Dementia Prevention and Care in an ageing world

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10/66 DRG research agenda

- Pilot studies (1999-2002)
  - Development and validation of culture and education-fair dementia diagnosis
  - Preliminary data on care arrangements
- Population surveys – baseline phase (2003-2009)
  - Prevalence of dementia and other chronic diseases
  - Impact: disability, dependency, economic cost
  - Nested RCT of ‘Helping carers to care’ caregiver intervention
- Incidence phase (2008-2010)
  - Incidence (dementia, stroke, mortality)
  - Risk factors
  - Course and outcome of dementia/ Mild Cognitive Impairment
- INDEP study (2011-2014)
  - Impact of needs for care on household functioning
- LIFE2YEARS1066 (2014-2019)
What do we do?

• Synthesise global evidence for policymakers and public
• Contribute our own research evidence from LMIC (10/66 DRG)
• Systematic and narrative reviews
  – Global epidemic
  – Health system and service responses
  – Public health perspective
• Robust science, communicated effectively
Launched in December 2013

*The Global Impact of Dementia 2013-2050*

- New UN population projections
- New prevalence data from China and Africa
- Full update of prevalence and incidence and cost scheduled for WAR 2015
Original (2009 WAR) and updated age-specific prevalence of dementia by region, showing impact of new data from Asia East (China) and Sub-Saharan Africa.
Numbers of people with dementia by world region (2015-2050)

- **North America:** 14.78
- **Latin America & Caribbean:** 18.78
- **Africa and the Middle East:** 12.04
- **Europe Central and Eastern:** 16.20
- **Asia (high income):** 19.62
- **Asia (low and middle income):** 63.16
- **World:** 135.46

Yearly estimates:
- **2015:** 4.78
- **2020:** 11.74
- **2025:** 16.02
- **2030:** 12.35
- **2035:** 3.24
- **2040:** 63.16
- **2045:** 19.62
- **2050:** 47.47

Legend:
- **North America**
- **Latin America & Caribbean**
- **Africa and the Middle East**
- **Europe Central and Eastern**
- **Asia (high income)**
- **Asia (low and middle income)**
- **World**
Everyone is using our numbers!

- An estimated 47.5 million people are currently living with dementia
- About 60% of this disease burden falls on low- and middle-income countries, which have the least capacity to cope
- As population ageing continues to accelerate, the number of dementia cases is expected to nearly double every 20 years
- In 2010 the worldwide cost of dementia was estimated at US$ 607 per year
- These costs are growing even more rapidly than the prevalence of the disease
What have we achieved? II

- A shift in tone
  - An explicit acknowledgement that the majority of the burden is in low and middle income countries
  - Care now, if we must wait for cure later
  - A public health approach to treatment and care
  - A recognition of the importance of prioritisation of efforts towards brain health promotion and dementia risk reduction
  - New priorities for research
What have we achieved? III

- A ‘call for action’
- 80 countries at WHO ministerial conference
- No commitments but…
- A World Health Assembly resolution?
- A Global Observatory
<table>
<thead>
<tr>
<th>Exposure</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Early life</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Midlife</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Mid- to late-life</td>
</tr>
<tr>
<td>Smoking</td>
<td>Mid- to late-life</td>
</tr>
</tbody>
</table>
## Not so robust findings

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Doubts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>Reverse causality likely</td>
</tr>
<tr>
<td>Obesity</td>
<td>Inconsistent findings. Confounding ++</td>
</tr>
<tr>
<td>Hyperlipidaemia</td>
<td>Inconsistent findings</td>
</tr>
<tr>
<td>Dietary factors (micronutrients)</td>
<td>Low quality trials. Null effects not supporting epidemiology</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Risk concentrated in non-drinkers. Upper limit not clear</td>
</tr>
<tr>
<td>Physical exercise/activity</td>
<td>No trials. Reverse causality not excluded</td>
</tr>
<tr>
<td>Cognitive stimulation</td>
<td>No trials. Reverse causality not excluded Occupation not associated</td>
</tr>
</tbody>
</table>
A two-decade comparison of prevalence of dementia in individuals aged 65 years and older from three geographical areas of England: results of the Cognitive Function and Ageing Study I and II

Fiona E Matthews, Antony Arthur, Linda E Barnes, John Bond, Carol Jagger, Louise Robinson, Carol Brayne, on behalf of the Medical Research Council Cognitive Function and Ageing Collaboration

Summary

Background The prevalence of dementia is of interest worldwide. Contemporary estimates are needed to plan for future care provision, but much evidence is decades old. We aimed to investigate whether the prevalence of dementia had changed in the past two decades by repeating the same approach and diagnostic methods as used in the Medical Research Council Cognitive Function and Ageing Study (MRC CFAS) in three of the original study areas in England.

Methods Between 1989 and 1994, MRC CFAS investigators did baseline interviews in populations aged 65 years and older in six geographically defined areas in England and Wales. A two stage process, with screening followed by diagnostic assessment, was used to obtain data for algorithmic diagnoses (geriatric mental state–automated geriatric examination for computer assisted taxonomy), which were then used to estimate dementia prevalence. Data from three of these areas—Cambridgeshire, Newcastle, and Nottingham—were selected for CFAS I. Between 2008 and
<table>
<thead>
<tr>
<th>Study</th>
<th>Finding</th>
<th>Other findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK, MRC CFAS</td>
<td>30% reduction in prevalence</td>
<td>1993-2011</td>
</tr>
<tr>
<td>Spain, Zaragoza</td>
<td>25% reduction in prevalence</td>
<td>1988-1995</td>
</tr>
<tr>
<td>NL, Rotterdam (Schrijvers et al 2012)</td>
<td>25% reduction in incidence</td>
<td>1990-2000</td>
</tr>
<tr>
<td>Germany (Doblhammer et al 2014)</td>
<td>20% reduction in incidence</td>
<td>2004-2007</td>
</tr>
<tr>
<td>USA, Framingham (Satizabal, 2014)</td>
<td>42% reduction in incidence</td>
<td>1980-2006</td>
</tr>
<tr>
<td>USA, HRS (Langa et al 2008)</td>
<td>29% reduction in prevalence of mod/sev CI</td>
<td>1993-2002</td>
</tr>
<tr>
<td>USA, Indianapolis (Gao et al, 2014)</td>
<td>55% reduction in incidence</td>
<td>1991-2002</td>
</tr>
<tr>
<td>Study</td>
<td>Finding</td>
<td>Period</td>
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<td>------------------------------</td>
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<tr>
<td>Japan, Hisayama (Sekita et al 2010)</td>
<td>Increasing prevalence of all dementia and AD</td>
<td>1985-2005</td>
</tr>
<tr>
<td>Umea, Sweden (Mathillas et al, 2012)</td>
<td>40% increase in the prevalence of dementia among &gt;85 yrs</td>
<td>2001-2006</td>
</tr>
<tr>
<td>USA, Chicago (Rocca et al, 2011)</td>
<td>No trend in incidence</td>
<td>1997-2008</td>
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Meta-regression of European prevalence studies (n=59)

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Prevalence ratio</th>
</tr>
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<tbody>
<tr>
<td><strong>Stratum characteristic</strong></td>
<td></td>
</tr>
<tr>
<td>Age (per year)</td>
<td>1.12 (1.11-1.12)</td>
</tr>
<tr>
<td><strong>Study characteristic</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Sampling</strong></td>
<td></td>
</tr>
<tr>
<td>Care homes not specifically included in sampling</td>
<td>1.68 (1.31-2.14)</td>
</tr>
<tr>
<td><strong>Assessment</strong></td>
<td></td>
</tr>
<tr>
<td>Multidimensional cognitive test battery</td>
<td>1.46 (1.17-1.82)</td>
</tr>
<tr>
<td>Structured assessment of disability</td>
<td>0.78 (0.61-0.99)</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td></td>
</tr>
<tr>
<td>Two phase with no screen negatives sampled</td>
<td>1 (REF)</td>
</tr>
<tr>
<td>Two phase with screen negatives sampled but no weighting back</td>
<td>1.22 (0.90-1.65)</td>
</tr>
<tr>
<td>Two phase correctly applied</td>
<td>0.97 (0.76-1.25)</td>
</tr>
<tr>
<td>One phase</td>
<td>0.86 (0.71-1.05)</td>
</tr>
<tr>
<td><strong>Period of survey</strong></td>
<td></td>
</tr>
<tr>
<td>1980-1989</td>
<td>1 (REF)</td>
</tr>
<tr>
<td>1990-1999</td>
<td>1.38 (1.11-1.72)</td>
</tr>
<tr>
<td>After 2000</td>
<td>0.99 (0.76-1.30)</td>
</tr>
<tr>
<td><strong>Year of survey as linear effect (as alternative to decennial periods above)</strong></td>
<td></td>
</tr>
<tr>
<td>Per calendar year</td>
<td>0.986 (0.971-1.002)</td>
</tr>
</tbody>
</table>
Increasing prevalence of dementia in China?

The prevalence of dementia in China 1990-2010
Chen et al, Lancet 2013

1990

3.5%

2010

5.1%

46% increase 1990-2010
China: Trends in the overweight and obesity prevalence among school children (northern coastal cities)

Based on Chinese BMI cutoff points (Ji and Cheng, Int J Cardiol, 2008)

Cigarette consumption in China

Source: Tobacco Control and the Future of China
Graphic by Zhang Jiawei / chinadaily.com.cn
ten years on – monitoring and improving health expectancy by targeting frailty

King’s College London Centre for Global Mental Health
What are the changes, over 10 years, in prevalence and social-patterning of dementia, other NCDs and underlying risk factors?

Is the coverage, effectiveness and equity of healthcare for older people improving? Has this translated into health improvements?

Is morbidity compressing or expanding, and are these trends equitably distributed with regard to gender, education and socioeconomic position?
Health sector problems

• Limited help-seeking (demand)
  • Little awareness
  • Ageism
  • Financial barriers

• Health services do not meet the needs of older people (supply)
  • Clinic based service
  • No continuing care
  • ‘Out of pocket’ expenses

Prince et al, World Psychiatry, 2007
• Increasing the coverage of evidence-based community interventions in low and middle income countries

• Seven priority areas – depression, psychosis, epilepsy, dementia, child and adolescent disorders, alcohol use, suicide

• Development of evidence-based practice guidelines for non-specialists in LAMIC

• Implementation

• Evaluation

Dua et al, PLOS Medicine 2011
Packages of care for dementia

- Casefinding
- Brief diagnostic screening assessment
- Making the diagnosis well – information and support
- Attention to physical comorbidity
- Carer interventions (carer strain)
- Prioritise non-pharmacological interventions
- Timely assessment, treatment and support across the course of the condition

Prince et al, PLOS Medicine 2010
A more integrated approach?

(WHO-COPE)

VERTICAL
(HEALTH CONDITIONS)
- Dementia
- Stroke
- Parkinson’s disease
- CHD
- COPD
- Depression
- Arthritis
- Anaemia

HORIZONTAL
(IMPAIRMENTS)
- Confusion and behaviour disturbance
- Mood
- Immobility/ Falls
- Incontinence
- Undernutrition/ hydration
- Sensory impairment
- Carer knowledge and strain

HOME-BASED/ TASK-SHARING/ OUTREACH/ LOW COST
WHO-COPE – a public health approach

– Improve coverage of, and access to care
– Affordable, accessible
– Scalable
– Using existing non-specialist resources
– Community level/ home-based
– Using existing outreach capacity