Delaware Residents' Awareness of and Attitudes Toward PFAS



Study Conducted for the
Delaware Department of Natural Resources and Environmental Control

2025

RESPONSIVE MANAGEMENT

Delaware Residents' Awareness of and Attitudes Toward PFAS

2025

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EXECUTIVE SUMMARY

This study was conducted to determine Delaware residents' awareness of and attitudes toward PFAS in the state. PFAS refers to pre- and polyfluoroalkyl substances, a group of man-made chemicals also referred to as "forever chemicals." The research was conducted on behalf of the Delaware Department of Natural Resources and Environmental Control (hereinafter referred to as DNREC or the Department). The study entailed a scientific, multimodal survey of Delaware residents using a three-pronged contact method (phone, text, and online) and a multimodal data collection approach (phone and online).

The telephone and online questionnaires were developed cooperatively by the Department and Responsive Management, based in part on a national survey about PFAS conducted by the Texas Water Resources Institute. The telephone survey was computer-coded for Responsive Management's computer-assisted telephone interviewing system. An important aspect of this system is that the computer controls which questions are asked, but each telephone survey was administered by a live interviewer. The online survey was coded in an online survey platform. For both the telephone and online surveys, the survey instrument was programmed to automatically skip questions that did not apply and to substitute phrases in the survey based upon previous responses, as necessary, for the logic and flow of the surveys.

Contacts were made by telephone, text, and online, and the surveys were conducted by phone and online. The three-pronged contact method and the multimodal approach to data collection ensured the best possible representation of Delaware residents: combined telephone (with text contacts) and online data collection ensured maximum coverage that included representation from residents who may otherwise have been difficult to reach by telephone, including young residents. Telephone surveys were conducted Monday through Friday from 12:00 p.m. to 9:00 p.m., local time. The survey was conducted in September 2025, and Responsive Management obtained 1,248 completed questionnaires from adult Delaware residents.

The analysis of data was performed using IBM SPSS Statistics as well as proprietary software developed by Responsive Management. The analysis included a look at county crosstabulations for all questions, as well as other demographic crosstabulations for several questions, which are shown in the body of the report. Additionally, comparisons were made between the aforementioned national study and this Delaware study, shown in its own chapter in the body of the report.

AWARENESS OF AND CONCERN ABOUT PFAS

A third of Delaware residents (33%) are either confident or think they know about PFAS. Meanwhile, 19% say they have heard of PFAS but do not know what they are, and nearly half (45%) have not heard of PFAS.

Overall, 17% of Delaware residents believe their community has been exposed to PFAS. In addition, 12% of residents believe that their primary source of drinking water has been impacted by PFAS.

About a third of residents (32%) are *extremely* or *very concerned* about PFAS in their drinking water. Meanwhile, 39% are *moderately* or *slightly concerned*, and 18% are *not at all concerned*.

INFORMATION ABOUT PFAS

Residents who heard about PFAS most often got the information from TV news, the internet in general, print or online newspapers, social media, and friends or family.

A fifth of residents (20%) have seen social media posts about PFAS in the past 12 months, and 7% of residents saw a social media post specifically about PFAS in Delaware.

FAMILIARITY WITH EXPOSURE TO PFAS

The survey provided respondents with a list of nine items and asked them about their familiarity with each as a potential source or pathway of exposure to PFAS contamination.

There is little marked difference between the results for the listed items. Looking at *extremely familiar* or *very familiar* percentages combined, the top results are for non-stick cookware (24% indicated this) and drinking water (22%). Otherwise, these percentages range from 13% to 18% for the other seven items.

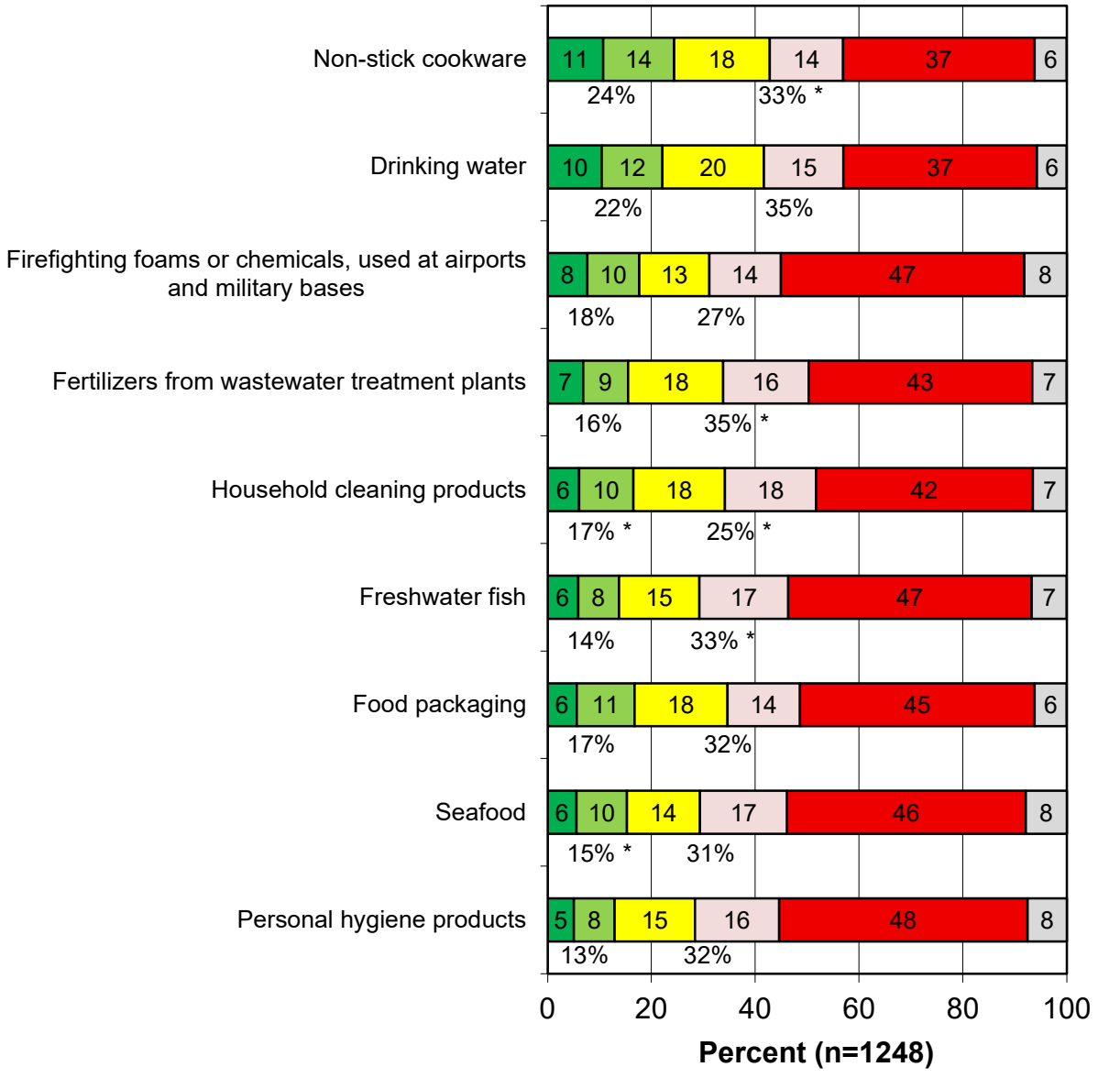
The combined percentages of *moderately familiar* and *slightly familiar* responses are about a quarter to a third for all items.

A slight majority give *not at all familiar* or *don't know* responses for most items.

Full results are shown on the following page, because a full page is needed for presentation.

Results are presented in descending order of *extremely familiar* responses. Combined percentages of *extremely familiar* or *very familiar* responses are shown below each bar, as are combined percentages of *moderately familiar* and *slightly familiar* responses.

How familiar are you with each of the following as a potential source of, or pathway of exposure to, PFAS contamination? (Overall)



* Rounding on graph causes apparent discrepancy in sum; calculation made on unrounded numbers.

BEHAVIOR CHANGES RELATED TO CONCERN ABOUT PFAS

The next series of questions asked residents if they had changed or plan to change their use of five products over concern about PFAS contamination. The overall results are listed below in descending order of *already changed* percentages.

- Drinking water: 27% already changed; 16% plan to change; 31% might change; 16% will never change; 9% don't know
- Non-stick cookware: 26% already changed; 21% plan to change; 35% might change; 10% will never change; 8% don't know
- Personal hygiene products: 15% already changed; 21% plan to change; 45% might change; 11% will never change; 7% don't know
- Food packaging: 15% already changed; 21% plan to change; 46% might change; 8% will never change; 9% don't know
- Household cleaning products: 14% already changed; 22% plan to change; 45% might change; 12% will never change; 8% don't know

PREFERRED SOURCES OF INFORMATION ABOUT PFAS

The survey asked residents to select up to three sources of information they would trust most to provide information about PFAS in Delaware, from a provided list. The top replies are state government agencies, such as DNREC or DHSS (45% selected this), and health professionals (40%). A second tier of responses includes environmental organizations (32%), universities or scientists (31%), and federal government agencies, such as the EPA or CDC (28%).

The top formats selected for receiving PFAS information, from a provided list, are newsletters or emails, fact sheets or brochures, and articles on websites—all selected by over a third of residents. Also, about a quarter of residents selected short videos or reels, in-person community meetings, and social media posts.

Residents were asked to name the single best way for DNREC to share important health information with them, from a provided list. The top responses, all with nearly a fifth of residents selecting them, are news media (such as TV, radio, or newspapers), email newsletters, and the Delaware PFAS information website (www.de.gov/pfas).

PRIMARY WATER SOURCE

Nearly two thirds of residents (62%) pay a water bill (or have it paid for them), whereas 30% do not (such as those on a private well or cistern).

The top source of drinking water for Delaware residents is a water utility (39% selected this), closely followed by bottled water (34%). A substantial percentage (19%) are on a private well or cistern.

Just over a third of Delaware residents (35%) filter their water before drinking.

COMPARISONS TO NATIONAL DATA

In 2023, the Texas Water Resources Institute conducted a national survey of the public's awareness of and concerns about PFAS contamination (the study is cited in the Introduction and Methodology chapter). Several questions in this survey match those from the national survey, so results of the two are presented in the report side-by-side for comparison.

For several questions, results between the 2023 national study and this 2025 Delaware study are very consistent. Most notably, the percentages who have never heard of PFAS are nearly identical, as shown below (all other comparison graphs are shown in the report body). However, some of the more notable differences are summarized below:

- Delaware residents are markedly more likely than U.S. residents to be confident in knowing about PFAS (16% compared to 6%, respectively).
- Compared to the nation as a whole, Delaware residents have more familiarity with drinking water and non-stick cookware as potential sources of PFAS contamination. On the other hand, they have less familiarity with personal hygiene products as a potential source.
- Markedly higher percentages of Delaware residents, compared to the nation, have already changed their use of drinking water and non-stick cookware due to concern about PFAS. On the other hand, a higher percentage of U.S. residents are planning to change their source of drinking water.

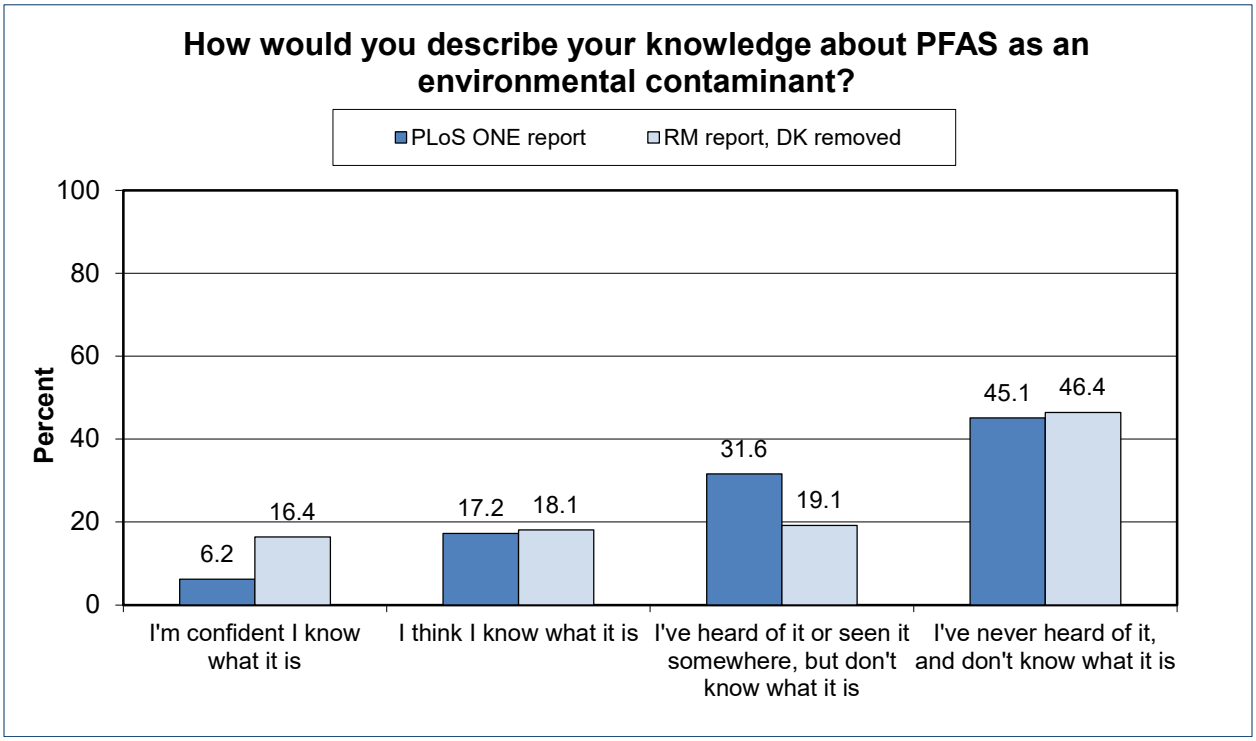


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INTRODUCTION AND METHODOLOGY

This study was conducted to determine Delaware residents' awareness of and attitudes toward PFAS in the state. PFAS refers to pre- and polyfluoroalkyl substances, a group of man-made chemicals also referred to as "forever chemicals." The research was conducted on behalf of the Delaware Department of Natural Resources and Environmental Control (hereinafter referred to as DNREC or the Department). The study entailed a scientific, multimodal survey of Delaware residents using a three-pronged contact method (phone, text, and online) and a multimodal data collection approach (phone and online). Specific aspects of the survey methodology are discussed below.

QUESTIONNAIRE DESIGN

The telephone and online questionnaires were developed cooperatively by the Department and Responsive Management, based in part on a national survey about PFAS conducted by the Texas Water Resources Institute. There were slight differences between the telephone and online versions of the survey to accommodate each survey mode, but otherwise the surveys were identical.

The telephone survey was computer coded for Responsive Management's computer-assisted telephone interviewing system. An important aspect of this system is that the computer controls which questions are asked, but each telephone survey was administered by a live interviewer. The online survey was coded in an online survey platform. This online survey was administered to both the online sample and to cell phone respondents who did not respond via phone call and were sent a text, as explained later. Note that the online survey was closed, meaning it was available only to respondents who were specifically selected for the survey. The questionnaire is shown in Appendix A: Survey Questionnaire.

For both the telephone and online surveys, the survey instrument was programmed to automatically skip questions that did not apply to certain respondents based upon previous responses, as necessary, for the logic and flow of the surveys. Responsive Management conducted pre-tests of both versions of the questionnaire to ensure proper wording, flow, and logic in the survey. Both the telephone and online versions produced data that could be exported directly into Responsive Management's data analyses programs.

SURVEY SAMPLING

For both survey modes, the statewide sample of Delaware adult general population residents was provided by MSG, a firm that specializes in providing scientifically valid samples for survey research. Screener questions at the outset of both modes of the survey ensured that each respondent was at least 18 years old and a resident of Delaware.

The sample was stratified by county. For the telephone portion of the survey, a probability-based sampling process ensured that each resident in a county had an approximately equal chance of being contacted by telephone. The counties were weighted to be in their proper proportions in the data analyses (as discussed later) so that the statewide sample was fully representative of the adult Delaware population. The statewide results are reported both overall and by county. The online portion of the survey used a sample maintained by MSG.

MULTIMODAL SURVEY ADMINISTRATION

As noted, the surveys were conducted by telephone and online. The multimodal approach to data collection ensured the best possible representation of Delaware residents: combined telephone and online data collection ensured maximum coverage that included representation from residents who may otherwise have been difficult to reach by telephone, including young residents. It also yielded a high response rate, increased the representativeness of the sample, and reduced bias.

Telephone surveys were conducted Monday through Friday from 12:00 p.m. to 9:00 p.m., local time. A multi-callback design was used to maintain the representativeness of the sample, to avoid bias toward people easy to reach by telephone, and to provide an equal opportunity for all to participate. When a respondent could not be reached on the first call, subsequent calls were placed on different days of the week and at different times of the day. The survey was conducted at the time of initial contact, or a callback time was set that was more convenient for the respondent.

Those with a cellular number who could not be reached after multiple attempts were sent a text message from a Delaware phone number inviting them to participate in the survey online. Those who did not respond to the text were called at least one more time, and then a reminder text was sent to nonrespondents approximately a week after the initial text invitation. The text message provided a link to the landing page for the online survey featuring an introduction with more information and instructions. The text and landing page are shown below and on the following page.

Text Message Sent With Invitation to Take the Survey

Hello, I'm Jeremiah with Responsive Management. The Delaware Department of Natural Resources and Environmental Control would like to hear your opinions on water resources and environmental issues in the state.

Please consider completing this survey: LINK

Landing Page to Start the Survey
This survey is being conducted by Responsive Management on behalf of the Delaware Department of Natural Resources and Environmental Control (DNREC). The Department is conducting this study to ask Delaware residents about water resources and environmental issues in the state.

This study is for research purposes only. You do not need to be knowledgeable about any specific topics or engage in any specific activities to participate in the study. The survey will take approximately 5 to 10 minutes.

Your responses will be kept strictly confidential and will not be associated with your name or contact information in any way.

Please click "Next" or the survey arrow  below to begin the survey.

The survey was conducted in September 2025. Responsive Management obtained 1,248 completed questionnaires from adult Delaware residents.

SURVEY QUALITY CONTROL

The first quality control feature is embedded in the survey instrument itself. For both the telephone and online versions of the questionnaire, error checkers and computation statements ensured that quality and consistent data were obtained. Furthermore, for the online version of the survey, an additional question developed by Responsive Management was used to identify and filter out invalid submittals that were automatically generated.

To further ensure the integrity of the telephone survey data, Responsive Management has interviewers who have been trained according to the highest industry standards of the American Association for Public Opinion Research. Methods of instruction included lecture and role-playing. The Survey Center managers conducted conference call briefings with the interviewers prior to the administration of this survey. Interviewers were instructed on type of study, study goals and objectives, handling of survey questions, interview length, termination points and qualifiers for participation, interviewer instructions within the survey questionnaire, reading of the survey questions, skip patterns, and probing and clarifying techniques necessary for specific questions on the survey questionnaire. Additionally, Survey Center managers monitored the interviews in real time and provided feedback to the interviewers.

After the telephone and online surveys were obtained, the Survey Center managers and statisticians checked each completed survey to ensure clarity and completeness and to flag any invalid respondents. These include online surveys that were completed in an unrealistically brief timeframe, which suggests that respondents were clicking through

responses without reading and evaluating the questions, or "straight-lining" of responses, which is when respondents select (for example) the first or same response options throughout the survey. Responses to open-ended questions were also examined to flag invalid submittals. All completed surveys of questionable quality were removed prior to data analysis.

DATA ANALYSIS

The analysis of data was performed using IBM SPSS Statistics as well as proprietary software developed by Responsive Management.

The final data were weighted by age and gender within each county, by ethnicity statewide, and by county in statewide data. Specifically, the age categories of respondents were made to match U.S. Census Bureau age categories. Likewise, gender was made to match U.S. Census data in each county. Then, the entire sample was made to match White and non-White ethnicity statewide, again matching U.S. Census Bureau data of adult Delaware residents. The counties were then weighted so that they would be in the proper proportions based on the proportion each county makes of the total statewide adult population.

Throughout this report, findings of the survey are reported at a 95% confidence interval. The sampling error was plus or minus 2.77 percentage points, based on a total sample size of 1,248 and an estimated population size of 795,476 adult Delaware residents. The sampling error equation is shown below.

Sampling Error Equation (Dillman Method)

$$B = \left(\sqrt{\frac{\frac{N_p(.25)}{N_s} - .25}{N_p - 1}} \right)(1.96)$$

Where: B = maximum sampling error (as decimal)
N_P = pop. size (i.e., total number who could be surveyed)
N_S = sample size (i.e., total number of respondents surveyed)

Derived from formula: p. 206 in Dillman, D. A. 2000. *Mail and Internet Surveys*. John Wiley & Sons, NY.

Note: This is a simplified version of the formula that calculates the *maximum* sampling error using a 50:50 split (the most conservative calculation because a 50:50 split would give maximum variation).

The analysis also includes comparisons to a national study on PFAS conducted in 2023 by the Texas Water Resources Institute.[1]

[1] Berthold, T.A., McCrary, A., deVilleneuve, S., and Schramm, M. 2023. "Let's talk about PFAS: Inconsistent public awareness about PFAS and its sources in the United States." PLoS ONE 18(11): e0294134. Texas Water Resources Institue. https://doi.org/10.1371/journal.pone.0294134.

PRESENTATION OF RESULTS

In examining the results, it is important to be aware that the questionnaire included several types of questions:

- Single response questions: Some questions allow only a single response.
- Multiple response questions: Other questions allow respondents to give more than one response or choose all that apply. Questions that allow more than a single response are indicated on the graphs with the label, "Multiple Responses Allowed."
- Open-ended questions are those in which no answer set is presented to the respondents; rather, they respond with anything that comes to mind from the question.
- Closed-ended questions have an answer set from which to choose.
- Scaled questions: Some closed-ended questions (but not all) are in a scale, such as those that range from extremely familiar to not at all familiar.
- Series questions: Many questions are part of a series, and the results are primarily intended to be examined relative to the other questions in that series (although results of the questions individually can also be valuable). Typically, results of all questions in a series are shown together.

Graphs typically show results rounded to the nearest integer; however, all data are stored in decimal format, and all calculations were performed on unrounded numbers. For this reason, some graphs may not sum to exactly 100% because of this rounding on the graphs. Additionally, rounding may cause apparent discrepancies of 1 percentage point between the graphs and the reported results of combined responses (e.g., when "extremely familiar" and "very familiar" are summed to determine the strength of familiarity). Finally, on some graphs, the "don't know" responses (as well as refused, etc.) are not shown for legibility, particularly at percentages of 1% or less, although they remain in the data. Because of this, the sum of all the percentages shown may not total to 100% on some of these graphs.

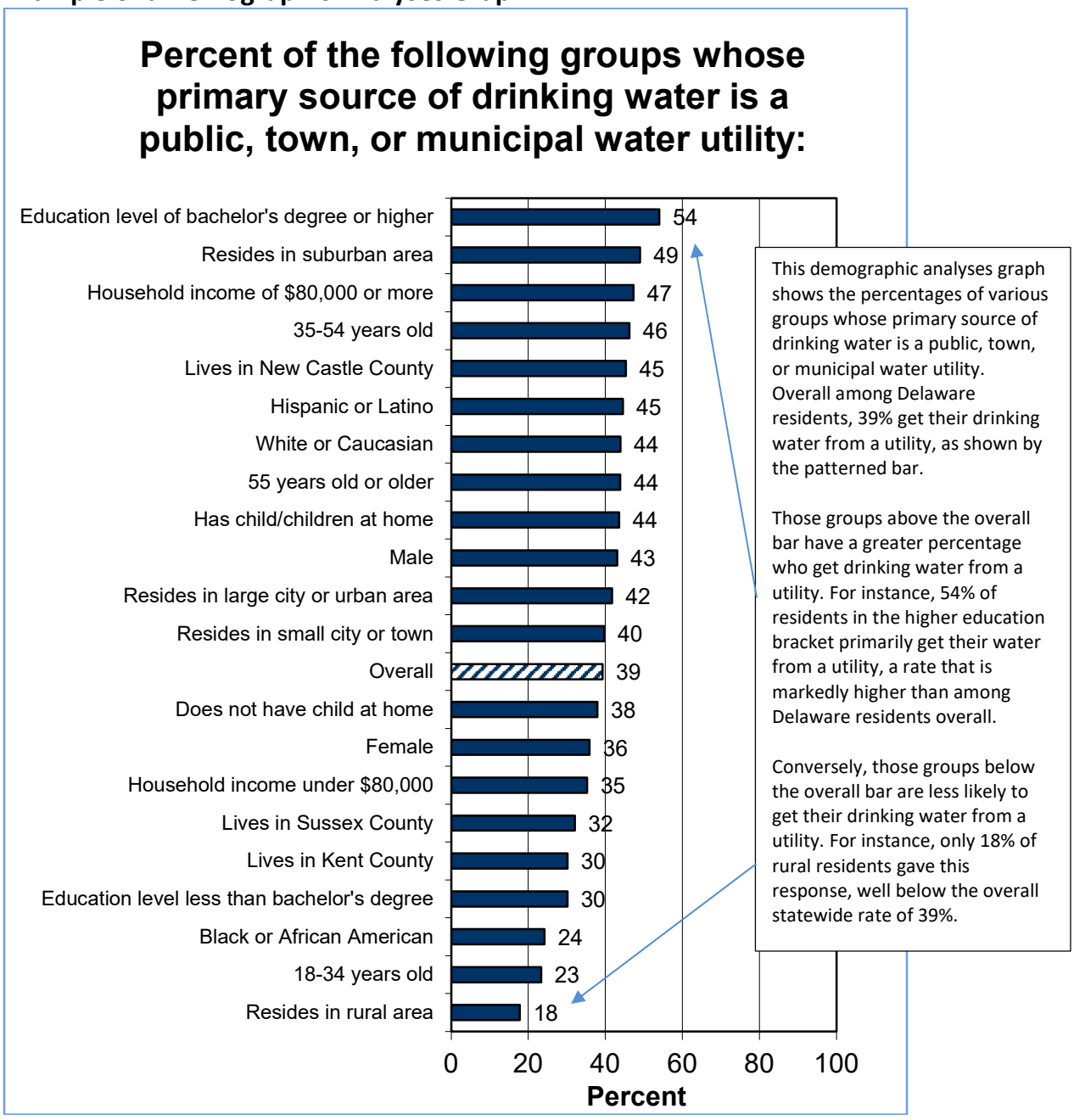
In addition to graphs depicting the results of the individual survey questions, the report includes special graphs that show how various demographic groups (e.g., males) respond to certain questions, hereinafter referred to as *demographic analyses graphs*. Not all the questions were analyzed in this way; questions chosen for these demographic analyses are those deemed to be of the most interest or utility. The example on the following page explains how to interpret these graphs. (Note: although used as an example, the graph shows actual data from this survey in Delaware.)

The example shows the percentage of various groups of Delaware residents whose primary source of drinking water is a public, town, or municipal water utility. Among Delaware residents overall, 39% get their drinking water from a utility, as shown by the patterned bar. Those groups shown above the overall bar have a higher percentage who

use a water utility, compared to Delaware residents overall. Meanwhile, those groups below the overall bar have a lower rate of getting their drinking water from a utility.

In the demographic analyses graphs, when one group is above the overall bar (for instance, in this example, suburban residents), its counterpart or one of its counterparts (in this instance, rural residents) will be below the overall bar. The distance from the overall bar matters, as well. If a group is close to the overall bar (for instance, those with no children at home in this example), then the group should not be considered markedly different from Delaware residents overall.

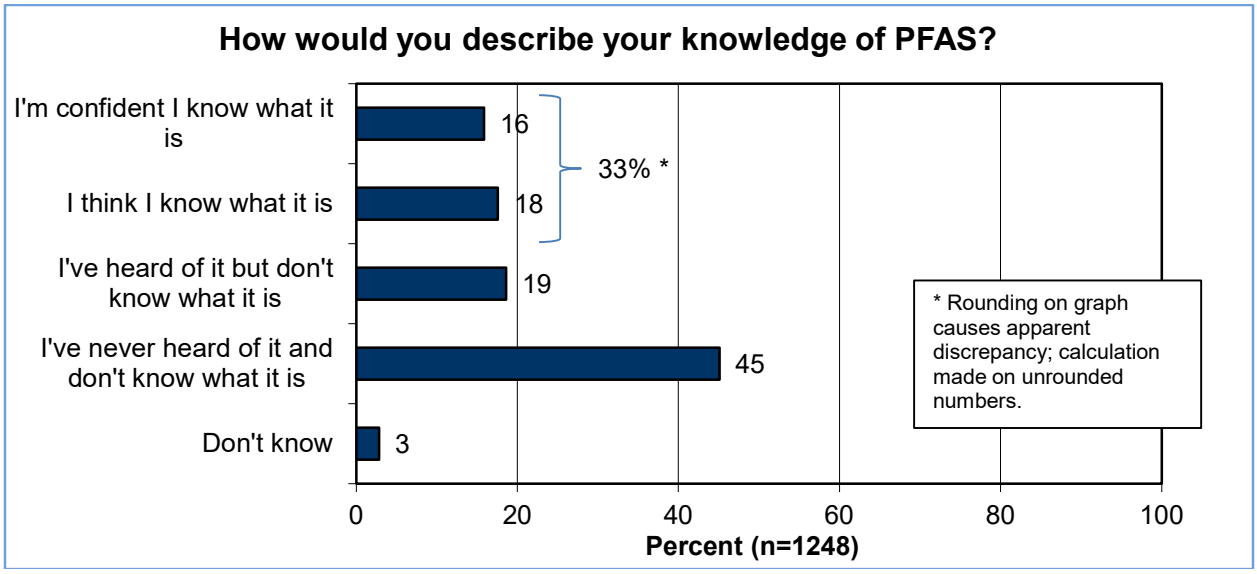
Example of a Demographic Analyses Graph

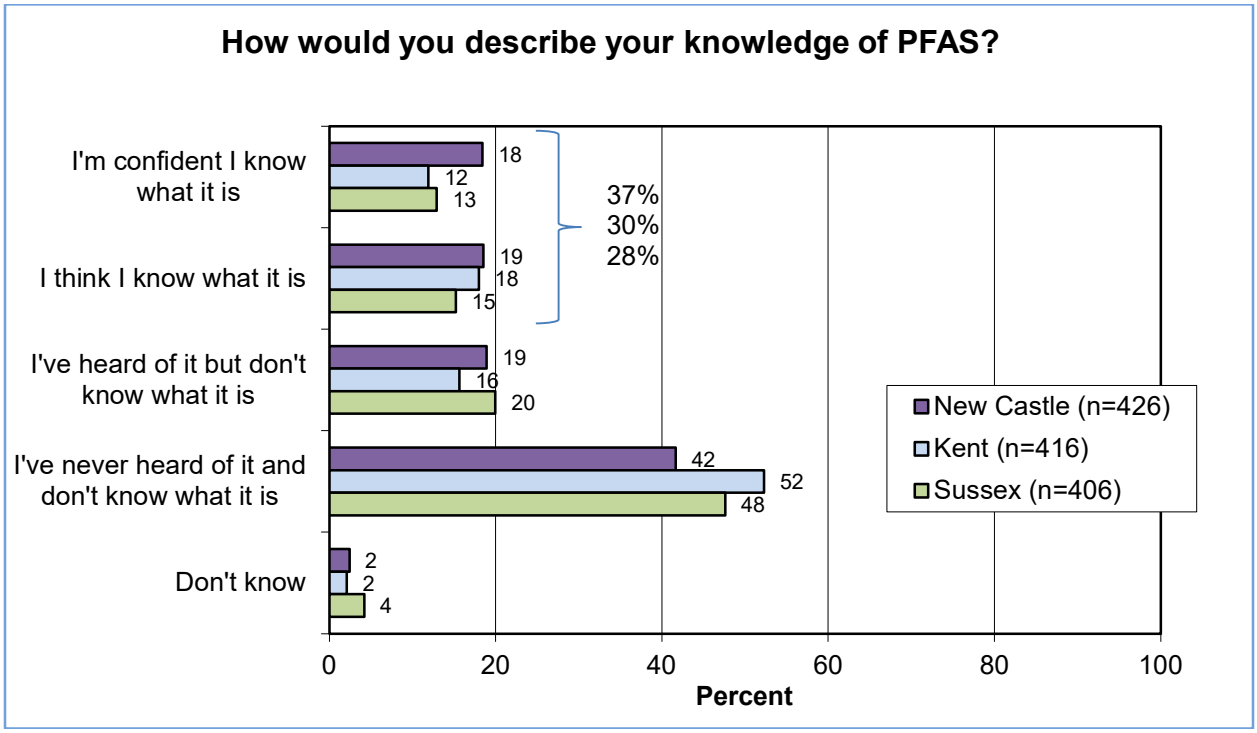


For each question, results are shown for statewide results, followed by a 3-bar graph of results by county. (The exception to this is series graphs, which need a full page for each county's results as well as the overall results.) These are followed by demographic analyses graphs for several selected questions.

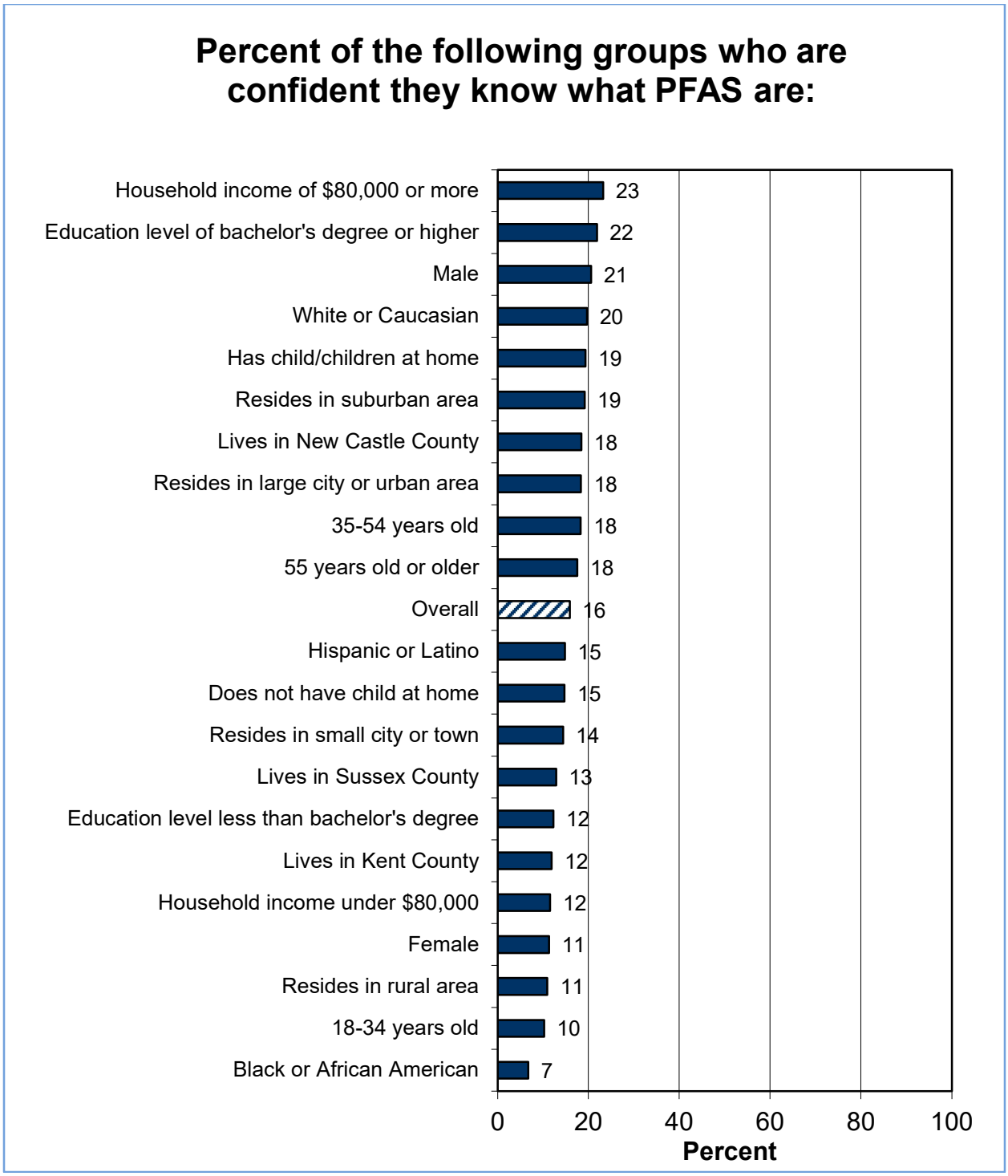
AWARENESS OF AND CONCERN ABOUT PFAS

A third of Delaware residents (33%) are either confident or think they know about PFAS (16% are confident they know; 18% think they know). Meanwhile, 19% say they have heard of PFAS but do not know what they are, and nearly half (45%) have not heard of PFAS. Knowledge is higher in New Castle County than in the other counties. (Note that the question wording in the national survey, discussed in a later chapter, refers to "PFAS as an environmental contaminant," hence the singular tense in the response options. Although the response options were kept consistent, this report narrative refers to PFAS as a plural term.)

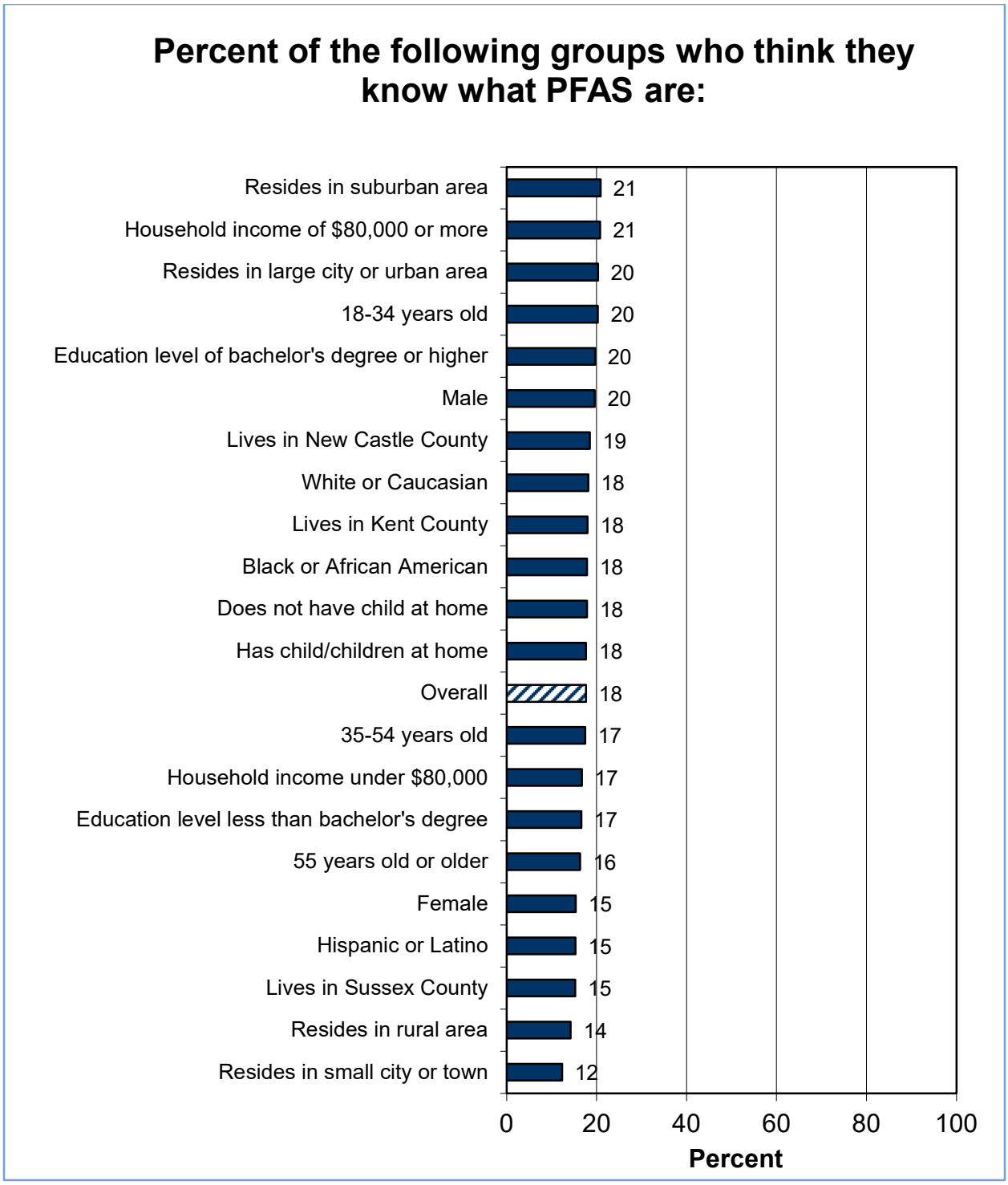




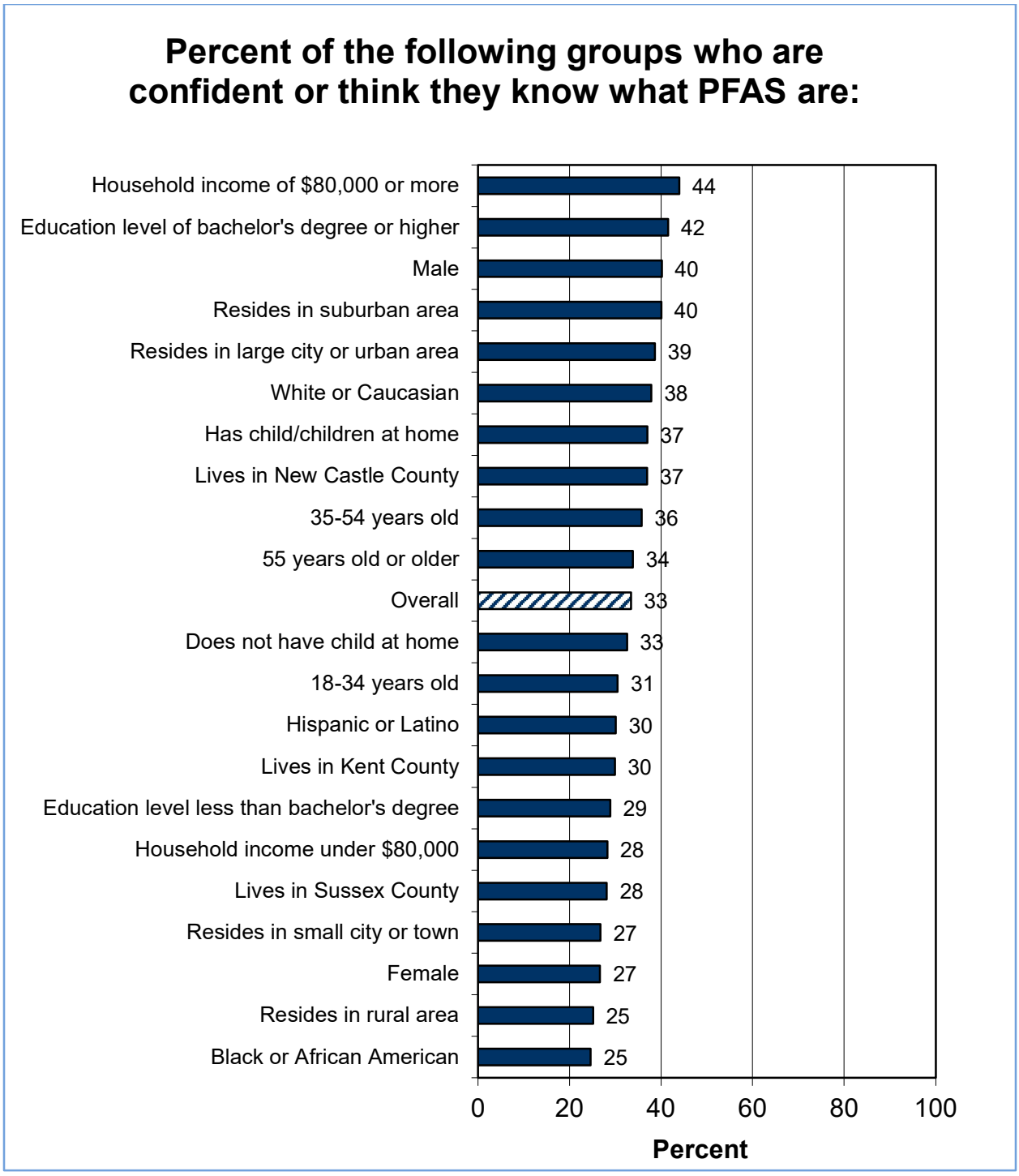
Confidence in knowing about PFAS is highest among those in the upper income and education categories and among male residents.



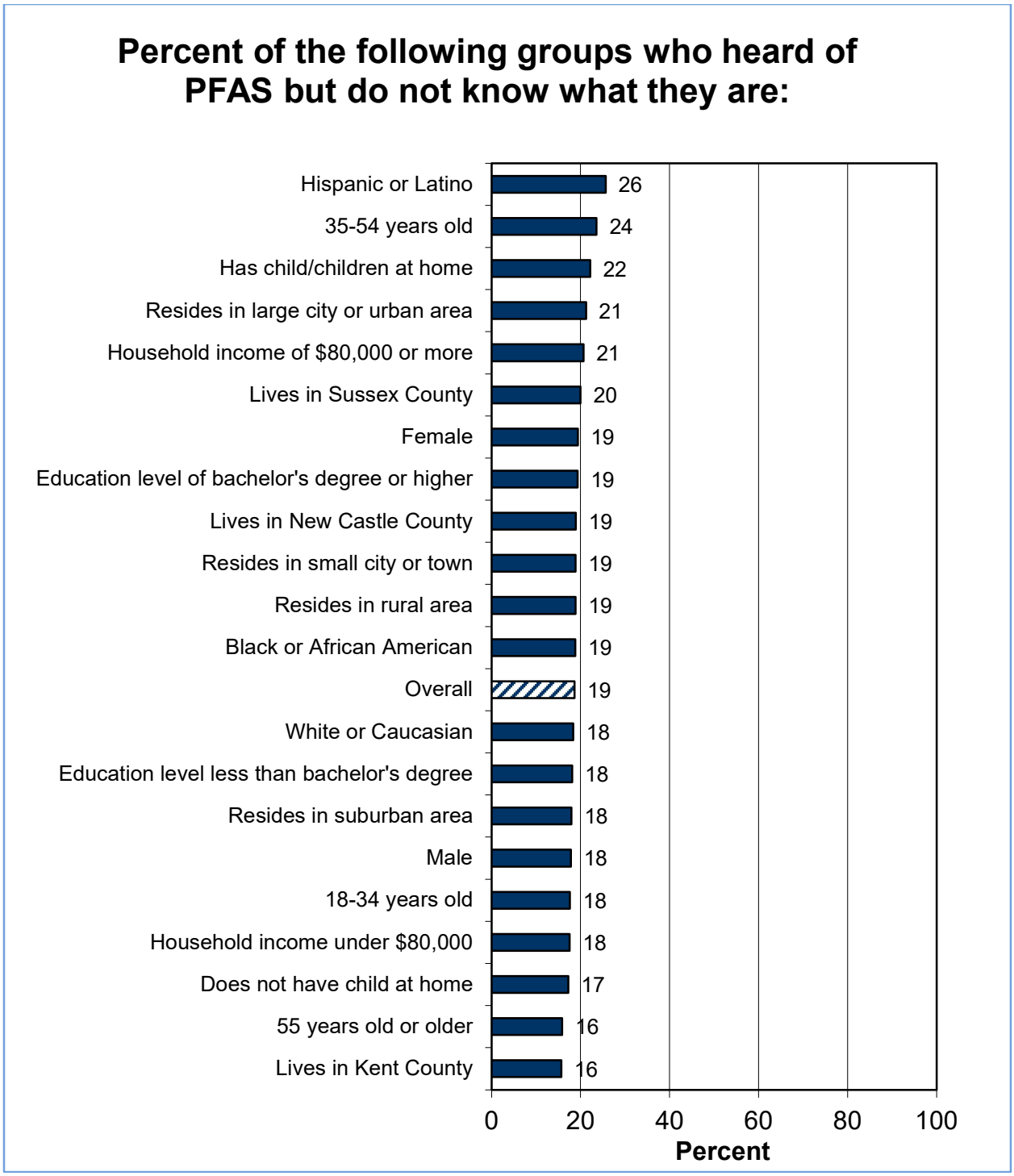
There is very little variability among the groups regarding those who think they know about PFAS.



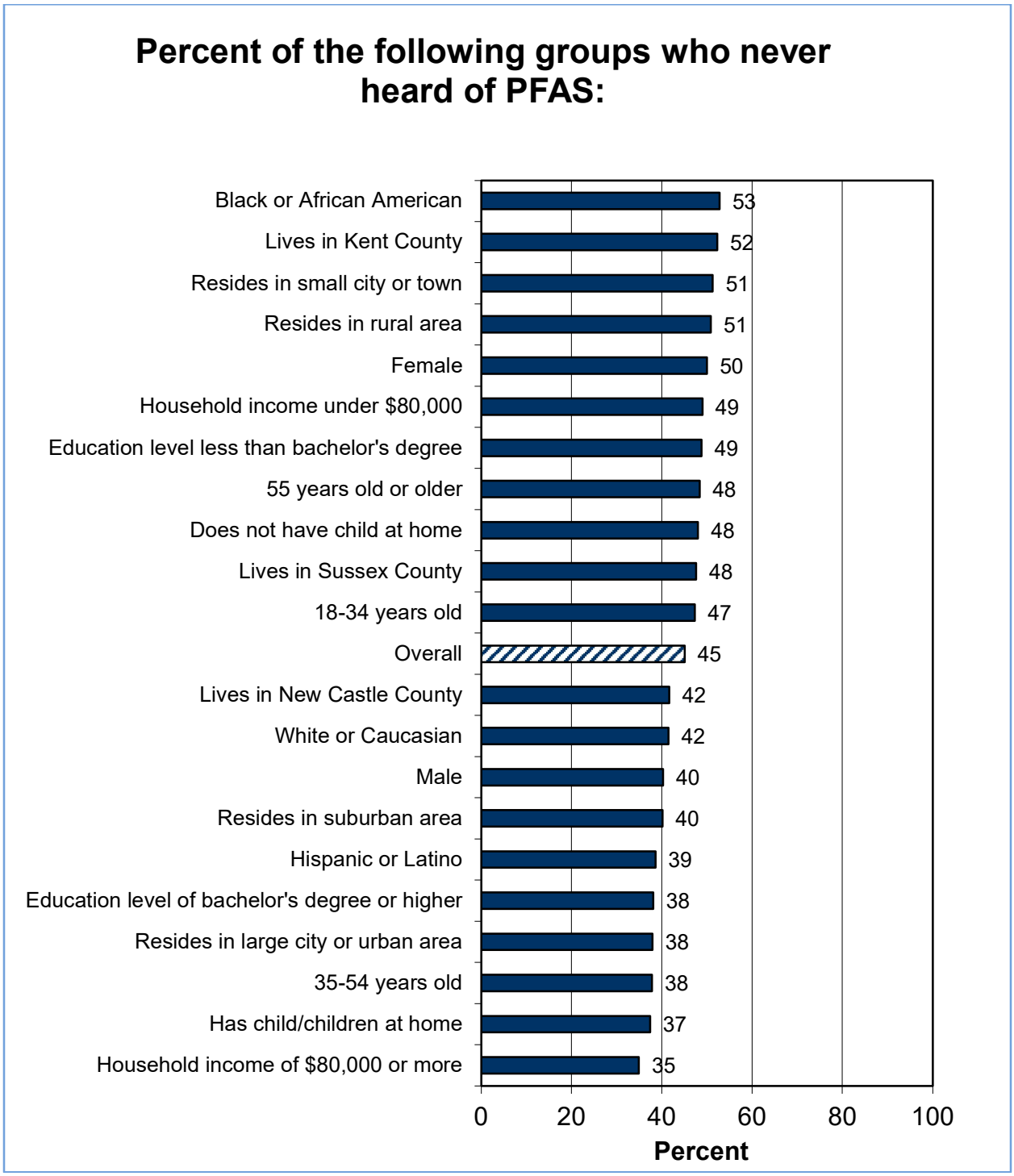
This demographic analyses graph shows the combined percentages of those who are confident or who think they know about PFAS.



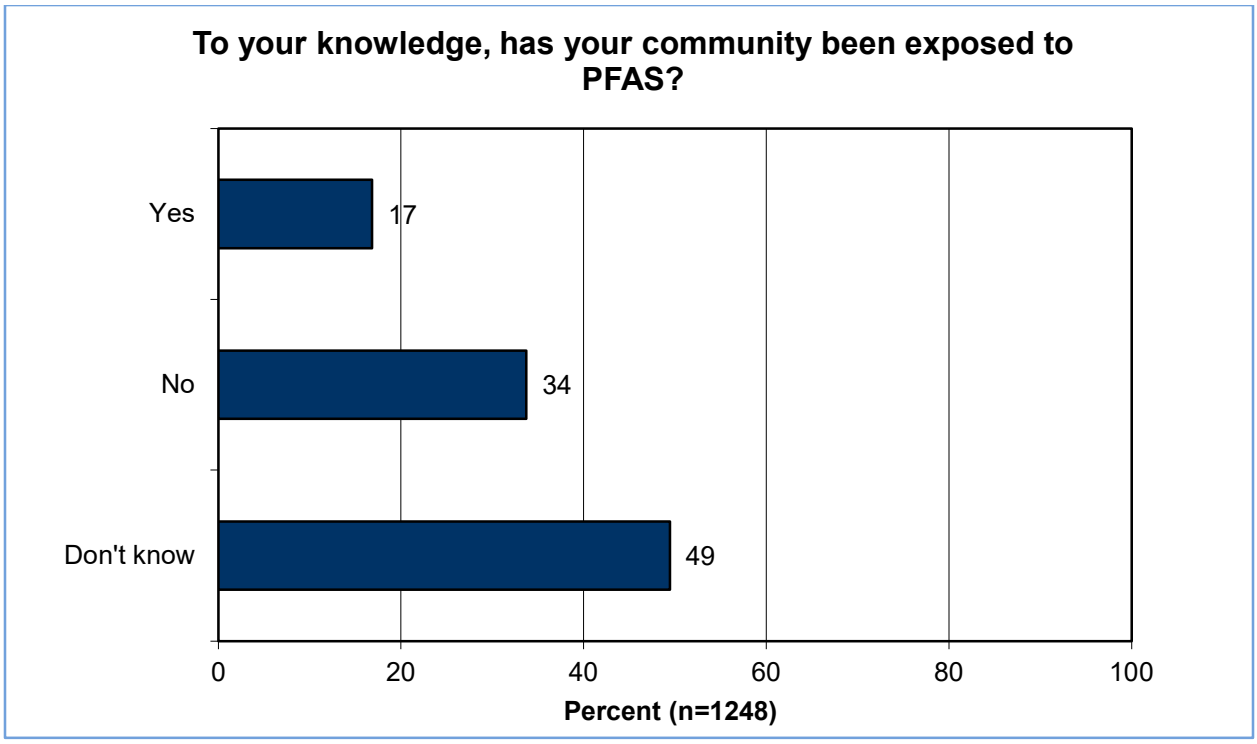
Hispanic residents and middle-aged residents are the groups that have the highest percentages who have heard of PFAS but do not know what they are.

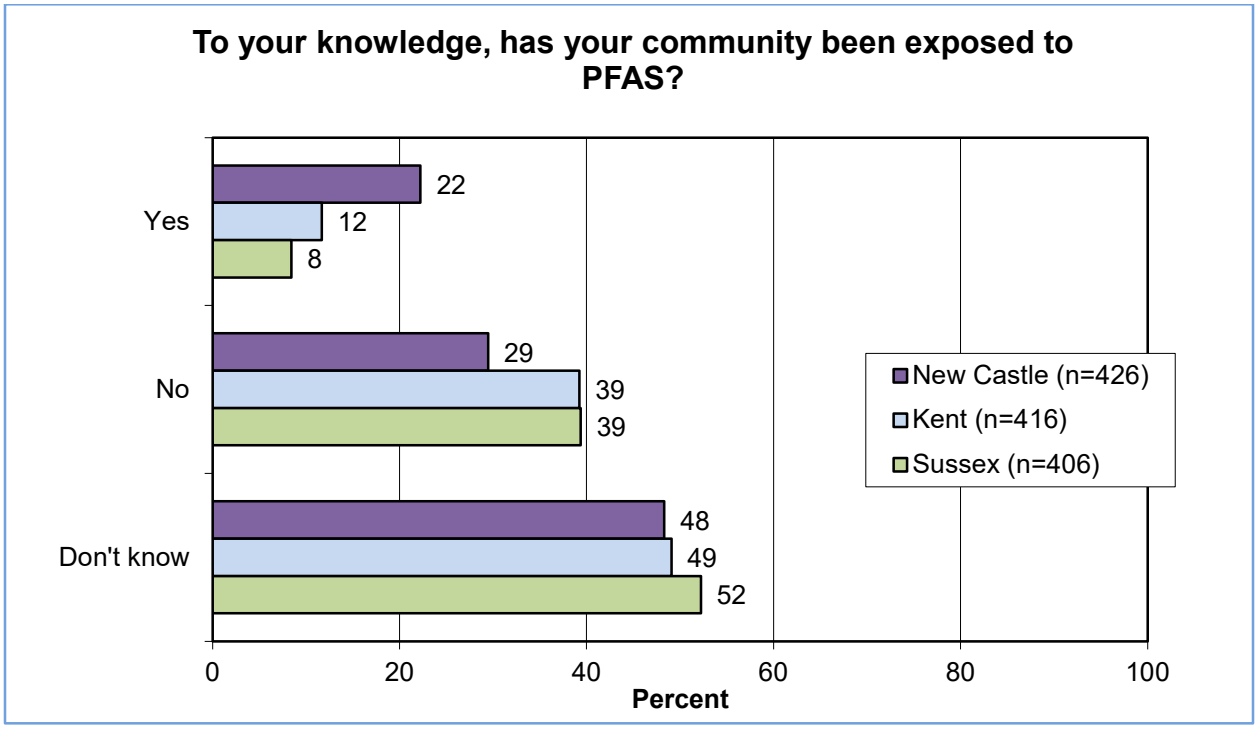


Groups most likely to indicate that they have never heard of PFAS include Black residents, those who live in Kent County, small city/town and rural residents, and female residents.

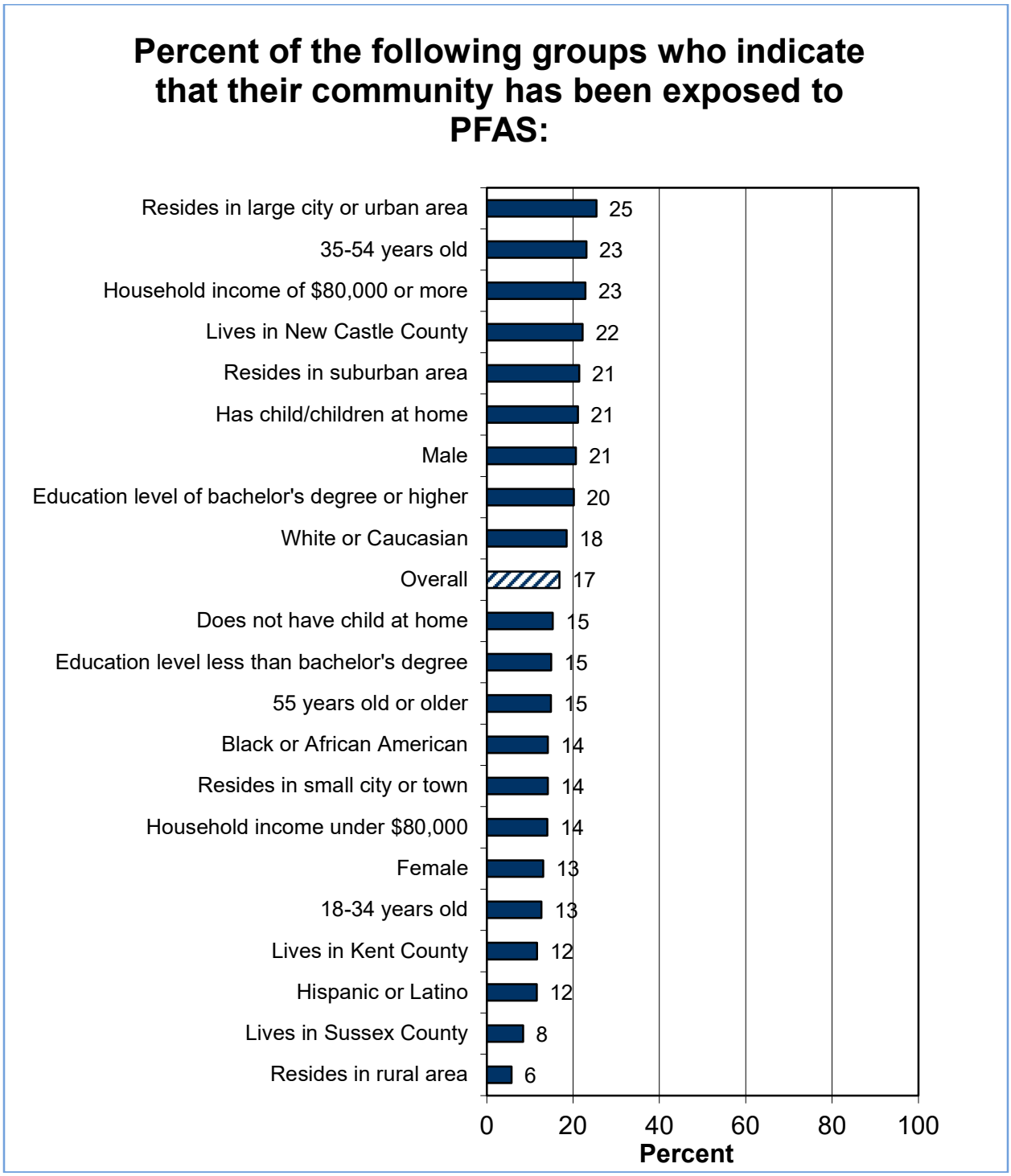


Overall, 17% of Delaware residents believe their community has been exposed to PFAS. This percentage is highest in New Castle County.

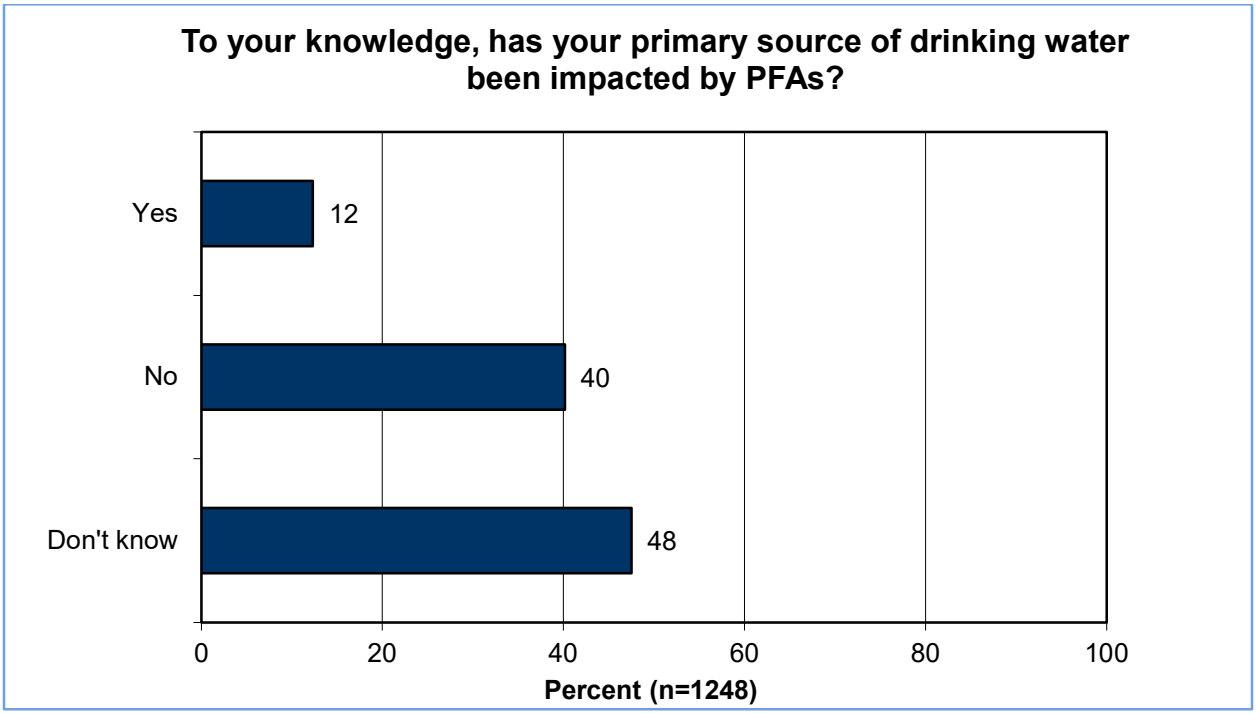


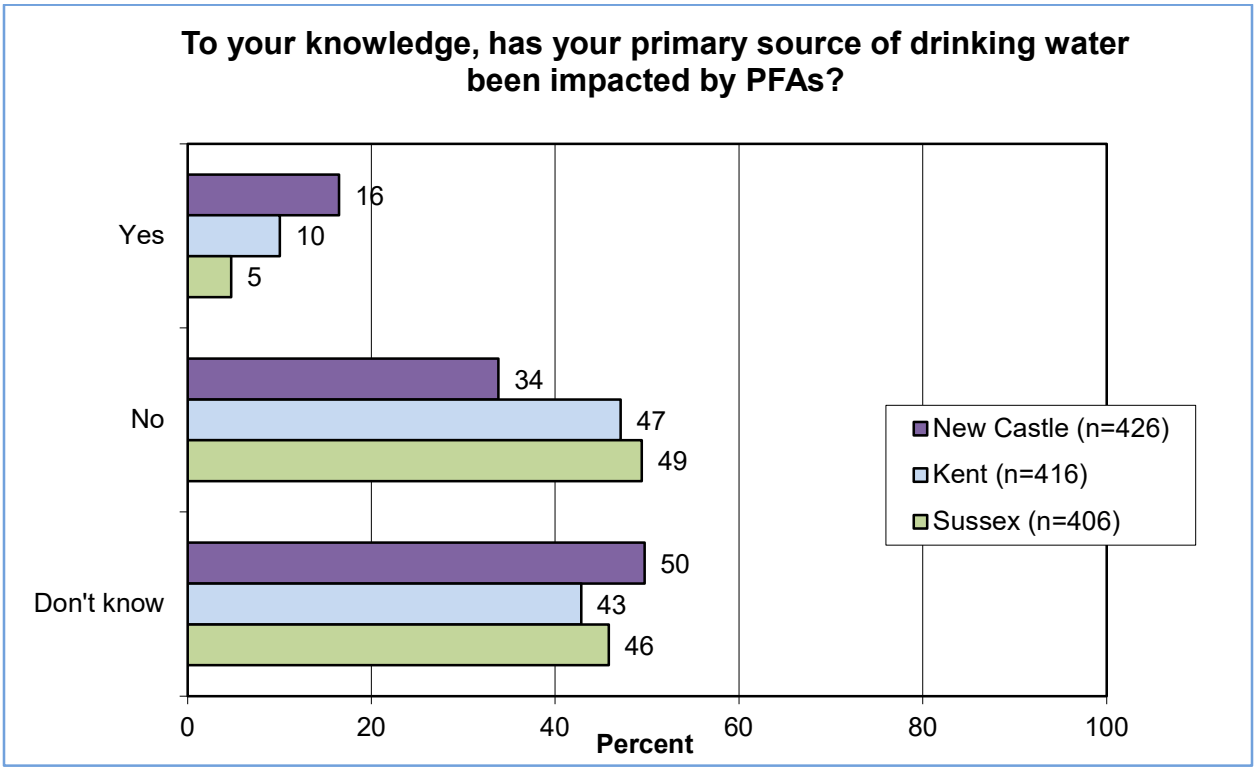


Residents of a large city or urban area, those 35 to 54 years old, those in the upper income bracket, and New Castle County residents most often indicated that their community has been exposed to PFAS.

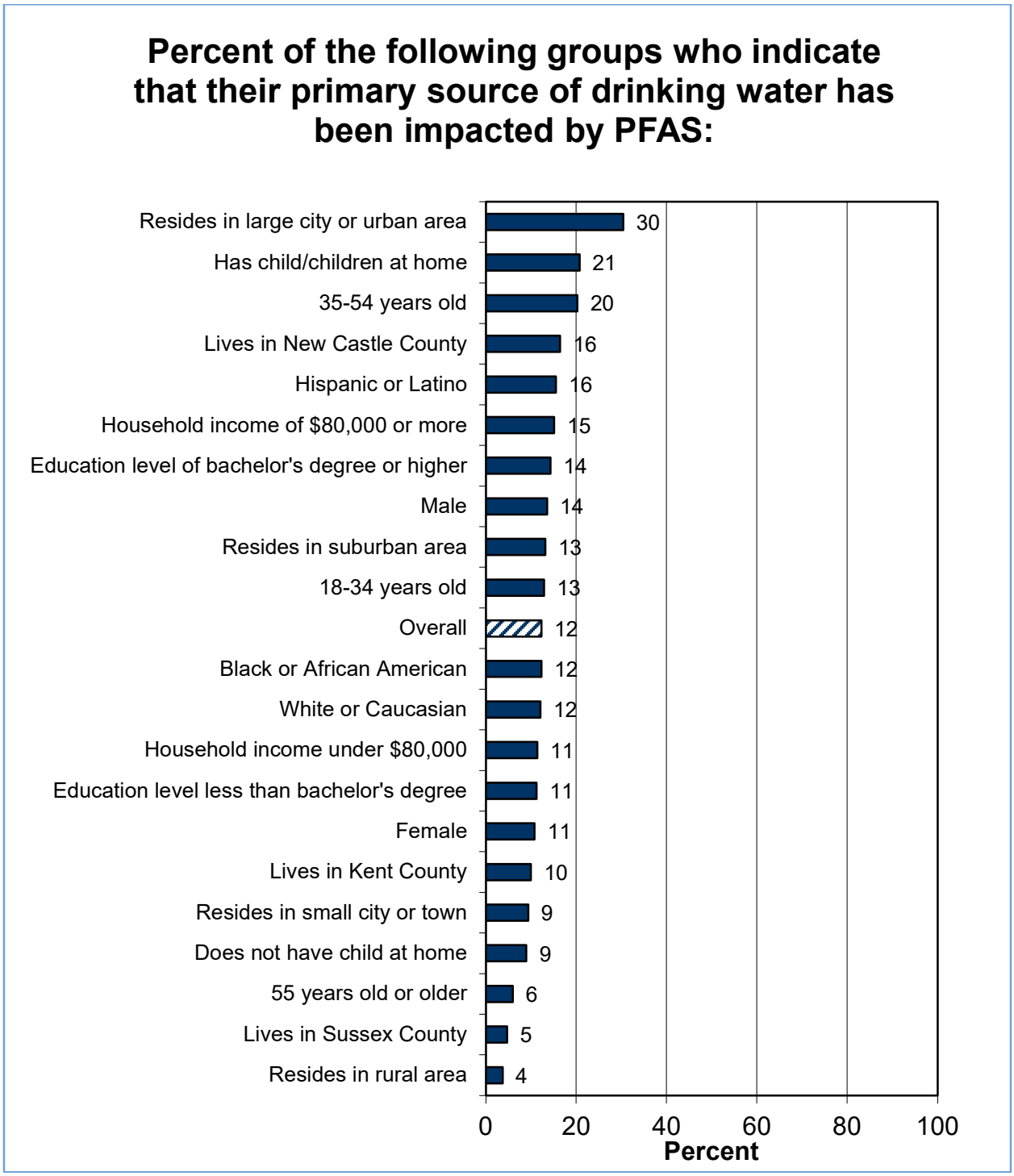


In a related question, 12% of residents believe that their primary source of drinking water has been impacted by PFAS. Again, this percentage is highest in New Castle County.

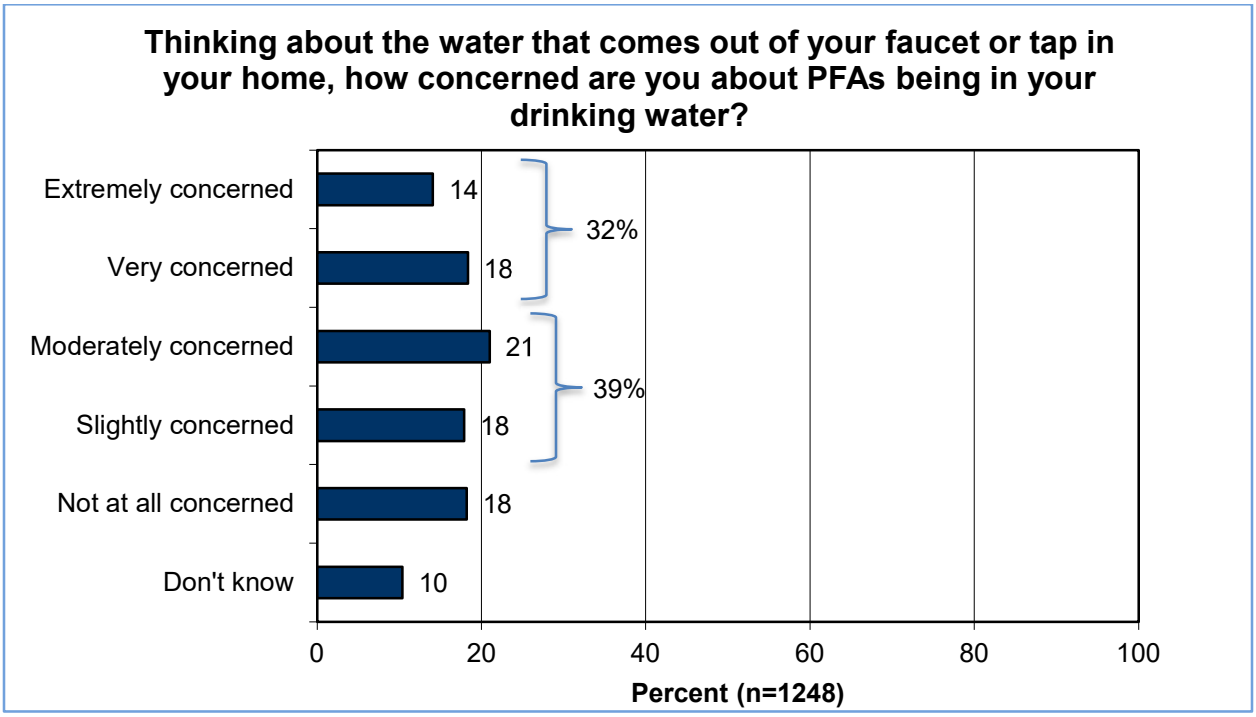


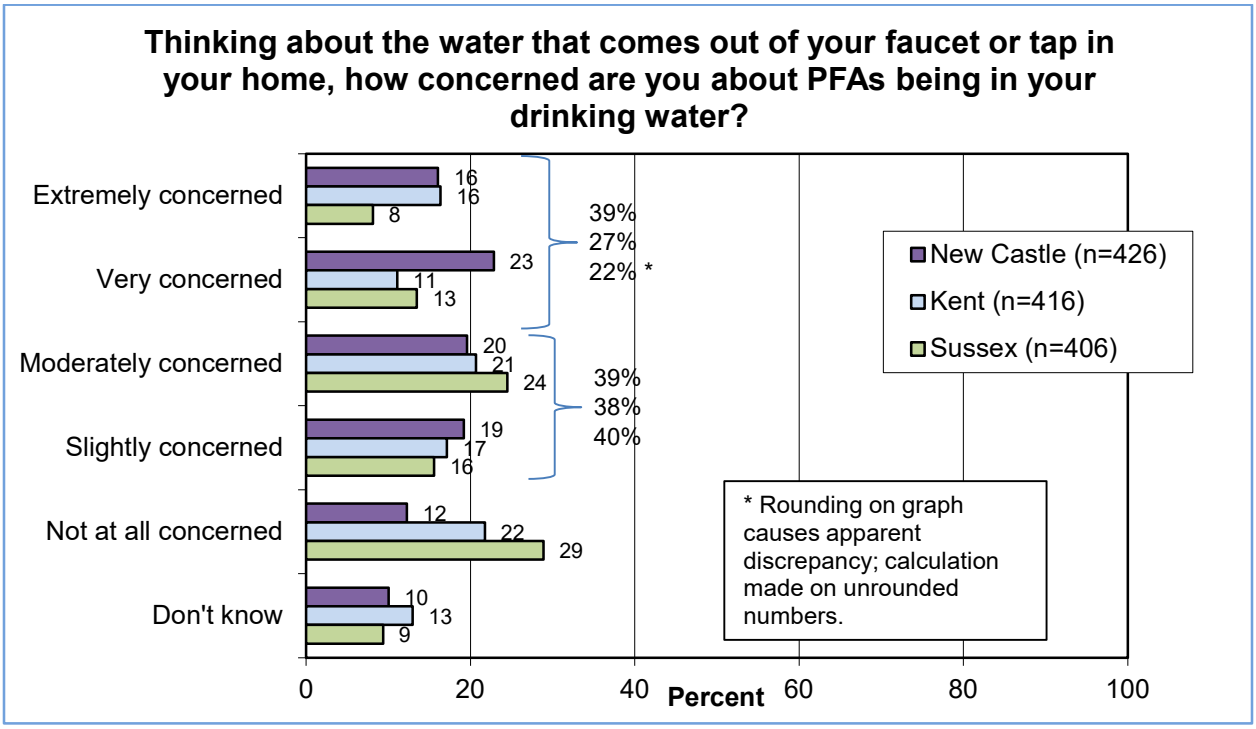


Large city/urban area residents, by far, are the group most likely to indicate that their primary source of drinking water has been impacted by PFAS, followed by those with children at home and those in the middle age category.

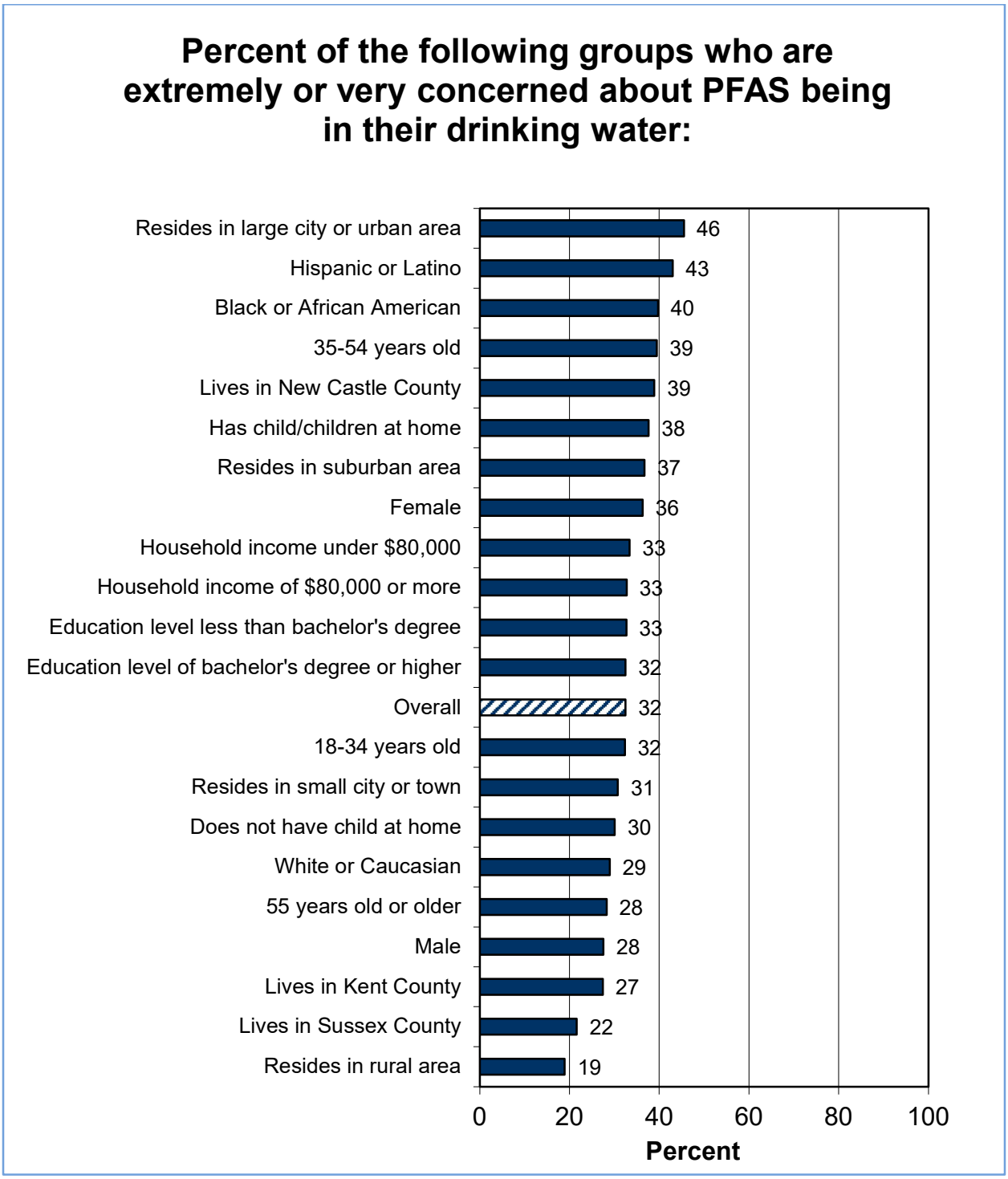


About a third of residents (32%) are *extremely* or *very concerned* about PFAS in their drinking water. Meanwhile, 39% are *moderately* or *slightly concerned*, and 18% are *not at all concerned*. Concern is highest in New Castle County.

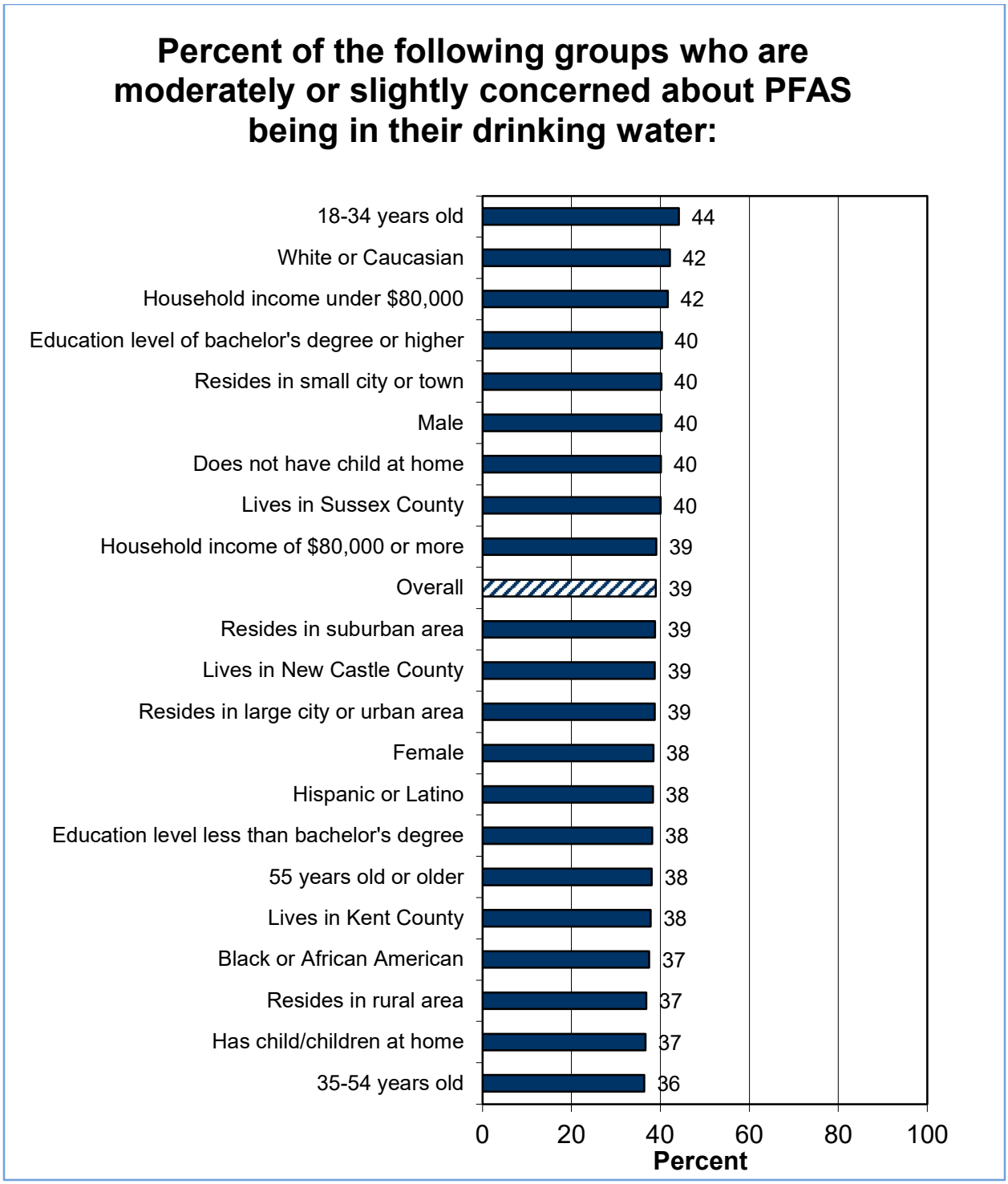




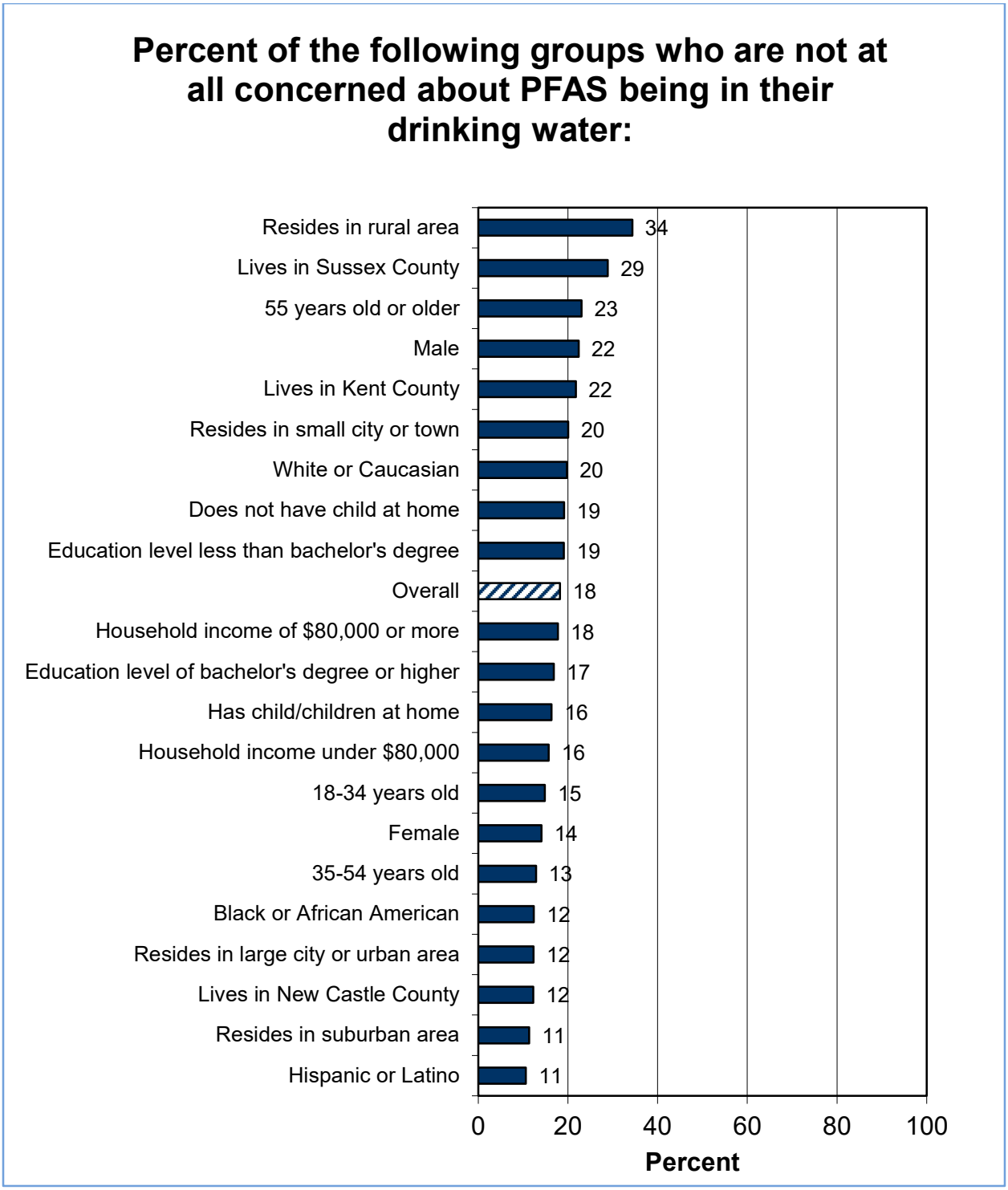
The highest levels of concern are exhibited in residents of large cities or urban areas, Hispanic residents, Black residents, middle-aged residents, and New Castle County residents.



Younger residents most often indicated being *moderately* or *slightly concerned* about PFAS in their drinking water.

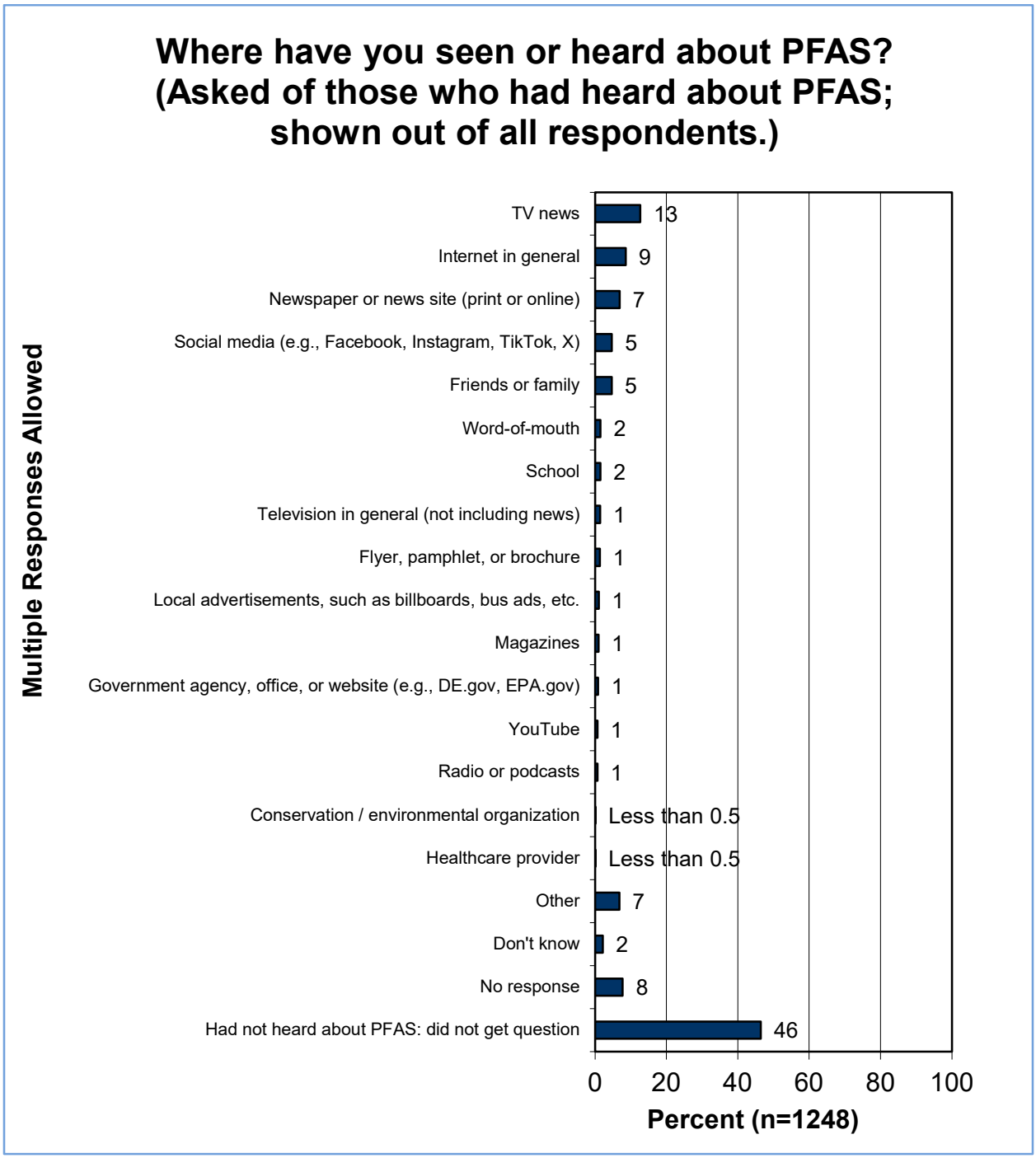


Concern about PFAS in their drinking water is lowest among rural residents, Sussex County residents, and older residents.

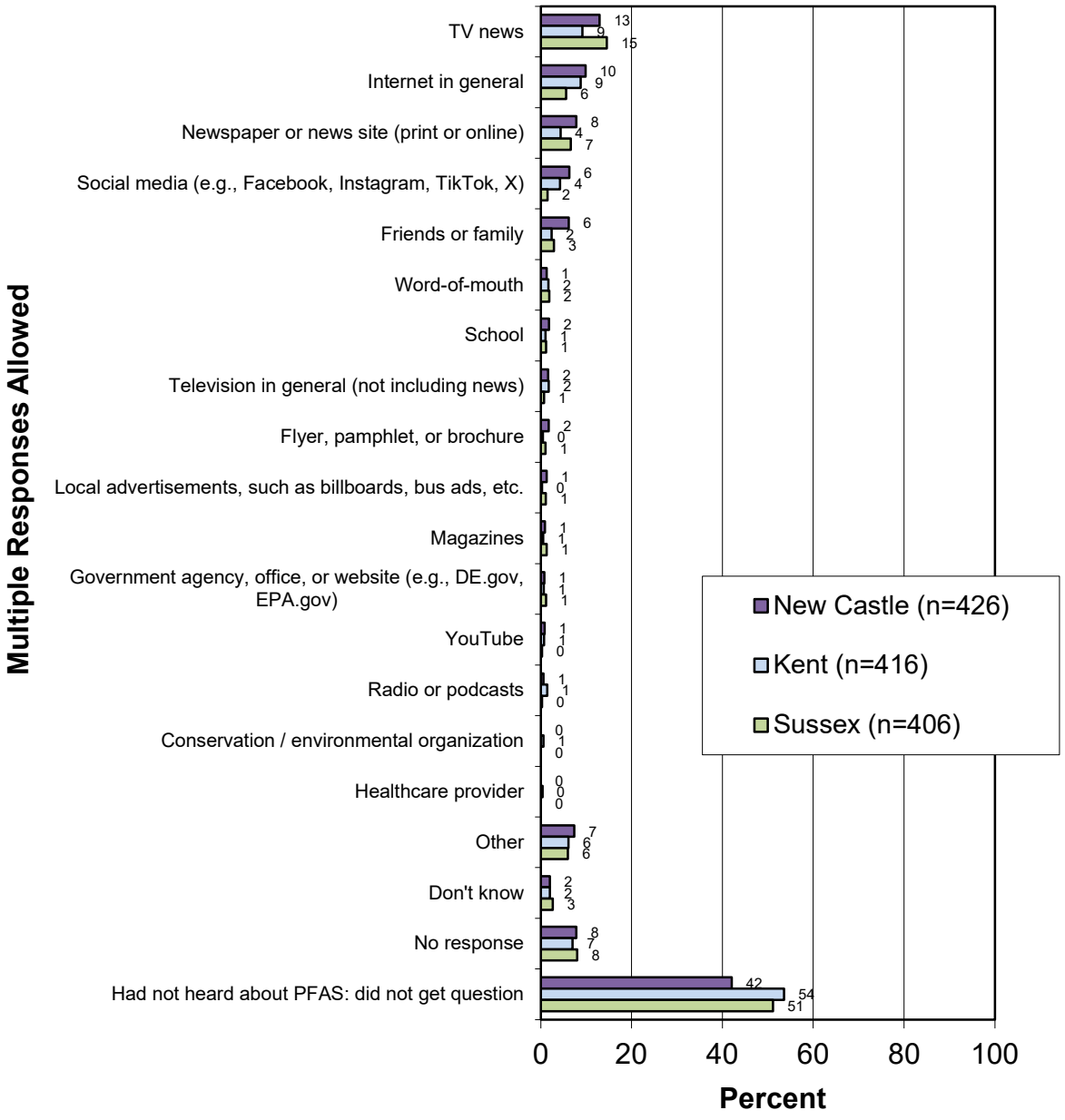


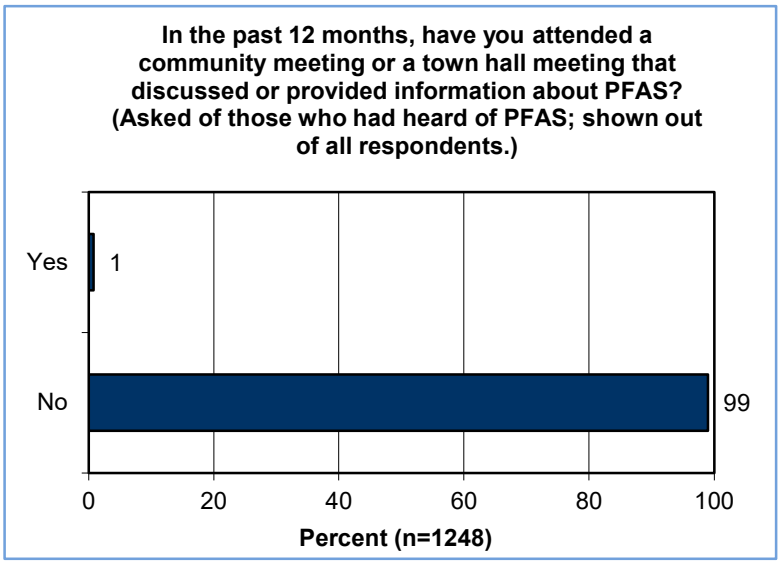
INFORMATION ABOUT PFAS

Residents who heard about PFAS most often got the information from TV news, the internet in general, print or online newspapers, social media, and friends or family.

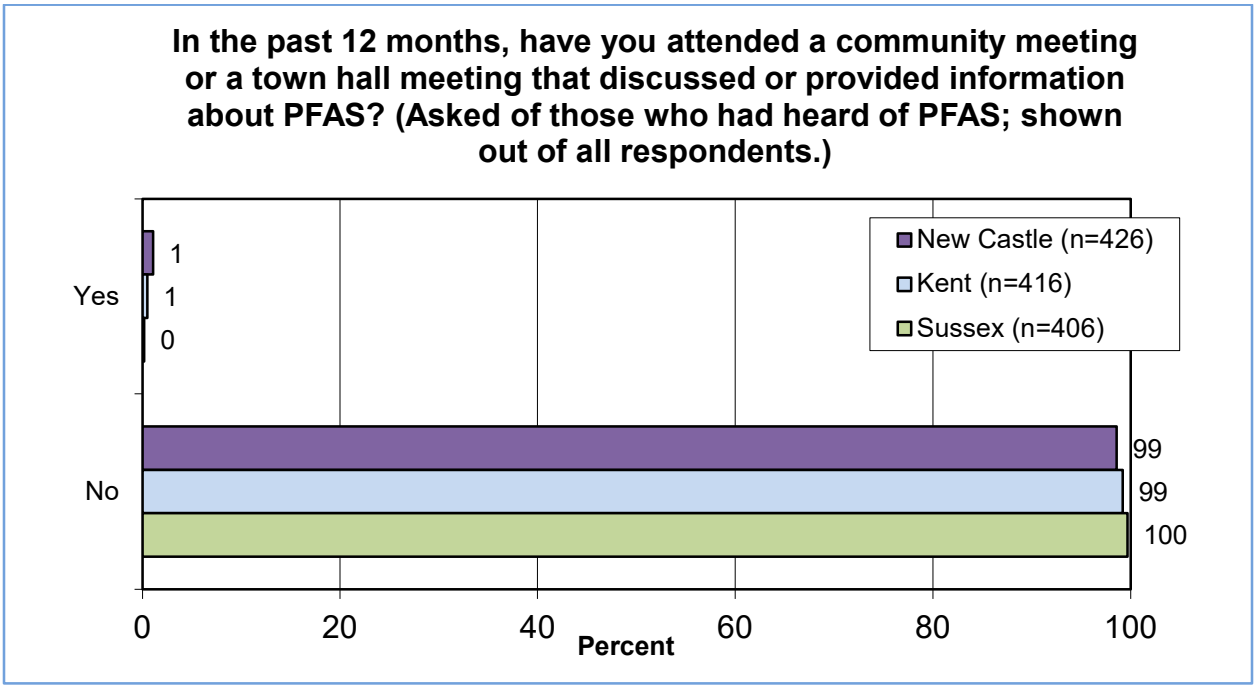


Where have you seen or heard about PFAS? (Asked of those who had heard about PFAS; shown out of all respondents.)

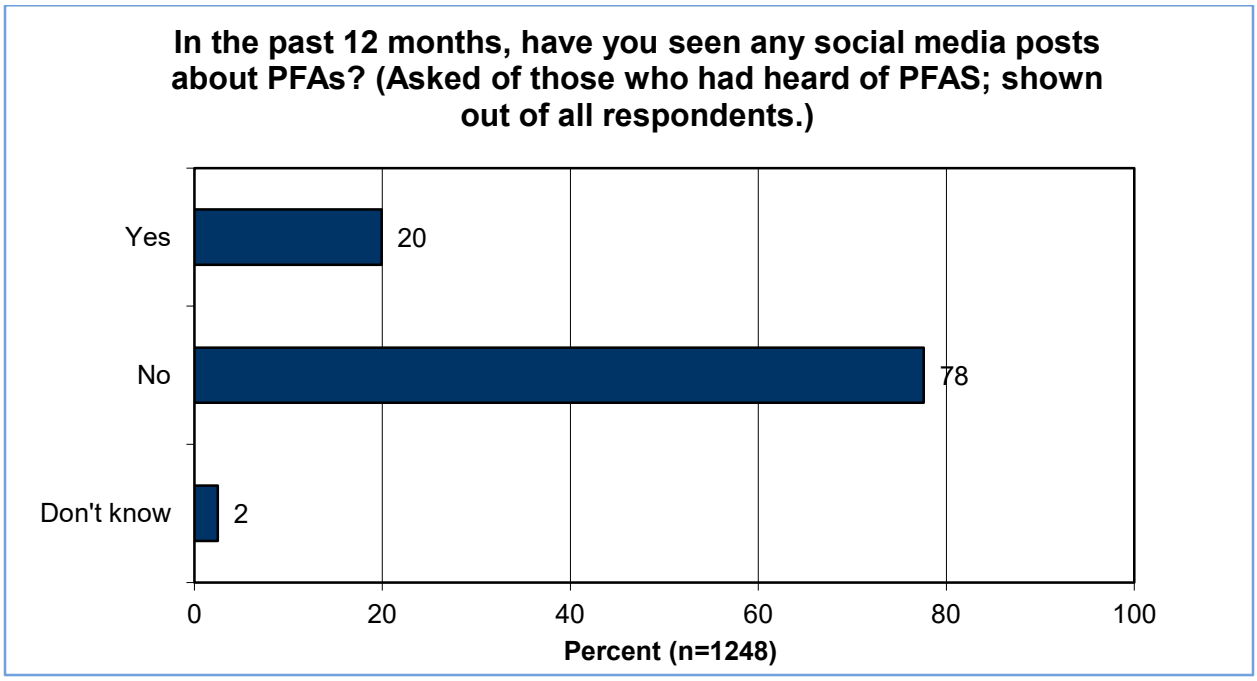


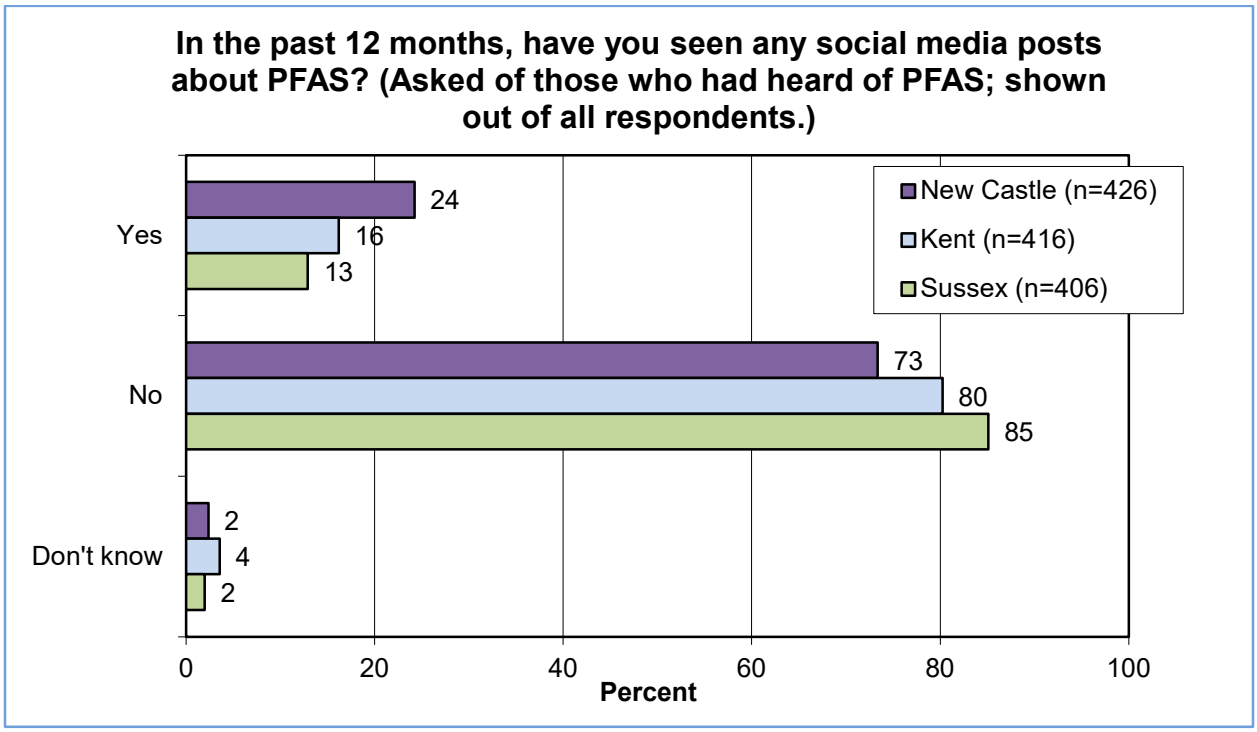


Overall, 1% of Delaware residents have attended a community meeting about PFAS.

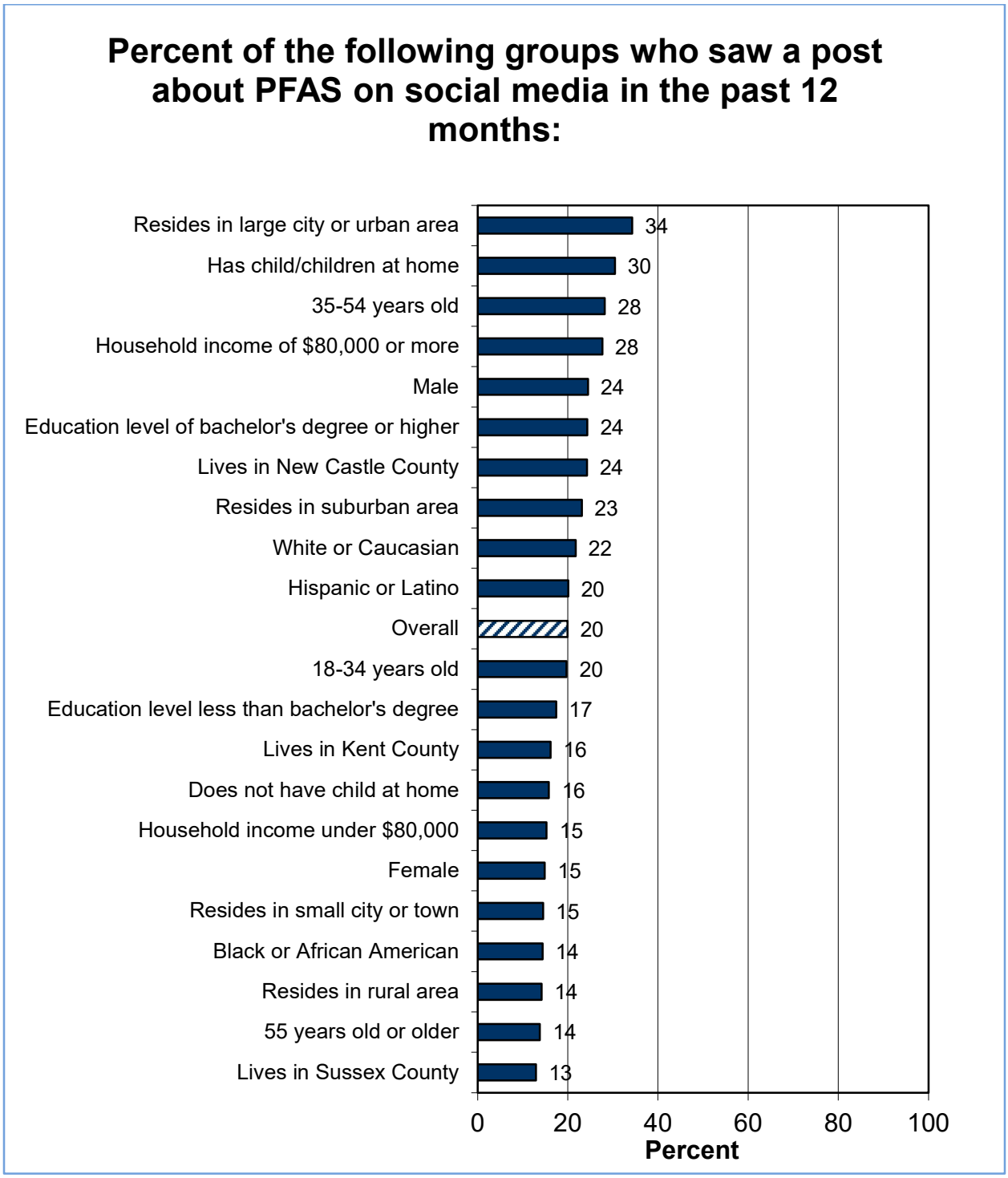


A fifth of residents (20%) have seen social media posts about PFAS in the past 12 months. New Castle County residents have seen social media posts more often than those from the other counties.



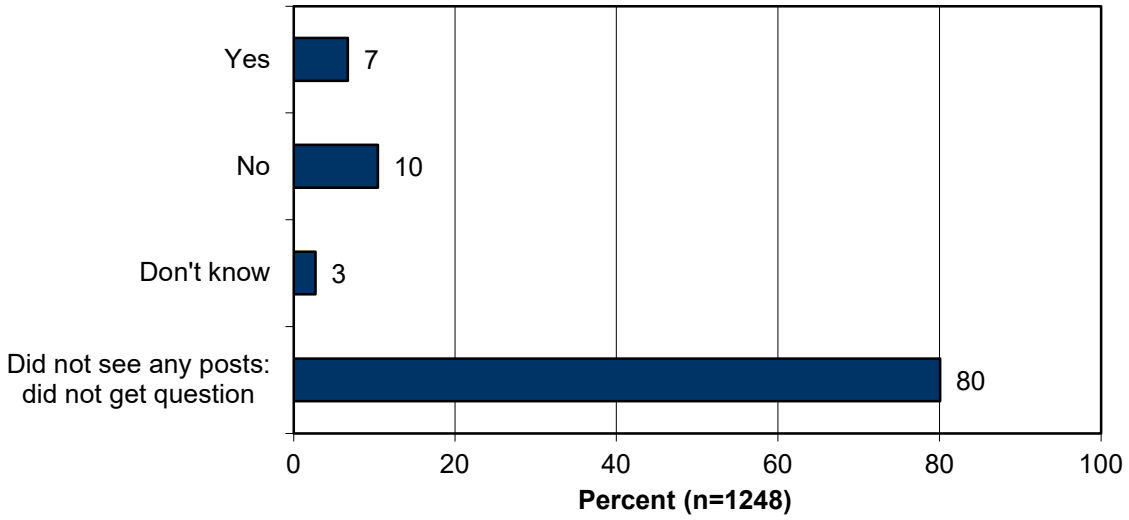


Groups most likely to have seen social media posts are large city/urban area residents, those with children at home, those in the middle age bracket, and those in the upper income bracket.

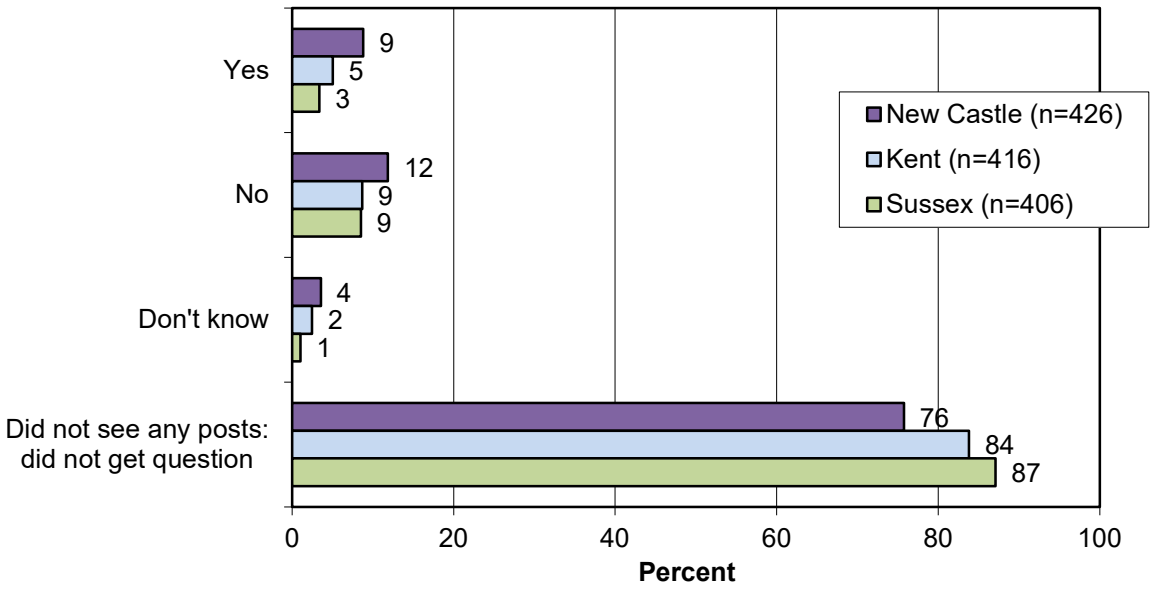


Overall, 7% of residents saw a social media post specifically about PFAS in Delaware.

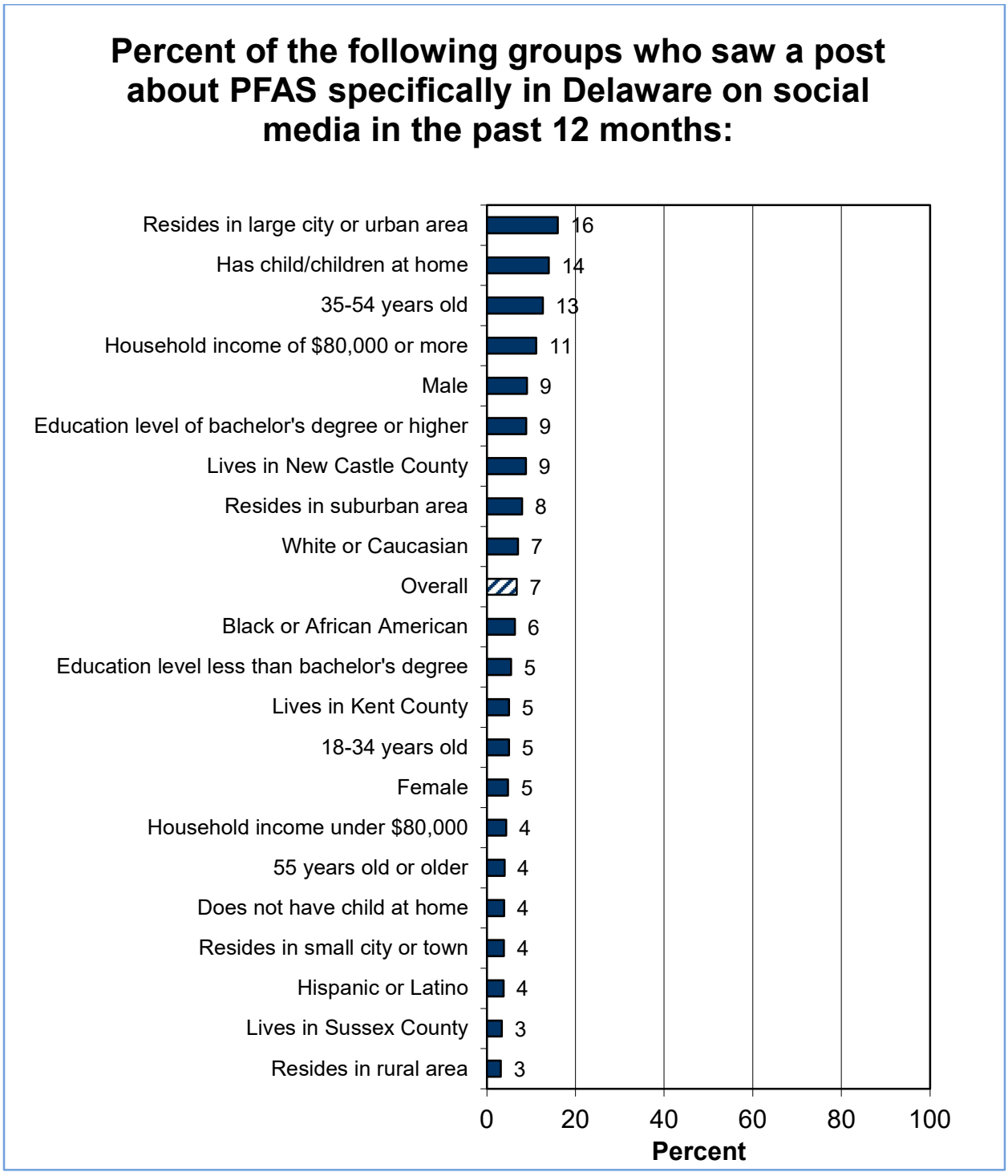
Were any of the social media posts you saw specifically about PFAs in Delaware? (Asked of those who saw a social media post; shown out of all respondents.)



Were any of the social media posts you saw specifically about PFAS in Delaware? (Asked of those who saw a social media post; shown out of all respondents.)



The groups most likely to have seen a social media post about PFAS in Delaware include large city/urban area residents, those with children at home, those 35 to 54 years old, and those in the higher income category.



FAMILIARITY WITH EXPOSURE TO PFAS

The survey provided respondents with a list of nine items and asked them about their familiarity with each as a potential source or pathway of exposure to PFAS contamination.

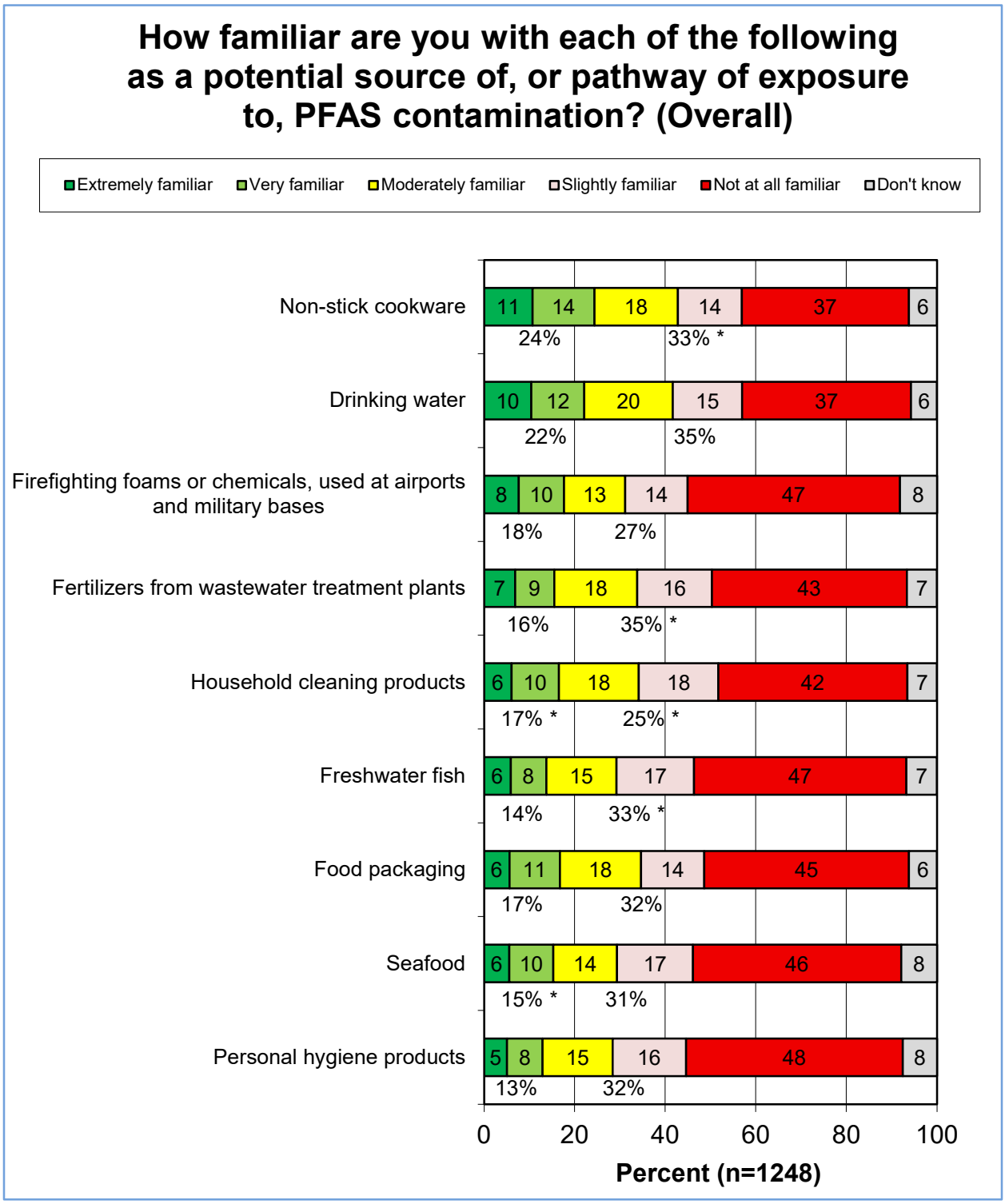
There is little marked difference between the results for the listed items. Looking at *extremely familiar* or *very familiar* percentages combined, the top results are for non-stick cookware (24% indicated this) and drinking water (22%). Otherwise, these percentages range from 13% to 18% for the other seven items.

The combined percentages of *moderately familiar* and *slightly familiar* responses are about a quarter to a third for all items.

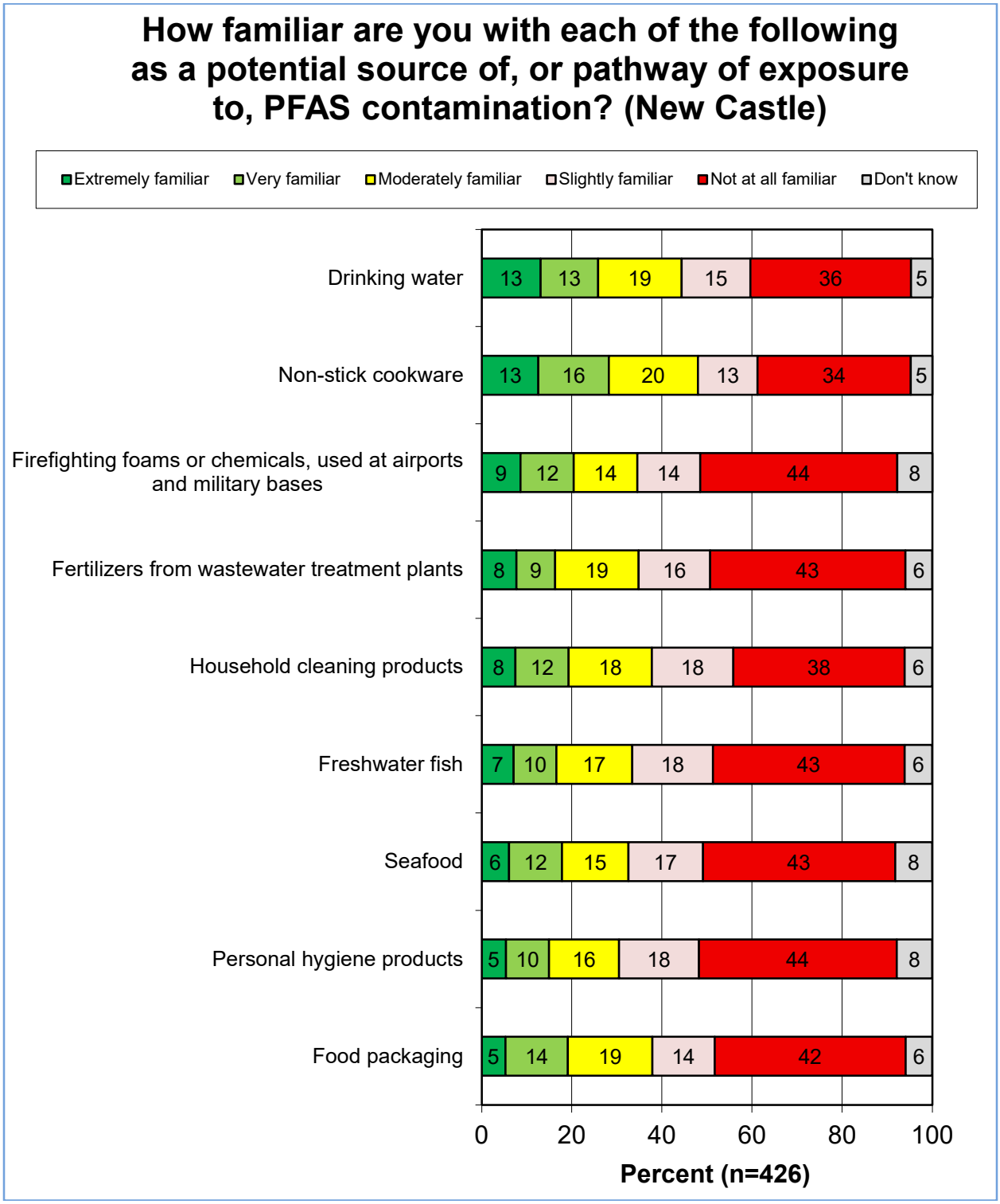
A slight majority give *not at all familiar* or *don't know* responses for most items.

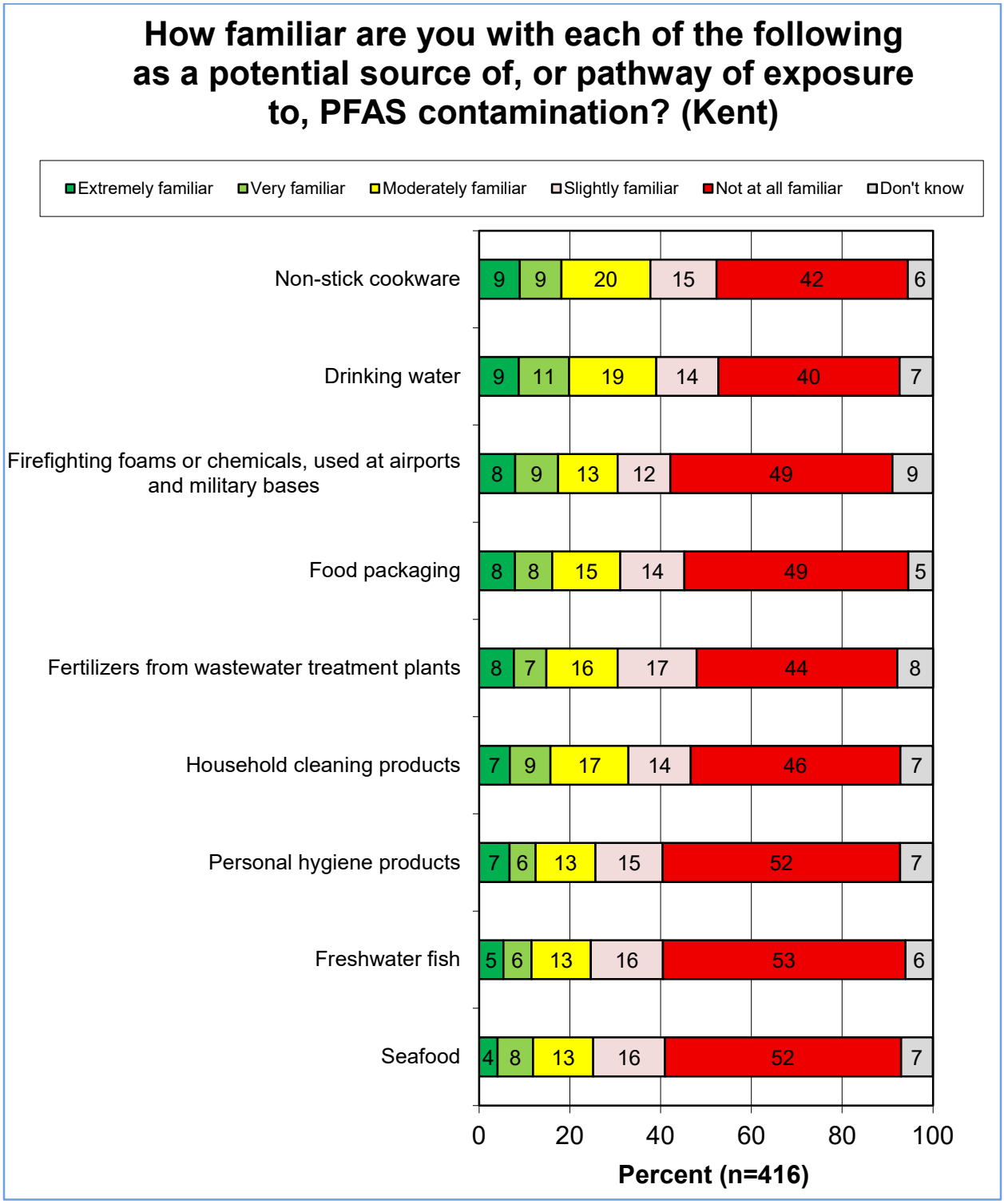
Full results are shown on the following page, because a full page is needed for presentation. The graph of overall results is followed by graphs of the results in each county.

Results are presented in descending order of *extremely familiar* responses. Combined percentages of *extremely familiar* or *very familiar* responses are shown below each bar, as are combined percentages of *moderately familiar* and *slightly familiar* responses.

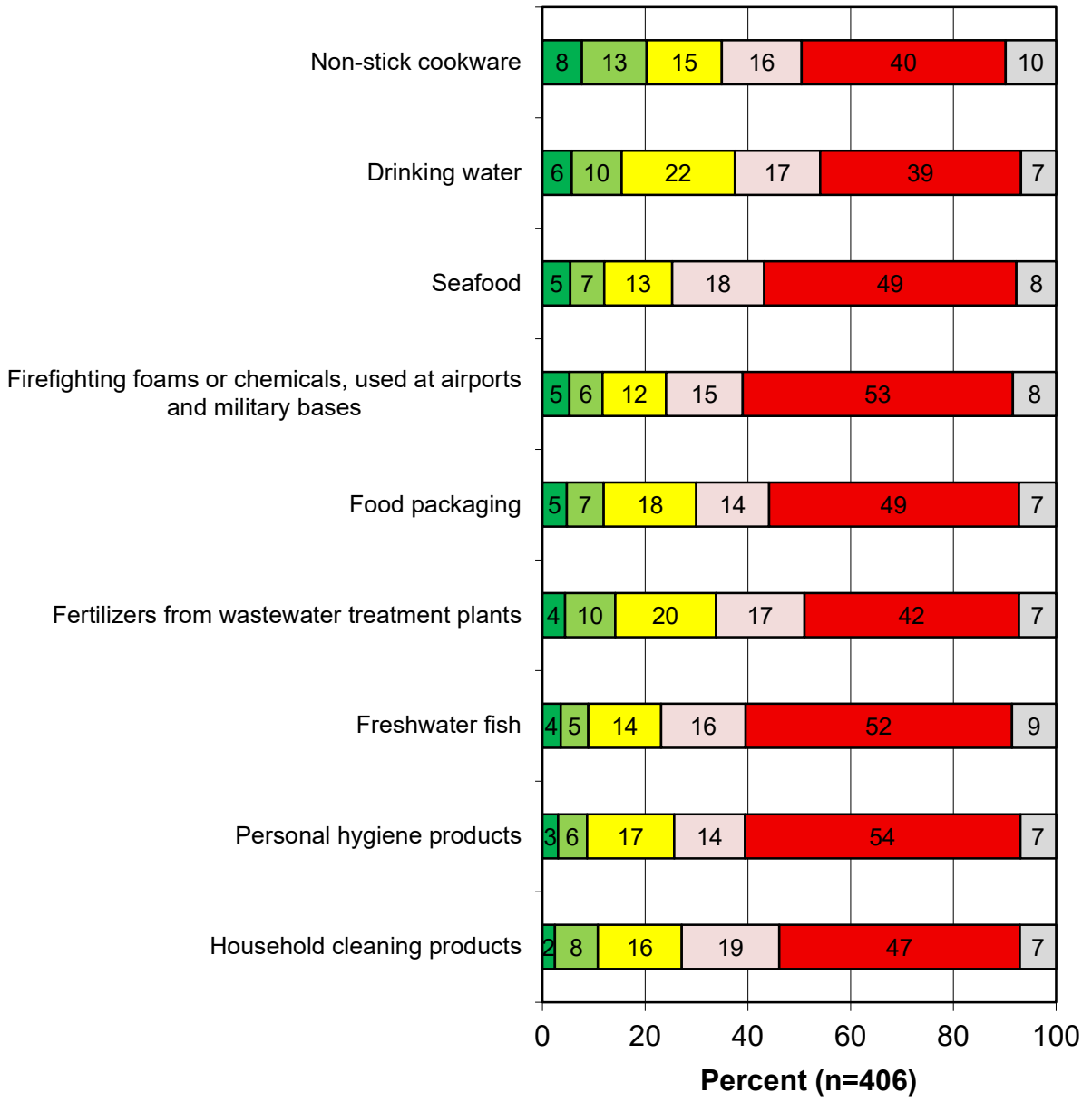


* Rounding on graph causes apparent discrepancy in sum; calculation made on unrounded numbers.


How familiar are you with each of the following as a potential source of, or pathway of exposure to, PFAS contamination? (New Castle)
Extremely familiar
Very familiar
Moderately familiar
Slightly familiar
Not at all familiar
Don't know
Drinking water
13
13
19
15
36
5
Non-stick cookware
13
16
20
13
34
5
Firefighting foams or chemicals, used at airports and military bases
9
12
14
14
44
8
Fertilizers from wastewater treatment plants
8
9
19
16
43
6
Household cleaning products
8
12
18
18
38
6
Freshwater fish
7
10
17
18
43
6
Seafood
6
12
15
17
43
8
Personal hygiene products
5
10
16
18
44
8
Food packaging
5
14
19
14
42
6
0
20
40
60
80
100
Percent (n=426)


How familiar are you with each of the following as a potential source of, or pathway of exposure to, PFAS contamination? (Kent)
Extremely familiar
Very familiar
Moderately familiar
Slightly familiar
Not at all familiar
Don't know
Non-stick cookware
9 9 20 15 42 6
Drinking water
9 11 19 14 40 7
Firefighting foams or chemicals, used at airports and military bases
8 9 13 12 49 9
Food packaging
8 8 15 14 49 5
Fertilizers from wastewater treatment plants
8 7 16 17 44 8
Household cleaning products
7 9 17 14 46 7
Personal hygiene products
7 6 13 15 52 7
Freshwater fish
5 6 13 16 53 6
Seafood
4 8 13 16 52 7
0 20 40 60 80 100
Percent (n=416)

How familiar are you with each of the following as a potential source of, or pathway of exposure to, PFAS contamination? (Sussex)



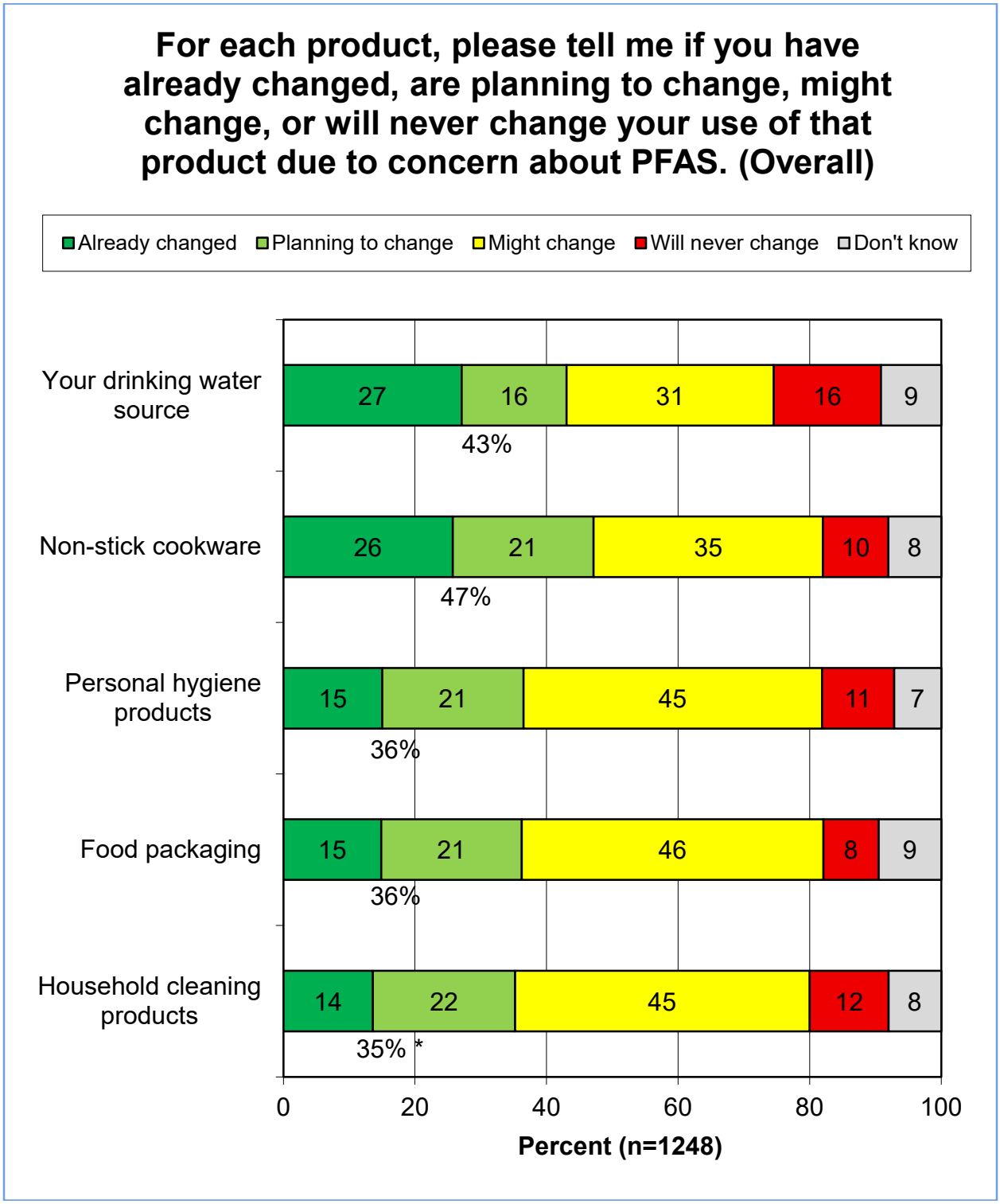
BEHAVIOR CHANGES RELATED TO CONCERN ABOUT PFAS

At this point, the survey provided respondents with the following information:

> *Next, we would like to tell you a little more about PFAS.*
>
> *PFAS chemicals are a group of man-made chemicals, specifically per- and polyfluoroalkyl substances.*
>
> *PFAS chemicals are used in a wide-range of products due to their ability to repel grease, water, and heat. Some products that may have PFAS include plastic food containers and packaging, nonstick cookware, soaps, cleaning products, fabrics, and more.*
>
> *PFAS are sometimes referred to as "forever chemicals" because they are extremely resistant to breakdown in the environment and in living organisms including humans, raising concerns about potential health effects.*

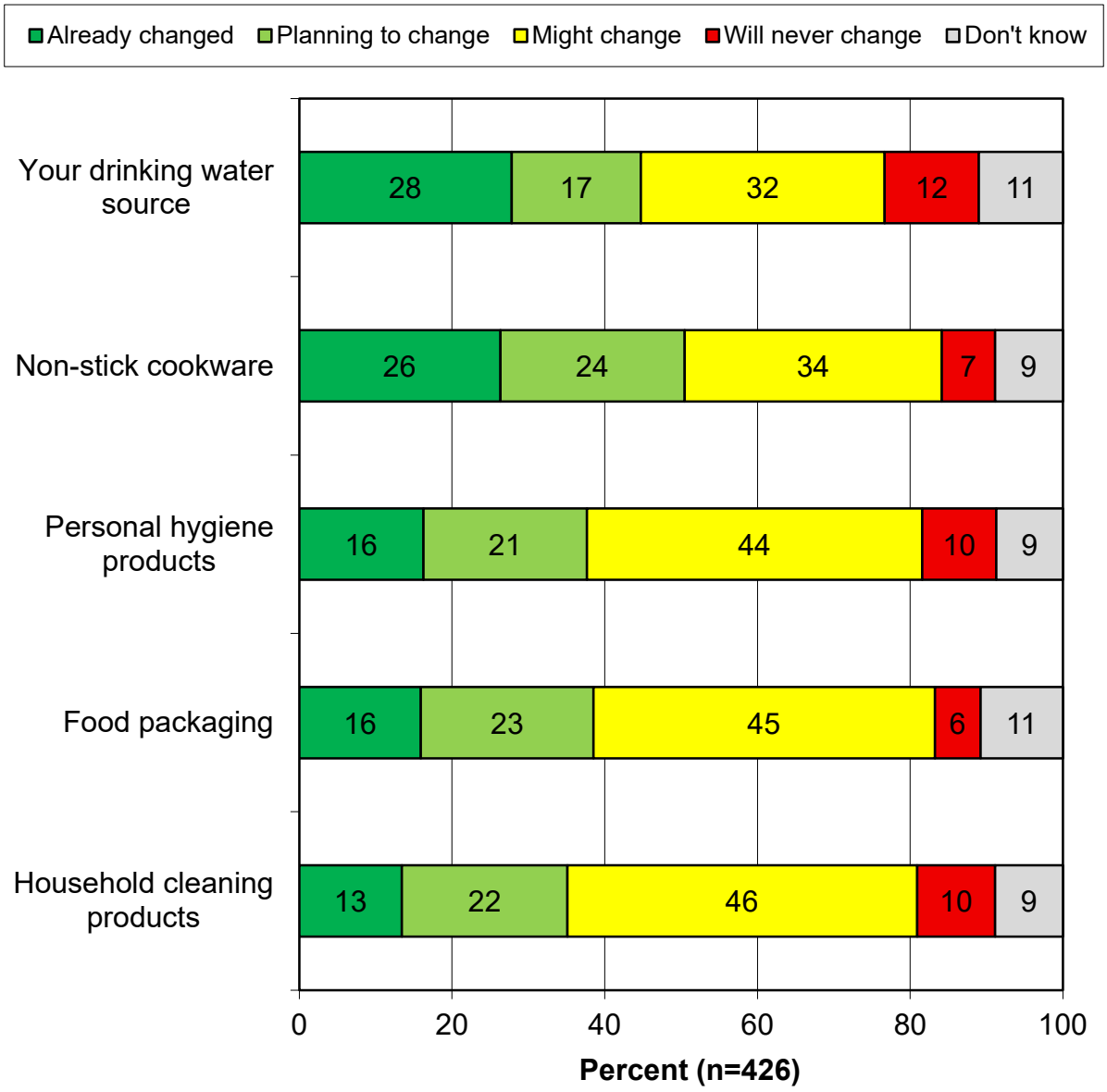
The next series of questions asked residents if they had changed or plan to change their use of five products over concern about PFAS contamination. As shown in the graph on the following page, the highest rates of change are in the use of drinking water and non-stick cookware.

The results are presented in the graph in descending order of *already changed* percentages. Combined percentages of *already changed* or *planning to change* responses are shown below each bar. Overall results on the next page are followed by county-level results. Those graphs are followed by demographic analyses graphs, shown in the same order and based on the same combined percentages.

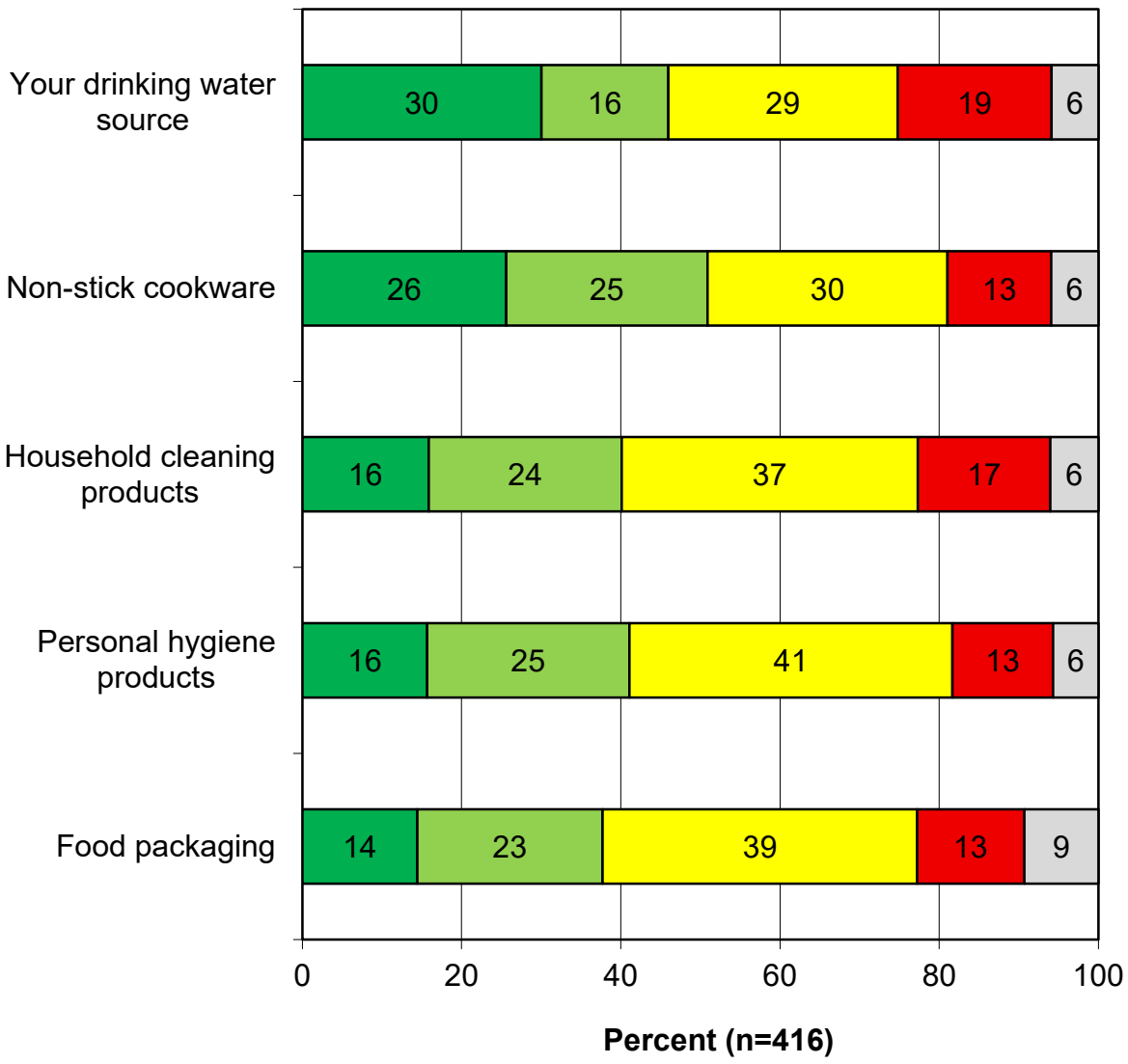


* Rounding on graph causes apparent discrepancy in sum; calculation made on unrounded numbers.

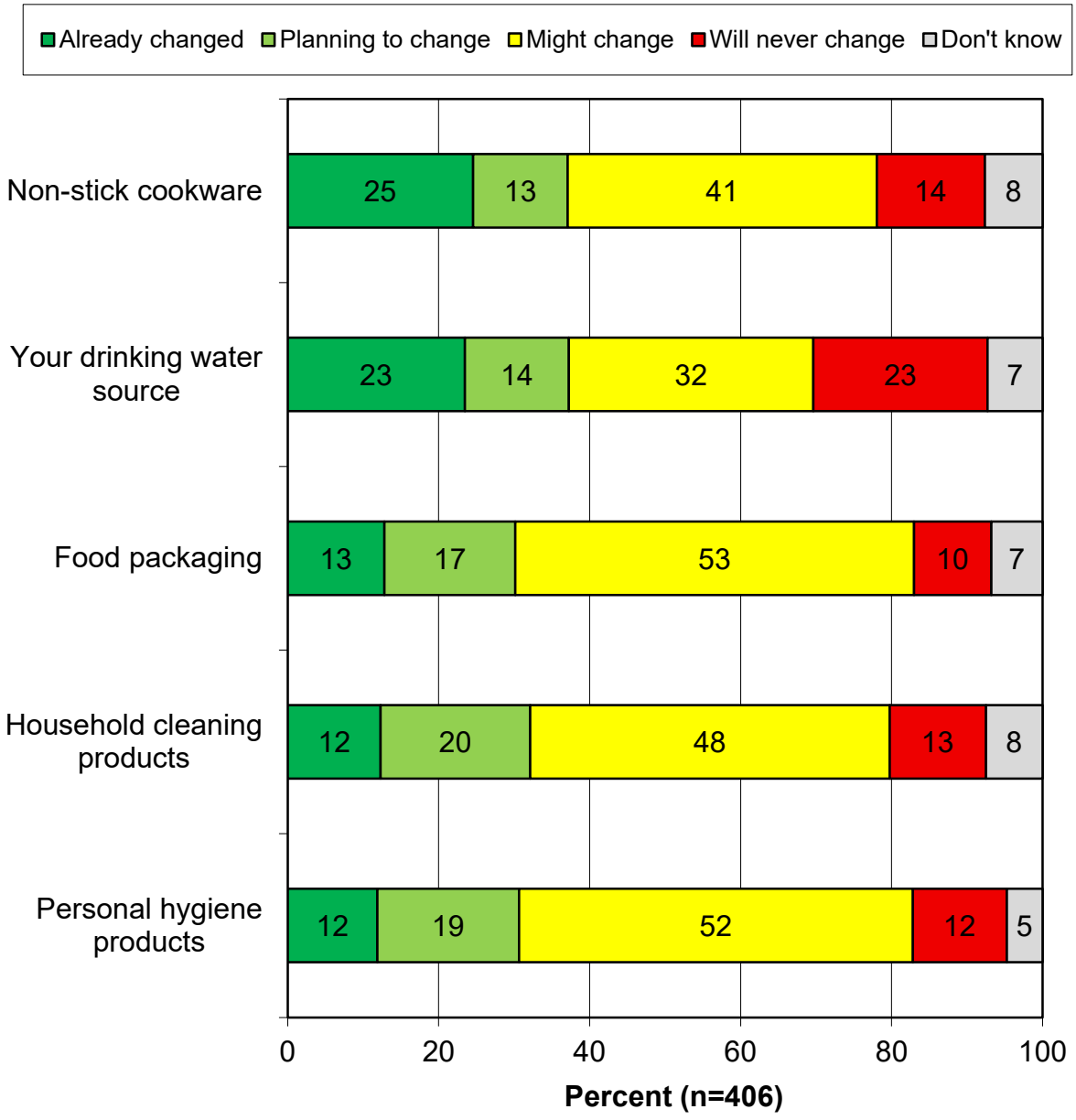
For each product, please tell me if you have already changed, are planning to change, might change, or will never change your use of that product due to concern about PFAS. (New Castle)



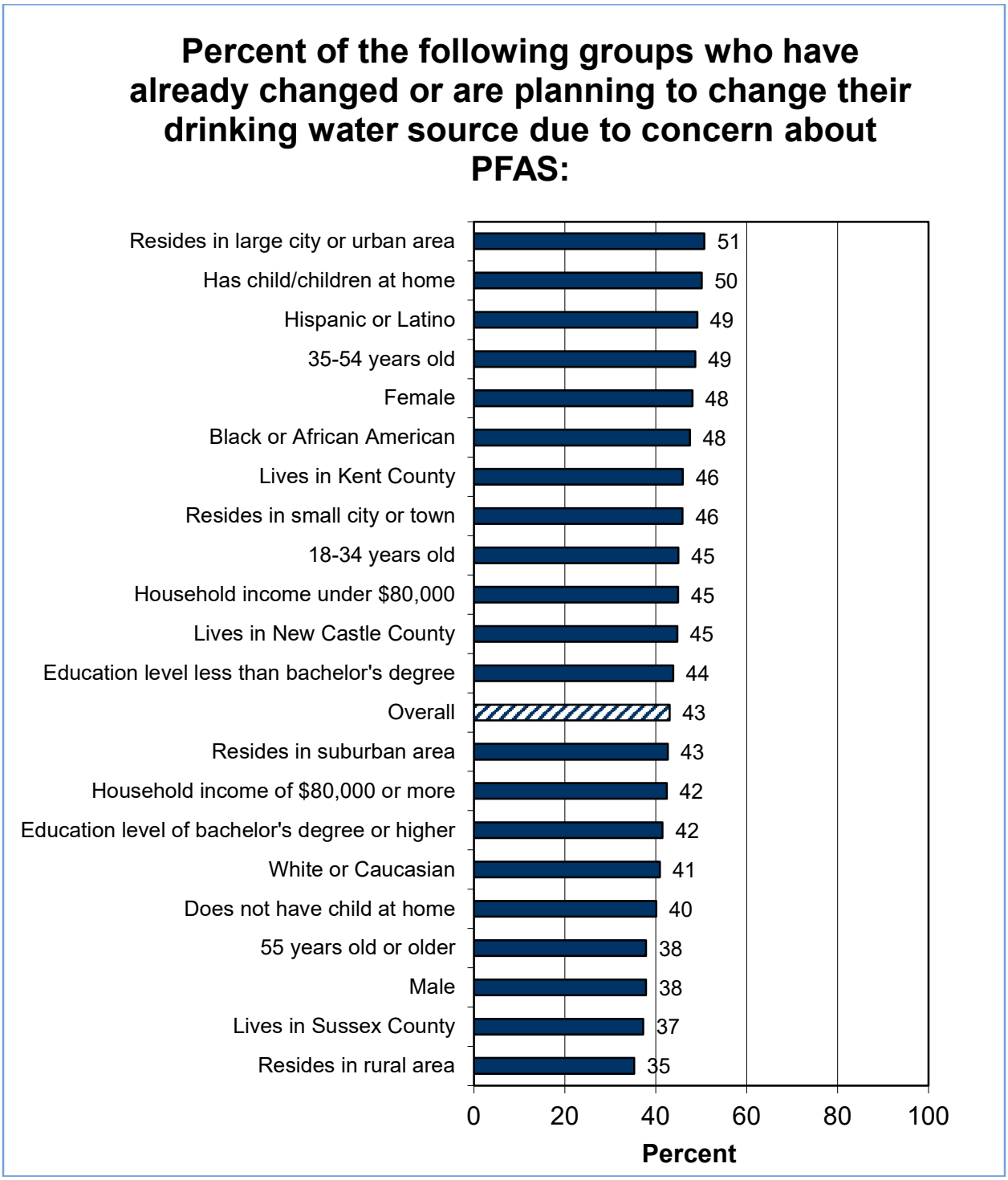
For each product, please tell me if you have already changed, are planning to change, might change, or will never change your use of that product due to concern about PFAS. (Kent)



For each product, please tell me if you have already changed, are planning to change, might change, or will never change your use of that product due to concern about PFAS. (Sussex)

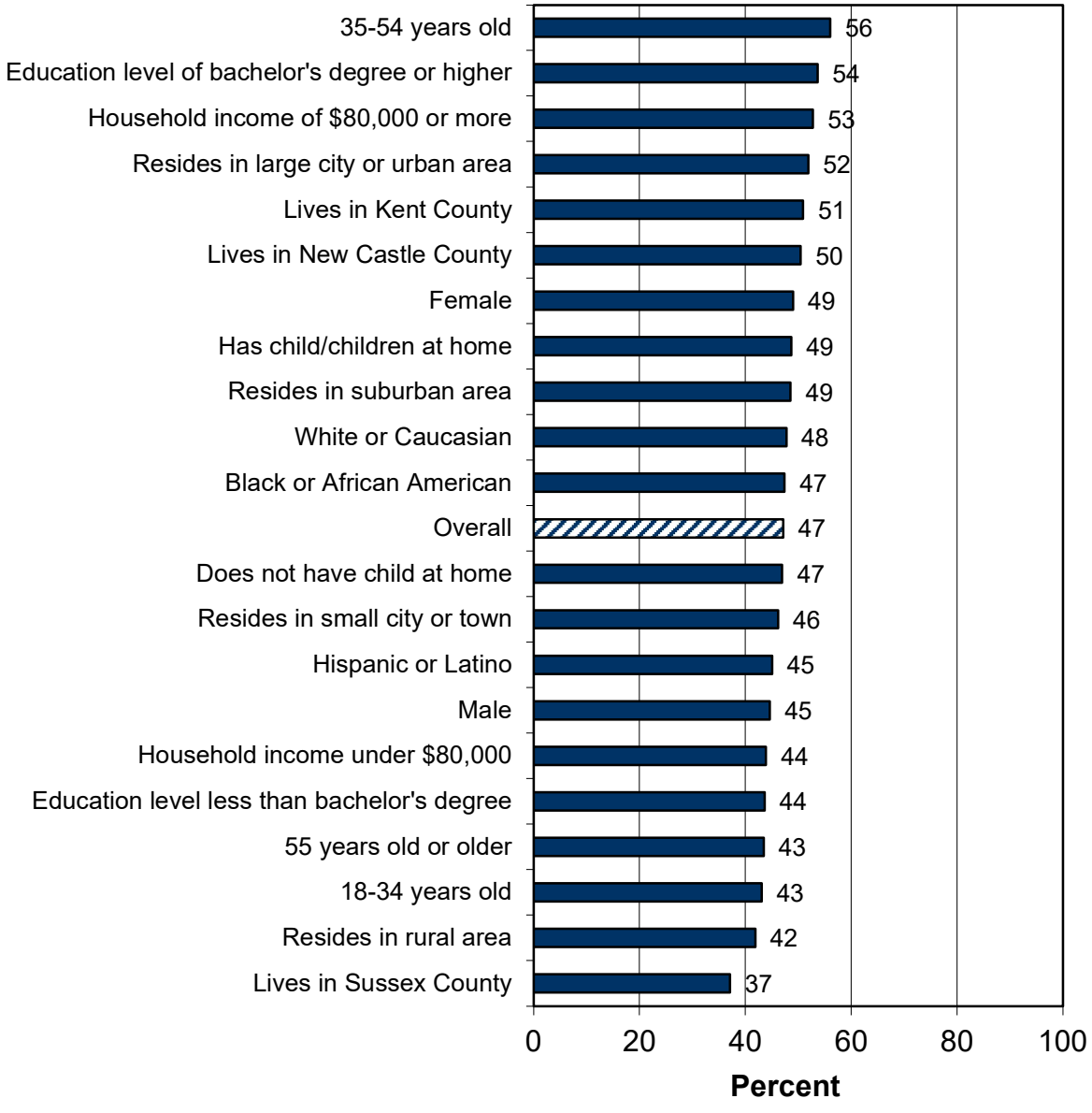


Large city/urban area residents, those with children at home, Hispanic residents, and middle-aged residents are most likely to have changed or are planning to change their drinking water source due to concern about PFAS.

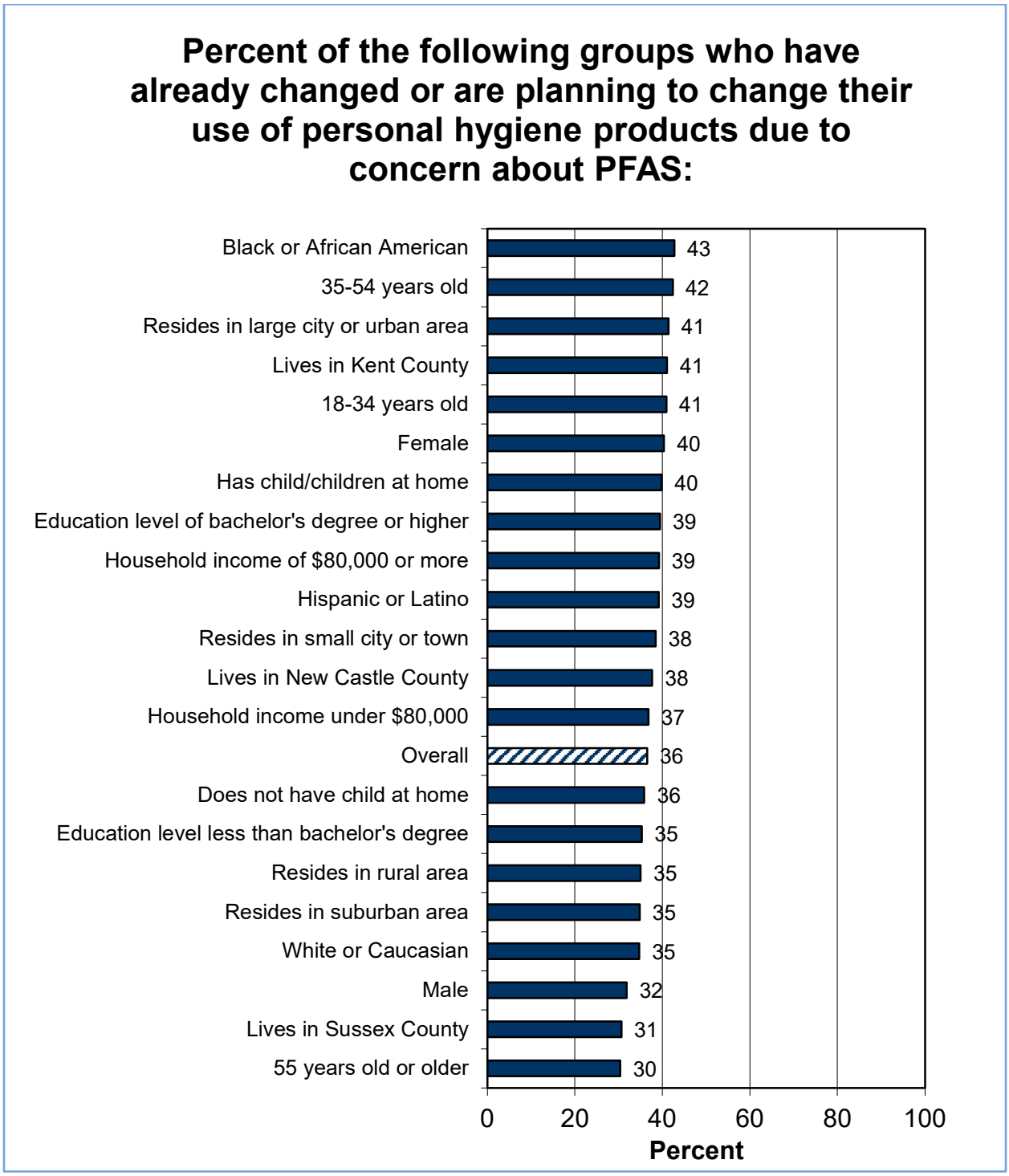


Those most likely to have changed or are planning to change their use of non-stick cookware due to concern about PFAS include middle-aged residents, those in the upper education and income categories, and residents of a large city or urban area.

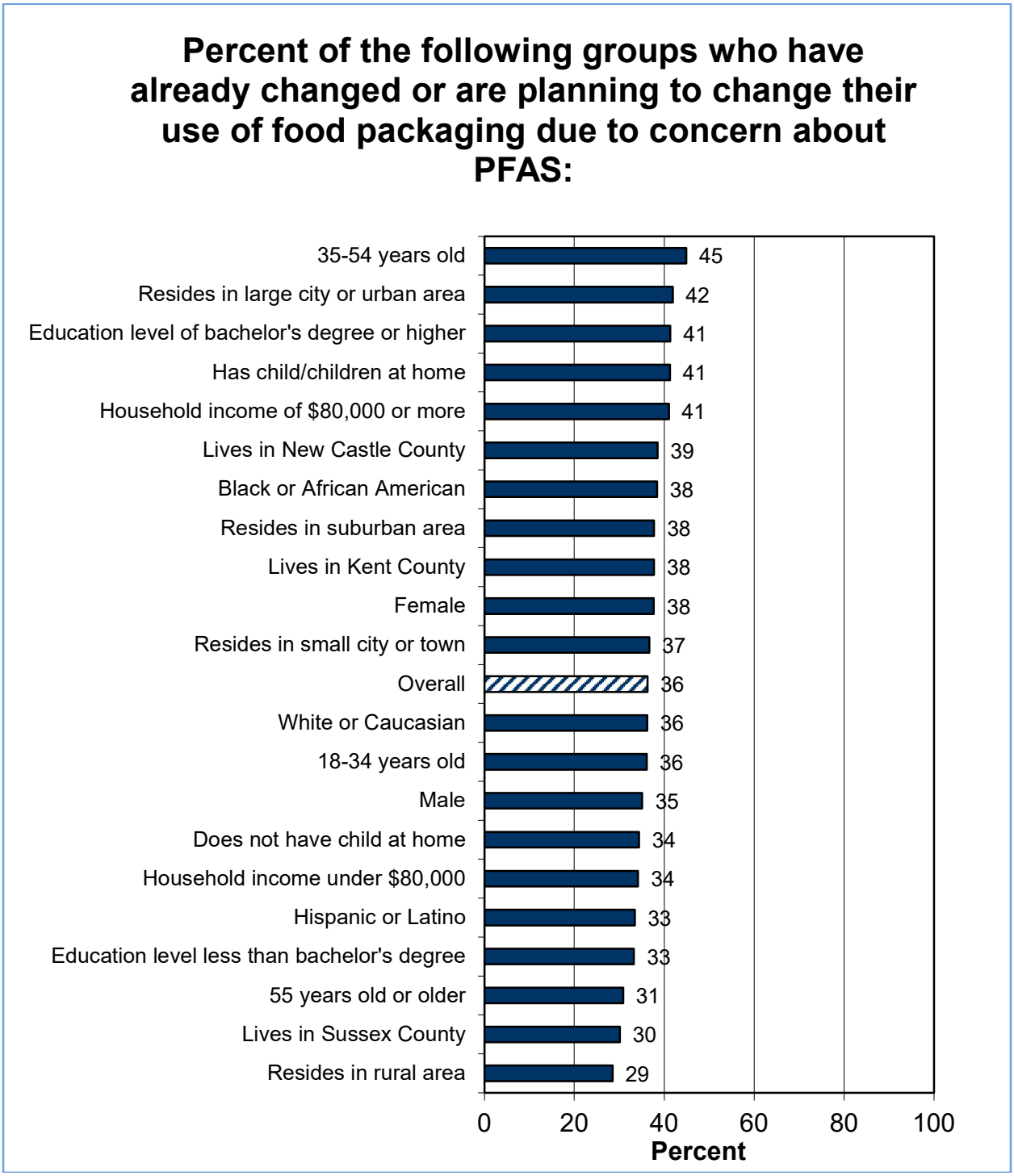
Percent of the following groups who have already changed or are planning to change their use of non-stick cookware due to concern about PFAS:



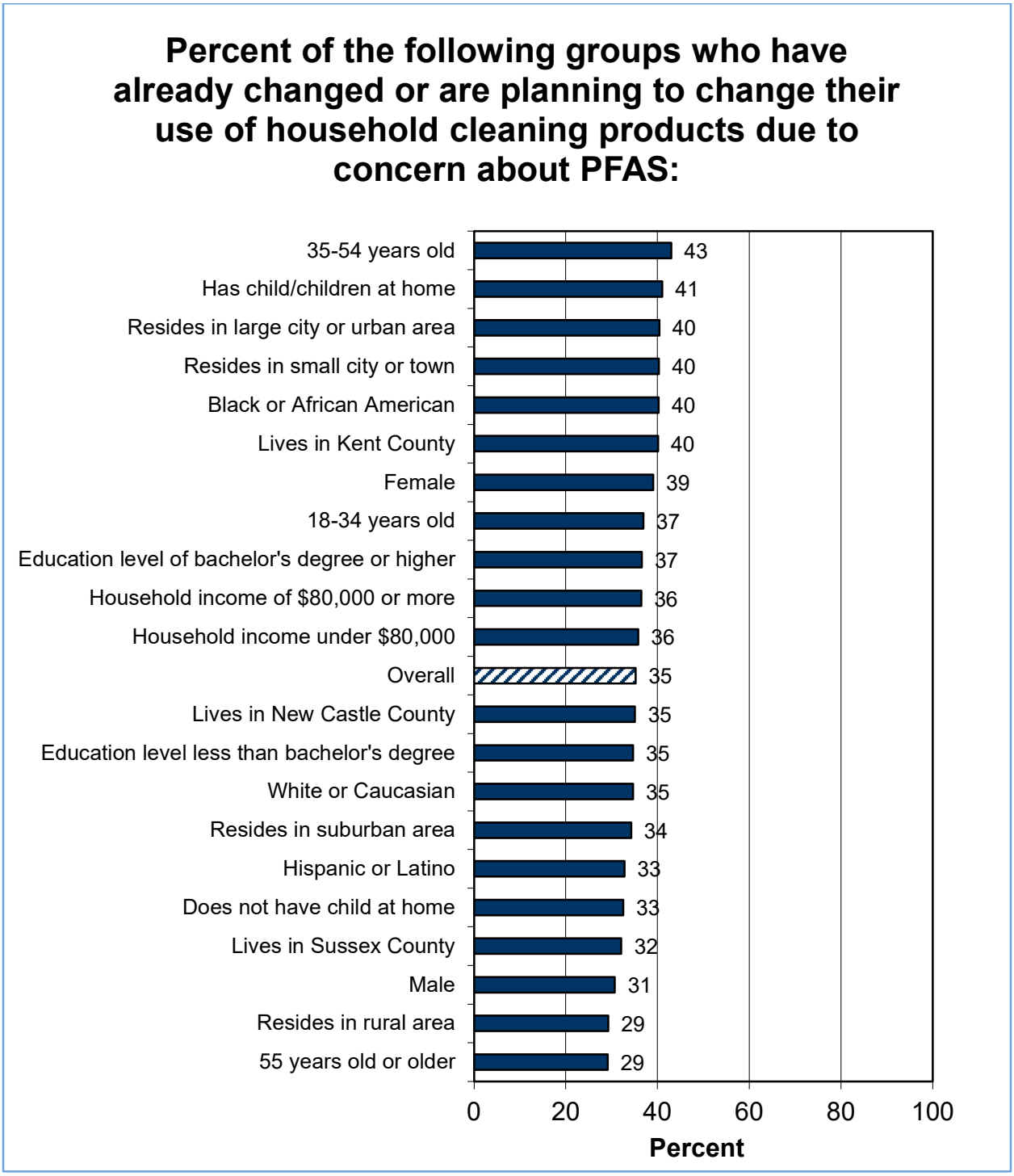
Those most likely to have changed or are planning to change their use of personal hygiene products due to concern about PFAS include middle-aged residents, those in the upper education and income categories, and residents of a large city or urban area.



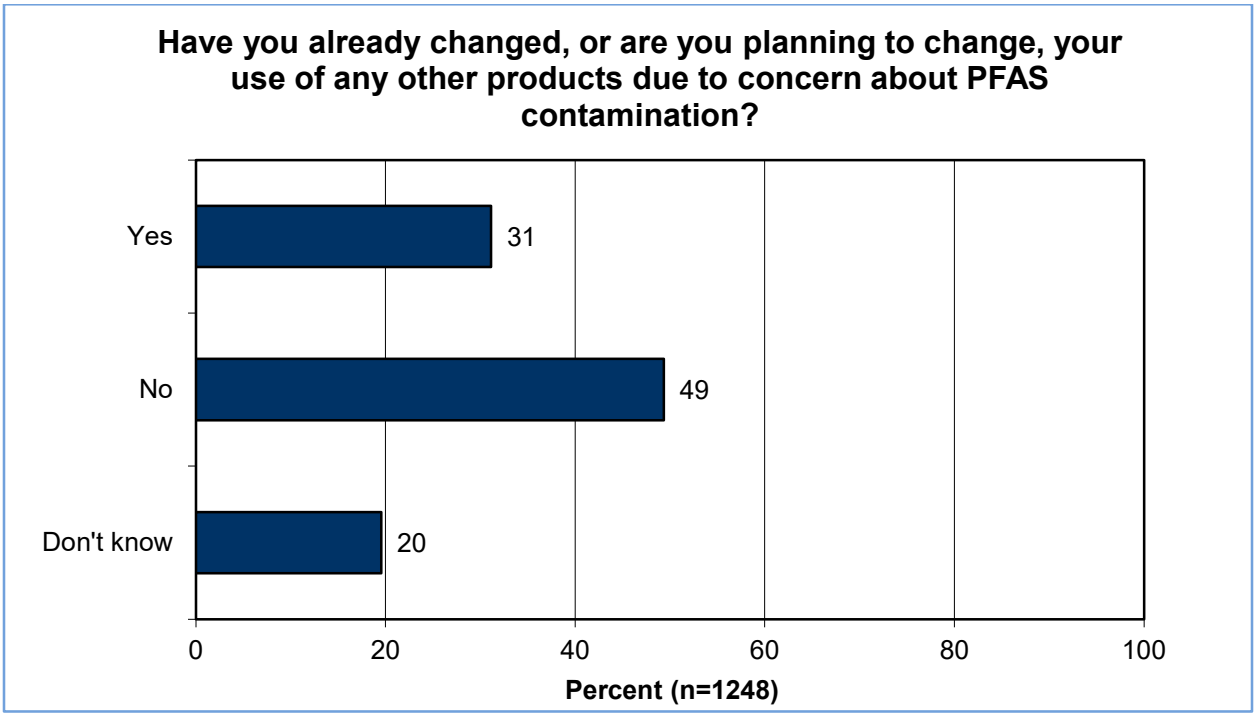
Those most likely to have changed or are planning to change their use of food packaging due to concern about PFAS include middle-aged residents, large city/urban area residents, those in the upper education and income categories, and those with children at home.

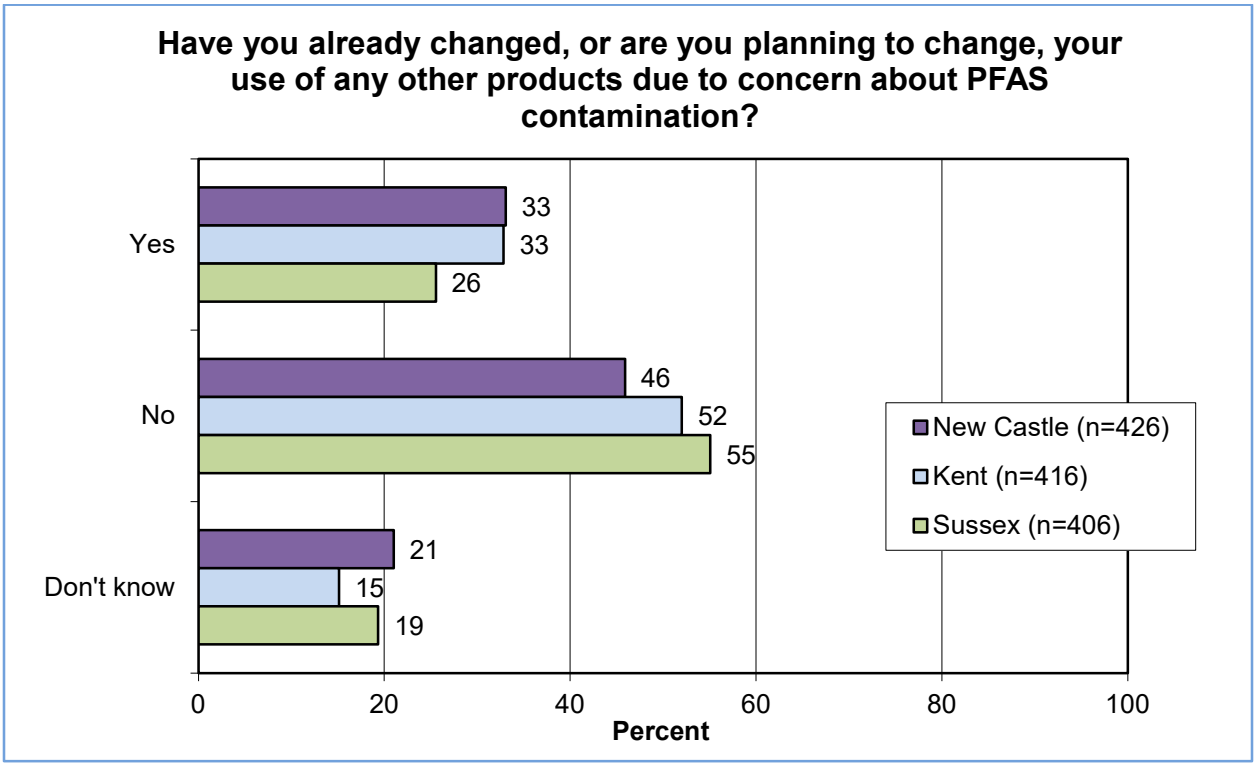


Those most likely to have changed or are planning to change their use of household cleaning products due to concern about PFAS include middle-aged residents and those with children at home.

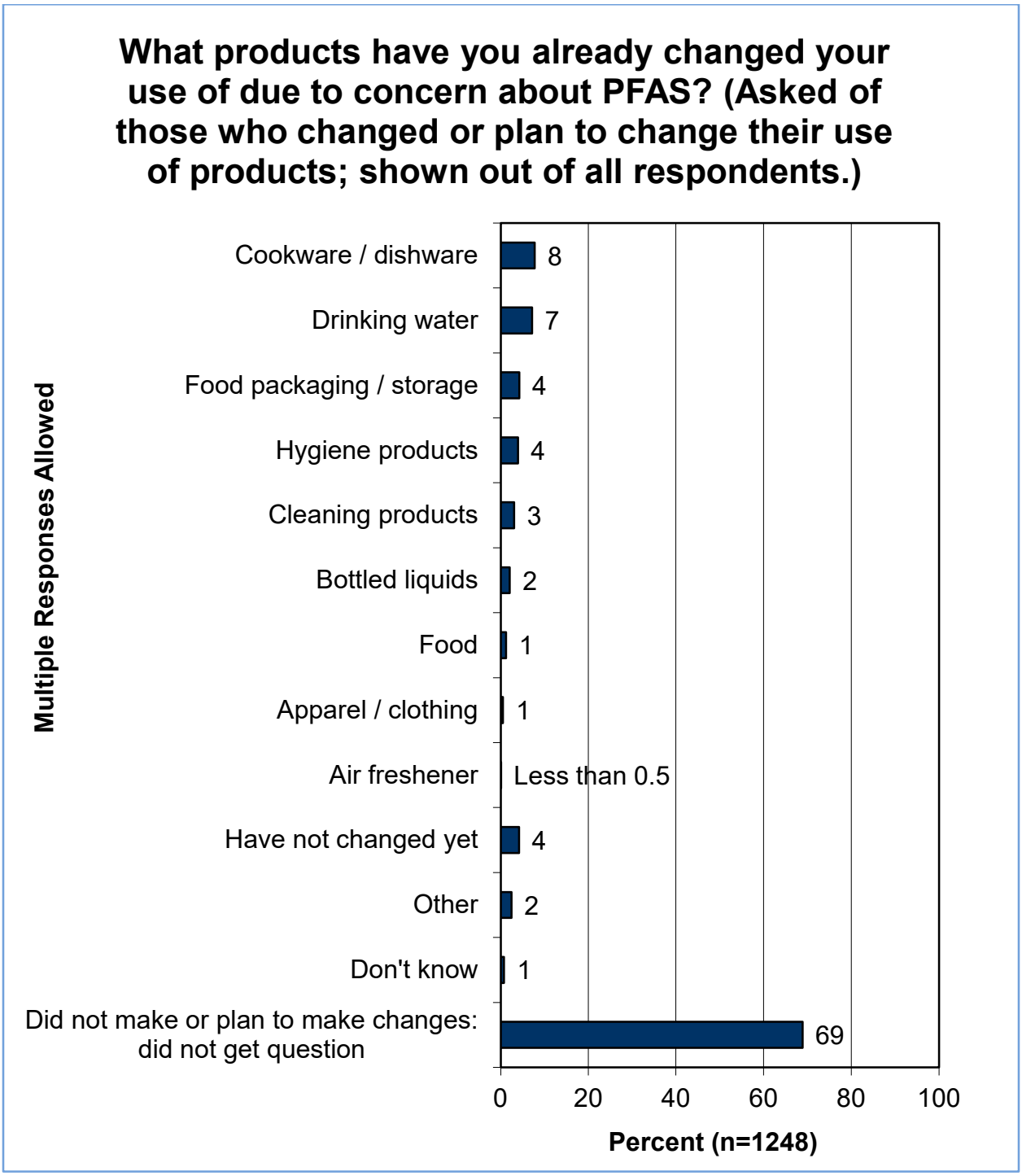


Nearly a third of residents (31%) stated that they have changed or plan to change their use of other products (beyond those previously listed) due to concern about PFAS contamination. This response was lowest among Sussex County residents.

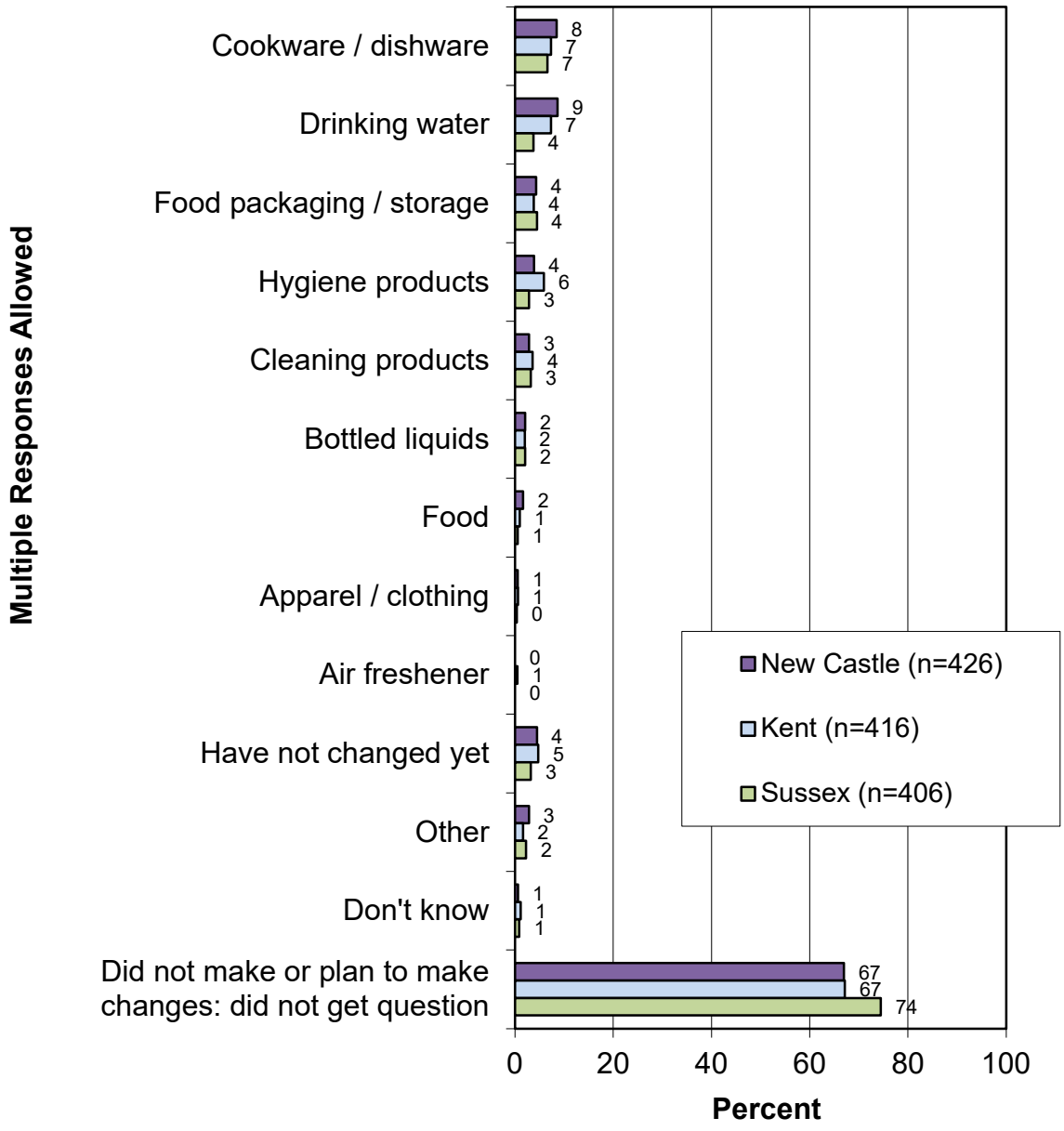




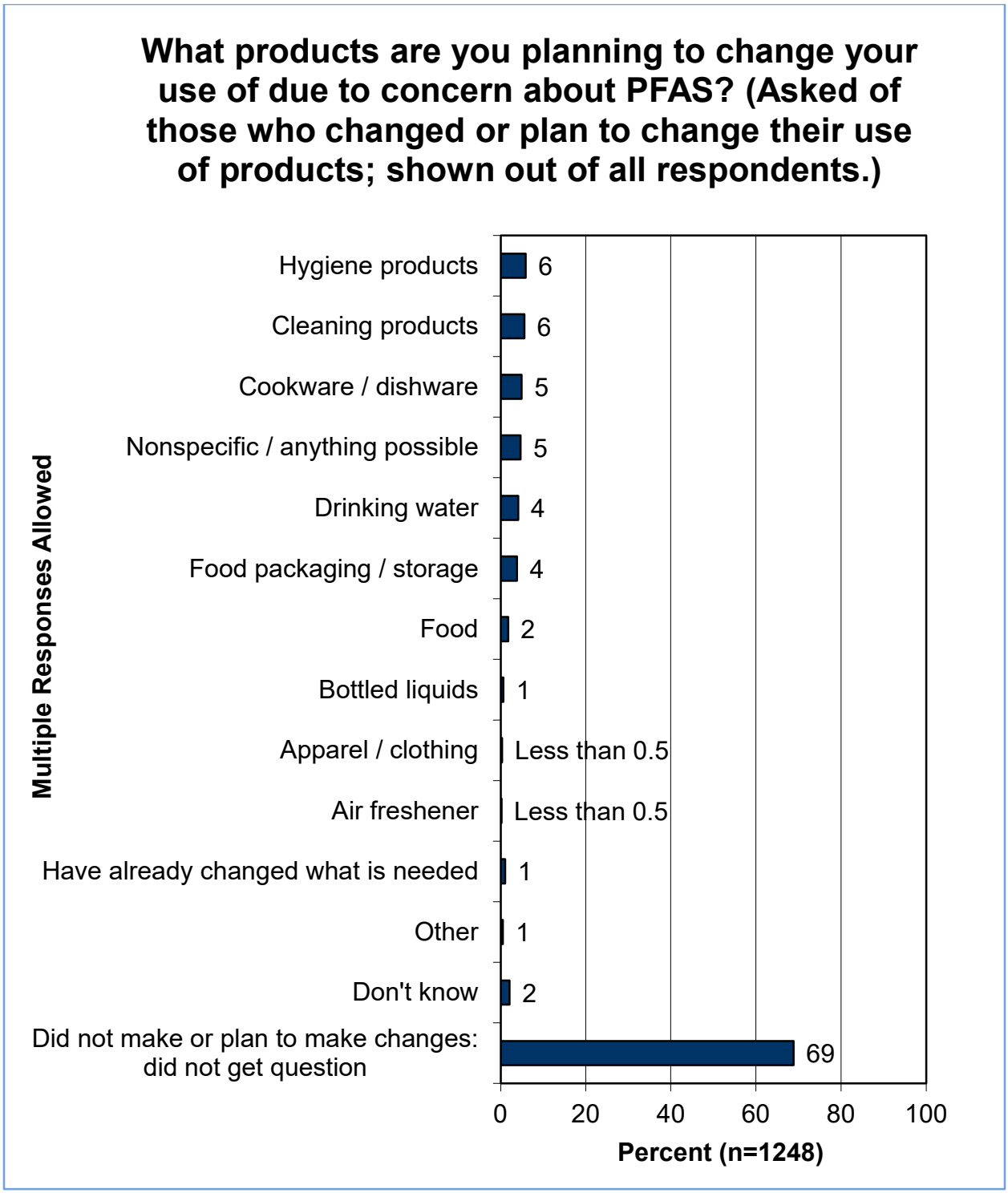
Those who indicated that there are other products they already changed were asked to name them, in an open-ended question. The full list is shown, although note that several responses were already on the previous list.



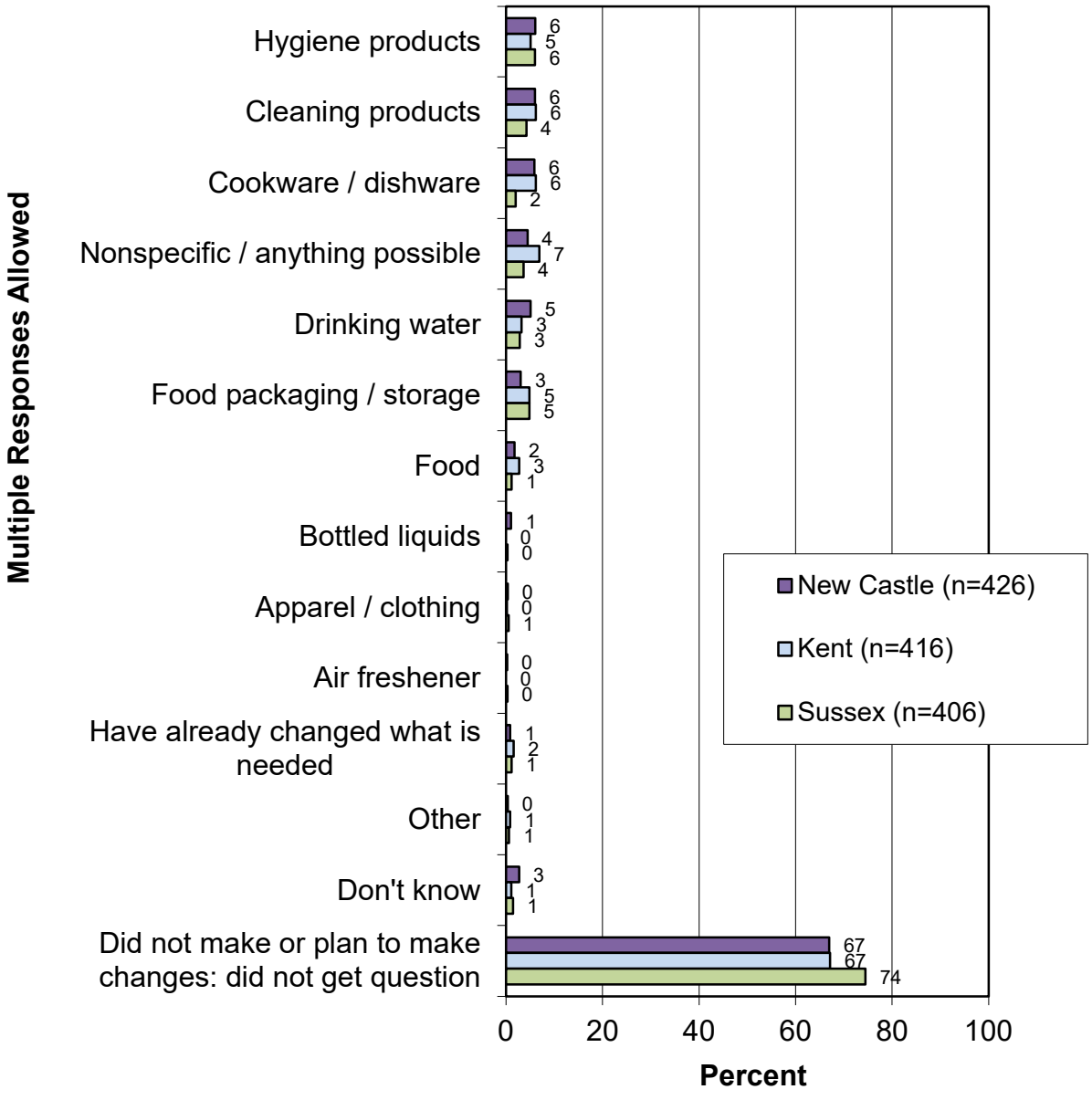
What products have you already changed your use of due to concern about PFAS? (Asked of those who changed or plan to change their use of products; shown out of all respondents.)



This shows the open-ended responses among those who are planning to change their use of products. Again, several responses were already on the provided list.

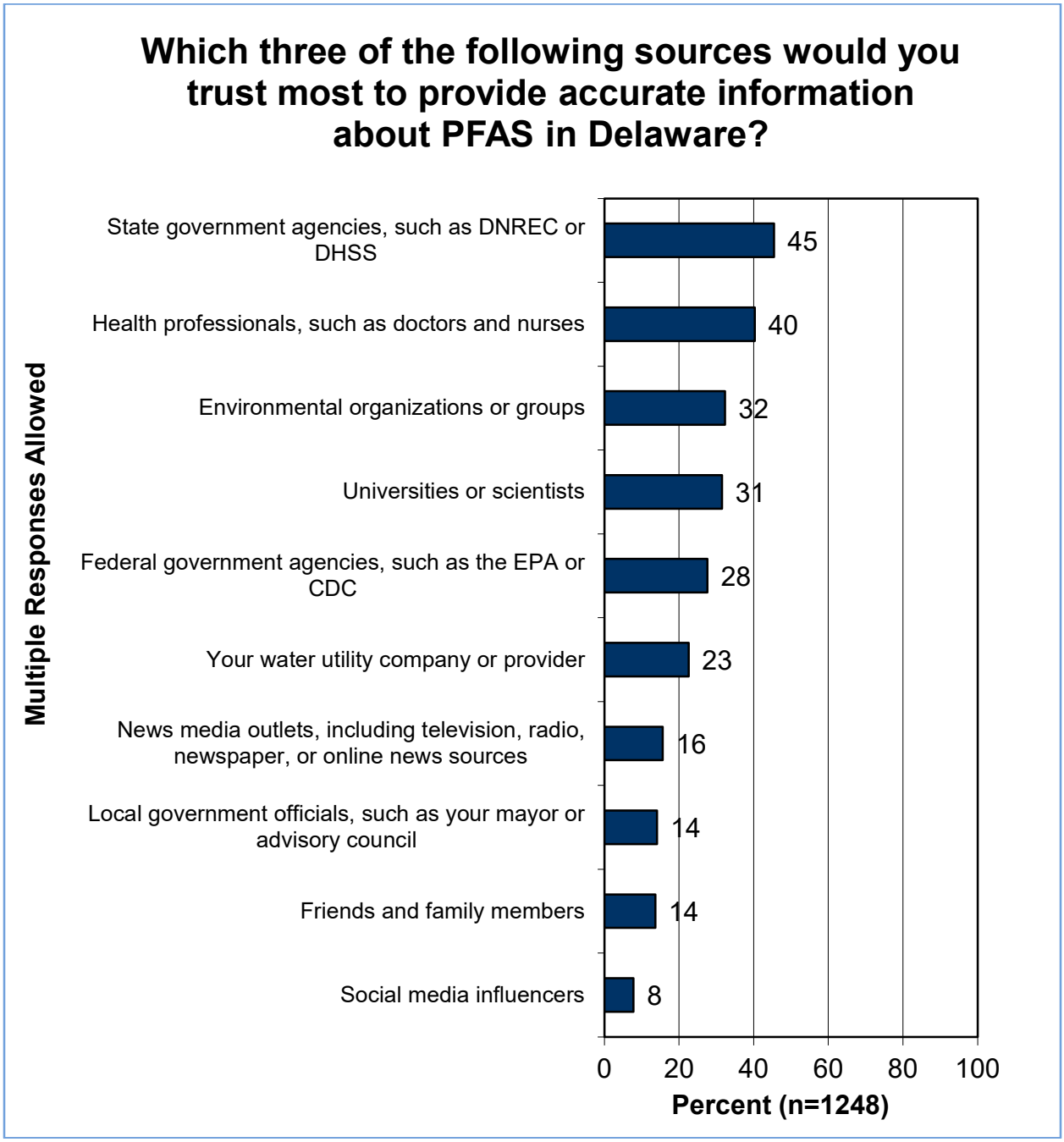


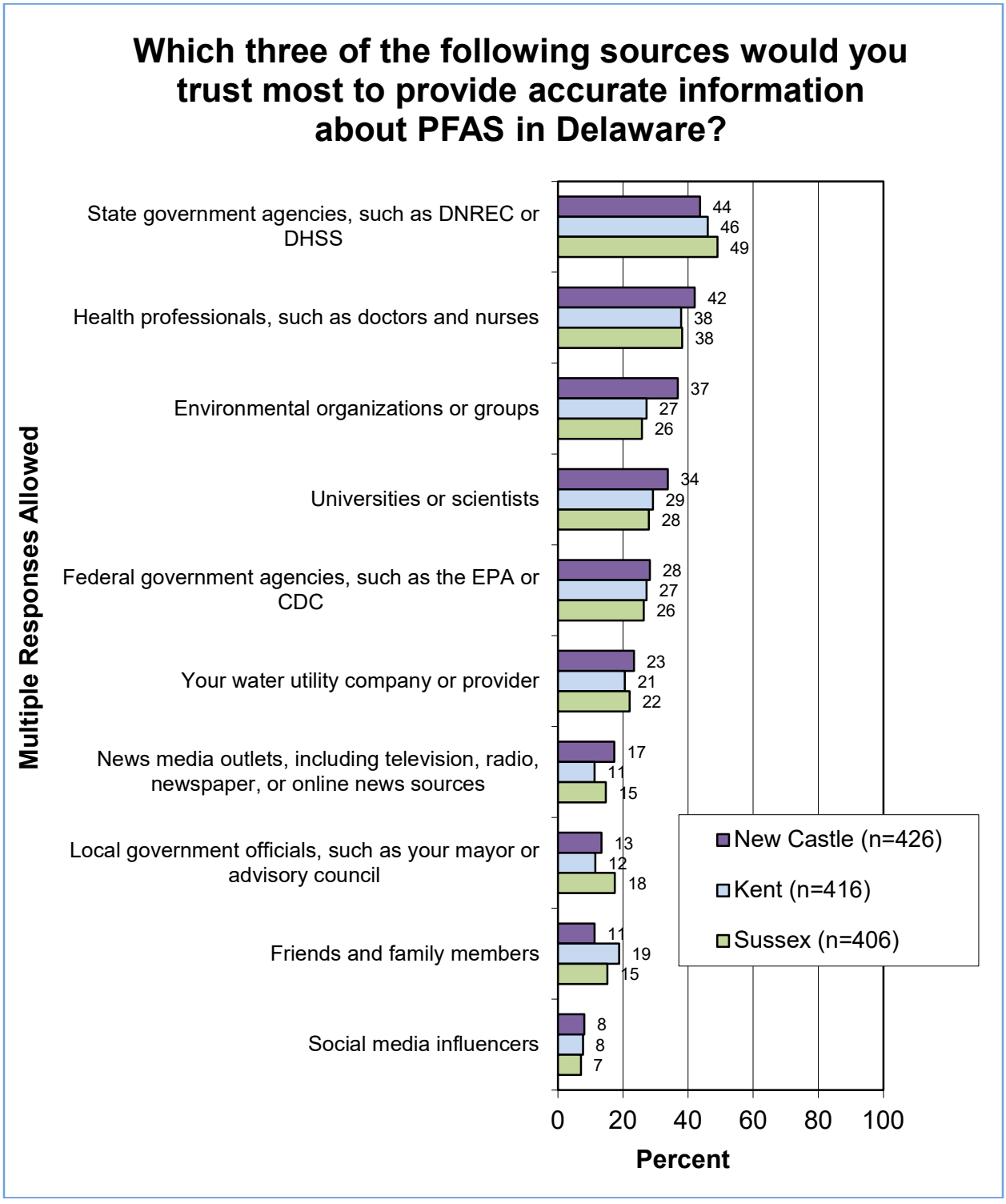
What products are you planning to change your use of due to concern about PFAS? (Asked of those who changed or plan to change their use of products; shown out of all respondents.)



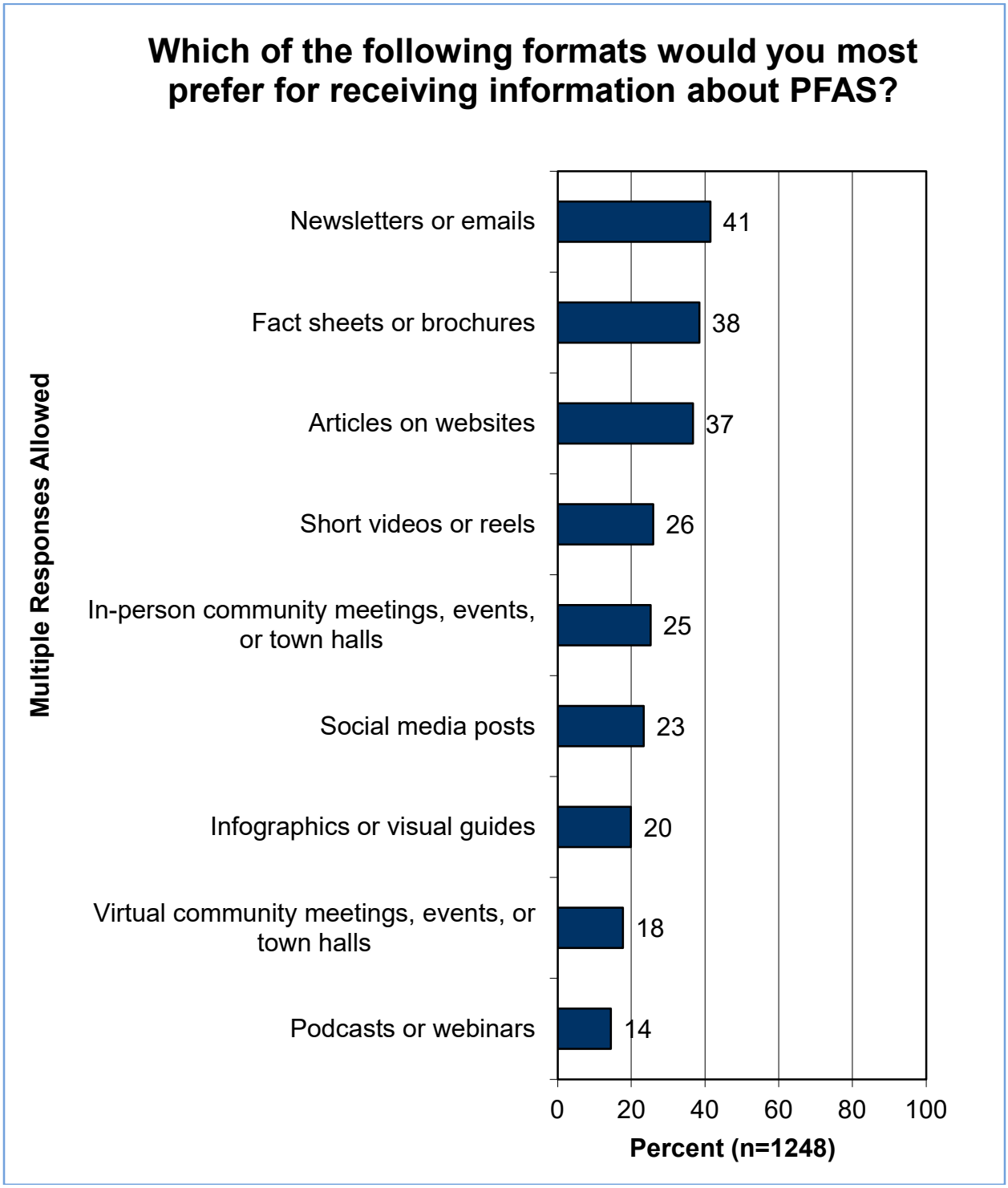
PREFERRED SOURCES OF INFORMATION ABOUT PFAS

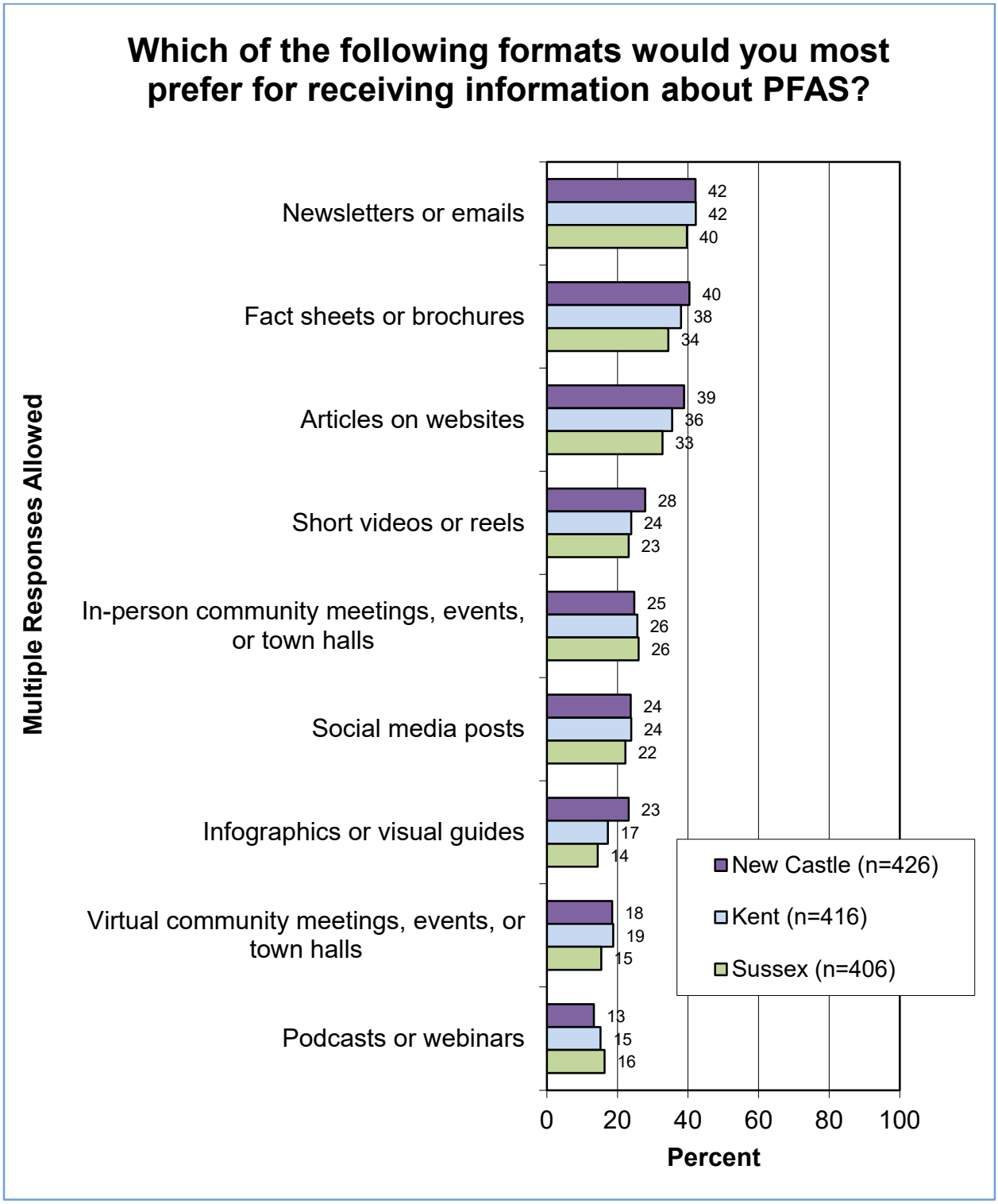
The survey asked residents to select up to three sources of information they would trust most to provide information about PFAS in Delaware, from a provided list. The top replies are state government agencies, such as DNREC or DHSS (45% selected this), and health professionals (40%). A second tier of responses includes environmental organizations (32%), universities or scientists (31%), and federal government agencies, such as the EPA or CDC (28%). The full list is shown, followed by county results.



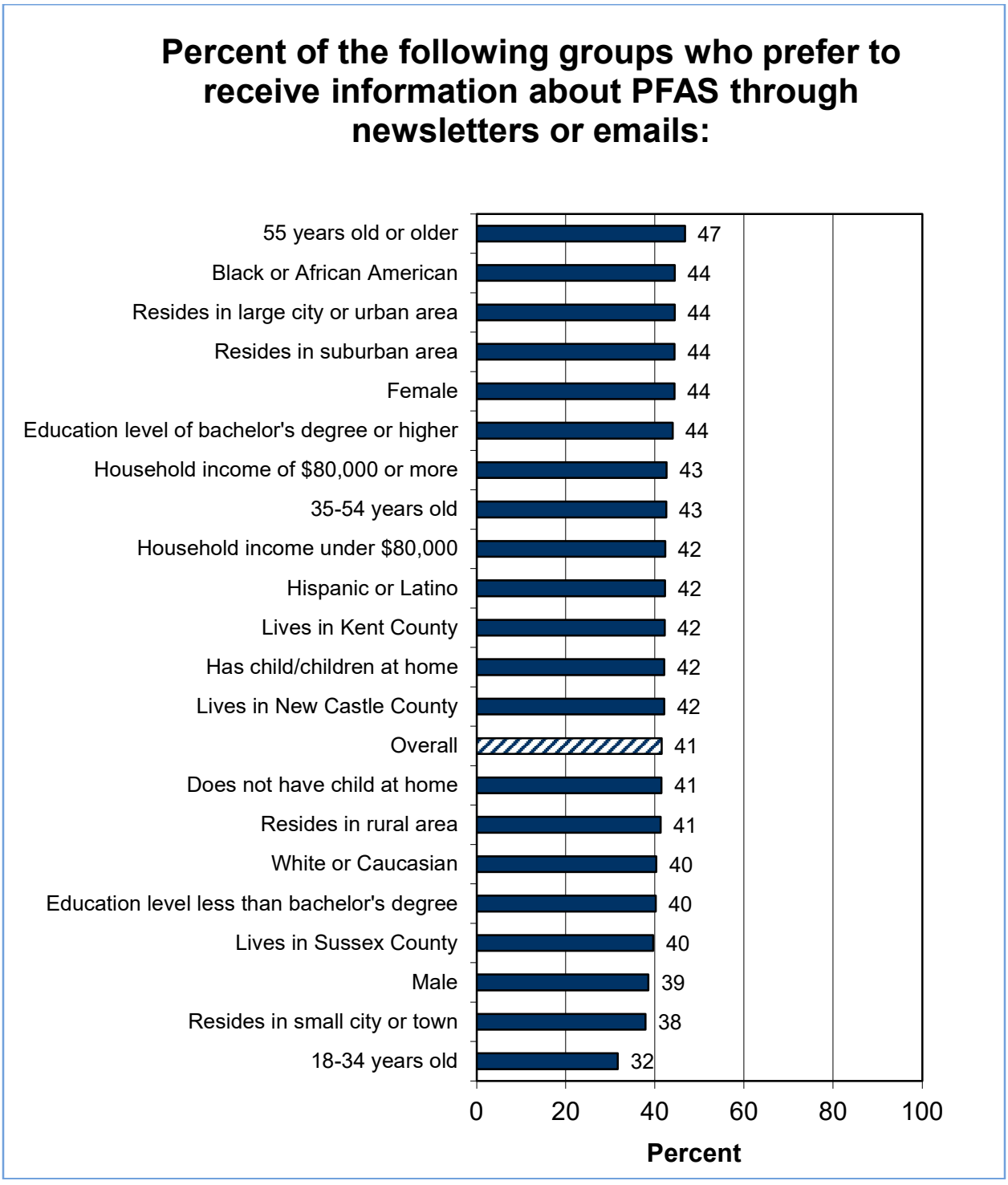

Which three of the following sources would you trust most to provide accurate information about PFAS in Delaware?
Multiple Responses Allowed
State government agencies, such as DNREC or DHSS
44
46
49
Health professionals, such as doctors and nurses
42
38
38
Environmental organizations or groups
37
27
26
Universities or scientists
34
29
28
Federal government agencies, such as the EPA or CDC
28
27
26
Your water utility company or provider
23
21
22
News media outlets, including television, radio, newspaper, or online news sources
17
11
15
Local government officials, such as your mayor or advisory council
13
12
18
Friends and family members
11
19
15
Social media influencers
8
8
7
New Castle (n=426)
Kent (n=416)
Sussex (n=406)
0
20
40
60
80
100
Percent

The top formats selected for receiving PFAS information, from a provided list, are newsletters or emails, fact sheets or brochures, and articles on websites—all selected by over a third of residents. Also, about a quarter of residents selected short videos or reels, in-person community meetings, and social media posts.

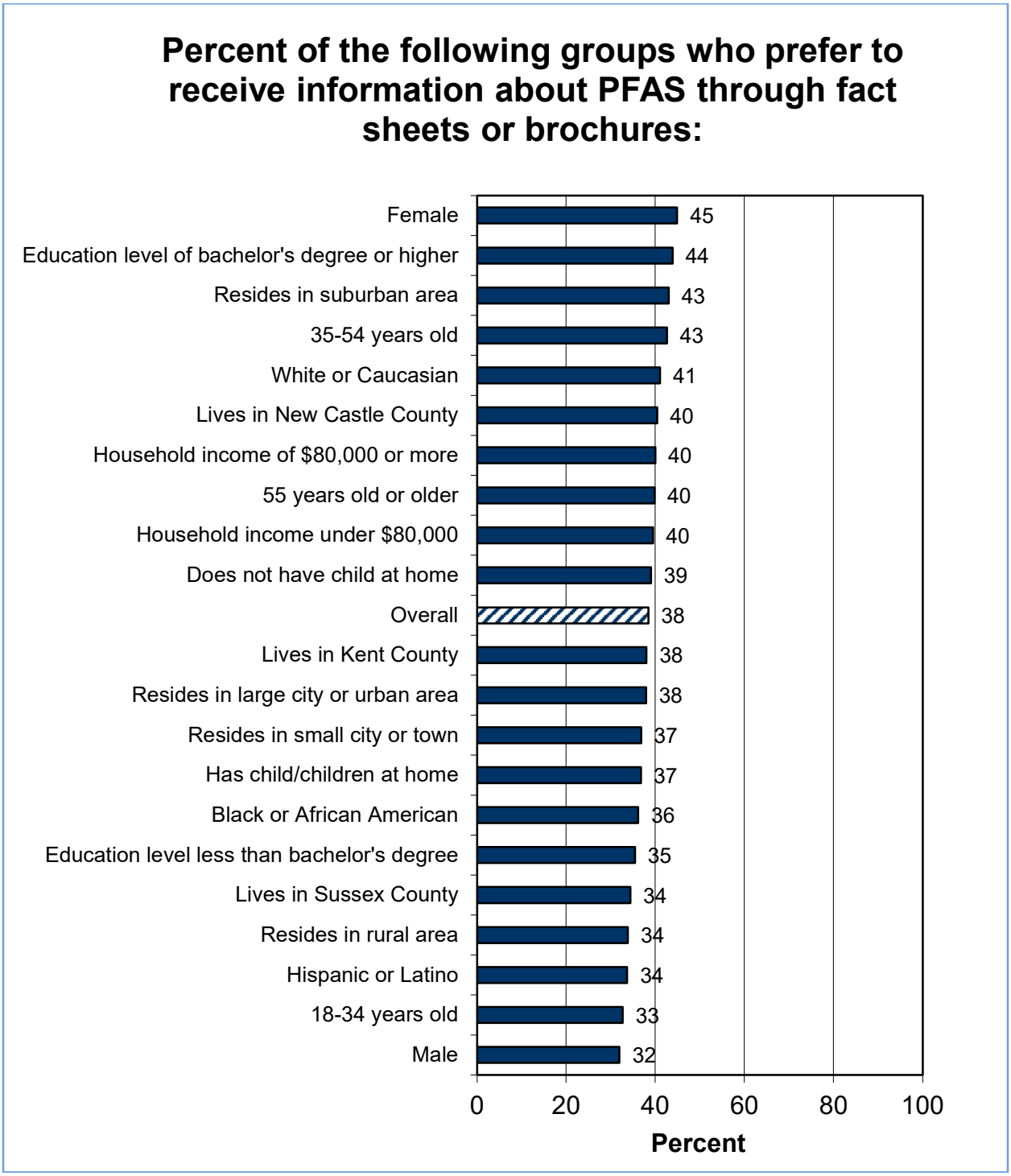



Which of the following formats would you most prefer for receiving information about PFAS?
Multiple Responses Allowed
Newsletters or emails
42
42
40
Fact sheets or brochures
40
38
34
Articles on websites
39
36
33
Short videos or reels
28
24
23
In-person community meetings, events, or town halls
25
26
26
Social media posts
24
24
22
Infographics or visual guides
23
17
14
Virtual community meetings, events, or town halls
18
19
15
Podcasts or webinars
13
15
16
New Castle (n=426)
Kent (n=416)
Sussex (n=406)
0
20
40
60
80
100
Percent

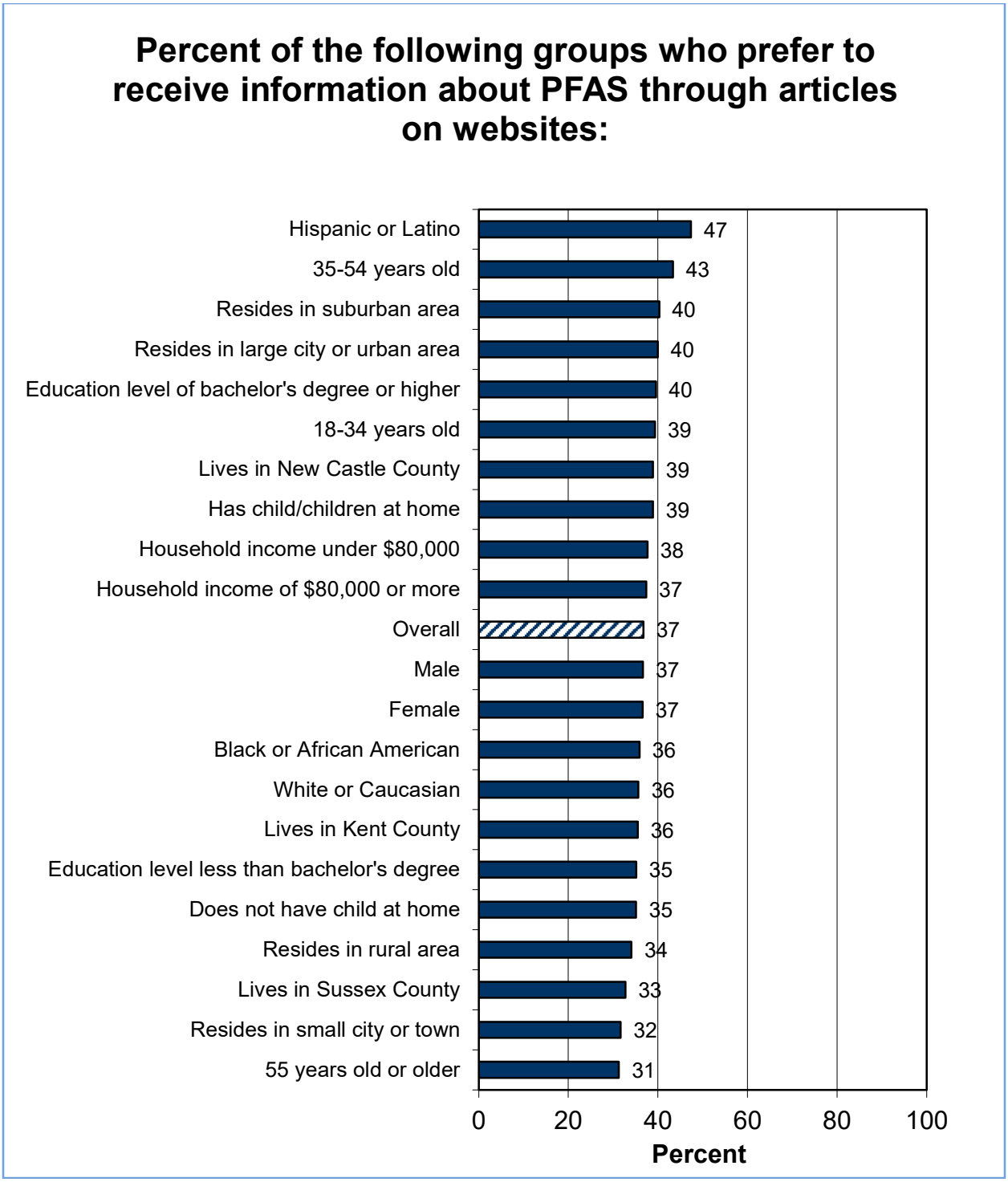
Older residents are the most likely and younger residents are the least likely to prefer information through newsletters or emails. Otherwise, there is little variability between the groups.



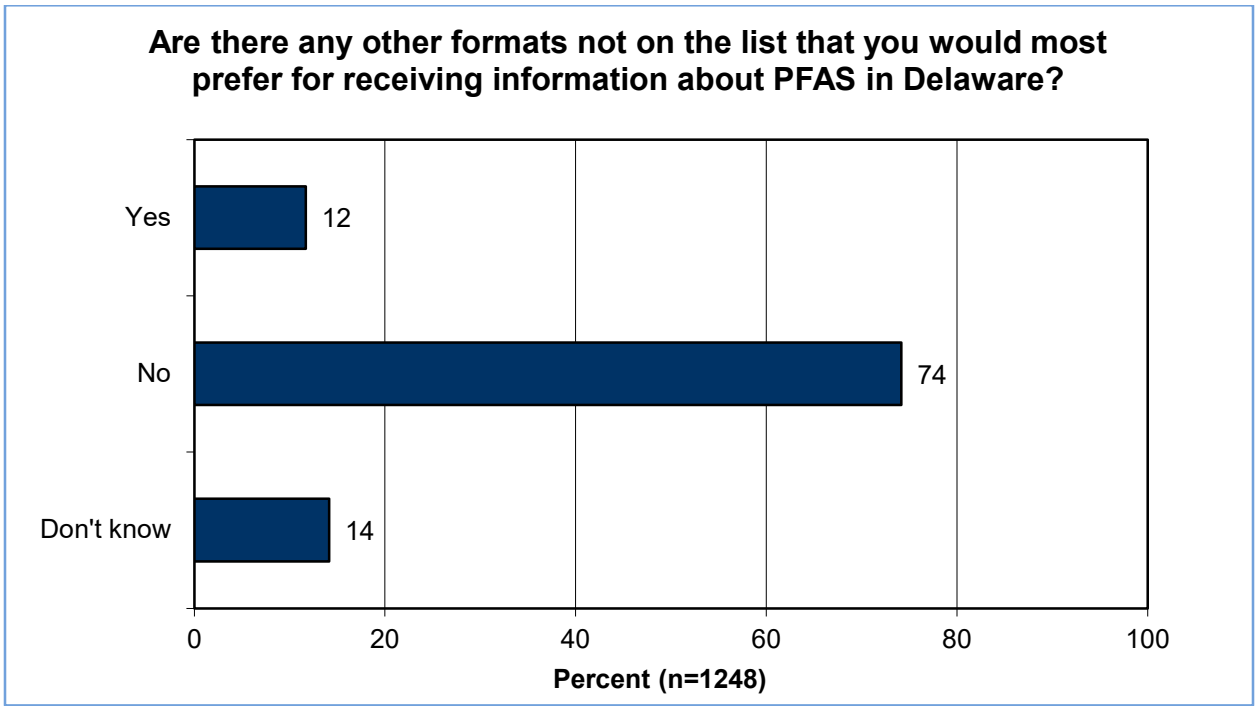
Those most interested in receiving PFAS information through fact sheets or brochures are female residents, those in the upper education category, suburban residents, and those in the middle age category.

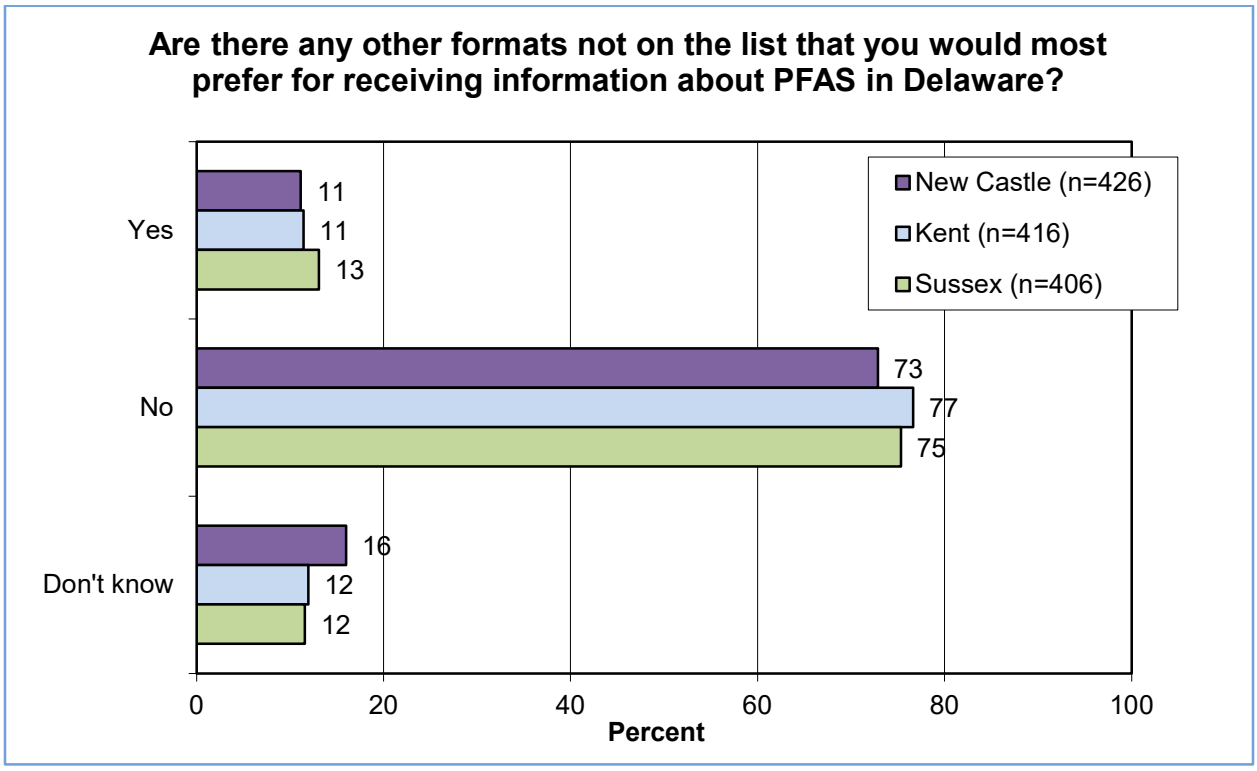


Hispanic residents and those in the middle age category are the groups who most prefer to receive PFAS information through articles on websites.



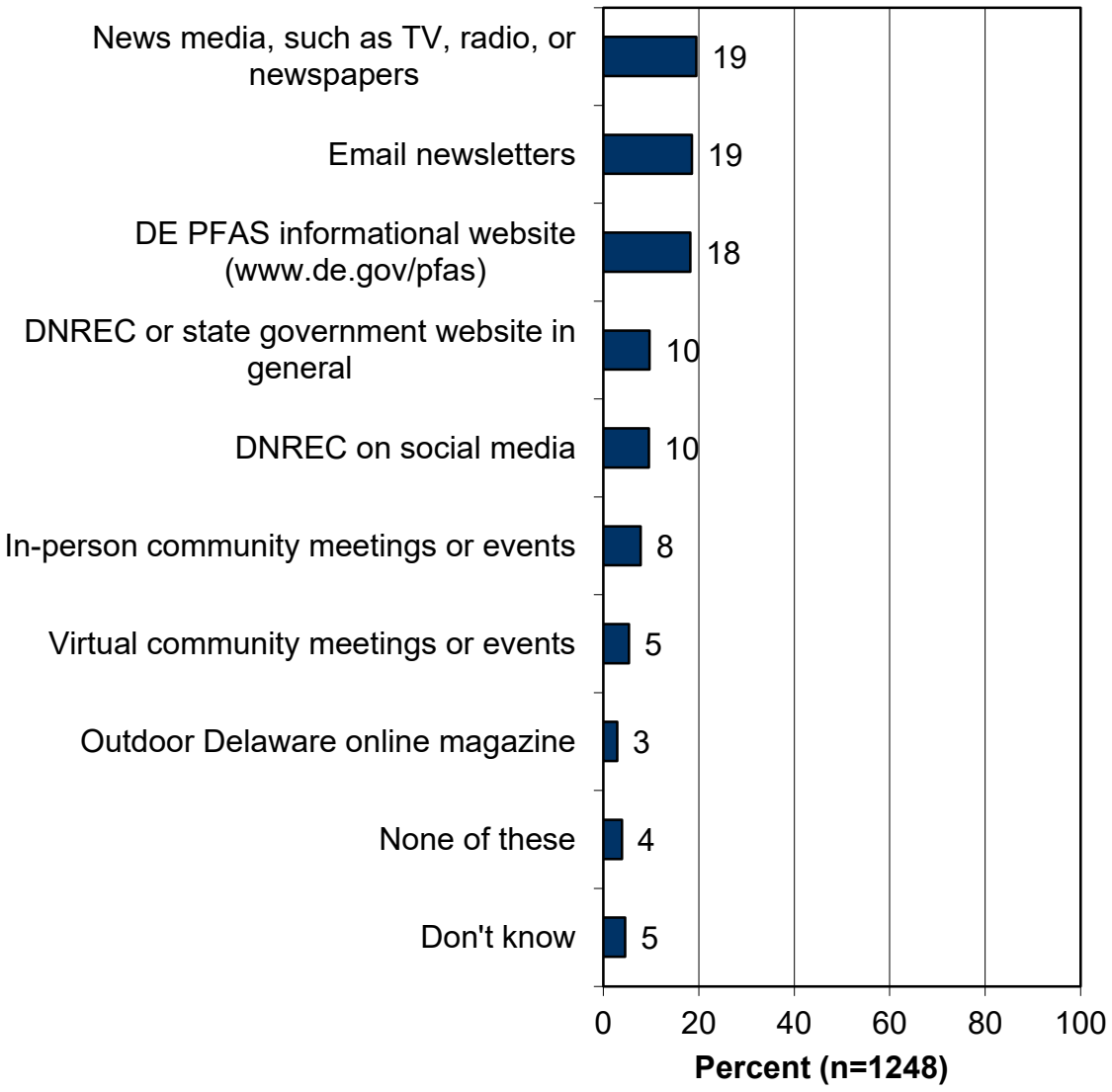
Following the listed options, 12% of residents indicated that there are other formats that they prefer for receiving information about PFAS in Delaware. The primary "other" format most often mentioned was anything that could be delivered by postal mail.



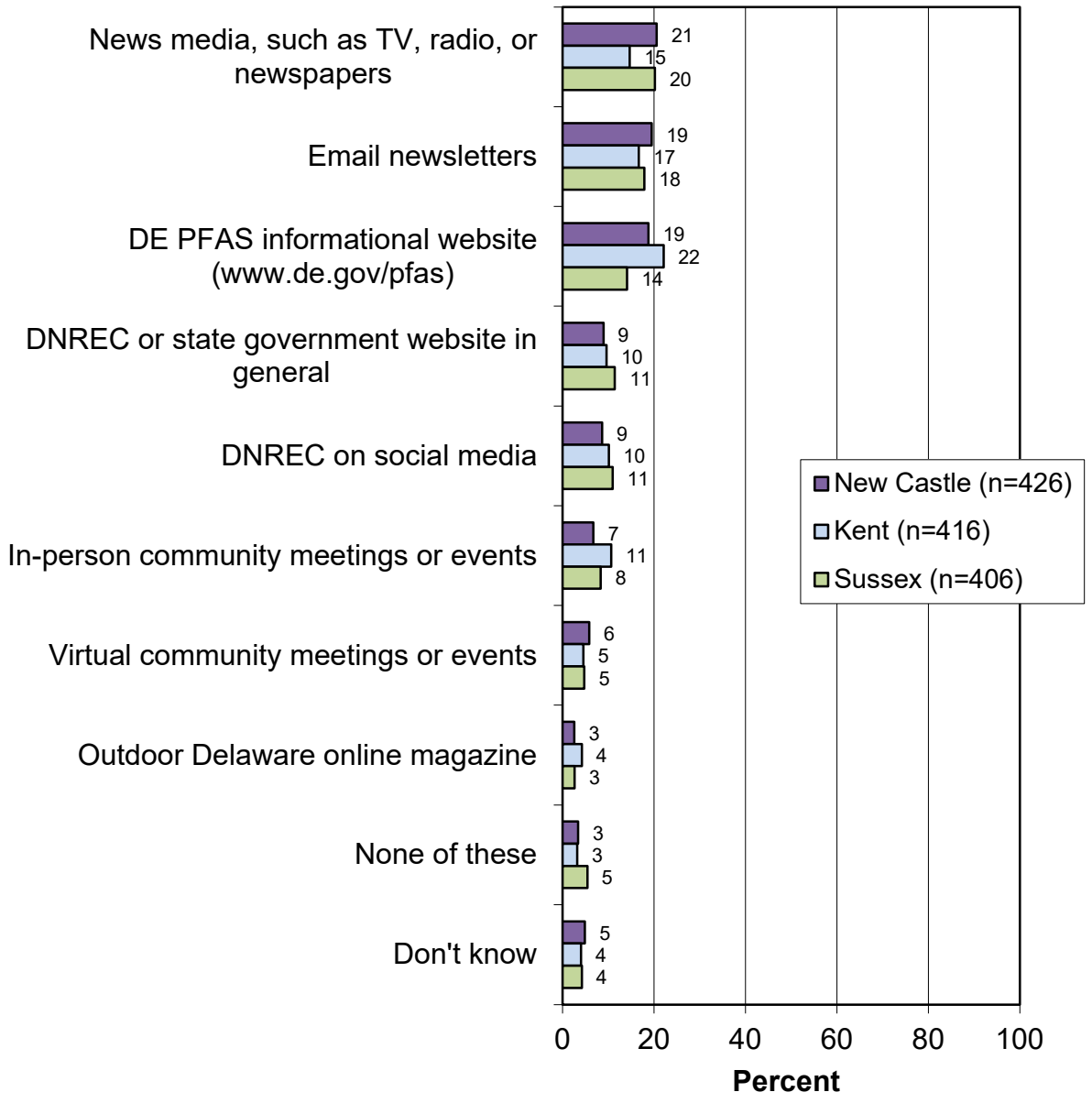


Residents were asked to name the single best way for DNREC to share important health information with them, from a provided list. The top responses, all with nearly a fifth of residents selecting them, are news media (such as TV, radio, or newspapers), email newsletters, and the Delaware PFAS information website (www.de.gov/pfas). Compared to their counterparts, Kent County residents are less likely to select news media and more likely to select the website.

Thinking specifically about DNREC, which one of the following is the best way for DNREC to share important environmental health information with you?

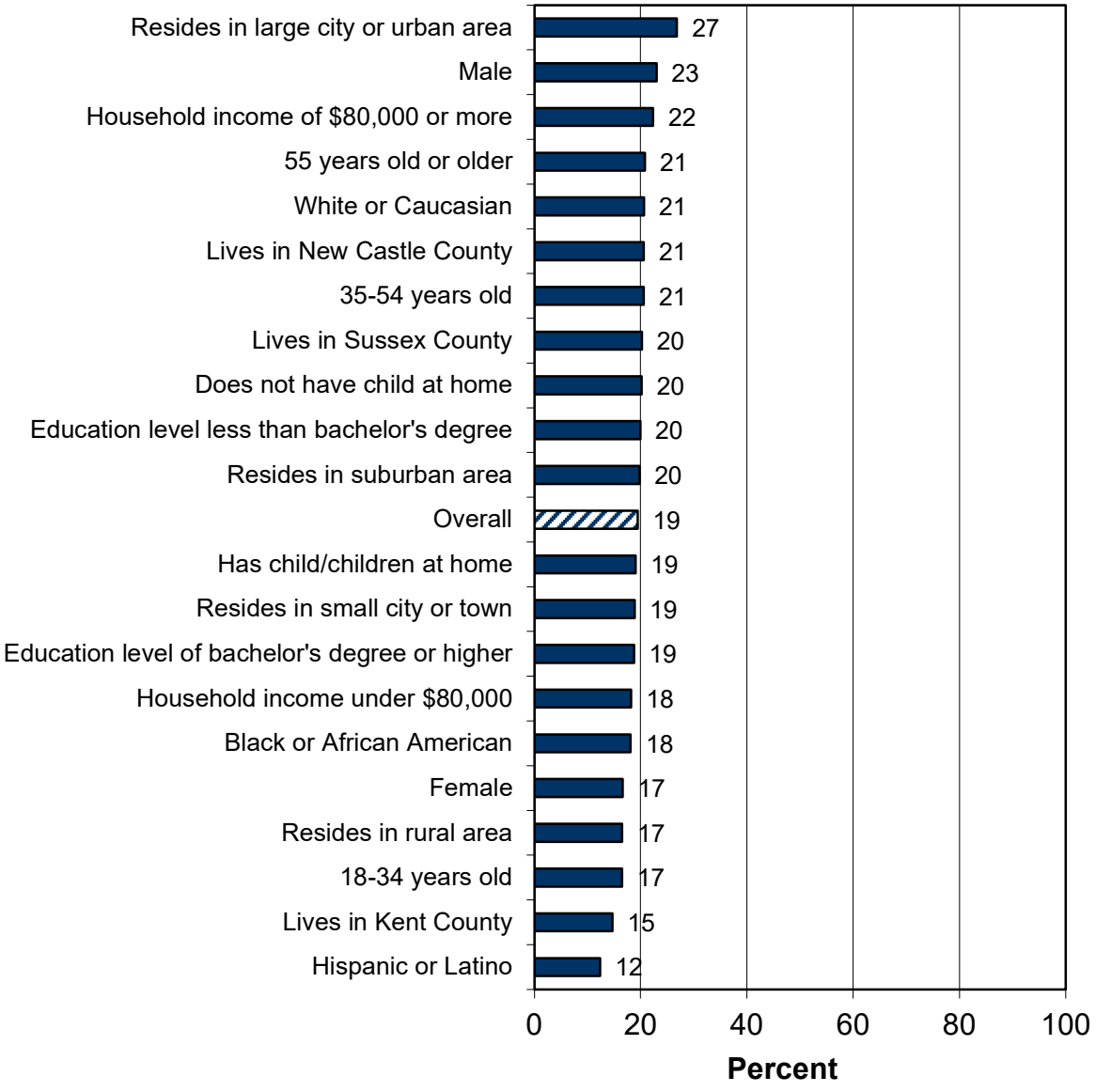


Thinking specifically about DNREC, which one of the following is the best way for DNREC to share important environmental health information with you?

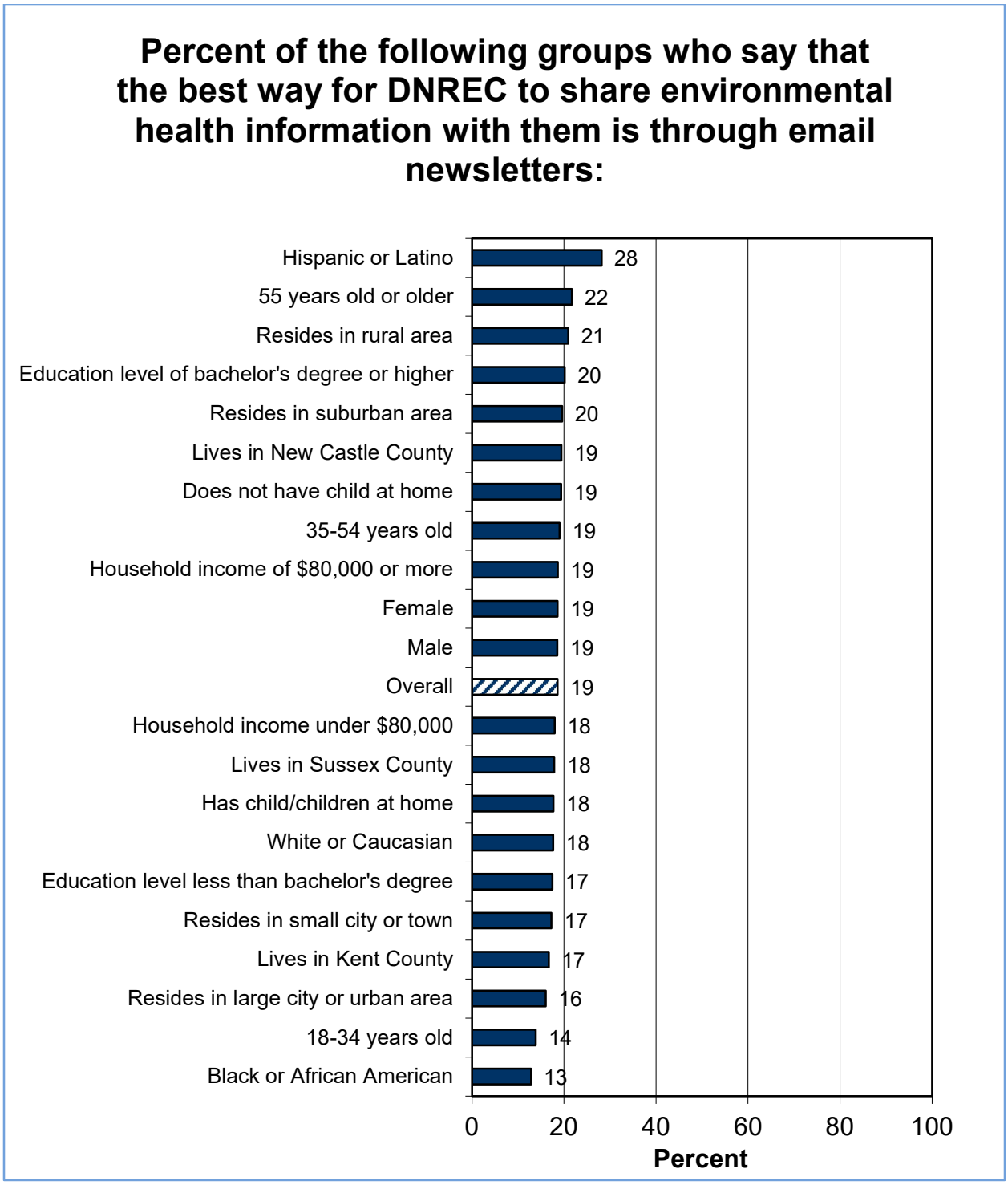


Large city residents are the most likely to want DNREC environmental health information through news media.

Percent of the following groups who say that the best way for DNREC to share environmental health information with them is through news media, such as TV, radio, or newspapers:

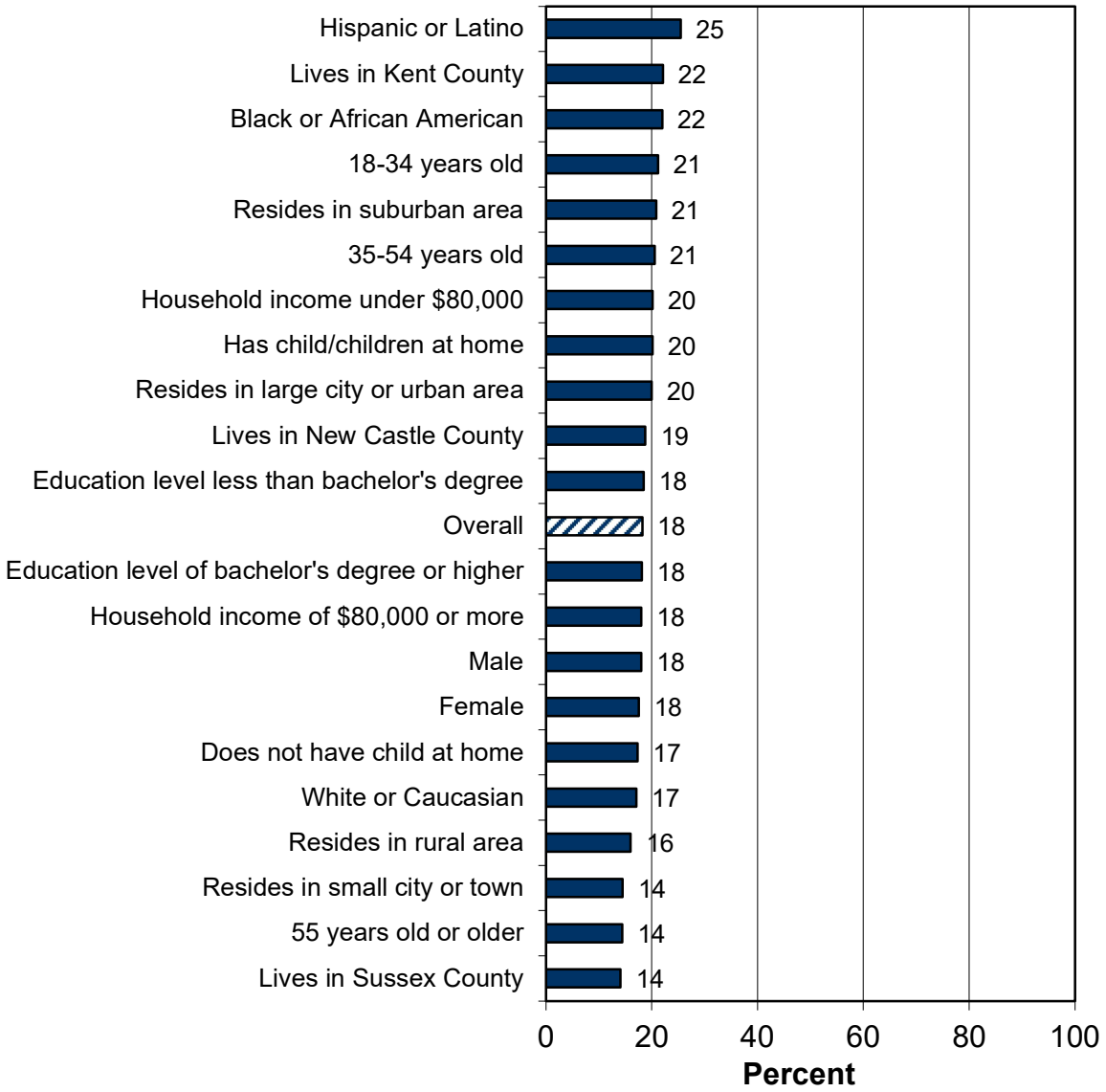


Hispanic residents are the most likely to want DNREC information through email newsletters.

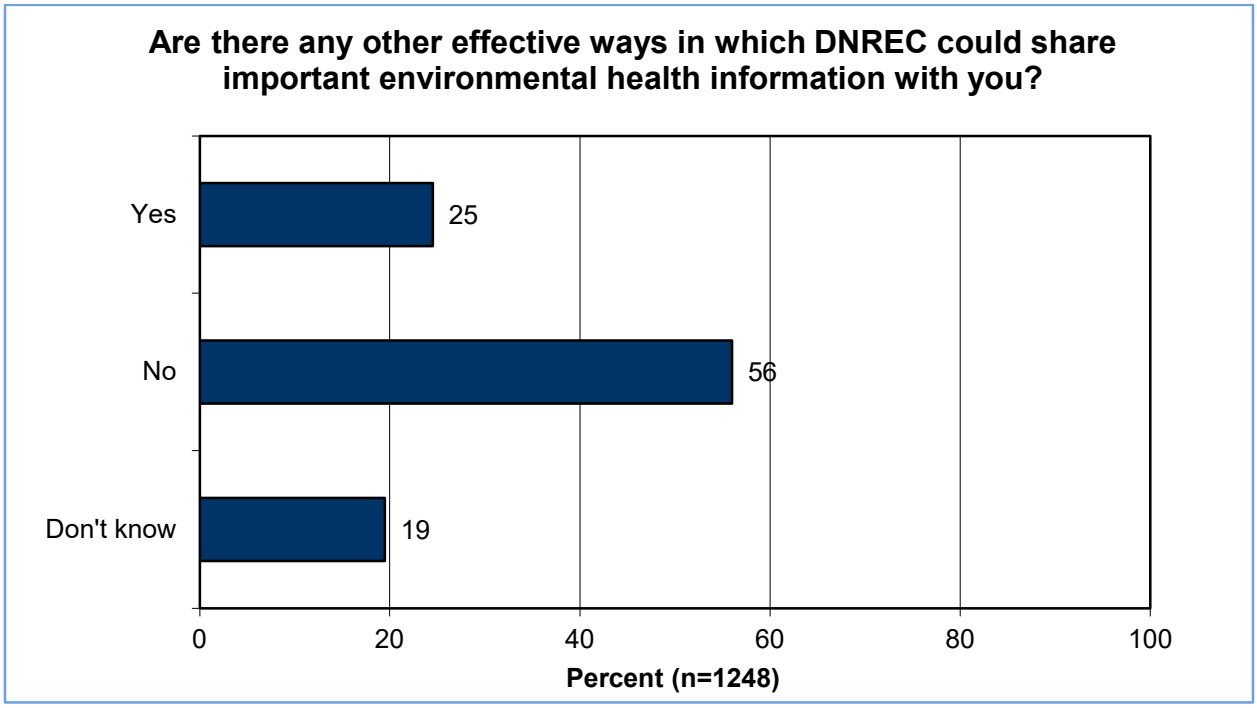


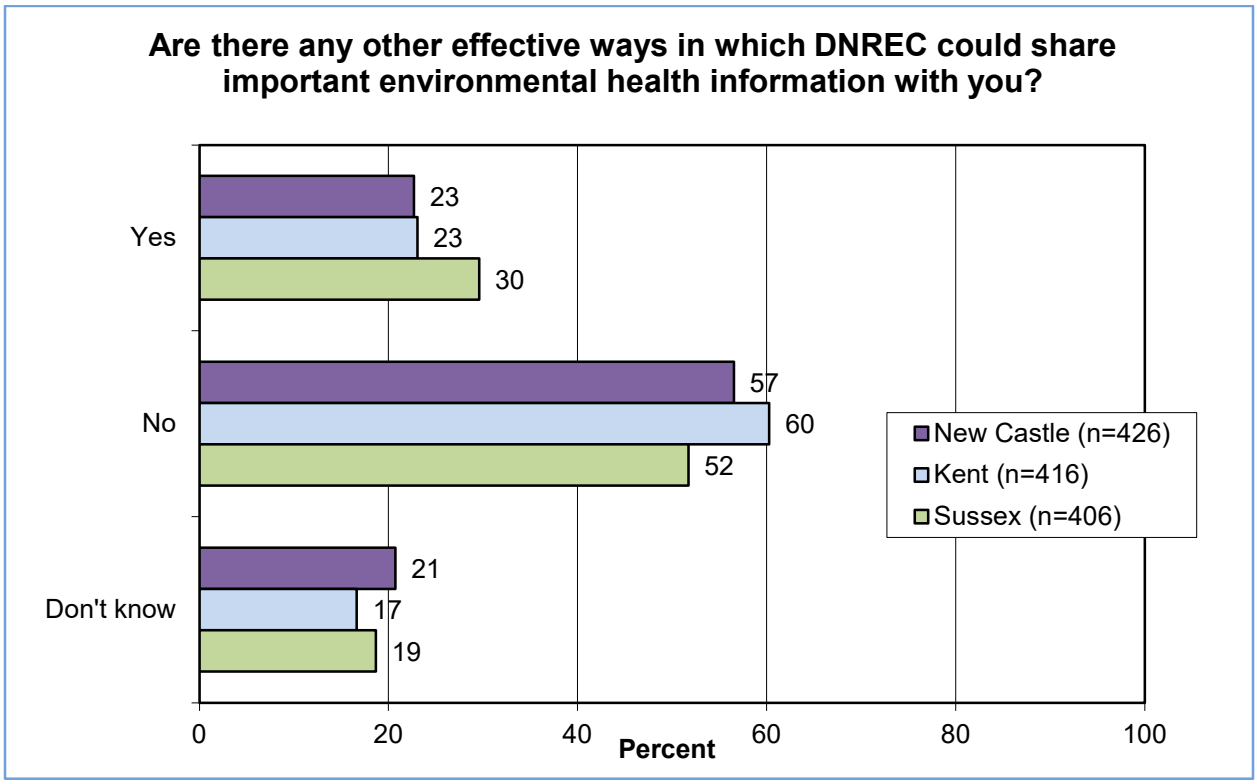
Hispanic residents are also the most likely to want DNREC information through Delaware's PFAS website (note that they were the least likely to prefer getting information through the news media.

Percent of the following groups who say that the best way for DNREC to share environmental health information with them is through Delaware's PFAS informational website (www.de.gov/pfas):



A quarter of residents (25%) stated that there are other effective ways for DNREC to share environmental health information with them (beyond those listed in the preceding question). The top write-in responses are direct mail or newsletters, phone texts or apps, and brochures.

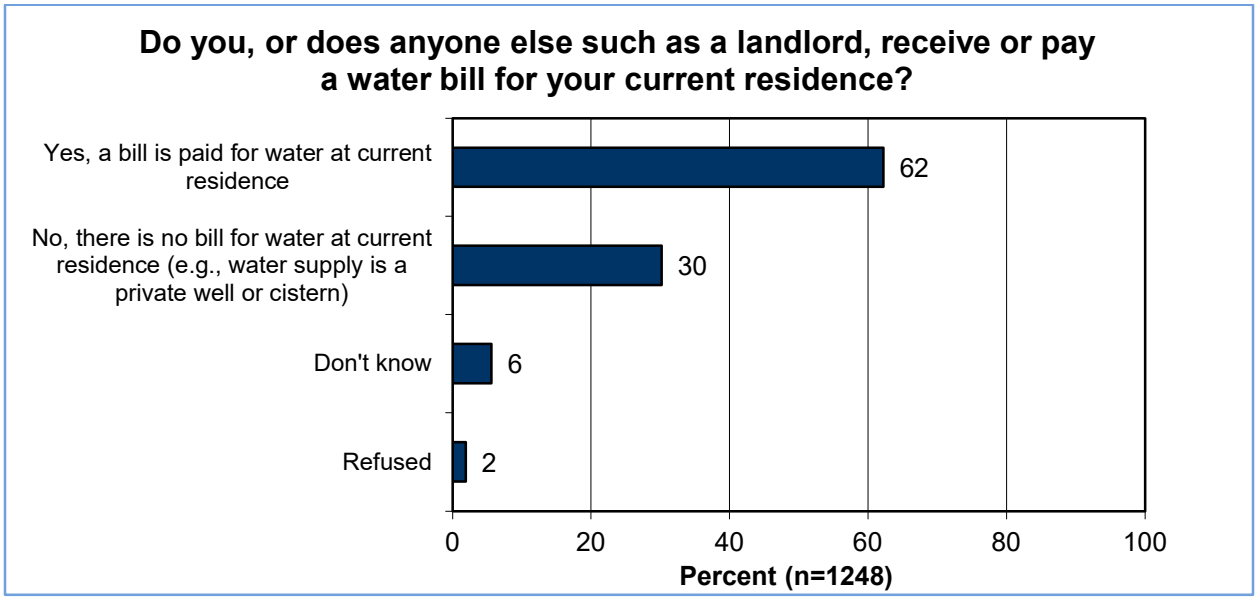


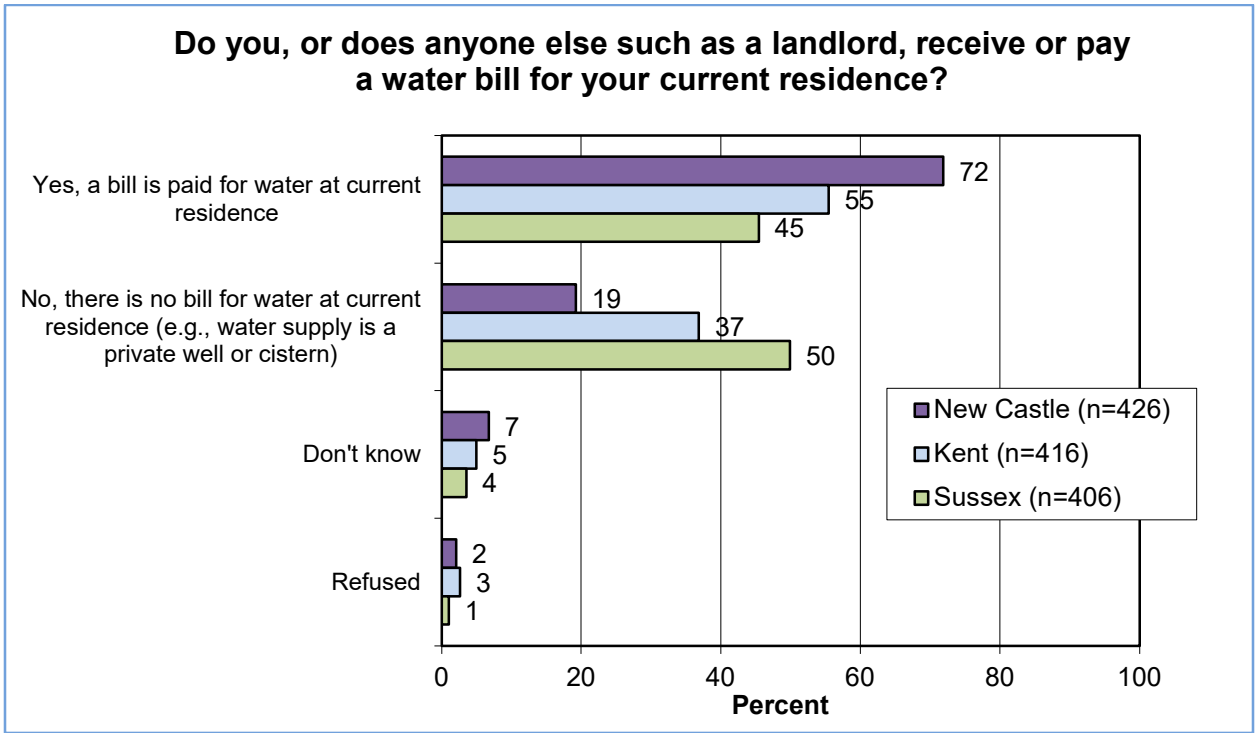


PRIMARY WATER SOURCE

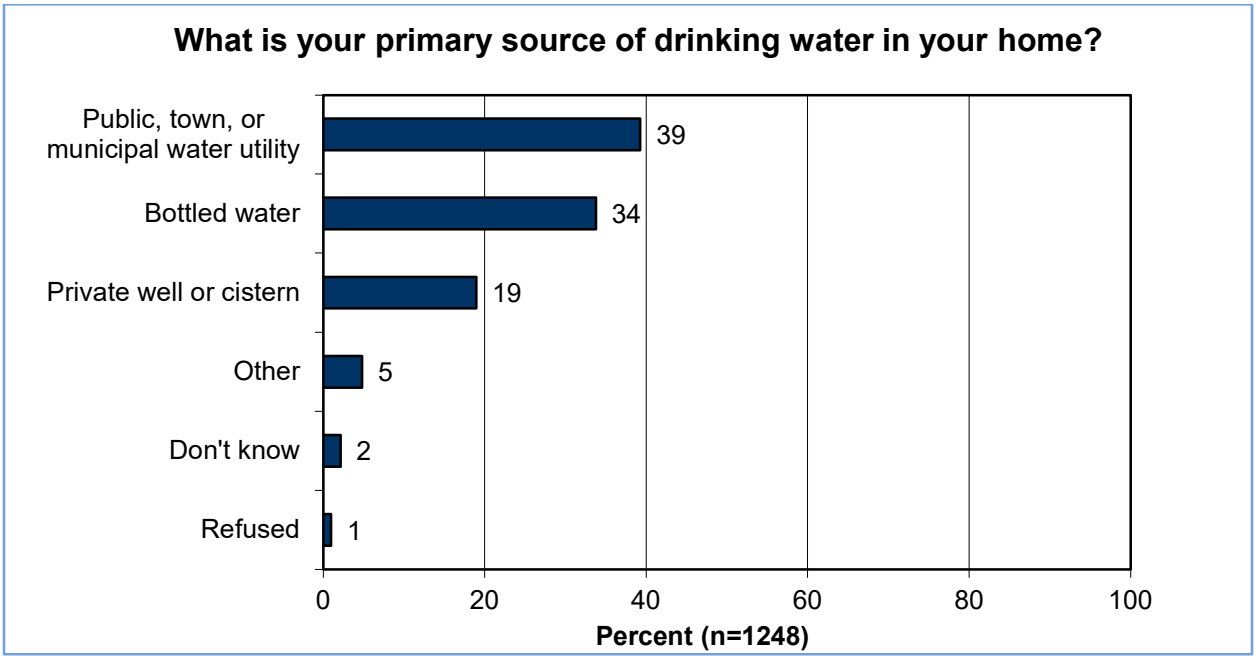
Nearly two thirds of residents (62%) pay a water bill (or have it paid for them), whereas 30% do not (such as those on a private well or cistern). There is substantial variation between the counties, with New Castle County residents being the most likely and Sussex County residents being the least likely to pay a water bill.

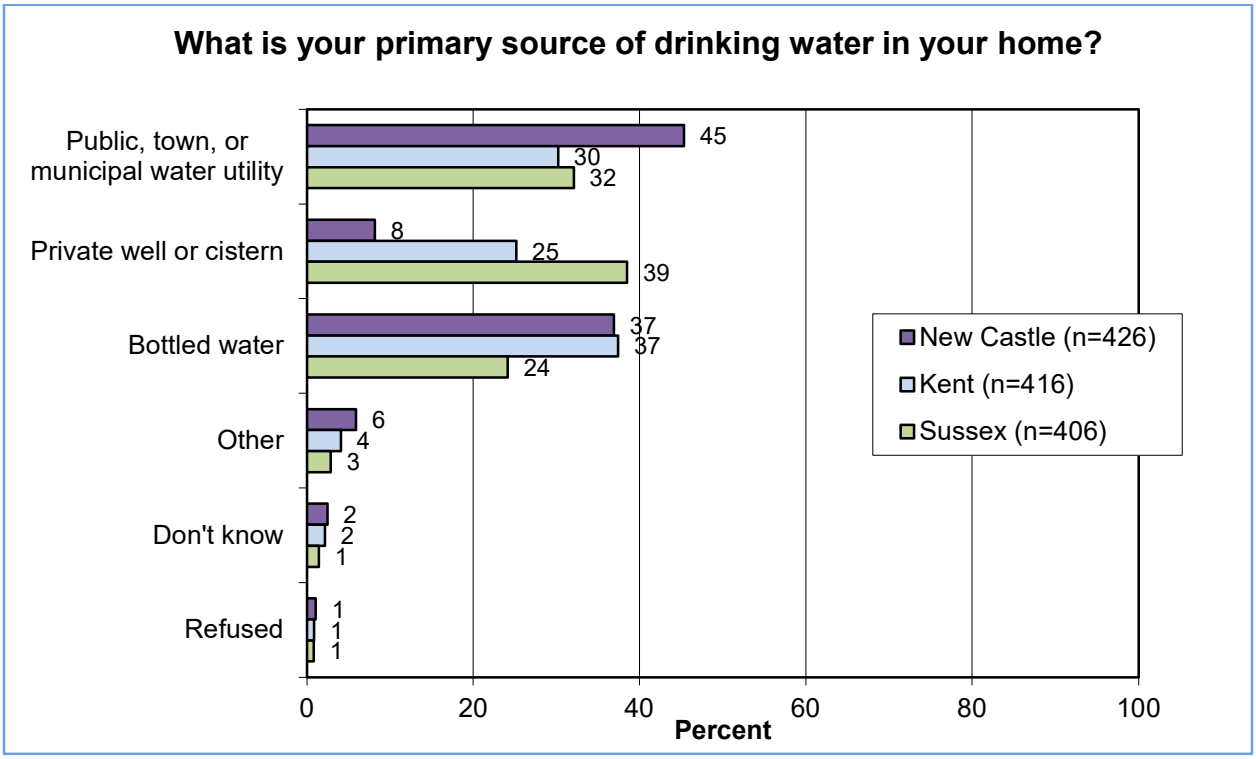
Those on a water system were asked to name their water provider; verbatim responses are shown in Appendix B: Open-Ended Responses.



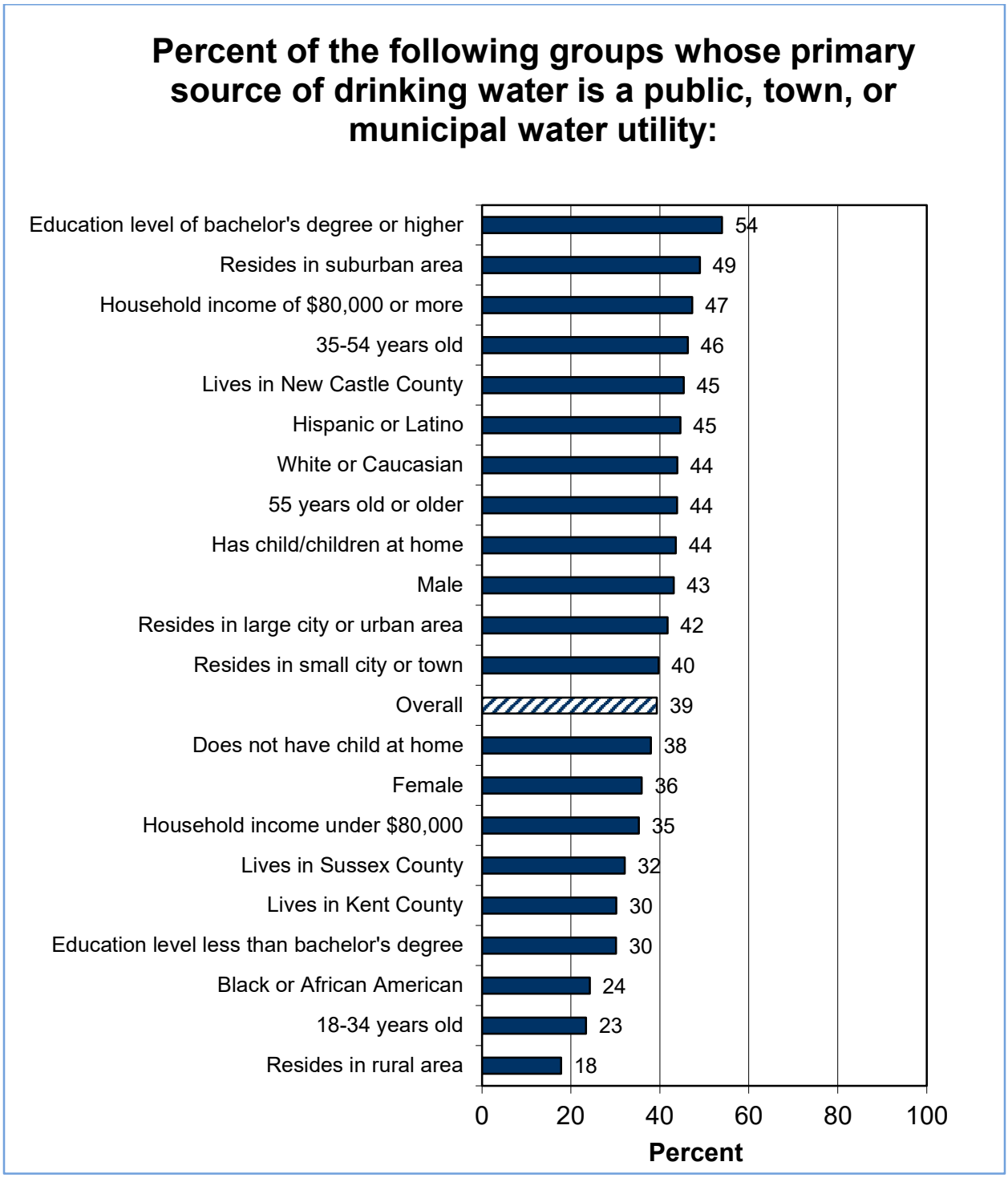


The top source of drinking water for Delaware residents is a water utility (39% selected this), closely followed by bottled water (34%). A substantial percentage (19%) are on a private well or cistern. New Castle County residents are the most likely to get their primary drinking water from a utility, and Sussex County residents are the most likely to be on a well or cistern. Over a third of New Castle and Kent County residents primarily consume bottled water.

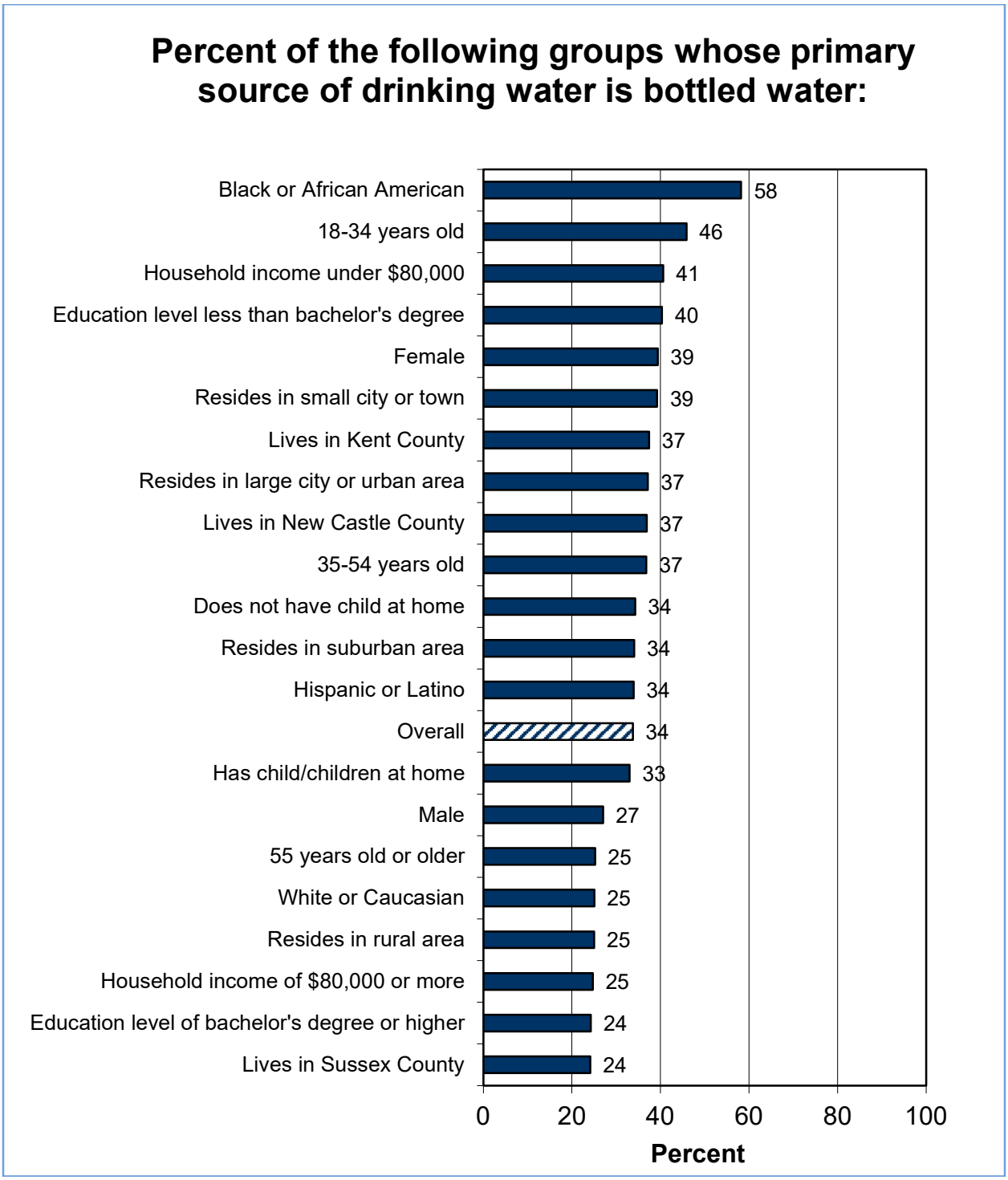




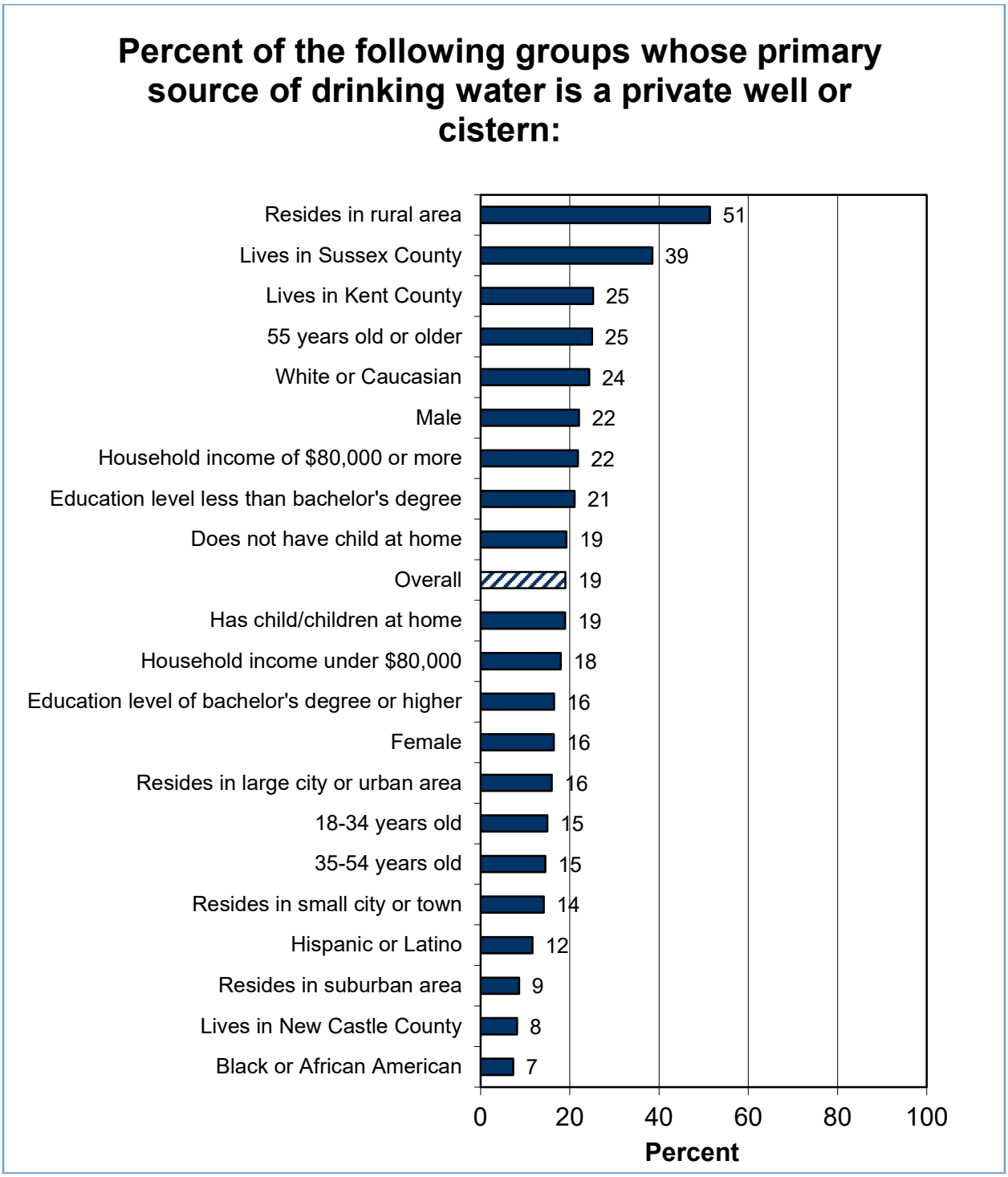
The groups who most often get their primary drinking water from a utility include those in the higher education and income categories, suburban residents, and those in the middle age category.



Groups who most often primarily consume bottled water are Black residents, by far the top group, along with younger residents and those in the lower income and education categories.

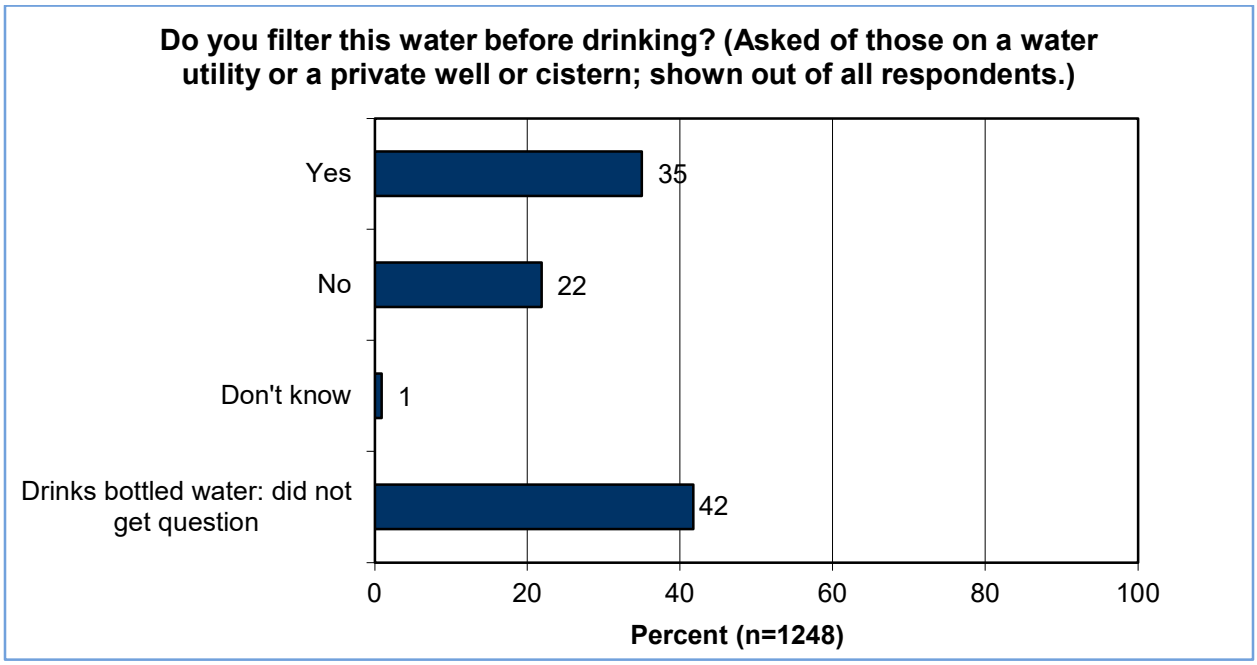


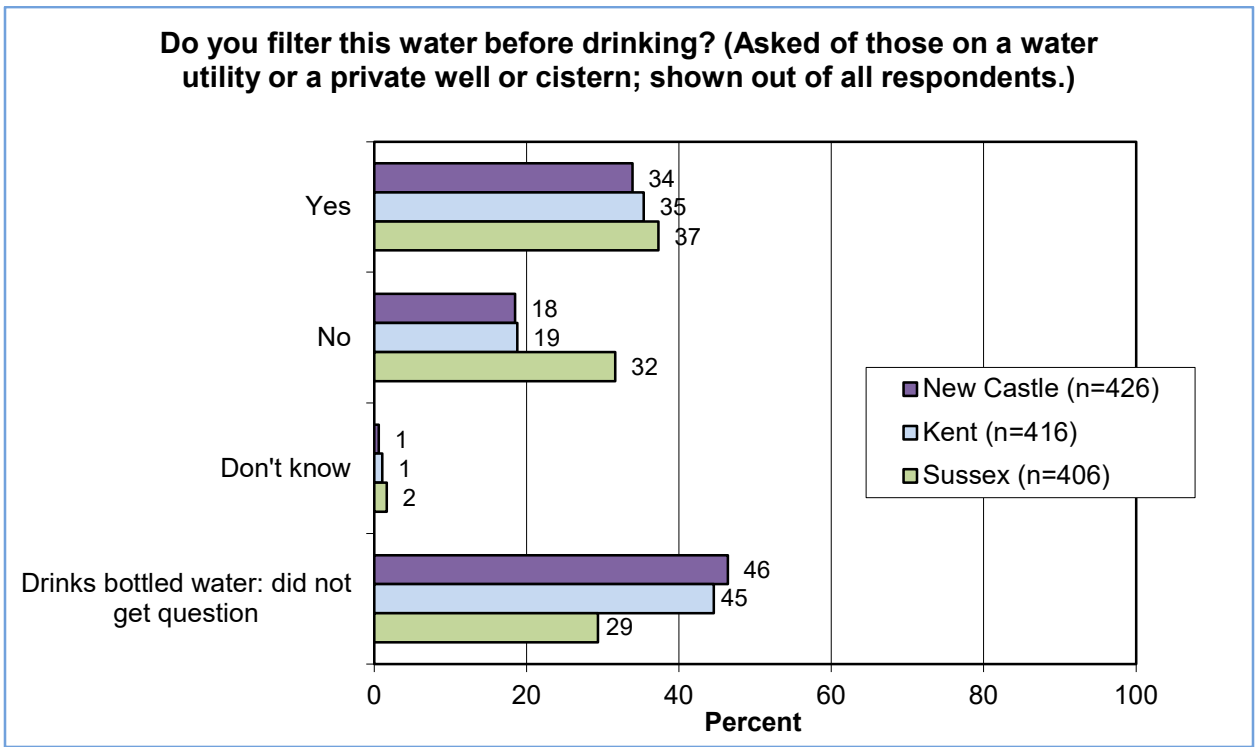
Rural residents and Sussex County residents are the groups who most often get their drinking water from a private well or cistern, along with Kent County residents, older residents, and White residents.



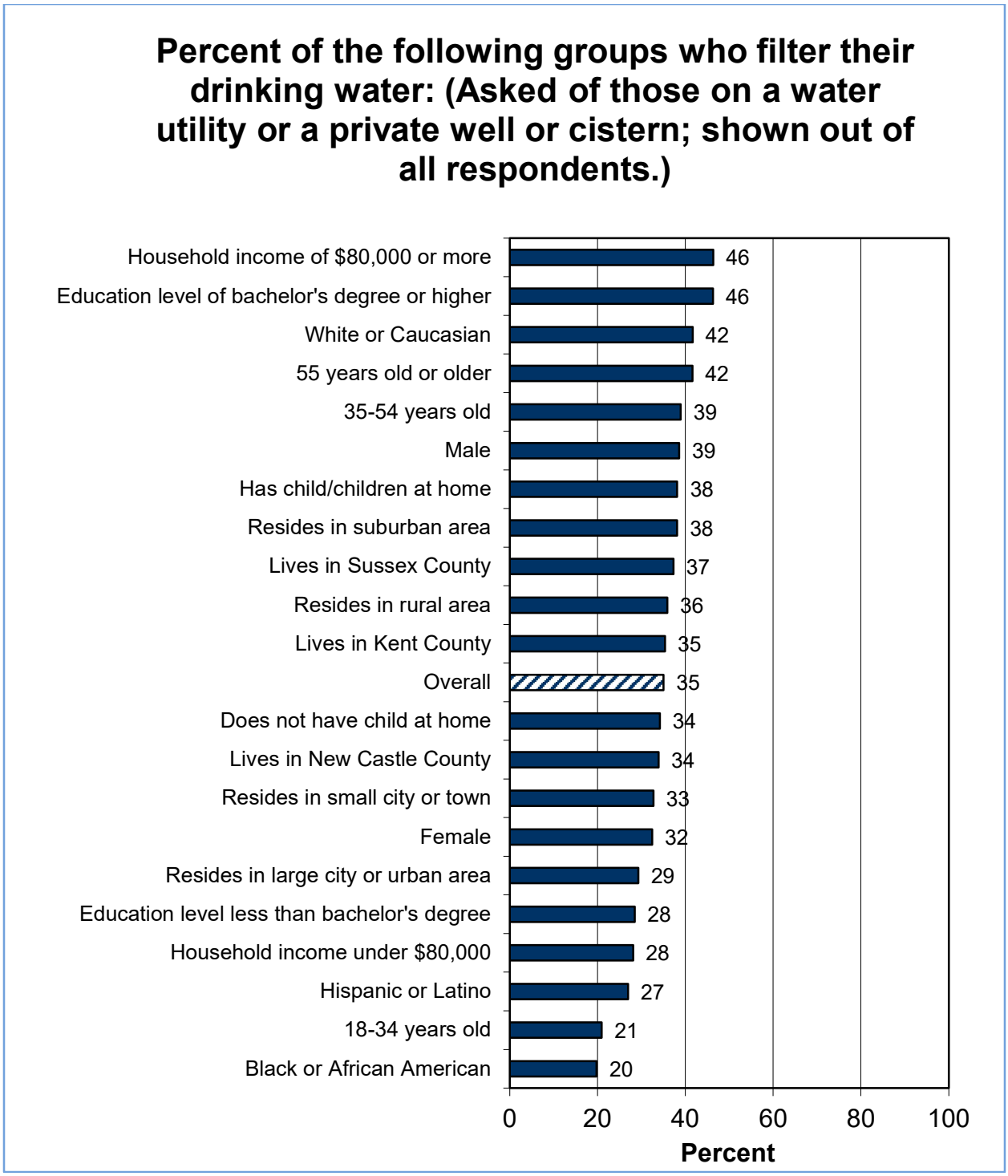
Just over a third of Delaware residents (35%) filter their water before drinking. (Note that those who primarily drink bottled water were not given this question, although results are shown out of the full sample.)

Those who filter their drinking water were asked to name the type of filter or filter system that they use. Verbatim responses are shown in Appendix B: Open-Ended Responses.





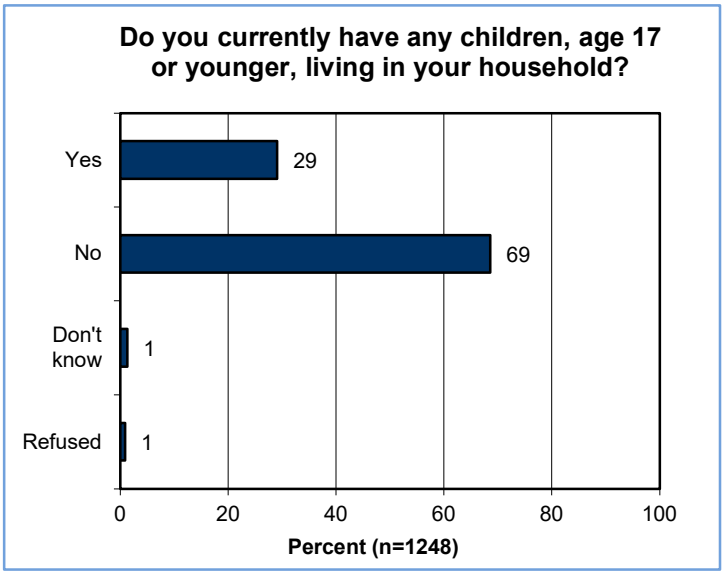
The groups most likely to filter their drinking water include those in the higher income and education brackets, White residents, and older residents.

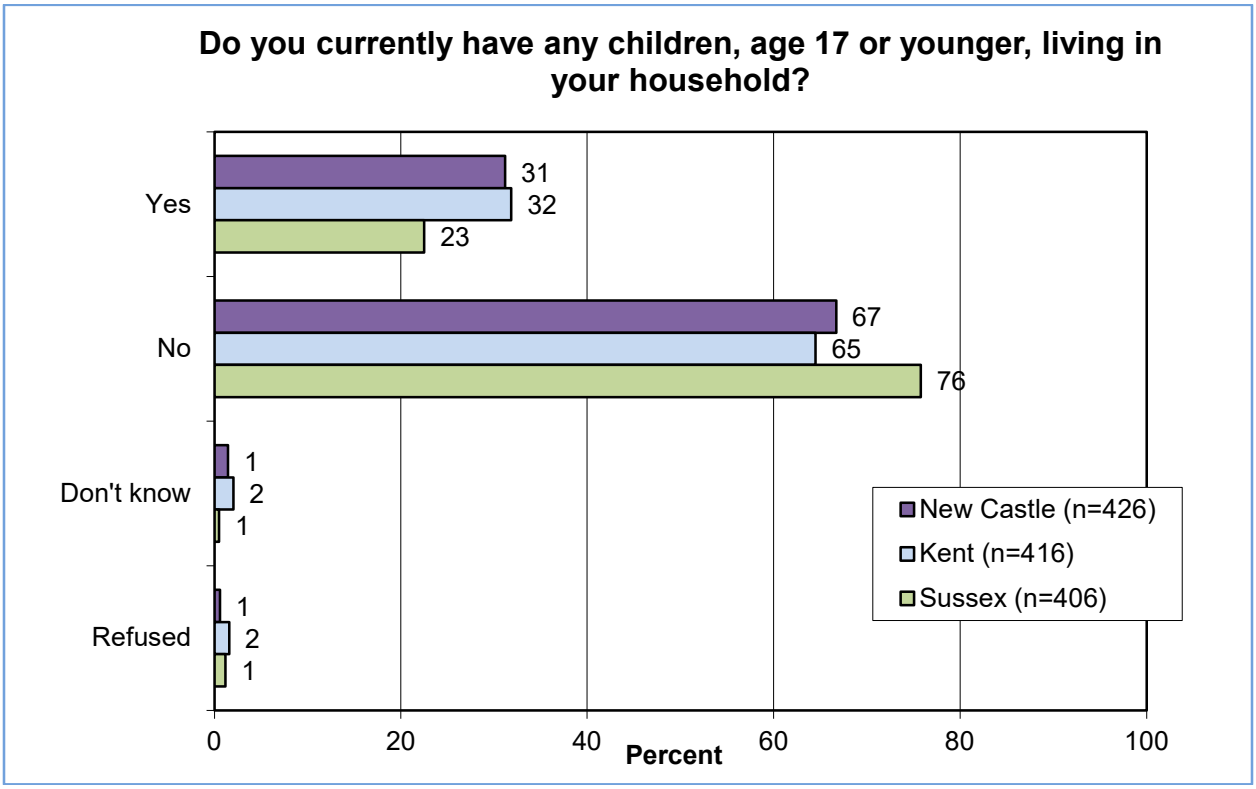


DEMOGRAPHIC CHARACTERISTICS

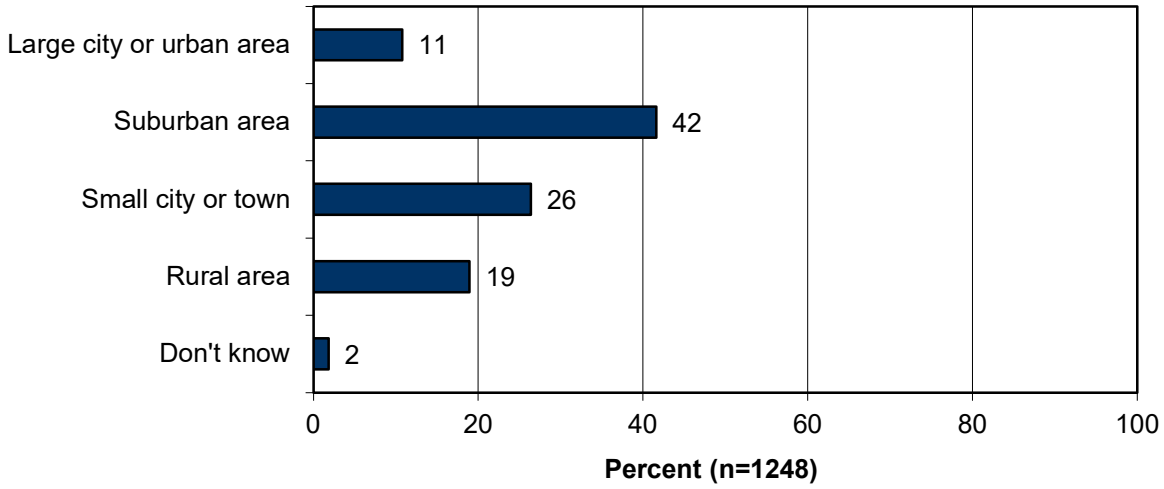
The following demographic data were collected by the survey, primarily for use in crosstabulations:

- Children in household.
- Type of residential area (urban—rural continuum).
- Education level.
- Race/ethnicity.
- Household income.
- Age.
- Gender.

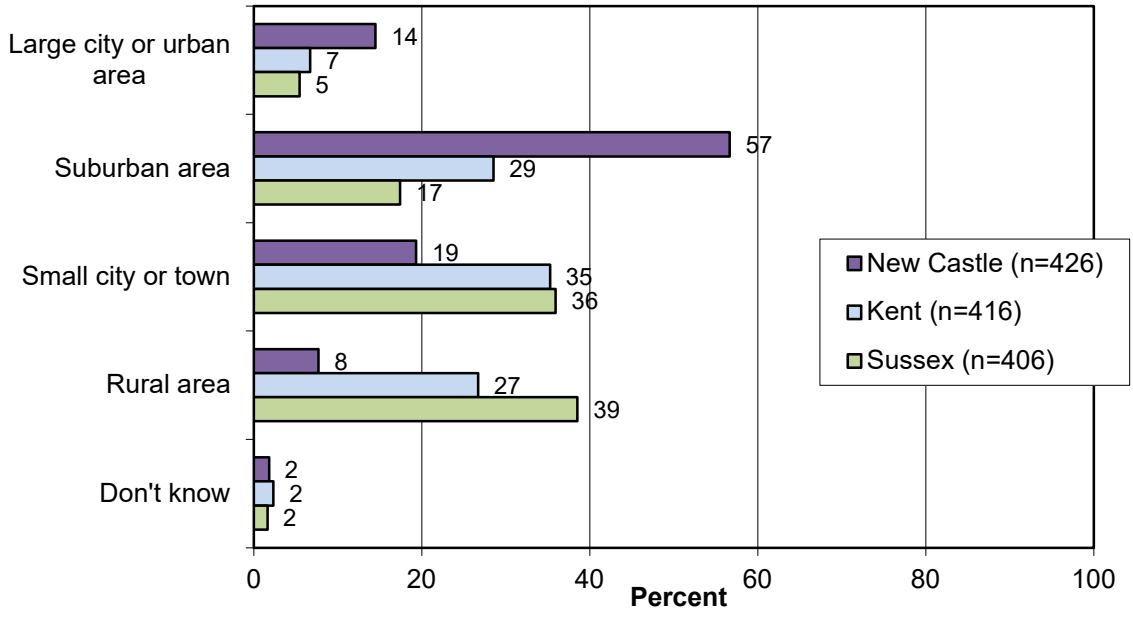




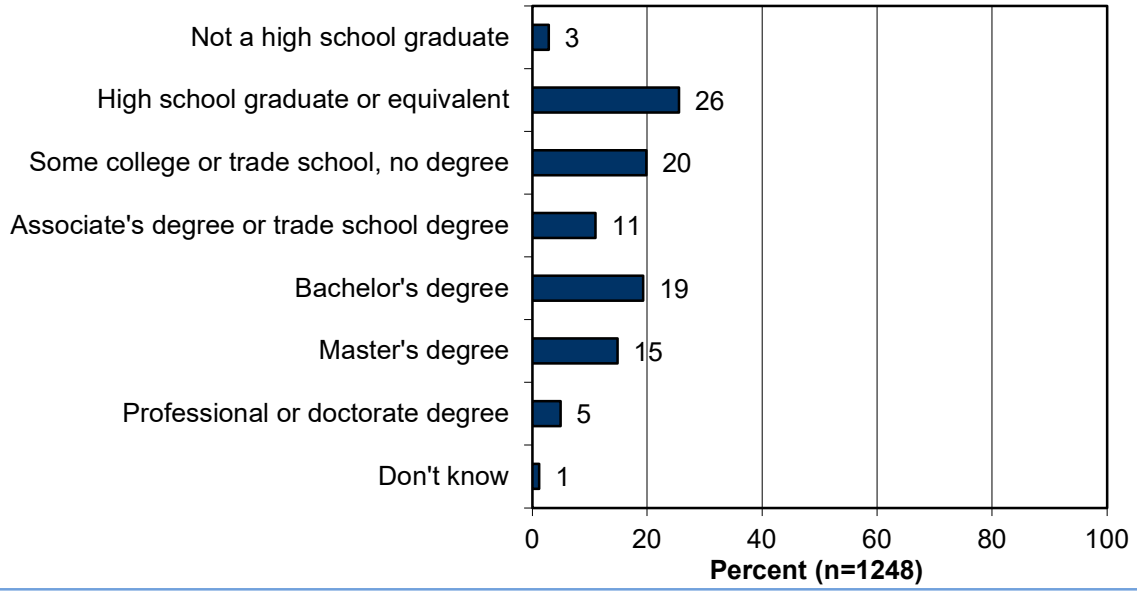
Do you consider your place of residence to be a large city or urban area, a suburban area, a small city or town, or a rural area?



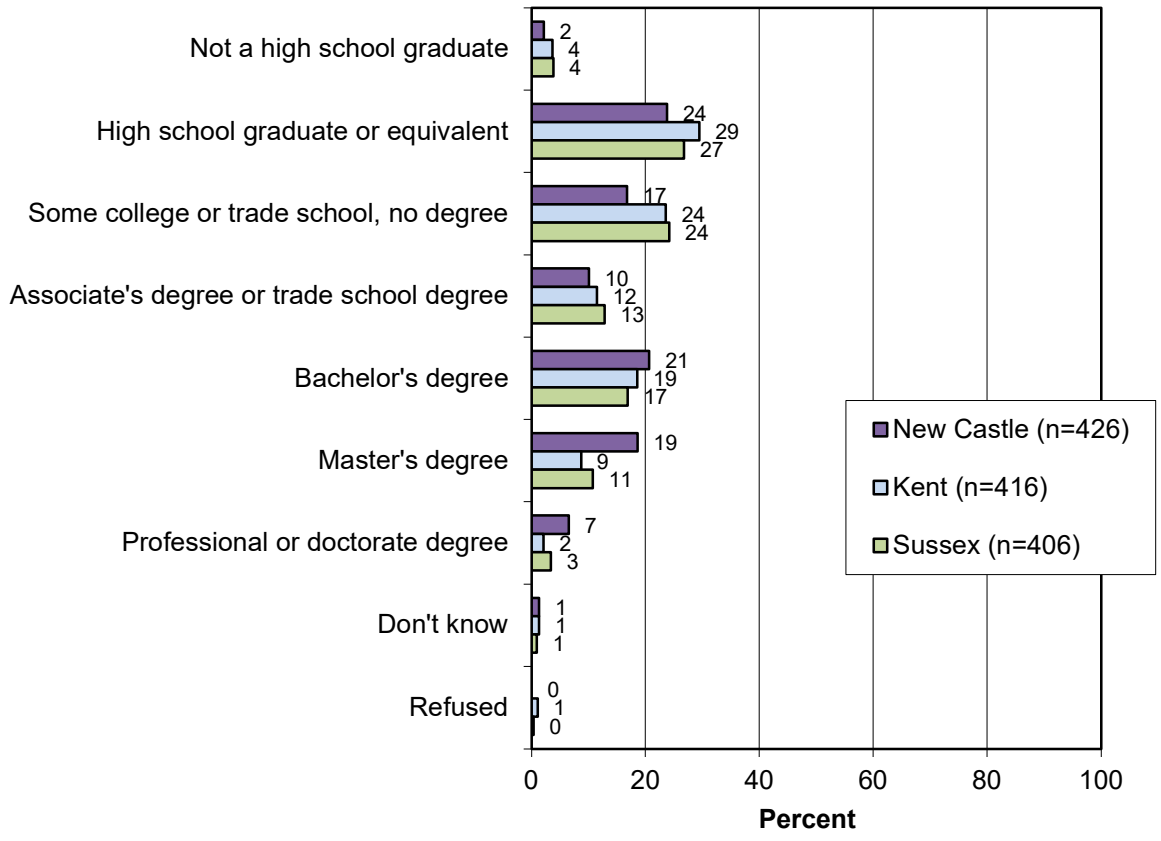
Do you consider your place of residence to be a large city or urban area, a suburban area, a small city or town, or a rural area?

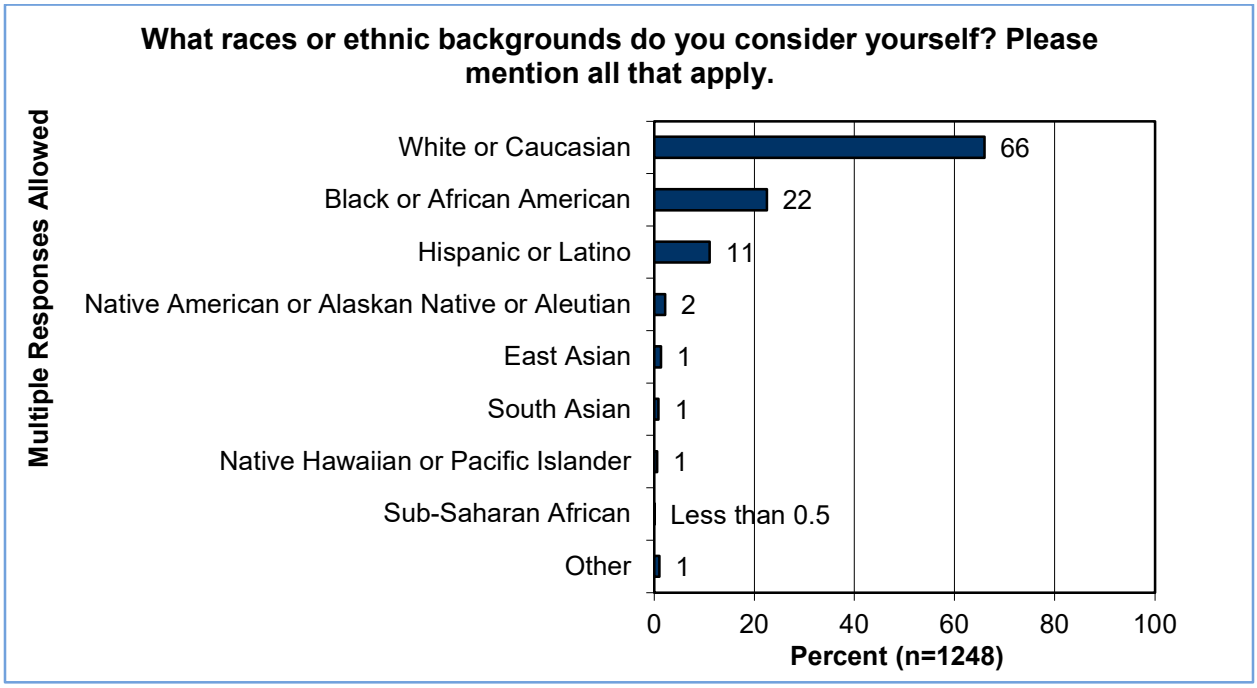


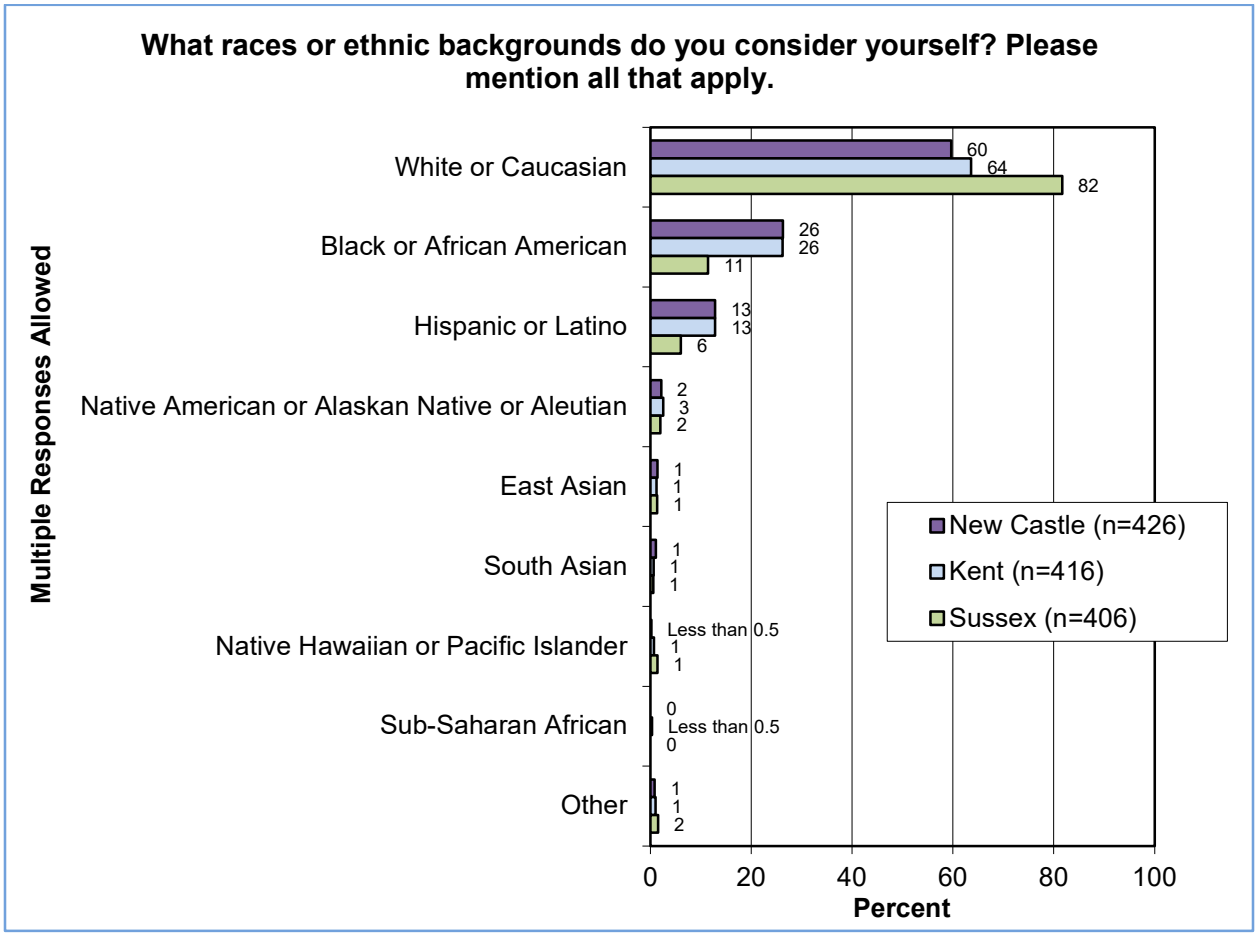
What is the highest level of education you have completed?



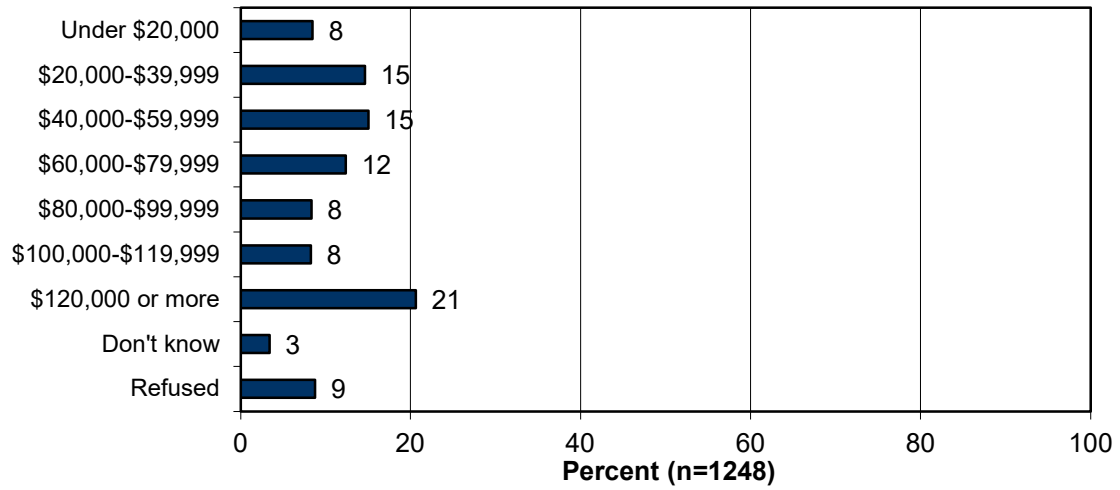
What is the highest level of education you have completed?



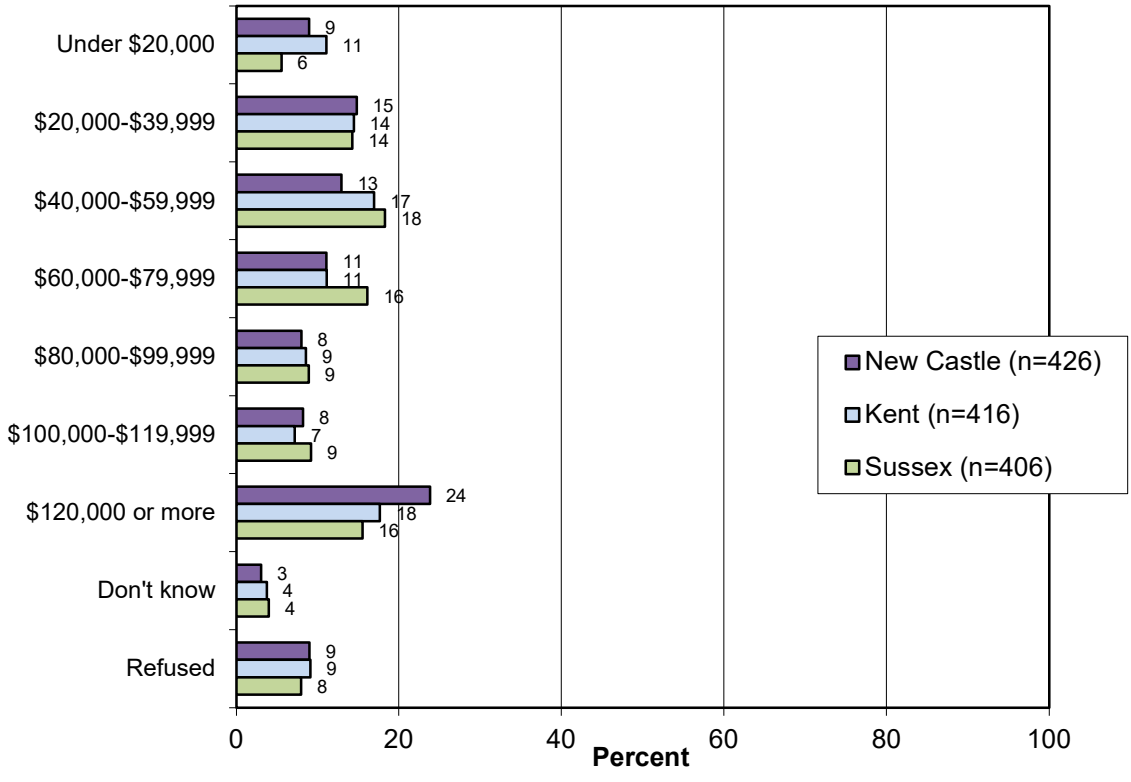

What races or ethnic backgrounds do you consider yourself? Please mention all that apply.
Multiple Responses Allowed
White or Caucasian
Black or African American
Hispanic or Latino
Native American or Alaskan Native or Aleutian
East Asian
South Asian
Native Hawaiian or Pacific Islander
Sub-Saharan African
Other
66
22
11
2
1
1
1
Less than 0.5
1
0
20
40
60
80
100
Percent (n=1248)

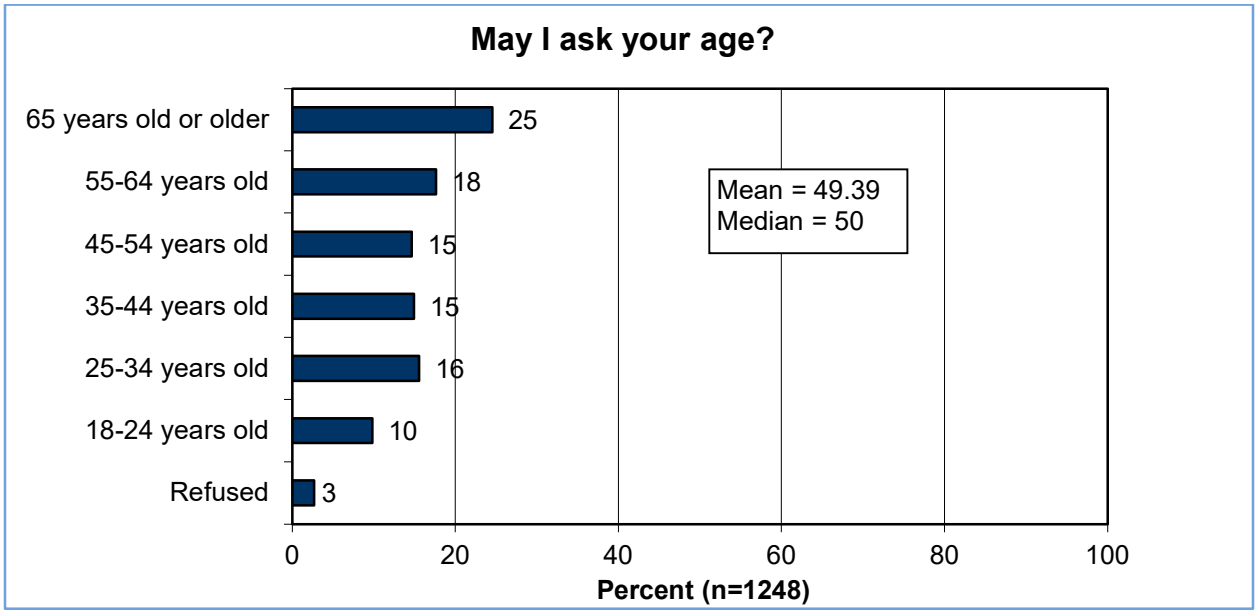

What races or ethnic backgrounds do you consider yourself? Please mention all that apply.
Multiple Responses Allowed
White or Caucasian
Black or African American
Hispanic or Latino
Native American or Alaskan Native or Aleutian
East Asian
South Asian
Native Hawaiian or Pacific Islander
Sub-Saharan African
Other
60
64
82
26
26
11
13
13
6
2
3
2
1
1
1
1
1
1
Less than 0.5
1
1
0
Less than 0.5
0
1
1
2
New Castle (n=426)
Kent (n=416)
Sussex (n=406)
0
20
40
60
80
100
Percent

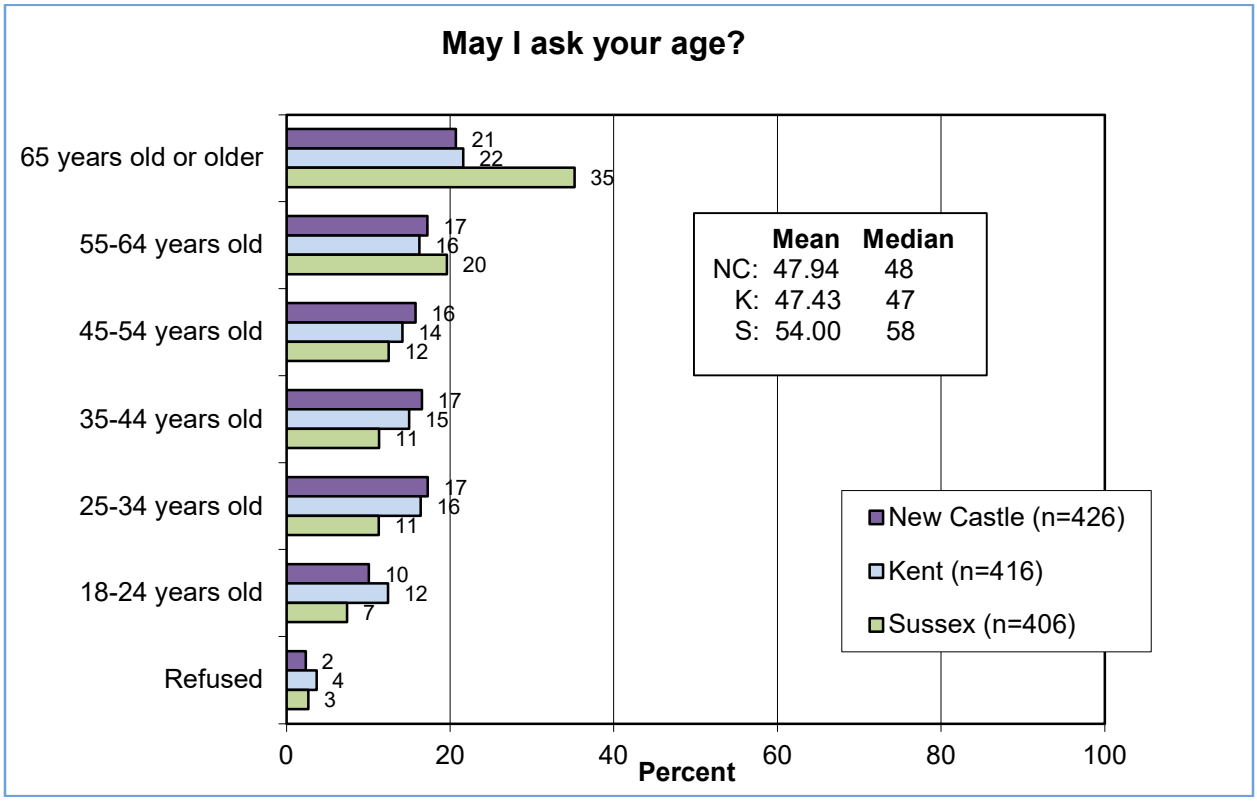
Thinking about your entire household, which of these categories best describes your total household income before taxes last year?

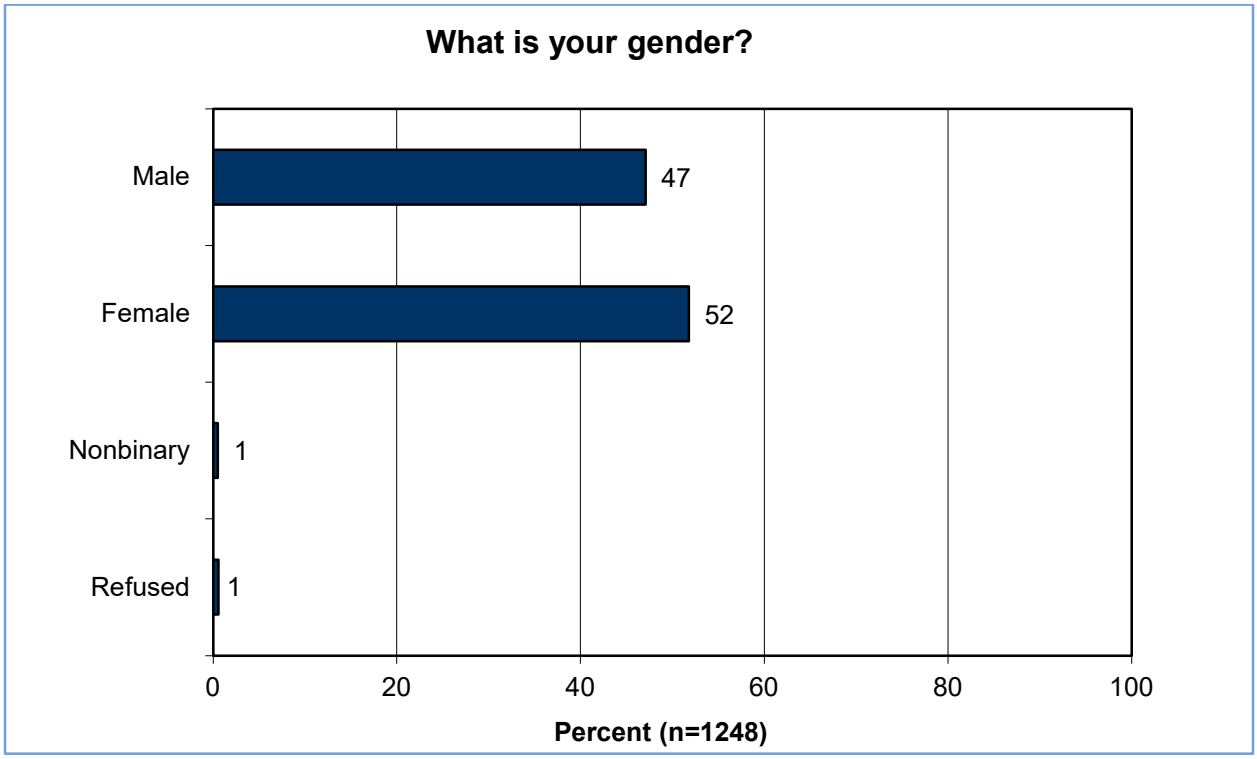


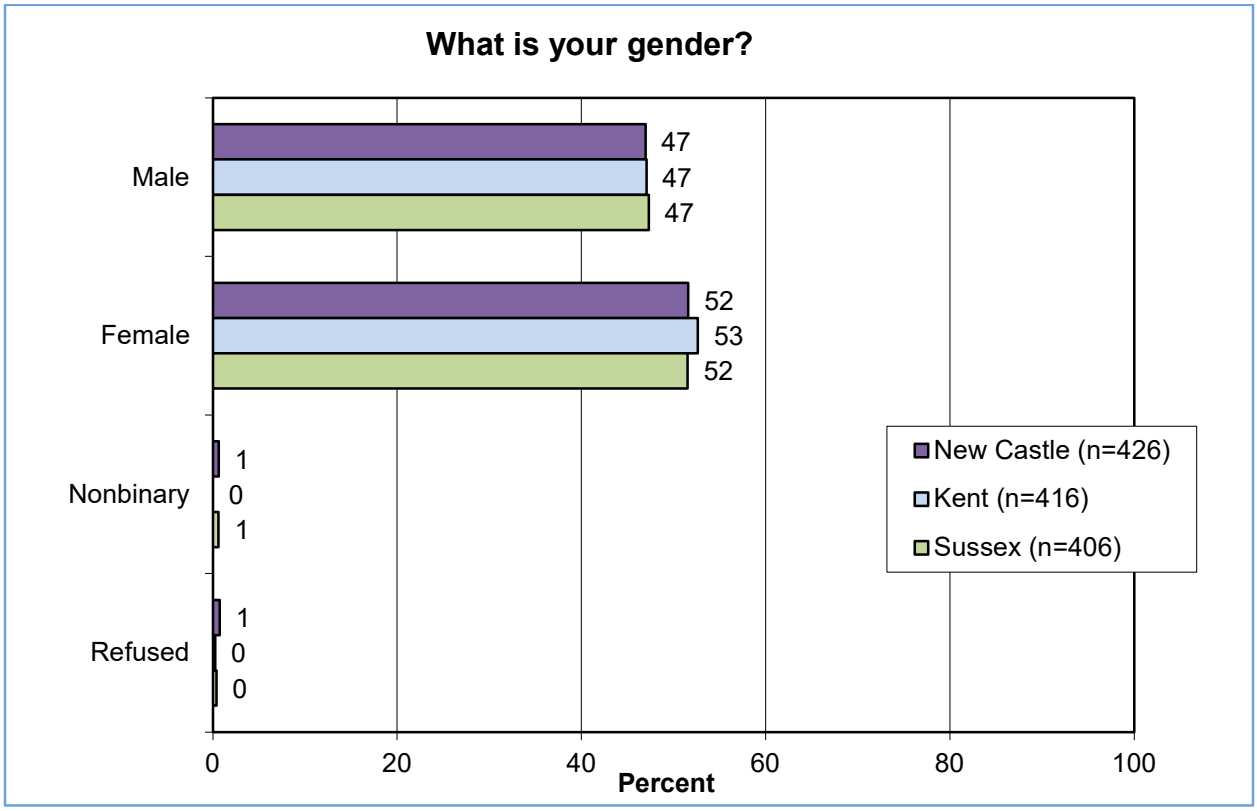
Thinking about your entire household, which of these categories best describes your total household income before taxes last year?




May I ask your age?
65 years old or older
55-64 years old
45-54 years old
35-44 years old
25-34 years old
18-24 years old
Refused
25
18
15
15
16
10
3
Mean = 49.39
Median = 50
0
20
40
60
80
100
Percent (n=1248)


May I ask your age?
65 years old or older
55-64 years old
45-54 years old
35-44 years old
25-34 years old
18-24 years old
Refused
21
22
35
17
16
20
16
14
12
17
15
11
17
16
11
10
12
7
2
4
3
Mean Median
NC: 47.94 48
K: 47.43 47
S: 54.00 58
New Castle (n=426)
Kent (n=416)
Sussex (n=406)
0
20
40
60
80
100
Percent


What is your gender?
Male
47
Female
52
Nonbinary
1
Refused
1
0
20
40
60
80
100
Percent (n=1248)

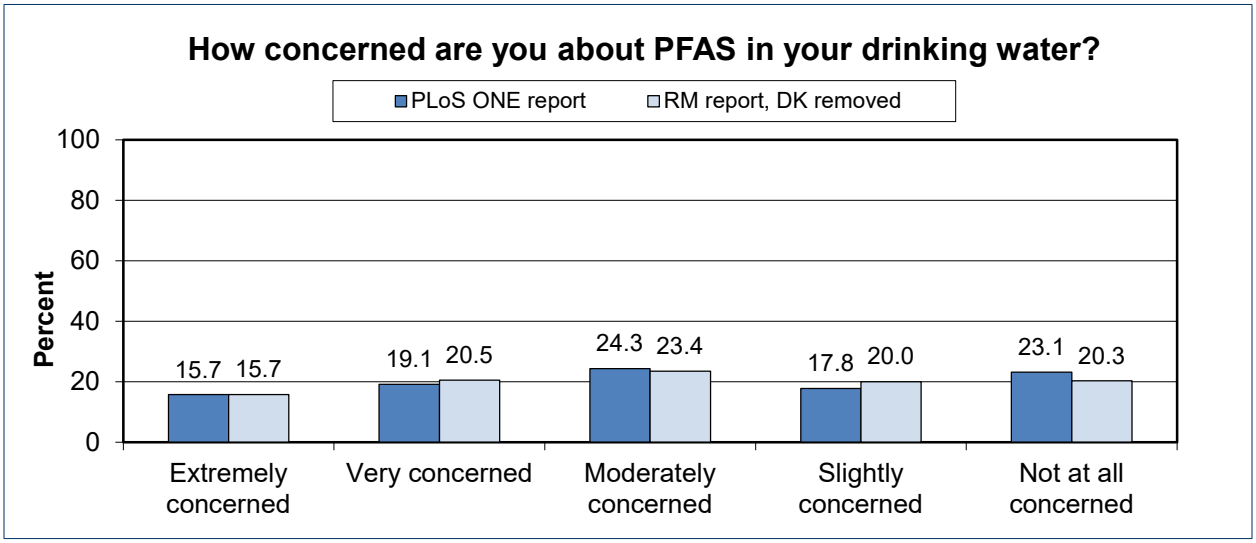

What is your gender?
Male
47
47
47
Female
52
53
52
Nonbinary
1
0
1
Refused
1
0
0
New Castle (n=426)
Kent (n=416)
Sussex (n=406)
0
20
40
60
80
100
Percent

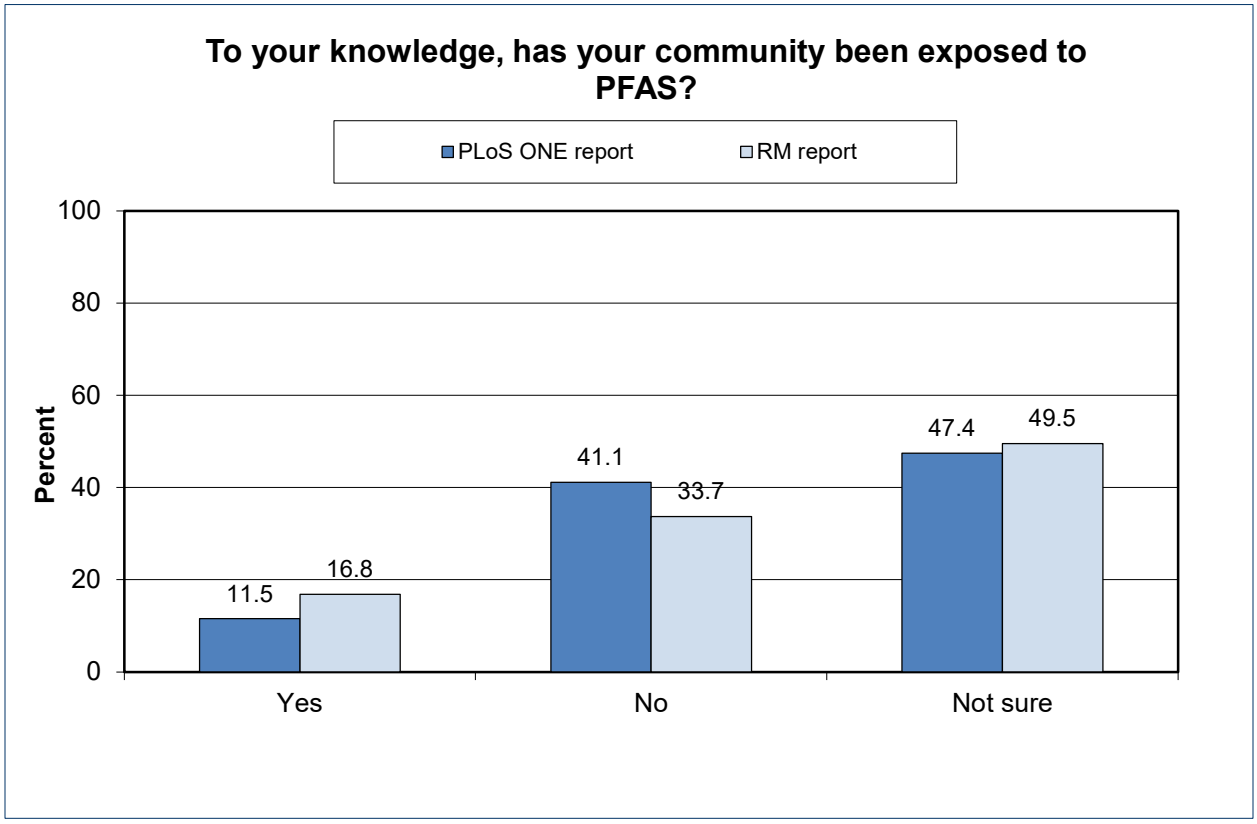
COMPARISONS TO NATIONAL DATA

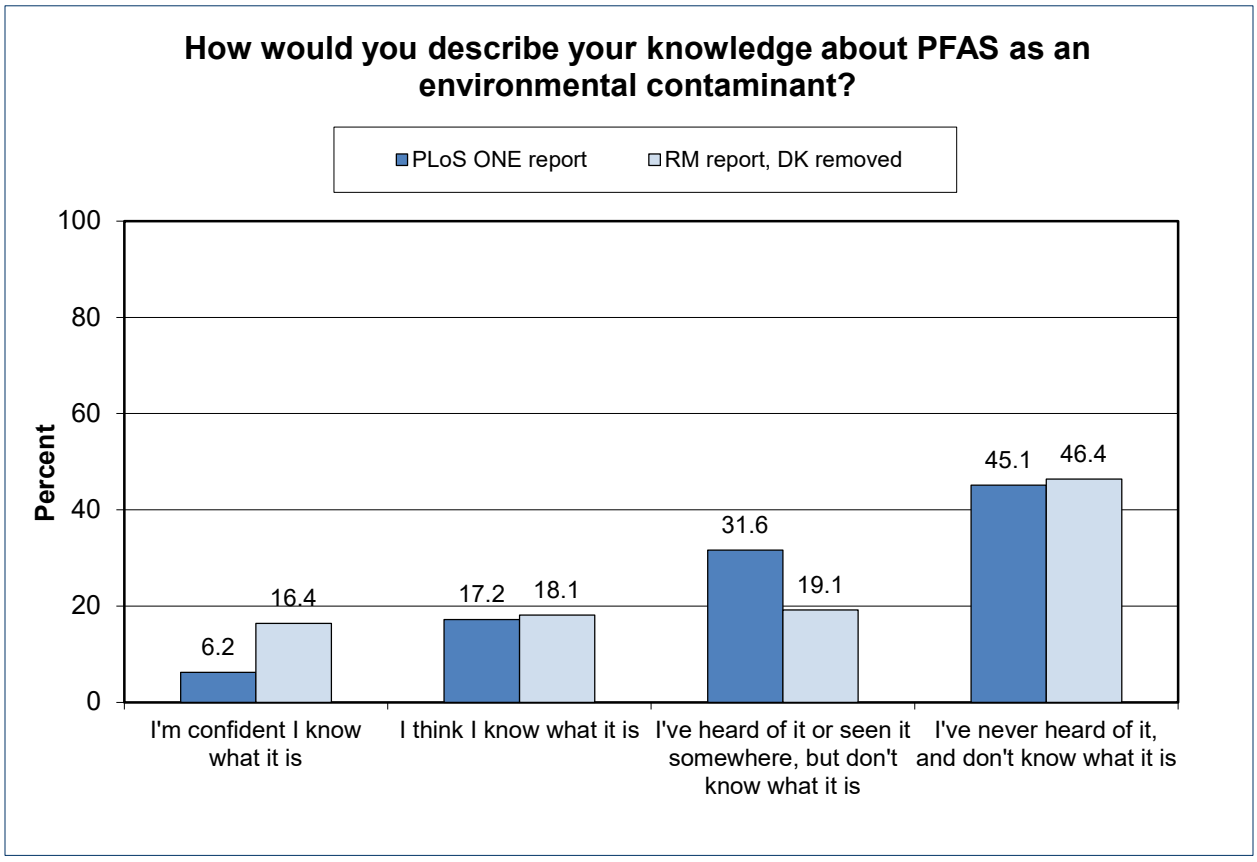
In 2023, the Texas Water Resources Institute conducted a national survey of the public's awareness of and concerns about PFAS contamination (the study is cited in the Introduction and Methodology chapter). Several questions in this survey match those from the national survey (which is reported in the publication, "PLoS ONE"), so results of the two are presented here side-by-side for comparison. Note that the national survey did not include "don't know" as a response option in several questions; therefore, Delaware results were recalculated without the "don't know" percentages so that valid comparisons could be made. In the graphs, the current report is referred to as "RM report" (for Responsive Management). In some graphs, the "don't know" responses were removed, referred to as "DK removed."

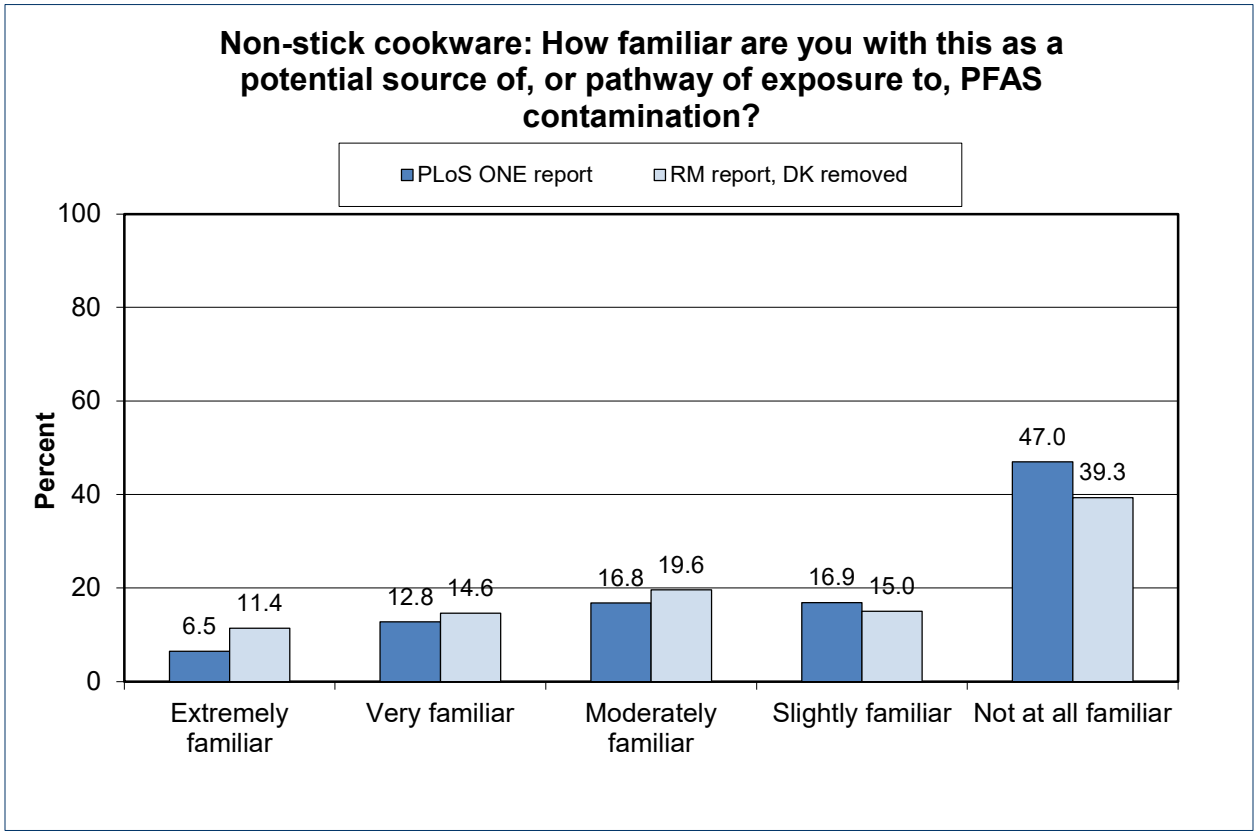
For several questions, results between the 2023 national study and this 2025 Delaware study are very consistent (such as concern about PFAS in the drinking water, the first graph shown below). Most notably, the percentages who have never heard of PFAS are nearly identical, as shown on the next page. However, some of the more notable differences are summarized below:

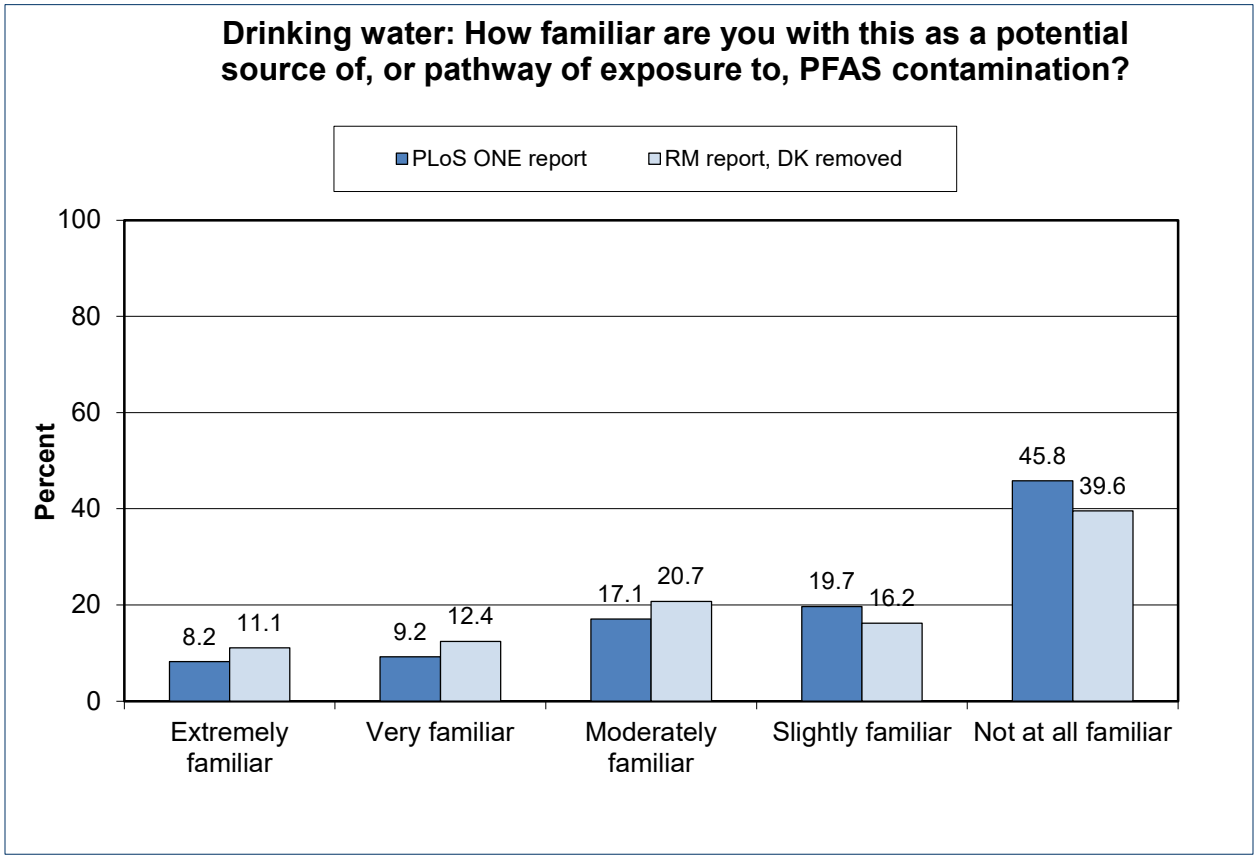
- Delaware residents are markedly more likely than U.S. residents to be confident in knowing about PFAS (16% compared to 6%, respectively).
- Compared to the nation as a whole, Delaware residents have more familiarity with drinking water and non-stick cookware as potential sources of PFAS contamination. On the other hand, they have less familiarity with personal hygiene products as a potential source.
- Markedly higher percentages of Delaware residents, compared to the nation, have already changed their use of drinking water and non-stick cookware due to concern about PFAS. On the other hand, a higher percentage of U.S. residents are planning to change their source of drinking water.

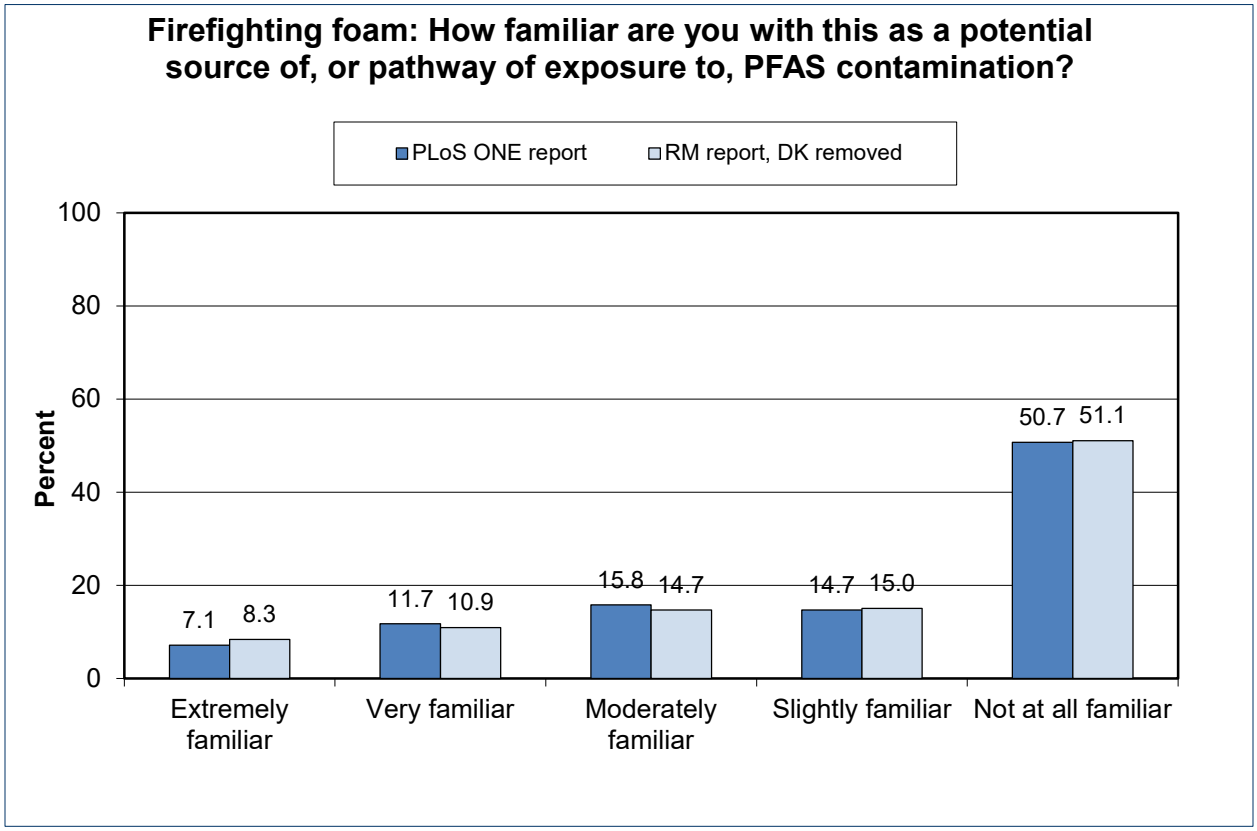


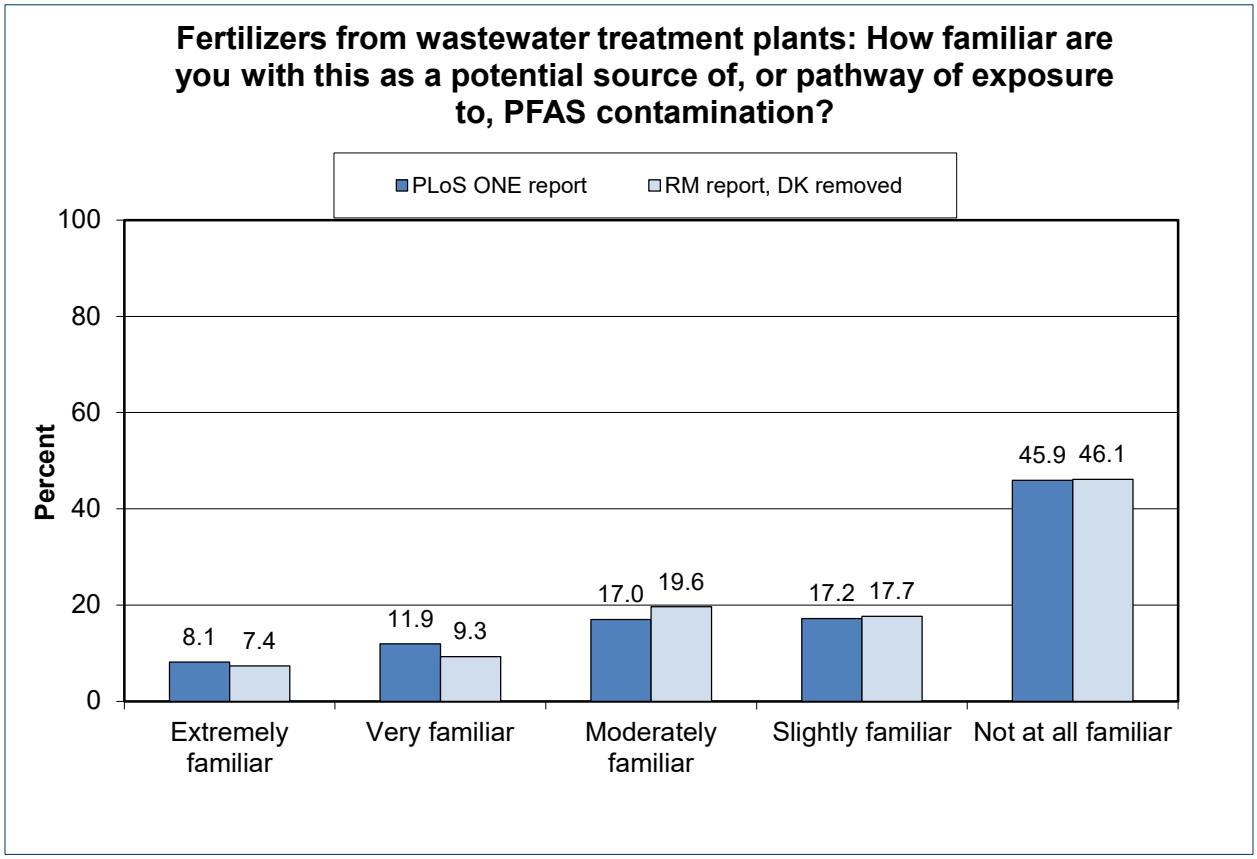

To your knowledge, has your community been exposed to PFAS?
PLoS ONE report
RM report
Percent
100
80
60
40
20
0
11.5
16.8
41.1
33.7
47.4
49.5
Yes
No
Not sure

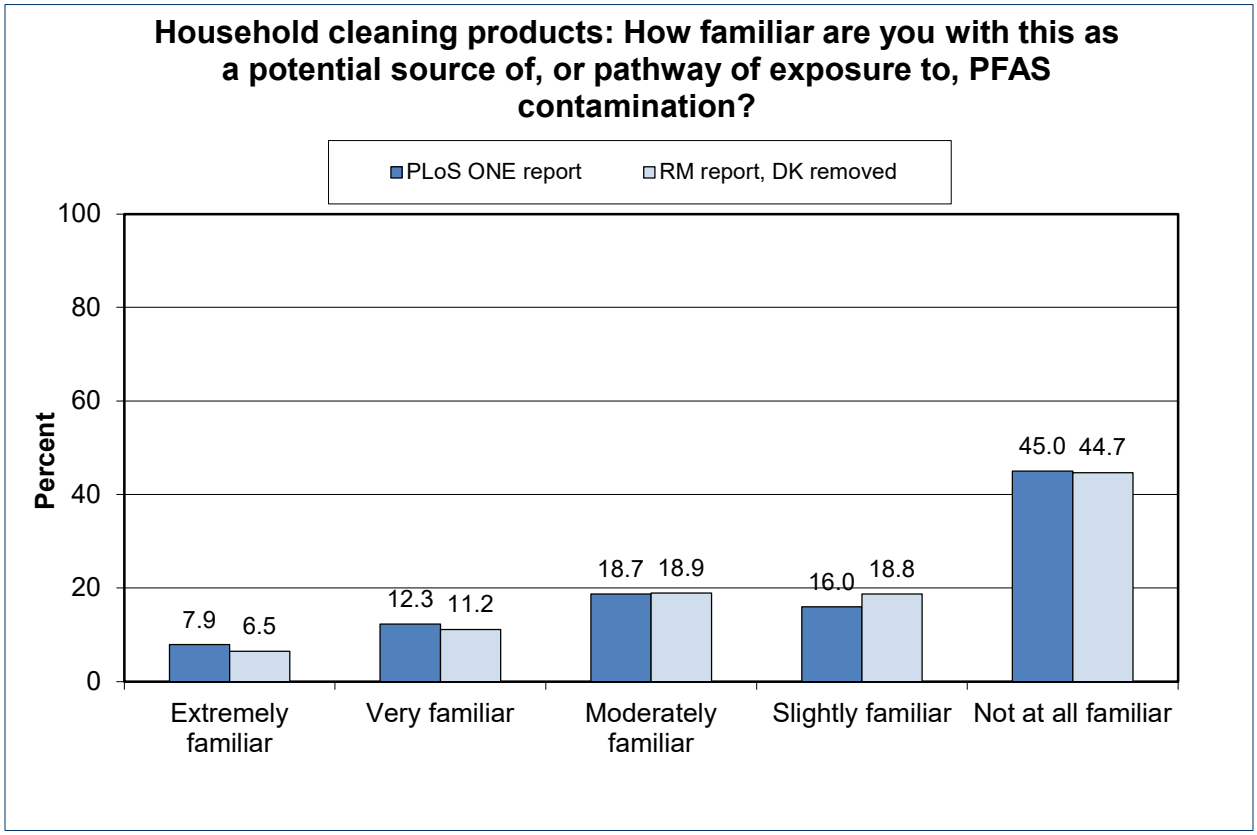

How would you describe your knowledge about PFAS as an environmental contaminant?
PLoS ONE report
RM report, DK removed
Percent
100
80
60
40
20
0
6.2
16.4
17.2
18.1
31.6
19.1
45.1
46.4
I'm confident I know what it is
I think I know what it is
I've heard of it or seen it somewhere, but don't know what it is
I've never heard of it, and don't know what it is


Non-stick cookware: How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?
PLoS ONE report
RM report, DK removed
Percent
100
80
60
40
20
0
6.5
11.4
12.8
14.6
16.8
19.6
16.9
15.0
47.0
39.3
Extremely familiar
Very familiar
Moderately familiar
Slightly familiar
Not at all familiar

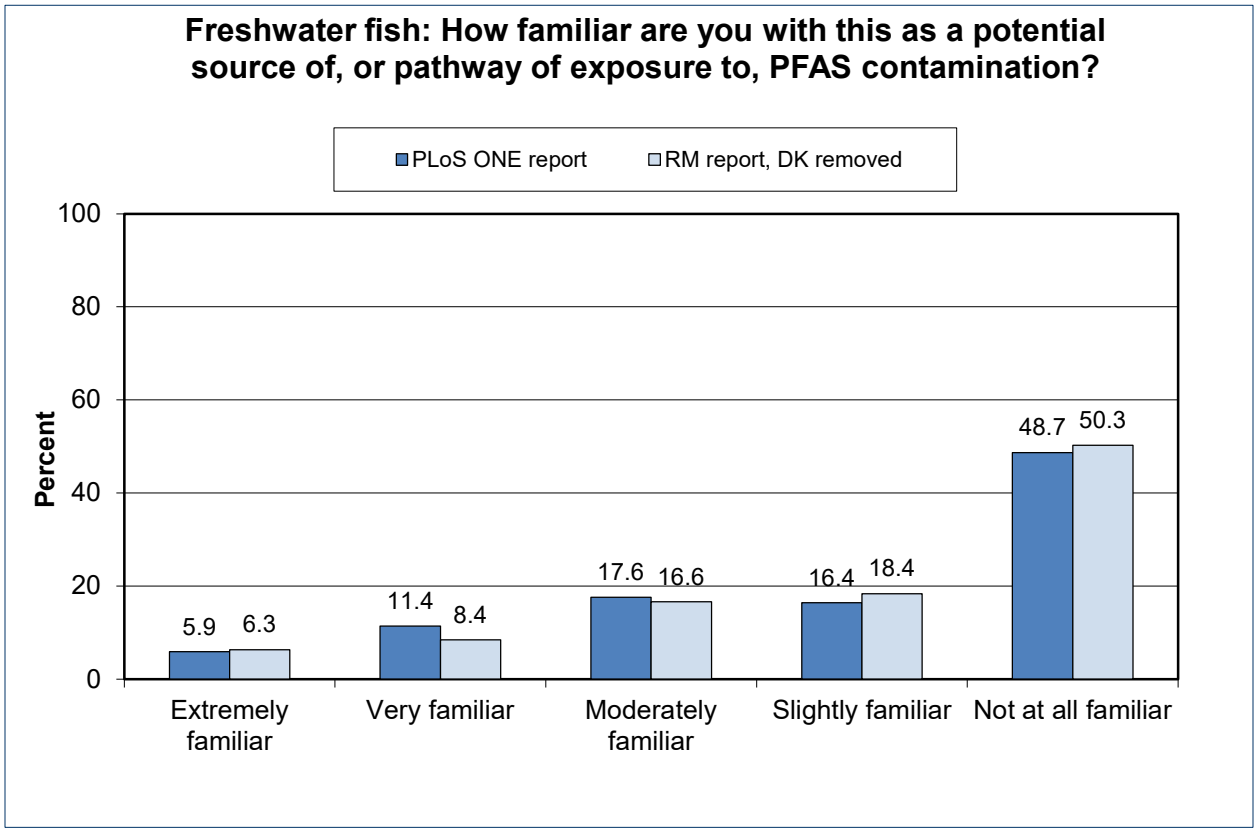

Drinking water: How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?
PLoS ONE report
RM report, DK removed
Percent
100
80
60
40
20
0
8.2
11.1
9.2
12.4
17.1
20.7
19.7
16.2
45.8
39.6
Extremely familiar
Very familiar
Moderately familiar
Slightly familiar
Not at all familiar

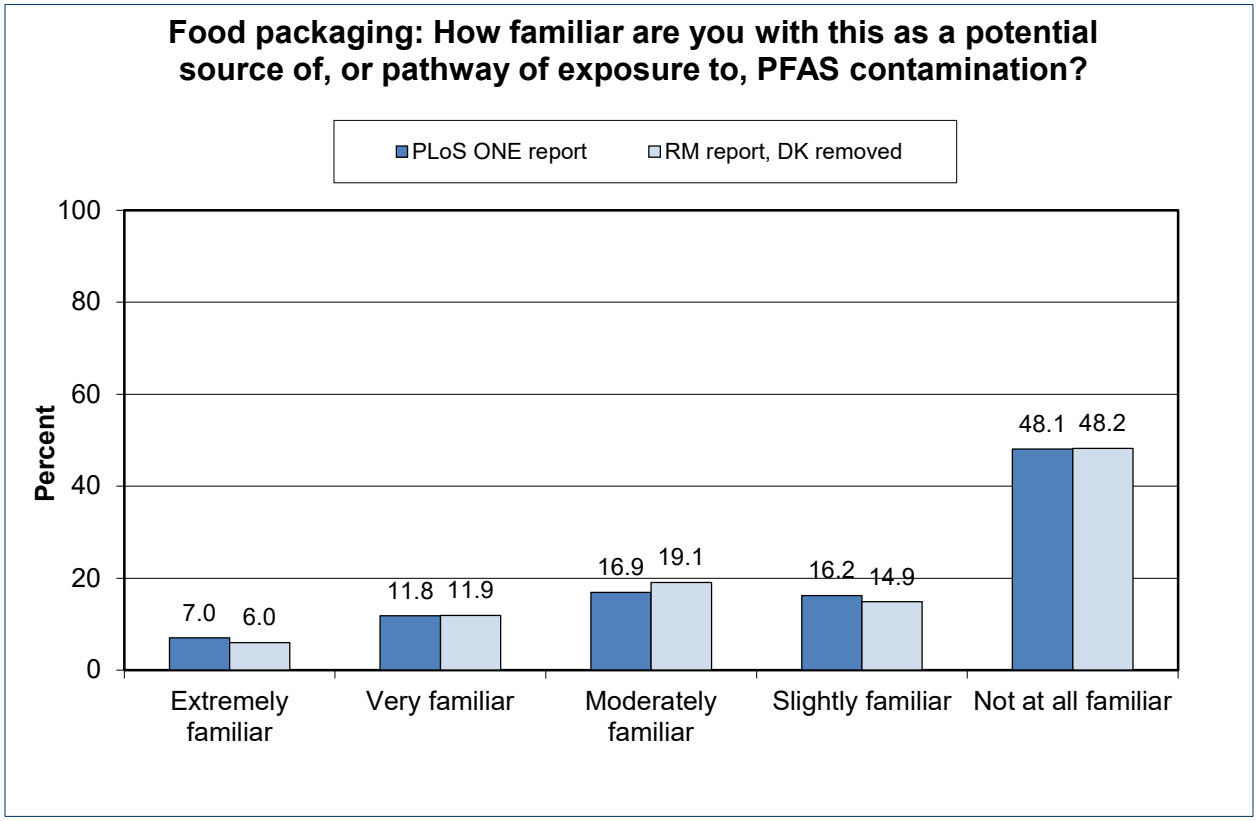

Firefighting foam: How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?
PLoS ONE report
RM report, DK removed
Percent
100
80
60
40
20
0
7.1
8.3
11.7
10.9
15.8
14.7
14.7
15.0
50.7
51.1
Extremely familiar
Very familiar
Moderately familiar
Slightly familiar
Not at all familiar

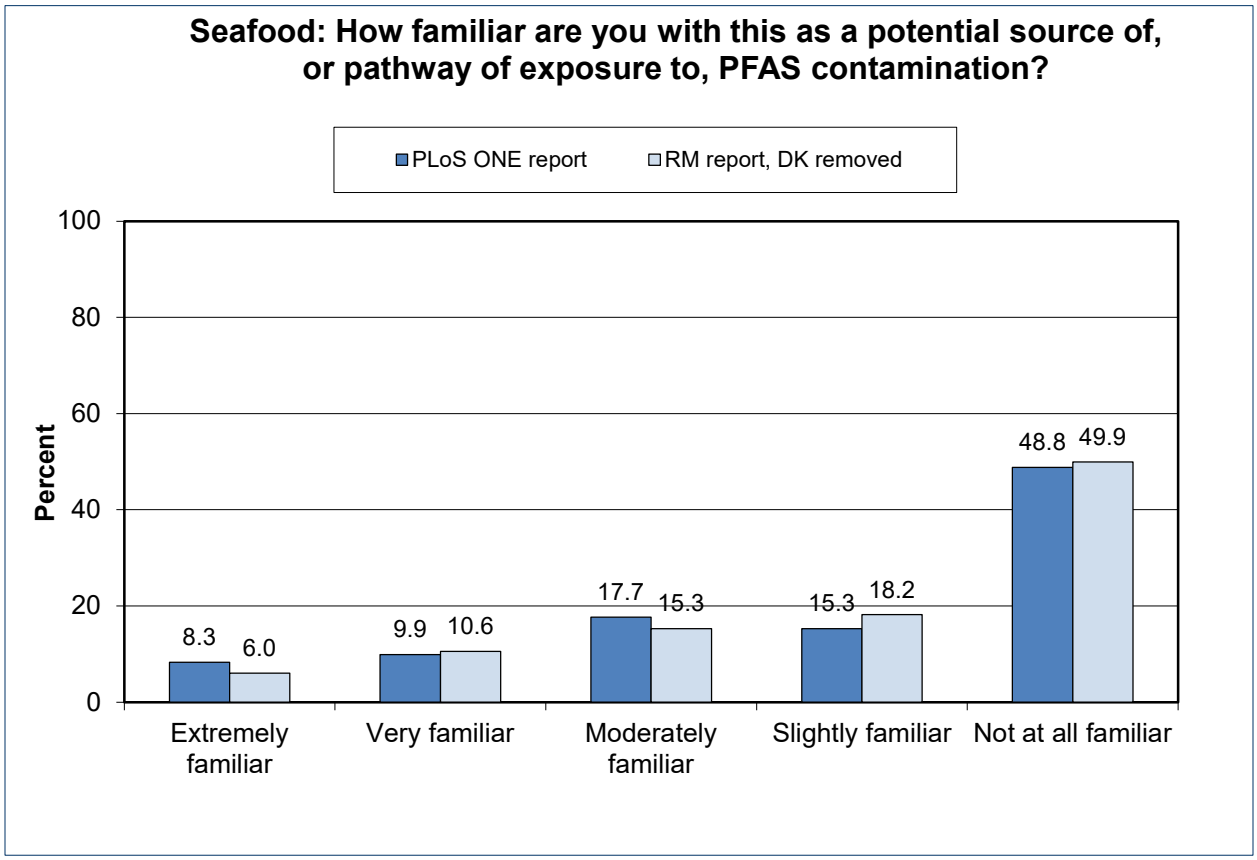

Fertilizers from wastewater treatment plants: How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?
PLoS ONE report
RM report, DK removed
Percent
100
80
60
40
20
0
8.1
7.4
11.9
9.3
17.0
19.6
17.2
17.7
45.9
46.1
Extremely familiar
Very familiar
Moderately familiar
Slightly familiar
Not at all familiar



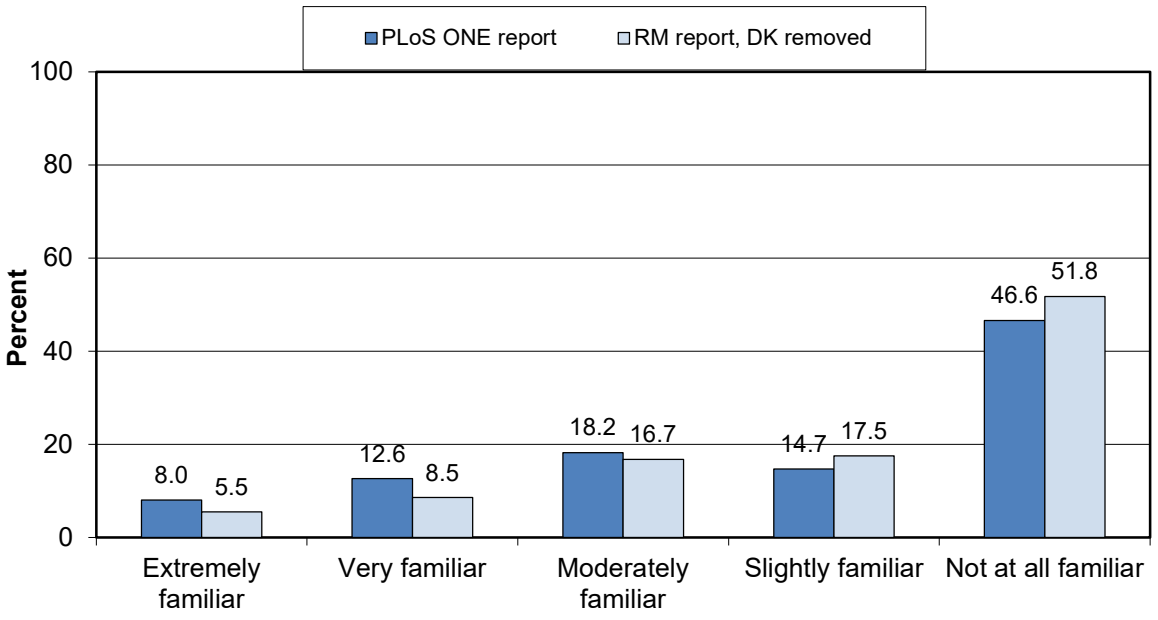
Note: the survey reported in the PLoS ONE report used the wording, "household products."



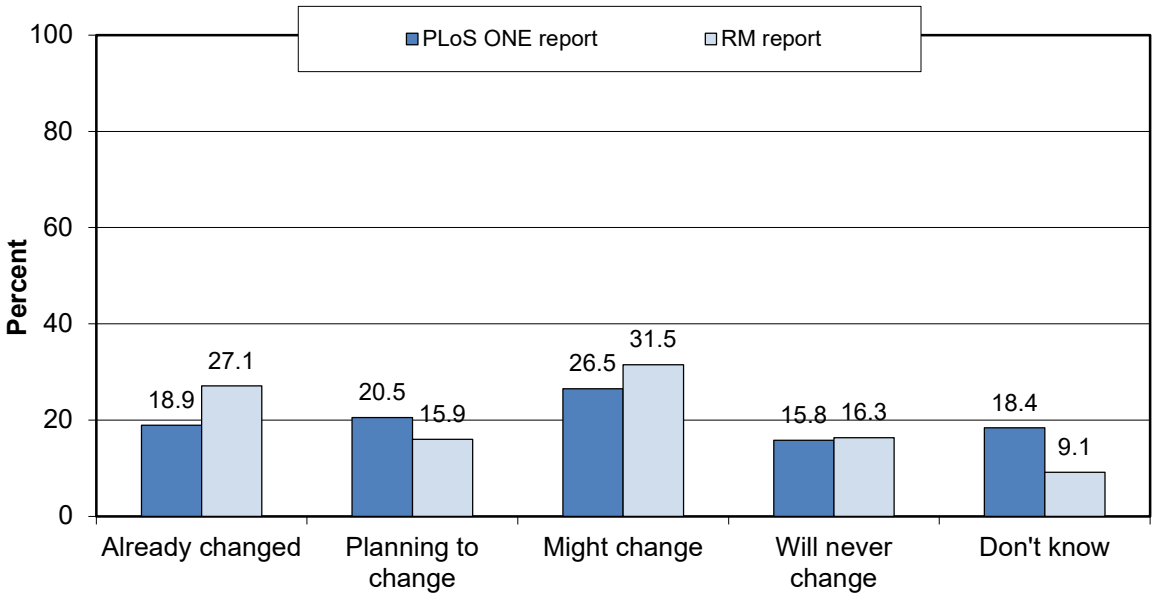

Food packaging: How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?
PLoS ONE report
RM report, DK removed
Percent
100
80
60
40
20
0
7.0
6.0
11.8
11.9
16.9
19.1
16.2
14.9
48.1
48.2
Extremely familiar
Very familiar
Moderately familiar
Slightly familiar
Not at all familiar


Seafood: How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?
PLoS ONE report
RM report, DK removed
Percent
100
80
60
40
20
0
8.3
6.0
9.9
10.6
17.7
15.3
15.3
18.2
48.8
49.9
Extremely familiar
Very familiar
Moderately familiar
Slightly familiar
Not at all familiar

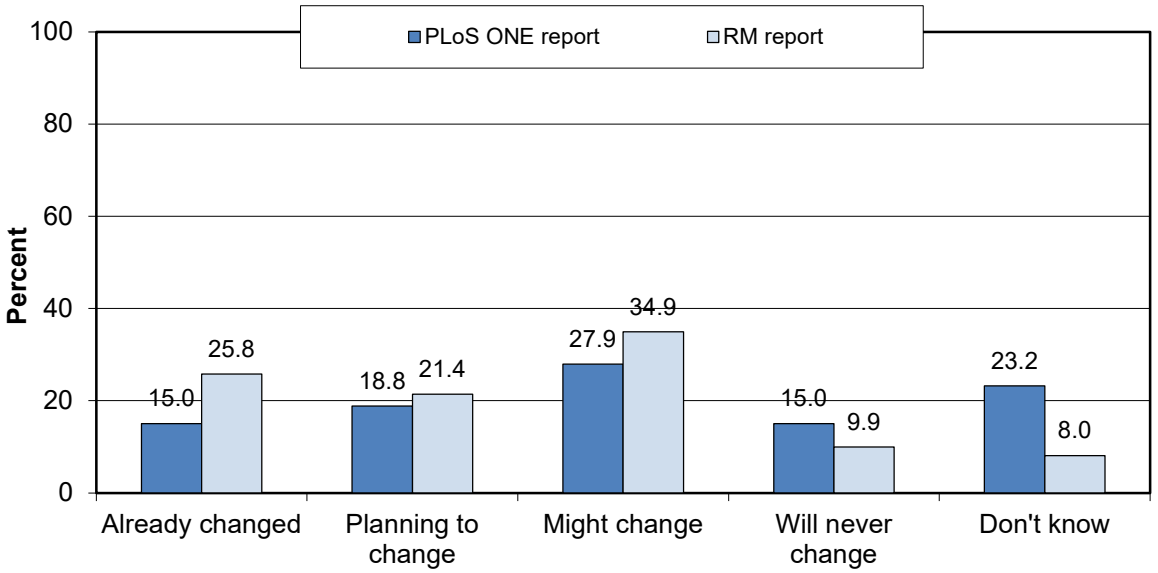
Personal hygiene products: How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?



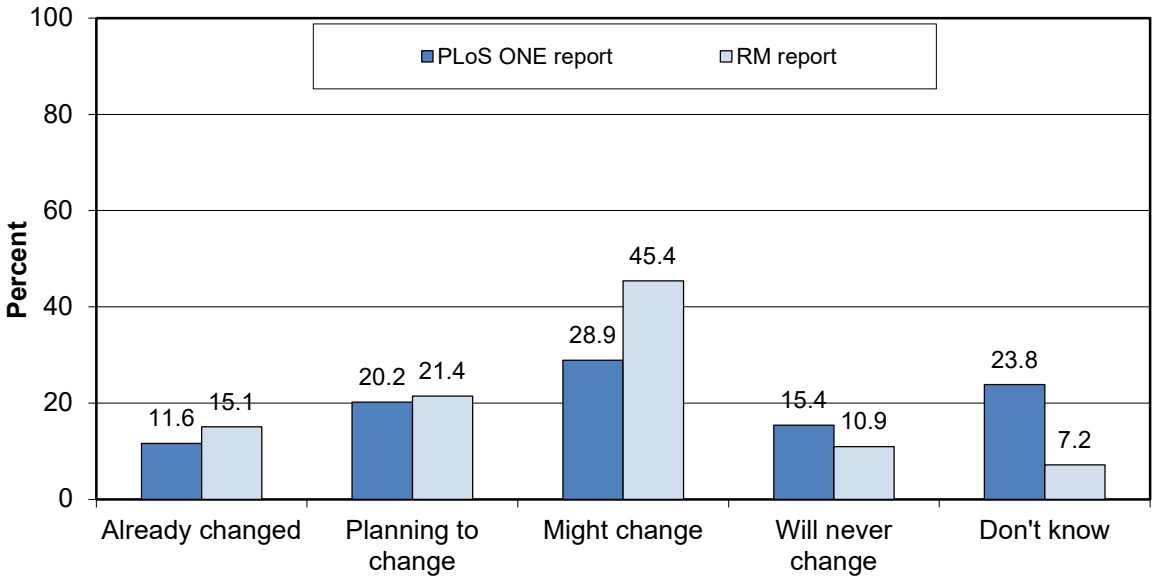
For each product, please tell me if you have already changed, are planning to change, might change, or will never change your use of that product due to concern about PFAS: your drinking water.



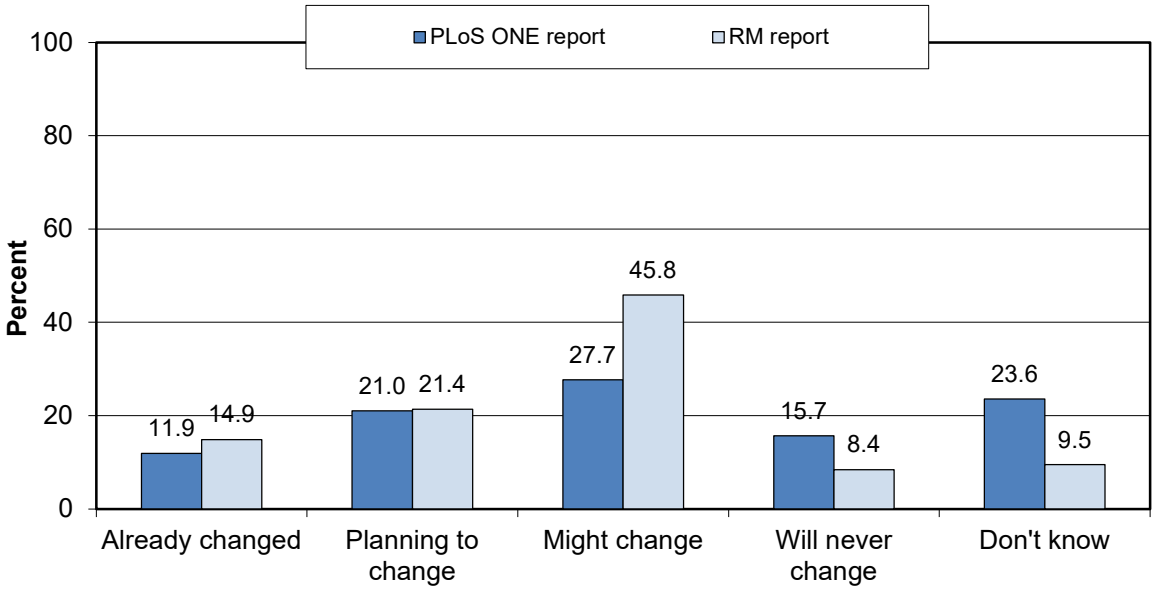
For each product, please tell me if you have already changed, are planning to change, might change, or will never change your use of that product due to concern about PFAS: non-stick cookware.



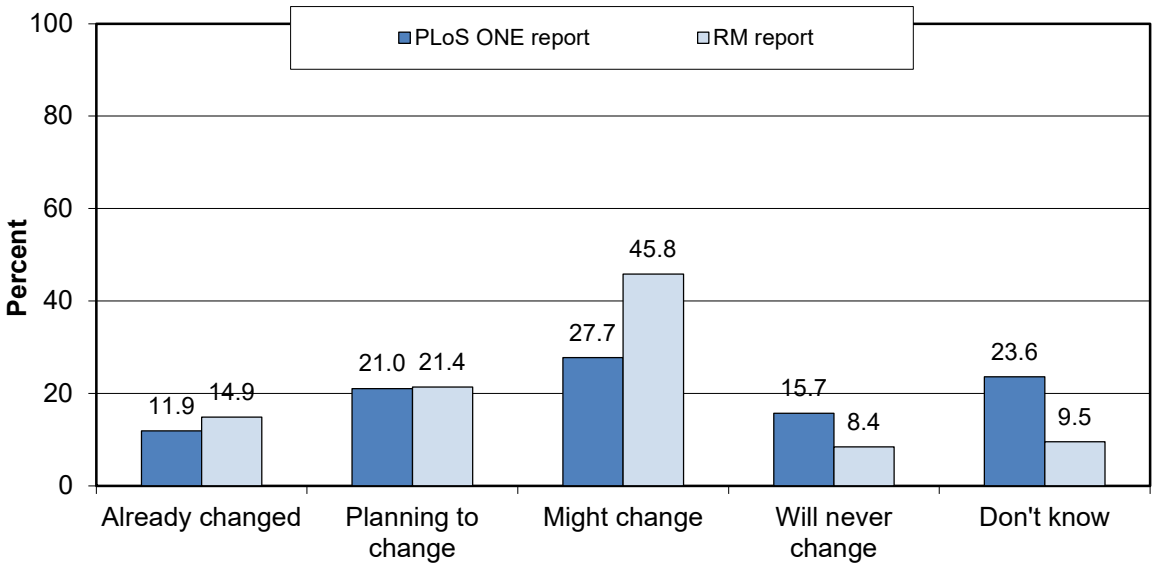
For each product, please tell me if you have already changed, are planning to change, might change, or will never change your use of that product due to concern about PFAS: personal hygiene products.



For each product, please tell me if you have already changed, are planning to change, might change, or will never change your use of that product due to concern about PFAS: food packaging.



For each product, please tell me if you have already changed, are planning to change, might change, or will never change your use of that product due to concern about PFAS: household cleaning products.



Note: the survey reported in the PLoS ONE report used the wording, "household products."

APPENDIX A: SURVEY QUESTIONNAIRE

This survey is being conducted by Responsive Management on behalf of the Delaware Department of Natural Resources and Environmental Control (DNREC). The Department is conducting this study to ask Delaware residents about water resources and environmental issues in the state.

This study is for research purposes only. You do not need to be knowledgeable about any specific topics or engage in any specific activities to participate in the study. The survey will take approximately 5 to 10 minutes.

Your responses will be kept strictly confidential and will not be associated with your name or contact information in any way.

Screeners

Are you at least 18 years old? [MUST BE AT LEAST 18 TO CONTINUE]

Do you currently live in Delaware? [MUST BE YES TO CONTINUE]

What county do you live in?

( ) New Castle
( ) Kent
( ) Sussex
( ) Don't know

Awareness and Knowledge of PFAS

First, how would you describe your knowledge of PFAS?
Prior to this survey, would you say…?

( ) I've never heard of it and don't know what it is
( ) I've heard of it but don't know what it is
( ) I think I know what it is
( ) I'm confident I know what it is
( ) Don't know

Awareness and Concern About PFAS Locally - Community

To your knowledge, has your community been exposed to PFAS?

( ) Yes
( ) No
( ) Don't know

To what extent has your community been exposed to PFAS?

( ) A great deal
( ) A moderate amount
( ) A little
( ) Not at all
( ) Don't know

Awareness and Concern About PFAS Locally - Drinking Water

To your knowledge, has your primary source of drinking water been impacted by PFAS?

( ) Yes
( ) No
( ) Don't know

Thinking about the water that comes out of your faucet or tap in your home…
How concerned are you about PFAS being in your drinking water?

( ) Extremely concerned
( ) Very concerned
( ) Moderately concerned
( ) Slightly concerned
( ) Not at all concerned
( ) Don't know

Sources of Information on PFAS

[IF HEARD ABOUT PFAS]
Earlier, you said you have heard of, or know about, PFAS.
Where have you seen or heard about PFAS?

_____

Informational Sources - Community Meetings and Social Media

[IF HEARD ABOUT PFAS]
In the past 12 months, have you attended a community meeting or a town hall meeting that discussed or provided information about PFAS?

( ) Yes
( ) No
( ) Don't know

[IF HEARD ABOUT PFAS]
In the past 12 months, have you seen any social media posts about PFAS?

( ) Yes
( ) No
( ) Don't know

[IF SAW A SOCIAL MEDIA POST]
Were any of the social media posts you saw specifically about PFAS in DELAWARE?
( ) Yes
( ) No
( ) Don't know

Familiarity With Sources of and Pathways to Exposure to PFAS

How familiar are you with each of the following as a potential source of, or pathway of exposure to, PFAS contamination?

Drinking water
(How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?)
( ) Extremely familiar
( ) Very familiar
( ) Moderately familiar
( ) Slightly familiar
( ) Not at all familiar
( ) Don't know

Food packaging
(How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?)
( ) Extremely familiar

( ) Very familiar
( ) Moderately familiar
( ) Slightly familiar
( ) Not at all familiar
( ) Don't know

Non-stick cookware
(How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?)
( ) Extremely familiar
( ) Very familiar
( ) Moderately familiar
( ) Slightly familiar
( ) Not at all familiar
( ) Don't know

Freshwater fish
(How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?)
( ) Extremely familiar
( ) Very familiar
( ) Moderately familiar
( ) Slightly familiar
( ) Not at all familiar
( ) Don't know

Seafood
(How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?)
( ) Extremely familiar
( ) Very familiar
( ) Moderately familiar
( ) Slightly familiar
( ) Not at all familiar
( ) Don't know

Personal hygiene products
(How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?)
( ) Extremely familiar
( ) Very familiar
( ) Moderately familiar
( ) Slightly familiar

( ) Not at all familiar
( ) Don't know

Household cleaning products
(How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?)
( ) Extremely familiar
( ) Very familiar
( ) Moderately familiar
( ) Slightly familiar
( ) Not at all familiar
( ) Don't know

Fertilizers from wastewater treatment plants
(How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?)
( ) Extremely familiar
( ) Very familiar
( ) Moderately familiar
( ) Slightly familiar
( ) Not at all familiar
( ) Don't know

Firefighting foams or chemicals, used at airports and military bases
(How familiar are you with this as a potential source of, or pathway of exposure to, PFAS contamination?)
( ) Extremely familiar
( ) Very familiar
( ) Moderately familiar
( ) Slightly familiar
( ) Not at all familiar
( ) Don't know

Behavior Changes Related to Concern About PFAS

Next, we would like to tell you a little more about PFAS.

PFAS chemicals are a group of man-made chemicals, specifically per- and polyfluoroalkyl substances.

PFAS chemicals are used in a wide-range of products due to their ability to repel grease, water, and heat. Some products that may have PFAS include plastic food containers and packaging, nonstick cookware, soaps, cleaning products, fabrics, and more.

PFAS are sometimes referred to as “forever chemicals” because they are extremely resistant to breakdown in the environment and in living organisms including humans, raising concerns about potential health effects.

We would like to know if you have changed or would consider changing your use of any of the following products due to concern about PFAS contamination.

Changing your use can include not using the product at all, altering how you use the product to reduce PFAS exposure, OR switching to PFAS-free products when available, among other alternatives.

For each product, please indicate if you have already changed, are planning to change, might change, or will never change your use of that product due to concern about PFAS.

(What about…?)

Your drinking water source
(Please indicate if you have already changed, are planning to change, might change, or will never change your use of this due to concern about PFAS.)
(An example of change is installing filters for water as it enters the home.)
( ) Already changed
( ) Planning to change
( ) Might change
( ) Will never change
( ) Don't know

Food packaging
(Please indicate if you have already changed, are planning to change, might change, or will never change your use of this due to concern about PFAS.)

(An example of change is eliminating or reducing the use of plastic and disposable packaging.)
( ) Already changed
( ) Planning to change
( ) Might change
( ) Will never change
( ) Don't know

Non-stick cookware
(Please indicate if you have already changed, are planning to change, might change, or will never change your use of this due to concern about PFAS.)
(An example of change is not using non-stick cookware at all or replacing older cookware with PFAS-free options.)
( ) Already changed
( ) Planning to change
( ) Might change
( ) Will never change
( ) Don't know

Personal hygiene products
(Please indicate if you have already changed, are planning to change, might change, or will never change your use of this due to concern about PFAS.)
(An example of change is changing your soap, shampoo, or lotion to PFAS-free products.)
( ) Already changed
( ) Planning to change
( ) Might change
( ) Will never change
( ) Don't know

Household cleaning products
(Please indicate if you have already changed, are planning to change, might change, or will never change your use of this due to concern about PFAS.)
(An example of change is changing to PFAS-free cleaners.)
( ) Already changed
( ) Planning to change
( ) Might change
( ) Will never change
( ) Don't know

Behavior Changes Related to Concern About PFAS

Have you already changed, or are you planning to change, your use of any other products due to concern about PFAS contamination?

( ) Yes
( ) No
( ) Don't know

[IF CHANGED OR PLANNING TO CHANGE USE OF PRODUCTS]
What products have you ALREADY CHANGED your use of due to concern about PFAS?
_____

[IF CHANGED OR PLANNING TO CHANGE USE OF PRODUCTS]
What products are you PLANNING TO CHANGE your use of due to concern about PFAS?
_____

Preferred Sources of Information

Which THREE of the following SOURCES would you trust MOST to provide accurate information about PFAS in Delaware?
(check up to 3 answers)

[ ] Federal government agencies, such as the EPA or CDC
[ ] State government agencies, such as the Delaware Department of Natural Resources and Environmental Control (DNREC) or Delaware Health and Social Services (DHSS)
[ ] Local government officials, such as your mayor or advisory council
[ ] Environmental organizations or groups
[ ] Health professionals, such as doctors and nurses
[ ] Universities or scientists
[ ] News media outlets, including television, radio, newspaper, or online news sources
[ ] Social media influencers
[ ] Friends and family members
[ ] Your water utility company or provider
[ ] None of these
[ ] Don't know

Are there any other sources not on the list that you would TRUST most to provide accurate information about PFAS in Delaware?
(If yes, what are they?)

( ) Yes *(please specify)*:: _____
( ) No
( ) Don't know

Preferred Formats

Which of the following FORMATS would you MOST PREFER for receiving information about PFAS?
(check all that apply)

[ ] Short videos or reels
[ ] Infographics or visual guides
[ ] Fact sheets or brochures
[ ] Social media posts
[ ] Newsletters or emails
[ ] Virtual community meetings, events, or town halls
[ ] In-person community meetings, events, or town halls
[ ] Virtual community meetings, events, or town halls
[ ] Articles on websites
[ ] Podcasts or webinars
[ ] None of these
[ ] Don't know

Are there any other formats not on the list that you would most PREFER for receiving information about PFAS in Delaware?
(If yes, what are they?)

( ) Yes *(please specify)*:: _____
( ) No
( ) Don't know

Best Way to Share Information

Thinking specifically about DNREC, which ONE of the following is the best way for DNREC to share important environmental health information with you?
(check only 1 answer)

( ) Delaware's PFAS informational website (www.de.gov/pfas)
( ) *Outdoor Delaware* online magazine
( ) DNREC or state government website in general
( ) DNREC on social media
( ) Email newsletters
( ) News media, such as TV, radio, or newspapers
( ) In-person community meetings or events
( ) Virtual community meetings or events
( ) None of these
( ) Don't know

Are there any other EFFECTIVE ways in which DNREC could share important environmental health information with you?
(If yes, what are they?)

( ) Yes *(please specify)*:: _____
( ) No
( ) Don't know

Demographics

Great, the survey is almost finished. The final questions are for background information and help us analyze the results.

What is your zip code?
(Enter 99999 if you do not know.)

_____

Do you consider your place of residence to be a...?

( ) Large city or urban area
( ) Suburban area
( ) Small city or town
( ) Rural area
( ) Don't know
( ) Prefer not to say

Do you currently have any children, age 17 or younger, living in your household?

( ) Yes
( ) No
( ) Don't know
( ) Prefer not to say

Water Source

Do you, or does anyone else such as a landlord, receive or pay a water bill for your current residence?

( ) Yes, a bill is paid for water at current residence
( ) No, there is no bill for water at current residence (e.g., water supply is a private well or cistern)
( ) Don't know
( ) Prefer not to say

[IF A BILL IS PAID, DON'T KNOW, OR PREFER NOT TO SAY]
Which water system provides water at your current residence?
_____

What is your primary source of DRINKING water in your home?

( ) Public, town, or municipal water utility
( ) Private well or cistern
( ) Bottled water
( ) Other *(please specify)*:: _____
( ) Don't know
( ) Prefer not to say

[IF ON UTILITY OR PRIVATE WELL OR CISTERN]
Do you filter this water before drinking?
( ) Yes
( ) No
( ) Don't know
( ) Prefer not to say

[IF FILTERS WATER BEFORE DRINKING]
What type of filter or filter system do you use on your drinking water?
_____

Demographics (cont.)

What is the highest level of education you have completed?

( ) Not a high school graduate
( ) High school graduate or equivalent
( ) Some college or trade school, no degree
( ) Associate degree or trade school degree
( ) Bachelor's degree
( ) Master's degree
( ) Professional or doctorate degree (e.g., M.D. or Ph.D.)
( ) Don't know
( ) Prefer not to say

What races or ethnic backgrounds do you consider yourself?
(check all that apply)

[ ] White or Caucasian
[ ] Black or African American
[ ] Hispanic or Latino
[ ] Native American or Alaskan Native or Aleutian
[ ] Native Hawaiian or Pacific Islander
[ ] Middle Eastern / North African
[ ] Sub-Saharan African
[ ] East Asian (from Japan, China, Korea, Philippines, etc.)
[ ] South Asian (from India, Pakistan, Bangladesh, etc.)
[ ] Other (ENTER OTHER):: _____
[ ] Don't know
[ ] Refused

Thinking about your entire household, which of these categories best describes your total household income before taxes last year?

( ) Under $20,000
( ) $20,000-$39,999
( ) $40,000-$59,999
( ) $60,000-$79,999
( ) $80,000-$99,999
( ) $100,000-$119,999
( ) $120,000 or more
( ) Don't know
( ) Prefer not to say

What is your age?*
(Enter 999 if you do not know.)

_____

What is your gender?

( ) Male
( ) Female
( ) Nonbinary
( ) Prefer to self-describe:: _____
( ) Prefer not to say

Interest in Receiving Information

Thank you for your input; that is the end of the survey.

Are you interested in receiving email information and updates from DNREC about PFAS and environmental issues in Delaware?
(We only need an email address and no other information. Your email address will never be sold and will only be used by DNREC.)

( ) Yes
( ) No
( ) Don't know

[IF INTERESTED IN RECEIVING INFORMATION]
What is the best email address to contact you?

_____

Additional Comments

Thank you very much for your time and participation. We appreciate your input, which is extremely valuable and will help DNREC improve public information efforts related to PFAS in Delaware.

For more information about PFAS and DNREC's ongoing work, please visit de.gov/pfas.

If you have any additional comments or suggestions about PFAS or how DNREC can better communicate about PFAS, you may share them below:

_____

APPENDIX B: OPEN-ENDED RESPONSES

The following tables show open-ended responses listing the water utility systems used and the filters or filter systems used, among those to whom the questions apply. Top responses are shown at the top of each table in bold, but otherwise the results are in random order. Attempts were made to show recurring responses only once, with the frequency of the responses noted in parentheses. Minor edits were made for consistency of presentation and to correct obvious errors, but otherwise the responses are verbatim.

Which water system provides water at your current residence? (Asked of those who pay or receive a regular bill for service.)
Don't know (123 responses)
Artesian Water Company (110 responses)
Tidewater Utilities (89 responses)
Progressive
Rain soft
Middlesex Water (4 responses)
Apartment, community water
Chesapeake
Deolia
City of Dover (31 responses)
City of Milford (19 responses)
Long Neck Water (8 responses)
Exelon (2 responses)
Culligan
City of Newark (7 responses)
Condo association
City water Lewis tide water community
Del utility
City of Georgetown
Deer Park
Veolia Water (25 responses)
Greenwood electric company
PWS
City of Lisford
County (nonspecific) (2 responses)
Hvc
Suez Water (4 responses)
City of Wilmington (46 responses)
City of Harrington (4 responses)
City (nonspecific) (40 responses)

Which water system provides water at your current residence? (Asked of those who pay or receive a regular bill for service.)
Lewis Public Works (3 responses)
Visio
Del-Co Water Co Inc (2 responses)
Sussex County Water System (5 responses)
Hvi
Brandywine Creek
Southern shores
American water
Delaware American Water (15 responses)
Doesn't know - landlord pays the bill (5 responses)
Department of Public Works (nonspecific) (2 responses)
Delmarva Water Solutions (39 responses)
Kent County Parks and Rec
City/well
Group home
DNREC (3 responses)
A bill is paid for water at current residence (if you get municipal/town water).
Aqua
Arction private
Aetna
City of Smyrna (3 responses)
City of Rehobeth (4 responses0
City of Seaford (5 responses)
Can't think
Camden Water (7 responses)
Selbyville
Brita
Tespeack Utility
Subco
Millsboro Water
Millstown CT
Psg
Aqua Flow
State water company (2 responses)
New Castle
The Felton water system

What type of filter or filter system do you use on your drinking water? (Asked of those who filter their water.)
Brita pitcher/filter (85 responses)
Refrigerator filter/built in (81 responses)
Don't know (35 responses)
Whole home and in refrigerator
3M Aqua-Pure AP904
It's on on the tab
A basic Walmart filter
Whole house filter and PH increaser
Zoowave in viro (like a Brita)
Target
Water conditioners and GE profile refrigerator with water filter system
Full house system and reverse osmosis and kangin
Well filter and Brita filter
Aquasana
On the pipe coming in from the well
I use a filter in my fridge.
Activated carbon filter pitcher and faucet-mounted filter system
I have a whole house filter and water softener and a second multistage filter on the sink
Pitcher filter (nonspecific) (6 responses)
House filter frig
We have a salt filtration system.
Brita and rainsoft
5 micron whole house water filter w/conditioning system
Cartridge on main line
A salt chlorine filtration system
Fridge faucet
Detached to faucet
High pass filters
Culligan entire home system and Brita water pitcher (2 responses)
Whole house salt based water system
Sharp water
Powder and salt fitler and separate drinking filter
Septic system
Delmarva water solutions
In line carbon filter/ fridge
Filter under sink
Salt filter (7 responses)
Heavy particle filter with a bridge, and Brita

What type of filter or filter system do you use on your drinking water? (Asked of those who filter their water.)
Becca filter
Gkoi
Pureit
SharpFilter system
Basic Walter filter system probably gravel or mesh based
Pur filter and a water softener
Brestil
Automated filter
Sediment
Pur (17 responses)
Whole home filter (8 responses)
Brita filter jug and refrig filter
Sharkwater
I use a refrigerator filter and under sink reverse osmosis.
Whole house water something system. At the tap professional grade restaurant system
Stand alone system
Activated carbon filter (15 responses)
Under sink filter (4 responses)
Jug filters
I dont know it is built in the faucet.
Epic
Rain soft
One that it's made by barro
Refrigerator filter and brita filters
Highest level reverse osmosis system
Burkey water system
Electric filter (6 responses)
Not sure...whole house filter system
Water softener/refrigerator
EcoWater system
Amazon filter
Nuvo
One that hooks on the spigot
Frigidaire refrigerator
Pump
Basement installed water filter and faucet purifier
Duel Media System
Whirlpool #1
Turatur filters

What type of filter or filter system do you use on your drinking water? (Asked of those who filter their water.)
Filter on pump
I use a pure water filter attachment on the faucet that I run into a blue view robot system
A pitcher filter with activeted carbon
Not sure, reverse osmosis
Have a water softener and filtration system
Alexapure
Water Conditioner
Water softener/reverse osmosis
Culligan (10 responses)
Hooked to the cold water
Water softener (4 responses)
2 stage
General Electric top of the line
5 stage osmosis and charcoal.
Water Purifier pro
System
Water softener and cartridge under sink
Amazon basics
Dirt & sediment
I have a water softener and a reverse osmosis
Pour in bottle filter
Whole house water softener and filter behind the refrigerator and one in the refrigerator and one co
Cartridge
In house water filter
Distillation Units (2 responses)
Brita on the spout
Pure source
Full house system and Brita
Under the sink and entire house filter
General electric
Rainsoft and sink faucet filter
Faucet filter (6 responses)
AquaTru Countertop Reverse Osmosis System
Filter (nonspecific) (9 responses)
Reverse osmosis (25 responses)
Basic filter
A softener

What type of filter or filter system do you use on your drinking water? (Asked of those who filter their water.)
Charcoal followed by reverse osmosis (2 responses)
Rope type cartridge whole house
Home Depot
Water purifiers
Rain Soft -- RO -- system
Percola
Attachment to faucet.
Clear filter by LG
Filter cylinder and water jug with filter
Whole house and Pur
House-wide water filter
Whole house filtration system with activated carbon and reverse osmosis.
Dispenser
A filter from the refrigerator.
Zero Water (4 responses)
Hepa
House filter hooked where well comes in
Installed under sink and main line downstairs - ionizing?
Installed a water filter on kitchen sink also there is one on the refrigerator
I use a pitcher-style water filter and an under-sink activated carbon filter.
Added sink faucet with filter system under sink
Brita filter for water pitcher and Culligan entire home

ABOUT RESPONSIVE MANAGEMENT

Responsive Management is an internationally recognized survey research firm specializing in natural resource and outdoor recreation issues. Our mission is to help natural resource and outdoor recreation agencies, businesses, and organizations better understand and work with their constituents, customers, and the public.

Focusing only on natural resource and outdoor recreation issues, over the past 35 years, Responsive Management has conducted multimodal, telephone, mail, and online surveys, as well as on-site intercepts, focus groups, public meetings, personal interviews, needs assessments, program evaluations, marketing and communication plans, and other forms of human dimensions research measuring how people relate to the natural world. Utilizing our in-house, full-service survey facilities with 75 professional interviewers, we have conducted studies in all 50 states and 15 countries worldwide, totaling more than 1,200 human dimensions projects *only* on natural resource and outdoor recreation issues.

Responsive Management has conducted research for every state fish and wildlife agency and every federal natural resource agency, including the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, the National Park Service, the U.S. Forest Service, the Bureau of Land Management, the U.S. Army Corps of Engineers, and the U.S. Coast Guard. Additionally, we have also provided research for all the major conservation NGOs including the Archery Trade Association, the American Sportfishing Association, the Association of Fish and Wildlife Agencies, the Hunters' Leadership Forum, Ducks Unlimited, the Izaak Walton League of America, the National Shooting Sports Foundation, the National Wildlife Federation, the Recreational Boating and Fishing Foundation, the Rocky Mountain Elk Foundation, Safari Club International, the Sierra Club, Trout Unlimited, and the Wildlife Management Institute.

Other nonprofit and NGO clients include the American Museum of Natural History, the BoatUS Foundation, the National Association of Conservation Law Enforcement Chiefs, the National Association of State Boating Law Administrators, and the Ocean Conservancy. As well, Responsive Management conducts market research and product testing for numerous outdoor recreation manufacturers and industry leaders, such as Winchester Ammunition, Vista Outdoor (whose brands include Federal Premium, CamelBak, Bushnell, Primos, and more), Trijicon, Yamaha, and others.

Responsive Management also provides data collection for the nation's top universities, including Auburn University; Boise State University; California Polytechnic State University, San Luis Obispo; Clemson University; Colorado State University; Cornell University; Duke University; George Mason University; Michigan State University; Mississippi State University; North Carolina State University; Oregon State University; Penn State University; Rutgers University; Stanford University; State University of New York; Stony Brook University; Texas Tech; University of Alaska; University of California-Davis; University of California-San Diego; University of Connecticut; University of Florida; University of Hawai'i; University of Montana; University of New Hampshire; University of Southern California; Virginia Commonwealth University; Virginia Tech; West Virginia University; Yale University; and many more.

Our research has been upheld in U.S. Courts, used in peer-reviewed journals, and presented at major wildlife and natural resource conferences around the world. Responsive Management's research has also been featured in many of the nation's top media, including *Newsweek*, *The Wall Street Journal*, *The New York Times*, Fox News, CNN, National Public Radio, and on the front pages of *The Washington Post* and *USA Today*.

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