011

Risk Models for Mass Prediction

Mobility Research Project

- Focus on the whole non-demented population

- **Research Question** Can we develop a simple tool that can identify those individuals at high risk of future dementia?

Potential Predictors

4 Year Incident Dementia in the 3-City Study

Easily Obtainable	Moderately Easily Obtainable	Difficult to Obtain
Demographics (e.g., age, gender)	**Psychiatric Co-morbidity** (e.g., depression)	**MRI and Ultrasound** (e.g., WMLs, atrophy, IMT)
Lifestyle (e.g., smoking and alcohol use)	**Vascular Health** (e.g., stroke, obesity, CHD)	**Blood/Serum** (e.g., glycaemia, cholesterol)
Cognition (e.g., memory and non-memory)	**Medication History** (e.g., psychotropic or statins)	**Genetics** (e.g., APOE e4)
Functional/Motor Status		

Stephan et al., Nature Reviews Neurology, 2010

The Model

- **Simple Risk Model** Age, cognition, functional performance, motor performance and psychotropic medication use
  - 3 risk categories: low (2.2% incident cases), moderate (18.3% incident cases) and high (56.3% incident cases)
  - Area Under the Curve (AUC)=0.81 [95%CI: 0.78-0.84]
- Discriminative accuracy was not improved with the addition of MRI, blood or genetic risk markers

Stephan et al., in preparation

Conclusions

- Relatively simple measures can be used to identify individuals at high risk of dementia with reasonable accuracy

- Identification of high-risk individuals is important to better focus prevention and early intervention efforts

Where to Next …

- Senior Research Associate (Risk Prediction)
  - New post 2012 as a Lecturer (Newcastle University, UK)

- Extended my research collaborations
  - **3-City Study** Develop a risk model where all components are modifiable
  - **EPIC-Norfolk** Undertake an MRI programme to determine the association between brain structural changes, health status and cognitive impairment

Advice for Mobility Period

- Organize start dates and accommodation as soon as possible
- Language courses
- VISA and residence permit (?)
- Go beyond your project: future projects for funding and continuing new collaborations

Acknowledgements

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  - EPIC-Norfolk (Hayat, Khaw)
  - 3-City Study (Dufouil, Kurth)

Good Luck!

- Questions?