Why Facts and Science Don’t Always Change People’s Minds

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The problem
How we wish the world worked

The facts are coming! The facts are coming!
How the world (often) actually works
Does myth-busting work?

President Barack Obama's attempt at explanation has only fanned the flames of controversy over his campaign line, "If you like your health care, you can keep it."

Obama was already dealing with a troubled rollout of the healthcare.gov website when reports of health insurance cancellation notices for many Americans started arriving.

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**Myth**

"The flu isn't a serious disease."

**Facts**

Influenza (flu) is a serious disease of the nose, throat, and lungs, and it can lead to pneumonia. Each year about 200,000 people in the U.S. are hospitalized and about 36,000 people die because of the flu. Most who die are 65 years and older. But small children less than 2 years old are as likely as those over 65 to have to go to the hospital because of the flu.

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**Myth**

"The flu shot can cause the flu."

**Facts**

The flu shot cannot cause the flu. Some people get a little soreness or redness where they get the shot. It goes away in a day or two. Serious problems from the flu shot are very rare.

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**Myth**

"The flu shot does not work."

**Facts**

Most of the time the flu shot will prevent the flu. In scientific studies, the effectiveness of the flu shot has ranged from 70% to 90% when there is a good match between circulating viruses and those in the vaccine. Getting the vaccine is your best protection against this disease.

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**Myth**

"The side effects are worse than the flu."

**Facts**

The worst side effect you're likely to get from a shot is a sore arm. The nasal mist flu vaccine might cause nasal congestion, runny nose, sore throat and cough. The risk of a severe allergic reaction is less than 1 in 4 million.

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**Myth**

"Only older people need a flu vaccine."

**Facts**

Adults and children with conditions like asthma, diabetes, heart disease, and kidney disease need to get a flu shot. Doctors also recommend children 6 months and older get a flu shot every year until their 5th birthday.

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**Myth**

"You must get the flu vaccine before December."

**Facts**

Flu vaccine can be given before or during the flu season. The best time to get vaccinated is October or November. But you can get vaccinated in December or later.

For more information, ask your healthcare provider or call 800-232-4636. Website www.cdc.gov/flu
When corrections fail
When corrections fail
When corrections fail

Iraq had WMD

Liberals
Conservatives

No correction
Correction

(Nyhan and Reifler 2010)
Vaccines: The threat of another UK

The Lancet, Volume 351, Issue 9103, Pages 637 - 641, 28 February 1998
doi:10.1016/S0140-6736(97)11096-0

This article was retracted

RETRACTED: Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

Dr AJ Wakefield FRCS a, SH Murch MB b, A Anthony MB a, J Linnell PhD a, DM Casson MRCP b, M Malik MRCP b, M Berelowitz FRCPsych c, AP Dhillon MRCPath a, MA Thomson FRCP b, P Harvey FRCP b, A Valentine FRCR a, SE Davies MRCPath a, JA Walker-Smith FRCP a

Summary

Background
We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

Methods
12 children (mean age 6 years [range 3–10], 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diarrhoea and abdominal pain. Children underwent gastroenterological, neurological, and developmental assessment and review of developmental records. Ileocolonoscopy and biopsy sampling, magnetic-resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were done under sedation. Barium follow-through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.
TABLE 2 Parental Perspectives on Vaccines

<table>
<thead>
<tr>
<th>Perspective</th>
<th>% That Strongly Agreed or Agreed With Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting vaccines is a good way to protect my child(ren) from disease.</td>
<td>90</td>
</tr>
<tr>
<td>Generally I do what my doctor recommends about vaccines for my child(ren).</td>
<td>88</td>
</tr>
<tr>
<td>I am concerned about serious adverse effects of vaccines.</td>
<td>54</td>
</tr>
<tr>
<td>New vaccines are recommended only if they are as safe as older vaccines.</td>
<td>51</td>
</tr>
<tr>
<td>Parents should have the right to refuse vaccines that are required for school for any reason.</td>
<td>31</td>
</tr>
<tr>
<td>Some vaccines cause autism in healthy children.</td>
<td>25</td>
</tr>
<tr>
<td>My child(ren) does(do) not need vaccines for diseases that are not common anymore.</td>
<td>11</td>
</tr>
</tbody>
</table>

(Freed et al. 2010)
Because signs of autism may appear around the same time children receive the MMR vaccine, some parents may worry that the vaccine causes autism. Vaccine safety experts, including experts at CDC and the American Academy of Pediatrics (AAP), agree that MMR vaccine is not responsible for recent increases in the number of children with autism. In 2004, a report by the Institute of Medicine (IOM) concluded that there is no link between autism and MMR vaccine, and that there is no link between autism and vaccines that contain thimerosal as a preservative.

**MMR Vaccine Safety Research**

Many carefully performed scientific studies have found no link between MMR vaccine and autism. These studies include:

- A *September 2008 case-control study* published in Public Library of Science (PLoS) was conducted in 2004-2008 to determine whether results from an earlier study that claimed to find measles virus RNA in the intestinal tissue of a specific group of autistic children could be confirmed. The results could not be confirmed, and no link between MMR and autism was found.

- An *April 2006 study* conducted by the National Institute of Child Health and Human Development (NICHD) of NIH and the CDC assessed data from 351 children with autism spectrum disorders and 31 typically-developing children. The study did not find a link between MMR vaccination and autism. The results were published in the *Journal of Autism and Developmental Disorders*.

- A *February 2004 case-control study* examined the possible relationship between exposure to the MMR vaccine and autism in Atlanta, Georgia. The results were published in *Pediatrics*.

- A *November 2002 study* by CDC and the Danish Medical Research Council that followed more than 500,000 children over 7 years and found no association between MMR vaccination and autism. The results were published in the New England Journal of Medicine.

(CDC.gov)
Effects of correcting autism myth: Belief

(Nyhan et al. 2014)
Effects of correcting autism myth: Intent

Least favorable toward vaccines

(Nyhan et al. 2014)
Best practices: Avoid reinforcing myths

The 2010 Surgeon General's Report reveals new facts about smoking. Some may surprise you. This new research shows how tobacco smoke causes disease and addiction. Maybe it will change what you think about smoking.

Myth 1
Smoking is just a choice.
- The first time? Yes. After just a few cigarettes? No.
- Addiction to nicotine can happen quickly. It changes the chemical balance in your brain. Smoking may seem like it's just a choice or a habit. In fact, most people who use tobacco are addicted.
- Breaking nicotine addiction is harder for some people than others. Quitting can take several tries. But don't give up.
- If you need help to quit, ask your doctor about nicotine replacement, medicines, or coaching.

Myth 2
Filters make cigarettes safer.
- Filters do not protect you. They are designed to make smoke particles smaller. That makes nicotine easier to absorb. This increases addiction.
- Cigarettes have been engineered to speed up nicotine's path to your brain. Their design feeds addiction.
- Light or low-tar cigarettes may sound less dangerous. They aren't. These misleading labels are no longer allowed.
- No cigarette is safe. Tobacco smoke contains more than 7,000 chemicals. At least 250 are toxic.

Myth 3
An occasional cigarette is no big deal.
- Smoking doesn't just cause diseases for heavy smokers or longtime smokers.
- The 2010 Surgeon General's Report shows how breathing tobacco smoke can cause immediate harm. Tobacco smoke can trigger sudden heart attacks and death, even in nonsmokers.
- Each cigarette you smoke hurts your lungs, your blood vessels, and cells throughout your body.
- Smoking a few cigarettes a week can cause a heart attack.
- Cutting back is not enough to protect you. You have to quit entirely.

(CDC)
Best practices: Use credible sources

**TABLE 2** Parental Report of Levels of Trust of Certain People for Vaccine-Safety Information

<table>
<thead>
<tr>
<th>Information Source</th>
<th>A Lot, %</th>
<th>Some, %</th>
<th>Not at All, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child(ren)'s doctor</td>
<td>76</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>Other health care providers</td>
<td>26</td>
<td>70</td>
<td>4</td>
</tr>
<tr>
<td>Government vaccine experts/officials</td>
<td>23</td>
<td>61</td>
<td>16</td>
</tr>
<tr>
<td>Family and friends</td>
<td>15</td>
<td>67</td>
<td>18</td>
</tr>
<tr>
<td>Parents who believe their child was harmed by a vaccine</td>
<td>8</td>
<td>65</td>
<td>27</td>
</tr>
<tr>
<td>Celebrities</td>
<td>2</td>
<td>24</td>
<td>74</td>
</tr>
</tbody>
</table>

**Experts Debunk Health Care Reform Bill's 'Death Panel' Rule**

Aug. 11, 2009

By KATE SNOW, JOHN GEVER and DAN CHILDS
In Collaboration With MedPage Today

Accusations that the health care reform bill now pending in the House of Representatives would use "death panels" to deny care to sick seniors and children with birth defects have taken center stage in the health care debate, giving the Obama administration even more of an uphill climb in getting the measures enacted into law.

But health care experts — even those who do not support the version of the health care reform bill now being discussed — note that these accusations are shocking, inflammatory and incorrect.

(Snow et al. 2009)
Throwing facts at people isn’t the answer!

(Naro 2013)