Prevention of brain disorders: a global priority

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prevention | priˈvenCHən |
noun
the action of stopping something from happening or arising

PHRASES
an ounce of prevention is worth a pound of cure proverb it's easier to stop something from happening in the first place than to repair the damage after it has happened.
1. Are brain disorders preventable?
2. So, can we, prevent brain disorders?
3. Should we invest in preventing brain disorders?
4. Can we afford not to try to prevent brain disorders?
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Depression in the U.S, 2008

Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report. Oct 2010; 59(38)
Depression, NYC, 2010

% With history of depression
- 4% - 8%
- 9% - 11%
- 12% - 14%
- 14.5% - 15%
- 15.5% - 26%

Community Health Survey 2010, NYC Department of Health and Mental Hygiene
1. Are brain disorders preventable?
2. So, can we, prevent brain disorders?
3. Should we invest in preventing brain disorders?
4. Can we afford not to try to prevent brain disorders?
Absolutely
SUMMARY REPORT

A Report of the
World Health Organization,
Department of Mental Health and Substance Abuse
in collaboration with
the Prevention Research Centre
of the Universities of Nijmegen and Maastricht

World Health Organization
Geneva
1. Are brain disorders preventable?
2. So, can we, prevent brain disorders?
3. **Should we invest in preventing brain disorders?**
4. Can we afford not to try to prevent brain disorders?
Three percent of US health care dollars go to prevention
a. A values argument
Ask yourself...would you prefer

To have access to effective treatment for your schizophrenia
Ask yourself... would you prefer

To have access to effective treatment for your schizophrenia

or

Never to have schizophrenia at all
One of [our] most difficult challenges is to ensure that the urgent does not crowd out the important. In health the challenge is especially difficult because urgent matters can be so riveting.
b. A numerical argument
Population
Exposure
Disorder
Should we invest in preventing brain disorders?
Yes
1. Are brain disorders preventable?
2. So, can we, prevent brain disorders?
3. Should we invest in preventing brain disorders?
4. Can we afford not to try to prevent brain disorders?
a. Our curative efforts are fixing only one very small bit of a much larger challenge
Figure 2. Distributions of systolic blood pressure in middle-aged men in two populations²,³
Population health

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Figure 2  Distributions of systolic blood pressure in middle-aged men in two populations\textsuperscript{2,3}
Figure 3 Percentage distribution of serum cholesterol levels (mg/dl) in men aged 50–62 who did or did not subsequently develop coronary heart disease (Framingham Study).
Table: Non-diseased Diseases Total

<table>
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<th>Non-diseased</th>
<th>Diseased</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>Unexposed</td>
<td>A</td>
<td>B</td>
<td>A+B</td>
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<tr>
<td>Exposed</td>
<td>C</td>
<td>D</td>
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<tr>
<td>Total</td>
<td>A+C</td>
<td>B+D</td>
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Figure 3 Percentage distribution of serum cholesterol levels (mg/dl) in men aged 50–62 who did or did not subsequently develop coronary heart disease (Framingham Study)
FIGURE 2. Probability distributions of a marker, $X$, in cases (solid curves) and controls (dashed curves) consistent with the logistic model $P(D=1|X) = \alpha + \beta X$. It has been assumed that $X$ has a mean of 0 and a standard deviation of 0.5 in controls so that a unit increase represents the difference between the 84th and 16th percentiles of $X$ in controls. The marker is normally distributed, with the same variance in cases. The odds ratio (OR) per unit increase in $X$ is shown.
b. These elements that might prevent brain disorders are *inevitably* driving brain disorders
An illustration, borrowing from cardiovascular disease
Will reducing the prevalence of junk food eating in the population reduce the risk of obesity in the population?
Baseline heritability

Food environment

Junk food eating
Therefore

Variation in the prevalence of inter-individual causes is directly associated with the number of obese people only when the prevalence of environmental causes is high/med and background causes are med/low.
Observation 1

Prevalence of junk food eating *never* matters to the effect of junk food eating on obesity in the population.
Observation 2

When genetic influence is low, the risk of obesity following junk food eating is high only when food environment is adverse.
Observation 3

Genetic influence obviates environmental influence only under ‘common variant’ conditions.
Therefore, understanding prevalence of junk food eating tells us very little about contribution of junk food to risk of obesity without understanding environment.
Therefore, reducing the prevalence of junk food eating in the population is not particularly relevant to reducing the risk of obesity secondary to junk food eating unless there is a concomitant effort to also improve the food environment.
It is impossible to predict *who* is going to develop disorder without understanding the environmental drivers of disease.
Can we afford not to try to prevent brain disorders?
No
It is no longer sufficient to expect that reforms in the medical care delivery system alone will improve the public’s health. Large proportions of the...disease burden are preventable.
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Preventing Brain Disorders: Improving global mental health

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