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Synthetic Biology: Public Awareness/Opinions

Key findings from a survey among 1,000 adults nationwide
Conducted August 2010

for

Synthetic Biology Project

The Woodrow Wilson International Center for Scholars

Margin of error = ±3.1 percentage points among all adults

Public Awareness Of Nanotechnology, *Among Key Subgroups*

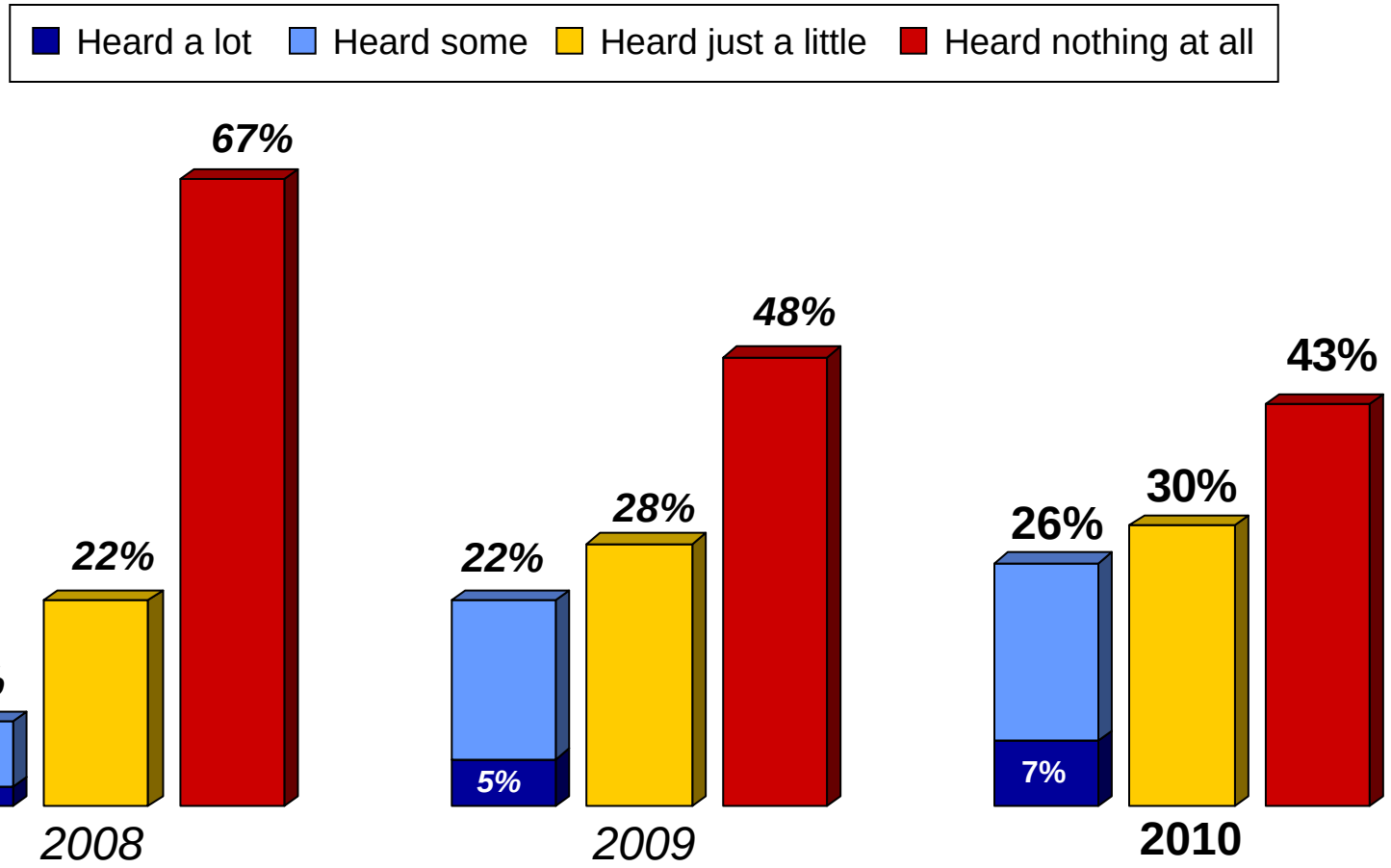
How much have you heard about nanotechnology?

	Heard a lot/some	Heard a little/nothing
All adults	**34%**	**66%**
Men age 18 to 49	**54%**	46%
Men age 50/over	38%	62%
Women age 18 to 49	25%	**74%**
Women age 50/over	21%	**78%**
High school/less	19%	**81%**
Some college/tech ed	32%	68%
College graduate	**47%**	53%
Whites	35%	65%
African Americans	20%	**80%**
Hispanics	**40%**	59%

	Heard a lot/some	Heard a little/nothing
Income:		
Under $30K	25%	**75%**
$30K to $50K	23%	**77%**
$50K to $75K	40%	59%
Over $75K	**50%**	50%
Protestants	26%	**73%**
Catholics	32%	68%
No religion	**53%**	46%

Public Awareness Of Synthetic Biology Continues To Increase

How much have you heard about synthetic biology?



Public Awareness Of Synthetic Biology, *Among Key Subgroups*

How much have you heard about synthetic biology?

	Heard a lot/some	Heard a little/nothing
All adults	**26%**	**73%**
Men age 18 to 49	**35%**	64%
Men age 50/over	28%	70%
Women age 18 to 49	19%	**79%**
Women age 50/over	22%	**78%**
High school/less	16%	**83%**
Some college/tech ed	22%	77%
College graduate	**37%**	62%
Whites	26%	72%
African Americans	18%	**82%**
Hispanics	25%	75%

	Heard a lot/some	Heard a little/nothing
Income:		
Under $30K	16%	**83%**
$30K to $50K	21%	**78%**
$50K to $75K	**31%**	69%
Over $75K	**40%**	59%
Protestants	22%	77%
Catholics	21%	**78%**
No religion	**41%**	58%

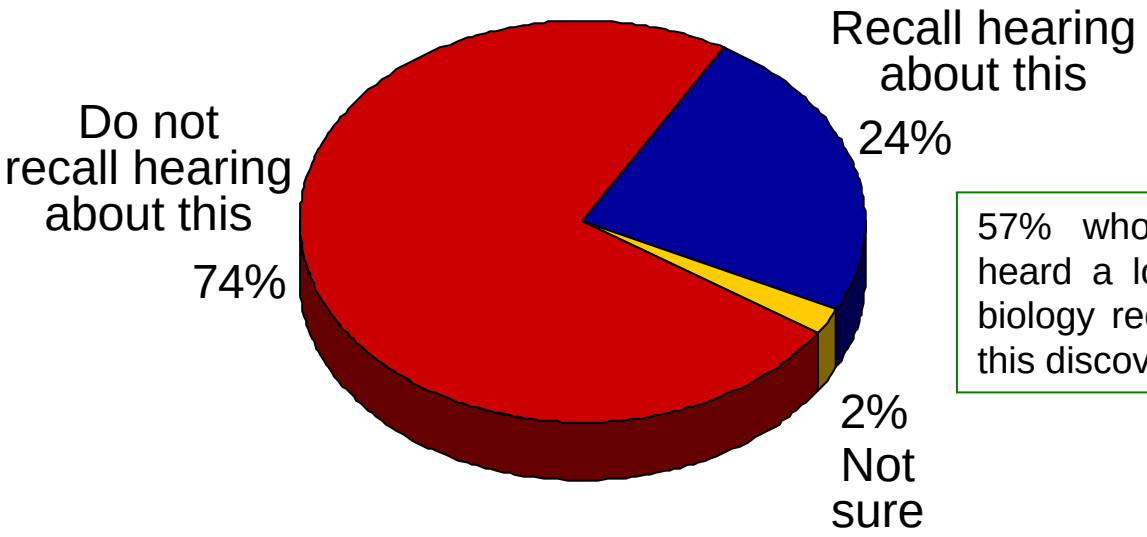
What Do You Think Synthetic Biology Is?

Volunteered Comments

Something man-made, artificial, fake, not natural, not real	30%
Has to do with genetic engineering, altering the biological makeup	12%
Has to do with science, biology, the study of living organisms	6%
Cloning	6%
Used in medical research to develop new medicines, treatments	5%
Some kind of synthetic material or chemical	5%
Don't know; no response	29%

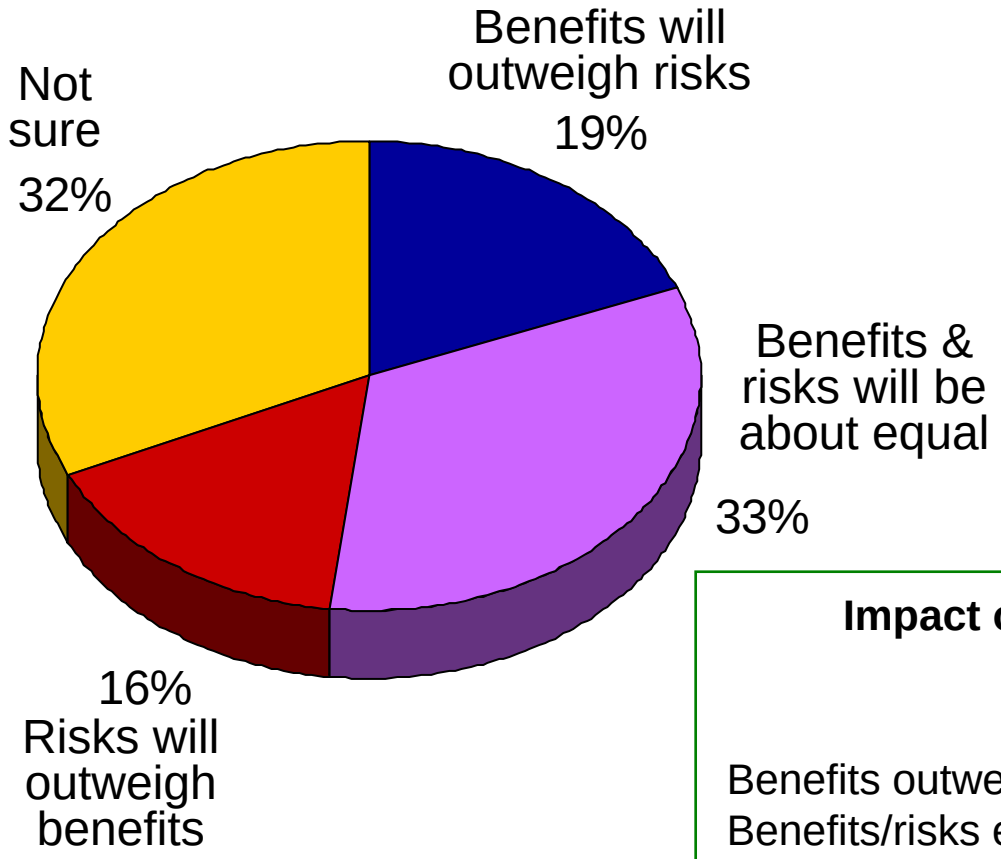
One In Four Adults Recalls J.C. Venter Announcement

In March this year, researchers at the J.C. Venter Institute announced that they had created a synthetic life form based on DNA created from scratch in the laboratory. Do you recall hearing about this discovery?



57% who say they have heard a lot about synthetic biology recall hearing about this discovery.

Initial Impression Of Risks And Benefits Of Synthetic Biology



Impact of Familiarity Prior to Survey

	Heard a lot	Heard some	Heard a little	Heard nothing
Benefits outweigh	**46%**	**31%**	16%	11%
Benefits/risks equal	30%	**42%**	**42%**	25%
Risks outweigh	20%	16%	18%	14%
Not sure	4%	11%	24%	**50%**

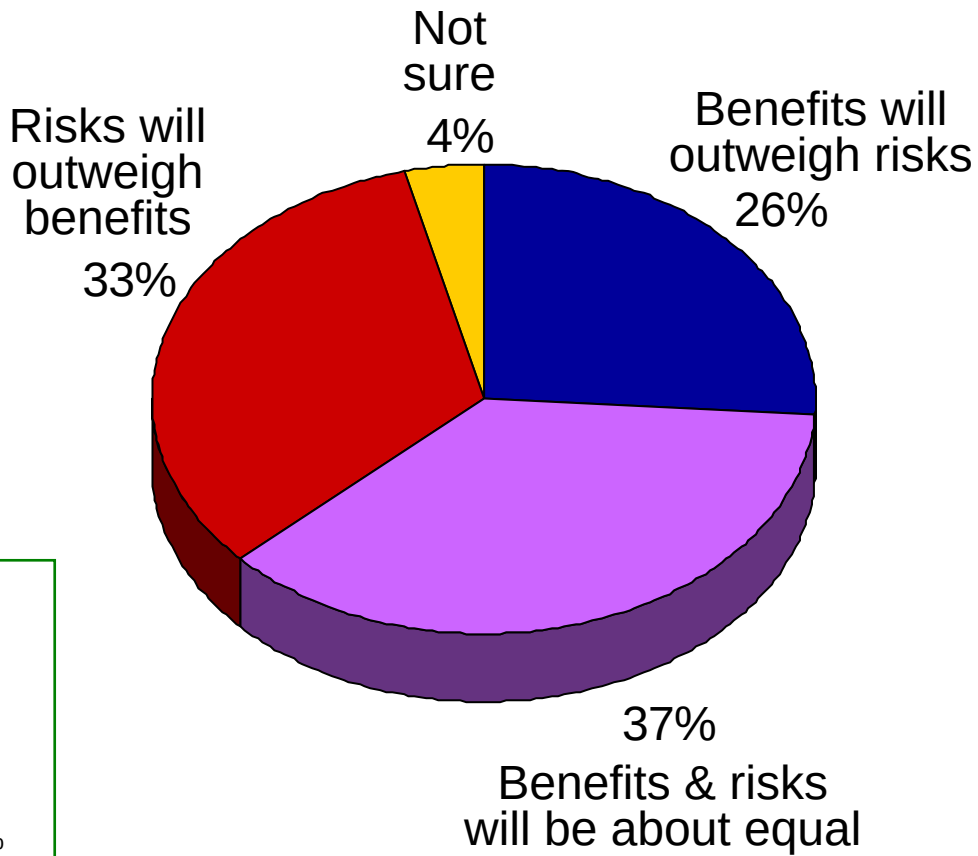
Information About Synthetic Biology

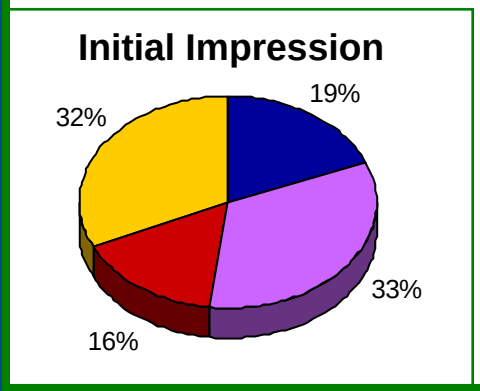
Synthetic biology is the use of advanced science and engineering to make or re-design living organisms, such as bacteria, so that they can carry out specific functions. Synthetic biology involves making new genetic code, also known as DNA, that does not already exist in nature.

The potential BENEFITS of synthetic biology include developing new micro-organisms to treat disease, including cancer, more effectively and to create new and less expensive medications. It also could be used to make new organisms that could provide cheaper and cleaner sources of energy than today's oil-based fuels, and to detect and break down environmental pollutants in the soil, air, and water.

While the potential RISKS of synthetic biology are not known, there are concerns that man-made organisms might behave in unexpected and possibly harmful ways and that they could cause harm to the environment. There also are concerns that, if these organisms fall into the wrong hands, they could be used as weapons. Additionally, the ability to create artificial life has raised moral and ethical questions about how life is defined.

Informed Impression Of Risks And Benefits Of Synthetic Biology





Initial/Informed Impressions Of Risks And Benefits Of Synthetic Biology

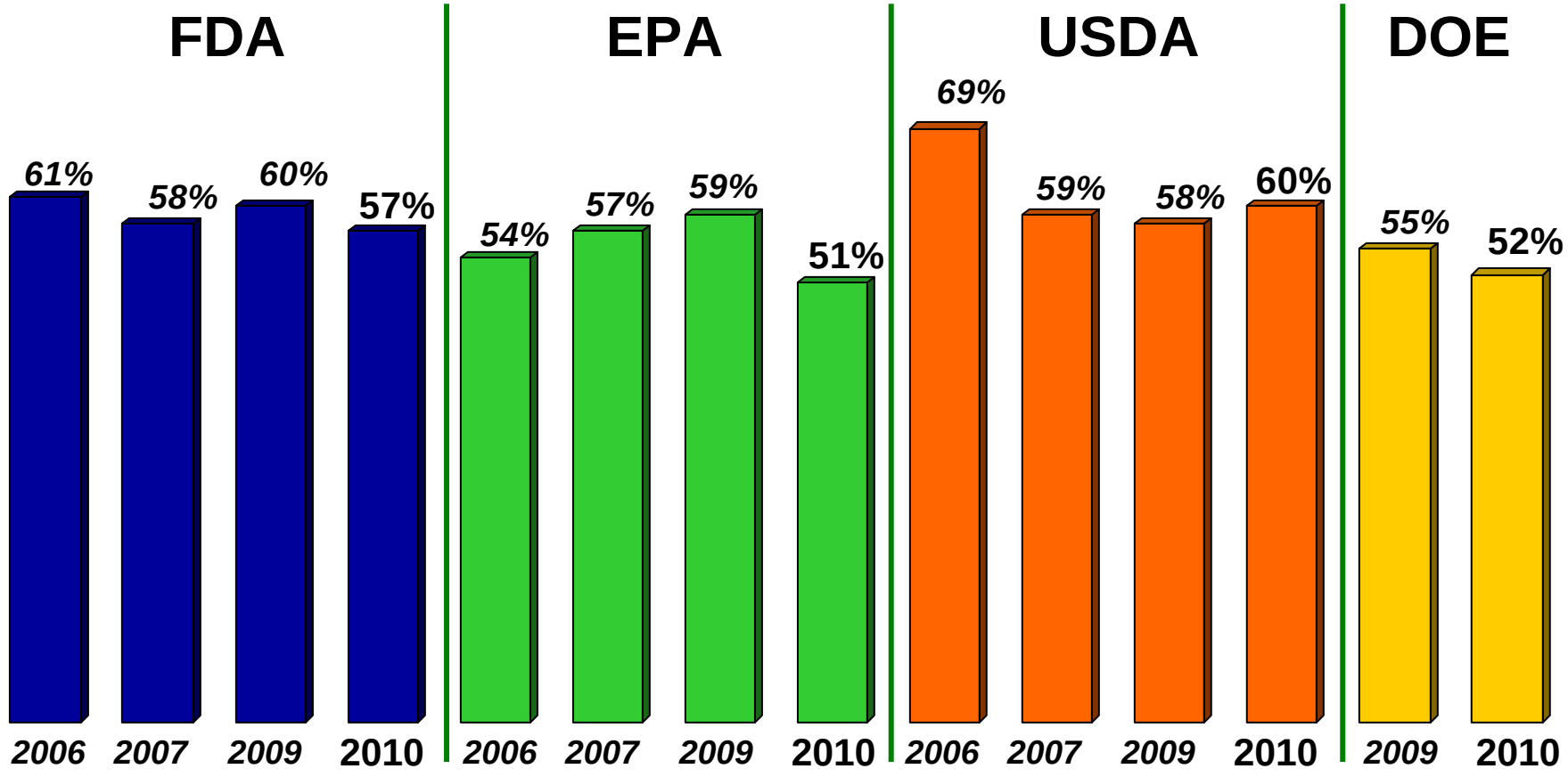
	Initial Impression			Informed Impression		
	Benefits outweigh	Equal	Risks outweigh	Benefits outweigh	Equal	Risks outweigh
All adults	**19%**	**33%**	**16%**	**26%**	**37%**	**33%**
Men age 18 to 49	**32%**	32%	12%	**36%**	37%	23%
Men age 50/over	22%	34%	13%	29%	41%	26%
Women age 18 to 49	12%	33%	20%	25%	34%	37%
Women age 50/over	11%	36%	17%	17%	37%	**42%**
High school/less ed	11%	37%	15%	18%	**46%**	31%
Some college/tech ed	18%	33%	17%	23%	35%	**40%**
College graduate/more	**26%**	33%	16%	35%	33%	27%
Income under $30K	12%	34%	19%	19%	**42%**	36%
Income $30K to $50K	15%	**38%**	15%	19%	**43%**	36%
Income $50K to $75K	**24%**	34%	16%	28%	36%	33%
Income over $75K	**28%**	33%	13%	**38%**	34%	24%

Initial/Informed Impressions Of Risks And Benefits Of Synthetic Biology

	Initial Impression			Informed Impression		
	Benefits outweigh	Equal	Risks outweigh	Benefits outweigh	Equal	Risks outweigh
All adults	**19%**	**33%**	**16%**	**26%**	**37%**	**33%**
Whites	20%	33%	15%	28%	37%	31%
African Americans	11%	36%	19%	19%	39%	35%
Hispanics	14%	**38%**	17%	21%	36%	36%
Have religious affiliation	16%	35%	17%	24%	37%	35%
No religious affiliation	**34%**	31%	8%	**40%**	40%	17%
Evangelicals	14%	33%	**24%**	15%	37%	**45%**
Initial familiarity:						
Heard a lot/some	**35%**	**39%**	17%	**37%**	34%	25%
Heard just a little	16%	**42%**	18%	25%	**40%**	31%
Heard nothing	11%	25%	14%	20%	37%	**39%**

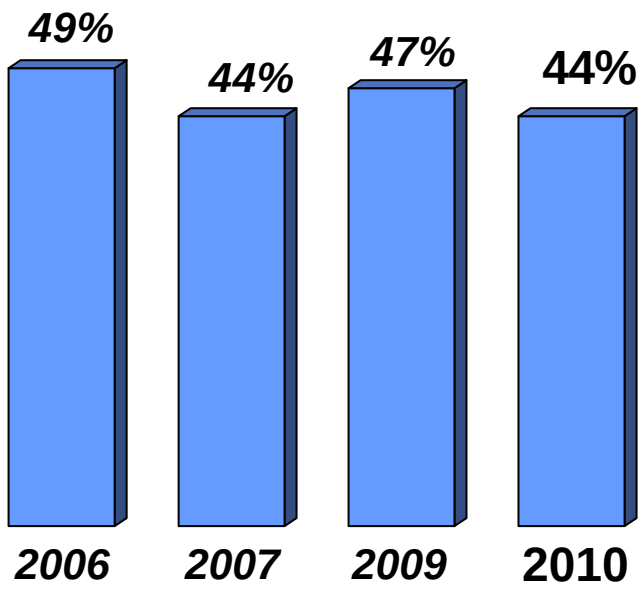
Only Slight Shifts In Public Confidence In Federal Agencies

% great deal/fair amount of confidence that they maximize benefits/minimize risks of scientific/technological advancements in the industry they are associated with



And Little Change In Public Confidence In Businesses

% great deal/fair amount of confidence that they maximize benefits/minimize risks of scientific/technological advancements in the industry they are associated with



By Two To One, Public Supports Continued Work In Synbio Over Ban

Which comes closer to your point of view?

Synthetic biology should move forward, but more research must be done to study its possible effects on humans and the environment

A ban should be placed on synthetic biology research until we better understand its implications and risks

View By Awareness of Synbio

	Move forward	Ban
Heard a lot	80%	15%
Heard some	76%	20%
Heard a little	66%	29%
Heard nothing	52%	44%

View By Informed Impression of Synbio

	Move forward	Ban
Benefits outweigh	90%	8%
Benefits/risks equal	72%	24%
Risks outweigh	31%	64%

Support For Continued Work Vs Ban, *Among Key Subgroups*

Which comes closer to your point of view?

	Move forward	Ban
All adults	**63%**	**33%**
Men	**72%**	25%
Women	55%	**40%**
High school/less	51%	**45%**
Some college/tech ed	61%	34%
College graduate	**74%**	22%
Whites	**68%**	29%
African Americans	41%	**52%**
Hispanics	53%	**43%**

	Move forward	Ban
Income:		
Under $30K	50%	**47%**
$30K to $50K	57%	**38%**
$50K to $75K	**71%**	25%
Over $75K	**80%**	16%
Attend religious services weekly	56%	**39%**
Evangelicals	51%	**43%**

Majority Wants Government Regulation

Which comes closer to your point of view on regulation of synthetic biology research?

Synthetic biology research should be regulated by the federal government because voluntary research guidelines developed jointly by industry and government cannot provide adequate oversight

52%

Voluntary research guidelines developed jointly by industry and government can provide adequate oversight of synthetic biology research

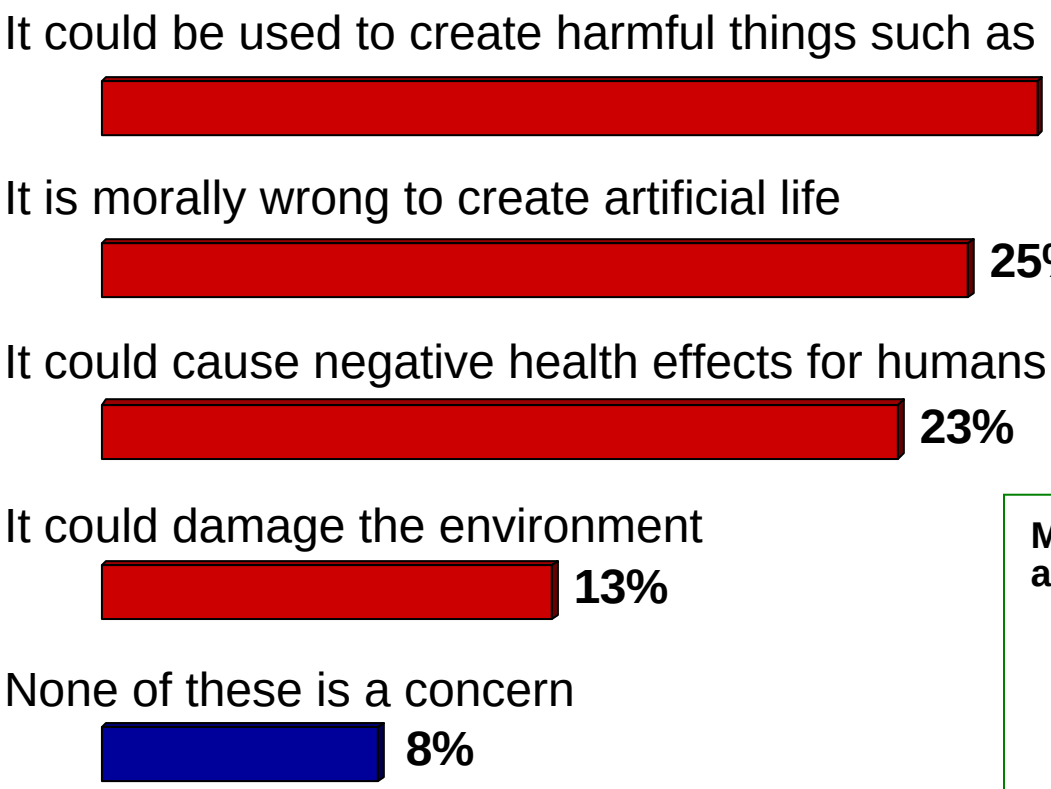
36%

Not sure

12%

Top Concerns About Synthetic Biology

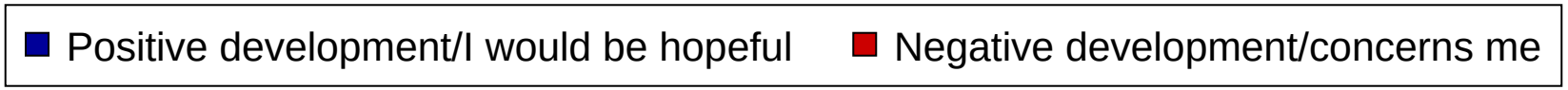
Which ONE of these concerns you most?

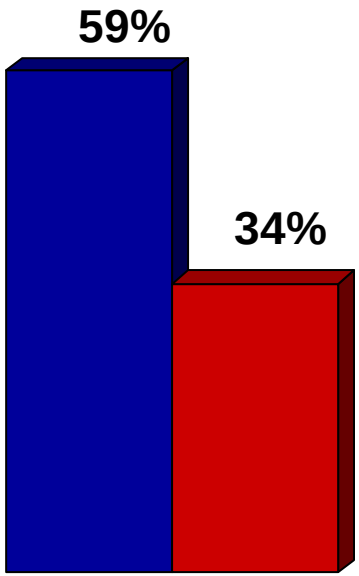


Moral implications are the top concern among adults who:

Have heard nothing about synbio	32%
Think risks outweigh benefits after hearing information	36%
Move to thinking risks outweigh	37%
Support ban until we know more	44%

Majority Sees Developing Flu Vaccine With Synbio As Positive Development



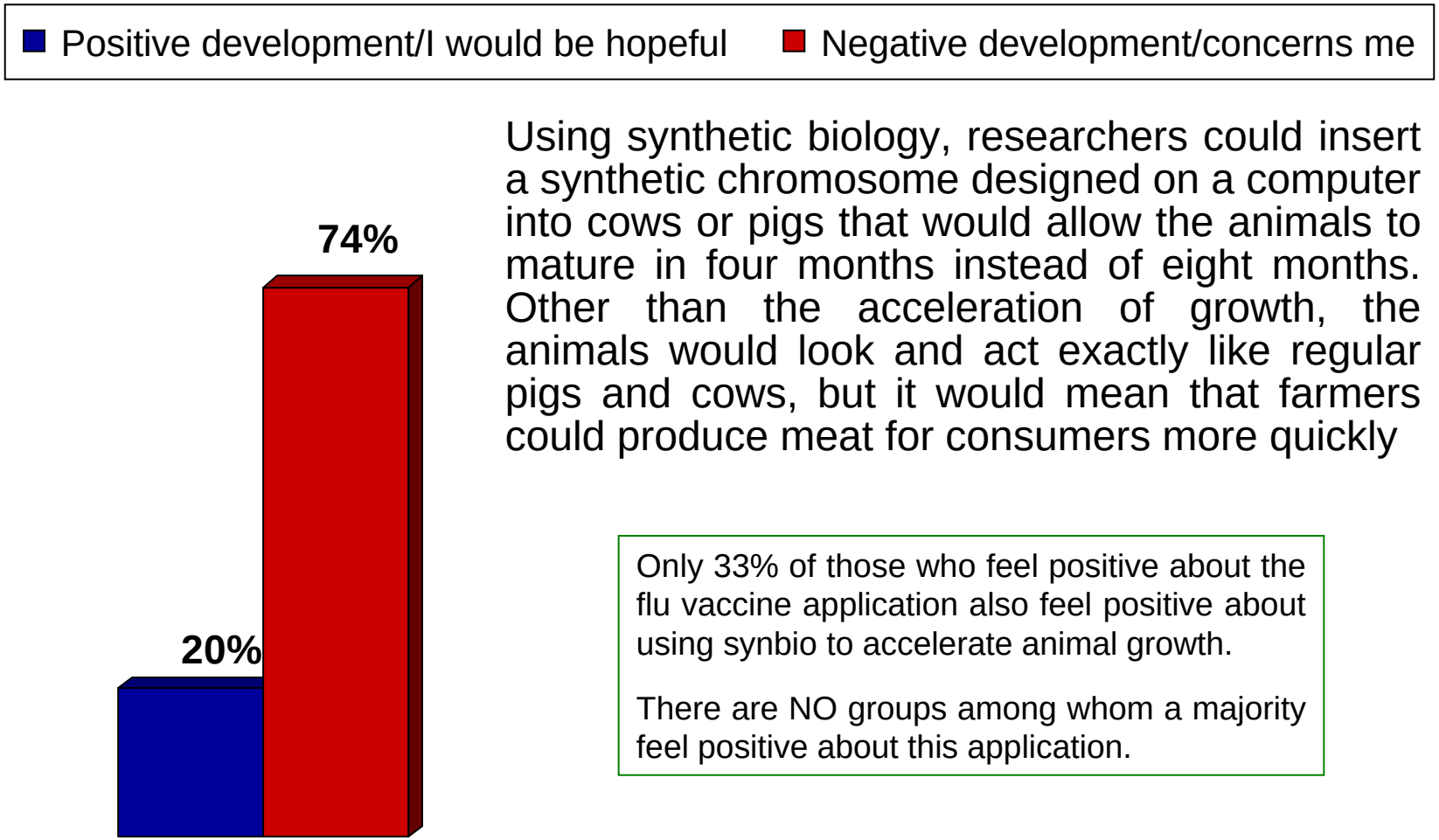


Current flu vaccine manufacturing requires the replication of the flu virus in chicken eggs. This is a lengthy and time-consuming process often taking four to five months to make vaccines available for use. Using synthetic biology, an influenza vaccine could be designed in a few hours on a computer and biologically manufactured in weeks instead of months.

Seen as negative development by majorities of:

Adults who support ban	64%
Adults who believe risks outweigh benefits	61%
African Americans	57%
Adults who say moral issues are greatest concern	54%

Large Majority Concerned About Using Synbio To Accelerate Animals Growth

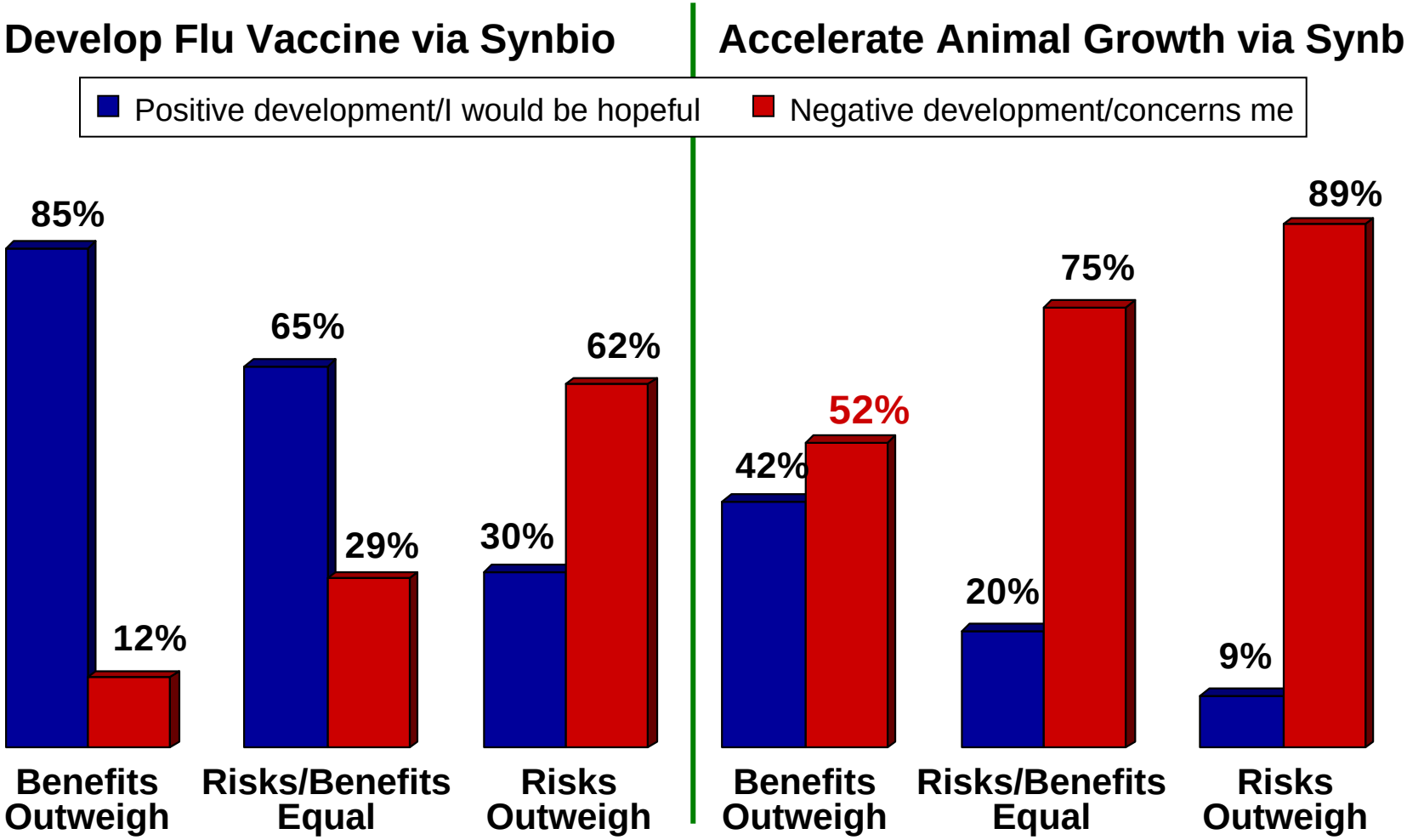


Using synthetic biology, researchers could insert a synthetic chromosome designed on a computer into cows or pigs that would allow the animals to mature in four months instead of eight months. Other than the acceleration of growth, the animals would look and act exactly like regular pigs and cows, but it would mean that farmers could produce meat for consumers more quickly

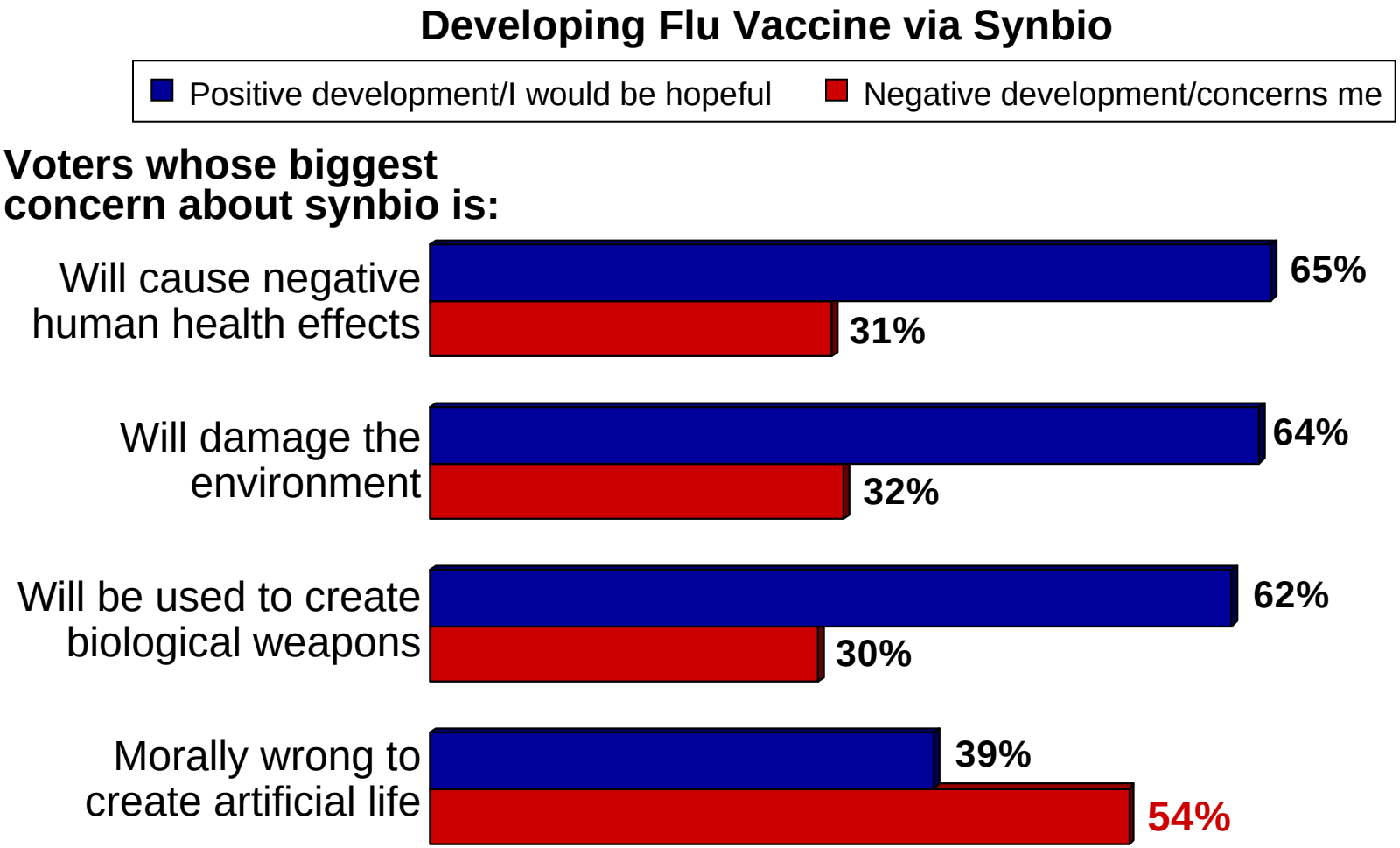
Only 33% of those who feel positive about the flu vaccine application also feel positive about using synbio to accelerate animal growth.

There are NO groups among whom a majority feel positive about this application.

Views Of Flu Vaccine/Growth Of Livestock, By Initial View Of Synbio



Views Developing Of Flu Vaccine, By Greatest Concern About Synbio



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