COMPaRE-PHC presents
Professor Iain Broom
Environmental Waist Disposal

Professor Iain Broom
Professor and Consultant in
Clinical Biochemistry and Metabolic Medicine
The Robert Gordon University, University of Aberdeen, NHS Grampian
“Sudden death is more common in those who are naturally fat than in the lean”

“Corpulence is not only a disease in its own right but a harbinger of others”

Hippocrates  400 BC
Venus of Willendorf
Stone-Age Depiction of Obesity

- Societal Importance
- Survival Advantage
Homo Sapiens → Homo Adipatus

50 Years

A NEW SPECIES?
Factors involved in the creation of “Homo Adipatus”

- Neurologic and Physiologic
- Biochemical
- Genetic
- Environmental
- Cultural and Socio-economic

Humans are endowed with an ANCIENT PHYSIOLOGY moulded by famine ...
... and ill equipped to handle our modern ‘toxic’ environment
CAUTION: HAZARDOUS WAIST

A hazardous substance is stored nearby. It's the excess fat packed around your middle. Fat that increases your risk of heart disease and other serious illnesses, such as diabetes. Good reason to start a waist disposal program today.
HEY TEACHER!
K C  Age 48 years
Waist circumference  96 cm
BP  120/75
Total Cholesterol  5.7 mmol/l
Triacylglycerol  1.0 mmol/l
HDL Cholesterol  1.6 mmol/l
LDL Cholesterol  4.0 mmol/l
Fasting Glucose  4.8 mmol/l
HbA1c  4.9%

C W  Age 48 years
Waist circumference  96 cm
BP  145/95
Total Cholesterol  6.0 mmol/l
Triacylglycerol  3.54 mmol/l
HDL Cholesterol  0.9 mmol/l
LDL Cholesterol  4.5 mmol/l
Fasting Glucose  6.1 mmol/l
HbA1c  6.3%
## Ethnic Variation

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>BMI</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>&gt;25</td>
<td>Overweight</td>
</tr>
<tr>
<td></td>
<td>&lt;30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;30</td>
<td>Obese</td>
</tr>
<tr>
<td>Asian</td>
<td>&gt;23</td>
<td>Overweight</td>
</tr>
<tr>
<td></td>
<td>&lt;25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;25</td>
<td>Obese</td>
</tr>
</tbody>
</table>

↑↑↑ Risk of Comorbidities in Asian Population at lower BMIs (Diabetes, CHD)
Ethnic Variation

- ↑ Risk of Diabetes/CHD unknown
- ? Body Composition
- ? Body Fat Distribution
- ↑ Omental Fat Distribution
Environmental Changes

- No change in Gene Pool in last 50 years
- Survival Gene/Environment Interaction
- Obesogenic/Diabetogenic Environment

→ MACRO

<table>
<thead>
<tr>
<th>MICRO</th>
<th>ENVIRONMENTAL ISSUES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
Aetiology

- Societal Change
  Food intake
  Activity Change
  Out of Home Eating

- Demographic Alteration
  Transport
  Preparation Time
  Social Interaction (Meal times)
Environmental changes
Evolutionary Flashpoint

- Energy Expenditure
- Energy Intake
- Automation
- COMPUTERISATION
# Calories Usage changed over 50 years

<table>
<thead>
<tr>
<th>Activity</th>
<th>1950’s</th>
<th>2000’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shopping on foot / car &amp; supermarket</td>
<td>2400</td>
<td>275</td>
</tr>
<tr>
<td>Washing clothes by hand / machine</td>
<td>1500</td>
<td>270</td>
</tr>
<tr>
<td>Making a coal fire / gas fire</td>
<td>1300</td>
<td>3</td>
</tr>
<tr>
<td>Hand lawn mower / electric mower</td>
<td>500</td>
<td>180</td>
</tr>
<tr>
<td>No power steering / with power</td>
<td>96</td>
<td>75</td>
</tr>
</tbody>
</table>
Childhood Obesity

↑ Dramatically with time

↓ Exercise  No school games

↓ P E

↑ Computing  Sociopathic

? Safety Issues
Childhood Obesity

Safety

• Child Molestation (no evidence of increase)

A  • Parents’ attitude
     • ↓ External Play

B  • No safe cycling/walking routes
    • Car Transport → ↓ activity
    • Local Council Joint Working

C  • Structured Play
    • Risk Assessment
    • Compensationitis
    • Societal Assessment
    ↓ Physical Activity
School Children involved in sporting activities (USA)

Data from Centre for Disease Control 2000

3% DROP per annum
## Deprivation

<table>
<thead>
<tr>
<th>Social Class</th>
<th>% Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>A and B</td>
<td>15%</td>
</tr>
<tr>
<td>D and C</td>
<td>28%</td>
</tr>
</tbody>
</table>

**WHY?**
- Types of Food
- Exercise
- Stress
Deprivation Counterweight Programme

• Less Practices willing to take part
  Deprivation scores >S5, <E3

• Less Patients willing to take part in practices as above

• Research Programme
  + Qualitative Research
  + Practice Problems
  + Patient Problems
  + Patient/Practitioner Choice
## Computerisation and Obesity

<table>
<thead>
<tr>
<th>Year</th>
<th>Computer Status</th>
<th>% Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>First desktop Computer</td>
<td>6 – 8 %</td>
</tr>
<tr>
<td>1980’s</td>
<td>Computerised machines</td>
<td>12 – 14%</td>
</tr>
<tr>
<td></td>
<td>Microwaves</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Automated Washing Machines</td>
<td></td>
</tr>
<tr>
<td>1990’s</td>
<td>Computer Games</td>
<td>16 – 18%</td>
</tr>
<tr>
<td>2000’s</td>
<td>Widespread computerisation</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>Globalisation</td>
<td>Childhood obesity</td>
</tr>
<tr>
<td></td>
<td>Free Market Economy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>↑ expenditure on computer education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>↓ School activity (Sport)</td>
<td></td>
</tr>
</tbody>
</table>
The Risk Society

• Not all environmental by force of nature (e.g., global warming)
• Interrelated changes within contemporary social life
• Shifting employment patterns
• Heightened job insecurity
• Erosion of traditional family patterns
## Index of Economic Freedom (IEF) and Obesity Rates

<table>
<thead>
<tr>
<th>Country</th>
<th>IEF</th>
<th>% Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>1.79</td>
<td>17</td>
</tr>
<tr>
<td>USA</td>
<td>1.85</td>
<td>25</td>
</tr>
<tr>
<td>Australia</td>
<td>1.88</td>
<td>20</td>
</tr>
<tr>
<td>Finland</td>
<td>1.95</td>
<td>13</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2.04</td>
<td>8</td>
</tr>
<tr>
<td>France</td>
<td>2.63</td>
<td>8</td>
</tr>
<tr>
<td>Norway</td>
<td>2.25</td>
<td>7</td>
</tr>
</tbody>
</table>
Globalisation and the Free Market Economy

- **AUSTRALIA, USA and UK** - DEREGULATED in an uncontrolled fashion with no political intervention

- **NETHERLANDS** - CONTROLLED DEREGULATION
  - prevention of inequalities in job security
  - food choice and leisure time activities

- **SCANDINAVIA** - similar political intervention to regulate the forces of globalisation
Index of Economic Freedom and Obesity Rates (% population) by country

Index of Economic Freedom

% Obesity

1.0 1.5 2.0 2.5 3.0

5 10 15 20 25 30
Globalisation

• Effects are not inevitable

• Political intervention is possible

• Beneficial effects on
  Food consumption
    ↑ leisure time → ↑ energy expenditure
Obesity Prevention

I Develop methods of dealing with the Obesogenic environment

II Alter the perception of risk in population

III Address “unacceptable politics”
   ie we know the areas that need to change but driving change may be politically unacceptable
Obesity Prevention

• Maternal health (pregnancy)
• Pre-school
• Education
  - Population
  - Individual
  - Health workers
• Food Industry
• Government policy
  - Transport
  - Planning
  - Education
  - Globalisation
• Challenging risk Prevention/Assessment (European Driven)
  “Nanny state”
Obesity Prevalence  UK 1980 - 2010
A dramatic rise in diseases linked to obesity is expected by 2023.

Source: Choosing Health, Department of Health 2004
NHS R & D HTA Project: Obesity Treatment *

- Systematic Review of Therapies
- Epidemiological Modelling
- Health Economic Modelling

* Avenell A, Broom J, et al
Long-term effects and economic consequences of treatments for obesity
Health Technology Assessment 2004 Vol 8 No 21
Obesity Therapy Options

- Diet and Lifestyle
- ↑ Activity/Exercise
- ↓ Inactivity
- Cognitive Behavioural Therapy

Combination appears most effective

- Drugs
- Surgery
NHS R & D HTA: Outcome

- More randomised control trials (RCTs) over longer time period of diet and lifestyle
- RCTs of Low Carbohydrate Diets urgently needed
- No knowledge of type of exercise appropriate to the obese phenotype
  + patient preference
  + effect on weight loss
  + effect on cardiovascular risk
  + effect on metabolic syndrome
- RCTs of long term group v individual therapy
- Evaluation of government policy and educational activity
- Implementation mechanisms (evaluation)
Obesity
A demographic time bomb

- Population comorbidities
- Type 2 Diabetes Mellitus
- Disability
- Workforce
- Life expectancy
- Pension

What pension
There is no satisfying of man