Dpt. Preventive Medicine & Public Health

Scientific evidence & behavior change

Cancer
- Nature or nurture?
- Vaccine against cancer?
- Cardiovascular prevention
- Moderate alcohol consumption?
- Diabetes
- Drugs or behaviour?
- Obesity
- Anti-obesity drugs?

Scientific evidence and behaviour change

Scientific evidence & behavior change

World Health Day: 7 April 2009

Save lives.

UNIV 2009

Conclusions

Inherited genetic factors make a minor contribution to susceptibility to most types of neoplasms. This finding indicates that the environment has the principal role in causing sporadic cancer.

Environmental and Heritable Factors in the Causation of Cancer

Analysis of Cohorts of Twins from Sweden, Denmark, and Finland

Paul Lichtenstein, Ph.D., Neil V. Hauge, M.D., Ph.D., Pål K. Vatten, M.D., Ph.D., Ann-Mari Knap, M.D., Ph.D., Magnus Rosendal, M.D., Ph.D., Rune Pedersen, Ph.D., Anna Sittme, M.S.L., and Kar Pietinen, M.D., Ph.D.
Cardiovascular disease accounts for 16.7 million deaths per year (30% of total deaths worldwide) and it is considered a "neglected" epidemic (World Health Report 2003).

<table>
<thead>
<tr>
<th>Disease</th>
<th>% of Total Global Deaths in 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary Heart Disease</td>
<td>16.8%</td>
</tr>
<tr>
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<tr>
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<tr>
<td>Diabetes</td>
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COLD: Chronic Obstructive Lung Disease

“Screening healthy people for disease exposes them to risks from excessive radiation, and can create a flood of false positive findings and unnecessary medical tests which ultimately increases the workload on the public system.”

Unhealthy, addictive behavior in the Medical Technology industry leads to increased costs.
### Scientific Evidence & Behavior Change

- **Cancer**
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- **Vaccine against cancer?**
- **Cardiovascular prevention**
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- **Diabetes**
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### Lalonde's Report, 1974

**Biology**
- Medical Care
- Lifestyle

**Environment**
- Medical Care

**Causes**
- Investment-Expenses

### Schönbrodt SA, Shattuck Lecture,
We Can Do Better — Improving the Health of the American People

#### Figure 1. Determinants of Health and Their Contribution to Premature Death.

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genetic predisposition</td>
<td>30%</td>
</tr>
<tr>
<td>Environmental exposure</td>
<td>5%</td>
</tr>
<tr>
<td>HEALTH care</td>
<td>10%</td>
</tr>
<tr>
<td>Behavioral patterns</td>
<td>40%</td>
</tr>
<tr>
<td>Social circumstances</td>
<td>15%</td>
</tr>
</tbody>
</table>

### Pleasure & Reward

- **Brain self-stimulation**

### Human Papillomavirus

>99% attributable to human papillomavirus infection

### World, Women

2nd (incidence)

The second most frequent cancer among 15-44 year women.
2392 young women (16 to 23 years of age) – 17.4 months
• The incidence of persistent HPV-16 infection was
  3.8 per 100 woman-years at risk in the placebo group
  0 per 100 woman-years at risk in the vaccine group
  100 percent efficacy
  (95% CI, 90 to 100; P<0.001).
• All nine cases of HPV-16-related cervical intraepithelial neoplasia occurred among the placebo recipients.

Ecological niche

- Types of a microorganism
  - They either coexist in a delicate balance
  - or one of them displaces others because of competition for the ecological niche

- If HPV-16 & HPV-18 are suppressed, will there be selective pressure on the remaining strains to replace those which were eliminated.
>1 million vaccinates, 4 severe cases of seizures

ARTÍCULO ESPECIAL
Vacuna contra el virus del papiloma humano: razones para el optimismo y razones para la prudencia
Miguel Ángel Martínez-González, Silvia Cortés y Julio de Ita
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Human Papillomavirus Vaccination — Reasons for Caution
Charlotte J. Yang, M.D., Ph.D.

Despite great expectations and promising results of clinical trials, we still lack sufficient evidence of an effective vaccine against cervical cancer. Several strains of human papillomavirus (HPV) can cause cervical cancer, and two vaccines directed against the currently most important oncogenic strains (i.e., HPV-16 and HPV-18) specimens have been developed. That is the good news. The bad news is that the overall effect of the preventive on cervical cancer remains uncertain. As Kim and Goldie* point out in this issue of The Journal, the real impact of HPV vaccination on cervical cancer will not be observable for decades.

Resolving the first essential questions will require decades of observation of large numbers of women. The last question may be answered sooner. Published reports of trials show an impressive trend of prevention with cervical cancer among women up through age 26 (HPV age of 16 and 18). The results were not statistically significant, however, possibly because there were too few clinically relevant end points in the observation periods reported. If randomized, controlled trials involving vaccinated and unvaccinated women continue for a few more years, we will most likely be able to tell whether this is a true trend. If so, there is no doubt that

Risk compensation: once feeling protected against 1 health risk, they engage in other risky behaviors → ↑ risk

Vaccine (HPV 16, 18) ↓"safer sex"

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Adjusted HR</th>
<th>95% CI</th>
<th>Infections per year at risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative sex partners (continuous)</td>
<td>1.1</td>
<td>1.03, 1.1</td>
<td>166/1,054</td>
</tr>
<tr>
<td>Condom use with new partners</td>
<td>0.8</td>
<td>0.6, 1.2</td>
<td>144/1108</td>
</tr>
<tr>
<td>Always</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not always</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative sex partners (continuous)</td>
<td>1.0</td>
<td></td>
<td>70/790</td>
</tr>
<tr>
<td>Time having fewer partners (months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>0.9</td>
<td>1.3, 3.9</td>
<td>20/235</td>
</tr>
<tr>
<td>1-5</td>
<td>1.0</td>
<td></td>
<td>53/515</td>
</tr>
<tr>
<td>&gt;5</td>
<td>1.2</td>
<td>1.9, 2.7</td>
<td>110/900</td>
</tr>
<tr>
<td>Current year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
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* Each adjusted for whether a new partner was reported in the last 12 months, history and for all other.

3 MAJOR RISK FACTORS
- Age of first sex
- # partners
- # Partners of the male partner

when one uses a risk-reduction ‘technology’ such as condoms, one often loses the benefit (reduction in risk) by ‘compensating’ or taking greater chances than one would take without the risk-reduction technology.
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Is not alcohol beneficial for your CV health?

Yes, but only in moderate amounts

The doctor said only one drink a day.
El alcohol atrofia el cerebro

Pruebas de imagen a 1.899 personas muestran que la bebida mermó el encéfalo.

Cristina de Matías


cardiovascular prevention

Moderate alcohol consumption?

Arch. Neurol. 2004;61:1363-7

Figure 1. Mean total cerebral brain volumes, including confidence intervals illustrated as error bars, adjusted for age, sex, body mass index (calculated as weight in kilograms divided by height in meters squared), and cardiovascular disease. Profiles (squares): control, 39-49 g/week; moderate, 49-78 g/week; and high, more than 14 drinks per week. Median 1 to 4 drinks per week; rest high, more than 14 drinks per week.

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FLECK, F.

Cardiovascular disease: a global health time bomb.


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% of total global deaths in 2030

Results: The estimated lifetime risk of developing diabetes for individuals born in 2000 is 32.8% for males and 38.5% for females. Females have higher residual lifetime risk.

1. Healthy diet
2. BMI<25 kg/m2
3. Phys. Activ. (>= 30 min/d)
4. No smoking
5. Moderate alcohol intake

Good news!!

Diabetes is largely PREVENTABLE
Drugs vs. lifestyle

- It is easier to provide a pill than to modify behaviors
- A pill enjoys the glamour of "hi-tech"

But...

- A modest improvement in behavior gets substantially greater benefits than "medicalized" preventive approaches
- Medicalized technologies simply don’t work in sizeable segments of the population
Don’t be naïve...

"behavior is not modifiable"

Use a hi-tech medicalized alternative

$ for hig-tech industry & addictive behaviors’ industries

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www.uniforum.org

THE LANCET

Volume 366, Number 9501

Lancet 2006 Mar 4;367:745

The catastrophic failures of public health

This threat is not the emergence of new infectious diseases, such as SARS or avian influenza, and it is not the potential for exposure to chemical or biological weapons. It is much simpler and less glamorous, but arguably much more difficult to combat. People are getting fatter and less physically active, and are therefore more prone to killer chronic illnesses...

Needs = 2,200 Kcal
Sellings = 3,800 Kcal

Increasing unhealthy lifestyles

Serving sizes growing

Gac Sanit. 2006;20(Supl 1):48-54
How to eat all what I like and avoid obesity?

Concentrations of CB, receptors

Rimonabant

Within each diet group, some participants achieved much better weight loss than others. Participants who lost more weight attended more counseling sessions and adhered more closely to the prescribed dietary composition. These observations led Sacks et al, to conclude that behavioral factors rather than macronutrient composition are what matters.

26 Feb 2009

Weight Loss Diets for the Prevention and Treatment of Obesity

It is obvious by now that weight losses among participants in diet trials will at best average 3 to 4 kg after 2 to 4 years and that they will be less among people who are poor or uneducated, groups that are hit hardest by obesity. We do not need another diet trial until we change the paradigm.

A little noticed study in France may point the way. A community-based effort to prevent overweight in schoolchildren began in two small towns in France in 2000. Everyone from the mayor to shop owners, schoolteachers, doctors, pharmacists, caterers, restaurant owners, sports associations, the media, scientists, and various branches of town government joined in an effort to encourage children to eat better and move around.

The time has come for common ground on preventing sexual transmission of HIV

Zero-grazing consensus Lancet, Nov 2004

2004;364:1913-5

community-based approaches involving religious organisations, women’s and men’s associations, care groups, youth organisations, health workers, local media, and both traditional and governmental leadership can foster new norms of sexual behaviour, as for example occurred with the successful zero-grazing strategy (fidelity and partner reduction) in Uganda.

Lancet

HIV PREVALENCE AMONG 15-19-YEAR-OLD PREGNANT WOMEN

Source: UNAIDS/WHO, 2005

Delayed sexual debut among primary school pupils (13-16 years) following information education and communication (IEC) social dance, Uganda

**Behavior Change**

- a more **difficult** (and less glamorous) task than fashionable research in **molecular biology** or **genomics** (very well funded)
- But it is the most **urgent** & most **effective** means to improve population health.
- **Behavior change** is the priority.