NATIONAL SURVEY OF PUBLIC OPINION ON GLOBAL WARMING

STANFORD UNIVERSITY

RESOURCES FOR THE FUTURE

RECONMR

Interviewing conducted by ReconMR

Survey designed by

Jon A. Krosnick and Bo MacInnis (Stanford University)

with

Scholars from Resources for the Future

Funding for this research was provided by the Woods Institute for the Environment at Stanford University, the Precourt Institute for Energy at Stanford University, the School of Earth, Energy, and Environmental Sciences at Stanford University, Resources for the Future, and ReconMR.

Interview dates: May 28- August 16, 2020

Interviews: 999 adults nationwide
Margin of error: +/- 4.0 percentage points at the 95% confidence level for full sample results

Notes:
All results show percentages among all respondents unless otherwise labeled.
All results shown are percentages unless otherwise labeled.
The sum might not add to exactly 100 due to rounding.
Some “0”s are numbers less than .5 rounded down
DK/RF is the sum of the percent of respondents who said “don’t know” and the percent of respondents who declined to answer a question.
“(Vol.)” means that interviewers were instructed to record a particular answer if a respondent provided it, despite that answer not being offered explicitly as a response option by the question.
Q1. How much do you trust the things that scientists say about the environment - completely, a lot, a moderate amount, a little, or not at all?

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<th>A moderate amount</th>
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Q4a. As far as you know, would you say that weather patterns around the world have been more stable in the last three years than before that, more unstable, or about the same?

Q4b. As far as you know, would you say that weather patterns around the world have been more unstable in the last three years than before that, more stable, or about the same?

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<tr>
<th>Month</th>
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Q5a. As far as you know, would you say that average temperatures around the world have been higher in the last three years than before that, lower, or about the same?

Q5b. As far as you know, would you say that average temperatures around the world have been lower in the last three years than before that, higher, or about the same?

---

1 Half of the sample was asked Q4A, and the other half of the sample was asked Q4B.
2 Half of the sample was asked Q5A, and the other half of the sample was asked Q5B.
### Table 1: Q5a/b

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### Table 2: Q6a/Q6b

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[Nov-2010, 2020] Q6a\(^3\). As far as you know, would you say that weather patterns in the county where you live have been more stable in the last three years than before that, more unstable, or about the same?

[Nov-2010, 2020] Q6b. As far as you know, would you say that weather patterns in the county where you live have been more unstable in the last three years than before that, more stable, or about the same?

[2009, Jun-2010] Q6a. Would you say that weather patterns in the county where you live have been more stable in the last three years than before that, more unstable, or about the same?

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\(^3\) Half of the sample was asked Q6A, and the other half of the sample was asked Q6B.
Q12. What is your personal opinion? Do you think that the world's temperature probably has been going up over the past 100 years, or do you think this probably has not been happening?

Q12. What is your personal opinion? Do you think that the world's temperature probably has been going up [HALF SAMPLE, slowly] over the past 100 years, or do you think this probably has not been happening?

Q12. You may have heard about the idea that the world's temperature may have been going up slowly over the past 100 years. What is your personal opinion on this - do you think this has probably been happening, or do you think it probably has not been happening?

<table>
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4 Half the sample was asked the question with the word “slowly” and the other half was asked the question without the word “slowly”.
Q13. How sure are you that the world's temperature has been going up over the past 100 years - extremely sure, very sure, somewhat sure, or not sure at all?

[2012] Q13. How sure are you that the world’s temperature has [IF Q12 = 2 “PROBABLY HAS NOT BEEN HAPPENING”, not] been going up [HALF SAMPLE, slowly] over the past 100 years - extremely sure, very sure, somewhat sure, or not sure at all?

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[5] Half the sample was asked the question with the word “slowly” and the other half was asked the question without the word “slowly”.
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[2014-2020] Q14A. If the world’s temperature did increase over the past 100 years, do you think this increase was caused mostly by things people did, mostly by natural causes, or about equally by things people did and by natural causes?

[2014-2020] Q14B. Assuming it’s happening, do you think a rise in the world’s temperature would have been caused mostly by things people do, mostly by natural causes, or about equally by things people do and by natural causes?

[2012-2013] Q14A1. Do you think that the increase in the world’s temperature over the past 100 years was caused mostly by things people did, mostly by natural causes, or about equally by things people did and by natural causes?

[2012-2013] Q14B1. If the world’s temperature did increase over the past 100 years, do you think this increase was caused mostly by things people did, mostly by natural causes, or about equally by things people did and by natural causes?

[2006-2011]. Do you think a rise in the world’s temperature is being caused mostly by things people do, mostly by natural causes, or about equally by things people do and by natural causes?

[2006-2011]. Assuming it’s happening, do you think a rise in the world’s temperature would be caused mostly by things people do, mostly by natural causes, or about equally by things people do and by natural causes?

[2006-2011]. Would you lean toward saying it would be caused mostly by things people do or mostly by natural causes?

[1997-8] Now I’d like to ask you what you think might cause global warming. [I realized that you don’t expect global warming to happen, but I would like to ask you what you think might cause it. Some people have told us that global warming would be brought about mostly by things people do. Others have said that global warming would be brought about mostly by what nature does itself. Still others think that people and nature would play about equal roles in causing global warming. Which of these views is closest to yours?

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[2013-2020] Q14C. Do you think the increase in the world’s temperature over the past 100 years is good, bad, or neither good nor bad?

[2013-2020] Q14D. If the world’s temperature did increase over the past 100 years, do you think that that increase would be good, bad, or neither good nor bad?

[2012] Q14C. Do you think the [HALF SAMPLE, slow] increase in the world’s temperature over the past 100 years is good, bad, or neither good nor bad?

[2012] Q14D. If the world’s temperature did increase [HALF SAMPLE: slowly] over the past 100 years, do you think that that increase would be good, bad, or neither good nor bad?

[2012-2020] Q14D1e. Do you lean toward thinking it [IF Q14C = 3, is/IF Q14D= 3, would be] good, lean toward thinking it [IF Q14C = 3, is/IF Q14D= 3, would be] bad, or don’t you lean either way?

[2012-2020] Q014D1. Would you say it [IF Q14C = 1 “GOOD”, is/IF Q14D = 1 “GOOD”, would be] very good or somewhat good?

[2012-2020] Q014D2. Would you say it [IF Q14C = 2 “BAD”, is/IF Q14D = 2 “BAD”, would be] very bad or somewhat bad?

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6 Half the sample was asked the question with the word “slow” and the other half was asked the question without the word “slow”.

7 Half the sample was asked the question with the word “slowly” and the other half was asked the question without the word “slowly”.
[1997-8, 2010, 2011, 2013-2020] Q14F. If nothing is done to prevent it, do you think the world’s temperature probably will go up over the next 100 years, or do you think the world’s temperature probably will not go up over the next 100 years?

[2012] Q14F. If nothing is done to prevent it, do you think the world’s temperature probably will go up over the next 100 years, or do you think the world’s temperature probably will not go up [HALF SAMPLE, slowly] over the next 100 years?

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[1997-8, 2010, 2011, 2013-2020] Q14F1. How sure are you that, if nothing is done to stop it, the world’s temperature probably (Q14F = 1 will/Q14F = 2 will not) go up over the next 100 years, extremely sure, very sure, somewhat sure, or not sure at all?

[2012] Q14F1. How sure are you that, if nothing is done to stop it, the world’s temperature probably (Q14F = 1 will/Q14F = 2 will not) go up [HALF SAMPLE, slowly] over the next 100 years, extremely sure, very sure, somewhat sure, or not sure at all?

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8 Half the sample was asked the question with the word “slow” and the other half was asked the question without the word “slow”.

9 Half the sample was asked the question with the word “slowly” and the other half was asked the question without the word “slowly”.

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[2012-2020] Q14E. If the world’s average temperature is about five degrees Fahrenheit higher 75 years from now than it is now, overall, would you say that would be good, bad, or neither good nor bad?

[2012-2020] Q14Ez. Do you lean toward thinking it would be good, lean toward thinking it would be bad, or don’t you lean either way?

[1997-8, 2006-2010]. Scientists use the term "global warming" to refer to the idea that the world’s average temperature may be about five degrees Fahrenheit higher in 75 years than it is now. Overall, would you say that if the world’s average temperature is five degrees Fahrenheit higher in 75 years than it is now, would that be good, bad, or neither good nor bad? For “neither good nor bad”: Do you lean toward thinking it would be good, lean toward thinking it would be bad, or don’t you lean either way?

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[2006-2012]. Q15. [Assuming it’s happening.] If nothing is done to reduce global warming in the future, how serious of a problem do you think it will be for THE UNITED STATES – very serious, somewhat serious, not so serious, or not serious at all?

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[2006-2012]. Q16. [Assuming it’s happening.] If nothing is done to reduce global warming in the future, how serious of a problem do you think it will be for THE WORLD – very serious, somewhat serious, not so serious, or not serious at all?

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Q19A. How important is the issue of global warming to you personally – extremely important, very important, somewhat important, not too important, or not at all important?

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Q19B. How strong are your opinions on the issue of global warming – extremely strong, very strong, somewhat strong, not too strong, or not strong at all?

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Q20. How much do you feel you know about global warming - a lot, a moderate amount, a little, or nothing?

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[2012-2020] Q25. How much do you think the U.S. government should do about global warming - a great deal, a lot, a moderate amount, a little, or nothing?

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[2015] Q25A. How much do you think the U.S. government should do about global warming - a great deal, quite a bit, some, a little, or nothing?

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Note: In 1997 and 1998, respondents who answered “probably has not been happening” to Q12 and answered “will not go up” to Q14F were not asked this question.

[2012-2020] Q29. How much do you think the U.S. government is doing now to deal with global warming - a great deal, a lot, a moderate amount, a little, or nothing?

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<th>Nothing</th>
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Q29A. How much do you think the U.S. government is doing now to deal with global warming - a great deal, quite a bit, some, a little, or nothing?

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Q25/Q29

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Note: In 1997 and 1998, respondents who answered "probably has not been happening" to Q12 and answered "will not go up" to Q14F were not asked this question. In 1997 and 1998, the percent of DK/RF includes the percent of respondents who were not asked the question, the percent of respondents who said "don't know", and the percent of respondent who declined to answer the question.
[2018-2020] How much do you think governments in other countries should do about global warming - a great deal, a lot, a moderate amount, a little, or nothing?

[1997-8, 2009, Jun-2010, Nov-2010] Q26. How much do you think governments in other countries should do about global warming - a great deal, quite a bit, some, a little, or nothing?

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Note 1: In 1997 and 1998, respondents who answered “probably has not been happening” to Q12 and answered “will not go up” to Q14F were not asked this question.

[2018-2020] How much do you think governments in other countries are doing about global warming - a great deal, a lot, a moderate amount, a little, or nothing?

[1997-8, 2009, Jun-2010, Nov-2010] Q30. How much do you think governments in other countries are doing about global warming - a great deal, quite a bit, some, a little, or nothing?

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Note 1: In 1997 and 1998, respondents who answered “probably has not been happening” to Q12 and answered “will not go up” to Q14F were not asked this question. In 1997 and 1998, the percent of DK/RF includes the percent of respondents who were not asked the question, the percent of respondents who said “don’t know”, and the percent of respondent who declined to answer the question.
[2012-2020] Q27. How much do you think U.S. businesses should do about global warming - a great deal, a lot, a moderate amount, a little, or nothing?

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>Note 1: In May-2018, a random sample of 72 respondents was not asked this question.

[2015] Q27A. How much do you think U.S. businesses should do about global warming - a great deal, quite a bit, some, a little, or nothing?

[1997-8, 2009-2010] Q27. How much do you think U.S. businesses should do about global warming? A great deal, quite a bit, some, a little, or nothing?

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>Note 1: In 1997 and 1998, respondents who answered “probably has not been happening” to Q12 and answered “will not go up” to Q14F were not asked this question.

[2012-2020] Q31A. How much do you think U.S. businesses are doing about global warming - a great deal, a lot, a moderate amount, a little, or nothing?

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>Note 1: In May-2018, a random sample of 72 respondents was not asked this question.

[1997-8, 2009-2010, 2015] Q31. How much do you think U.S. businesses are doing about global warming? A great deal, quite a bit, some, a little, or nothing?

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</table>

Note 1: In 1997 and 1998, respondents who answered “probably has not been happening” to Q12 and answered “will not go up” to Q14F were not asked this question. In 1997 and 1998, the percent of DK/RF includes the percent of respondents who were not asked the question, the percent of respondents who said “don’t know”, and the percent of respondent who declined to answer the question.
**[2013-2020] Q28. How much do you think average people should do about global warming - a great deal, a lot, a moderate amount, a little, or nothing?**

<table>
<thead>
<tr>
<th></th>
<th>A great deal</th>
<th>A lot</th>
<th>A moderate amount</th>
<th>A little</th>
<th>Nothing</th>
<th>DK/RF</th>
<th>Total</th>
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**[2015] Q28A. How much do you think average people should do about global warming - a great deal, quite a bit, some, a little, or nothing?**

**[1997-8, 2009-2010] How much do you think average people should do about global warming? A great deal, quite a bit, some, a little, or nothing?**

<table>
<thead>
<tr>
<th></th>
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<th>Some</th>
<th>A little</th>
<th>Nothing</th>
<th>DK/RF</th>
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</table>

*Note 1: In 1997 and 1998, respondents who answered “probably has not been happening” to Q12 and answered “will not go up” to Q14F were not asked this question.*

**[2013-2020] Q32. How much do you think average people are doing now to deal with global warming? A great deal, a lot, a moderate amount, a little, or nothing?**

<table>
<thead>
<tr>
<th></th>
<th>A great deal</th>
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<th>A moderate amount</th>
<th>A little</th>
<th>Nothing</th>
<th>DK/RF</th>
<th>Total</th>
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**[1997-8, 2009-2010, 2015] Q32. How much do you think average people are doing now to deal with global warming? A great deal, quite a bit, some, a little, or nothing?**

<table>
<thead>
<tr>
<th></th>
<th>A great deal</th>
<th>Quite a bit</th>
<th>Some</th>
<th>A little</th>
<th>Nothing</th>
<th>DK/RF</th>
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<td>52</td>
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</table>
Q28. How much do you think average people should do about global warming - a great deal, a lot, a moderate amount, a little, or nothing?

Q28A. How much do you think average people should do about global warming - a great deal, quite a bit, some, a little, or nothing?

[1997-8, 2009-2010] How much do you think average people should do about global warming? A great deal, quite a bit, some, a little, or nothing?

[1997-8, 2009-2010, 2015] Q32. How much do you think average people are doing now to deal with global warming? A great deal, quite a bit, some, a little, or nothing?

[2013-2020] Q32. How much do you think average people are doing now to deal with global warming? A great deal, a lot, a moderate amount, a little, or nothing?

<table>
<thead>
<tr>
<th>Q28/Q32</th>
<th>Average people should do more</th>
<th>Average people should do the same</th>
<th>Average people should do less</th>
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<td>19</td>
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</tr>
</tbody>
</table>

Note 1: In 1997 and 1998, respondents who answered “probably has not been happening” to Q12 and answered “will not go up” to Q14F were not asked this question. In 1997 and 1998, the percent of DK/RF includes the percent of respondents who were not asked the question, the percent of respondents who said “don’t know”, and the percent of respondent who declined to answer the question.

[Some questions are held for future releases]

Q82. Do you think you have seen any effects of global warming happening already, either in person or through television, radio, newspapers, magazines, or the Internet, or you think you haven't seen any effects of global warming in any of these ways?

<table>
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<th>Total</th>
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<td>75</td>
<td>23</td>
<td>1</td>
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<td>999</td>
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</tbody>
</table>
[2012-2020] Q22. If you were to guess, about what percent of the scientists who study the world’s climate believe that the world’s temperature has been going up over the last 100 years? You can answer with a number between zero percent and one hundred percent.

[NOV 2010]. If you were to guess, about what percent of the scientists who study the world’s climate think global warming is happening? You can answer with any number between zero percent and one hundred percent.

[NOV 2010]. If you were to guess, about what percent of the scientists who study the world’s climate believe that the world’s temperature has been going up slowly over the last 100 years? You can answer with any number between zero percent and one hundred percent.

[Nov 2010, 2012, 2013, 2015, 2018] Q22x. Did you say 50 percent because you think about half of those scientists believe that, or did you say 50 percent because you’re not sure how many scientists believe that?

[2012, 2013, 2018] Q22y. If you were to guess, how many of the scientists who study the world’s temperature believe that the world’s temperature has been going up over the last 100 years? All, most, about half, a few, or none?

<table>
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<th>10-19%</th>
<th>20-29%</th>
<th>30-39%</th>
<th>40-49%</th>
<th>50-59%</th>
<th>60-69%</th>
<th>70-79%</th>
<th>80-89%</th>
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<th>100%</th>
<th>DK/RF</th>
<th>Total</th>
<th>N</th>
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<table>
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<td>Aug-2020</td>
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<td>911</td>
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</table>

_Note:_ Respondents who answered 50% to Q22 were asked Q22x, and respondents who answered “about half of those scientists believe that” were coded 50%, and respondents who answered “not sure how many scientists believe that” were asked Q22y. Respondents who said “don’t know” or refused to answer Q22 were asked Q22y. Respondents who said “all”, “most”, “about half”, “a few”, or “none” in answer to Q22y were coded 100%, 75%, 50%, 25%, and 0% for Q22, and respondents who said “don’t know” or refused to answer Q22y were coded “don’t know” or “refused” for Q22.
Q17B1. [IF Q12 = 1 “PROBABLY HAS BEEN HAPPENING”, If/IF Q12 = DK OR REF OR 2 “PROBABLY HAS NOT BEEN HAPPENING”, Assuming it’s happening, if] nothing is done to reduce global warming in the future, how much do you think it will help you personally—a great deal, a lot, a moderate amount, a little or not at all?

<table>
<thead>
<tr>
<th></th>
<th>A great deal</th>
<th>A lot</th>
<th>A moderate amount</th>
<th>A little</th>
<th>Not at all</th>
<th>DK/RF</th>
<th>Total</th>
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<tbody>
<tr>
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<td>12</td>
<td>72</td>
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</tbody>
</table>

Q18A1. [IF Q12 = 1 “PROBABLY HAS BEEN HAPPENING”, If/IF Q12 = DK OR REF OR 2 “PROBABLY HAS NOT BEEN HAPPENING”, Assuming it’s happening, if] nothing is done to reduce global warming in the future, how much do you think it will help future generations—a great deal, a lot, a moderate amount, a little, or not at all?

<table>
<thead>
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<th>A moderate amount</th>
<th>A little</th>
<th>Not at all</th>
<th>DK/RF</th>
<th>Total</th>
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<tbody>
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<td>11</td>
<td>69</td>
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</table>

Q18A2. [IF Q12 = 1 “PROBABLY HAS BEEN HAPPENING”, If/IF Q12 = DK OR REF OR 2 “PROBABLY HAS NOT BEEN HAPPENING”, Assuming it’s happening, if] nothing is done to reduce global warming in the future, how much do you think it will hurt you personally—a great deal, a lot, a moderate amount, a little, or not at all?

<table>
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<th>A moderate amount</th>
<th>A little</th>
<th>Not at all</th>
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<td>100</td>
<td>801</td>
</tr>
<tr>
<td>Jan-2015</td>
<td>18</td>
<td>16</td>
<td>20</td>
<td>17</td>
<td>28</td>
<td>1</td>
<td>100</td>
<td>1006</td>
</tr>
<tr>
<td>Aug-2020</td>
<td>22</td>
<td>9</td>
<td>22</td>
<td>20</td>
<td>27</td>
<td>0</td>
<td>100</td>
<td>999</td>
</tr>
</tbody>
</table>

Q18A. [IF Q12 = 1 “PROBABLY HAS BEEN HAPPENING”, If/IF Q12 = DK OR REF OR 2 “PROBABLY HAS NOT BEEN HAPPENING”, Assuming it’s happening, if] nothing is done to reduce global warming in the future, how much do you think it will hurt future generations—a great deal, a lot, a moderate amount, a little, or not at all?

<table>
<thead>
<tr>
<th></th>
<th>A great deal</th>
<th>A lot</th>
<th>A moderate amount</th>
<th>A little</th>
<th>Not at all</th>
<th>DK/RF</th>
<th>Total</th>
<th>N</th>
</tr>
</thead>
<tbody>
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<td>42</td>
<td>21</td>
<td>13</td>
<td>8</td>
<td>15</td>
<td>1</td>
<td>100</td>
<td>1005</td>
</tr>
<tr>
<td>Jun-10</td>
<td>43</td>
<td>21</td>
<td>16</td>
<td>11</td>
<td>9</td>
<td>*</td>
<td>100</td>
<td>1000</td>
</tr>
<tr>
<td>Nov-10</td>
<td>38</td>
<td>21</td>
<td>16</td>
<td>11</td>
<td>12</td>
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<td>1001</td>
</tr>
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<td>Dec-2013</td>
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<td>19</td>
<td>13</td>
<td>9</td>
<td>10</td>
<td>1</td>
<td>100</td>
<td>801</td>
</tr>
<tr>
<td>Jan-2015</td>
<td>43</td>
<td>16</td>
<td>15</td>
<td>11</td>
<td>14</td>
<td>1</td>
<td>100</td>
<td>1006</td>
</tr>
<tr>
<td>Aug-2020</td>
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<td>17</td>
<td>11</td>
<td>12</td>
<td>14</td>
<td>0</td>
<td>100</td>
<td>999</td>
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</tbody>
</table>

[Some questions are held for future releases]
Appendix A: 2020 National Survey of Public Opinion on Global Warming Method

The 2020 National Survey of Public Opinion on Global Warming involved telephone interviews with a representative sample of 999 adults living in the United States. 310 respondents were interviewed on a landline telephone, and 689 were interviewed on a cell phone. Interviewing was conducted from May 28 to August 16, 2020, in English. AAPOR’s Response Rate 3 was 18% for the landline frame, 6% for the cell phone frame, and 10% for the whole study sample.

Sample Design

Phone numbers used for this study were randomly generated from landline and cell phone sampling frames, with an overlapping frame design. The RDD landline sample was generated through Dynata. The Dynata RDD procedure produces an Equal Probability Selection Method (EPSEM) sample of randomly drawn telephone numbers from all working banks with one or more assigned numbers. The sample was generated shortly before the beginning of data collection to provide the most up-to-date sample possible, maximizing the number of valid telephone extensions. Additional sample was generated during the fielding period to ensure appropriate representation between census regions. The initial landline sample went through Dynata’s disconnect screening process. The unlisted phone numbers are sent a ‘pulse’ to determine switch status. If the switch is not active, the number is flagged disconnected. If the switch is active, the system uses post-call analysis to determine if the number is disconnected (SIT, fax, fast busy etc.) or working (no answer, live answer, answering machine).

The RDD Cell Phone sample was generated by Dynata. Dynata starts with the most recent monthly Telcordia TPM (Terminating Point Master) Data file. This is Telcordia’s master file of NPA-NXX and Block-1D records for the North American Number Plan. It contains at least one record per NPA-NXX. For prefixes (NPA-NXXs) where 1000-block number pooling is in effect, this file also provides information for individual 1000-blocks. This allows users to identify those 1000-blocks that have either not been assigned for service or that have been allocated to different service providers. “Mixed” or “shared” 100-blocks (NXXTYPES 50, 54, 66) are then compared to Dynata’s list-assisted RDD database. 100-blocks with no listed numbers are retained in the wireless frame and 100-blocks containing listed numbers on the RDD frame are removed. The result is a frame of 100-blocks that is mutually exclusive of Dynata’s list-assisted RDD frame while allowing coverage in prefixes and 1000-blocks that potentially provide both landline and wireless service.

Field Procedures

Because of the onset of the global Covid-19 Pandemic and in order to provide a safe environment for the employees to work, ReconMR shut down on-site operations in March 2020, and turned it into a virtualized call center environment. As such, the survey was conducted by interviewers working from home. Measures were taken to ensure data security and the continued adherence to data quality and data collection standards for ReconMR’s work from home solution. Interviewers were set up to connect to ReconMR’s data center via a secure, private VPN tunnel. This solution employs end-to-end encryption as well as multi-factor authentication. In addition, all servers remained behind a secure firewall, and all calls were initiated from on-premises devices. ReconMR work-from-home solution allowed for all agents to continue to be live-monitored for quality assurance via our Voxco audio and video monitoring systems.

Interviews were conducted using computer-assisted telephone interviewing (CATI) software. Interviewer training was conducted prior to the study pilot. CATI interviewers received an annotated questionnaire and project materials that explained the history, background, and goals of the study. The background and overview training of the study’s various components was followed by a detailed CATI program training. Experienced project team supervisors and trainers spent time reviewing both questionnaires one question at a time with each interviewer. The goal was to fully explain the proper delivery of each question and the reasoning and intent behind all the sections and response option in
each questionnaire. Interviewers spent a great deal of time practicing with the CATI program and conducting mock interviews with each other and the data collection supervisors. Interviewers were carefully trained to ask for the youngest male or the youngest female currently at home when calling a landline. Interviewers were also trained at explaining the purpose of the study, how to gain respondent cooperation by explaining the inherent benefits of the research, how the project will benefit the public good and how to answer respondent’s questions, as well as how to record respondents’ answers accurately.

In order to maximize survey participation, the following procedures were enacted during the field period:

- Up to 5 follow-up attempts were made to contact non-responsive numbers (e.g. no answer, busy, answering machine). Exception was made to records flagged as belonging to census groups greater than 50% Hispanic. These cases received up to 7 follow-up attempts to non-responsive numbers.

- Non-responsive numbers were contacted multiple times, varying the times of day, and the days of the week that call-backs were placed.

- Interviewers stressed that the study was done for research purposes and that responses were strictly confidential and, when asked, they stated as accurately as possible the expected length of the interview. In addition, interviewers were provided with responses to possible respondent concerns raised during interviews, in order to minimize break offs.

- Respondents were offered the option of scheduling a call-back at their convenience.

- Households where the initial call resulted in respondents hanging up the phone or breaking off during the interview were called back after a 28-hour delay in an attempt to convert into a completed interview. Interviewers received special instructions on how to handle these calls.

- Respondents reached by cell phone were offered $10 if they requested compensation for their time. No such cell phone complaints were made during fielding of either study.

Quality/Data Verification

Project supervisors validated 10% of each interviewer’s completed surveys by calling back the respondent and verifying specific responses. Additionally, supervisors continually monitored live calls through ReconMR’s call monitoring system in order to ensure proper interviewing procedures were maintained.
Appendix B: 2020 National Survey of Public Opinion on Global Warming Weighting

This Appendix describes the two-stage procedure used to construct weights. During the first stage, each respondent was assigned a base weight that accounted for unequal probability of selection. The second stage introduced adjustments to the base weights so that sample distributions of target variables match distributions of those same variables in the U.S. adult population. More details about each of these stages are provided below.

Stage 1: Constructing base weights

A base weight was constructed for each respondent to account for unequal selection probabilities. Some respondents could have been contacted by via multiple telephone numbers (mobile and/or landline), and for some telephone numbers persons other than the respondent may also have been reachable. The base weights account for these differences by assigning respondents who could have been contacted via several telephone numbers a value that is proportionally smaller that values assigned to respondents who could have been contacted via fewer numbers.

The base weights were constructed by first computing a total number of “selection opportunities” for each respondent. Each selection opportunity for a respondent is the probability of selecting the respondent via one of the telephone numbers by which she or he could have been contacted. Each selection opportunity is based on the assumption that mobile device telephone numbers are not shared with other adults while landline telephone numbers are shared with all adults in a household. This means the probability of selecting the respondent if a respondent’s mobile device telephone number had been dialed is 1.00. However, for landline telephone numbers the selection opportunity is proportional to the number of adults in a household. For example, the probability of selecting the respondent if the respondent’s landline telephone number had been dialed and the respondent lives in a household with three other adults would be \( \frac{1}{4} \) or .25. The selection opportunities across all telephone numbers by which a respondent could have been reached were summed to produce a “total selection opportunities” for each respondent.

Two transformations to each respondent’s total selection opportunities produced the base weights. First, 1 was divided by each respondent’s total selection opportunities to produce values that decreased proportionally to increases in total selection opportunities. This transformation produced values that ranged from 4.00 to .06, with a mean value across the sample of .67. Second, the values produced by the first transformation were divided by the mean value for a sample. This second transformation produced base weights for the respondents with a sample mean value of 1.00. For the sample, the base weights ranged from 5.98 to .10.

Stage 2: Post-stratification

Post-stratification using ANESRake in R was used to adjust the base weights to produce weights that brought sample distributions in line with U.S. adult population distributions in terms of sex, age combined race and ethnicity, education, census region, and telephone use. The U.S. adult population distributions of sex, age combined race and ethnicity, education, and census region were based on data from the March 2020 Current Population Survey (CPS). The U.S. adult population distribution of telephone use was based National Health Interview Survey data collected during the first six months of 2019 and published by the National Center for Health Statistics (Blumberg & Luke, May, 2020).

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Post-stratification raking using ANESRake in R was conducted such that the one-way marginal distributions of the preceding demographic variables in the sample converged on the one-way marginal distributions of those variables in the U.S. adult population. Post-stratification raking was conducted using only variables for which all categories included at least 5% of the U.S. adult population and 5% of the sample, and for which the percentage in the U.S. adult population differed from the percentage in the sample by at least 5 percentage points. The weights produced by post-stratification raking were constrained such that no weight was greater than 5, and the mean weight was 1, ranging from .80 to 5.0.

Effects of weighting

Weights produced by post-stratification brought the sample distributions into alignment with population distributions. Table 1 includes the U.S. adult population distributions of variables used in post-stratification raking, as well as the unweighted, base weighted, and post-stratification weighted sample distributions of those variables. The table also include U.S adult population and sample distributions of variables that were not used in post-stratification. For all categories of variables used in post-stratification, no difference between the post-stratification weighted sample and U.S. adult population was greater than 1.5 percentage points. Thus, no difference exceeded the 5 percentage points identified by DeBell and Krosnick (2009) as a criterion for additional post-stratification adjustment.

The design effect associated with the final (post-stratification) weights was 1.64.

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Table 1. Distributions of variables in the U.S. adult population and the sample (variables used for post-stratification raking are in **bold**)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Sample (N=999)</th>
<th>Difference between base weighted plus post-stratified and U.S. adult population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>53.7%</td>
<td>53.9%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>46.0%</td>
<td>45.8%</td>
</tr>
<tr>
<td></td>
<td>Missing</td>
<td>.3%</td>
<td>.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>18 to 24 years old</td>
<td>6.8%</td>
<td>8.2%</td>
</tr>
<tr>
<td></td>
<td>25 to 34 years old</td>
<td>8.5%</td>
<td>8.7%</td>
</tr>
<tr>
<td></td>
<td>35 to 44 years old</td>
<td>14.2%</td>
<td>14.3%</td>
</tr>
<tr>
<td></td>
<td>45 to 54 years old</td>
<td>16.0%</td>
<td>14.8%</td>
</tr>
<tr>
<td></td>
<td>55 to 64 years old</td>
<td>20.8%</td>
<td>20.7%</td>
</tr>
<tr>
<td></td>
<td>65 years old or older</td>
<td>33.2%</td>
<td>32.8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>100.0%</td>
<td>99.9%</td>
</tr>
<tr>
<td><strong>Combined race and Hispanicity</strong></td>
<td>Hispanic</td>
<td>7.7%</td>
<td>7.9%</td>
</tr>
<tr>
<td></td>
<td>White</td>
<td>72.2%</td>
<td>71.9%</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>7.8%</td>
<td>8.2%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>12.3%</td>
<td>12.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Education</strong></td>
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<td>5.0%</td>
</tr>
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<td></td>
<td>High school</td>
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<td>17.6%</td>
</tr>
<tr>
<td></td>
<td>Some college</td>
<td>25.8%</td>
<td>25.1%</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s degree</td>
<td>26.2%</td>
<td>26.4%</td>
</tr>
<tr>
<td></td>
<td>Advanced degree</td>
<td>24.4%</td>
<td>24.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Census region</strong></td>
<td>Northeast</td>
<td>17.5%</td>
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</tr>
<tr>
<td></td>
<td>Midwest</td>
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<td>21.9%</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>35.3%</td>
<td>35.3%</td>
</tr>
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<td><strong>Total</strong></td>
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<td>100.0%</td>
</tr>
<tr>
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<td>Missing</td>
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</tr>
<tr>
<td>----------------</td>
<td>---------</td>
<td>-----</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
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<td>100.1%</td>
</tr>
<tr>
<td><strong>Phone service</strong></td>
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<tr>
<td>Not mobile only</td>
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<td>45.6%</td>
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<td><strong>Total</strong></td>
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<td>100.0%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
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<td>White only</td>
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<td>Black only</td>
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<td>.0%</td>
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<td>100.0%</td>
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<tr>
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<td>100.1%</td>
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<td>51.3%</td>
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<tr>
<td>Not married</td>
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<td>48.1%</td>
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<td>.6%</td>
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<tr>
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<td>100.0%</td>
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<td>$35,000 to $49,999</td>
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<td>11.1%</td>
<td>11.8%</td>
</tr>
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<td>$50,000 to $74,999</td>
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<td>15.3%</td>
<td>15.3%</td>
</tr>
<tr>
<td>$75,000 to $99,999</td>
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<td>12.2%</td>
<td>12.2%</td>
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<td>$100,000 or more</td>
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