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CONTENTS

1. PSYCHOTIC MAJOR DEPRESSION AND ELDERLY

Psychotic (delusional) major depression (PMD) is a sub-type of Major Depression Disorder (MDD) in DSM-IV (APA 1994). It involves more severe mood and psycho-motor disturbances, stronger feelings of guilt, more anxiety, and delusional ideation (Gournellis et al 2001).

Overall, PMD is rare, but its prevalence increases with age (eg: 1% of over 60s in Finnish study; quoted in Gournellis et al 2001). This increase may be due to changes in the ageing brain, like a decrease in activity of dopamine-beta-hydroxylase. This enzyme converts dopamine to noradrenaline, and the consequent decrease produces more dopamine relative to noradrenaline in the brain (Gournellis et al 2001).

Gournellis et al (2001) investigated the presence of PMD among 118 MDD sufferers aged 60 and over in Athens, Greece [1]. Forty-five individuals were diagnosed with PMD (38%). When compared to the rest of the sample, these individuals had a later onset of depression (58 vs 51 years old), were more likely to not be married and to live alone (ie: single, separated, divorced, or widowed), and have certain symptoms more - eg: severity of depression, guilt, insomnia, hypochondrial ideation, and lack of insight. Delusions [2] were also more common - for example, twenty-two individuals reported paranoid content, and twelve impending disaster.

Strengths (and methodological challenges)

1. Sample based on those consecutively admitted to the two hospitals and the private clinic between 7th January 1997 and 30th May 2000. (Sample during that period is a cohort, and may be influenced by specific factors not relevant to individuals outside that period).

2. Only individuals with unipolar depression and no co-morbidity with other conditions included in the study. (This excluded 57 of 175 individuals; 33%).

3. All individuals were diagnosed independently by two psychiatrists using standardised DSM-IV criteria. (Diagnosis can vary depending on the criteria used - DSM-IV or ICD-10).

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[1] The sample was 175 individuals before exclusions.

[2] Defined as "a fixed belief of the patient that could be tested against known reality, which was clearly false and was not shared by the family members, social or cultural group" (Gournellis et al 2001 p1086).

Limitations (and ways overcame)

1. Recall problems with older adults about age of depression onset. (Asked close relatives).

2. Urban sample. (Drawn from two hospitals and one private psychiatric clinic in different parts in the greater Athens area).

3. The PMD and non-PMD sufferers may not be comparable groups. (Forty of each group were sex and age matched).

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2. THE HERTFORDSHIRE AGEING STUDY

The Hertfordshire Ageing Study (HAS) [3] (Syddall et al 2010) is a longitudinal study of the effects of early life on adult ageing. It makes use of a set of infant records [4] collected in Hertfordshire, England between 1911 and 1948 (Syddall et al 2005).

The baseline involved 6803 live births in North Hertfordshire in 1920-30, of which 1428 were alive at follow-up 1 (1994-5; mean age 67), and 359 were interviewed at follow-up 2 (2003-5; mean age 76) (figure 2.1).

BASELINE	6803 births (i)
	↓
FOLLOW-UP 1 (age 67)	3477 traced (ii) (51.1% of i)
	2621 alive in UK (iii) (75.4% of ii)
	1428 alive in N Herts (iv) (54.5% of ii)
	824 interviewed (v) (57.7% of iv) [5] (717 attended clinic for check-up) (vi)
	↓
FOLLOW-UP 2	359 interviewed (vii) (50% of vi) (156 died) (309 declined/untraced [6])

(After Syddall et al 2010)

Figure 2.1 - Stages of HAS.

The findings from follow-up 1 showed links between early life and health in later life. For example (Syddall et al 2010):

- Lower birth weight and sarcopenia (age-related loss of muscle mass, strength and function [7]).
- Lower weight at one-year old and certain eye problems.

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[3] http://www.mrc.soton.ac.uk/herts/.

[4] Weight at birth, method of infant feeding, weight at one-year old, and illness and development until age five years.

[5] Male non-responders were more likely to have memory problems, lower social class, and felt "average" for age than sample. Female non-responders were more likely to have had heart attack, be non-smoker, and felt "old" or "average" for age than sample at follow-up 1.

[6] Male non-responders at follow-up 2 more likely to have poorer cognition, and lower social class, and women to have poorer cognition than sample.

[7] http://www.unm.edu/~lkravitz/Article%20folder/sarcopenia.html; accessed 29/01/11.

Table 2.1 summarises the main strengths and weaknesses of the HAS.

STRENGTHS	WEAKNESSES
1. Data on participants including lifestyle, socio-economic characteristics as well as medical information including DNA (table 2.2). 2. The infant records allow for a prospective study on early life and later ageing. 3. All measurements made by trained researchers using strict study protocols. 4. The mortality patterns in the study are similar to England and Wales as a whole (Syddall et al 2010). The HAS survivors at follow-up 2 were comparable to their age group using the 2005 Health Survey for England (HSE) data (http://www.data-archive.ac.uk). 5. The study covers a long period (ie: over fifty years) which is rare in research. 6. The longitudinal study method allows researchers to follow the progress/development on individuals rather than compare age groups (as in cross-sectional studies) which has limitations.	1. Death and drop-out/non-response means that the study survivors are no longer representative of the target population. 2. Limited to a small area in North Hertfordshire (north of London). 3. The cohort is relatively small now. 4. Syddall et al (2010) admitted that "with the benefit of hindsight it would have been desirable to include a broader panel of items that were measured at both follow-ups, in particular to have asked about falls, SF-36 self-assessed health, physical activity and performance at the first HAS follow-up" (p42). 5. Though the infant records are unique, researchers are dependent on information collected (and that not collected). 6. The cohort has experienced many similar events to other age groups, but also many unique ones (table 2.3). This is called the "cohort effect".

Table 2.1 - Main strengths and weaknesses of the HAS.

Physical ageing markers:
- Grip strength (eg: using Jamar hand grip dynamometer)
- Cognitive function (eg: IQ, memory)
- Skin thickness (via ultrasound scanner)
- Eye examination (eg: visual acuity)
- Hearing test
- Falls in past year
- Frailty

Medical information
- Height, weight etc (anthropometry)
- Prescribed medication
- Blood pressure
- DNA from blood sample
- Cardiovascular and respiratory functioning
- Self-assessed health (SF-36 questionnaire)

Lifestyle and socio-economic characteristics
- Social class
- Self-reported diet
- Smoking and alcohol habits
- Occupational history

(Source: Syddall et al 2010)

Table 2.2 - Main data collected in the HAS.

DECADE	AGE	KEY EVENTS
1930s	Child/teen	"Great Depression"
1940s	Young adult	Fought in World War II
1950s	Adulthood	Post-war austerity, then growth of consumerism
1960s	Mid-life	Parents of "hippies"
1990s	Retirement age	Post-Thatcher Britain; grandparents of "Thatcher's children"

Table 2.3 - Common experiences of HAS cohort in UK.

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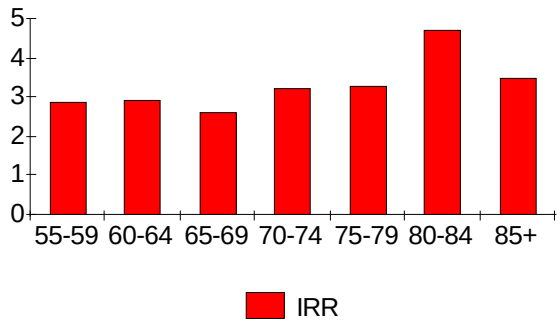
3. SUICIDE AND RELATED BEHAVIOURS AMONG OLDER ADULTS

3.1. SUICIDE IN EUROPE

Older adults kill themselves more often than other age groups generally (Conwell 2009), but the rates of elderly suicide vary among countries.

Corcoran et al (2010) assessed the pattern of older adult suicide (aged 55 years and more) in Ireland using Irish Central Statistics Office data between 1980-2006. The suicide rate for older women was relatively stable over the study period (mean rate: 5.9 per 100 000), while the male rate fluctuated (mean rate: 19.1 per 100 000) [8] [9]. Male suicides are much greater at all age groups above 55 years (figure 3.1). Hanging was the most popular method for men, and drowning for women (table 3.1).



(IRR = incidence rate ratio of the male rate to the female rate)

Figure 3.1 - The number of times that the male rate of suicide is greater than the female rate at different ages in Ireland, 1997-2006

[8] These figures do not include undetermined deaths. When this is included, the female rate becomes 7.6 and the male rate 22.1 per 100 000.

[9] These figures are dependent on the official classification of death (eg: use of "death of undetermined intent" instead of suicide to spare the feelings of relatives), and ignores the misclassification of death by natural causes (eg: severely terminally ill individual who brings about their death by deliberate cessation of vital medication) (Corcoran et al 2010).

MALE (%)	FEMALE (%)
1. Hanging (40.6) 2. Drowning (28.7) 3. Firearms (9.0)	1. Drowning (39.3) 2. Drug overdose (24.1) 3. Hanging (17.3)

Table 3.1 - Most popular methods of suicide (and undetermined deaths) by older adults in Ireland.

Yur'gev et al (2010) investigated whether the social attitudes towards the elderly accounted for the variation in rates in 26 European countries.

Mean annual suicides for 65 year-olds and over were calculated from World Health Organisation data [10] for each country, and for males and females. The attitudes towards the elderly in a society were taken from the European Social Survey (ESS) [11] (table 3.2). Higher scores are more positive attitudes towards the elderly.

A. How do most people view the status of people aged over 70 years? (Score: 0–10, where 0 means "extremely low status" and 10 means "extremely high status").

B. All things considered, do you think people over 70 contribute very little or a great deal economically to [country] these days? (Score: 0–10, where 0 means "they contribute very little economically to [country]" and 10 means "they contribute a great deal").

C. How likely it is that most people view those over 70 as friendly? (Score: 0–4, where 0 means "not at all likely to be viewed that way" and 4 means "very likely to be viewed that way").

D. How likely it is that most people view those over 70 as having high moral standards? (Score: 0–4, where 0 means "not at all likely to be viewed that way" and 4 means "very likely to be viewed that way").

E. How likely it is that most people view those over 70 with admiration? (Score: 0–4, where 0 means "not at all likely to be viewed that way" and 4 means "very likely to be viewed that way").

(Source: Yur'gev et al 2010 p1338)

Table 3.2 - Questions about attitudes to elderly from ESS.

The mean suicide rate was found to be 44.4 per 100 000 for men (ranging from 9.4 in Greece to 95.0 in Russia), and 11.8 for women (from 1.5 in Greece to 23.1 in Switzerland).

Attitudes about the elderly negative correlated with

[10] http://data.euro.who.int/hfamdb (January 2010).

[11] Round 4 - 2008-9 (http://www.europeansocialsurvey.org).

suicide rates among older adults (ie: positive attitude/low suicide rate, negative attitude/high rate) (figure 3.2). The relationships were stronger for men than women (table 3.3).

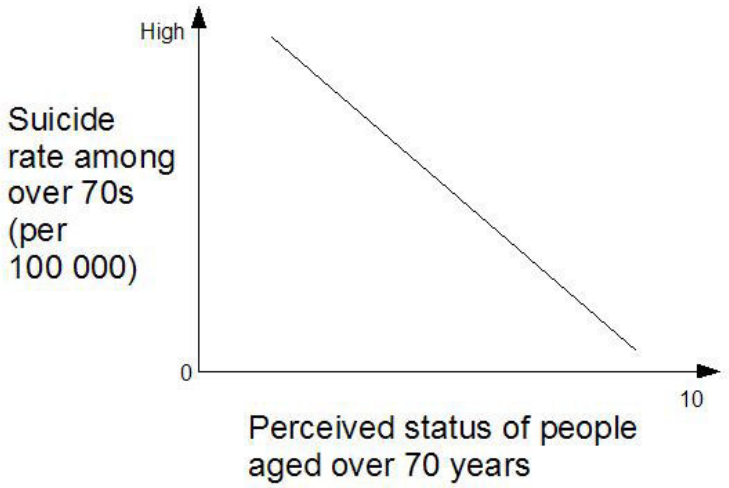


Figure 3.2 - Example of negative correlation between suicide rate and attitudes towards elderly.

ESS QUESTION	MEN	WOMEN
A - status	-0.47	-0.27
B - contribution	-0.56	-0.32
C - friendly	-0.37	-0.33
D - moral standards	-0.31	-0.34
E - admiration	-0.58	-0.53

(After Yur'gev et al 2010)

Table 3.3 - Mean correlations between suicide rate among older adults and attitudes to elderly.

Yur'gev et al (2010) concluded that "Seemingly trivial favourable behaviours, such as regarding elderly people as friendly, perceiving them as having higher status and moral standards, and experiencing feelings of admiration towards them may be considered protective factors that support elderly people and reduce suicide mortality among them" (p1341).

3.2. SUICIDE ATTEMPTS BY THE ELDERLY IN TAIWAN

Suicide among the elderly can be a greater risk than among the general population (eg: 4-5 times greater in south-east Asian study; Yip 1996). The characteristics of elderly suicides are difficult to ascertain, as with all suicides, because the information is retrospective (eg: psychiatric records) or from others. This has led to the study of suicide attempters (ie: "failed suicides").

Yang et al (2001) collected data on all patients (older than 65 years) admitted to the geropsychiatric unit [12] of the Veterans General Hospital - Taipei (Taiwan) as suicide attempters during 1991-6. There were 55 patients (78.2% male) out of 722 in total in the geropsychiatry unit (7.6%) [13]. The non-attempters were used as a comparison group.

The suicide attempts were more likely to suffer from depressive disorders, delusional disorders, and adjustment disorders, and less likely to have organic mental disorders than non-attempters [14] [15] [16].

The main motives reported by attempters were physical illness, family problems (eg: conflict with child), psychosocial problems (eg: social isolation), adjustment problems (eg: change of residence), and interpersonal problems (eg: conflict with friends) in that order. An average of 2.2 motives per person were reported.

3.3. DELIBERATE SELF HARM (DSH)

Corcoran et al (2010) used the data from the Irish National Registry of Deliberate Self Harm in 2006-2008 [17]. This register collects all cases in forty hospital emergency departments in Ireland [18]. Overall, more women than men presented with DSH (mean rate: 83.4 vs 67.4 per 100 000). This was also the case for age groups above 55

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[12] A specialist psychiatry ward for geriatric patients.

[13] An equivalent figure for inpatients in the West is 12% (eg: Draper 1994).

[14] These differences were significant using the chi-square test (appendix 3A).

[15] Overall, 78.2% of attempters had a history of psychiatry illness compared to 32-54% in the West (Draper 1996).

[16] Overall, 31 of the attempters had previously attempted suicide (56.4%) (compared to 7-45% in the West; Draper 1996).

[17] This only records DSH where the individual visited a hospital. Thus, it could an underestimate as minor DSH, and where help not sort, not included.

[18] DSH was defined as "An act with a non-fatal outcome, in which an individual deliberately initiates a non-habitual behaviour that, without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognised therapeutic dosage, and which is aimed at realising changes which the subject desired via the actual or expected physical consequences" (Corcoran et al 2010 p1328). This is a standard WHO definition.

years old with the exceptions of the 70-74, 80-84, and 85+ age groups (figure 3.3). Drug overdose and self-cutting were the most popular methods, overall (85% and 10% of women, and 72% and 15% of men respectively).

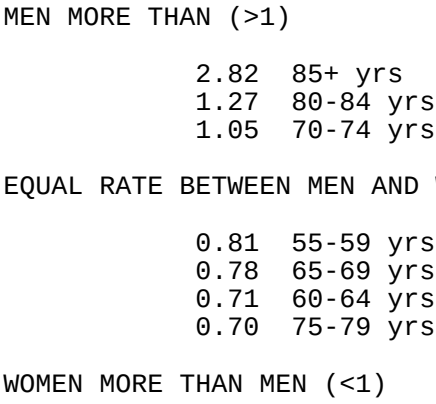


Figure 3.3 - Incidence rate ratio of the male rate to the female rate for DSH in Ireland, 2006-2008.

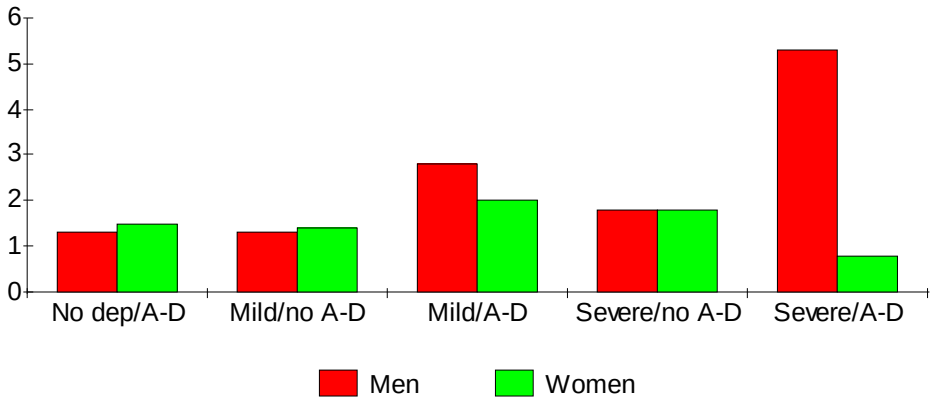
DSH can be a failed suicide attempt or a desire to self-harm without suicidal intention. Sometimes, it can be difficult to discern which type (Dennis et al 2007).

3.4. DEPRESSION AND MORTALITY

Late-life depression can be associated with increased mortality generally (other than through suicide). Using data from the Three City Study (3C) in the French cities of Bordeaux, Dijon, and Montpellier, Ryan et al (2008) assessed the four-year survival of 7363 community-dwelling over 65s. The presence of depression, and its severity, along with anti-depressant use were measured.

Overall, 10.2% were diagnosed with severe depression and 12.1% with mild depression, of which women were significantly more. Compared to non-depressed individuals, the depressed ones were more likely to live alone, have disability, and cognitive impairment.

The risk of mortality was highest among men with severe depression using anti-depressants (five times greater risk than non-depressed), and among severely depressed women not taking such medications (twice as likely) (figure 3.4).



(A-D = uses anti-depressants)

(Hazard ratio of 1 = no depression/no anti-depressant use)

(After Ryan et al 2008)

Figure 3.4 - Fully adjusted hazard ratio for mortality.

But why does depression increase the risk of mortality? There are a number of possible reasons (Ryan et al 2008):

- Depression exacerbates physical illness, and hinders recovery (possibly through suppression of immune system).
- Depression reduces motivation, including to eat, and this has an affect on health.
- Depressed individuals are less likely to adhere to medication regimen for physical illnesses, and the negative consequences of this on health.
- Depressed individuals may behave in unhealthy ways (eg: increased alcohol consumption).

3.5. APPENDIX 3A - CHI SQUARE

Chi-square (X^2) is used to establish if the observed data are different to chance (expected values). Each piece of datum must be independent (ie: appear in one category only). Any level or type of data can be used.

Table 3.4 shows the number of individuals in the Yang et al (2001) study showing depressive disorders. The question is whether depressive disorders is significantly more likely for suicide attempters.

DEPRESSIVE DISORDERS:	ATTEMPTERS	NON-ATTEMPTERS
Yes	31	87
No	24	580

Table 3.4 - Number of individuals with depressive disorders who attempted suicide or not.

The equation for X^2 is $\sum (O-E)^2/E$ (The sum of observed data minus expected data, squared, divided by expected data.

This formula can be calculated in a series of steps (table 3.6) after the data are prepared (table 3.5).

DEPRESSIVE DISORDERS:	ATTEMPTERS	NON-ATTEMPTERS	**ROW TOTALS**
Yes	31 (A)	87 (B)	**118**
No	24 (C)	580 (D)	**604**
COLUMN TOTALS	**55**	**667**	**GRAND TOTAL: 722**

(Letters = cell labels for convenience. It does not matter which letters are attached to which cells)

Table 3.5 - Number of individuals with depressive disorders who attempted suicide or not as data prepared for X^2.

	1: O	2: E *	3: O-E	4: $(O-E)^2$	5: $(O-E)^2/E$
A	31	9	22	484	5.4
B	87	109	-22	484	4.4
C	24	46	-22	484	10.5
D	580	558	22	484	0.9

(* Numbers rounded up to wholes for convenience)

Table 3.6 - Steps in calculation of X^2.

1. Column 1 is the observed frequency (O) (ie: data collected).

2. Column 2 is the expected frequency (E) by chance. This is calculated by the equation: Row Total (RT) x Column Total (CT) ÷ Grand Total (GT). For example, cell A = 118 x 55/722 = 9.

3. Column 3 is the observed frequency minus the expected frequency for each cell.

4. Column 4 is the previous column squared.

5. Column 5 is the previous number divided by its expected frequency.

6. Add column 5 to give chi-square ($X^2 = 21.2$).

7. This figure is the calculated value and needs to be checked against a table of critical values for chi-square. The calculated value needs to be equal to or greater than the critical value to be significant. For a p value [19] of 0.001 with a df of 1 [20], the critical value is 10.83 [21]. Thus the calculated value is greater than that, and so there is a significant difference in the results. Suicide attempters were significantly more likely to suffer from depressive disorders than non-attempters.

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[19] This is the probability of the results being due to chance. The smaller the number, the less likely the results are due to chance.

[20] Degrees of freedom (df) = (number of rows - 1) x (number of columns - 1). In table , this is (2-1) x (2-1) = 1.

[21] Figure from table 4 p284 Coolican (1990).

4. COUNSELLING AND OLDER ADULTS

Mental health problems among older adults tend to be under-diagnosed, and often viewed as a consequence of ageing anyway (ie: untreatable). Sigmund Freud himself was negative about offering psychoanalysis to older individuals: "Psychotherapy is not possible near or above the age of 50, the elasticity of the mental processes, on which treatment depends, is as a rule lacking - old people are not educable - and, on the other hand, the mass of material to be dealt with would prolong the duration of treatment indefinitely" (Freud 1956/1905; quoted in Biggs 2005).

This view has led to a limited availability of therapy and counselling for older adults. But if mental health problems are a "natural" consequence of ageing, maybe counselling and therapy are of little use?

Hill and Brettle (2006) undertook a systematic review of studies on counselling with older adults. Counselling was defined as any technique used in response to the needs of the client with the intention of bringing about psychological and behavioural change. The cut-off point of fifty years old was used.

Forty-seven studies were classed as meeting the inclusion criteria. The studies covered the following areas:

i) Setting of counselling:

- 24 studies investigated counselling with clients in the community (ie: in their own homes or at a local primary care medical centre).
- 14 studies were based on nursing homes, and all concentrated on dementia/cognitive decline.
- 3 studies involved counselling older people in hospital settings.
- 6 studies - other or unclear.

ii) Target problems - 12 studies covered multiple problems or general level of well-being and counselling. Where the focus was upon a specific problem, depression was most common (21 studies) followed by dementia/cognitive decline (7), anxiety (5), and physical illnesses (2).

iii) Counselling techniques used - 15 studies involved cognitive-behaviour therapy (CBT), eight general counselling, 14 reminiscence and life review therapy (RT), and the others included psychodynamic therapy, and gestalt therapy.

iv) Type of counselling - The studies looked at individual or group therapy. These are not necessarily comparable for the same technique (eg: individual CBT vs group CBT) because individuals may benefit from being in a group irrelevant of the technique used.

v) Views of older adults - Where older adults were asked, the majority said that they would use psychological services if available, and the preference was for individual counselling rather than group.

vi) Feasibility - This is the question of whether providing counselling for older adults is feasible. Two studies found that it was relatively straightforward to train nursing and associated staff in counselling techniques. For home-bound or limited mobility community dwellers, individual therapy was more feasible, while in residential homes, group sessions were viewed as more feasible by staff.

The question is whether counselling is effective for helping older adults. The answer depends on the mental health problem.

a) Depression - All techniques used, in some way, were beneficial when compared to controls (ie: untreated). CBT was probably the most effective.

b) Dementia/cognitive decline - RT is most often used here, and it aims to help the client achieve a sense of integration by looking back over their lives. The evidence about effectiveness was mixed.

c) Anxiety - Counselling produced significant improvements.

d) Physical illnesses - Only two studies investigated counselling with older adults with disabling physical illnesses, but both showed beneficial effects (eg: brief group CBT with chronic obstructive pulmonary disease sufferers).

Overall, the studies reviewed provided evidence of the effectiveness of counselling with older adults for anxiety and depression, and for improving subjective well-being. These studies are consistent with studies of counselling with younger populations. CBT was the technique with the most supportive evidence, but this was partly due to the lack of studies evaluating other techniques.

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5. PHYSIOLOGICAL AGEING AND DEATH

5.1. THE INCREASING LIFESPAN

In 1800 the lifespan on average was thirty years (Brown 2007). Average life expectancy has increased dramatically in the last century in rich countries due to the developments in sanitation, and medical care and technology, and the decline in infant mortality and childbirth-related deaths, for example. "In the richer countries around the world it lengthens five hours or more every day, and in many developing countries that are catching up the rate quickens still faster" (Kirkwood 2010a p26).

Because healthy life expectancy has not increased at the same rate as general life expectancy, it means that individuals are experiencing ill health for longer. The increasing lifespan is mainly due to better survival from chronic diseases ("expansion of morbidity") not from slowing the ageing process (Brown 2007) [22]. This produces a moral issue, argued Grayling (2007), in relation to the cost and practicalities of dealing with more and more incapacitated elders for longer periods. Euthanasia is then an issue. Or "to abandon our current practice of promoting longevity" (Grayling 2007).

The ideal would be that as the lifespan increased, disability would be squeezed into a short period before death ("compression of mortality") (Brown 2007).

However, the course of disability in the last year of life does not necessarily follow a predictable pattern, Gill et al (2010) found. They performed monthly telephone interviews with 754 community-dwelling over 70s for ten years. At the start of the study, all participants had no disability in "essential activities of daily living" (bathing, dressing, walking, and transferring from a chair to standing). Five trajectories were identified in the last year of life:

[22] At the extreme, medical technology can keep individuals alive even if the brain cannot regulate the body (eg: mechanical breathing in coma patients). This has challenged the whole definition of death (Hughes 2007).

- No disability before death (17% of sample);
- Catastrophic disability (19.8%) - sudden decline in certain abilities in last three months of life;
- Accelerated disability (17.5%) - decline worsens in certain abilities in last year;
- Progressive disability (23.8%) - decline over the last year;
- Persistently severe (21.9%) - disability in all areas of daily living studied.

5.2. THEORIES OF PHYSIOLOGICAL AGEING

There are a number of theories about physiological ageing (and death) including the idea that death is not programmed into organisms.

Cells in the body are subject to the wear and tear of life. Senescence occurs when they stop dividing, while apoptosis is programmed cell death. In the case of the former, it has been found that about fifty divisions is the limit (known as "Hayflick's limit"; Hayflick 1965). The inability to divide leads to health problems, for example (Twyman 2006).

In cell senescence, the cell still performs its functions in the body without ever dividing again. Finding a way for the cells to continue to divide (without becoming uncontrollable) could be a way to increase the lifespan (Kirkwood 2010a) [23] [24].

Senescence and apoptosis are complex processes, but they are generally beneficial because cell division out of control is, simplistically, cancer.

Genetic inheritance can influence how well the body responds to wear and tear on cells generally. For example, it was found in the 1980s (eg: Klass 1983) that the lifespan of the nematode worm (figure 5.1) could be increased by mutation to a gene called age-1. Subsequently, daf-2 mutation was found to double the worm's lifespan. Other genetic manipulations have

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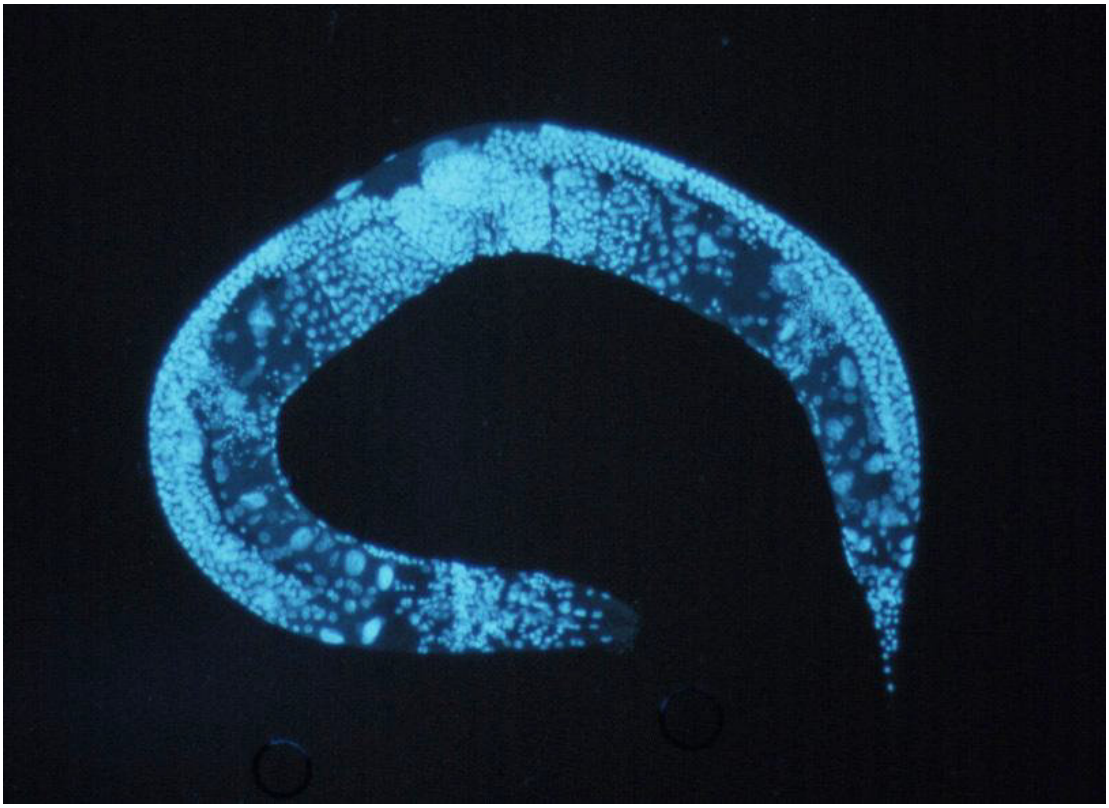
[23] A radical alternative to stopping or delaying physiological ageing is offered by trans-humanists (eg: World Trans-Humanist Association). They suggest the uploading of and individual's memories to a computer, for example, that does not have physiological death (Egan 2007).

[24] There are a number of areas of physical deterioration that researchers can focus upon in order to challenge physiological ageing (Nuland 2005):

- Loss and degeneration of cells.
- Accumulation of unwanted cells (eg: fat cells).
- Mutations in chromosomes.
- Mutations in mitochondria.
- The accumulation of "junk" within the cell, which limits its functioning.
- The accumulation of "junk" outside the cell (eg: amyloid).
- Cross-links in proteins outside the cell (leading to a loss of elasticity of tissue).



(Source: US National Institute of Health; in public domain)

Figure 5.1 - A nematode worm.

extended the lifespan six-fold (Kenyon 2005).

While in fruit flies, a mutation in the chico gene extends lifespan by nearly half (Clancy et al 2001), but at the expense of dwarfism and sterility (Melton 2006a).

Mutations that increase the lifespan are often in genes related to metabolism, like the insulin-signalling pathway (Kirkwood 2010a).

5.3. EVOLUTION AND AGEING

An early evolutionary theory in the 1880s by August Weissman explained senescence as benefiting the population by removing old, unproductive individuals. However, this is no evolutionary benefit to the individual (Monaghan et al 2008).

Evolutionary theories have focused on the genes that give evolutionary benefits to individuals with consequent negative effects in old age (eg: antagonistic pleiotropy theory; Williams 1957). In other words, genes that lead to greater reproductive success and an early death will be more likely than genes that produce a small reproductive success and long life.

While the mutation accumulation theory (eg: Medawar 1952) sees the pressure of selection declining with age,

which means that maladaptive genes are not removed. These genes accumulate in populations, thereby reducing the survival and reproductive success of older individuals. Put simply, ageing has not been "evolved out" of the population like other maladaptive behaviours.

5.3.1. Disposable Soma Theory

The daily maintenance of the body (eg: cell repair, anti-oxidant defences [25]) is important but costly in energy terms. Under the pressures of evolution, the body repairs itself for a reasonable amount of time to allow the opportunity for reproduction for early humans (eg: 30-40 years). But in the modern world, with better long-term survival rates, the repairing of the body becomes too "expensive", and deterioration occurs leading to death (Kirkwood 2006). "Nature cares more about survival of the young than managing decline in old age.." (Kirkwood 2010a p30) [26].

This is not so much of an issue in other species because most animals die before old age due to predation, starvation, infection, injury, or accident. Ageing is thus not necessarily "natural" for non-human animals. Furthermore, it is only a product of modern human society (Brown 2007).

It can be argued that women live longer than men because the state of the female body is crucial to survival of the offspring. Thus, from an evolutionary point of view, it is important that damage to the female body is repaired. Evidence from rats shows that cells in a female body repair themselves better than in a male body, and if the ovaries are removed the difference is eliminated (Kirkwood 2010b).

5.3.2. Kin Selection

Longer living individuals are competing against younger ones including their offspring for resources (eg: mates, food), so there must be evolutionary benefits that outweigh this for ageing (particularly post-reproduction for females) to evolve.

Kin selection theory (Hamilton 1964) explains the evolution of behaviour based on the benefits at the level of the gene rather than the individual. So, a mother, for

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[25] For example, the normal functioning of cells leads to the accumulation of oxidative damage (the free radical theory; Harman 1956). Combating this damage requires resources.

[26] "Our genes treated the body as a short-term vehicle to be maintained well enough to grow and reproduce, but not worth a greater investment in durability when the chance of dying an accidental death was so great" (Kirkwood 2010b p18).

example, who sacrifices herself to save her three offspring is benefiting overall because half her genes in three individuals (ie: ½ x 3 = 1½) are continuing into the next generation.

Applied to post-reproductive individuals, they can help their offspring, grand-offspring, and other relatives, and this will give benefits at the gene level. This is sometimes called "altruistic ageing" (Bourke 2007). If this is the case, where post-reproductive females live longer there should be more grandchildren than where post-reproductive females die earlier. This explanation seems better at accounting for ageing females than for males.

5.4. CALORIE RESTRICTION

Clive McCay (McCay et al 1935) found that rats fed two-thirds of the normal calories lived about one-third longer than normal calorie-fed ones. More recently, 38 rhesus macaques fed 30% fewer calories lived longer compared to those on normal calorie diets in a twenty-year study. At the end of the study, 80% of the former group were still alive compared to 50% on the normal diet (Colman et al 2009) [27].

For mice, the diet needs to begin after 12 months old and be continuous throughout life. Such female mice remain reproductive longer (eg: up to 30 months old instead of usually up to 18 months old) (Merry 1999).

Kirkwood (2010a) felt that calorie restriction is less likely to work with the slow-paced metabolism of humans compared to other species.

Calorie restriction may work to encourage the body to move resources towards longer term survival (ie: cell maintenance), and less on immediate reproduction because a food shortage is a bad time to have offspring (Kirkwood 2010a).

Subsequent research has shown that calorie restriction by itself is not the answer because, in some species, it is the type of diet that matters. For example, fruit flies can live longer on a normal calorie diet containing proportionately less yeast. But calorie restriction reduces the lifespan of house flies (Melton 2006b).

Rats placed on the calorie restricted diet pre-weaning have shorter lifespans than the average (Merry 1999).

In terms of applicability to humans, experiments

[27] Low calorie diet has been studied in various species including guppy (fish), water fleas, and spiders (Merry 1999).

have been started that compared individuals on calorie restriction diets with individuals on the typical calorie diet in the USA (eg: Racette et al 2006).

However, very thin individuals risk early death to the same level as overweight individuals (Melton 2006b).

A similar effect to calorie restriction has been found with rapamycin. This is released by soil bacteria to kill off other micro-organisms. Mice given it regularly had an increased lifespan of 30% (Sharp and Stone 2010). It triggers the production of a protein usually released when food is in short supply. But rapamycin has the side effect of suppressing the immune system (and thereby making the animal vulnerable to infection) (Update 2009).

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6. LATE-LIFE WELL-BEING AND DEPRESSION

The idea of disengagement and withdrawal in later life was a dominant idea in the mid-twentieth century. "The elder would become increasingly preoccupied with the self and decrease their emotional investment in persons and objects in the environment. The image of the elder happily being placed on an iceberg and cut loose from the tribe to float into oblivion emerges" (Blazer 2005 p497).

However, subsequent research has shown that social engagement leads to better well-being. Social disengagement, isolation and exclusion only lead to depression.

For example, Ranzijn et al (2005) interviewed 27 individuals aged 45-71 who were seeking work after being forced to retire early. A number of themes emerged from the qualitative analysis including loss of self-worth, poorer quality of life, narrowing of horizons (ie: previous retirement plans reconsidered), and inability to use talents and contribute.

The death of a spouse can be a traumatic event, but does the subsequent widowhood leave the individual vulnerable to psychiatric illness? To answer this question, Onrust and Cuijpers (2006) performed a systematic review of studies on major depressive disorder (MDD) and anxiety disorders among the widowed. Eleven studies were found which included a total of 3481 widowed individuals and 4685 non-widowed controls (eg: demographically similar married or divorced or never married).

In the 12 months after widowhood, 22% of individuals were reported as suffering from MDD on average, and 12% post-traumatic stress disorder (PTSD) (table 6.1). Compared to the non-widowed controls, widowed individuals were at least three times more likely to develop one of the disorders.

DISORDER	NUMBER OF STUDIES	NUMBER WIDOWED	MEAN RATE (%)	RANGE (%)	RELATIVE RISK
MDD	8	1051	21.9	9 - 31	3.17 - 9.76
PTSD	5	772	11.8	6 - 25	-
Anxiety disorder	1	102	31	-	3.49

Table 6.1 - Rates of three disorders among widowed individuals.

Berg et al (2006) investigated life satisfaction among the oldest-old (ie: older than 80 years old) in the

Swedish Origins of Valence in the Old-Old (OCTO-Twin) Study. Begun in 1991, it follows pairs of twins. Life satisfaction was measured with statements like, "As I grow older, things seem better than I thought they would be", and "When I think back over my life, I didn't get most of the important things I wanted".

Life satisfaction was found to be significantly related to certain variables: quality of social networks, self-rated health, depression, locus of control, and being a widower for men (figure 6.1).

LOW LIFE SATISFACTION		HIGH LIFE SATISFACTION
Few friends/poor quality	SOCIAL NETWORK	Many friends/good quality
As poor	SELF-RATED HEALTH (women only)	As good
Symptoms present	DEPRESSION (women only)	No symptoms
External - feel life controlled by others	LOCUS OF CONTROL	Internal - feel in control of life
Yes	WIDOWER (men only)	No

Figure 6.1 - Significant variables and life satisfaction.

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7. "AGEING WELL" IN CONSUMER SOCIETY

"Ageing well" is the idea that individuals will enjoy their later life [28]. However, in consumer society, it has become associated in various ways with consumerism. This can be seen in advertising aimed at older adults.

Ylanne et al (2009) analysed the presentation of older adults in 140 advertisements in eleven British magazines (eg: "Radio Times", "Men's Health", "The Economist") during the period June 1999 to May 2004. The magazines chosen were representative of eight basic categories of magazines including older audience, general, men's, and women's. Random sampling of all issues from the study period produced 121 issues for analysis. From them, any advertisements with a "recognisable" [29] human figure appearing sixty years or older involving a quarter of a page and larger were collected. The final corpus was 221 advertisements.

Content analysis was performed on the advertisements using categories like product, tone of advertisement, type of portrayal, and sex of the character. This analysis focused upon the collection of quantitative data, while qualitative analysis drew out themes in the advertisements. The main product advertisements were mobility aids, specially designed furniture to provide comfort, food supplements, and aids to living (eg: personal alarm systems; health insurance).

The researchers were interested in the discourses about health and ageing in the advertisements. Six themes/discourses emerged from the qualitative analysis. One key discourse was "responsibility and choice":

> Some ads suggest that "you" - the consumer - are responsible for your own (and your family's) health: "take charge of your bladder problem" urges one ad. Henry Cooper, a well-known retired British boxing champion, says "Don't get knocked out by the flu", as he urges older people to get their flu jabs. Note the imperative mood in these ads, invoking a moral duty (going beyond just choice) for an ageing individual to take action. An ad for Bupa (private) hospital poses the question "When should you start to do something about your health?". Flora pro active margarine is allegedly "good news for anyone trying to maintain a healthy heart". "Interested in a healthy

[28] However, there is no consensus about defining and measuring "ageing well" (or "successful ageing" which is often used instead/as well) (Torres and Hammarstrom 2009).

[29] "A 'recognisable' human figure meant enough of the face was visible to be reasonably certain of the character's sex, age and expression. Isolated photographic images of human hands, for example, even though they may have been clearly hands of an older person were not sampled, neither werecartoons nor puppets" (Ylanne et al 2009 p42).

> retirement?" asks an ad for Research into Ageing, a research charity. These ads connote agency, the allusion is that people are not passive victims of ill-health in older age. The adverts also appear to place the burden of responsibility on the consumers. They often imply that older adults owe it to their family to take care of their health and thus to enjoy an active and healthy old age. This (as the questions posed in the adverts indicate) is a lifestyle choice - a choice that is presented as obvious and unproblematic, as common sense even (Ylanne et al 2009 p52).

The other themes were health problems in older age and how the products could help; the maintenance of independence and quality of life; managing risks; staying younger, healthy and active; and taking pride in appearance.

The advertisements were aimed at the niche of "relatively wealthy older consumers": "An ageing cohort which is accustomed to purchasing household equipment to ease the daily chores (such as vacuum cleaners, food processors, lawnmowers, etc), might well be expected to respond well to aids that give a promise of the maintenance of a certain quality of life" (Ylanne et al 2009 p55). Products also promised to delay the ageing process.

Overall, "ageing well" (a positive old age) was presented as associated with the ability to consume the products available. But what about the less wealthy older adults who cannot afford such products, can they "age well"? "Ageing well" (or "successful ageing") is not always consumer-based for older individuals themselves.

For example, Torres and Hammarstrom (2009) interviewed sixteen 77-86 year-old individuals in Uppsala, Sweden (some requiring home-help care) about their views on "ageing well" and "successful ageing". The latter term was seen as an oxymoron (ie: "successful ageing" meant not ageing at all):

> Our informants' understandings of successful ageing suggest that the term can be regarded as an oxymoron since ageing is believed to be about the kinds of transitions that jeopardise being able to continue as usual and to age well one would need to be able to "freeze time" since remaining the same is the only way in which one could avoid the various deteriorating transitions with which ageing seems to have been associated (Torres and Hammarstrom 2009 pp45-46)

However, common statements about "successful ageing" emerged from analysis of the interviews:

a) What is needed for "successful ageing" - eg:

being healthy; remaining alert and "clear-headed" (ie: not demented); having good relationships; finances.

b) Attitudes that aided "successful ageing" - eg: having a positive approach to things; curiosity and thus continuing to learn; avoid dwelling on negative things.

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8. LATER-LIFE RELATIONSHIPS

"Elders did not grow old in a vacuum but were affected through the years by myriad biological, psychological, socio-cultural, and life cycle forces" (Blieszner 2006 p2). Late-life relationships are influenced by various factors:

i) Lifespan development - Earlier experiences influence relationships in later life. For example, individuals born into lower social classes had smaller social networks and less non-kin relationships in later life than higher social classes in a Dutch study (Broese van Groenou and van Tilburg 2003).

ii) Social contexts - like where the relationship takes place (eg: in nursing home).

iii) Historical contexts - social changes over time like increases in divorce, single-parent households, and non-traditional households in the West in recent years.

Early Life and Later Relationships

The early relationship between a child and its parent(s) can affect adult and late-life relationships. For example, McCarthy (1999) showed the link between the type of attachment in the early years and romantic relationships among a group of middle-aged English women. Those women having insecure attachment styles had more problems in their romantic relationships.

Attachment styles in babies and infants are divided into secure, insecure: anxious, and insecure: avoidant (Ainsworth 1973). The latter shows an indifferent to the mother's absence which can lead to inability to form later attachments, while insecure: anxious style involves being too pre-occupied with the absent mother. Hazan and Shaver (1987) were the first to show similar patterns in adult relationships using a series of statements:

- Secure attachment - comfortable with intimacy, and have warm and loving intimate relationships (eg: "I have little difficulty expressing my needs and wants to my partner"; "I don't often worry about being abandoned or about someone getting too close to me").

- Insecure: anxious - pre-occupied with the partner leaving (eg: "When my partner is away, I'm afraid that he or she might become interested in someone else"; "I find that others are reluctant to get as close as I would like").

- Insecure: avoidant - view intimacy as a loss of independence and so avoid it (eg: "My partners often want me to be more intimate than I feel comfortable being"; "I am somewhat uncomfortable being close to others") (Levine and Heller 2011).

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9. AGEING AND LEARNING DISABILITIES

Ageing among adults with learning disabilities (AWLD) shows differences to the general population. For example, adults with Down syndrome (DS) experience decline about ten years earlier than the general population, while long-term memory declines rapidly after age 39 (Hawkins et al 2003).

Rates of dementia among older AWLD vary from 6-22% of over-65s, depending on the study. While DS individuals have an even higher prevalence of dementia because of, for example, the overproduction of amyloid precursor protein (McCallion and McCarron 2004).

However, "Due to language and other difficulties experienced persons with intellectual disabilities, screening and other diagnostic measures for dementia used for the general population have limited utility" (McCallion and McCarron 2004 p350).

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10. EARLY LIFE EXPERIENCE AND LATE-LIFE MENTAL DISORDERS

The effect of early life on the lifespan is seen as important as evidence grows (eg: birth weight and adult diseases). This is also the case for "brain health" in later life (Salum et al 2010). Table 10.1 lists some lifespan factors that can influence late-life mental disorders (Salum et al 2010).

- Foetal development (eg: foetal malnutrition)
- Early life experiences
- Socio-economic conditions
- Childhood trauma and stress
- Childhood infections
- Adult health
- Education (eg: mental activity slows development of dementia)
- Family environment
- Life stressors
- Genes

Table 10.1 - Lifespan factors that influence late-life mental disorders.

Though brain growth is unique to the individual depending upon their experiences, there are general patterns. The grey matter increases in thickness in early childhood, but then decreases after seven years old and throughout adulthood until aged 60. White matter in the brain continues to grow until the mid-40s (Salum et al 2010).

In relation to mental disorders, Shaw et al (2010), for example, found a delay in development of the cortex in children with attention deficit hyperactivity disorder (ADHD), while autism is associated with early acceleration of brain growth.

Most mental disorders in later life (with the exception of dementia) have their onset in earlier life. For example, less than 5% of anxiety and mood disorders occurred for the first time after fifty years old (Kessler et al 2005). While some disorders in childhood can precede others in later life - eg: childhood conduct disorders was common in late adult sufferers of anxiety, depression and alcohol abuse in a forty year study (Colman et al 2009).

Concerning risks factors for dementia, for example, ADHD in childhood and adulthood has been associated with dementia with Lewy bodies, but not Alzheimer's disease, and post-traumatic stress disorder associated with dementia generally (Salum et al 2010).

Salum et al (2010) concluded about early life and late life mental disorders:

> There is no unifying theory explaining all variations of human behaviour from childhood to late life. First, it is difficult to systematically observe human behaviour controlling for all environmental and genetic factors across the life course and to capture phenotypical changes along the development. Second, we still have little information about mechanisms involved in the reaction of brain to environment and how genetics can moderate it. Third, although several theories are emerging, the validity of their conceptual psychopathological models and the extension that these new theories add to the actual understanding of the neurobiology of brain development need further empirical evidence. Fourth, it is important to note that childhood development is strictly connected to vulnerabilities and psychiatric phenotypes across the lifespan, although we are still far from being capable of capturing the complex interplay among variables associated with normal and abnormal development (p502).

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11. THE EXPERIENCE OF DEMENTIA

Only a small amount of the research on dementia involves asking sufferers about their experiences.

Clare et al (2008) collected their data from unstructured conversations between researchers and individuals with moderate to severe dementia living in residential care homes in England and Wales. Eighty-one individuals from ten homes were "interviewed" between 1999 and 2001. They were aged between 59 and 96 years old.

The conversation transcripts were studied using Interpretative Phenomenological Analysis (IPA), which focuses upon understanding the subjective experience of the speaker and how they make sense of their experiences. Four main themes (with associated sub-themes) were identified based on the participants' own words:

1. "Nothing's right now".

"This theme conveyed a sense that the participants' psychological experience was characterised to a considerable extent by suffering, with expressions of distress centred on feelings of uncertainty, loss, isolation and loneliness, fear, and worthlessness" (Clare et al 2008 p714).

"As one participant said, 'Well, I don't know what they're going to do with me in here, but er, they haven't said what they're doing, [and] I don't know why they've put me in here..'(BG06). Another said, 'I don't know whether I'm stuck here for the rest of me life or what's happening really' (GR03)" (p714).

The sub-themes were: "I don't know what's happening", "I've lost a lot", "It isn't a very happy life", "I'm no good now", and "I'm frightened; please help me".

2. "I'm alright, I'll manage".

This theme related to the individuals making the best of things in the home.

"As one resident said, 'It's not as nice as I'd like it to be but I have to be.. satisfied with small things these days' (GR06). Another explained: 'I wouldn't say it was as good as home, like.. er.. you haven't got that same feeling or love or anything is.. a.. at a place like this. You're just.. one of a number, group, who are pretty well in a similar position.. but you do your best and.. give as much help. I've been sorting books out all morning' (CB04). One resident said, 'I haven't got to.. do any shopping, I haven't got to

cook any meals, and that's a lot, isn't it.. You've gotta get used to it, haven't you?' (CB01). In this way it could be possible to achieve a degree of contentment: 'I never thought I'd come to a place like this but I'm quite happy' (BG06)" (p716).

The sub-themes were: "I'm alright here", "People are all quite friendly", "Such a help to me", "They've got their own lives now", "Time marches on", "I'm getting older; you accept that".

3. "I still am somebody".

Here individuals "conveyed a sense of pride in oneself and one's life, reflected in affirming one's own sense of identity. The psychological experience was one of pride in one's origins and family, appreciation of the chance to review one's life, a degree of nostalgia for the past, a sense that achievements were still possible, a sense that one was managing well despite limitations, and feeling sorry for those less well off than oneself" (Clare et al 2008 p716).

The sub-themes were: "It's been nice looking back", "I came from a very good home", "I'm hoping I'll get back to it", "I'm thankful for what I can do", "Marvellous considering, aren't I", and "People worse than I".

4. "It drives me mad".

This theme summarised frustration and anger experienced by the individuals, particularly boredom. One resident said, "'I get bored here.. they, they go to sleep, I feel like throwing something at them, because they, nobody talking or got nobody goes walking.. It's, you've gotta do something, haven't you, to help you go through, because it wasn't the things I've been used to.. They just sit here, it drives me mad' (MB03)" (p717).

The sub-themes were: "I'd rather be doing something", "I want to be free", and "Drive you crazy".

The themes highlighted how the individuals were coping with the dementia, and with living in the residential care homes while trying to make the best of it. Clare et al (2008) concluded:

> For most of the participants, daily experience was shaped by the losses resulting from dementia and was characterised to a considerable degree by distressing thoughts and feelings. Many participants acknowledged positive aspects of the care they received, but some indicated that living in a home was an unwelcome development in their lives. The participants tried to endure the challenges

> of living with dementia in residential care with good grace, bringing to bear a number of constructive coping strategies, but some found the situation confining and frustrating (pp717-718).

Ashworth and Ashworth (2003) took a phenomenological approach to Alzheimer's disease, which attempts to understand the lifeworld of the individual sufferer, based on the following assumptions:

(a) The Alzheimer's sufferer is a person.

(b) This means they are living consciousnesses, acting in accordance with the meaning of situations for them—and that the analyses of phenomenology apply to them.

(c) To understand the Alzheimer's sufferer as a person, it is not a matter of an external analysis of their cognitive capacities and deficiencies, but a description of their lifeworld – from their own point of view. There is a belief here that, if carried out carefully, the phenomenology of the lifeworld of an Alzheimer's sufferer has features which are understandable.

(d) It is postulated that the task of caring may well be made more bearable and satisfying if, instead of regarding the individual with dementia as malfunctioning, they are seen as a person acting in terms of a meaningful lifeworld which the carer can attempt to discover and may even enter in interaction (pp189-190).

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12. DRUG TREATMENT FOR ALZHEIMER'S DISEASE: A CRITICAL CHALLENGE TO NICE GUIDELINES

The National Institute for Health and Clinical Excellence (NICE 2006) Guidelines recommended the use of donepezil, galantamine, and rivastigmine for moderately severe Alzheimer's disease only, but not memantine. In other words, these drugs were not recommended for mild Alzheimer's though authorisation is held by their producers for such use in the UK.

The Midlands Psychology Group [30] have observed the workings of the NICE, and challenge a number of aspects of its guidelines, particularly related to mental health. The NICE Guidelines, which began as guidelines to aid in health care provision, became mandatory as health/mental health trusts were audited in relation to them. The Guidelines "appear to be presented as unchallengeable documents of science and fact" (Midlands Psychology Group 2010 p19).

Four versions are produced of each set of Guidelines. The "Quick Reference Guide" and "Shortened Guidelines" are summaries of the full Guidelines "with all caveats and ambiguities removed. The effect of this is to make them read as largely more 'authoritative' statements of fact, whereas the full Guidelines allow for fat more questioning of both process and outcome" (Learmonth 2006 quoted in (Midlands Psychology Group 2010).

The Guideline Development Groups tend to be weighted towards the "treatment end" of the spectrum at the expense of "expert by experience" (Midlands Psychology Group 2010).

Humphries (2003) criticises the evidence-based approach, of which NICE is part, as ignoring other aspects of health and social care, like the views of patients/service users. Furthermore, talking specifically about social work, but her comments are relevant here, she said:

> On the face of it, it should be regarded as a shocking revelation that policy and practice have not been informed by evidence, as otherwise how, and on what basis, can a knowledge base be built? At the same time, the collection of evidence is a complex social activity, and is influenced by competing interests. Moreover, policy and practice are often not based on evidence but on ideology or politics, which may lead to an ignoring of the available evidence... Programmes being

[30] http://www.midpsy.org.

> evaluated are not neutral, but are themselves the creatures of political decisions. "Evidence" is seldom without ambiguity, and is contingent to unique, local contexts (Humphries 2003 p82).

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13. MEMORY AND AGEING: THREE STUDIES

Study 1

Memory significantly declines with widowhood compared to not widowed individuals. The Longitudinal Ageing Study Amsterdam (LASA) recruited 474 married women and 690 married men in 1992. Six years later 28% of the women (135) were widowed and 10% of the men (69). The memory test used involved four trials of recalling fifteen words.

The widowed group (n = 204) showed an average decline of 0.5 over six years (5.9 to 5.4 out of 15 words recalled) compared to the still married group (n = 960) (decline of 0.1; 6.1 to 6.0 words recalled) (Aartsen et al 2005).

Study 2

Gazzaley et al (2005) scanned the brains of seventeen young participants (aged 19-30) and sixteen older participants (60-77 years) with functional magnetic resonance imaging while they looked at alternating photographs of faces, and outdoor scenes. They were instructed to remember either the faces, the scenes, or neither (control group). The brain activity observed showed that the older participants struggled with interference from the stimuli not instructed to remember (ie: failure to suppress activity in the area of the brain processing other information).

Study 3

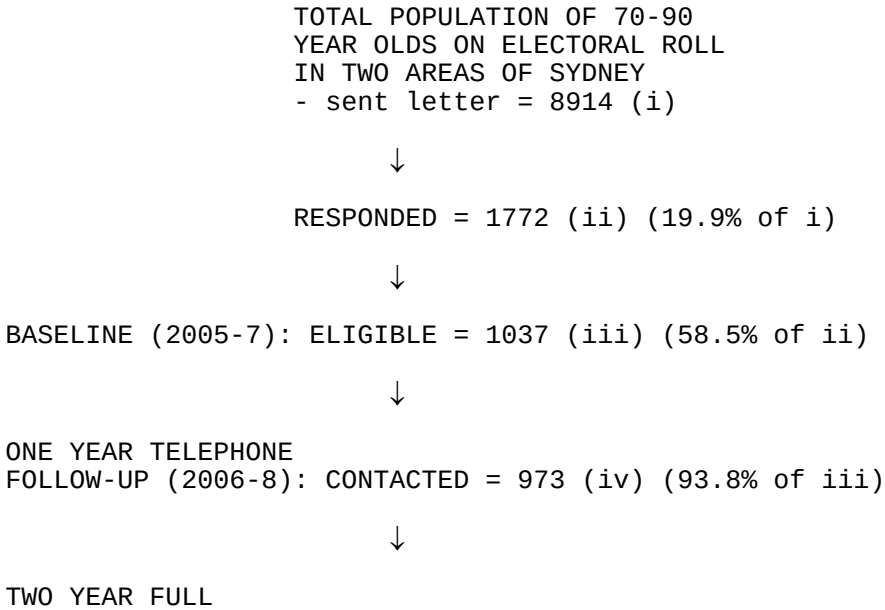
Dementia has a gradual onset, and pre-dementia problems have been noted with names like age-associated memory impairment (AAMI), late-life forgetfulness (LLF), ageing-associated cognitive decline (AACD), mild cognitive impairment (MCI), and cognitive impairment no dementia (CIND) (Sachdev et al 2010).

The Sydney Memory and Ageing Study (MAS) was set up in 2005 to study MCI in older Australians in Kingsford-Smith and Wentworth (two areas of Sydney, New South Wales). Participants were aged 70-90 at September 2005, and did not suffer from dementia, psychosis, and major medical illness at that point.

Baseline measures were taken via telephone and face-to-face assessments. These included cognitive tests (eg: three different memory tests), medical history, and DNA from a blood sample. Follow-up assessments were made every year by telephone, and medical details every two years. At baseline there were 1039 participants, and 889

two years later (figure 13.1).

Of those fully assessed, 34.8% had both objective and subjective evidence of MCI (table 13.1).



(After Sachdev et al 2010)

Figure 13.1 - Stages of MAS.

	SUBJECTIVE - YES	SUBJECTIVE - NO *
OBJECTIVE - YES	288 (34.8%)	13 (1.6%)
OBJECTIVE - NO	440 (53.2%)	21 (2.5%) **

* Subjective - eg: felt memory poorer than used to be.
** Some data missing or incomplete.

(After Sachdev et al 2010)

Table 13.1 - Distribution of participants based on subjective and objective measures of MCI.

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14. COGNITIVE CHANGES ACROSS THE LIFESPAN

Longitudinal studies over the lifespan are often difficult to undertake because different researchers will be involved between baseline measures and later data collection. Many changes in methodology can occur in, say, fifty years.

Researchers are aided by using data gathered in an official capacity. For example, the Mental Survey Committee in Scotland used various cognitive tests on Wednesday 1st June, 1932 on all children in school in the country (ie: born since 1921) (n = 87 498). The Scottish Council for Research in Education (SCRE) collated the information along with extensive data from 1947 (n = 70 805), for example (Deary et al 2004).

Deary et al (2004) attempted to contact all those still living from the 1932 survey (n = 550). Similar tests were used (eg: Moray House Test of intelligence) [31].

The following key findings emerged from the study:

i) The stability of intelligence over the lifespan - A comparison of scores on the Moray House Test between age 11 in 1932 and age 77 in 1998 showed a mean correlation of 0.63 for those at school in Aberdeen and 0.66 for Edinburgh ones.

ii) The dedifferentiation of intelligence with age - This is the idea that general intelligence becomes stronger with age at the expense of specific intelligence (eg: visuo-spatial abilities). This study found support for this idea.

iii) Gender differences in cognitive change over the lifespan - At age 80, men showed less cognitive decline than women. But the number of men and women alive at that age is not equal, so the "men tested in the present cohorts might represent a relatively cognitive spread survivor group" (Deary et al 2004 p137).

iv) Intelligence and survival into old age - Higher childhood intelligence was associated with greater chance of survival at age 76.

Deary et al (2004) proposed four possible explanations for this association:

- Childhood intelligence is a record of "bodily insults" that account for early death - eg: low birth weight leads to lower intelligence and earlier death.

[31] Items include: "Fin is to fish as wing is to [feather, air, bird, sail, herring]"; "'Tragu' is cheaper than 'vashol' and 'vashol' is dearer than 'spongop'. Which is the dearest?" (Deary et al 2004 p131).

- Childhood intelligence is a predictor of survival - eg: Down's Syndrome (low intelligence) where health problems can cause early death.

- Childhood intelligence predicts health behaviours (eg: smoking, diet), which accounts for survival.

- Childhood intelligence predicts later environmental risks - eg: lower intelligence individuals work in manual jobs with greater risk of injury or death.

The authors admitted: "We were unable to estimate the contribution of each of our four proposed causal pathways on survival. It is possible that the impact of childhood intelligence on mortality proceeds by subtle, dynamic processes... whereby environmental effects can become greatly multiplied from small initial inequalities" (Deary et al 2004 p139).

NATURE OF COGNITIVE CHANGES

Since the development of neuroimaging, it has been discovered that older adults show increased activation in brain regions not activated in younger adults doing the same task (eg: prefrontal sites) (Grady and Craik 2000). The overactivation may be in the areas of the opposite hemisphere to active sites in younger adults as well (known as hemispheric asymmetry reduction in older age; HAROLD; Cabeza 2002). For example, recognition memory activates areas in one hemisphere of the prefrontal cortex, but both hemispheres in older adults (Reuter-Lorenz and Cappell 2008).

Underactivation of brain areas in older adults can be seen as due to impairment. "However, the cognitive and neural mechanisms associated with age-specific regions of overactivation are more ambiguous. Determining whether overactivations are neural correlates of processes that are beneficial, detrimental, or inconsequential to cognitive function is the crux of many research efforts in the cognitive neuroscience of ageing" (Reuter-Lorenz and Cappell 2008 p177).

a) Overactivation and poor performance - probably due to impairment as the declining brain attempts to perform tasks.

b) Overactivation and good performance - in this case overactivation in one area is seen as compensating for decline in brain activity in another. The overactivation could also be because the input to areas of the brain is degraded (ie: greater "noise"), or that older adults are poorer at silencing the "default mode" (background brain activity) when doing a cognitive task.

All these situations require the brain to work harder. This means that older adults reach a ceiling as cognitive task complexity increases before younger adults do, and their performance declines ultimately. This approach has been called the compensation-related utilisation of neural circuits hypothesis (CRUNCH) (Reuter-Lorenz and Cappell 2008).

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15. REDUCING COGNITIVE DECLINE

15.1. COGNITIVE TRAINING

Slowing the onset of cognitive decline would reduce the number of dementia sufferers predicted in the future.

The Advanced Cognitive Training for Independence and Vital Elderly (ACTIVE) study (Jobe et al 2001) compared three types of cognitive training and a control group among 2832 independent living older adults in six US cities. The participants were randomised to one of 4 conditions:

- Memory training - teaching mnemonic strategies to aid recall.
- Reasoning training - teaching strategies for finding patterns in letter or word series (eg: 3, 6, 9, ..).
- Speed of processing training - eg: visual search task (identifying an object on a computer screen presented for a brief time).
- Control group.

The training involved ten one-hour sessions followed by booster sessions at eleven and 35 months later. The main outcome measures were self-reported and test-based daily functioning and cognitive abilities (eg: time to look up a telephone number).

Willis et al (2006) reported a five-year follow-up. Each type of training produced improvements in the relevant cognitive ability which lasted five years. The training groups had less self-reported difficulty with daily functioning than the control group.

15.2. EXERCISE

Lifelong exercise benefits the brain (Motluk 2005), but so does taking up exercise at a later age. For example, old sedentary mice who took up exercise (using a running wheel) showed improvements on cognitive tests after one month. It was found that the mice had new neuron growth in the brain (van Praag et al 2005).

The best explanation for exercise improving cognition is that exercising the heart stimulates growth of new nerve cells in the brain (Gorman 2010). For example, Uda et al (2006) found that rats who ran on a

treadmill for 30 minutes per day for seven days had more cells in the hippocampus than inactive controls.

Physical activity appears to protect older individuals from cognitive decline.

The Nurses Health Study in the USA followed 18 766 women (former nurses) aged 70-81. They completed a baseline cognitive test over the telephone in 1995, and then again in 1997, 1999, and 2001. Women engaged in physical activity including walking (eg: more than ninety minutes per week) had less cognitive decline than the inactive (eg: walking less than forty minutes per week) (Weuve et al 2004).

Lautenschlager et al (2008) reported cognitive benefits from physical activity in the Fitness for the Aging Brain Study (FABS) conducted in Perth, Australia in 2004-7. One hundred and seventy over 50s who reported memory problems were randomised to a six-month programme of physical activity or a control group. The physical activity involved at least 150 minutes per week of moderate-intensity exercise (eg: brisk walking). In each group 69 individuals completed the study (ie: visited one year after exercise programme ended).

The physical activity group had moderately better cognitive test scores than the control group at 18 months after the baseline (ie: before study began).

But strenuous exercise can be detrimental to cognition. Tierney et al (2010) compared ninety post-menopausal women on their life-long exercise habits. Those who had exercised strenuously showed significantly poorer performance on cognitive tests than moderate exercisers.

15.3. CHEMICAL COMPOUNDS

Searching for chemical compounds which reduce the decline in cognitive abilities with ageing is a popular activity, including foods to eat or pharmaceuticals to take.

Flavonoids are one particularly compound (though technically there are over 6000 different flavonoids), which are found in fruits, vegetables, cereal grains, cocoa, tea, and wine among other foods (Franz 2011).

For example, older rats given food enriched with flavonoids for eight weeks did significantly better on tasks involving learning and memory than normally feed rats (Franz 2011).

In a ten-year longitudinal study of healthy older adults in France, Barberger-Gateau et al (2007) found that those individuals with the highest level of flavonoids in their diet at the start of the study did

better on the cognitive tests over the study. They also had less risk of developing dementia (an odds ratio of 0.72 compared to the lowest level of flavonoids).

In a small-scale study, Krikorian et al (2010) asked nine over-75s with mild memory loss to drink two cups of wild blueberry juice (flavonoids) for twelve weeks compared to seven individuals who drank a sweetened beverage (without flavonoids). The former group perfromed about 30% better on the cognitive tests than the latter group (quoted in Franz 2011).

Franz (2011) concluded: "The science does not yet reveal which flavonoid-containing foods have the greatest potential for enhancing learning and memory. But eating flavonoid-rich foods is probably better than taking supplements" (p59).

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16. GRANDFATHERHOOD AND MASCULINITY: THREE POINTS TO CONSIDER

1. With men living longer today, they are more likely to be grandfathers, and for longer periods of time (eg: twenty-five years) (Mann 2007).

"An important and potentially paradoxical new role for older men is that of grandfather. It is paradoxical because, on one hand, men may be exhibiting a 'gentler', more nurturing relationship with a grandchild than they had with their own children but, on the other hand, may still be viewed and view themselves, as having the traditional role as 'sage' or 'wise man' (Davidson et al 2003 pp178–179 quoted in Mann 2007 p282).

2. Traditionally women have been (and are) central in the family with the men as peripheral. But men's roles are changing within the family in recent years.

"More recently a number of studies have pointed to a more complex and contradictory scenario. There is some evidence of grandfathers' occupying a central role within the lives of grandchildren. The level of care provided by both grandfathers and grandmothers is often underestimated... Thus, while there is a greater prevalence of care-giving amongst grandmothers compared to grandfathers, in keeping with the bulk of care-giving done by women over the life course, it is suggested that the transition to grandfatherhood is met with an increase in care-giving amongst men. Likewise the research by Harper and Ruicheva (2004) suggests that financial, caring and emotional/psychological support on the part of grandfathers may all equally be underestimated. They have also identified 'replacement partner' for lone mothers as a potential role for grandfathers. Moreover... differences between grandfathers and grandmothers maybe less acute compared to differences between parents because they are not directly involved in child-rearing" (Mann 2007 p287).

3. Older men are still men faced with the demands of masculinity.

"As Brandth and Kvande (1998) find, even when men do 'women's work' they may still do so in a way that conforms to the norms of hegemonic masculinity. For example, they found fathers to emphasise activities outside the home as ways of looking after the child... By taking the child out on walks to the woods or into town, fathers are able to maintain their link to hegemonic

masculinity through the world outside the home" (Mann 2007 p286).

But "As men get older the tough image of masculinity softens. With this may come an opportunity to become more emotionally expressive and affectionate. Grandfathers – usually older men – talked much more emotionally and lovingly about their grandchildren than they did about their own children. Many spoke with delight of their relationships and their conversations with them" (Thompson et al 1990 pp190–191 quoted in Mann 2007 p287).

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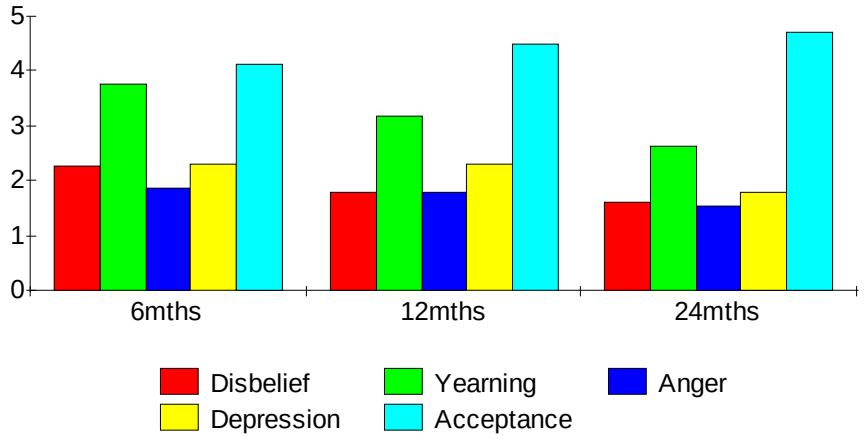
17. AN EXAMPLE OF A LONGITUDINAL STUDY OF GRIEF

The Yale Bereavement Study collected data between January 2000 and January 2003 in the Bridgeport/Fairfield and New Haven areas of Connecticut, USA (Maciejewski et al 2007).

Newly bereaved individuals (ie: less than six months post-loss) were recruited through newspaper advertisements, fliers, and referrals. This produced 575 individuals who were contacted by letter asking if they would participate in the study. Agreement to participate came from 317 individuals (55.1%), and this was reduced to 233 with exclusions (eg: grief over traumatic death). They were interviewed on three occasions (6, 11, and 23 months post-loss on average [32]).

Grief was measured using an interviewer-administered version of the Inventory of Complicated Grief-Revised (Prigerson and Jacobs 2007). It measures the key elements of grief - disbelief, yearning, anger, and acceptance of the death - using a Likert scale (1-5). A separate measure was used for depression (Hamilton Rating Scale for Depression; HRSD; Hamilton 1960).

It was found that acceptance of the death was the most common element at all three interviews followed by yearning (figure 17.1).



(Data from Maciejewski et al 2007 Table 2 p719)

Figure 17.1 - Mean scores (out of 5) for elements of grief at three points post-loss.

[32] These three interviews covered the periods 1-6, 6-12, and 12-24 months post-loss.

Evaluative Issues

1. The sample varied from the general US widowed population - younger, more males, and a higher proportion of White individuals, and better educated and richer than the US general population.

2. The reasons for non-participation given included being too busy, reluctance to participate in research, being too upset, "doing fine", and not being interested as well as no reason given. Non-participants were more likely to be male and older than participants.

3. In terms of ethics, it was better to exclude survivors of traumatic deaths.

4. The use of standardised questionnaires to measure the elements of grief. Maciejewski et al (2007) admitted: "Although it would have been preferable to use separate scales for the assessment of yearning, disbelief, anger, and acceptance of the death, no such scales exist for each of these grief stages" (p718).

5. Because this study was a longitudinal design, it was able to show the progress of grief over time (approximately two years) for the participants. This cannot be achieved by a cross-sectional study that compares two groups at one point in time.

6. "Ideally, all individuals would have been assessed immediately after the loss rather than beginning at month 1 post-loss. Due to respect for the initial mourning period and institutional review board concerns about harm to participants, we did not interview individuals within a month of the death" (Maciejewski et al 2007 p722).

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18. SUPER-CENTENARIANS

More individuals are living longer to become centenarians (100 years old) in the past twenty years in the West, and the number of super-centenarians (110 years old) has increased (eg: 60-100 individuals in the USA in 2000; Schoenhofen et al 2006). However, there can be problems in accurately validating the age of such individuals (table 18.1).

- National databases can include individuals assumed to be alive who are actually dead. For example, the US census listed 1400 super-centenarians in 2000. Also errors in data input including using only the last two digits of a birth year (eg: 80 assumed to be 1880 when it was 1980 (Schoenhofen et al 2006).
- Intentional misreporting at a younger age - individuals may have exaggerated their age to get married, for example, and then maintained that claim (or official documents used the claim).
- Intentional misreporting now - there are gains in terms of media attention and even money to the individual and their relatives for being the oldest person alive in a town, country, or the world.

Table 18.1 - Problems related to age-validation for extreme old age.

Schoenhofen et al (2006) reported a US study of 32 age-validated super-centenarians. Age-validation was based on birth certificate, census record, or baptismal record, for example. Their ages ranged from 110 to 119, and most were female (27 of them).

Not surprisingly, these long-living survivors were healthy with few of the major problems of older adults - cardiovascular problems (2 individuals), stroke (4), treated hypertension (7), adult-onset diabetes (1), Parkinson's disease (1), and cancer (8).

Nearly half of them (thirteen) were classed as independent or needing minimal assistance in daily life, while three were totally dependent.

Schoenhofen et al (2006) concluded: "Older people are well known for their heterogeneity across a broad spectrum of genetic and environmental variables known to effect longevity. However, it is likely that super-centenarians might be more homogeneous with regard to phenotypic presentation and genetic and environmental characteristics that play significant roles in the ability to achieve such exceptional old age" (p1240).

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19. SEXUALLY ACTIVE HEALTHY OLDER ADULTS

Contrary to popular beliefs, many older adults are sexually active, and this behaviour is correlated with physical health (Lindau and Gavrilova 2010).

This is confirmed by data from MIDUS and NSHAP in the USA. MIDUS (or mid-life cohort) is the national survey of mid-life development, and the 1995-6 wave included 3032 adults aged 25 to 75 from 48 US states. NSHAP (the national social life, health and ageing project) (or later life cohort) includes 3005 community-dwelling 57 to 85 year-olds in the 2005-6 wave (Lindau and Gavrilova 2010). The former is based on telephone interviews and postal questionnaires, and the latter on home interviews.

Sexual activity was defined as "any mutually voluntary activity with another person that involves sexual contact, whether or not intercourse or orgasm occurs" in NSHAP, and as having "had sex with anyone" in MIDUS (Lindau and Gavrilova 2010). Table 19.1 lists examples of questions used in each survey.

Frequency of sex

MIDUS - "Over the past six months, on average, how often have you had sex with someone?" Responses ranged from: "never or not at all" to "two or more
times a week". Respondents having sex 2-3 times a month or more were defined as having sex regularly.

NSHAP - "During the last 12 months, about how often did you have sex with [partner]?" Responses ranged from "once a month or less" to "once a day or more". Respondents having sex 2-3 times a month or more were defined as
having sex regularly.

Interest in sex

MIDUS - "How much thought and effort do you put into the sexual aspect of your life?" Responses ranged from 0, "none", to 10, "very much". Respondents with rating of ≥6 were considered to be interested in sex.

NSHAP - Estimated using the following question: "About how often do you think about sex?" with six variants ranging from "never" to "several times a day".
Respondents who reported thinking about sex "one to a few times a week" or more were considered to be interested in sex.

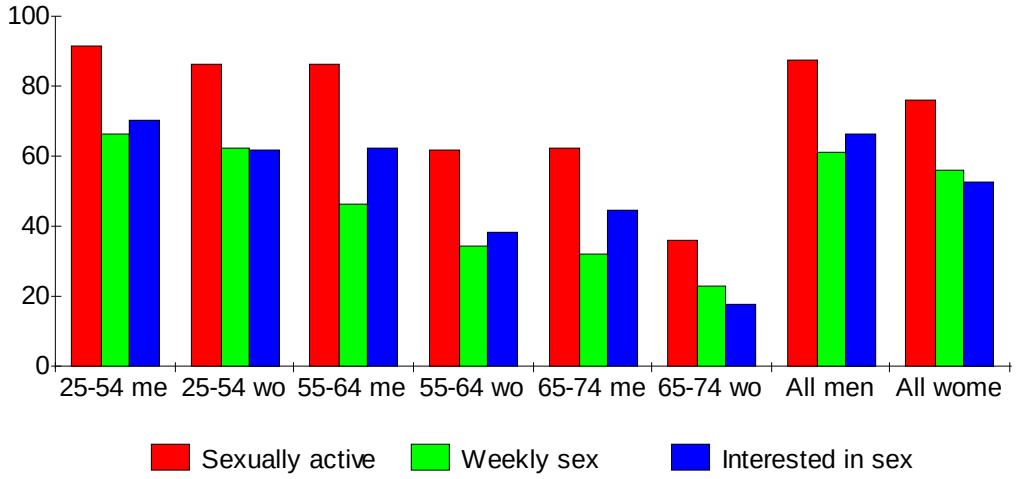
(Source: Lindau and Gavrilova 2010 table 1)

Table 19.1 - Examples of questions about sexual activity.

Lindau and Gavrilova (2010) used a new concept - "sexually active life expectancy" - defined as the "average number of years remaining spent as sexually

active. At age 55, it was calculated as fifteen years for men and 10.6 years for women.

Self-rated sexual activity during the past six months declined across age groups in MIDUS. For men, from 91.2% of 25-54 year-olds to 86.3% of 55-64 year-olds and 62.1% of 65-74 year-olds. The positive response to "have sex once or more weekly" was 66.3%, 46.5%, and 32.2% of the sexual active individuals respectively. For women, 86%, 61.5%, and 35.8% were sexually active respectively, and 62.2%, 34.5%, and 22.8% having regular sex respectively (figure 19.1).



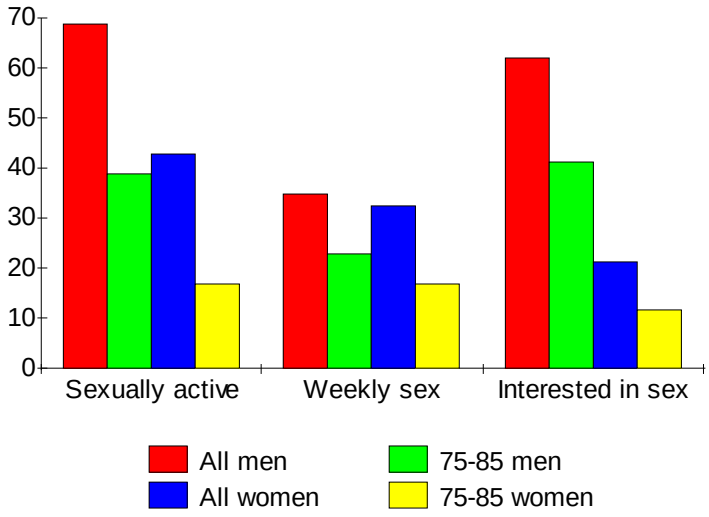
(Source: Lindau and Gavrilova 2010 table 3)

Figure 19.1 - Responses (%) to three questions on MIDUS based on age and gender.

Data from NSHAP showed that, among 75-85 year-olds, 38.9% of men and 16.8% of women were sexually active in the past twelve months (figure 19.2). In both surveys, the figures varied whether the individual was living with a partner or not (figure 19.3).

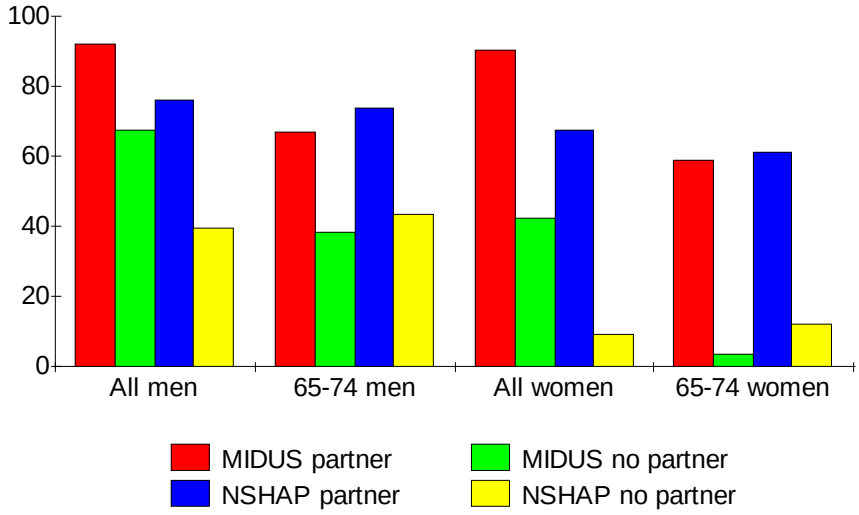
Comparing the two surveys:

Both the midlife and the later life cohort included people aged 57-64 and 65-74. When these age groups were compared across the cohorts, surveyed 10 years apart, the distributions of prevalence estimate for partnership, sexual activity, sexual frequency, and good quality of sex life (among sexually active individuals) were highly consistent. Interest in sex among women in this age group surveyed 10 years apart was also stable (17.5% in 1995, 19.1% in 2005-6). In contrast, a significantly higher proportion (75.3%) of men aged 57-64 in the later life cohort reported an interest in



(Source: Lindau and Gavrilova 2010 table 4)

Figure 19.2 - Responses (%) to three questions on NSHAP for 75-85 year-olds.



MIDUS = sexually active in past 6 months; all = 25-74 year-olds
NSHAP = sexually active in past 12 months; all = 57-85 year-olds

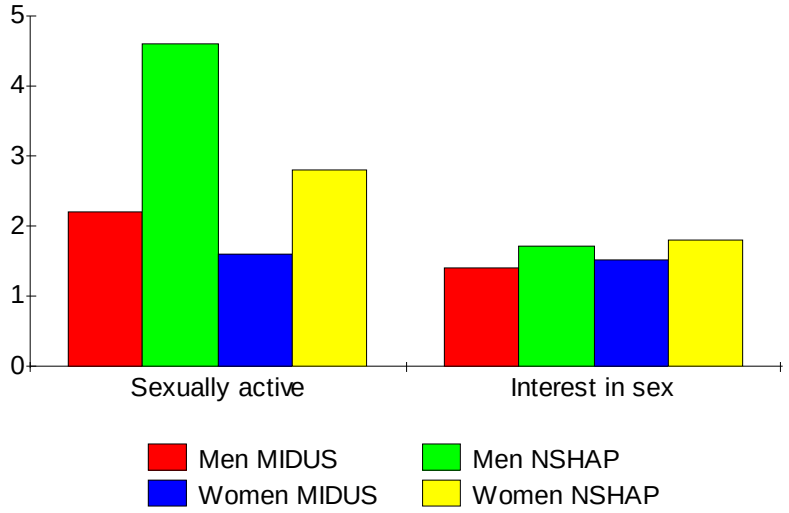
(Source: Lindau and Gavrilova 2010 tables 3 and 4)

Figure 19.3 - Those sexually active (%) based on living with partner or not.

> sex compared with only 44.6% of men of the same age surveyed 10 years earlier..
> (Lindau and Gavrilova 2010 p5).

Health was associated with sexual activity and interest with, for example, individuals in good or

excellent self-rated health being 1.5 - 1.8 times more likely to report an interest in sex than those in poor health (figure 19.4).



(Source: Lindau and Gavrilova 2010 table 5)

Figure 19.4 - Odds ratio of self-rated very good or excellent health compared to self-rated poor health.

REFERENCE

Lindau, S.T & Gavrilova, N (2010) Sex, health, and years of sexually active life gained due to good health: Evidence from two US population based cross sectional surveys of ageing British Medical Journal 340, c810

20. ETHNIC MINORITY OLDER ADULTS IN THE UK AND POOR HEALTH

The UK Census 2001, 27% of 50-64 year-olds reported suffering from a long-term illness (like diabetes or hypertension). This overall figure hid the health inequalities among ethnic minorities. Among the same age group of individuals self-defined as Bangladeshi it was 54%, 49% among Pakistani, 36% of Black Caribbean, and 28% of Black African, but only 20% of Chinese (Holder 2008).

Health inequalities are usually linked to economic inequalities (ie: poor health and low income). Ethnic minorities tend to be disproportionately among lower income groups. They also more likely to live in deprived areas, and to have worked in manual jobs, not to mention experiencing post-migration hostility and exclusion (Nazroo 2006). So this may account for the poorer health among ethnic minorities. But "economic and health disadvantage are not experienced uniformly among older ethnic minority people - the disadvantage is greater for some groups compared with others and even within particular disadvantaged groups there are gender.. and class.. differences" (Nazroo 2006 p67).

On the plus side, older ethnic minority adults have more contact with family and social networks than do White British (eg: Bajekal et al 2004).

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