Are Rates of Depression Increasing?

The Pros and Cons of the Debate

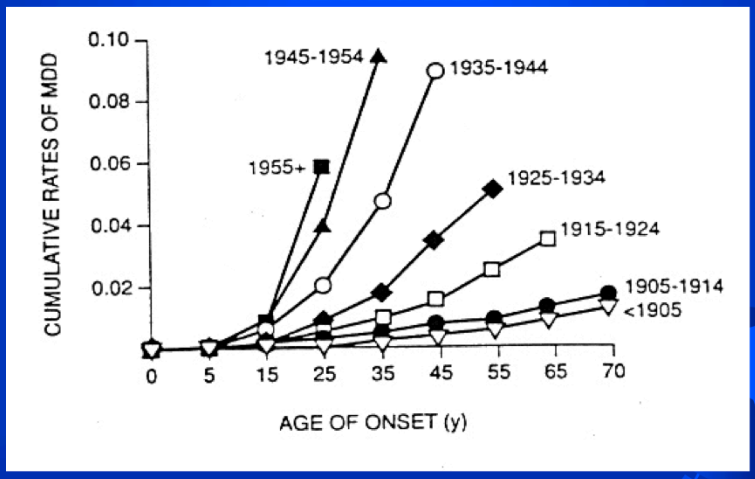
Temporal (secular) Effects

- Age effects
  - disease rate varies with age
- Period effects
  - change in disease rate associated with a demarcated time period (eg. epidemic)
- Cohort effects
  - disease rate varies with the time of birth that defines a group of individuals (generation)

The evidence

- Large scale community surveys and family studies.
- Assess lifetime prevalence of major depressive episodes based on RDC, DSM-III and ICD criteria.
- Samples from North America, Puerto Rico, Western Europe, Middle East, Asia (Korea, Taiwan) and Pacific Rim. Includes ECA.

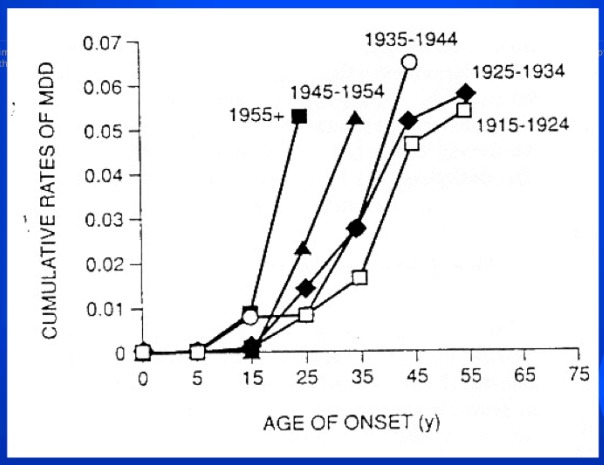
Life-table methodology (ECA)



Heterogeneity of samples

- Ethno-cultural factors
  - Hispanic and Korean samples show minimal difference in cumulative lifetime effects
  - Taiwanese sample had extremely low prevalence rates altogether
- Other specific period and cohort effects
  - Significant variability across all samples during specific time periods and in specific cohorts

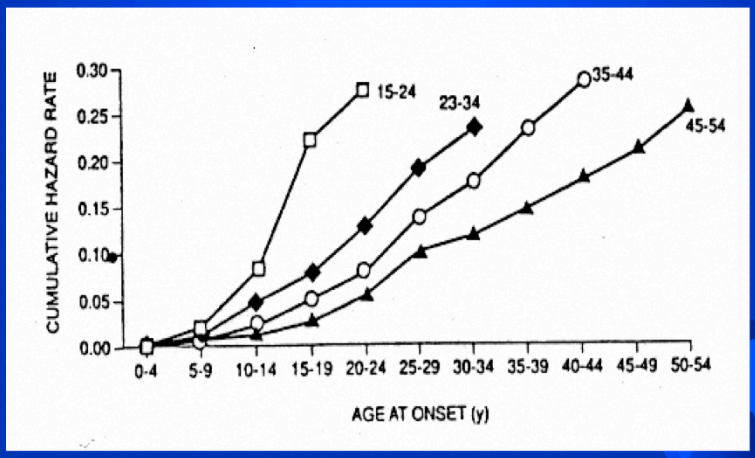
Puerto Rico sample



Corroborating evidence

- Dramatic increase in suicide rates among 15-24 year olds in US parallels increases in depression.
- Increasing rates of substance abuse also demonstrated.

N.C.S. sample


CUMULATIVE HAZARD RATE
0.30
0.25
0.20
0.15
0.10
0.05
0.00
15-24
23-34
35-44
45-54
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
AGE AT ONSET (y)


Possible artifacts

Differential mortality

- Since depression leads to higher mortality, there will be fewer depressives in older cohorts
- Studies of the connection between depression and mortality are inconsistent

Institutionalization

- Hospitalization of depressives could remove them from interview samples.
- However, ECA study included institutional patients

Selective migration

- Younger depressives may leave rural areas to go to large urban centres
- The temporal effects persist at all five ECA sites (which include both rural, suburban, and urban subjects)
- Temporal effects also found in studies in Scandinavia, Germany, Canada, and New Zealand

Changing diagnostic criteria

- diagnostic criteria have changed to include less ill people
- Temporal trends remain even when severity criteria are varied, eg hospitalization, duration of Sx, Rx with drugs or ECT
- No decline in proportion of "severe" depressions found

Changing attitudes of professionals

- A shift away from a psychoanalytic orientation, *eg* "adolescent turmoil" has now become depression
- Data re temporal trends are from family and community samples, with many individuals who have never been treated by any mental health professional

Changing societal attitudes

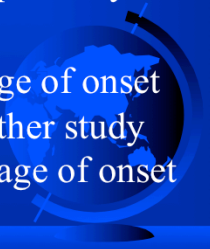
- Elderly more likely to consider emotional experiences as God's will or simply part of the human condition
- Less stigma means more reporting
- There has been an increase in the serious consequences of depression, eg suicide, hospitalization, treatment seeking

General reporting bias

- A tendency to report symptoms and to respond positively to inquiries
- Thought to be operative because there are also increases in suicide, alcoholism, and drug abuse
- Rates of schizophrenia, panic disorder, phobias have not shown a temporal change
- Increases in drug abuse are for cohorts born after 1955
- Alcohol abuse had a sharp increase after prohibition, but depression did not

Recall and memory

- Elderly have poorer recall of events, depressive Sx, age of onset, or impact on functioning
  - *eg*,one study found older respondents reported later age of onset on retest
- Temporal trends persist even when respondents are limited to < 52 yrs
- One-year test re-test reliability was excellent for subjects up to 80 yrs of age
- Re reported age of onset on retest: another study found earlier age of onset



Limitations of diagnostic procedures (*eg* DIS, CIDI) [Knaüper & Wittchen, 1994]

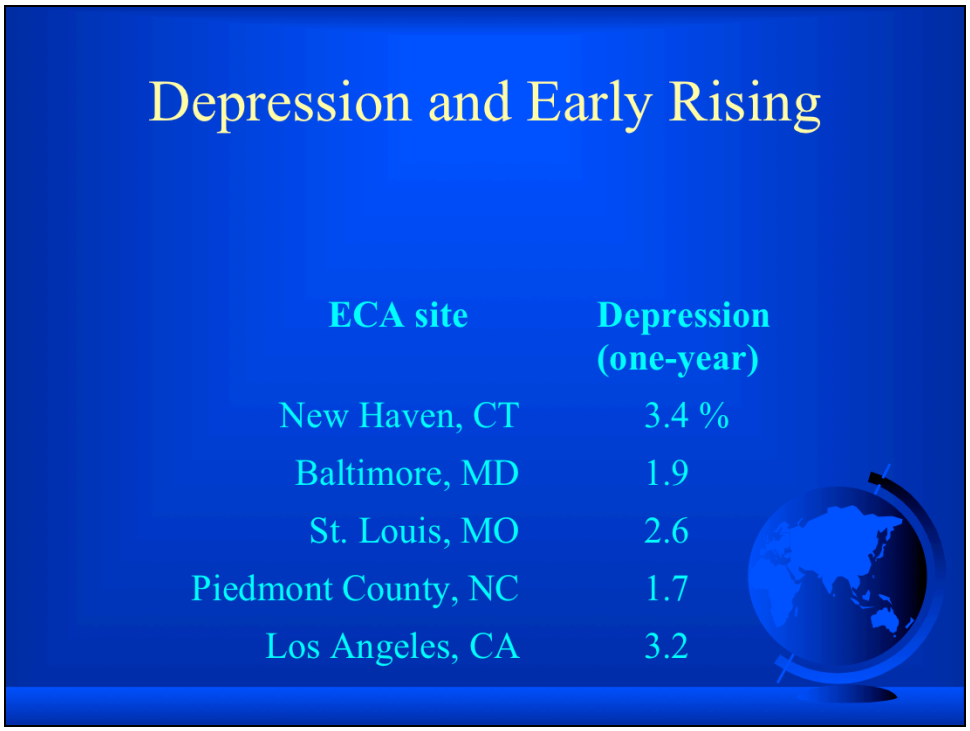
- Do not account for decreased working memory capacity of elderly subjects
- Inflexible when comprehension is poor
- Do not properly account for the increase in somatisation in elderly depression
  - *ie*, the tendency to attribute symptoms to physical illnesses or conditions, *eg* medications
- Many elderly have clinically relevant syndromes which do not meet strict DSM-IIIR or ICD-10 criteria

However...

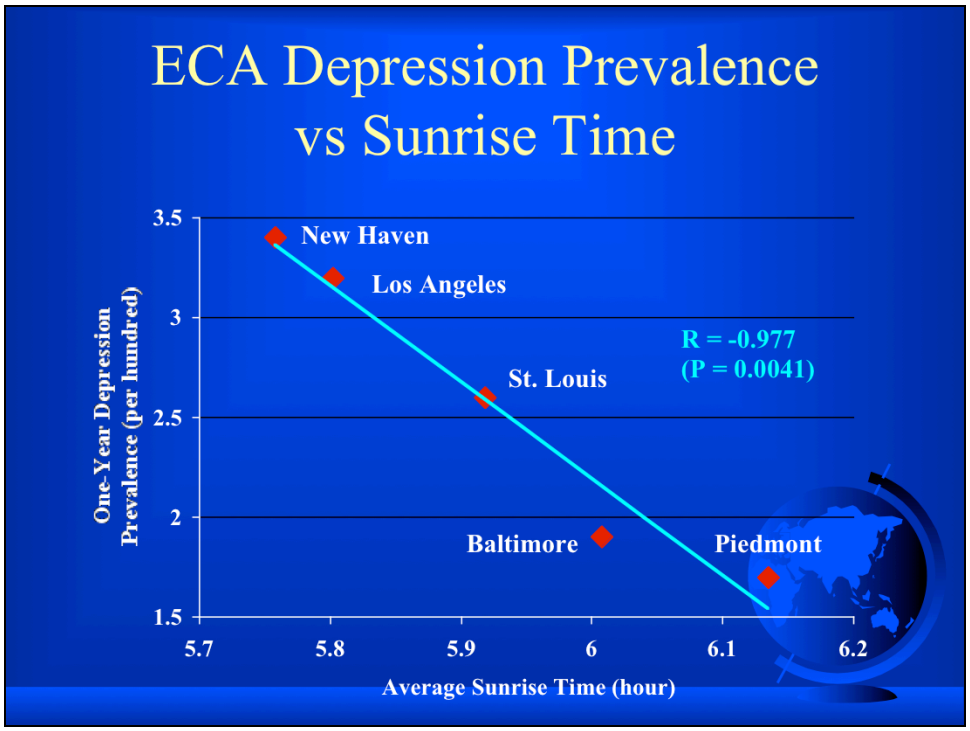
- Prevalences of other disorders should therefore also show an increase; but rates of schizophrenia, panic disorder, and phobias have remained the same
- The Lundby study:
  - used clinical psychiatric interviews (ie less influenced by reduced working memory capacity, poor comprehension, or strict adherence to diagnostic criteria)
  - found rising prevalence

•Hypothesis re increased depression

- Individuals who get up later with respect to sunrise, or who sleep longer, will get more REM sleep
- Getting too much REM sleep may trigger depression in susceptible people
- Thus, look for factors affecting sleep length or rising time when seeking explanations for changes in depression prevalence



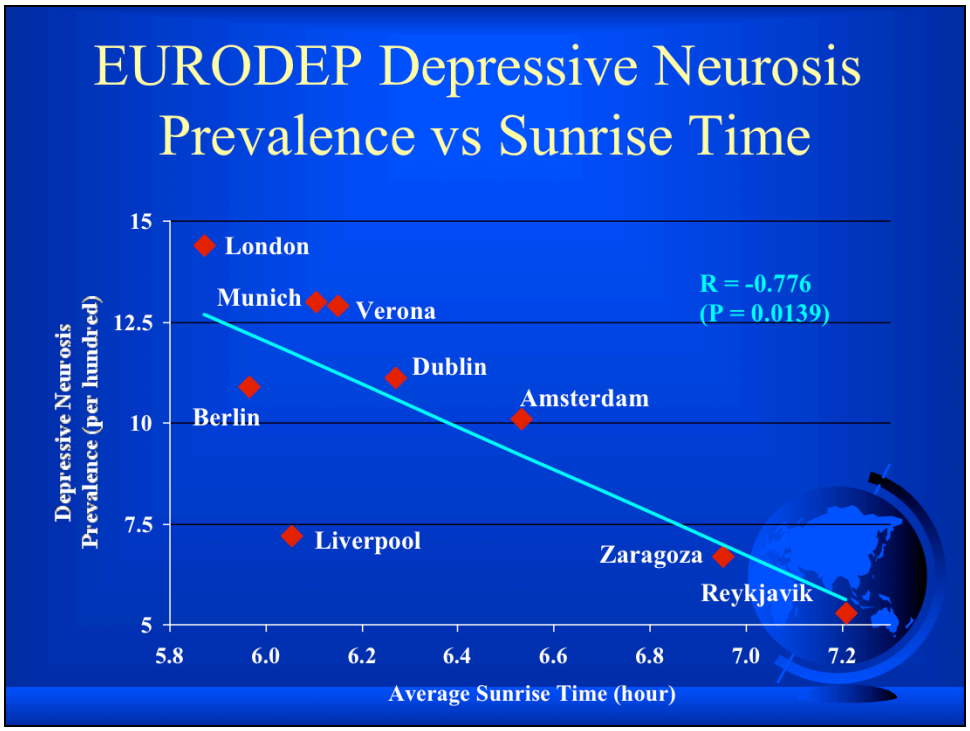
You know, there's nothing at all in the research literature that I could find on a connection between getting up early and preventing depression or fatigue. However, I did come across some numbers which I found very interesting. Back in the early 1980's the Epidemiologic Catchment Area Project was carried out in five communities in the United States to collect data on the prevalence of affective disorders. This study, sponsored by the National Institute of Mental Health, consisted of interviewing a probability sample of over 18,000 adults, using a structured questionnaire called the Diagnostic Interview Schedule. Over 200 papers have appeared in the literature looking at the data which resulted. I was not able to find any satisfactory explanation of why the prevalences varied so widely from one site to another. This slide shows, for example, the one-year prevalence for major depression, which was lowest in Piedmont County, but was twice as high in New Haven, Connecticut.



When I plotted these prevalence figures against the times for sunrise for the various communities, it looked like this. The sunrise times are averaged over the whole year. The Pearson correlation coefficient was -.895.

What is the significance of this? The majority of people who live in urban centres get up by the clock, not by the time of sunrise. So if you live in a city where the sun gets up late in relation to the clock, you will be getting up relatively earlier than you would if you lived where the sunrise is earlier. Thus, residents of New Haven who get up at say, 6:00 am, would be getting up almost 15 minutes after the sun, on average, while people in Piedmont who also get up at 6:00 am would be beating the sun by 8 minutes, on average.

According to my hypothesis, getting up earlier would mean less depression. That's exactly what this graph shows.



If this were the only study for which this relationship existed, it wouldn't mean much. But a study which was published this past April in the British Journal of Psychiatry, termed the EURODEP Programme, looked at the prevalence of affective disorder in the geriatric population in 9 European cities. Again, when I plotted the prevalence figures for depressive neurosis against average sunrise times, I got a Pearson correlation coefficient of -0.776.

Increased urbanization

- Urban populations are more depressed
- Urban populations have higher suicide rates

Occupation-related changes

- Increased shift work, flextime
- Increased unemployment and welfare
- Alteration in roles of women
- Shifts in occupational patterns
  - Shirt from industrial/manufacturing to service
    - Reduced physical activity
    - Later start times for service occupations

Introduction of daylight saving time

- (WWII, U.S.; WWI, many other countries)
- Late Oct switch from DST to Standard Time may trigger winter depression
- Iceland, which has no DST, has very low depression prevalence & little SAD

Increased institutionalization

- Institutionalized patients have higher rates of depression
  - Longer times in bed
  - More depressogenic medications, eg BDZ, which increase sleep

Increased drug use/abuse

- Alcohol,stimulants are associated with depression

Changing diet patterns

- Decreasing fish (omega-3) intake, starting in 1930
- Increasing obesity, which is associated with depression

How to explain lack of increase:

- Korea
  - Earlier start times for work and school
- Puerto Rico
  - Evidence is inconclusive
- Mexican-Americans in Los Angeles
  - More blue-collar work with earlier start times
- Stirling County study
  - Actually, recent data show increased prevalence among women < 45 yrs [Murphy et al, 2000]

Hypothesis re diminishing gender difference [Wittchen et al, 1994]

- Urban men and women's sleep length and rising times are converging:
  - More women working outside the home
  - More men in service industry
  - More men working in office settings

Stirling County Study

Table 2. Standardized Current Prevalence Rates of Depression Identified by 3 Methods in 1952, 1970, and 1992*

	Prevalence (SE) of Depression (per 100)											
	1952 (n = 1003)				1970 (n = 1201)				1992 (n = 1396)			
	Age, y				Age, y				Age, y			
Method	<45	45-64	≥65	Total	<45	45-64	≥65	Total	<45	45-64	≥65	Total
DPAX-1†												
Female	4.5 (1.2)	6.1 (1.9)	11.0 (3.3)	6.4 (1.1)	3.9 (1.2)	6.7 (1.8)	7.7 (2.6)	5.6 (1.0)	4.4 (1.2)	3.3 (1.2)	2.2 (1.1)	3.6 (0.7)
Male	2.3 (1.1)	7.0 (2.0)	4.4 (2.1)	4.1 (0.9)	3.1 (1.1)	10.0 (2.0)	1.9 (1.3)	5.0 (0.9)	1.8 (0.9)	2.1 (1.0)	3.8 (1.7)	2.3 (0.6)
Total	3.4 (0.8)	6.6 (1.4)	7.9 (2.0)	5.3 (0.7)	3.5 (0.8)	8.4 (1.3)	5.0 (1.5)	5.3 (0.6)	3.1 (0.7)	2.7 (0.8)	3.0 (1.0)	2.9 (0.5)
DPAX-2‡												
Female					3.3 (1.1)	8.1 (1.9)	8.9 (2.7)	5.9 (1.0)	8.2 (1.6)	6.6 (1.6)	5.7 (1.7)	7.1 (1.0)
Male					2.8 (1.1)	9.3 (2.0)	1.9 (1.3)	4.6 (0.8)	3.2 (1.1)	4.7 (1.4)	6.2 (2.1)	4.2 (0.8)
Total					3.0 (0.8)	8.7 (1.4)	5.6 (1.6)	5.3 (0.6)	5.6 (1.0)	5.6 (1.1)	5.9 (1.3)	5.7 (0.6)
DIS§												
Female									9.3 (1.7)	7.6 (1.8)	4.8 (1.7)	7.8 (1.0)
Male									3.7 (1.2)	2.9 (1.1)	2.6 (1.5)	3.2 (0.7)
Total									6.4 (1.0)	5.2 (1.0)	3.8 (1.1)	5.5 (0.6)

** DPAX-1 and DPAX-2 indicate the original and revised methods of the Stirling County Study method for diagnosing depression (DP) and anxiety (AX); DIS, Diagnostic Interview Schedule. The DPAX rates are point prevalence rates for depression, and the DIS rates combine major depressive episode (1-month prevalence) and dysthymia.*

† Between-year comparisons for DPAX-1 indicated that the year of study was not significant for 1952 vs 1970 but was significant for 1970 vs 1992 ($\chi^2_1 = 8.95$; P = .003). There were no significant interactions. Within-year comparisons indicated that sex was not significant for any year but age was significant in 1952 ($\chi^2_2 = 7.08$; P = .03) and also in 1970 ($\chi^2_2 = 8.11$; P = .02) but not in 1992.

‡ Between-year comparisons for DPAX-2 indicated that the year of study was not significant. Sex did not interact significantly with year of study but age did ($\chi^2_2 = 7.96$; P = .02). Within-year comparisons indicated that age was significant in 1970 ($\chi^2_2 = 13.33$; P<.001) but not in 1992, while sex was not significant in 1970 but was significant in 1992 ($\chi^2_1 = 5.95$; P = .02).

§ Within-year comparisons for DIS indicated that sex was significant ($\chi^2_1 = 10.16$; P = .001) but age was not.

Comparison of DIS studies

Table 4. Lifetime and 1-Month Prevalence Rates of Major Depressive Episode (MDE) Based on the Diagnostic Interview Schedule in 3 North American Studies

	Prevalence of MDE (per 100)					
	Epidemiologic Catchment Area (ECA) Study 1980-1984* (n = 18 571)		Edmonton Epidemiologic Study 1983-1986† (n = 3258)		Stirling County Study 1992-1995 (n = 1396)	
	Lifetime	1-Month	Lifetime	1-Month	Lifetime	1-Month
Overall	6.3	2.2	8.6	2.3	7.9	2.6
Sex						
Female	8.7	2.9	11.4	2.9	11.5	3.6
Male	3.6	1.6	5.9	1.7	4.4	1.5
Female-male ratio	2.4/1	1/8	1/9	1/7	2/6	2/4
Age, y						
<45	7.7	2.8	8.8	2.3	9.4	3.7
45-64	4.8	2.2	10.1	3.0	8.2	1.9
≥65	1.9	1.0	4.1	0.7	4.1	0.9
<45-to-≥65 ratio	4/0	2/8	2/1	3/3	2/3	4/1

**For the ECA study, the lifetime rates for MDE are shown in the study by Weissman et al[41] and the 1-month rates in the study by Regier et al.[36] To show the rates for 3 age groups, the public-use tape containing the ECA data was used with the recommended weights. The published data by age for the lifetime rates are, for 18 to 29 years, 6.7%; for 30 to 44 years, 9.5%; for 45 to 64 years, 5.0%; and for 65 years or older, 2.0%. The published data by age for the 1-month rates are, for 18 to 24 years, 2.2%; for 25 to 44 years, 3.0%; for 45 to 64 years, 2.0%; and for 65 years or older, 0.7%.*

†For the Edmonton study, the lifetime rates for MDE are shown in the study by Bland et al[34] and the overall 1-month rates in the study by Bland et al.[35]