

Awareness Of And Attitudes Toward Nanotechnology And Federal Regulatory Agencies

A Report Of Findings

Based On A National Survey Among Adults

Conducted On Behalf Of:

**Project On Emerging Nanotechnologies
The Woodrow Wilson International Center For Scholars**

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On August 27 and 28, 2007, Peter D. Hart Research Associates, Inc., conducted a nationwide survey among 1,014 adults about awareness of and attitudes toward nanotechnology, and opinions about the entities involved in the oversight of new scientific and technological advances. This is the second consecutive year the survey has been conducted. At the 95% confidence level, the data's margin of error is ± 3.1 percentage points.

Overview

Large majorities of the American public are aware of the Food and Drug Administration (FDA), the U.S. Department of Agriculture (USDA), and the Environmental Protection Agency (EPA), three federal agencies likely to be involved in the regulation of nanotechnology. However, job approval ratings and the public's confidence in the FDA and USDA to maximize benefits and minimize risks of the products and industries they regulate are declining. Still, the public remains more confident in the federal government's ability to play an oversight role and manage the risk associated with new advances in science and technology than it does in business.

Awareness of nanotechnology has not increased in the past year. Currently only 6% of the public has heard a lot about it and about two in five (42%) say they have heard nothing at all about it. Those who are very aware of nanotechnology are much more likely to have the initial impression that its benefits will outweigh its risks; whereas those who have heard very little or nothing about it are more likely to be unsure and to not express an opinion at all about the risks-versus-benefits tradeoff.

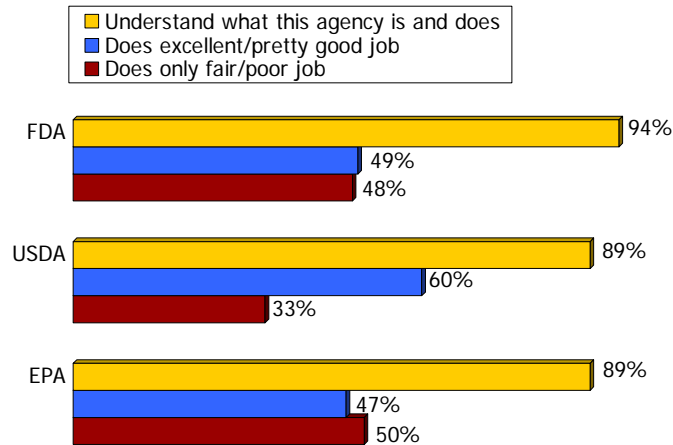
However, after hearing a brief description of the potential benefits and risks of nanotechnology, unaware adults are significantly more likely to say that the risks will outweigh benefits.

By two to one, the public feels that the food supply has become less safe in recent years. Regarding the specific use of nanotechnology in food-related products and foods, Americans want more information, and large majorities say that they need more information about the health risks and benefits associated with using the technology to enhance these products before they would use them.

Key Findings

While substantial majorities of the public say they understand the role of the Food and Drug Administration (FDA), the U.S. Department of Agriculture (USDA), and the Environmental Protection Agency (EPA), three government agencies that are likely to be involved in the regulation of nanotechnologies, job approval ratings and confidence in at least two of these entities is diminishing. Job approval ratings for the three agencies vary. More adults credit the USDA with doing a pretty good or excellent job (60%) than either the FDA (49% pretty good or excellent) or the EPA (47% pretty good or excellent).

Familiarity And Approval Ratings For Government Agencies



However, these job approval ratings have been declining steadily over the past several years. From 2005¹ to 2007, job approval ratings for both the FDA and the USDA have declined nine points. Among adults who understand what each agency does, the proportion saying the FDA is doing a pretty good or excellent job declined from 58% to 49% and the proportion saying the USDA is doing a pretty good or excellent job declined from 69% to 60% during that period. The EPA's ratings have remained fairly constant over the past year, but have declined seven points since 2004. Among Americans who understand what the EPA does, the proportion saying it is doing a pretty good or excellent job declined from 54% in 2004² to 47% in 2007.

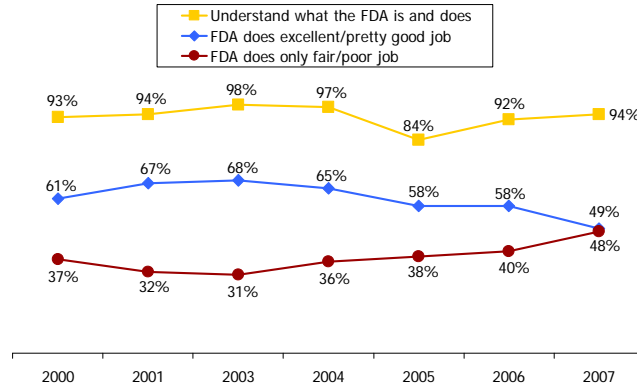
The proportion who rate the FDA as doing an only fair or poor job has increased from 31% in 2003³ to 48% in 2007. This represents a 17-point increase in their negative rating in just four years; half of that increase occurred in the past year, when the proportion of the public rating the FDA as doing an only fair or poor job increased from 40% to 48%.

¹ Harvard School of Public Health, 2005.

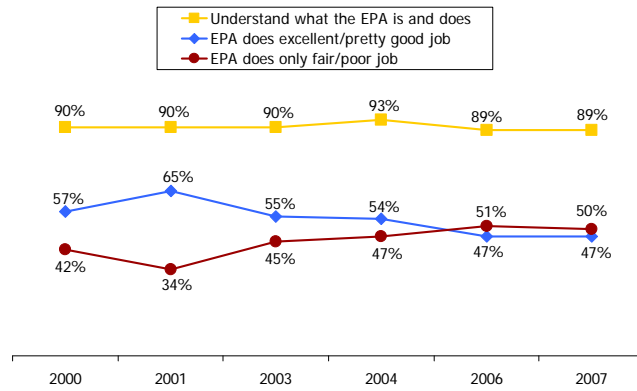
² Harris Interactive, 2004.

³ Harris Interactive, 2003.

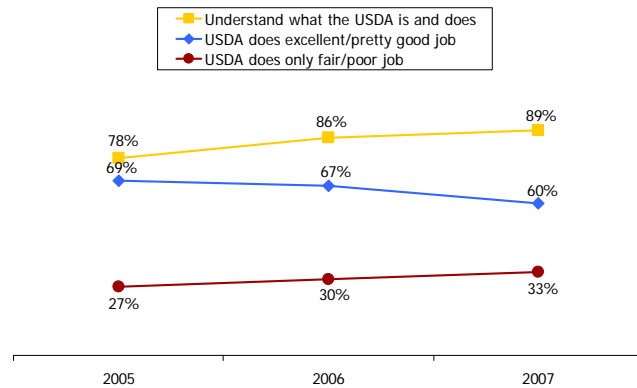
Familiarity And Approval Ratings For The FDA Over Time



Familiarity And Approval Ratings For The EPA Over Time



Familiarity And Approval Ratings For The USDA Over Time

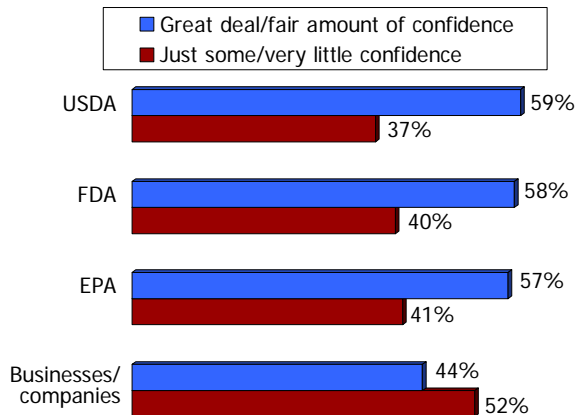


Confidence in business to maximize benefits and minimize risks associated with scientific and technological advancements has eroded in recent years, and it continues to lag behind public confidence in several federal agencies. Confidence in business has decreased five points since last year. Among the USDA, FDA, EPA, and business, business scores the lowest, with only 44% of the public having a fair amount or a great deal of confidence in business to maximize benefits and minimize risks of new products and technologies they produce.

Among the three government agencies and business, the public continues to have the greatest confidence in the USDA to maximize benefits and minimize risks of scientific advancements. However, public confidence in the USDA has declined by 10 points in just the past year, falling from 69% to 59% of adults saying they have a fair amount or great deal of confidence in that agency. Public confidence in the FDA and EPA are similar to that of the USDA, with 58% and 57% of Americans respectively having a great deal or fair amount of confidence in the agencies to maximize benefits and minimize risks.

Public Confidence In Agencies/Business

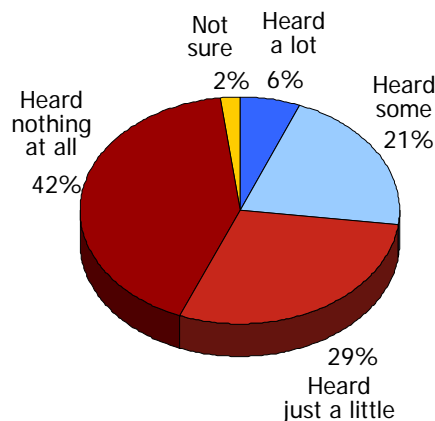
Confidence in Each to Maximize Benefits & Minimize Risks of Scientific/Technological Advancements



Americans' awareness of nanotechnology remains low, with seven in 10 adults having heard just a little or nothing at all about it. The proportion of adults who have heard a lot or some about nanotechnology actually decreased slightly in the past year, from 30% in 2006 to 27% today. Only 6% say they have heard a lot about nanotechnology, one in five (21%) has heard some, 29% have heard just a little, and two in five (42%) adults have heard nothing at all about it.

Public Awareness Of Nanotechnology

How much have you heard about nanotechnology?



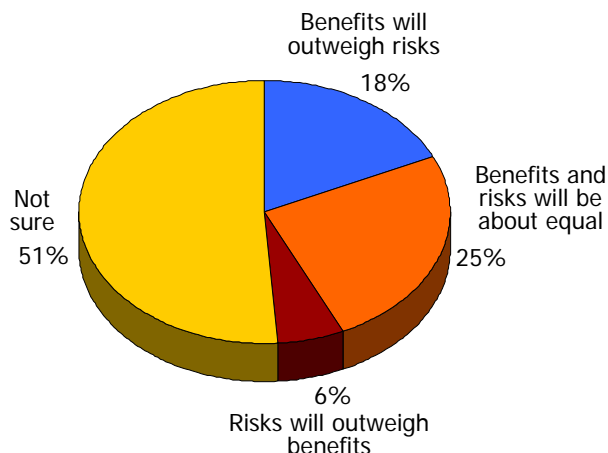
Men, especially those under age 50, as well as individuals with more education and higher incomes are more likely to have heard at least something about nanotechnology. In fact, 39% of adults with a college education and 40% of those with household incomes exceeding \$75,000 report hearing some or a lot about nanotechnology. These relatively high levels of awareness among those with more education and higher incomes are very similar to the 2006 poll findings.

Women, older Americans, and individuals with less education and lower incomes are the least likely to have heard about nanotechnology. More than half (55%) of adults with a high school degree or less and the same proportion of those with household incomes less than \$30,000 report that they have heard nothing at all about nanotechnology. However, awareness has increased slightly among some of these groups—19% of adults age 65 and over report hearing some or a lot about nanotechnology, compared with 12% of adults in the same age group who reported that level of awareness last year. Still a very high proportion (57%) of this age group reports having heard nothing at all about nanotechnology.

Those who have heard anything at all about the technology were asked specifically where they heard about it. The most frequently cited sources include: news programs and the newspaper; television, with the Discovery Channel and science channels frequently referenced; magazines, journals, and scientific publications; the Internet; and friends or family.

A majority of the public are too uncertain about nanotechnology to make any judgment about its risks and benefits. Without having been provided any information about nanotechnology, respondents were asked to assess the trade-offs between the risks and benefits of nanotechnology. About half (51%) of adults had no opinion either way, indicating that they are not sure about the risks-versus-benefits tradeoff. Another 25% report that they think the risks and benefits will be about equal, 18% say that benefits will outweigh risks, and 6% say risks will outweigh benefits. In comparing these results with the 2006 poll, there is a slight increase in the proportion of adults who think that benefits will outweigh risks, increasing from 15% in 2006 to 18% today. The proportion of adults who say that risks will outweigh benefits remains about the same, with 7% saying the risks will outweigh the benefits in 2006 and 6% saying that today.¹

Initial Impression Of Risks And Benefits Of Nanotechnology



The perspective that benefits will outweigh risks is associated positively with familiarity and awareness of nanotechnology. Those who lack awareness of nanotechnology are significantly less likely to make an initial judgment at all about the risks and benefits. A strong relationship exists between awareness of nanotechnology and the opinion that benefits will outweigh risks. More than half (51%) of adults who have heard a lot about nanotechnology believe that the benefits will outweigh the risks, as compared with 42% of those who have heard some, 17% of those who heard just a little, and 3% of those who heard nothing at all.

Not surprisingly, as awareness decreases, so does willingness to make a judgment at all about the risks-versus-benefits tradeoff of nanotechnology.

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Three-quarters (76%) of adults who heard nothing at all about nanotechnology reported they were not sure about the risks-versus-benefits tradeoff and another 17% in this group reported that risks and benefits will be about equal. Only 7% of adults who are completely unaware of nanotechnology assess whether the risks would outweigh benefits or vice versa.

Among those willing to state their assessment of the risks versus benefits of nanotechnology, within every demographic subgroup, individuals are more likely to think that the benefits will outweigh the risks than that the risks will outweigh the benefits. However, with the exception of a few segments of the population (older men, adults with a college degree or more education, those with a household income over \$75,000, and adults who have heard at least something about nanotechnology), the more frequent initial impression is that the risks and benefits will be about equal. (See detailed table on page 9).

After being informed about nanotechnology's potential risks and benefits, the proportion of Americans who believe that the benefits will outweigh the risks increases, as does the proportion who believe that the risks and benefits will be about equal. The greatest increase, however, occurs in the proportion of adults who believe that the risks will outweigh the benefits. Informed assessment of the risks-versus-benefits tradeoff remains strongly tied to awareness of nanotechnology. Adults were read the following information about nanotechnology, and then asked again to decide whether the benefits of nanotechnology will outweigh the risks, the risks will outweigh the benefits, or the risks and benefits will be about equal.

Nanotechnology is the ability to measure, see, predict, and make things on the extremely small scale of atoms and molecules. Materials created at the nanoscale are called nanomaterials, and they often can be made to exhibit very different physical, chemical, and biological properties than their normal-sized counterparts.

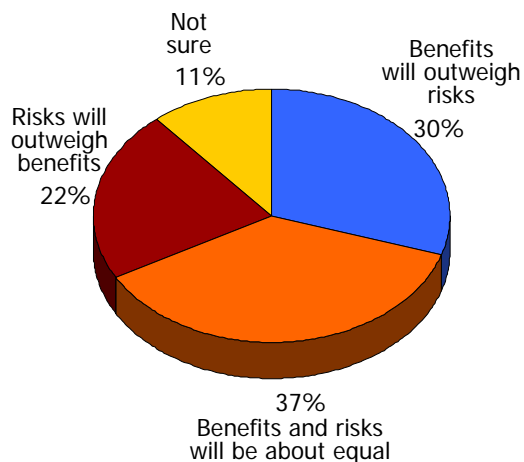
I would like to read your statements about the potential benefits and potential risks of nanotechnology and get your reaction.

The potential BENEFITS of nanotechnology include the use of nanomaterials in products to make them stronger, lighter, and more effective. Some examples are food containers that kill bacteria, stain-resistant clothing, high-performance sporting goods, faster, smaller computers, and more effective skin care products and sunscreens. Nanotechnology also has the potential to provide new and better ways to treat disease, clean up the environment, enhance national security, and provide cheaper energy.

While there has not been conclusive research on the potential RISKS of nanotechnology, there are concerns that some of the same properties that make nanomaterials useful might make them harmful. It is thought that some nanomaterials may be harmful to humans if they are breathed in and might cause harm to the environment. There also are concerns that invisible, nanotechnology-based monitoring devices could pose a threat to national security and personal privacy.

Upon being read this information, 30% of adults report that the benefits will outweigh the risks, a 12-point increase from their initial impression, 22% say the risks will outweigh the benefits, a 16-point increase, and 37% say the risks and benefits will be about equal, a 12-point increase. One in 10 (11%) remains unsure.

Informed Impression Of Risks And Benefits Of Nanotechnology



As with the initial assessment of the risks and benefits of nanotechnology, awareness of nanotechnology also is associated with informed assessment. Those who have greater awareness of nanotechnology are considerably more likely to say that benefits will outweigh risks and those who have no knowledge of the technology are more likely to say that risks will outweigh benefits. (See detailed table on page 9—recall that those who have heard nothing about nanotechnology are more likely to be unsure when asked their initial impression of the risks-versus-benefits tradeoff). In fact, for those who lack any awareness of nanotechnology, the shift toward risk is substantial. As the table on page 9 illustrates, the proportion saying that risks will outweigh benefits increases 27 points, from 4% to 31% of that subgroup.

Women also shift toward risk at a higher rate than the public overall, with the proportion who believe that risks will outweigh benefits increasing 22-points, from 7% to 29%.

Initial And Informed Impressions Of Nanotechnology, 2007

	Initial Impressions			Informed Impressions		
	Benefits Outweigh Risks	Risks Outweigh Benefits	Risks and Benefits about Equal	Benefits Outweigh Risks	Risks Outweigh Benefits	Risks and Benefits about Equal
	%	%	%	%	%	%
All adults	18	6	25	30	22	37
Men	25	5	27	38	15	36
Women	11	7	24	21	29	39
Age 18 to 34	15	9	33	29	22	42
Age 35 to 49	23	7	23	31	21	37
Age 50 to 64	19	6	24	32	26	33
Age 65 and over	13	2	20	25	16	39
Men 18 to 49	26	7	30	39	14	37
Men 50 and over	24	4	23	38	15	34
Women 18 to 49	11	9	27	22	29	41
Women 50 and over	11	5	21	21	29	36
High school or less	9	6	29	20	26	42
Some college/tech	14	7	25	26	26	38
College grade or more	29	5	23	41	15	33
Less than \$30,000	8	7	29	18	28	43
\$30,000-50,000	13	6	30	25	26	39
\$50,000-\$75,000	16	7	30	29	26	38
More than \$75,000	32	5	22	46	12	32
Racial/ethnic minorities	11	10	31	23	25	41
Heard a lot	51	8	30	57	8	29
Heard some	42	7	31	48	11	33
Heard just a little	17	8	33	29	20	42
Heard nothing	3	4	17	17	31	38

We see similar trends in the initial and informed impressions of risks versus benefits in the 2006 and 2007 data. In both years, the overwhelming majority of adults who were initially not sure about the risk-versus-benefits tradeoff were willing to make an assessment after being provided with the statement about potential risks and benefits.

In 2007 there was a slight increase in the proportion of adults who shift to 'risks will outweigh benefits' after being provided the information (from 7% to 18% in 2006 and from 6% to 22% in 2007) and a more pronounced move to 'risks will outweigh benefits' for women and for adults who had heard nothing about nanotechnology.

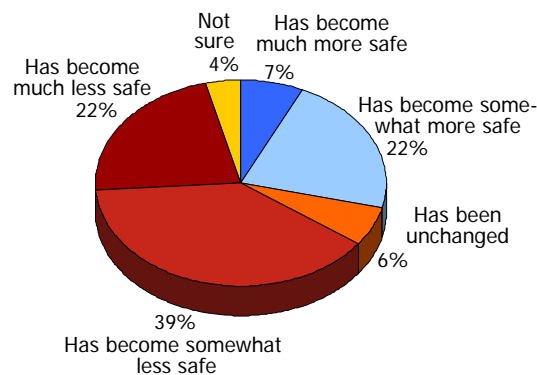
Initial And Informed Impressions Of Nanotechnology, 2006 and 2007

	Initial Impressions			Informed Impressions		
	Benefits Outweigh Risks %	Risks Outweigh Benefits %	Risks and Benefits about Equal %	Benefits Outweigh Risks %	Risks Outweigh Benefits %	Risks and Benefits about Equal %
2006						
All adults	15	7	35	26 (+11)	18 (+11)	49 (+14)
Women	10	7	31	19 (+9)	22 (+16)	53 (+22)
Heard nothing	3	4	20	16 (+13)	23 (+19)	52 (+32)
2007						
All adults	18	6	25	30 (+12)	22 (+16)	37 (+12)
Women	11	7	24	21 (+10)	29 (+22)	39 (+15)
Heard nothing	3	4	17	17 (+15)	31 (+27)	38 (+21)

The American public wants more information about the health risks and benefits of nanotechnology-enhanced food and food products before they will use them. In the 2007 survey, adults were asked a series of questions to ascertain their opinions on nanotechnology use in the specific application of food and food-related products. A solid majority (61%) feel that the food supply has become less safe in recent years, with 22% feeling that it has become much less safe in the past five years. One in three adults (29%) feels that the food supply has become safer and 6% feel that it is unchanged in the past five years.

Safety Of The Food Supply

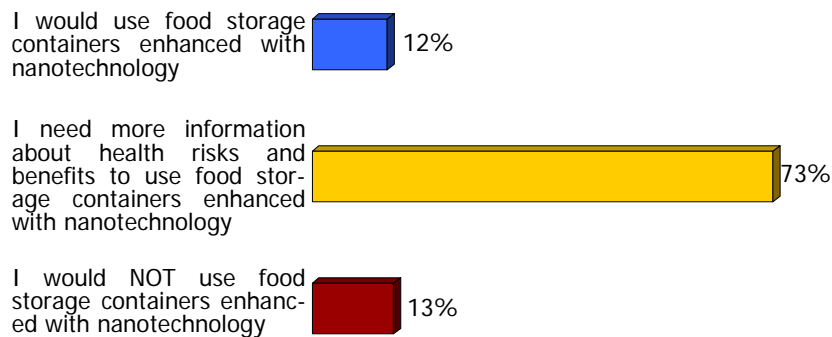
Over the past five years, the food supply:



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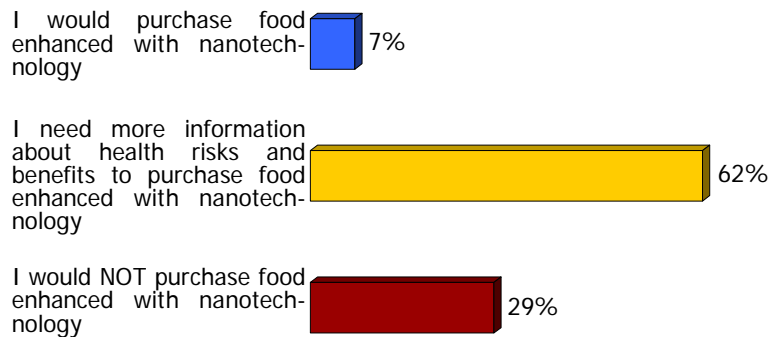
If the public is to use food storage products or foods that have been enhanced with nanotechnology, it wants more information about the health risks and benefits associated with nanotechnology in these products. Thirteen percent (13%) of adults say that they would not use food storage products enhanced with nanotechnology and 73% would need more information about nanotechnology used in food storage products before they would use them.

Use Of Food Storage Products Enhanced With Nanotechnology



Similarly, one in three adults (29%) would not purchase food enhanced with nanotechnology and another 62% need more information to do so.

Purchase Of Food Enhanced With Nanotechnology



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Adults who initially are more aware of nanotechnology are considerably more likely to report that they would use both food storage products and foods enhanced with nanotechnology. Adults who have heard a lot about nanotechnology are nearly three times more likely than adults who have heard nothing, to say that they would use food storage products enhanced with nanotechnology (31% compared with 11%), and are two and a half times more likely to use foods enhanced with nanotechnology (15% compared with 6%).

It is interesting to note that women are the primary purchasers of many of the consumer products enhanced with nanotechnology that are already on the market, such as dietary supplements, anti-aging products, and other cosmetics. Women also make up a large majority of primary grocery shoppers, taking responsibility for the food and food product purchases for their households. We know from this study that women are more likely to be unaware of nanotechnology (more than half have heard nothing at all) and that women are more likely to be focused on risks rather than benefits after being provided with a brief statement about potential risks and benefits. These findings regarding awareness of nanotechnology, initial and informed impressions of the risks-benefits tradeoff of nanotechnology, and the public's desire for more information regarding food and food-related products enhanced by nanotechnology, point to the need to provide the public with the information it desires about nanotechnology, including its many and varied applications, as well as the potential risks and benefits associated with those applications.

ⁱ In the 2006 analysis, data pertaining to the proportion of adults who say risks will outweigh benefits and adults who say risks and benefits will be about equal were transposed. A revised report reflecting the correction has been posted at www.nanotechproject.org