

Values in Conflict: Public Attitudes on Embryonic Stem Cell Research

A Report from the Genetics and Public Policy Center

**Values in Conflict:
Public Attitudes on Embryonic Stem Cell Research**

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Introduction

Embryonic stem cell (ESC) research has raised profound moral issues that have become the focus of a polarized policy debate. Some believe that human life at all stages of development – including embryos – holds the same moral value and therefore deserves the same respect and protection as a born child. Others have argued that human embryos are not morally equivalent to born babies but are nevertheless deserving of more respect than cells in a Petri dish. Still others hold that a human embryo in a Petri dish is “just a clump” of cells with no more moral status than any other cells growing in the laboratory.

Some surveys and social science research have sought to tap into how the public feels about ESC research. However, how the public lines up along the continuum of available policy options concerning ESC research is much less clear.

Our goal was to field a credible, unbiased, comprehensive survey to assess the awareness and approval or disapproval of human embryonic stem cell (ESC) research. We also aimed to identify values underlying these attitudes as well as the public’s policy preferences for ESC research.

The Attitudes Towards Stem Cell Research Survey collected data from 2,212 Americans between September 9 and 19, 2005. The respondents were

sampled randomly from Knowledge Network’s web-enabled research panel designed to be representative of the entire U.S. population. The panel is representative because it was selected using high-quality probability sampling techniques, and was not limited to current Web users or computer owners. Households were selected using random digit dialing (RDD) and each household was provided with free hardware and Internet access as needed for research participation. Three thousand ninety-nine panel members were sampled and 2,254 cases completed the survey for a completion rate of 73 percent. Forty-two cases were excluded from final analysis because they did not answer more than one-third of the survey questions. Statistical results were weighted to correct for sampling error for characteristics highly correlated with population benchmarks. For the results based on all 2,212 qualified completions, there is a 95 percent confidence that the maximum margin of sampling error is +/- 2.5 percentage points. For more details about the methodology go to: www.knowledgenetworks.com/ganp/index.html

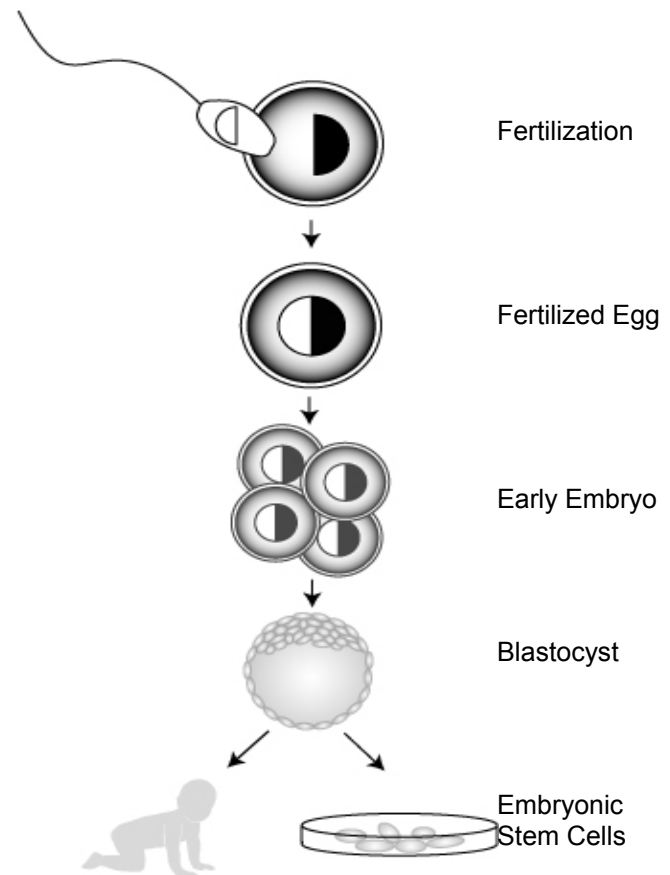
The survey questions on embryonic stem cell research used in this report are available at www.DNApolicy.org.

Scientific and Policy Environment

Stem cells are unique cells found all over the human body. They can, in theory, divide indefinitely to produce more of the same cells and also can, when coaxed, develop into specialized cell types such as muscle, skin, or nerve. Stem cells generally exist in the body to replace cells normally lost due to age, damage, normal wear and tear, injury, or disease.

There are several types of stem cells, defined mainly by the tissue from which they are isolated – embryos or adult tissues. Adult stem cells have been found in several tissues in the body. They are limited in their ability to develop into specialized cell types; generally they only can develop into the cell types of the tissue from which they were isolated. Embryonic stem cells, however, are believed to be able to develop into all adult human cell types. ESCs are isolated from human embryos early in development.

A fertilized human egg will divide and form two cells; each of those cells will divide, forming four cells, and so on. If one cell of a two-cell embryo is destroyed, the remaining cell can produce an entire embryo. Or, if the two cells become separated, each cell can give rise to an individual embryo, resulting in identical twins. Thus, early embryonic cells can give rise to all the cells in an adult.



At five to seven days after fertilization, the cells of the embryo undergo physical changes to prepare it for implantation into the uterine wall. However, if these cells are isolated and grown under lab conditions in a Petri dish, they can continue to divide and remain stem cells capable of giving rise to all cell types for long periods of time. These cells are the embryonic stem cells that are used in research.

The ability of embryonic stem cells to develop into more cell types than adult stem cells is what makes them more promising for research and for future therapies and cures. Although adult stem cells and umbilical cord blood stem cells can provide research material and already have demonstrated

promising success with patients, most scientists think that embryonic stem cells will give rise to better results.

The ESCs currently available were generated by isolating and culturing cells from week-old human embryos. Because ESCs currently only can be created by destroying human embryos, the debate surrounding their creation and use turns, at least in part, on how people assign moral status to a human embryo.

Some consider it immoral under any circumstance to destroy an embryo for any purpose, including for medical research. Others consider it acceptable to destroy embryos to isolate ESCs only if the embryos are remaining after in vitro fertilization (IVF), since such embryos would likely be discarded anyway. Still others believe that the science to develop cures and therapies from stem cell research is too important to be hindered and they consider the destruction of embryos in order to pursue stem cell research to be not only acceptable but necessary.

Key Events in Science:

1978 – First “test tube” baby, Louise Brown, born in Manchester, UK.

1981 – First American IVF baby, Elizabeth Carr, born in Norfolk, VA.

1997 – First successful cloning of a mammal, Dolly the sheep, by Dr. Ian Wilmut’s group of the Roslin Institute in Edinburgh, Scotland.

1998 – Dr. James A. Thomson of University of Wisconsin, Madison and colleagues are the first to report the isolation of human embryonic stem cells.

2004 – Korean scientists led by Dr. Woo Suk Hwang of Seoul National University in Korea report the cloning of 30 human embryos. The embryos were destroyed after one week to harvest human embryonic stem cells. Only one cell line was generated successfully.

2005 – Dr. Woo Suk Hwang’s group of Seoul National University in Korea reports the creation of 11 human embryonic stem cell lines from cloned human embryos to be used to study human disease and therapies.

Key Events in Policy

1978 – The US establishes an Ethics Advisory Board (EAB) whose review is required for federal funding of in vitro fertilization research. Failure of the Department of Health and Human Services to name members to the EAB results in a “de facto” moratorium on federal funding for this research.

1993 – The NIH Revitalization Act nullifies the requirement for EAB review.

1994 – The National Institutes of Health (NIH) establishes the Human Embryo Research Panel, which recommends federal funding for embryo research using either “spare” embryos from IVF with parental consent, or embryos created solely for research purposes.

1994 – President Clinton responds to the NIH recommendations announcing that he did “not believe that federal funds should be used to support the creation of human embryos for research purposes” and directs the NIH not to support such research.

1996 – Congress passes the Dickey-Wicker Amendment banning NIH-funding of human embryo research.

1999 – The Department of Health and Human Services concludes that public funds can be used for research on human embryonic stem cells derived using only private funds.

2000 – The NIH, with support from President Clinton, releases final guidelines allowing federally funded research on human embryonic stem cells derived in the private sector.

2001 – President Bush allows federal funding of human embryonic stem cell research to proceed but only on cell lines already in existence worldwide, which were derived from leftover embryos from fertility clinics. President Bush also establishes the President’s Council on Bioethics to study ethical issues in biomedical and behavioral sciences, and oversee all federally funded human embryonic stem cell research.

2004 – H.R. 4682, the Stem Cell Research Enhancement Act of 2004, is introduced into the House that would relax limits on federal funding of human embryonic stem cell research.

2004 – Californians pass Proposition 71, allowing the state to spend \$3 billion over 10 years to fund human embryonic stem cell research.

2005 – A number of bills on stem cell research are introduced in Congress that support alternatives to embryonic stem cell research funding including H.R. 596, the Cord Blood Stem Cell Act of 2005; H.R. 2541, the Joe Testaverde Adult Stem Cell Research Act of 2005; and S.1557, the Respect for Life Pluripotent Stem Cell Act of 2005.

2005 January – The state of New Jersey announces it will fund a \$150 million stem cell research center with promise of a future ballot initiative to allocate another \$230 million toward the center.

2005 May – The President’s Council on Bioethics publishes “Alternative Sources of Pluripotent Stem Cells” describing theoretical methods for obtaining embryonic stem cells without destroying embryos.

2005 May – The House approves, by a vote of 238 to 194, H.R. 810, that would to loosen restrictions on federal funding for human embryonic stem cell research. A similar bill, S. 471, is introduced in the Senate.

2005 May – Connecticut lawmakers earmark \$100 million for stem cell research over 10 years to compete with biotech industries in California and New Jersey.

2005 July – Illinois Governor Rod Blagojevich uses an executive order to circumvent the state legislature to dedicate \$10 million for stem cell research.

2005 July – Senate Majority Leader Bill Frist (R-TN) breaks with President Bush and announces his support to loosen federal restrictions on human embryonic stem cell research.

Survey Findings

Awareness

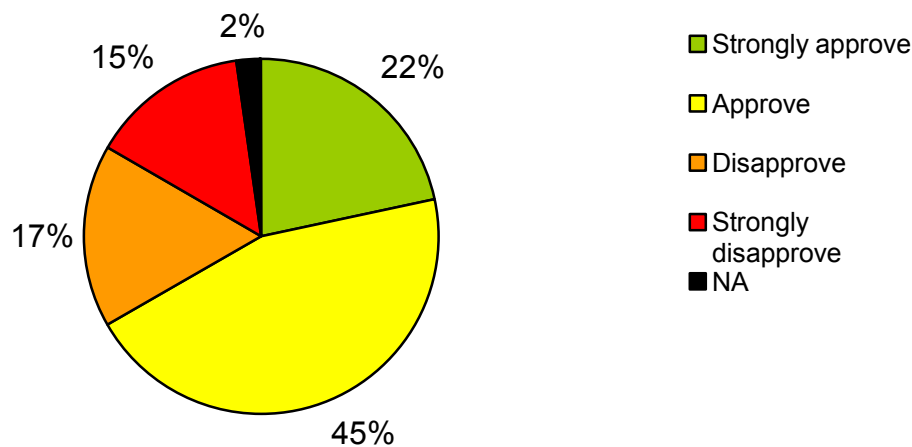
Most survey respondents (81 percent) indicated they had heard of ESC research prior to the survey. Survey respondents also were presented with three images and asked to identify the image of a one-week-old embryo. More than two-thirds (72 percent) correctly identified the image of a one-week embryo while 25 percent misidentified a 4-week fetus as a one-week embryo and 1 percent misidentified a 16-week fetus. There was almost no variation among demographic variables in respondents' abilities to correctly identify which image was that of a one-week embryo.

Approval

After reviewing a definition of ESC research (below), respondents were asked, "in general, do you strongly approve, approve, disapprove, or strongly disapprove of embryonic stem cell research?" Two-thirds of respondents indicated that they approve or strongly approve of ESC research.

- A majority of respondents of both sexes and all ages, education levels, political affiliations, and racial/ethnic groups approve or strongly approve of ESC research.

Approval of Embryonic Stem Cell Research



- Women are more likely than men to disapprove or strongly disapprove of ESC research (35 percent vs. 27 percent).
- More Democrats (75 percent) than Republicans (55 percent) approve or strongly approve of ESC research with independents falling in between (66 percent).
- No significant difference was observed in approval/disapproval by race/ethnicity.
- Those with a college degree or higher were twice as likely as those with no college degree to strongly approve of ESC research (33 percent vs. 16 percent).
- A clear majority of those in all religion groups, except Fundamentalist and Evangelical Christians, approve of ESC research.
- More than two-thirds of Catholics approve or strongly approve of ESC research.
- Fundamentalist and Evangelical Christians were divided, with 50 percent approving or strongly approving and 48 percent disapproving or strongly disapproving of ESC research.
- The highest levels of approval were among “non-Christians” (85 percent approve or strongly approve) and those with no religious affiliation (80 percent approve or strongly approve).
- Fundamentalist and Evangelical Christians were 10 times more likely than those with no religious affiliation to strongly disapprove of embryonic stem cell research (25 percent vs. 2.5 percent respectively).

Embryonic Stem Cell Definition

Stem cells are cells that are able to give rise both to more stem cells and to specialized cell types (e.g. muscle cells, blood cells, liver cells). The next few questions will be about one type of stem cells called embryonic stem cells. For the purposes of today’s questions, here is a definition of embryonic stem cells.

Embryonic stem cells are obtained from early embryos and can give rise to all cell types in the human body. When stem cells are obtained from embryos, the embryo is destroyed. Most scientists believe that human embryonic stem cell research holds great promise for understanding human disease and developing new treatments for diseases such as diabetes, heart disease and Parkinson disease. Stem cells can be obtained from embryos that were created through IVF for couples trying to have a baby. Sometimes there are embryos remaining after IVF. Couples can donate these embryos to stem cell research in which the embryo will be destroyed.

Stem cells also can be obtained from bone marrow and umbilical cord blood. These stem cells are useful in treating some diseases such as some cancers and blood diseases. However, most scientists believe that developing new treatments for many diseases from these stem cells will take longer and is less certain than using embryonic stem cells.

Approval/Disapproval of ESC Research

		Approve (Net)	Strongly Approve	Approve	Disapprove	Strongly Disapprove	Disapprove (Net)	Don't know/ No Answer
	Total	66.6	21.6	45.0	16.7	14.6	31.2	2.1
Sex	Male	71.6	24.7	46.8	15.2	11.7	26.9	1.5
	Female	62.1	18.8	43.3	18.0	17.3	35.5	2.6
Age	18-29	68.8	19.6	49.3	18.0	12.0	30.0	1.2
	30-49	65.2	22.4	42.7	18.3	13.9	32.2	2.6
	50+	66.8	22.0	44.8	14.6	16.5	31.0	2.1
Education	No College	63.0	15.6	47.5	17.3	17.7	34.0	3.0
	Some College/Tech	65.4	21.2	44.2	18.0	15.8	33.8	0.07
	Bachelor's degree	74.2	29.6	44.6	13.8	9.5	23.3	2.4
	Post-Grad	75.1	40.0	35.2	14.6	9.2	23.8	1.0
Political Affiliation	Republican	54.8	13.8	41.0	21.8	21.0	42.8	2.4
	Democrat	75.1	28.1	47.0	12.2	10.8	23.0	1.8
	Indep/other /NA	66.3	13.8	52.5	19.1	11.4	30.5	3.2
Religion	Protestant*	73.9	22.4	51.4	13.3	10.5	23.8	2.3
	Roman* Catholic	68.9	22.7	46.3	14.5	15.2	29.7	1.4
	Other* Christian	57.2	13.6	43.6	21.3	18.9	40.0	2.8
	Fund/Evan	49.6	8.6	41.0	23.0	24.9	48.0	2.4
	Non- Christian	84.7	37.9	46.8	7.3	6.6	13.9	1.4
	None	79.5	40.8	38.8	16.0	2.5	18.5	2.0
Race/Ethnicity	White	66.5	23.3	43.2	16.9	15.0	31.9	1.6
	Black	64.1	13.2	50.9	18.8	12.9	31.7	4.2
	Hispanic	64.1	21.7	42.4	17.3	15.6	32.9	3.0

* not Fundamentalist/Evangelical

Conflicting Values

Survey respondents were asked a series of five questions, in random order, that sought to unearth the relative value respondents placed on pursuing ESC research and protecting embryonic life.

All three of the statements supporting protecting embryonic life garnered lower levels of agreement than the two statements supporting ESC research (see below).

Responses to these five statements were evaluated to determine the extent to which respondents consistently favored one side or the other. A small number of respondents (6 percent) strongly agreed with the three statements supportive of embryonic life

and strongly disagreed with the two statements supportive of ESC research. An equal number (6 percent) of respondents strongly agreed with the two statements supportive of ESC research and strongly disagreed with the three statements supportive of protecting embryonic life. In some respects, these two groups represent the extremes of the debate, with consistent and strongly held views.

Thirteen percent agreed or strongly agreed with the embryo protection statements and disagreed or strongly disagreed with the statements promoting ESC research. Twenty-one percent disagreed or strongly disagreed with the embryo protection statements and agreed or strongly agreed with the statements supporting ESC research.

ESC Research: Protecting Embryos or Pursuing Research

Survey Question	Net Agree	Strongly agree	Agree	Disagree	Strongly Disagree	Net Disagree	DK/NA
Using embryos for research is dehumanizing and turns embryos into commodities.	41.0	16.8	24.2	40.0	16.0	56.0	3.0
It is really important to protect human embryos, even if it will delay the development of new medicines.	47.5	16.9	30.6	34.3	15.8	50.1	2.4
It would be terrible if embryos were destroyed because of policies that promote embryonic stem cell research.	53.2	17.3	35.9	30.6	13.3	43.9	3.0
It is really important to find cures for diabetes, heart disease, and Parkinson as quickly as possible, even if it means destroying embryos to do so.	56.1	21.2	34.9	26.5	14.9	41.4	2.6
It would be terrible if cures were delayed because of policies that make embryonic stem cell research difficult.	67.3	24.2	43.1	20.1	10.2	30.3	2.4

These respondents also had consistent views but expressed them less strongly than the respondents at the poles. Fifty-two percent of respondents agreed with one or more statements supportive of embryonic life AND one or more statements supporting ESC research. It is likely that these respondents have moral concerns about the destruction of human embryos but also wish to see important research proceed.

On balance, the responses to this series of questions evidenced somewhat higher support for pursuit of research than for protection of embryos. This finding was supported by responses to the single item: “All in all, which is more important to you, conducting embryonic stem cell research that might result in new medical cures OR not destroying the human embryos involved in this research?” A majority, 61 percent, indicated that conducting ESC research was more important, while 37 percent indicated that not destroying embryos was more important¹.

¹ Question from an earlier survey by the Pew Research Center for the People and the Press
<http://people-press.org/commentary/display.php3?AnalysisID=111>

Policy Preferences

Survey respondents were asked to review the following four possible approaches the government could take towards embryonic stem cell research using embryos remaining after IVF and select the one that they thought is the best government policy.

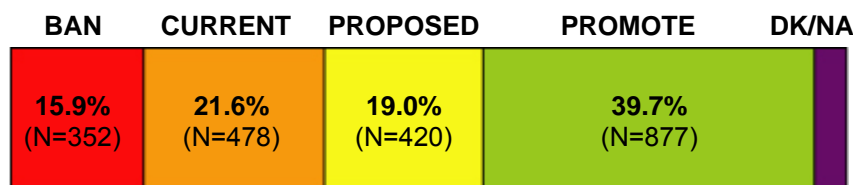
Ban: The government should prohibit all research to create or study embryonic stem cells.

Current: The government should keep the current policy that allows federal funding for research to study a small number of embryonic stem cells created before August 2001.

Proposed: The government should not fund research to create new embryonic stem cells, but if private funding is used to create new embryonic stem cells then the government should fund research to study these cells.

Promote: The government should fund research to both create and study new embryonic stem cells.

The responses are shown below:



Survey Text Preceding Policy Questions

There is a public debate about embryonic stem cell research and disagreement about the public policies that should be put in place regarding this research. Some believe embryonic stem cell research is morally acceptable because research to find cures for diseases is extremely important. Others believe embryonic stem cell research is morally unacceptable because it requires the destruction of human embryos.

A number of proposals have been put forward for embryonic stem cell research policy. The current policy of the US government has three components: 1) it allows federal funding of research using a limited number of embryonic stem cells that were created before August 2001 (because those IVF embryos had already been destroyed); 2) it prohibits federal funding to create new embryonic stem cells or to study new embryonic stem cells created with private funds; and 3) it permits private funds to be used to create and study new embryonic stem cells. Some feel the current policy is a good compromise because of the controversy about destroying embryos. Others feel that federal funding is essential to spur important medical research.

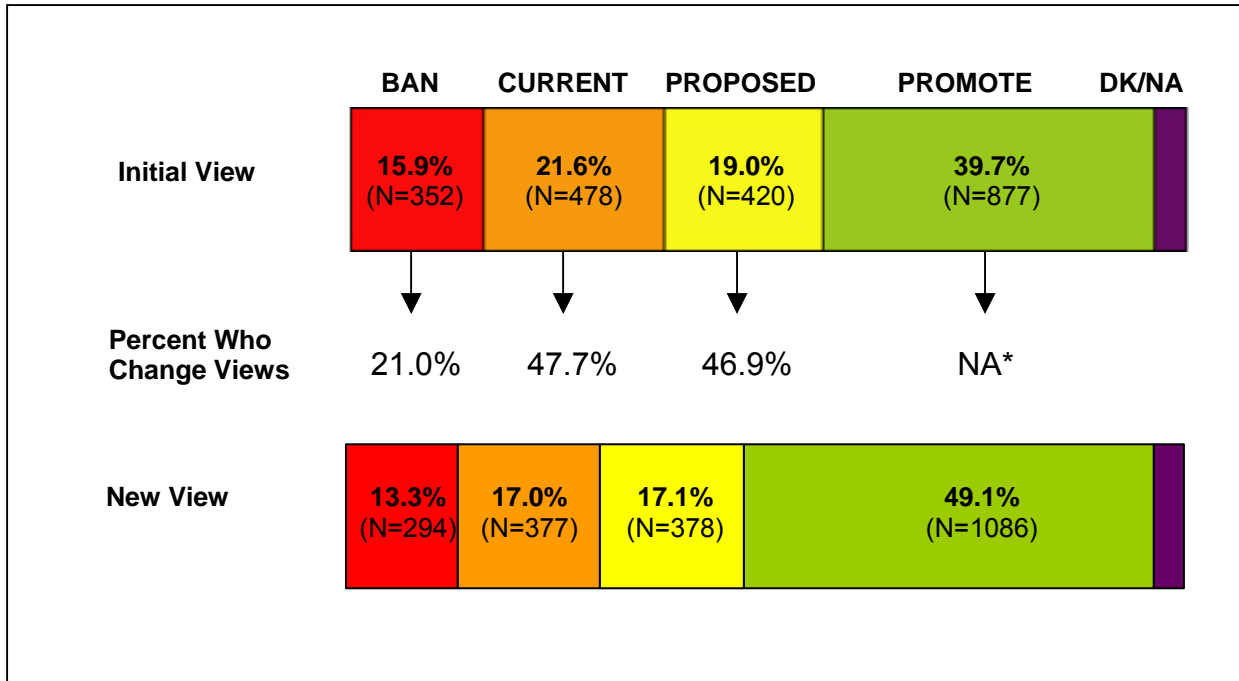
- Sixteen percent of Americans want a more restrictive policy than is currently in place.
- Twenty-two percent of Americans support the current human embryonic stem cell policy.
- Fifty-nine percent support policies that are more permissive toward embryonic stem cell research than the current policy.
- More Americans support a government policy of funding both creation and study of new embryonic stem cells than support any other policy.

To get a sense of how “fixed” or “fluid” these policy preferences are and how they might shift in response to potential scientific advances in embryonic stem cell research, respondents were presented with two hypothetical scenarios. In the first scenario, the *treatment scenario*, respondents were asked to “imagine that in a year from now scientists report results from new research showing that embryonic stem cells are an effective treatment for a serious disease like diabetes.”

In the second scenario, the *alternative scenario*, respondents were asked to “imagine that in a year from now scientists report results from new research in which new embryonic stem cells are created from embryos without harming or destroying the embryo. The embryos that provided the stem cells could still be transferred to a woman’s womb and produce healthy babies.”

Following each scenario, survey respondents were asked, “Would such a development change your views about government policy about research using embryonic stem cells from embryos donated by couples after IVF?”

In response to the treatment scenario, a significant number of respondents indicated this new information would change their view. Those that selected “ban” as their initial policy preference were least likely to change their view in response to the treatment scenario. Nearly half of those who preferred the current or proposed ESC policy said that the treatment scenario would change their view.



Those who said their view would change were then asked what their policy preference would be based on the new information. In fact, 30 percent reaffirmed their original policy preference. Of those who did change their position in response to the treatment scenario, most selected a more permissive policy. In particular, 25 percent of respondents who initially supported either a complete ban or the current policy, would, in response to the treatment scenario, now support the proposed or promote policy options. The new distribution of policy preferences following the treatment scenario is shown above.

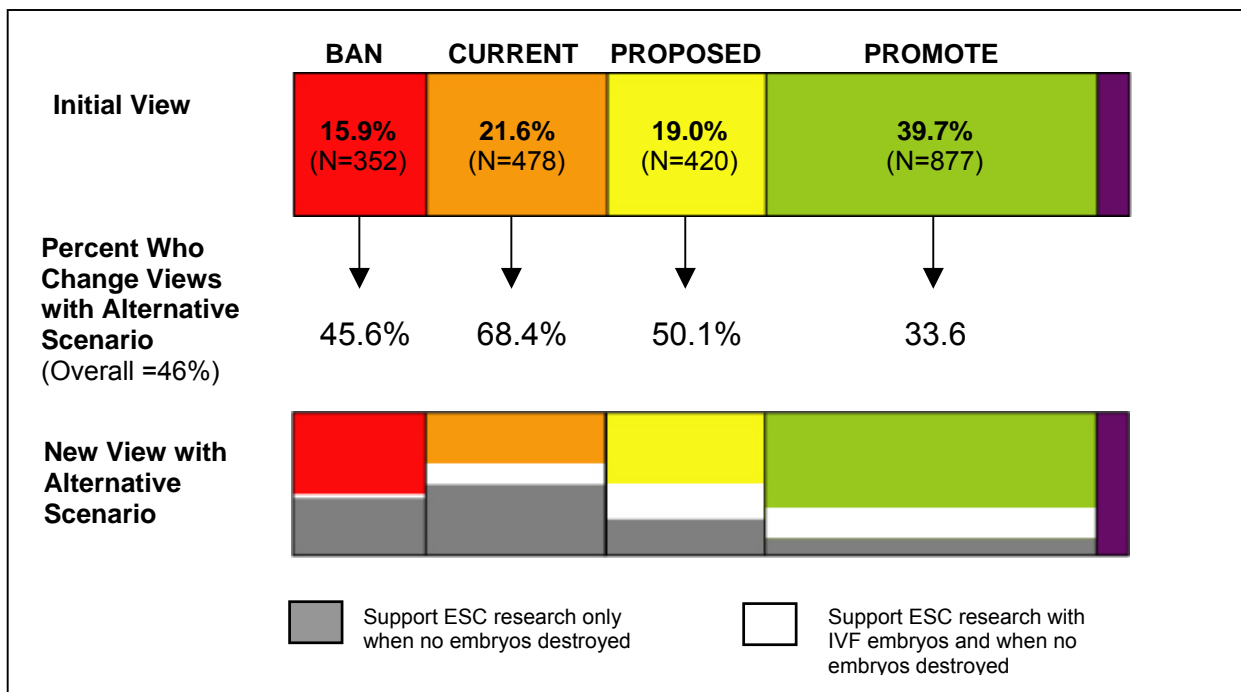
* Those who initially selected “promote” were not asked about the treatment scenario since they already held the most permissive of the four ESC policy options.

In response to the alternative scenario, nearly half (46 percent) of respondents indicated they would change their minds. Those who originally favored current policy were mostly likely to say they would change their views in response to the alternative scenario (68 percent) while those who selected the promote option were least likely to say the alternative scenario would change their minds (34 percent).

Those indicating the alternative scenario would change their views were asked whether, based on this new information, they would support ESC research “only when embryos are not destroyed” or if they would support embryonic stem cell research “using embryos from both sources.”

After being presented with the alternative scenario, 41 percent of respondents who initially preferred a complete ban on ESC research were willing to support ESC research if no embryos are destroyed. Similarly, 52 percent of those who initially supported the “current” policy would support ESC research only if embryos would not be destroyed.

The prospect that ESC research could be pursued without embryo destruction had a less pronounced effect on the views of respondents who favored government policies more supportive of ESC research. Twenty-four percent of those who initially supported the “proposed” policy and 12 percent of those who supported the “promote”



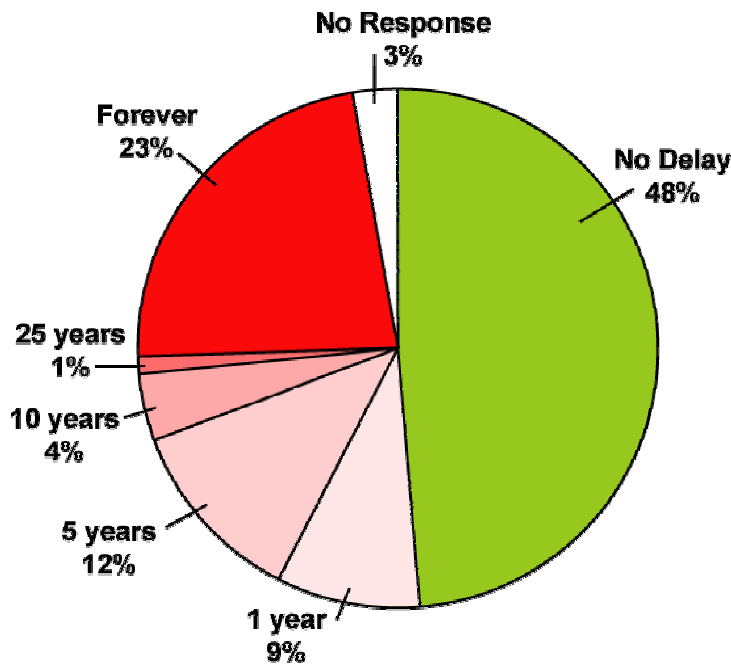
policy of funding both the creation and study of new ESCs would then only support ESC research if embryos are not destroyed. Thus, 16 percent of respondents favoring one of the two more permissive policies would, in response to the alternative scenario, only favor ESC research if embryos were not destroyed.

Although progress is being made in the development of techniques for creating ESCs without destroying embryos, the alternative scenario does not yet exist. Survey respondents were asked whether they would be willing to delay research to find alternative sources.

Those who said “yes” were asked how long they would be willing to delay progress in medical research. The results are shown in the chart below.

The responses were almost equally divided between those who said they would accept a delay in medical research and those who would not, with nearly a quarter saying they would be willing to delay progress in medical research “forever.”

Would you be willing to delay progress in medical research in order to find sources of stem cells that do not involve embryo destruction? If so, for how long?



More than Moral Status

Survey respondents were provided with a description of moral status (below) and then asked to indicate on a continuum from no moral status to maximum moral status, what moral status they would accord to a one-

Survey Text for Moral Status

There is debate about the “moral status” of human eggs, embryos and fetuses. Moral status is a term people use to capture the extent to which “something” should be given the protections and the level of respect that society gives to each of us. For example, some people believe that an embryo has “maximum moral status” which means that it is always morally wrong to destroy an embryo. By contrast, other people believe that an embryo has no moral status, which would mean that there are no moral problems in destroying an embryo. Still others believe that the moral status of an embryo falls somewhere in between. These people believe that under some circumstances it might be morally permissible to destroy an embryo.

week-old embryo in a Petri dish. There was a significant grouping of responses at maximum moral status (maximum) and another significant grouping at or near no moral status (none/low). The remaining responses were distributed across the continuum and were divided into two groups on either side of the midpoint (high and moderate).

More than half of the respondents either ranked the embryo as having maximum moral status (28 percent) or as having no/low moral status (30 percent).

Levels of disapproval of ESC research (63 percent) were considerably higher among those who believe that a one-week embryo in a Petri dish has maximum moral status than among those who granted the embryos high, moderate, or no/low moral status.

For some respondents, attitudes towards ESC research could not be explained by their views about the moral status of embryos. For example, more than one-third (36 percent) of respondents who accorded the embryo maximum moral status nevertheless approved of ESC research. Moreover, 33 percent of those assigning maximum moral status to the embryo preferred an ESC research policy that is more permissive than current policy. Among the respondents who accorded the embryo no or low moral status, 17 percent disapproved of ESC research and 22 percent preferred either the current policy on ESC research or a total ban.

Embryo Moral Status	ESC Research				Policy Preference		
	Total	Approve	Disapprove	Ban	Current	Proposed	Promote
Maximum	27.7	35.5	63.0	34.0	29.8	14.0	18.5
High	25.7	70.1	27.7	7.6	32.4	18.6	39.1
Moderate	14.5	85.4	12.4	6.7	17.4	23.4	49.6
None/Low	29.5	81.3	16.6	10.1	12.0	20.1	53.0

Intent vs. Use

In the policy debate on embryo research, a distinction often is made between using embryos remaining after IVF and creating embryos specifically for research. Some hold the position that it is ethically acceptable to destroy embryos in ESC research if they were created with the intent of using them in fertility treatment, are not needed for that purpose, and likely will be discarded, but that it is not ethically acceptable to create embryos with the intent of destroying them in research.

This idea of the intent behind the creation of embryos has become more prominent in public discourse about ESC research and about research cloning in particular.

However, little previous work has been done to determine how the American public feels about this issue.

Survey respondents were presented with the following text about this issue:

Survey Text: Intent vs. Use

In addition to embryos donated by couples after infertility treatment with IVF, it is possible for people to donate sperm and eggs specifically to create embryos to be used to make embryonic stem cells. Some scientists believe that stem cells from these embryos would be particularly useful in research. Some people oppose creating embryos specifically to be used to make stem cells because they believe it is wrong to create embryos only to destroy them.

A majority (60 percent) responded that they do not see a moral difference between creating embryos for research and using those remaining after IVF.

	Yes	No	DK/NA
In your view, is there a moral difference between creating embryos specifically for research and using embryos remaining after IVF for research?	37.9%	60.2%	1.8%

Respondents were divided on whether they approve (49 percent) or disapprove (48 percent) of using embryos specifically created to be used in ESC research.

	Net Approve	Strongly Approve	Approve	Disprove	Strongly Disapprove	Net Disapprove	DK/NA
In general, do you strongly approve, approve, disapprove or strongly disapprove of using embryos specifically created to be used in to make embryonic stem cells in which the embryo will be destroyed?	48.6%	10.2%	38.4%	26.5%	21.3%	47.8%	3.6%

Conclusion

Stem cells are unique among human cells in that they possess the uncanny ability to develop into virtually any other cell of the body, offering a hypothetical tool kit for repairing diseased hearts, mending broken spinal cords, or correcting genetic diseases, among other hoped-for benefits. Stem cells derived from very early embryos show the most promise in research to date, but the embryo is destroyed in the process of acquiring the cells themselves. This outcome is not acceptable to individuals and institutions that believe human life at all stages of development deserves protection and should not be destroyed.

Much current debate focuses on whether other sources of stem cells – blood from the umbilical cord removed at birth, for example – might be as useful without the need to destroy embryos, but the scientific consensus so far is that embryos remain the best research choice. Typically, the embryos used are those remaining at the conclusion of fertility treatments that would otherwise be discarded or kept in frozen storage; a ban on the use of Federal funds to create new stem cells using these embryos currently is in effect, and various pieces of legislation pending in Congress would either extend this ban or relax it.

A survey of 2,212 Americans conducted September 9-19, reveals a

public opinion landscape that bears little resemblance to the polarized, deep moral divide expressed on the floor of the Congress and in the op-ed pages of American newspapers.

The survey found wide support for embryonic stem cell research that cut across political, religious and socio-economic lines, with two-thirds of respondents either approving or strongly approving of human embryonic stem cell research. Even Fundamentalist and Evangelical Christians – long considered the most hard-line opponents of embryonic stem cell studies – split evenly on approval for embryonic stem cell research.

Respondents were given a choice of four ESC research policy options: banning all embryonic stem cell research, retaining the current Bush administration policy, relaxing restrictions along the lines of some Congressional proposals that would allow federal funding of research using embryonic stem cell lines created using private funds, and unqualified Federal support for embryonic stem cell creation and research.

Twenty-two percent of respondents expressed support for the current Bush administration policy; fewer still (16 percent), would ban embryonic stem cell research altogether. A majority favor relaxing embryonic stem cell restrictions, including 40 percent who would support federal funding for both the creation of new embryonic stem

cell lines and further research using them.

The survey also explored how potential future changes in the scientific landscape might affect public opinion. Respondents were asked to imagine two scenarios – the development of a technique to isolate ESCs without destroying embryos, or a major advance in treating disease based on embryonic stem cell technologies. About 25 percent of respondents who initially favored the current policy or a complete ban of ESC research indicated that if the treatment scenario were to materialize, they would support a public policy for ESC research that is more supportive than their initial policy position. Similarly, if the alternative scenario were to materialize, 16 percent of respondents who currently endorse a public policy towards ESC research that is more permissive than the current public policy would then support ESC research only if embryos were not destroyed.

The survey looked beyond overall attitudes toward ESC research to explore the competing values that underlie them. Survey respondents were asked a series of questions designed to ascertain the value placed on progress in ESC research and protecting early human embryos. The survey revealed a subtle topography of the public's attitudes with only a small fraction (6 percent at each pole) of the public occupying the extreme positions that so frequently characterize the

public and policy debate. Fully half expressed agreement both with statements that placed high priority on protecting human embryos *and* with statements that placed high priority on searching for medical cures through ESC research. When asked in a single item which was more important, 60 percent selected ESC research and 37 percent selected not destroying embryos.

While the moral status of human embryos has been the centerpiece of the political debate about ESC research, often articulated as an all-or-nothing proposition that is fully predictive of all of an individual's other views on embryonic stem cell research, the public's views about the moral status of embryos and the relationship of those views to ESC research policy preferences has not been fully explored.

The survey showed that nearly the same number of Americans believe that an embryo in a Petri dish has no or low moral status (30 percent) or maximum moral status (28 percent). The remainder (42 percent) accord embryos some intermediate moral status.

A third of those who believe an embryo in a Petri dish has maximum moral status nonetheless approve of ESC research. Similarly, a third support ESC research policies more permissive than the current policy and which involve funding for research using new ESCs.

In a parallel fashion, 17 percent of those who accord an embryo in a Petri dish no or low moral status nevertheless disapprove of ESC research and support the current ESC policy or an all-out ban (22 percent). Thus, even for a sizeable number of respondents who fall at the polar ends of the moral status continuum, the commonly held expectation that they will support the corresponding policy extreme does not hold true.