English baby boomers nearing retirement: the healthiest generation?

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Universities of Exeter and Plymouth, UK
Talk Outline

Who are the English “baby boomers”?

What’s the big deal?

Are the baby boomers different?
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Who are the English “baby boomers”?

What’s the big deal?

Are the baby boomers different?
Who are the English “baby boomers”?

Definition: A sharp increase in the birth rate of a population, esp the one that occurred after World War II.  
*Collins English Dictionary*

i.e. people born between 1945-54
Baby boomer’s perceived advantages

“Let us be frank about it: most of our people have never had it so good.”
Harold MacMillan, Prime Minister 1957-1963

• Better healthcare under the National Health Service
• Improved education
• Better post-war nutrition
• More financial and social freedom
• Relative economic stability and prosperity
• etc
Talk Outline

Who are the “baby boomers”?

What’s the big deal?

Are the baby boomers different?
What’s the big deal?

Increasing fiscal burden in western societies
What’s the big deal?

Increasing fiscal burden in western societies

Governments encouraging older workers to remain in employment for longer
What’s the big deal?

Increasing fiscal burden in western societies

Governments encouraging older workers to remain in employment for longer

Little known about health status and risks for current “baby boom” generation.
Talk Outline

Who are the “baby boomers”?

What’s the big deal?

Are the baby boomers different?
Previous Research

US:
- obesity $\uparrow$
- disability / difficulty with everyday tasks $\uparrow$
- days spent in poor physical / mental health $\uparrow$
- pain $\uparrow$
- number of chronic conditions $\uparrow$
- psychiatric problems $\uparrow$
- hospital admittance for strokes and CHD $\uparrow$

Refs: Linda Martin, Vicki Freedman, Beth Soldo, David Weir etc.
Previous Research

**US:**
- obesity ↑
- disability / difficulty with everyday tasks ↑
- days spent in poor physical / mental health ↑
- pain ↑
- number of chronic conditions ↑
- psychiatric problems ↑
- hospital admittance for strokes and CHD ↑
- *Refs: Linda Martin, Vicki Freedman, Beth Soldo, David Weir etc.*

**Canada:**
- **Chronic disease burden** ↑
- **Number of doctor visits** ↑
- *ref: Wister et al. University of Toronto, 2005*
Previous Research

Europe:
- Austria: Cholesterol and blood pressure ↓
  Glucose ↑
  Ref: (Ulmer et al, J Intern Med 2007)
- Netherlands: Risk of fatal CVD ↓
  Ref: (Bonneux et al, Eur J Public Health 2003)
Methods


N= ~18000 per annum.
Methods - Data

Data from the Health Survey for England (HSE) 1994 - 2007:
Annual cross-sectional survey of community dwelling individuals in England.

N = ~18000 per annum.

Interview:
- self-reported health conditions & socio-economics
- measured height and weight

Nurse visit:
- bloods taken and blood pressure recorded.
Methods – Analytical Approach

All comparable variables at each HSE survey.
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All comparable variables at each HSE survey.

Stage 1:
Linear and logistic regression models:
  • baby boomers at age 50-61 years (born 1946-1955)
  • wartime predecessors at age 50-61 years (born 1936-1945).
Methods – Analytical Approach

All comparable variables at each HSE survey.

Stage 1:
Linear and logistic regression models:
• baby boomers at age 50-61 years (born 1946-1955)
• wartime predecessors at age 50-61 years (born 1936-1945).

Stage 2:
Age, period, cohort (APC) models to attribute differences to period or cohort effects.
(ref Yang & Land. Sociolog Methods Res. 2008)
Stage 1: Methods

n=4556

aged 50-61
n=5555

1945 - 1954
Baby Boomers born

1935 - 1944
comparison group born

How do the two groups compare? Socio-economic differences

Wartime Cohort  Baby boom cohort

- Education: P<0.001
- Professional: P<0.001
- Working: P<0.001
How do the two groups compare?

Smoking Status

<table>
<thead>
<tr>
<th>Smoking Status</th>
<th>Wartime Cohort</th>
<th>Baby boom cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current smokers</td>
<td>30%</td>
<td>45%</td>
</tr>
<tr>
<td>Former smokers</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Never smokers</td>
<td>40%</td>
<td>35%</td>
</tr>
</tbody>
</table>

P<0.001
How do the two groups compare?  
Measured differences

<table>
<thead>
<tr>
<th>Measure</th>
<th>Wartime Cohort</th>
<th>Baby Boomers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weight (kg)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>83.1</td>
<td>87.4 **</td>
</tr>
<tr>
<td>Women</td>
<td>70.5</td>
<td>72.4 **</td>
</tr>
<tr>
<td><strong>Height (cm)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>174.1</td>
<td>174.8 **</td>
</tr>
<tr>
<td>Women</td>
<td>160.4</td>
<td>161.3 **</td>
</tr>
<tr>
<td><strong>Obesity, Men</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI 30-34.9</td>
<td>15.9%</td>
<td>22.0% **</td>
</tr>
<tr>
<td>BMI 35+</td>
<td>3.1%</td>
<td>7.6% **</td>
</tr>
<tr>
<td><strong>Obesity, Women</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI 30-34.9</td>
<td>16.3%</td>
<td>18.1% **</td>
</tr>
<tr>
<td>BMI 35+</td>
<td>8.3%</td>
<td>10.9% **</td>
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</tbody>
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How do the two groups compare? 
Measured differences

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<th>Measure</th>
<th>Wartime Cohort</th>
<th>Baby Boomers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-standing illnesses</td>
<td>Men 50.9%</td>
<td>Women 50.9%</td>
</tr>
<tr>
<td></td>
<td>51.9%</td>
<td>55.3% **</td>
</tr>
<tr>
<td>Self-rated health</td>
<td>Men 8.4%</td>
<td>Women 7.5%</td>
</tr>
<tr>
<td>‘bad’/‘very bad’</td>
<td>9.4%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Diagnosed hypertension/high blood pressure</td>
<td>11.2%</td>
<td>16.4% **</td>
</tr>
<tr>
<td>Blood Systolic (mm Hg)</td>
<td>139.6</td>
<td>132.8 **</td>
</tr>
<tr>
<td>Blood Diastolic (mm Hg)</td>
<td>79.1</td>
<td>74.6 **</td>
</tr>
</tbody>
</table>
How do the two groups compare? Reported Conditions by ICD-10 Chapter

<table>
<thead>
<tr>
<th>Odds Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

1) Neoplasms & benign growths
2) Endocrine & metabolic
3) Mental disorders
4) Nervous system
5) Eye complaints
6) Ear complaints
7) Heart & circulatory system
8) Respiratory system
9) Digestive system
10) Genito-urinary system
11) Skin complaints
12) Musculoskeletal system
How do the two groups compare?

Reported Conditions by ICD-10 Chapter

1) Neoplasms & benign growths
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Reported Conditions by ICD

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- Endocrine & metabolic
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How do the two groups compare?
Self-reported Individual Diseases
How do the two groups compare?

Self-reported Individual Diseases

- Diabetes including hyperglycemia
- Other endocrine/metabolic
How do the two groups compare? Self-reported Individual Diseases

<table>
<thead>
<tr>
<th>Diabetes including hyperglycemia</th>
<th>Other endocrine/metabolic</th>
<th>Mental illness</th>
</tr>
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</table>

Odds Ratios

0 0.5 1 1.5 2 2.5 3
How do the two groups compare? Self-reported Individual Diseases

<table>
<thead>
<tr>
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<th>Odds Ratios</th>
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<tbody>
<tr>
<td>Diabetes including hyperglycemia</td>
<td><img src="#" alt="Odds Ratio" /></td>
</tr>
<tr>
<td>Other endocrine/metabolic</td>
<td><img src="#" alt="Odds Ratio" /></td>
</tr>
<tr>
<td>Mental illness</td>
<td><img src="#" alt="Odds Ratio" /></td>
</tr>
<tr>
<td>Stroke</td>
<td><img src="#" alt="Odds Ratio" /></td>
</tr>
<tr>
<td>Heart attack</td>
<td><img src="#" alt="Odds Ratio" /></td>
</tr>
<tr>
<td>Hypertension</td>
<td><img src="#" alt="Odds Ratio" /></td>
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How do the two groups compare?
Self-reported Individual Diseases

- Diabetes including hyperglycemia
- Other endocrine/metabolic
- Mental illness
- Stroke
- Heart attack
- Hypertension
- Arthritis / rheumatism / fibrositis
- Back problems
- Other musculoskeletal problems

Odds Ratios

0 0.5 1 1.5 2 2.5 3
Are the Baby Boomers really less healthy?

- Improved case finding?
- Shifting diagnostic criteria?
- Reporting differences?

*Period effect* (i.e. the whole population is changing)?

Vs

*Cohort effect* (i.e. differences specific to the baby boomers)?
APC Modelling

Very hard to separate age, period and cohort effects in analysis (the identification problem)

May be possible to use repeated cross-sections to construct APC models

We use a hierarchical modelling framework with period and cohort treated as random effects (ref Yang & Land, 2008)
Period / Cohort Effects?
Log of variance components of period effect / cohort effect

ICD-10 disease groups
- Endocrine conditions
- Circulatory conditions
- Mental disorders
- Musculoskeletal conditions
- Diabetes

Specific conditions
- Heart Attack
- Hypertension
- Body Mass Index
- Systolic Blood Pressure
- Diastolic Blood Pressure

Measures

Resultant Cohort Effect
Resultant Period Effect
Conclusions

- Compared with their wartime predecessors, English baby boomers are moving into retirement with improved cardiovascular health.

- However, the baby boom cohort has a higher prevalence of mental illness and shows no improvement in self-rated health.

- There remains substantial scope to reduce health risks and future disability.
Acknowledgements

Professor David Melzer, Peninsula Medical School

Dr William Henley, Dr Iain Lang, Peninsula Medical School
“They never phone, they never visit, they never text message…”
The identification problem

Period (P) = Age (A) + Cohort (C)

1994  \rightarrow  54  \rightarrow  1940
APC model

If \( \pi_{ijk} = \) probability of diabetes

\[
\log \left( \frac{\pi_{ijk}}{1-\pi_{ijk}} \right) = \mu + \beta_1 \text{age} + \beta_2 \text{age}^2 \\
+ \text{period}_j \\
+ \text{cohort}_k
\]

\( \text{period}_j \sim N(0, \sigma_p^2) \quad \text{cohort}_k \sim N(0, \sigma_c^2) \)
Maslow’s hierarchy of need theory

Ref: Abraham Maslow, A Theory of Human Motivation, 1943
-1 not applicable
1 cancer (neoplasm) including lumps, masses, tumours and growths
2 diabetes. incl. hyperglycemia
3 other endocrine/metabolic
4 mental illness/anxiety/depression/nerves (nes)
5 mental handicap
6 epilepsy/fits/convulsions
7 migraine/headaches
8 other problems of nervous system
9 cataract/poor eye sight/blindness
10 other eye complaints
11 poor hearing/deafness
12 tinnitus/noises in the ear
13 Menieres disease/ear complaints causing balance problems
14 other ear complaints
15 stroke/cerebral haemorrhage/cerebral thrombosis
16 heart attack/angina
17 hypertension/high blood pressure/blood pressure (nes)
18 other heart problems
19 piles/haemorrhoids incl. varicose veins in anus.
20 varicose veins/phlebitis in lower extremities
21 other blood vessels/embolic
22 bronchitis/emphysema
23 asthma
24 hayfever
25 other respiratory complaints
26 stomach ulcer/ulcer (nes)/abdominal hernia/rupture
27 other digestive complaints (stomach, liver, pancreas, bile duct)
28 complaints of bowel/colon (large intestine, caecum, bowel, cecum)
29 complaints of teeth/mouth/tongue
30 kidney complaints
31 urinary tract infection
32 other bladder problems/incontinence
33 reproductive system disorders
34 arthritis/rheumatism/fibrositis
35 back problems/slipped disc/spine/neck
36 other problems of nerves/bones/joints/muscles
37 infectious and parasitic disease
38 disorders of blood and blood forming organs
39 skin complaints
40 other complaints
41 unclassifiable (no other codable complaint)
42 complaint no longer present nb only use this code if it is a complaint no longer present
97 inadequate information to code.
99 Not answered/refusal
Previous work...


Lang IA, Rice NE, Wallace RB, Guralnik JM & Melzer D.

1712 smokers (aged 55 to 70) followed up for 5 to 6 years.

Retirees more than twice as likely to quit smoking as those who remained in work. (Odds Ratio = 2.50 (95% CI 1.35-4.62))

Retirees should be targeted with smoking cessation interventions.