IQ & Mental Illness

Dr Tony Florio
**Summary**

**Fact**
Risk of Mental Illness increases as IQ decreases

**Fact**
IQ has increased over past 100 years
Flynn effect

**Hypothesis**
Rates of Mental Illness have decreased over the past 100 years as a result

**What is the evidence?**
Binet-Simon Test

- Standardised IQ assessment is now 100 years old

- Alfred Binet and Theodore Simon developed an IQ test in 1905

- They were asked by the French government to find a way to determine which children required Special Education

- They arranged 30 items in developmental order and gave each item a Mental Age.
In 1916 Lewis Terman at Stanford University, California revised the Binet-Simon test. He introduced the idea of an Intelligence Quotient (IQ):

\[
\text{IQ} = \frac{\text{Mental Age}}{\text{Chronological Age}}
\]

In WWI he helped develop the Army Alpha IQ test, which was administered to 1.7 million recruits.

Terman and other Psychologists recommended everyone with a Mental Age below 10 years (bottom 3%) should be rejected from military service, but army bureaucrats decided to accepted all but the bottom 0.5% of recruits.

Therefore about 2% of US soldiers in WWI would have had a mild Intellectual Disability compared to their peers.
WAIS - deviation IQ

- David Wechsler worked for the army doing IQ testing in WWI
- Developed the WAIS in 1939
- He introduced the idea of the deviation IQ
- IQ was now calculated from a normal distribution with a mean of 100 and standard Deviation of 15
- An individual is compared to peers (in a set of norms)
- All other IQ tests after this followed
Mental Illness (MI)

- We currently have a categorical approach to Mental Illness
- Where Mental Illness = Psychiatric Disorder
- If you meet a set a criteria based upon signs and symptoms observed by an appropriately qualified clinician you have a Psychiatric Disorder.
- The criteria are currently defined in
  - DSM-IV or ICD-10
Cognitive Reserve Hypothesis

Cognitive Reserve (proxied by IQ) protects from Mental Illness

Hazard Ratios for Psychiatric Diagnosis by IQ

- Schizophrenia
- Other Nonaffective Psychoses
- Neurotic Disorders
- Mood Disorders
- Adjustment Disorders
- Personality Disorders
- Comorbity 2+
Swedish Conscript Study

- Gale et al (2010) studied a birth cohort of all (1,346,545) Swedish males born between 1950 and 1976 who were all given an IQ test at age 18 years as part of national military conscription.

- Cross-matched with the Swedish National Deaths Register and the National Hospital Discharge Register.

- 22 year follow-up period (ages 18 years to 40 years)

- 52,478 men (5% of the sample) had at least one inpatient admission for a Psychiatric disorder.
Hazard Ratios for MI by IQ

- The Hazard Ratio is the ratio of the risk of selected group having a disorder compared to risk of the average of the population. For IQ the average is IQ = 100.

- Probability of an inpatient admission with a diagnosis of Schizophrenia increased by a factor of 1.60 for every 15 point (1 standard deviation) decrease in IQ.

- for Other NonAffective Psychoses 1.49
  for Neurotic Disorders 1.51
  for Mood Disorders 1.50
  for Adjustment Disorders 1.60
  for Personality Disorders 1.75
Mental Disorders by IQ

- Schizophrenia: Hazard Ratio by IQ
- Non Affective Psychosis: Hazard Ratio by IQ
- Mood Disorders: Hazard Ratio by IQ
- Neurotic Disorders: Hazard Ratio by IQ
- Adjustment Disorders: Hazard Ratio by IQ
- Personality Disorders: Hazard Ratio by IQ
Danish study - Patients Vs Controls

Fig. 3. Theoretical curve for the risk of being a patient versus being a control.
NZ - Dunedin Study

- The Dunedin Birth Cohort study (Koenen et al 2009)

- 1,037 persons born in Dunedin, New Zealand in 1972-1973 are followed up until age 32 years.

- Their IQ was assessed at ages 7, 9 and 11 years

- Research diagnoses of psychiatric disorders were made at ages 18, 21, 26 and 32 years.

- Their findings are reported as “Lower childhood IQ was associated with increased risk of developing schizophrenia spectrum disorder, adult depression, and adult anxiety. Lower childhood IQ was also associated with greater comorbidity and with persistence of depression; the association with persistence of generalized anxiety disorder was nearly significant. Higher childhood IQ predicted increased risk of adult mania.” (p 50)
GPA is like HSC it is an educational attainment measure (also a proxy for Cognitive Reserve)
Conclusions about MI & IQ

• IQ is inversely related to Mental Illness

• Applies to a range of Psychiatric Diagnoses
  – Schizophrenia
  – Depressive Disorders
  – Anxiety Disorders
  – Adjustment Disorders
  – Personality Disorders
  – Not Bi-Polar

• comorbidity, persistence of disorder and to treatment resistance

• Kind of tells us what we already know that smart people cope better and respond better
Intellectual Disability has more than 2.5 times the rate of Mental Illness.

- If you calculate the weighted risk of Mental Illness by IQ it gives a Hazard Ratio of -1.6 per standard deviation.

- At 2 standard deviations below the mean this means that the hazard ratio is about 2.5.

- That is there is two and a half times the rate of mental illness for persons with an Intellectual Disability compared to average.

- This agrees with the empirical estimates, such as those by Einfeld & Tonge (1996) which found about this rate of increased Mental Illness.
The Flynn Effect

- IQ tests are periodically revised & renormed
- Each time the “old” is compared to the “new”
- James Flynn found that on all occasions, the same subjects simultaneously score higher on the “old” compared to the “new”
- So the new revised – renormed test is by comparison more difficult.
- Individuals score lower on the new test, because they are being compared to a smarter population
Gains in IQ  (3 points every 10 years)

WISC IQs went up **18 points in 54 years.**

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### TABLE 1

Fourteen Estimates of Recent IQ Gains Over Time

<table>
<thead>
<tr>
<th>Tests Compared</th>
<th>Gains</th>
<th>Period Years</th>
<th>Rate</th>
<th>Ideal Gain</th>
<th>Ideal vs. Real</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. WAIS-III (1995) &amp; SB-5 (2001)</td>
<td>+5.50</td>
<td>6</td>
<td>+0.917</td>
<td>1.80</td>
<td>3.70</td>
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<tr>
<td>2. WAIS-R (1978) &amp; SB-4 (1985)</td>
<td>+3.42</td>
<td>7</td>
<td>+0.489</td>
<td>2.10</td>
<td>1.32</td>
</tr>
<tr>
<td>3. WAIS-III (1995) &amp; WISC-IV (2001.75)</td>
<td>+3.10</td>
<td>6.75</td>
<td>+0.459</td>
<td>2.03</td>
<td>1.07</td>
</tr>
<tr>
<td>4. WISC-III (1989) &amp; SB-5 (2001)</td>
<td>+5.00</td>
<td>12</td>
<td>+0.417</td>
<td>3.60</td>
<td>1.40</td>
</tr>
<tr>
<td>5. WISC-III (1989) &amp; WISC-IV (2001.75)</td>
<td>+4.23</td>
<td>12.75</td>
<td>+0.332</td>
<td>3.83</td>
<td><strong>0.40</strong></td>
</tr>
<tr>
<td>6. WISC-R (1972) &amp; WISC-III (1989)</td>
<td>+5.30</td>
<td>17</td>
<td>+0.312</td>
<td>5.10</td>
<td><strong>0.20</strong></td>
</tr>
<tr>
<td>7. WISC-R (1972) &amp; SB-4 (1985)</td>
<td>+2.95</td>
<td>13</td>
<td>+0.227</td>
<td>3.90</td>
<td>0.95</td>
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<td>8. SB-4 (1885) &amp; SB-5 (2001)</td>
<td>+2.77</td>
<td>16</td>
<td>+0.173</td>
<td>4.80</td>
<td>2.03</td>
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<tr>
<td>9. WAIS-R (1978) &amp; WAIS-III (1995)</td>
<td>+4.20</td>
<td>17</td>
<td>+0.247</td>
<td>5.10</td>
<td><strong>0.90</strong></td>
</tr>
<tr>
<td>10. SB-LM (1972) &amp; SB-4 (1985)</td>
<td>+2.16</td>
<td>13</td>
<td>+0.166</td>
<td>3.90</td>
<td>1.74</td>
</tr>
<tr>
<td>11. WISC-R (1972) &amp; WAIS-R (1978)</td>
<td>+0.90</td>
<td>6</td>
<td>+0.150</td>
<td>1.80</td>
<td>0.90</td>
</tr>
<tr>
<td>12. WISC-III (1989) &amp; WAIS-III (1995)</td>
<td>-0.70</td>
<td>6</td>
<td>-0.117</td>
<td>1.80</td>
<td>2.50</td>
</tr>
<tr>
<td>14. WISC-IV (2001.75) &amp; WAIS-IV (2006)</td>
<td>+1.20</td>
<td>4.25</td>
<td>+0.282</td>
<td>1.28</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Average of all 14 comparisons: +0.311  1.23
Average of 4 WISC/WISC & WAIS/WAIS comparisons: +0.299  0.39

*Note.* This table is useful for analyzing whenever the norms of a given test seem eccentric. For example, if a test has substandard norms, it will inflate estimates when paired with a later test and deflate estimates when paired with an earlier test. Use the Ideal versus real column to assess the WAIS-III: (1) It is paired with a later test in (1), (3), and (13) and these show deviations of 3.70, 1.07, and 0.07 toward too many points gained; (2) It is paired with an earlier test in (9) and (12) and these show deviations of 0.90 and 2.50 toward too few points gained; (3) the sum of the deviations is 8.24 and divided by 5 = 1.65, as the number of points by which the WAIS-III inflated IQ scores even at the time it was standardized.
Rates of IQ Increase  ("g" was fastest)

Figure 1. Smoothed curves depicting the differential increase in mean scores on Wechsler, Stanford–Binet, and Raven’s Matrices tests during the middle and latter parts of the twentieth century. Adapted from Neisser (1998a). Copyright © 1998 by the American Psychological Association. Adapted with permission.
IQ increasing by year of birth

Figure 2. Median raw scores for 10 samples of British adults with birth dates ranging from 1877 to 1967. The five data points on the left represent groups tested in 1942 at ages 65 to 25 years (from left to right). The five data points on the right represent groups tested in 1992 at ages 65 to 25 years (from left to right). The dashed line indicates that a raw score falling at the 90th percentile in 1942 fell at the 5th percentile in 1992. Data from Raven et al. (1995). Figure adapted from Flynn (1998a). Copyright © 1998 by the American Psychological Association. Adapted with permission.
What happened?

• All forms of intelligence increased
  ▫ Processing speed increased
  ▫ Abstract problem solving increased
  ▫ Vocab increased
  ▫ Information increased
  ▫ Comprehension increased

• But those subtests associated with “g” increased more.
Why did this happen?

- Cannot be genetic – timeframe is too short

- Must be environmental
  - Better maternal nutrition and healthcare
    - Before pregnancy, during pregnancy and at birth it's all better
  - Better child nutrition and healthcare
    - Children also taller and fatter
  - Fewer children per family
    - Each child gets more attention and more of much else
  - More stimulating early environment
    - TV, Cars, Preschool, computers
  - Earlier, better and longer education
    - Most complete high school, many university
  - Technology
    - Calculators, Computers, Phones – free up brain-space

- A perfect storm of all of the above
Intellectual Disability & the US Death Penalty

- In the United States, the constitution prohibits the execution of a person who has an Intellectual Disability.

- The Flynn Effect has been used as a consideration in determining a person’s IQ and Intellectual Disability in court.

- Edward Lee Elmore was tested with an IQ of 72 at age 12 years. The Flynn Effect was used to determine he was ID and he was not executed

- We should do the same here in diagnosing Intellectual Disability

- Using past test results without Flynn corrections can lead to misclassification.
IQ - Nature Vs Nuture?

- An ill posed question
- Better to ask about underlying processes
- Eugenics movement in 1900, based on belief that genetics determined intelligence and environment counted for little → forced sterilisation by law
- Current view in Australian debate on education that the quality of teaching can make children more intelligent
- However both are wrong
  - Environment improved intelligence after 1900, sterilisation would have failed
  - Differences in academic performance between schools in Australia today are likely to in large part reflect geographical differences in intelligence between school populations, not better or worse teaching.
  - Evidence is that standard of teaching in Australia is high. Therefore no room to improve
Early Intervention

• There have been numerous well researched attempts to raise IQ and/or Educational outcomes in children, particularly children with a Developmental Disability

• All have failed (Head Start, Carolina Abcerderian, Perry Preschool)

• They produce effects whilst the children are receiving intervention, but the effects “wash out” a few years after the program ends and Intervention Group = Control Group

• Exception is orphans from East European or third world orphanages, adopted in the first world. Results in lifelong gains compared to peers left behind

• Some researchers have correctly concluded that “Early” Intervention needs to continue lifelong to be effective.

• This is at least partly what seems to have happened with the Flynn Effect
Cognitive Reserve Hypothesis

- Research on ageing provides an theoretical explanation as to how the Flynn Effect has happened

- Cognitive Reserve is composed of:
  - Brain Reserve – how many neurons\synapses etc you have
  - Neural Reserve – spare neurons and networks to throw at a task
    - due to efficient neural networks
  - Neural Compensation
    - the capacity to do things differently with your neural networks

- IQ is a proxy measure for Cognitive Reserve

- Cognitive Reserve forestalls the onset of dementia
Cognitive Reserve & Dementia

Fig. 1. Theoretical illustration of how cognitive reserve may mediate between AD pathology and its clinical expression. We assume that AD pathology slowly increases over time, and this is graphed on the x-axis. The y-axis represents cognitive function, in this case memory performance. Assuming that AD pathology increases over time at the same rate in two individuals with high and low reserve, the following predictions can be made about the individual with high CR: (1) the point of inflection, where memory begins to be affected AD pathology will be later; (2) clinical diagnostic criteria for AD be reached later, when pathology is more severe; (3) at any level of memory performance, AD pathology will be more severe; (4) after the point of inflection, clinical progression will be more rapid.
Some findings on Cog Reserve & Ageing

• Cognitive Reserve protects from the onset of dementia and age-related cognitive decline

• Dementia and decline appear later, but once dementia or decline start the rate of decline is more rapid

• Young people and old people use different neural networks and brain structures to perform at the same level on a cognitive task.

• See Yaakov Stern, or locally Valenzuela and Sachdev (UNSW)
Hypothesis: Flynn ↑ IQ = ↓ MI?

- The increase in IQ is an observed fact.
- The inverse relationship between IQ and MI is also an observed fact.
- That combining the two to speculate that as IQ has increased in the population, Mental Illness in the population has decreased is a hypothesis, which I am proposing.
- Is there any Evidence?
The Australian National Survey of Mental Health and Well-being (2007) found 20% of adults meet criteria for a psychiatric Disorder in a 12 month period.

They used the CIDI a World Health Organisation developed measure based upon ICD-10

This finding agrees broadly with similar findings in other countries

Basically how you measure determines results
Estimated Mental Disorders: Australia

The 2007 National Survey of Mental Health and Wellbeing

Total persons aged 16–85 years
- 16,015,300 (100%)

Any lifetime mental disorder (a)
- 7,286,600 (45%)

Any 12-month mental disorder (b)
- 3,197,800 (20%)

No lifetime mental disorder
- 8,728,700 (55%)

No 12-month mental disorder
- 4,088,800 (25%)

(a) Persons who met criteria for diagnosis of a lifetime mental disorder (with hierarchy)
(b) Persons who met criteria for diagnosis of a lifetime mental disorder (with hierarchy) and had symptoms in the 12 months prior to interview.
Mental Disorders: Australia

The 2007 National Survey of Mental Health and Wellbeing

Any 12-month mental disorder(a)(b) (20%)

<table>
<thead>
<tr>
<th>Anxiety disorders(b) (14.4%)</th>
<th>Affective disorders(b) (6.2%)</th>
<th>Substance Use disorders(b) (5.1%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panic Disorder (2.6%)</td>
<td>Depressive Episode(c) (4.1%)</td>
<td>Alcohol Harmful Use (2.9%)</td>
</tr>
<tr>
<td>Agoraphobia (2.8%)</td>
<td>Dysthymia (1.3%)</td>
<td>Alcohol Dependence (1.4%)</td>
</tr>
<tr>
<td>Social Phobia (4.7%)</td>
<td>Bipolar Affective Disorder (1.8%)</td>
<td>Drug Use Disorders(d) (1.4%)</td>
</tr>
<tr>
<td>Generalised Anxiety Disorder (2.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obsessive-Compulsive Disorder (1.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Traumatic Stress Disorder (6.4%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) Persons who met criteria for diagnosis of a lifetime mental disorder (with hierarchy) and had symptoms in the 12 months prior to interview.
(b) A person may have had more than one mental disorder. The components when added may therefore not add to the total shown.
(c) Includes Severe Depressive Episode, Moderate Depressive Episode, and Mild Depressive Episode.
(d) Includes Harmful Use and Dependence.
Prediction of Flynn Effect on MI

- 0.3 points of IQ increase per year... That’s 30 points in 100 years

- That means that an average person IQ=100 in 1910 would score around IQ = 70 on WAIS-IV

- If that is true, then Mental Illness would be greater by a factor of about 2.5 times, then compared to now

- If the CIDI was used in 1910 it would find **50% have a Clinical Mental Illness**, rather than the 20% of today.

- That is a big difference. Is there any evidence?
Suicide rate by IQ

Suicide is the only Mental Health Indicator we have 100 years of data on.

Swedish conscript study

- Found that in the population suicide varies by IQ
- Low IQ have higher rates
- High IQ have lower rates

So Suicide rates over time should go down as population IQ went up due to the Flynn Effect.

* Did this occur?
Mental Illness Epidemic?

• But wait ...... Everyone knows we have an epidemic of Mental Illness today?

• The government has funded Psychologists to fight this epidemic and is contemplating doing much more?

• Hasn’t the rate of Mental Illness really risen?

• Isn’t it just plain stupid to contemplate that rates of Mental Illness have fallen over the past 100 years?

• Suicide in particular is an increasing problem, isn’t it?
Maybe there is a Perceptual Error?

- If I want to look tall
- The easiest way for me to do this is ....
- To stand next to someone who is short.
- This in fact what has happened to the rates of Mental Illness and rates of suicide
- Mental Illness used to stand next to giants now it is hanging around with midgets
- This makes it look like Mental Illness has grown when in fact, it has not
Causes of Death: Australia 1907-2004
# 10 Leading Causes of Death by Age Group, United States – 2006

<table>
<thead>
<tr>
<th>Rank</th>
<th>&lt;1</th>
<th>1-4</th>
<th>5-9</th>
<th>10-14</th>
<th>15-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Congenital Anomalies 5,819</td>
<td>Unintentional Injury 1,618</td>
<td>Unintentional Injury 1,644</td>
<td>Unintentional Injury 1,214</td>
<td>Unintentional Injury 16,225</td>
<td>Unintentional Injury 14,954</td>
<td>Malignant Neoplasms 50,354</td>
<td>Malignant Neoplasms 101,454</td>
<td>Heart Disease 510,542</td>
<td>Heart Disease 631,836</td>
<td>631,836</td>
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<tr>
<td>2</td>
<td>Short Gestation 4,841</td>
<td>Congenital Anomalies 515</td>
<td>Malignant Neoplasms 459</td>
<td>Malignant Neoplasms 448</td>
<td>Homicide 5,717</td>
<td>Suicide 4,985</td>
<td>Malignant Neoplasms 13,917</td>
<td>Heart Disease 38,095</td>
<td>Heart Disease 65,477</td>
<td>Malignant Neoplasms 387,515</td>
<td>Malignant Neoplasms 559,888</td>
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<tr>
<td>3</td>
<td>SIDS 2,323</td>
<td>Malignant Neoplasms 377</td>
<td>Congenital Anomalies 182</td>
<td>Homicide 241</td>
<td>Suicide 4,183</td>
<td>Homicide 4,726</td>
<td>Heart Disease 12,339</td>
<td>Unintentional Injury 19,875</td>
<td>Chronic Low Respiratory Disease 12,375</td>
<td>Cerebrovascular 137,119</td>
<td>137,119</td>
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<tr>
<td>4</td>
<td>Maternal Pregnancy Comp. 1,583</td>
<td>Homicide 366</td>
<td>Homicide 149</td>
<td>Suicide 216</td>
<td>Malignant Neoplasms 1,664</td>
<td>Malignant Neoplasms 3,556</td>
<td>Suicide 6,591</td>
<td>Liver Disease 7,712</td>
<td>Unintentional Injury 11,446</td>
<td>Chronic Low Respiratory Disease 106,845</td>
<td>Chronic Low Respiratory Disease 124,583</td>
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<tr>
<td>5</td>
<td>Unintentional Injury 1,147</td>
<td>Heart Disease 191</td>
<td>Heart Disease 163</td>
<td>Heart Disease 1,076</td>
<td>Heart Disease 3,307</td>
<td>Heart Disease 4,019</td>
<td>Suicide 7,426</td>
<td>Diabetes Mellitus 11,432</td>
<td>Alzheimer’s Disease 71,869</td>
<td>Unintentional Injury 121,599</td>
<td>121,599</td>
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<td>6</td>
<td>Pneumonia &amp; Influenza 125</td>
<td>Chronic Low Respiratory Disease 52</td>
<td>Congenital Anomalies 162</td>
<td>Congenital Anomalies 460</td>
<td>HIV 1,182</td>
<td>Homicide 3,829</td>
<td>Cerebrovascular 6,341</td>
<td>Chronic Low Respiratory Disease 10,518</td>
<td>Diabetes Mellitus 52,351</td>
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<td>7</td>
<td>Respiratory Distress Syndrome 625</td>
<td>Septicemia 86</td>
<td>Cerebrovascular 45</td>
<td>Chronic Low Respiratory Disease 63</td>
<td>Chronic Low Respiratory Disease 210</td>
<td>Cerebrovascular 673</td>
<td>Diabetes Mellitus 5,692</td>
<td>Liver Disease 7,421</td>
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<td>Alzheimer’s Disease 72,432</td>
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<tr>
<td>8</td>
<td>Bacterial Sepsis 867</td>
<td>Septicemia 90</td>
<td>Cerebrovascular 40</td>
<td>Influenza &amp; Pneumonia 40</td>
<td>HIV 2,551</td>
<td>Cerebrovascular 2,221</td>
<td>HIV 4,377</td>
<td>Suicide 4,383</td>
<td>Nephritis 37,377</td>
<td>Influenza &amp; Pneumonia 56,326</td>
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<tr>
<td>9</td>
<td>Neonatal Hemorrhage 618</td>
<td>Septicemia 40</td>
<td>Septicemia 44</td>
<td>Septicemia 184</td>
<td>Congenital Anomalies 437</td>
<td>Diabetes Mellitus 2,094</td>
<td>Chronic Low Respiratory Disease 3,124</td>
<td>Neoplasm 4,368</td>
<td>Unintentional Injury 38,889</td>
<td>Nephritis 45,344</td>
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<tr>
<td>10</td>
<td>Circulatory System Disease 543</td>
<td>Cerebrovascular 54</td>
<td>Benign Neoplasms 38</td>
<td>Benign Neoplasms 38</td>
<td>Complicated Pregnancy 179</td>
<td>Influenza &amp; Pneumonia 335</td>
<td>Septicemia 870</td>
<td>Viral Hepatitis 2,911</td>
<td>Septicemia 26,201</td>
<td>Septicemia 34,234</td>
<td></td>
</tr>
</tbody>
</table>

Source: National Vital Statistics System, National Center for Health Statistics, CDC.
Produced by: Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC.
Psychiatric Hospital Beds

Mentally ill become more visible – no longer out of sight -

\[1965 = 261 \text{ beds} / 100K\]

\[2005 = 27 \text{ beds} / 100K\]

10 fold reduction in 40 years – not absorbed in Prisons


\[\text{National Health Strategy (1993) Help Where Help is Needed: Continuity of Care for People with Chronic Mental Illness. Issues Paper No. 5, Commonwealth of Australia, Canberra.}\]
Suicide by Males Australia: 10 years

Figure 1. Suicide methods by males 1997–2007.
Suicide 40 years

Table A.1: Suicide deaths reported in Australian mortality data, 1964–2006

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
<th>Rate/100,000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>1,070</td>
<td>549</td>
<td>23.3 11.5</td>
</tr>
<tr>
<td>1965</td>
<td>1,078</td>
<td>608</td>
<td>22.3 12.4</td>
</tr>
<tr>
<td>1966</td>
<td>1,012</td>
<td>606</td>
<td>21.3 12.2</td>
</tr>
<tr>
<td>1967</td>
<td>1,125</td>
<td>653</td>
<td>23.8 12.9</td>
</tr>
<tr>
<td>1968</td>
<td>1,020</td>
<td>505</td>
<td>20.4 9.9</td>
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<tr>
<td>1969</td>
<td>1,025</td>
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| 2006 | 1,368| 401    | 13.6 3.8                

Figure 2.1: All ages age-adjusted rates of suicide by sex, deaths registered in Australia 1965–2006

Source: National Injury Surveillance Unit, based on ABS mortality data. Age adjustment is by the direct method, using Australia 2001 as the reference.
Suicides: 85 years

But accuracy of recording a death as suicide has increased
Homicides 1915 to 2000

C8.10  TRENDS IN HOMICIDE, Australia—1915 to 1998

(a) Rate per 100,000 population.

Source: Mouzos 2000, p. 9
Suicide and Ill-defined deaths

3 Crude rates of suicide and ill-defined deaths (IDD) among people aged over 10 years: Queensland and Australia, 1968–2006

Data were obtained from Helen Kliive, former Manager, Queensland Suicide Register, Australian Institute for Suicide Research and Prevention, Griffith University, Brisbane, QLD, and are based on Australian Institute of Health and Welfare GRIM books (General Record of Incidence of Mortality: Interactive Excel workbooks); 2006 data, published 2009.
Some Testable Predictions

The hypothesis that Cognitive Reserve protects from Mental Illness and that the Flynn Effect has increased Cognitive Reserve predicts:

1. The rates of Mental Disorders and Mental Health Indicators (e.g., Suicide) have decreased over the past 100 years.

2. Successive generations have progressively lower lifetime rates of Mental Illness. The generation of young people will have better Mental Health than the generations of parents and grandparents.

3. Mental Disorders should onset (and offset) quicker with higher IQ (an indicator of cognitive reserve).

4. We can prevent Mental Illness by increasing cognitive reserve.

Some of this runs counter to current beliefs in the profession.
Increasing Cognitive Reserve

- IQ is a proxy for Cognitive Reserve, it is not Cognitive Reserve

- Evidence is you can increase Cognitive Reserve
  
  Sachdev (2010) suggests:
  
  ▫ Cognitive Activity – Social Activity
  ▫ Physical Activity
  ▫ Mild Stress

  ----------------

  ▫ New drugs and other molecules are coming
  ▫ Neural transplantation is being explored (+ artificial Neural Nets)
  ▫ Brain stimulation (trans-cranial magnetic or direct electrical)
• Psychologists have been interested in both Intelligence and Mental Illness for over 100 years

• Our profession seems to have missed some very big and important changes going on in both, let alone the relationship between them

• We focus on individuals not on populations, so we seemed to have missed things going on at a population level

• We should begin to pay more attention to what is happening at the population level

• The psychologists who developed IQ, Binet, Simon, Terman and Wechsler used population level information (norms) to look at individuals

• But then we did not continue along this path

• As a result I wonder what else we have missed?