

# Children's Questions, Worries, and Information Needs A Year Into the COVID-19 Pandemic

*A study based on listeners of the children's science podcast*

  
**brains on!**



Vaccine drawing submitted by a Brains On! child listener

## FULL REPORT

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## OVERVIEW

Over the course of the COVID-19 pandemic, families have been seeking trusted and engaging sources of scientific information to help their children understand prevention, transmission, treatment, and many other topics related to COVID-19 in an effort to ease children's fears. The goal of our NSF-funded RAPID research study is to understand how children's science podcasts, as well as other educational products, can provide families with information to help ease children's fears and worries during a pandemic by increasing children's understanding of pandemic-related science concepts, answering their pandemic-related questions, and supporting pandemic-related family conversations. The following questions guide our research:

1. How and to what extent do Brains On!'s coronavirus-based episodes help children and their families understand and talk about science-related pandemic topics? What kind of conversations are sparked by these episodes?
2. What kinds of worries and questions do Brains On! listeners have about coronavirus and related aspects of the pandemic? How do children's worries and questions change over the course of the pandemic?
3. What resources do caregivers need to answer children's questions and help them understand science topics related to the pandemic?

This research builds on previous studies we have done of the children's science podcast Brains On! (see <http://bit.ly/BrainsOnResearch> for previous studies). We drew on Brains On!'s listeners as our research sample for this study. Brains On! has a global listening audience and primarily reaches children ages 5 to 12 (Grack Nelson, Dominguez, & Van Cleave, 2019).

The findings in this report are focused on Research Questions 2 and 3. This report compliments and at times builds on what we learned at the beginning of the pandemic in relation to these research questions. Results from the survey we administered in June 2020 can be found in two additional reports (Grack Nelson et al., 2020; Grack Nelson et al., 2021).

We as researchers are living through the pandemic as well, and we acknowledge that our findings may be influenced by our own experiences, even as we have used many strategies to check interpretations, with others beyond the immediate research team. However, taken together, we believe that these findings provide a snapshot of children and families' experiences and questions a year into the COVID-19 pandemic. We hope these findings and prior results of our research can inform the development of coronavirus-related educational resources responsive to the science information and learning needs of families during the COVID-19 pandemic, as well as help create educational resources that are adaptable to future global crises.

## METHODOLOGY

### Online Survey

An online survey was conducted with caregivers of children ages 5 to 12 years old who listen to the children's podcast Brains On!. (Note: We use the terms "adult" and "caregiver" throughout this report to refer to the parents and/or guardians of Brains On! listeners). The online survey was administered January 11–25, 2021.

## Think-aloud Interviews

The survey was tested with groups of adult and child listeners before it was widely administered to ensure the questions gathered reliable and valid data. We tested the survey using think-aloud interviews. Think-aloud interviews allowed us to ascertain how well people understood the survey questions and if they were interpreting the questions as intended. During a think-aloud interview, the person reads the survey out loud and verbalizes how they are thinking through their response to the question. During the interview, one of the caregivers completed the survey out loud while asking for input from family members. Interviews were conducted over the video-conferencing software, Zoom. Think-aloud results were used to revise question wording and inform response options. The sample for the think-aloud interviews were families in the United States with 5- to 12-year-old children who had listened to Brains On!. We had 53 families interested which allowed us to sample in a way that ensured we tested the survey with families that had children of different ages and may have had varying experiences with the pandemic in different areas of the country. If families had multiple children ages 5 to 12 who had listened to Brains On!, all children were invited to participate in the think-aloud interview with the caregiver to gather a wider range of responses to test out the survey questions. A total of 11 families, which included 19 children, participated in think-aloud interviews. Families were provided with a \$25 pre-paid Visa card in appreciation for their time.

## Survey Sample

### Recruitment

A challenge faced when gathering data from podcast audiences is that we don't know who comprises the population of podcast listeners, so we don't have a list of listeners we can recruit survey respondents from. Since we don't know who listens to Brains On!, we used multiple methods to try to recruit as many listeners as possible. At the beginning of our research study in May 2020, we started to recruit listeners to participate in the two surveys we administered as part of the research. A webpage, [www.brainson.org/research](http://www.brainson.org/research), was created where adults (ages 18 and above) with children ages 5 to 12 in the household who listened to Brains On! could sign up to participate. Before the first survey, invitations to sign up were added to current and past Brains On! episodes, information was posted on Brains On! social media (Twitter, Facebook, Instagram), included in the Brains On! newsletter, and posted on the Brains On! website. As findings were disseminated from the first survey, an invitation for families to sign up on the research website to participate in a future survey was included. For the second survey, Brains On! posted invitations to participate on their social media. We emailed the survey directly to the 1,011 people that signed up to participate in the research through our [www.brainson.org/research](http://www.brainson.org/research) webpage. Brains On! also sent direct email invitations to 3,210 families that had previously submitted something to Brains On! (a question, mystery sound, show topic idea, drawing, etc.) to invite them to participate in the survey. Upon completion of the survey, people could download free Brains On! activity pages that were only available to survey respondents.

### Sample Characteristics

A total of 537 caregivers of 5- to 12-year-old Brains On! listeners responded to the survey. Caregivers were asked to complete the survey based on only one child listener in their household between the age of 5 to 12. If they had multiple 5- to 12-year-olds in their household that had listened to Brains On!, they were told to answer the survey questions based on the child whose birth day and month was

closest to the date they were taking the survey. This was done in an effort to decrease bias in the survey sample.

It is important to understand the characteristics of the sample for this study and keep this in mind when looking at these survey results, as well as pay attention to who is not adequately represented in this sample. As previously mentioned, the sample are children and their families who listen to the Brains On! podcast. This sample of listeners has the following characteristics (see Appendix A for full demographic details about the sample).

- The children represented in the sample are mostly 6- to 10-year-olds (79%).
- The sample is composed of more male children (53%) than female children (46%) or children who preferred to self-describe their gender identity (2%).
- The sample lacks racial/ethnic diversity with 79% of 5- to 12-year-old listeners identifying (by their caregiver) as white only.
- Most children (89%) in the sample are from the United States. The survey was open to all Brains On! listeners, which includes listeners from around the world.
- Over half (53%) of children in the sample had experienced school in a remote only format between September 2020 and mid-January 2021.
- Close to two-thirds (65%) of children in the sample come from highly-educated households with at least one person in the household holding a graduate or professional degree.
- A majority of households (64%) in the sample have a pre-pandemic annual household income of \$100,000 or more (which is more affluent than the average U.S. household) (Fontenot, Semega, & Kollar, 2018).
- A little over half of households in the sample (53%) had at least one adult with a job in a science, technology, engineering, math, and/or medical/health sciences field.
- The adult filling out the survey tended to be female (88%), between the ages of 30 and 49 (95%), and identify as white only (87%). It is important to note that the survey was sent to the email address of the adult who signed up for the study. We didn't ask respondents to randomly choose an adult from the household to complete the survey.

## Sample Limitations

Even though we have an adequate sample size, one thing to keep in mind is we don't know if this sample is representative of all Brains On! listening households since we don't have a list of the population of listeners we can randomly sample from. Instead, the sample is based on people who saw or heard the recruitment information and chose to sign up to participate in the survey. We recognize this type of sampling brings with it some coverage error because the sample will be people who feel compelled to reach out to participate in the study and complete the survey.

This sample is also not representative of all children ages 5 to 12 and their families in the United States or globally, nor was it meant to be. This RAPID study took advantage of a large, pre-existing audience of children and families already seeking out educational information from a particular informal science education resource in an effort to not only learn more about Brains On! and similar kinds of children's science podcasts, but to use it as an opportunity to gain some insight into children and caregivers' pandemic experiences and education needs. However, even with the general insights we gained, we recognize this sample tends to be reflective of the experiences of white identifying, high income, and highly educated families which means the experiences and voices from populations of children and

families that have been most affected by the pandemic in terms of economic and racial disparities are not adequately represented in our study. This is a major limitation of our survey sample and we hope that other researchers will build on these findings and work to fill in the gaps of our sample and knowledge.

## **Survey Context**

Data were gathered for this survey during a particular period of the COVID-19 pandemic. It is important to understand what was happening in the United States, and world, during this time to put these survey findings into context.

January 2021 marked a year into the global pandemic, with much more known about coronavirus transmission and preventative measures, as well as the emergence of new treatment options. Even so, by the end of 2020, guidance about and resistance to preventative measures continued to differ across the United States, and people were experiencing “COVID fatigue” in different ways, including impatience with social distancing measures and mental health impacts because of the isolation, compounded by the fact that the case and death rates of coronavirus had reached all-time highs. For some children and families, there were chronic stressors, such as a decline in household incomes, particularly among low-middle income groups, and existing health and educational disparities across racial and economic groups were exacerbated by the pandemic. Across the country, there was variation in how children and families were experiencing school. There were simultaneous concerns about teacher and administrator safety, as well as concern that schools needed to re-open so that the public education system could address the negative impacts of remote schooling, limited access to the technology needed for virtual learning, and social isolation on children’s learning. Finally, in the days leading up to when the Brains On! survey opened, the highly politicized insurrection at the United States Capitol occurred on January 6, bringing more societal unrest into public discourse.

Vaccine development and deployment was a key part of the public discourse in the last few months of 2020. Never before had humanity developed a vaccine so quickly, and unfortunately, during the U.S. presidential election, the rapid development of coronavirus vaccines was politicized, sowing mistrust by some in their safety. Thus, solutions to the public health crisis in the U.S., such as support for pandemic relief, vaccines, and employing preventative measures, had become a matter of politics and the nature of science questioned. After the Moderna and Pfizer vaccines were approved in the U.S., healthcare professionals, certain frontline workers, and other key people (e.g. Presidents) started to receive the vaccine in public ways. However, there was no consistent or transparent timeline of vaccinations across different groups in the U.S., and no vaccine trials for children underway globally. Additionally, vaccine distribution was much slower than what had been promised by the U.S. administration. Adding to these uncertainties, we still don’t know if widespread vaccinations mean things will be able to go back to “normal,” because scientists don’t know yet if those who are vaccinated are likely to transmit the virus to others. It has been a year that started with uncertainty and ended with it as well.



## RESULTS AND DISCUSSION

### Children’s Questions Related to the COVID-19 Pandemic

Brains On! encourages children to be curious and ask questions of the world around them, submit their questions to the show, and then uses children’s questions to inform the development of their episodes. In late 2020, children had not submitted many pandemic-specific questions to Brains On! so there were not enough to analyze to be able to understand what questions children had at that point of the pandemic (as we were able to do for our study in June 2020). Instead, we decided to ask caregivers as part the survey what questions their child currently had about the COVID-19 pandemic. Of the 537 respondents, close to two-thirds (62%) provided a question or multiple questions from their child. The rest of the caregivers either said their child didn’t currently have any questions (29%) or they left the survey question blank (9%).

In January 2021, children had a wide range of questions about the COVID-19 pandemic. Children’s questions were coded into one or more themes based on themes we developed from our first round of question analysis in June 2020 as well as additional themes that emerged from the new survey data. As illustrated in Figure 1, children’s questions spanned a wide range of topic areas. The most frequently asked questions were related to uncertainty around the length of the pandemic, vaccines, and preventative measures. See below for discussions of these question topics and see Appendix B for sample questions children have for each of these topic areas.

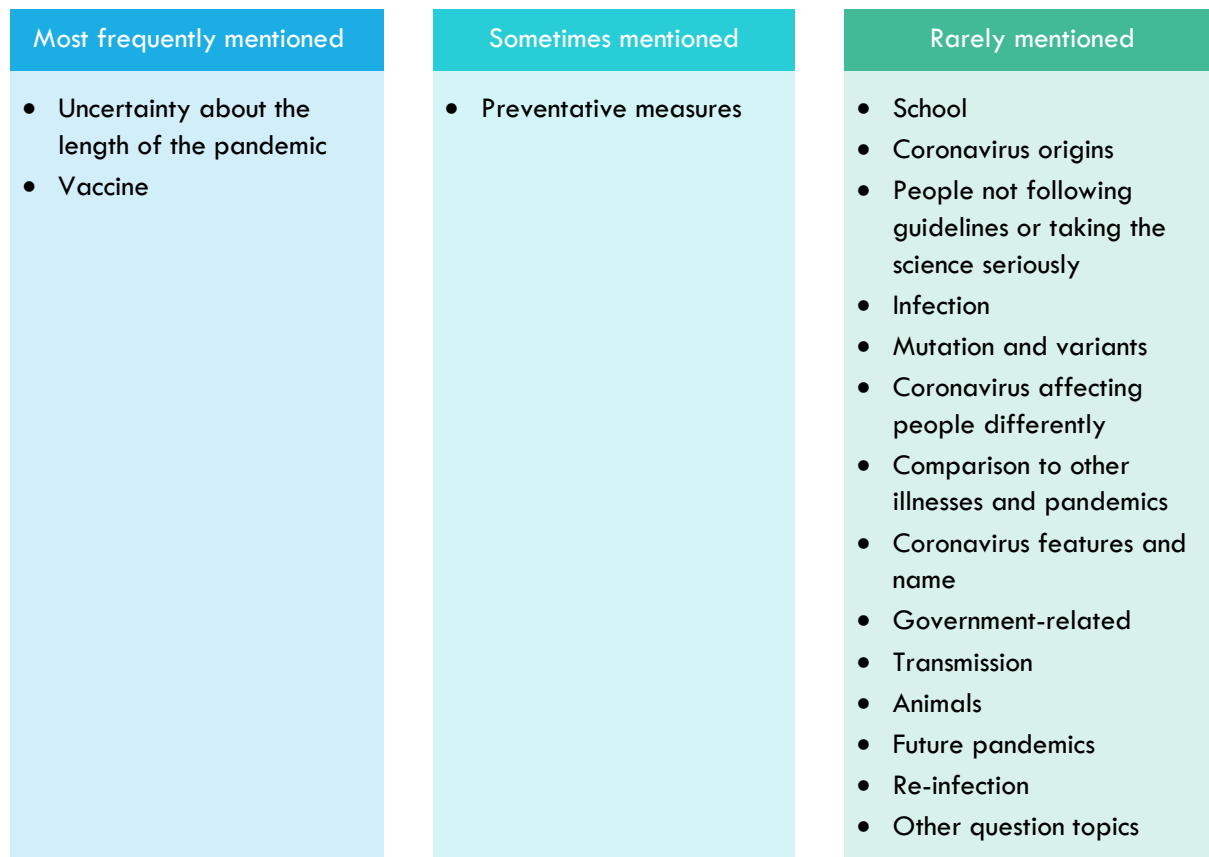


Figure 1: Topics of children’s questions related to the COVID-19 pandemic ( $n = 331$ ).

Around half of the children had questions related to the uncertainty around how long their life will be different. Most often these were general questions around “*when will it end?*” or “*how long until life is back to normal?*” Other times they were questions about specific aspects of their life such as when they would be able to see friends and family again, when they can do certain activities (travel, playdates, sports, camps, etc.), or when they will be able to go back to school. Some children had questions about when the vaccine would be available (most often asking when it would be available for children) or when they would be able to stop doing preventative measures such as wearing masks and social distancing.

Children also had a wide range of questions about the COVID-19 vaccines. Most frequent were the unknowns around how the vaccines relate to getting life closer to “normal.” Children wanted to know what the vaccine means in terms of what people will be able to do and when they might be able to do certain things (stop wearing masks, see friends and family, travel), how many people will need to get vaccinated before life can get back to “normal” (even though children didn’t say “herd immunity” their questions related to that idea), and how vaccinations will help to stop the pandemic. By January 2021, there were a number of effective vaccines for adults being administered globally, however children’s vaccines were still under development. There were a number of questions related to a vaccine for children. These included questions about why kids can’t get the vaccine yet, why it is taking longer to develop a vaccine for children, and when the vaccine will be available. Questions about the currently available vaccines included how the vaccines work, if people will need to get the vaccine yearly, why the currently available vaccines require two shots, and why the vaccine has to be a shot. Children wanted to know how the vaccine was developed and tested to make sure it is effective and how scientists were able to develop the vaccines so quickly. Some children wondered about the safety of the vaccines, the potential side effects, and if the vaccines will be effective against the mutations of the virus. There were a number of questions around why the vaccines aren’t being distributed faster and why it will take so long for everyone to get vaccinated. There were also a number of vaccine-related question topics that were only asked by one or two children that can be seen in Appendix B.

Questions around preventative measures were asked by a number of children. Children wondered how masks work and why they need to wear them; why they can’t do particular activities right now, usually related to the need to socially distance or be safe by staying at home, not traveling, or not going inside certain places; and why particular places are still closed. As previously discussed, children also had questions around how long they would need to take certain preventative measures such as wearing masks and how the vaccine relates to how long they may have to continue to take preventative measures.

Children had questions about a variety of other topical areas related to the COVID-19 pandemic.

Question topics that rarely came up but are still important include:

- Why schools are closed, what determines when they are open, why some schools were open for a while and then they closed again, and why schools are open in some places but closed in others. What school might be like in the fall. As mentioned earlier, children also had questions about when they would go back to school in person. Some children already attending school in person had questions about preventative measures they have to follow while at school.
- The origins of the coronavirus, specifically how it started and where it came from.

- Why some people don't seem to be taking the pandemic and the guidelines seriously, particularly why they aren't following guidelines (wearing masks, social distancing), aren't taking care of their community, don't trust the science, or don't think the virus is real.
- How the coronavirus infects people and makes them sick, why it is so deadly, and what might be long-lasting effects of being infected.
- What a virus mutation is, why the virus mutates, and how dangerous the coronavirus variants might be.
- Why coronavirus affects people differently, particularly why it affects children differently than adults and why some people might be asymptomatic while others may get sick and possibly even die.
- How COVID-19 compares to the flu and other pandemics in history.
- What the coronavirus looks like and why, specifically its size, shape, color.
- Questions about the United States federal government's response to the pandemic, how the pandemic affects the U.S. economy, and why preventative measures differ in some states and cities.
- How the coronavirus spreads, how fast it spreads, and why it spreads so quickly.
- If animals can get COVID-19, if animals should get vaccinated, and if pets should wear masks.
- If and when there will be other pandemics in the future.
- If you can get re-infected with COVID-19 if you already had it.
- Appendix B also includes other questions that were only brought by one or two children.

## Children's Worries Related to the COVID-19 Pandemic

Almost all of the children in our study (97%) had expressed worry or fear about something related to the COVID-19 pandemic in the month or so prior to taking the survey (from the beginning of December 2020 until they took the survey between January 11–25, 2021). For the small percentage of children (3%) that hadn't expressed worries or fears during this time, a few caregivers provided comments that explained why their child wasn't worried. *"My child has adapted very well to the coronavirus pandemic. Strangely, he hasn't expressed any worries or fears about it at all. He is maybe frustrated about not being able to do some activities in person or have friends over to play. But I have not seen him express or show signs at all of fears or worries."*

**Almost all children in our study (97%) expressed a worry or fear related to the COVID-19 pandemic between December 2020 and mid to late January 2021.**

The survey included a list of 13 worries children may have experienced between December 2020 and mid to late January 2021. This list was developed based on themes that emerged from the open-ended worry data from the first survey we administered to Brains On! listener families in June 2020. We also updated the list based on expert guidance about the socio-emotional impacts of the pandemic on children's sense of loss and anxiety about their isolation from friends (Steinberg & Hill, 2020). The list of worries was confirmed and refined during think-aloud interviews with families to ensure the list included the main worries children were having related to the pandemic. We also asked caregivers to describe any other worries their child may have had other than the 13 worries presented in the survey.

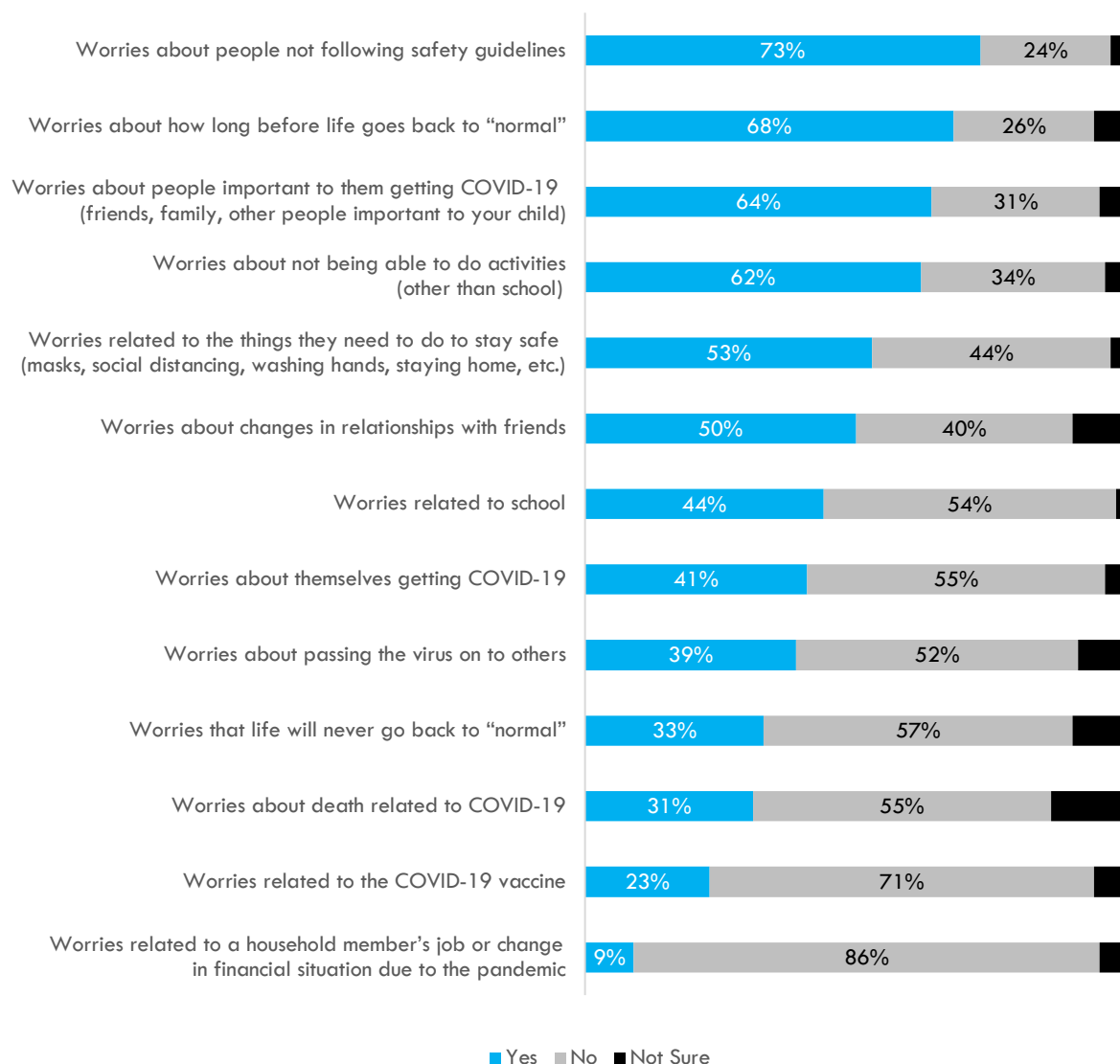


Figure 2. Children’s worries about the COVID-19 pandemic between December 2020 and mid to late January 2021 (n = 537).

As illustrated in Figure 2, children were experiencing a wide range of worries during the timeframe of December 2020 to January 2021. The most frequent worry was about people not following the safety guidelines, with close to three quarters (73%) of children expressing this worry. Safety guidelines were also a worry for about half the children (53%) in terms of what they need to do themselves to stay safe.

Children’s daily lives have changed in many ways during the pandemic and these changes are reflected in their worries. The uncertainty of how long before life goes back to “normal” was a common worry from a little over two-thirds of children (68%) with a third (33%) worried that life may never go back to “normal.” Children also had worries related to specific aspects of their life such as school (44%) and not being able to do activities other than school (62%). With some of these changes in their life,

children may not see their friends as often or at all. As a result, half of the children are worried about changes in relationships with friends.

Not surprisingly, infection and transmission were areas of worry for many children. More children were worried about someone important to them getting sick from COVID-19 (64%) than getting sick themselves (41%). Death related to COVID-19 was a worry for less than a third of children (31%). Getting others sick was also a worry with over a third of children (39%) worried about passing the virus on to others.

COVID-19 vaccines for adults were just beginning to be administered in December 2020 and January 2021. Less than a quarter of children (23%) had worries related to the vaccine. We wanted to understand what worries children were having about vaccines at this time since vaccines were still in development during the administration of our first survey in June 2020 and it was unknown when a vaccine would be available or how affective it would be. We asked caregivers to describe what their child was expressing worries about in relation to vaccines. See the subsection “Vaccine Specific Worries” for a description of these results.

We know that the pandemic has impacted many families economically due to people being laid off or changes in caregivers’ salaries. This was only a worry for a very small percentage of children in our study (9%). When looking specifically at the 128 households that experienced a decrease in income due to the COVID-19 pandemic, only 18% of them had children that expressed a worry about changes in a household member’s job or change in financial situation.

We asked caregivers if their child had worries or fears about any other things that weren’t included in the list of worries provided. A total of 69 children (13%) expressed other kinds of worries. See Appendix C for a sampling of responses that illustrate the other types of worries children were expressing. These worries included:

- Worries about not being able to see others (friends, family).
- Worries about their pet getting COVID-19.
- Worries related to access to healthcare during the pandemic.
- Worries about another pandemic happening in the future.
- Worries about the long-lasting effects of having COVID-19.
- Worries about mutation and variants of the coronavirus.
- Worries related to the insurrection at the U.S. Capitol and COVID-19.
- General worries and anxiety increased by the pandemic.
- And other worries only mentioned by one or a few children.

### **Worries By Demographic Characteristics**

We looked more closely at the 13 worries in Figure 2 to see if there were any statistically significant difference in children expressing a worry based on particular demographic characteristics: child’s age, child’s gender identity, child’s race/ethnicity, and STEM households (a household with an adult working in a STEM field). We ran chi-square tests of independence to see if there were any relationships between the presence of a worry and the different demographic characteristics. Full statistical test results can be found in Appendix D.

### Worries based on child's age

For the purposes of analyses, we grouped children into four age groups (5 and 6, 7 and 8, 9 and 10, 11 and 12). “Worries about death related to COVID-19” was the only worry that had a statistically significant relationship based on age ( $X^2(3) = 9.10, p = .03$ ). As illustrated in Figure 3, younger children were less likely to be worried about death related to COVID-19 than older children. The proportion of children expressing a worry did not differ by age group for the other 12 worries.

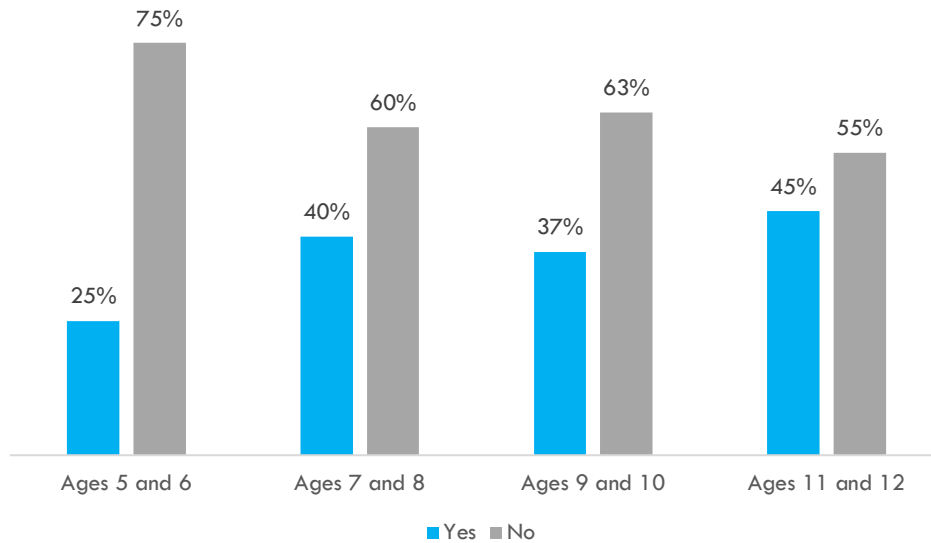


Figure 3. Worries about death related to COVID-19 by age group.

### Worries based on child's gender identity

When looking at gender identity, there were only two worries where there was a statistically significant difference between male and female children (we removed “prefer to self-describe” responses from the analyses because of how small that group was). As illustrated in Figures 4 and 5, female-identifying children were more likely to be worried about changes in relationships with friends ( $X^2(1) = 13.83, p < .001$ ) and that life will never go back to “normal” ( $X^2(1) = 7.63, p = .006$ ).

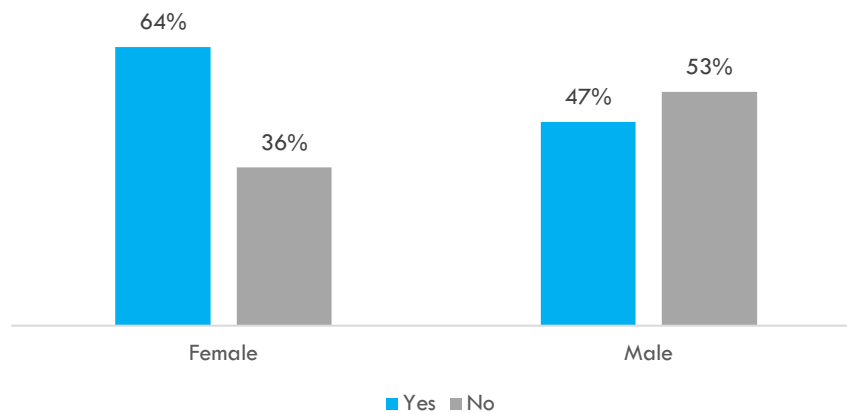


Figure 4. Worries about changes in relationships with friends by gender identity.

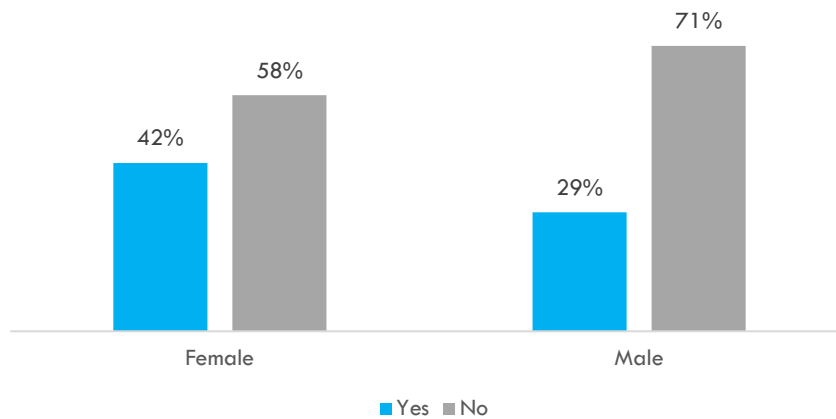


Figure 5. Worries that life will never go back to “normal” by gender identity.

#### *Worries based on child’s racial/ethnic identity*

Because of the small number of children in non-white subgroups in our data set, children were recoded as identifying as either white only or a racial/ethnic group other than only white, which we are labeling as BIPOC (Black, Indigenous, and People of Color). Across 12 of the 13 worries there was no significant difference between white or BIPOC children. Of note is that even with documented racial/ethnic disparities around infection by and death from COVID-19 (Centers for Disease Control and Prevention, 2020), there was not a statistically significant relationship between racial/ethnic identity and children’s worries about themselves or someone they love getting COVID-19 or dying from COVID-19. The only statistically significant relationship was between worries related to school and a child’s racial/ethnic identity, with BIPOC children more likely to have school-related worries than white children ( $X^2(1) = 6.99, p = .008$ ).

**Worries related to school were more likely to be expressed by BIPOC children (57%) than white children (42%) between December 2020 and mid to late January 2021.**

#### *Worries based on having an adult in the household with a STEM job*

Having an adult in the household with a job in science, technology, engineering, math and/or the medical/health sciences did not play a role in if a child expressed a worry or not, as there were no statistically significant relationships between the 13 worries and an adult in the household having a STEM job.

### **Vaccine Specific Worries**

While 123 children had worries related to the COVID-19 vaccine, 108 caregivers described the specifics worries their child had about the vaccine. Children’s worries were coded into one or more themes which were developed based on topics that emerged from the data. As illustrated in Figure 6, the most frequently mentioned worries were related to the pain and method of receiving the coronavirus vaccine (shots), as well as the timing or schedule for vaccinations. See below for discussions of the themes of these worries, and see Appendix E for sample worries children have for each of these thematic areas.

Most frequently mentioned	Sometimes mentioned	Rarely mentioned
<ul style="list-style-type: none"> <li>• Worries about pain or fear of shots</li> <li>• Worries about the uncertainty of the timing or scheduling of vaccinations</li> </ul>	<ul style="list-style-type: none"> <li>• Worries about whether the vaccine is safe and/or if it will work</li> <li>• Worries about the distribution of and access to the vaccine</li> </ul>	<ul style="list-style-type: none"> <li>• Worries related to how the vaccines work</li> <li>• Worries related to the development and experimental aspects of the vaccine</li> <li>• Worries related to children's sense of agency or control in the decision to get a vaccine</li> <li>• Worries about others avoiding the vaccine</li> </ul>

Figure 6. Children's vaccine-related worries between December 2020 and mid to late January 2021 ( $n = 108$ ).

Caregivers explained that their children have fear and anxiety around receiving vaccination shots. Many indicated that this fear or worry was not uniquely related to the COVID-19 vaccine, but existed prior to the pandemic. This was most often associated with the pain that accompanies the shot or continues at the injection site after the vaccination, but also with the needle that delivers the shot. The other most frequently mentioned worry indicated that children had different types of worries related to uncertainty about the timing or scheduling of vaccinations. Some children are worried about when they or their families will get the vaccine, while others are worried that vaccination delays will also delay when life returns to normal.

Some caregivers mentioned that their child had worries and fears related to the availability of vaccines for their parents, loved ones, or themselves; this could be related to the delayed rollout of vaccines that was highly publicized during December 2020, as noted in the *Survey Context* section, just before families responded to this survey. Children were worried about issues of availability of the vaccine, accessibility to the vaccine in a place and manner the family felt comfortable receiving the vaccine, and whether there would be enough vaccine for everyone in society. Some children also expressed worry about whether the vaccine would work. There seemed to be some uncertainty around how mutations might impact whether vaccines work, or whether the vaccines would eliminate the possibility of transmission. Some children were also worried about the safety of the vaccine, either just general worries about side effects or that they knew of family members or friends who had received the vaccine and had experienced side effects.

A few caregivers reported that their children were worried about the rapid, large-scale, and experimental aspects of COVID-19 vaccine development. In the description of the months prior to the survey period (see *Survey Context* section), we describe the politicization of the vaccine development process, which may account for why these types of worries emerged. These worries could also relate to lack of understanding about the nature of vaccine development and how even though the processes for the COVID-19 vaccines were quicker than normal, they still followed a standard scientific process for vaccine development, testing, and approval. Another theme that emerged from the data was that a



few children had questions and some worry about how the vaccine works, wondering why two shots are needed, and whether the vaccine would wipe out COVID-19. A few children also had worry over their sense of their own lack of agency or control in the decision about whether and how they receive the vaccine. Lastly, only two caregivers mentioned their child had worries and fears around vaccine-avoidant members of their family and/or the public not getting the vaccine, and thus risking becoming ill themselves or making others ill.

As this list of children's vaccine-specific worries indicate, some of these worries have their roots in vaccinations generally (e.g. pain and fear), but some of the worries that children have are unique to the COVID-19 vaccine—the way it was developed, the issues with distribution and access, and the real and felt potential that the vaccine could change their lives dramatically over the course of the next year.

## **Supporting Caregivers' COVID-19 Pandemic-Related Information Needs**

We knew from the survey we administered to Brains On! listener families in June 2020 that caregivers were turning to a wide range of resources to answer their child's questions and help them understand science topics related to the COVID-19 pandemic. These resources included both adult- and child-focused resources such as podcasts, websites, news media, videos, books, and more.

### **Use of Brains-On! Coronavirus Episodes**

Brains On! has provided families with coronavirus-related episodes covering important topics throughout the COVID-19 pandemic. At the time when the survey was administered in January 2021, Brains On! had released six coronavirus-related episodes (see Appendix F for descriptions of these episodes). As illustrated in Figure 7, the highest percentage of children listened to the first episode that was released in the early days of the pandemic. Follow up episodes were less popular with listeners, although still listened to by 50% or more of child listeners. Of the children responding to the survey, almost all (91%) had listened to at least one of the coronavirus episodes (see Figure 8). Over a third (37%) listened to all six episodes and around three quarters (74%) listened to at least half (3 or more) of the episodes. Chi-square tests of independence found that the proportion of children that listened to a particular episode did not differ by age group (5 and 6, 7 and 8, 9 and 10, 11 and 12), a child's gender identity (male, female), a child's racial/ethnic identity (white, BIPOC), or being a part of a household with an adult holding a STEM job. For more detailed listening information about the coronavirus episodes and the impact of the episodes on children and their families, see the report from our first phase of this research (Grack Nelson et al., 2021).

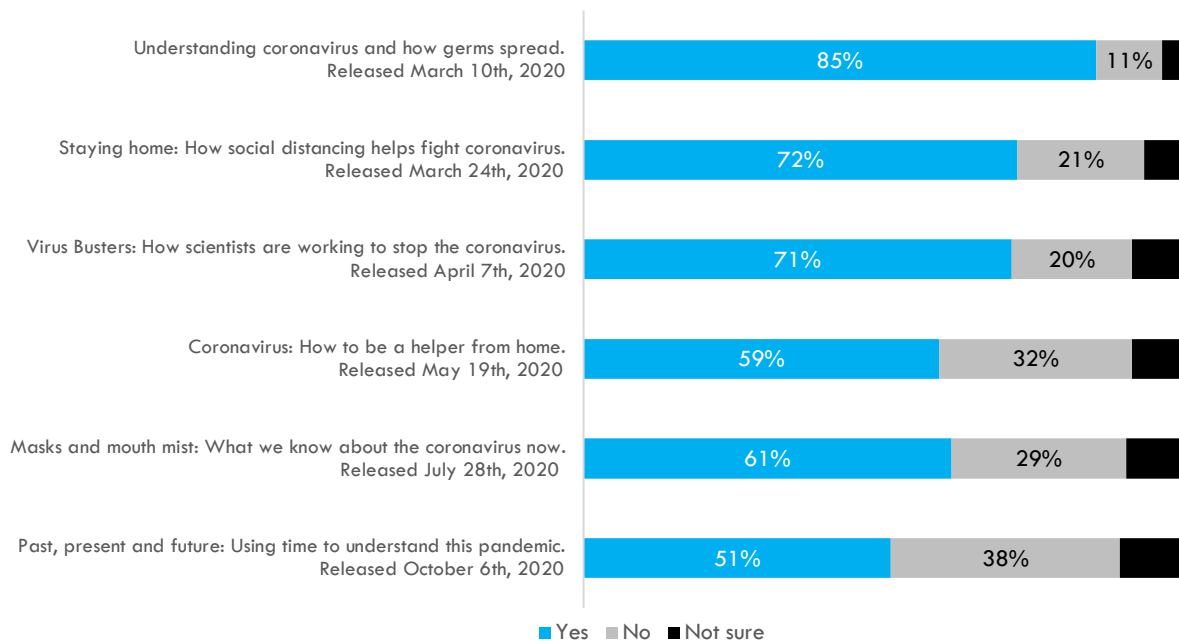


Figure 7. Percent of Brains On! coronavirus episodes listened to by child listeners (n = 537)

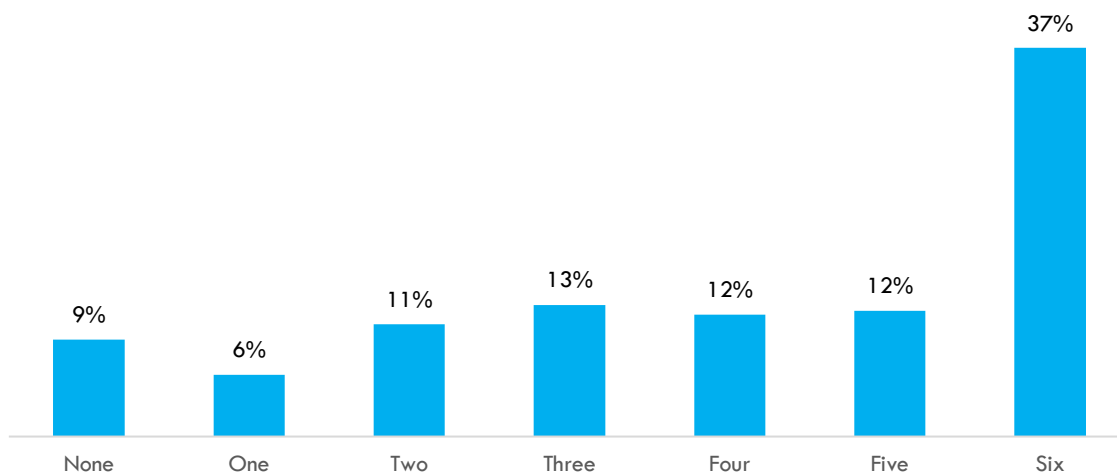


Figure 8. Number of Brains On! coronavirus episodes listened to by child listeners (n = 537).

### Use of Other Child-Focused Resources

We wanted to understand if caregivers were finding enough resources to meet their child’s needs, beyond just Brains On! episodes. We asked caregivers if they or their child had searched for other pandemic-related resources meant for children (not including Brains On!), specifically resources designed for children to read, watch, look at, or listen to. As illustrated in Figure 9, less than half of families (43%) had sought out child-specific pandemic information other than Brains On!. Close to half of families (47%) said they didn’t search out additional information (42% had only listened to Brains On!, while 5% didn’t search out child-specific information at all—Brains On! or other resources).

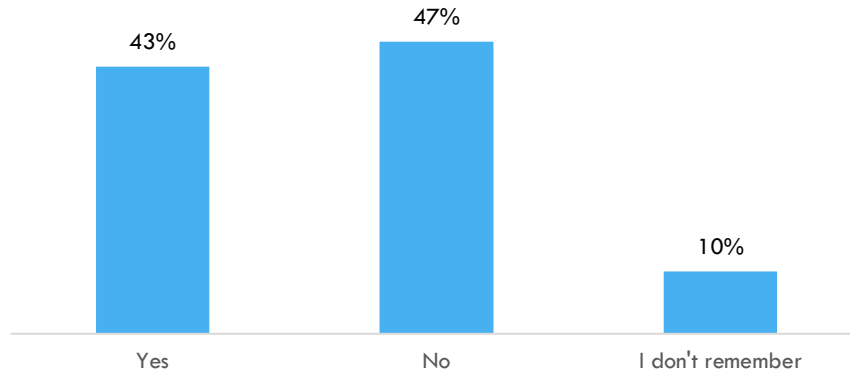


Figure 9. Percent of caregivers and/or children that sought out pandemic-related resources meant for children (other than Brains On!) ( $n = 536$ ).

Of the 228 caregivers and families that searched out additional information, we asked if they felt they were able to find enough kid-friendly resources about the pandemic for their child's needs. Over two-thirds of families (68%) felt they were able to find enough pandemic-related resources meant for children (see Figure 10).

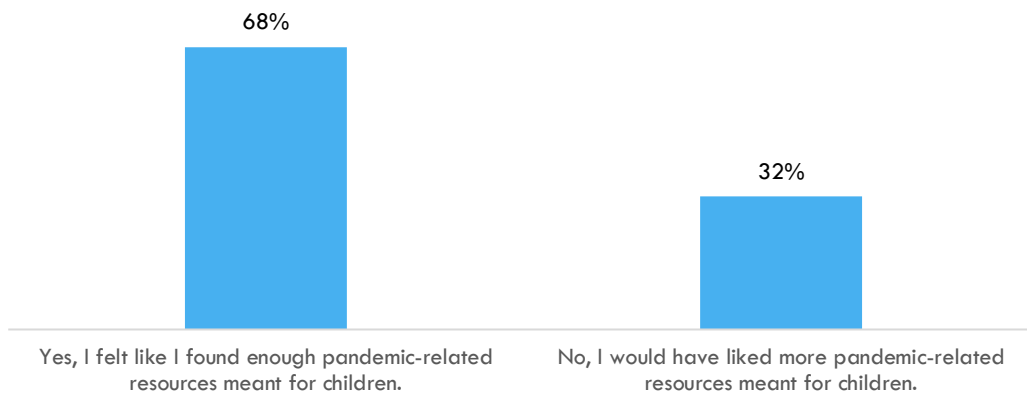


Figure 10. Ability of caregivers to find enough pandemic-related resources meant for children ( $n = 228$ ).

### Topic Ideas for Additional Child-Focused Resources

We asked the caregivers who said they would have liked more pandemic-related resources meant for children what topics they would like these additional child-focused resources to cover. A total of 60 caregivers described a wide range of topics. See Appendix G for the full list of topic ideas and example responses. The most frequently mentioned topic was related to helping kids deal with mental health struggles and the range of emotions they might be feeling such as loneliness, worry, stress, sadness, and depression. Vaccines were also frequently mentioned in relation to how the vaccines are developed, how they work, and why children can't get the vaccine. A number of other topics were mentioned less frequently and include the reasons and importance of preventative measures, understanding why people may not be following safety guidelines, how the government is responding to the pandemic, how the virus makes people sick, how the virus spreads, experiences of remote learning, history of pandemics, coronavirus variants, as well as a number of other topics mentioned by only one or two caregivers (see Appendix G).

### Use of Resources Meant for Adults or the General Public

One thing we learned from our June 2020 survey is that many caregivers turn to resources that are meant for adults or the general public to help them explain pandemic-related topics to their child. We wanted to understand more deeply how caregivers were using these resources with their child. As illustrated in Figure 11, most caregivers (80%) had used information from one of these resources to help them understand a topic and then explained that information to their child in a more kid-friendly way. When sharing these resources with children, caregivers were more likely to look, watch, or listen to the resources together with their child (60%) than having a child look, watch, or listen to the resource on their own (27%). We also heard in the June 2020 survey that some caregivers were sharing graphs and other illustrations with their child to help explain information about the pandemic. We wanted to get a sense of how frequently this was happening, which as illustrated in Figure 11, four out of ten caregivers were sharing graphs and illustrations with their child.

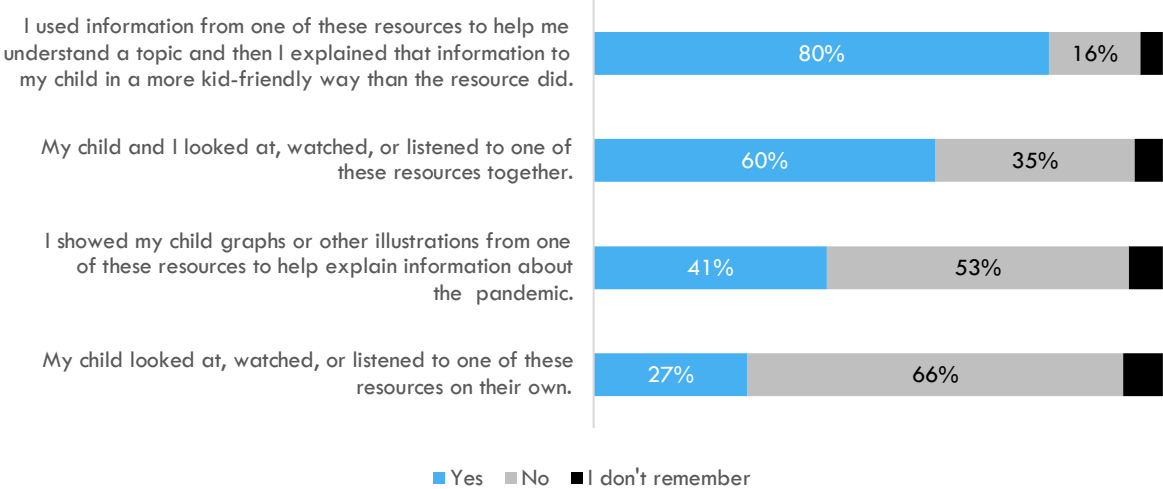


Figure 11. How caregivers used general public or adult-focused resources with their child (n = 537).

We looked more closely at how caregivers used general public or adult-focused resources with their child to see if there were any statistically significant relationship between how these resources were used and demographic characteristics: child's age, child's gender identity, child's race/ethnicity, and STEM households (a household with an adult working in a STEM field). Chi-square tests of independence found that there was not a statistically significant relationship between how caregivers used general public or adult-focused resources (the four statements in Figure 11) and a child's gender identity (male, female), a child's racial/ethnic identity (white, BIPOC), highest level of education of an adult in the household (less than bachelor's degree, bachelor's degree, master's degree, professional or doctorate degree), or being a part of a household with an adult holding a STEM job. When looking at child's age, there was no statistically significant difference based on age and a caregiver looking at one of these resources with their child or sharing graphs or illustrations from these resources with their child. There was a statistically significant relationship, however, between age and if a child looked at, watched, or listened to one of these resources on their own ( $X^2(3) = 15.50, p = .001$ ), with older children more likely to engage with a general public or adult-focused resource on their own than younger children (see Figure 12).

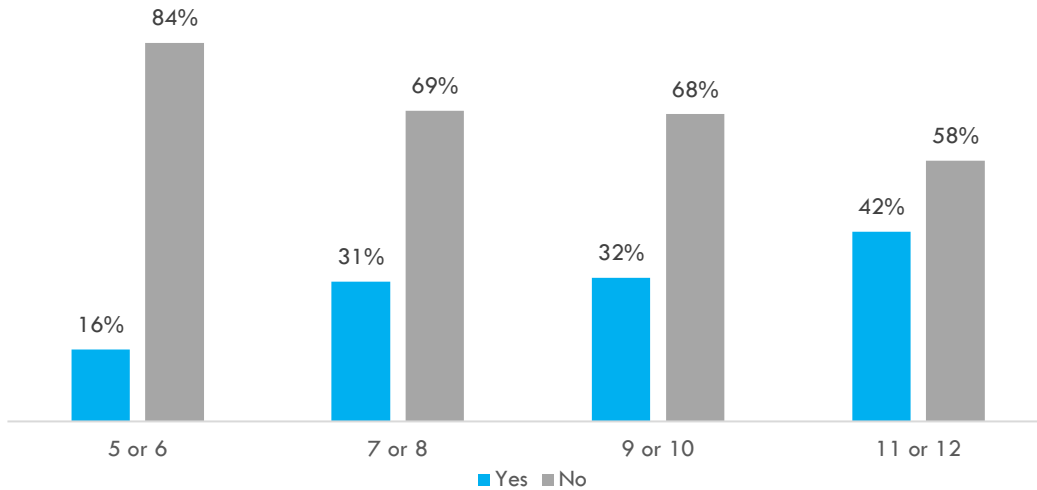


Figure 12. Percent of children looking at, watching, or listening to an adult-focused or general public resource on their own by age group.

There was also a statistically significant relationship between age and if a caregiver used information from an adult-focused or general public resource to help them understand a topic and then explained that information to their child in a more kid-friendly way than the resource did ( $X^2(3) = 9.73, p = .02$ ), with caregivers more likely to do this with younger children than older children (see Figure 13).

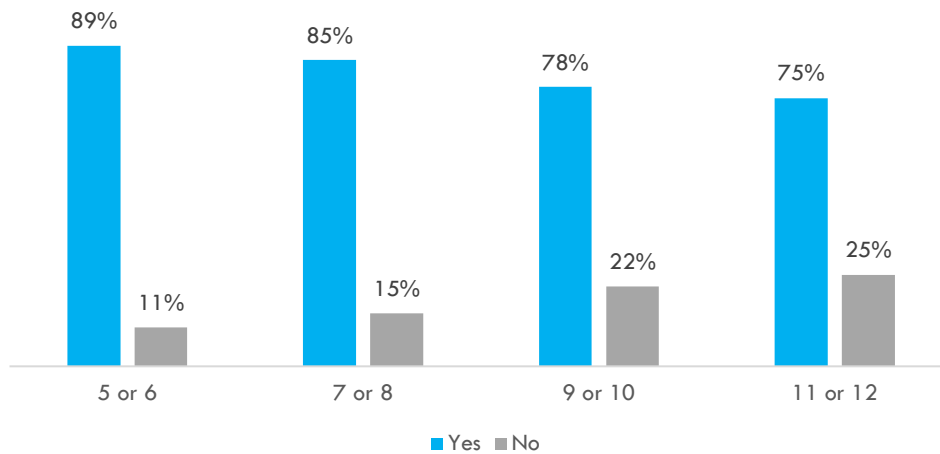


Figure 13. Percent of caregivers that used information from an adult-focused or general public resource to help understand a topic and then explained that information to their child in a more kid-friendly way than the resource did based on child's age.

# SUMMARY OF FINDINGS

## Main Findings

### Children's Questions Related to the COVID-19 Pandemic

Children were wondering about a range of topics related to the COVID-19 pandemic in January 2021. Most frequently, children's questions were around the uncertainty of how long their life will be different because of the pandemic or they wondered about the COVID-19 vaccines. See Figure 1 on page 7 for the full list of question topics.

**Children's questions in January 2021 were most frequently related to how long before life goes back to "normal" and the COVID-19 vaccine.**

Children's questions about the uncertainty around the length of the pandemic were most often related to how long until life will return to "normal" and they will be able to do "normal" activities such as see family and friends, go back to school, travel, participate in sports, and more. Similarly, children wondered about when vaccines would be available (especially for children) and when they would no longer have to take preventative measures, which related to a sense of their life going back to "normal."

Children had a wide range of questions about the COVID-19 vaccines. Most frequent were the unknowns around how the vaccines relate to getting life closer to "normal." Children wanted to know what the vaccine means in terms of what people will be able to do and when they might be able to do certain things (stop wearing masks, see friends and family, travel), how many people will need to get vaccinated before life can get back to "normal" (even though children didn't say "herd immunity" their questions related to that idea), and how vaccinations will help to stop the pandemic. There were a number of questions related to a vaccine for children. These included questions about why kids can't get the vaccine yet, why it is taking longer to develop a vaccine for children, and when the vaccine will be available. Questions about the currently available vaccines included how the vaccines work, how the vaccine was developed and tested to make sure it is effective, and how scientists were able to develop the vaccines so quickly. Some children wondered about the safety of the vaccines, the potential side effects, and if the vaccines will be effective against the mutations of the virus. There were a number of questions around why the vaccines aren't being distributed faster and why it will take so long for everyone to get vaccinated.

### Children's Worries About the Coronavirus

Almost all children (97%) in our study had worries related to COVID-19 between December 2020 and mid to late January 2021. The most frequent worry was about people not following the safety guidelines, with close to three-quarters (73%) of children expressing this worry. The uncertainty of how long before life goes back to "normal" was a common worry from a little over two-thirds of children (68%), with a third (33%) worried that life may never go back to "normal." More children were worried about someone important to them getting sick from COVID-19 (64%), than getting sick themselves (41%). Safety guidelines were also a worry for about half the children (53%) in terms of what they need to do themselves to stay safe. Children also had worries related to specific aspects of

their life such as school (44%) and not being able to do activities other than school (62%). With some of these changes in their lives, children may not see their friends as often or at all. As a result, half of the children are worried about changes in relationships with friends.

**Children were most frequently worried about people not following the safety guidelines and how long it will be before life goes back to “normal.”**

When looking at worries by demographic characteristics, for many of the worries there was not a significant relationship between presence of a worry and a child’s age, gender identity, or racial/ethnic identity. Of particular note is that even with documented racial/ethnic disparities around infection by and death from COVID-19 (Centers for Disease Control and Prevention, 2020), there was not a statistically significant relationship between racial/ethnic identity and children’s worries about themselves or someone they love getting COVID-19 or dying from COVID-19.

#### **Differences in Worries by Demographic Characteristics**

- **BIPOC children were more likely to have worries related to school than white children.**
- **Female-identifying children were more likely to be worried about changes in relationships with friends than male-identifying children.**
- **Female-identifying children were more likely to be worried about life never going back to “normal” than male-identifying children.**
- **Of children between the ages 5 to 12, older children were more likely to be worried about death related to COVID-19 than younger children.**

While only a quarter of children (23%) had vaccine-specific worries, because communication about vaccines will continue to be important over the coming months, we asked for more details about these vaccine-related worries. The pain and fear associated with the shot was the most frequently mentioned worry. Other key worries were the uncertainty around the timing or scheduling of vaccines, as well as the distribution of and access to vaccines. While the pain and fear children associated with vaccination shots are universal across vaccines, some of the worries children had were unique to the COVID-19 vaccine, such as the speed at which it was developed, whether it was safe, and its effectiveness, especially against new variants of the coronavirus. See Figure 6 on page 14 for a full list of the children’s vaccine-related worries.

#### **Supporting Caregivers’ COVID-19 Pandemic-Related Information Needs**

Caregivers reported turning to resources meant for children, as well as resources meant for the general public or adult audiences, to answer their child’s questions and help them understand science topics related to the COVID-19 pandemic. Brains On! coronavirus episodes were an important child-focused information source for families during the pandemic, although the episodes released in the early months of the pandemic were more popular than episodes released later on. When looking at adult-focused or general public resources we saw some differences in how caregivers used these resources depending on their child’s age. While most caregivers (80%) reported using information from adult-focused or

general public resources to help them personally understand a pandemic-related topic and then explain it to their child in a more kid-friendly way, caregivers were more likely to do this with younger children than older children. With older children, caregivers were more likely to have their child use an adult-focused or general public resource on their own (42% of 11- to 12-year-olds compared to 16% of 5- to 6-year-olds).

While over two-thirds (68%) of caregivers felt they found enough child-friendly resources to help their child understand pandemic-related topics, some identified a need for more child-focused resources. A year into the pandemic, caregivers most frequently wanted support for helping their child deal with mental health struggles and their range of emotions. Caregivers also frequently wanted support in discussing topics related to the vaccine, such as how the vaccines were developed, how they work, and why children can't get the vaccine yet.

**Caregivers most frequently mentioned needing additional kid-focused resources to help with children's mental health struggles and emotional wellbeing during the pandemic, as well as resources that cover a variety of vaccine-related topics.**

## **Cross-Cutting Themes**

A number of cross-cutting themes emerged from looking across the survey findings. These are additional areas of importance to consider for individuals and organizations who are looking to develop resources to support children and their families in the coming months of the pandemic.

### **Uncertainty Around the Unknown Length of the Pandemic Troubles Children**

Children had many questions and worries related to the uncertainty of how long the pandemic will last and most importantly how long before key aspects of their life will return to "normal." Although most children seem to understand that things would return to normal eventually, they had worries and questions about the many things that could delay a return to normal such as vaccine distribution and the emergence of variant forms of the coronavirus. Children also voiced concerns about how key activities, such as school, and relationships with friends and family may be changed permanently after the pandemic. Some children even expressed a worry that life may never go back to "normal," with female-identifying children more likely to be worried about this than male-identifying children. Even though the vaccine had become available, which many see as key to returning to a normal routine, there was still much uncertainty about its distribution, when vaccination numbers will decrease the need for preventative measures, and, most importantly for children, when a vaccine would be available for them. It is important that educational efforts around the pandemic include acknowledgement of the stress and emotional toll these various areas of uncertainty can have on children.

### **The Social Impacts Are Just as Important to Address as the Science**

Children's questions and worries were not only about the specific scientific aspects of the pandemic but how the pandemic has affected the social aspects of their life. These two are interconnected since the many impacts on children's lives occurred because of the coronavirus. The variety of preventative measures that children and their families are following to prevent getting sick and keeping others safe are disrupting children's normal everyday life in immense ways. Many children lack the everyday



routines of going to school and seeing their friends and teachers in person; they miss playing with friends and interacting with extended family members; and they want to know when they can participate in some of their favorite activities again like participating in sports, going on family vacations, and celebrating birthdays with others. It is important that educational efforts focused on children don't just highlight the scientific information and public health guidance, but acknowledge the social impact this is having on children and the attached emotions of frustration and loneliness this can bring, especially given the uncertainty of when children will be able engage in social activities in "normal" ways again.

### **Attending to Children's Emotional Wellbeing and Mental Health**

The pandemic has taken a toll on children's mental health and emotional wellbeing. Almost all children in the study were experiencing worry or fear. Many responses also mentioned feelings of frustration, loneliness, disappointment, and/or sadness, oftentimes because of the drastic changes in children's lives related to not being able to do many of their "normal" activities or see people important to them. Caregivers would like resources to help them talk to their child not just about the science of the pandemic but how to attend to the emotional and psychological impact the pandemic is having on their child.

### **Need for Greater Understanding About Vaccines**

Vaccines were a topic that came up repeatedly across the survey data. This isn't surprising given that some COVID-19 vaccines were just beginning to be distributed at the end of 2020 and there were still many unknowns related to vaccines. These unknowns came up in children's questions and worries – when the vaccine will be available for kids and people important to them, how the vaccine will work with the new variants, how long preventative behaviors will need to remain in place as people get vaccinated, how long before enough people are vaccinated so that life can go back to "normal," and how the vaccines will help to stop the pandemic. Children want to know more about the process of developing and testing the vaccine, how the vaccines work, their effectiveness, side effects, and why there isn't a vaccine for children yet. Some of the information about vaccines is difficult for children to understand and caregivers to translate, so more kid-friendly resources need to be developed to help address any worries or fears children and their families may have in relation to getting vaccinated. The stakes couldn't be higher for better communication about vaccines for children and their families.

### **Helping Children Make Sense of Inconsistencies In People's Preventative Behaviors**

Children have questions and worries around topics that are particularly difficult for caregivers to talk about and explain, such as why people seem to lack a sense of empathy or don't believe the science related to the pandemic. The most frequently mentioned worry is why people aren't following preventative guidelines, which was echoed in the children's questions in addition to questions about why some people don't think the pandemic is real or don't want a vaccine. These are all behaviors and opinions they see people expressing that are counter to what they are hearing when they listen to the Brains On! podcast and what scientists are communicating to the public. Related to this, some children were also voicing concern about why people don't seem to care for others and their community, recognizing that the preventative behaviors don't just protect the person doing them but protect those around them. Some children also expressed frustration and confusion over behaviors that were counter to the guidelines and seemed unfair, for instance why some friends were able to play with others but they couldn't because of their family's approach to prevention. These instances can be especially difficult for children to understand and for caregivers to navigate as they try to balance the safety of

their family with the impact the pandemic is having on their child's social interactions and overall emotional wellbeing.

### **Continued Need for Education Around Preventative Measures**

Preventative measures continue to be a frequent topic of children's questions a year into the pandemic. Children's questions about how long preventative measures would have to remain in place figured prominently, as well as questions about why particular measures were needed and how they worked to stop the spread of the coronavirus. Children are also worrying about both how they are using preventative measures to stay safe, and, more acutely, they are worrying about people who are not following the safety guidelines to prevent transmission of the coronavirus. Some caregivers are still looking for child-focused resources to support these various conversations with their child about preventative measures.

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## APPENDIX A: SURVEY SAMPLE DEMOGRAPHICS

### Characteristics of Brains On! Listeners in the Survey Sample

Most Brains On! child listeners in our sample are in the 6–10 age range (see Figure 14).

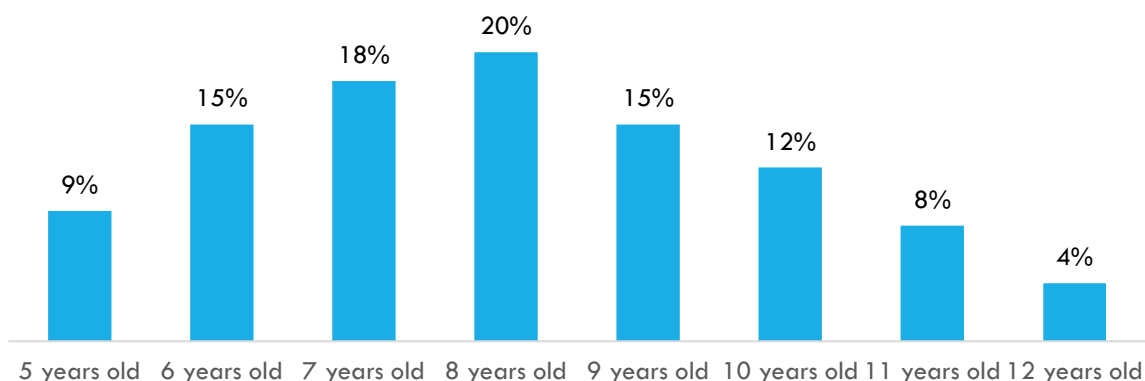


Figure 14. Ages of Brains On! child listeners in the survey sample ( $n = 537$ ).

The sample included more male (53%) Brains On! child listeners than female (46%) or children who preferred to self-describe their gender (2%). Those who self-described their gender included children who identified as non-binary, transgender girl, transgender boy, gender non-conforming, and two-spirit.

The sample of child listeners lacks racial/ethnic diversity with 79% of 5- to 12-year-old listeners identifying (by their caregiver) as white only (see Table 1). For comparison, according to 2018 census data, 50% of children age 15 and under in the United States identify as white non-Hispanic (Frey, 2019). Note: The data in Table 1 are only for child listeners in the United States.

Table 1. Race/ethnicity of U.S. Brains On! child listeners in the sample ( $n = 458$ ).

Race/ethnicity	Percent of children ages 5 to 12
White	79%
Multiracial <sup>a</sup>	15%
Hispanic or Latino	2%
Asian	2%
Black or African American	1%
American Indian or Alaskan Native	< 1%
Native Hawaiian or Pacific Islander	<1%
Racial or ethnic group not listed	<1%

a. Respondents could choose multiple racial/ethnic groups. People that chose multiple groups were recoded as “multiracial.”

## School Formats Experienced By Brains On! Listeners

Across the United States, the pandemic had an impact on how children experienced school in the fall of 2020. Some schools were closed and only offered remote, virtual learning; some schools opened with safety measures in place; and some schools had a hybrid structure where children alternated between in-person and virtual learning during the week. Some families that may have sent their child to public or private school turned to homeschooling instead, and families that had been homeschooling continued to do so but with pandemic-related adjustments to their activities (for instance, forgoing fieldtrips or participating in in-person homeschool groups or activities with other homeschool families).

We asked caregivers located in the United States how their child had participated in school since September 2020 (this question wasn't asked of respondents outside of the U.S.). Recognizing that some children experienced school in multiple ways between September 2020 and mid to late January 2021, we asked caregivers to indicate all of the ways in which their child had experienced school. As illustrated in Figure 15, over half of children (53)% had experienced school in a remote only format. When looking across all of the children, 44% had experienced some sort of in-person school whether it be in-person only or hybrid, and 11% had only experienced in-person learning during this time. Close to a fifth of children (18%) had experienced homeschool. It is unclear how many of these children were doing homeschool before the pandemic and how many may have been doing other learning formats pre-pandemic and their families opted to do homeschool instead during this time.

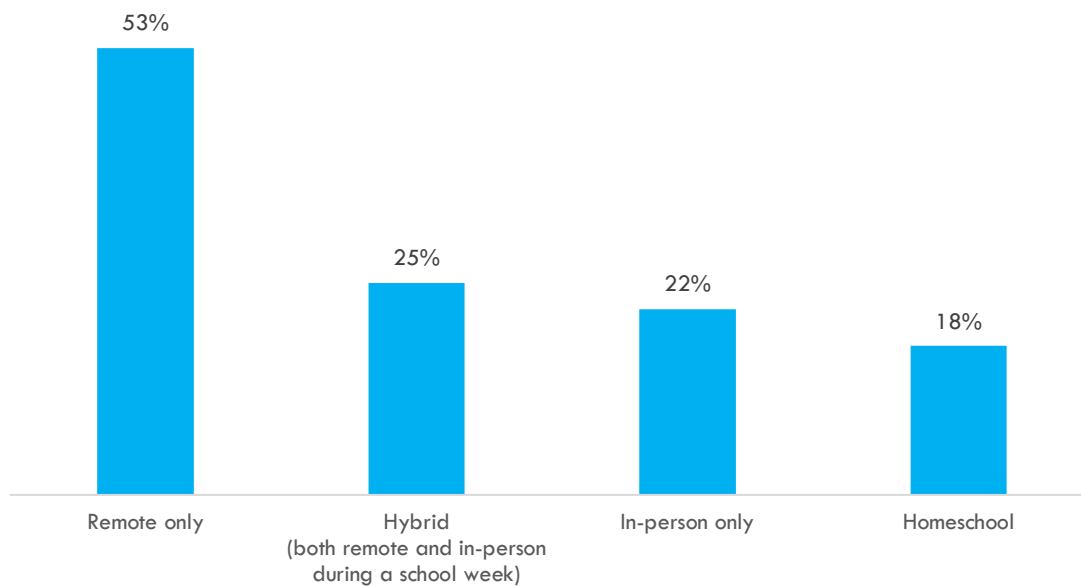


Figure 15. The various ways Brains On! U.S. child listeners experienced school between September 2020 and mid to late January 2021 ( $n = 477$ ).

## Characteristics of Respondent Households

As illustrated in Figure 16, close to two-thirds (65%) of respondents come from highly-educated households with at least one person in the household holding a graduate degree. Most households (93%) have at least one adult holding a bachelor’s degree or higher. Note: This data is only for households in the United States.

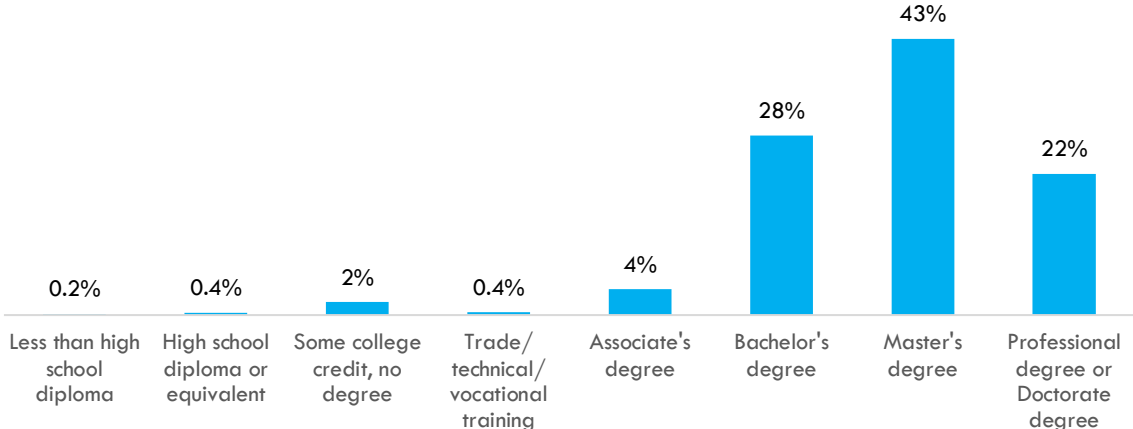


Figure 16. Highest education level attained in U.S. respondent households (n = 475).

As illustrated in Figure 17, a majority of households (64%) have a pre-pandemic annual household income of \$100,000 or more<sup>1</sup>. For reference, the United States median household income in 2017 was \$61,372 (Fontenot, Semega, & Kollar, 2018). With this in mind, respondent households tend to be more affluent than the average U.S. household (84% of respondent households make over \$75,000 a year). Note: This data is only for households in the United States.

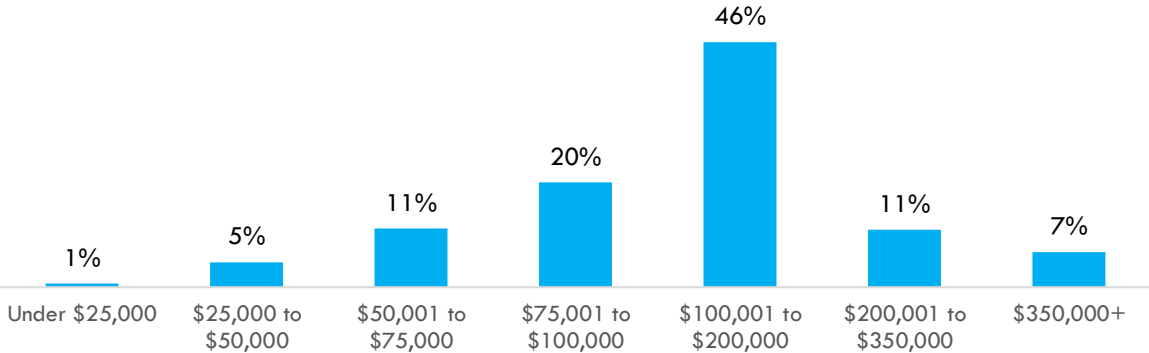


Figure 17. Pre-pandemic annual household income (before taxes) in U.S. respondent households (n = 424).

<sup>1</sup> We asked about pre-pandemic annual household income, instead of current income, since many families had changes in income during the pandemic (furlough, unemployed, decrease in wages, or other changes in income) or their income was in flux so it was difficult for them to answer based on current income.

The COVID-19 pandemic has affected many families financially. In our survey sample, close to a third (30%) of households had experienced a decrease in their household income due to the pandemic (see Figure 18).

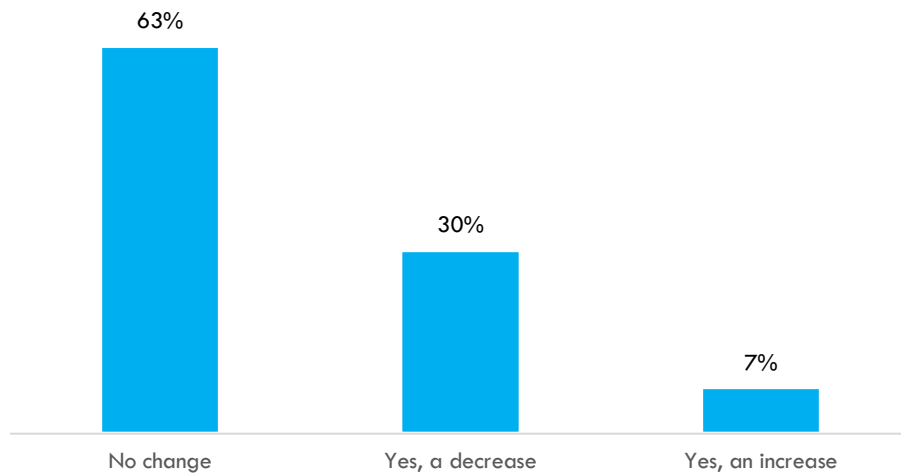


Figure 18. Percent of U.S. respondent households with a change in income due to the COVID-19 pandemic ( $n = 454$ ).

A little over half of respondent households (53%) had at least one adult that has a job in a science, technology, engineering, math, and/or medical/health sciences field (see Figure 19).

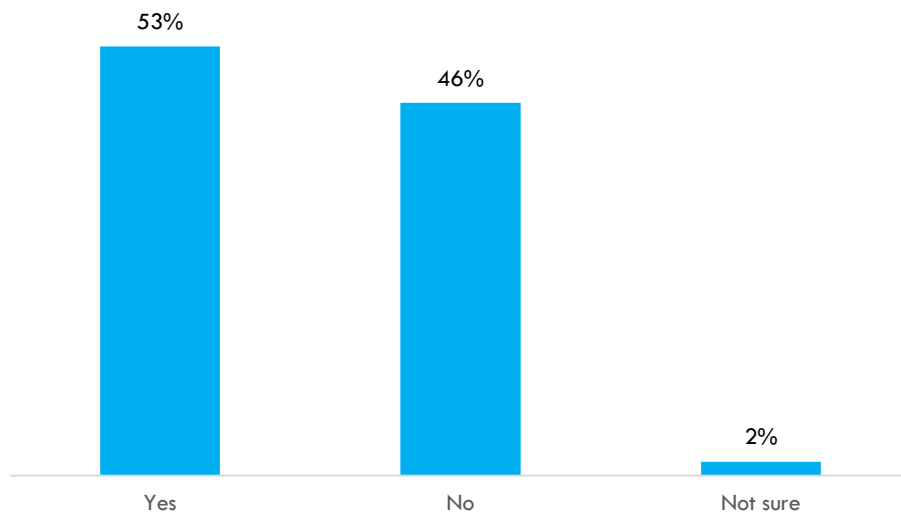


Figure 19. Percent of respondent households with an adult in a STEM-based job ( $n = 532$ ).

Most respondents (89%) were from the United States (see Figure 20). When only considering the United States, respondent households came from almost every state, except for North Dakota and South Dakota (see Figure 21). California had the most responses (82 responses), which is also a location of two of the Brains On! hosts.

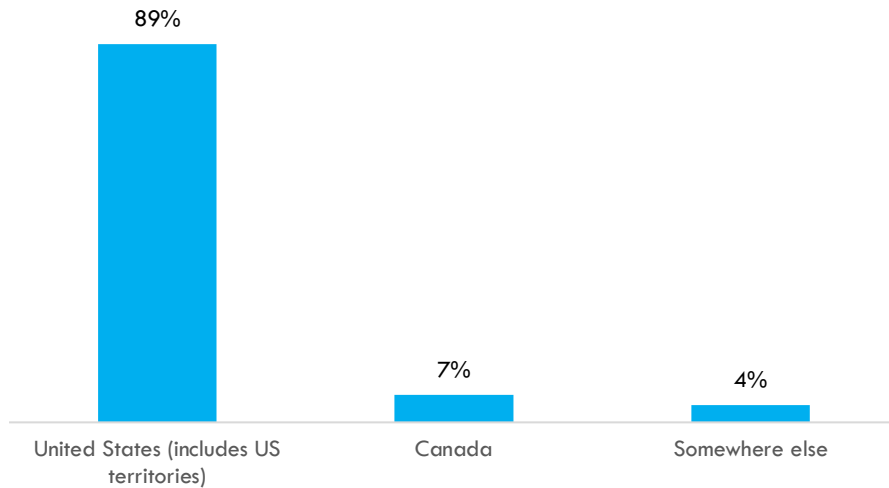


Figure 20. Respondent household locations in the world ( $n = 537$ ).

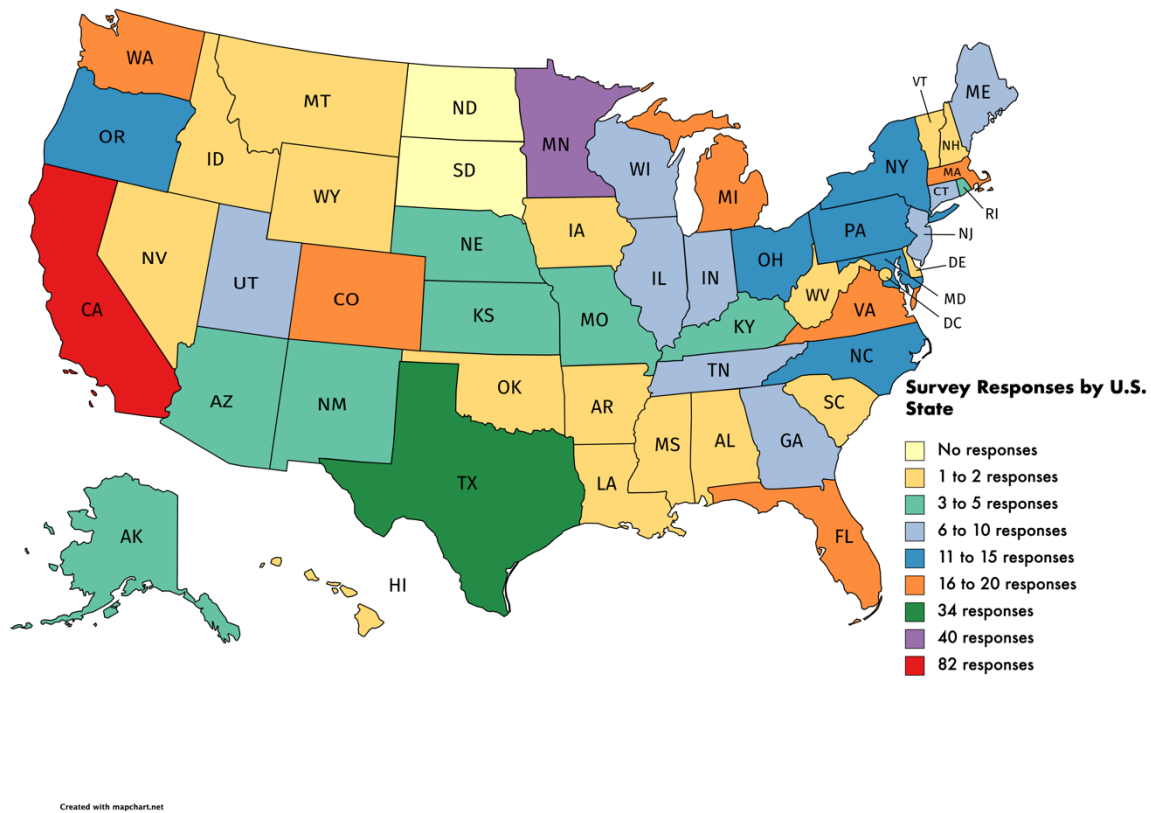


Figure 21. Respondent household locations in the United States ( $n = 479$ ).



## Information About the Adult Filling Out the Survey

Of adults who filled out the survey, most (88%) were female caregivers in the household (12% male, 0.2% preferred to self-describe). This does not represent caregivers of Brains On! listeners in general since we didn't ask respondents to randomly choose an adult from the household to complete the survey. It could have just been that females were more likely to complete the survey. Note: The survey was sent to the email address of the person who signed up for the study. There were not instructions on what adult in the household should fill out the survey to try to get a more representative sample of adult experiences. The following tables (Table 2 and Table 3) provide more data on adult respondents' age range and racial/ethnic identity.

Table 2. Age of adult filling out survey ( $n = 530$ ).

Age range	Percent of adult respondents
18–29	2%
30–39	42%
40–49	53%
50–59	3%
60–69	<1%
70–79	0%
80 and above	0%

Table 3. Race/ethnicity of adult filling out survey. Note: This data is only for respondents from the United States ( $n = 459$ ).

Race/ethnicity	Percent of adults
White	87%
Multiracial <sup>a</sup>	5%
Asian	4%
Hispanic or Latino	2%
Black or African American	1%
Native Hawaiian or Pacific Islander	<1%
American Indian or Alaskan Native	<1%
Racial or ethnic group not included in the list	<1%

a. Respondents could choose multiple racial/ethnic groups. People that chose multiple groups were recoded as "multiracial."

## APPENDIX B: CHILDREN'S QUESTIONS ABOUT THE COVID-19 PANDEMIC

We asked caregivers if their child had any questions about the coronavirus or the COVID-19 pandemic at the time they completed the survey. A total of 331 caregivers (62%) provided a question or multiple questions from their child. Below are example questions children had in January 2021.

### *Uncertainty around the length of the pandemic*

Uncertainty of when the pandemic will end/life will be back to "normal"

- *I think his biggest questions right now are when will things go back to normal?*
- *I know it won't be here forever, but when will it go away?*
- *Do the best scientists know an estimated time when COVID will be over?*
- *I think the most common question is when will it end?*
- *I would like to know how soon it will end or if it will never end.*
- *When will it go away? Will life ever get back to normal?*

Uncertainty of when they can see friends and family

- *When they can see friends again?*
- *If we will ever be together again with our friends?*
- *When can we hang out with friends in a normal way?*
- *When will I be able to play with my friends again?*
- *When can we see family again?*
- *When will it be safe to visit his grandparents?*
- *When can I hug my grandparents again?*

Uncertainty related to when they can do various activities

- *When can we do xyz activity?*
- *When will it be safe to travel? When can he go to the zoo? When can he go to the science museum?*
- *When can we do activities in public? science museum? soccer league?*
- *When will we get to go on vacation?*
- *When will I get to play my favorite sport again?*
- *When will I be able to have a playdate inside?*
- *When can we go fun places again?*
- *When will it be over so we can go on adventures again?*
- *When I think we'll be able to do the activities we used to do.*

Uncertainty related to going back to school

- *How long will it actually be until we go back to school?*
- *When are we going to work at school again?*
- *When will I see my teachers again?*
- *When can I see my friends at school again?*

Uncertainty related to how long they need to follow preventative measures

- *How long will we be wearing masks?*
- *When will it be safe to see people without masks?*
- *Are we going to wear masks forever?*
- *My child wonders if she will ever not need to stay socially distanced and wear a mask.*

Uncertainty related to the timing or scheduling of vaccinations

- *How long will it take for the vaccine to get to everyone?*
- *When will the vaccine come out for normal people who work from home?*
- *When can mommy and daddy have the vaccine?*
- *When will kids like me take the vaccine?*
- *My child is aware that the currently available vaccines are not approved for children, and he wants to know when there will be a vaccine available for kids.*

## Vaccine

How the vaccine relates to things going back to "normal"

- *What can and can't we do after we get vaccinated? How long do we have to wait after our second vaccination to do stuff? How? How many people have to get vaccinated before things go back to "normal"?*
- *Why do we have to wear masks after getting the vaccine?*
- *Will it allow us to not wear masks anymore?*
- *Will we have to wear a mask after we get the shot?*
- *What will happen after the vaccine, can I see my friends again?*
- *When we can travel to visit relatives after vaccination?*
- *When my grandparents get vaccinated can I hug them again?*
- *Is it safe to be with people after they have been vaccinated?*
- *How long will it take after mass inoculation for life to go back to more normal?*
- *How many people need to be vaccinated to stop the virus from spreading like it is now?*
- *My son wants to know some expert's best guesses as to when the pandemic will be over, especially now that people are beginning to get vaccinated.*
- *Once everyone gets the vaccine, will life go back to normal?"*
- *How will the vaccine stop the pandemic?*
- *Why can't we go back to normal now that the vaccination program has started?*

Vaccine for kids

- *When will kids get vaccines and why are they taking longer than vaccines for adults?*
- *What is happening with the vaccine for children? Why does it take longer to make a vaccine for children than for adults?*
- *Why can't kids get the vaccine yet?*
- *Will it be different from the vaccines adults are getting now?*

#### How the vaccines works

- *How does the vaccine work?*
- *How do vaccines protect us from the virus? Is it like a force field?*
- *Why the vaccine has to be two shots?*
- *How often will we have to get the vaccines?*
- *How long will the vaccine work for?*

#### How the vaccine is administered

- *He asked whether the COVID vaccine could be a spray that gets sprayed in a house for everyone. (This sounded like fumigating for COVID. It's clever, albeit not feasible.)*
- *Why does it have to be a needle? Why can't it be a pill?*
- *Do I have to get a shot (of the vaccine)? [This is more fearful of getting a shot, rather than the vaccine itself]*
- *Will the shot hurt?*

#### Vaccine development

- *How are vaccines made?*
- *How is the vaccine being tested? What is the vaccine made of?*
- *Her biggest question is how do we know that the vaccine will work?*
- *Well, I guess I just want to know why they did a vaccine so quickly if they've never done a vaccine this way before?*
- *How was a vaccine developed so fast?*

#### Vaccine safety and side effects

- *Is the vaccine safe?*
- *Could the vaccine make you sick?*
- *He wonders about the side effects of the COVID-19 vaccine.*
- *Have scientists have found any side effects of the vaccine? If so, what are they?*

#### Vaccine effectiveness for variants

- *How does the variant of the virus relate to the vaccine? Will the vaccine still work if the virus is changing?*
- *Does the vaccine work against the new strand?*
- *Will they have to get a vaccine for all the different mutations?*

#### Distribution of and access to the vaccine

- *Why aren't they giving out the vaccines faster?*
- *Why can't everyone get a vaccine now?*
- *He asked why there isn't enough vaccine for everyone.*
- *Why it will take so long to give everyone the vaccine even though the vaccine has already been developed.*

### Other vaccine questions

- *Do you have to get the vaccine if you already got coronavirus and now you feel better? Why can't we use the vaccine to help people who are sick in the hospital now with COVID to get better?*
- *What about people who can't get vaccines, like people who have cancer or are allergic to vaccines?*
- *How many people have been vaccinated?*
- *Why is it getting worse when people are getting the vaccine?*
- *They also wonder why if there is a vaccine, why they hear some people don't want it.*

### Preventative measures

- *How do masks help us?*
- *How does your mask protect you from the coronavirus?*
- *So like, if the coronavirus is so small, how do we know that it can't go through people's masks? Small things can usually go through big things.*
- *Who came up with the idea of masks, and why is it that children specifically ages 2 and up, have to wear them?*
- *Why is it so hard to travel right now?*
- *Why can't I go to the hospital when my mommy has the baby? (I just gave birth 2.5 weeks ago and there were no visitors allowed in maternity.)*
- *Why are my favorite places to go and play are closed and many places like supermarkets are open?*
- *Why can't we meet with people still? Why can't we go to the ice cream shop?*
- *Why do we have 'bubbles' if everyone has different people in their bubbles? If my best friend sees her other friend, and that friend has COVID, then my best friend sees me and I get COVID. What's the point of the bubbles?*
- *How can kids protect themselves if they are too young to get the vaccine?*

### School

- *Why he can't go to school right now.*
- *What determines when it is safe to go back to school? Why is it different in different places?*
- *Why are some kids in school but we still aren't? Why do we have to do distance learning?*
- *In Canada, why were we able to go to school before Christmas, but now we have to stay home until February?*
- *He wondered why we had to return to remote learning which led to a discussion about how infection rates can fluctuate, some of which is due to human behavior (holiday gatherings, mask wearing).*
- *Why is it so hard to learn in distance learning? Why don't his teachers want him back in the classroom?*
- *Can school always be from home?*
- *Will we be able to go back to school this year?*
- *Will school be normal in the fall?*
- *How many other kids are also learning from home?*
- *Why do we have to sit still in school (this is some sort of prevention method)?*

- *Why do I have to wear a mask so much at school? Why can't I stay home all the time instead of going to school? ;)*
- *Would we going to have smaller classes and mask on for the next five years?*

### Coronavirus origins

- *How did the coronavirus start and why?*
- *How and where did the coronavirus start?*
- *Where did the virus come from? (a constant question)*
- *Why is the virus here and how did it get here?*
- *Why did the pandemic happen?*
- *Where did coronavirus come from? I've heard it came from bats, is that true?*
- *Questions about how the transmission from a bat from a human occurred exactly.*

### People not following guidelines or taking the science seriously

- *Why don't people just trust or believe their doctors and follow guidelines for masking, social distancing, and vaccines?*
- *Why do some people not wear masks? Why do some people think it's not real?*
- *She wants to know why people just don't wear masks, when it helps to keep people safe.*
- *Why are people not agreeing about masks, distance, vaccines?*
- *Why are people not taking it seriously? Why are adults being selfish and not wearing masks?*
- *She wants to know why people aren't wearing masks and why ppl don't care about our community*
- *Why do people choose to ignore the safety guidelines (masks, distancing, staying home, etc.)? Why don't we feel more of a need as a society to take care of each other in our country?*
- *Why do people usually think that they shouldn't care about COVID and they do what they want without masks? Why do they do that? What would COVID be like if everyone did that?*
- *Why don't some people follow the rules and take the pandemic seriously?*
- *Why are grown-ups not listening to the rules?*
- *Why do some people think the virus isn't real or serious?*
- *Why do people say it isn't real?*
- *Why people won't listen to the scientists?*
- *Why people don't understand or accept the science?*

### Infection

- *How does the coronavirus get you sick?*
- *How does the coronavirus infect our bodies?*
- *How does it destroy cells? I know that it gets in through the eyes and mouth and nose, but how does it get to where the cells are? How do the viruses get into cells?*
- *How does it damage your lungs?*
- *Why is COVID-19 so dangerous? Why does it make some people die?*
- *How does it kill you?*
- *Long-lasting effects from having had Corona.*

### *Mutation and variants*

- *Why do viruses mutate? Do the mutated viruses make people more sick? Will vaccines protect everyone even if it mutates?*
- *Why does the virus change and make new versions?*
- *What is the difference between the original Coronavirus-19 and the recent mutation originating in the UK?*
- *What is a mutation and why is it more contagious?*
- *How serious are the virus mutations the news keeps focusing on?*
- *Will the virus mutate and get to kids easier?*
- *Is the mutation more dangerous?*

### *Coronavirus affecting people differently*

- *Why don't children get severe cases like adults do?*
- *Why aren't kids getting the virus as much as old people?*
- *Why does it really hurt some people but not other people?*
- *How can someone have the virus but no symptoms?*
- *Why does coronavirus sometimes cause breathing problems but not others?*
- *Why do some people get it but they don't feel sick at all, but others do feel sick and need to be hospitalized or die?*

### *Comparison to other illnesses and pandemics*

- *Why is it worse than the flu?*
- *Is coronavirus really worse than the flu?*
- *Is the coronavirus like the flu, in that there are different strains every year?*
- *Has this ever happened before? What happened then and is now worse than it was then?*
- *How does this compare to other pandemics?*

### *Coronavirus features and name*

- *What does the coronavirus look like? Why does it have crowns on it?*
- *What shape and color is the virus? How big is the virus? How much does it weigh?*
- *Why is the COVID molecule shaped like that?*
- *How does the protein spike gets its form or shape?*
- *Why is the coronavirus so small and invisible?*
- *Why is the virus so tiny we can't see it?*

### *Government-related*

- *She has heard that Biden's plan is expensive and she has some concerns about how it will be paid for. She wanted to make extra sure that it wouldn't put added burdens on poor people and people who are already struggling with their financial situation in the pandemic.*
- *I would be curious to know if we had better government what would it be like with COVID-19.*
- *Why didn't our president listen to the CDC? Why didn't our president encourage people to wear masks?*

- *How did coronavirus affect our economy? How did it affect our election and why did the riots happen?*
- *Why don't all states/cities have the same rules/guidelines?*
- *Why are some states more locked down compared to others?*

#### *Transmission*

- *What is causing it to spread so quickly?*
- *How fast does the virus spread?*
- *How fast will COVID-19 spread through a family?*
- *How can coronavirus get through people's mask?*

#### *Animals*

- *Can dogs/cats get COVID-19?*
- *Which animals can get corona and can they give corona to humans and can humans give corona to them?*
- *Will our pets need to get vaccinated too?*
- *Whether or not spiders and other animals will get a vaccine.*
- *My child has asked whether our dog should wear a mask.*

#### *Future pandemics*

- *Will there be other viruses that cause pandemics?*
- *Is there a chance for something like this to happen again?*
- *Will I have to go through this again?*
- *When will the next one come? Will the next one be worse? How can we prevent this from happening again?*

#### *Re-infection*

- *Can someone who's already had it get the virus again?*
- *Can you get COVID-19 more than once?*

#### *Other questions*

- *My kids are worried about getting tested. They wonder why they have to go up through the nose and are terrified of that experience if they have to get tested.*
- *She asks what it feels like to have coronavirus.*
- *What are different techniques that doctors use to help people with COVID-19?*
- *How leaders know how many people have the virus.*
- *Is the death rate going down because we're learning more about the virus? What can they do to help learn more about the virus and stop this from happening again? What kind of scientists investigate these kinds of things and where do they work?*
- *Why is COVID much worse in the USA than Australia?*
- *He wants to know what kinds of effects or changes the pandemic has had on the world besides the obvious ones (quarantine, lots of people getting sick and dying, etc.)*



- *And why can it not go back to only an animal disease if it came from bats & leave people alone?*
- *Why is it taking so long for things to go back to normal?*
- *Why is it still here if we are staying safe?*
- *How will we know when it's over and safe to resume "normal" activity level?*
- *What if COVID-19 is here forever? What does that mean for us?*

## APPENDIX C: OTHER WORRIES CHILDREN EXPERIENCED

We asked caregivers if their child had worries or fears about any other things that weren't included in the list of worries provided. A total of 69 children (13%) expressed other kinds of worries or fears. Below are example responses of the other kinds of worries and fears children had been experiencing in December 2020 through mid to late January 2021.

### *Worries about not being able to see others (friends, family)*

- *She has worried about not being able to see her friends.*
- *Just the lack of time with friends. He is a VERY social boy and has been missing interacting.*
- *My son's biggest worry is missing out on time with friends. Because of where we live we decided to do individual homeschooling and it's been hard because he missed his friends.*
- *Mostly the relational stuff-missing friends and social opportunities.*
- *Worries about not seeing family.*
- *Missing out on specific things like time with grandparents.*
- *Not being able to visit sibling away at school or grandparents.*
- *She is afraid that her grandfather (with dementia) will not remember her after the coronavirus is over from not seeing her in so long.*
- *She worries that grandma isn't coming to visit because she doesn't love us, and she doesn't understand that we're not seeing them because we have a higher risk exposure than other family members so it just isn't safe.*

### *Worries about their pet getting COVID-19*

- *Was very concerned about whether our animals might get sick from the virus. Regularly prayed for the virus not to spread to her dogs.*
- *She is also extremely worried that our pets could get it if it mutates.*
- *Worries about if pets can get COVID.*

### *Worries related to access to healthcare during the pandemic*

- *His grandfather needs a knee replacement that keeps getting postponed due to COVID. He worries about grandpa because he is in pain.*
- *That we can't get needed medical and dental care without putting ourselves at risk.*
- *Having surgery or getting other needed healthcare during corona, being able to get needed healthcare when hospitals are overwhelmed.*
- *Worries about people in other countries having access to care.*

### *Worries about mutation and variants of the coronavirus*

- *Worries about the virus strain changing.*
- *Worries about the mutations and new variants and what that might mean.*
- *New mutations/strands of the coronavirus, and will the new variant be like starting over.*
- *She is worried about there being a new "germ."*

### Worries about another pandemic happening in the future

- He has expressed worry COVID will go away and something else comes that makes us go back to lock down.
- What if we get through the coronavirus and then another pandemic happens with a new virus.

### Worries about the long-lasting effects of having COVID-19

- We were all diagnosed with COVID at the end of December. Kiddo has been worried about what that means for healing and future health as well.
- Long-lasting effects from having had corona.

### Worries related to the insurrection at the U.S. Capitol and COVID-19

- Worries about how political unrest will impact pandemic response.
- We talked about last Wednesday's events (insurrection at the Capitol). We talked about some basics of what happened and why. At the end, I asked both children, "Do you have any questions that you want to ask us?" and my daughter (the one who I am responding about on this survey) said, "I just have one question. Were the people who entered the Capitol wearing masks?" That was really important to her. I think coronavirus has almost risen to a danger level that exceeds an attack, and she was concerned for the safety of the senators relative to the virus.
- She has been concerned about whether the violence at the Capitol will delay the Biden transition, and with it, Biden's plan for addressing the pandemic. She sees that the current administration "doesn't take coronavirus seriously" (in her words), and she's been looking forward to the new pandemic plan. The Capitol riot really shook her, because she never imagined that Americans would use violence to stop the government from doing its job.

### General anxiety

- My child has had previous anxiety in the past, but lately their anxiety has been even worse. We are trying to find the cause but can't seem to find one.
- My child panics anytime I am not in the room, if I need to open the door to the house to let the dogs out, he yells, "Mommy!" and runs for me, making sure I didn't just leave. It has gotten progressively worse the longer we are in isolation.
- When going to bed at night he has expressed feeling worried and lonely and has had a hard time going to sleep. He expresses these as general feelings not related to specific things, just an overall feeling of worry and feeling lonely.
- He is very anxious around people now, and I can't blame him - he hasn't really been around people in person for nearly a year during this formative time in his young life.
- My child seems to get more worried about more things unrelated to COVID. For example, when he hears a siren, he worries there could be a fire that could affect us nearby.
- The holidays already bring anxiety and stress to my two boys with Autism. This year was very different and that much more difficult.

### Other worries

- Worries about getting tested and what that feels like (she still hasn't been).
- He has worried about friend's families and their financial and job concerns.

- *Worried that businesses we like will close.*
- *Shortages of food and supplies.*
- *That there wouldn't be enough masks for everybody in the world.*
- *He has been worried about possible, not-yet-known side effects the pandemic might have on the world after we recover.*
- *COVID will unbalance the world and it will collapse in on itself.*
- *My child is reluctant to go outside... could you please consider an episode on why getting outdoors for at least an hour a day is good for you?*
- *People spreading COVID at protest events.*
- *Worry that they're not going to be able to launch rockets in the space because astronauts will not be able to wear masks.*

## APPENDIX D: WORRY CHI-SQUARE RESULTS BY DEMOGRAPHICS

Table 4. Chi-square test results for worries by age group.

Worry	$\chi^2$	df	p-value
Worries about people not following safety guidelines	1.82	3	.61
Worries about how long before life goes back to “normal”	2.05	3	.56
Worries about people important to them getting COVID-19 (friends, family, other people important to your child)	2.41	3	.49
Worries about not being able to do activities (other than school)	1.51	3	.68
Worries related to the things they need to do to stay safe (masks, social distancing, washing hands, staying home, etc.)	3.40	3	.33
Worries about changes in relationships with friends	0.23	3	.97
Worries related to school	3.34	3	.34
Worries about themselves getting COVID-19	1.48	3	.69
Worries about passing the virus on to others	5.74	3	.13
Worries that life will never go back to “normal”	3.42	3	.33
Worries about death related to COVID-19	9.10	3	.03*
Worries related to the COVID-19 vaccine	2.00	3	.57
Worries related to a household member’s job or change in financial situation due to the pandemic	5.99	3	.11

Note. For the purpose of analyses, worries were based on yes or no responses, not sure responses were removed from the analyses. Ages were grouped into four groups (5 or 6, 7 or 8, 9 or 10, 11 or 12).

\*  $p < .01$

Table 5. Chi-square test results for worries by child's gender identity.

Worry	$\chi^2$	df	p-value
Worries about people not following safety guidelines	1.25	1	.26
Worries about how long before life goes back to "normal"	1.35	1	.25
Worries about people important to them getting COVID-19 (friends, family, other people important to your child)	2.04	1	.15
Worries about not being able to do activities (other than school)	1.69	1	.19
Worries related to the things they need to do to stay safe (masks, social distancing, washing hands, staying home, etc.)	0.80	1	.37
Worries about changes in relationships with friends	13.83	1	< .001*
Worries related to school	1.14	1	.29
Worries about themselves getting COVID-19	0.06	1	.81
Worries about passing the virus on to others	1.35	1	.25
Worries that life will never go back to "normal"	7.63	1	.006*
Worries about death related to COVID-19	1.73	1	.19
Worries related to the COVID-19 vaccine	3.05	1	.08
Worries related to a household member's job or change in financial situation due to the pandemic	0.29	1	.59

Note. For the purpose of analyses, worries were based on yes or no responses, not sure responses were removed from the analyses. Gender identity was based on male or female, "prefer to self-describe" responses were removed from the analyses because of their small number.

\*  $p < .01$

Table 6. Chi-square test results for worries by child's racial/ethnic identity.

Worry	$\chi^2$	df	p-value
Worries about people not following safety guidelines	0.30	1	.59
Worries about how long before life goes back to "normal"	0.31	1	.58
Worries about people important to them getting COVID-19 (friends, family, other people important to your child)	1.52	1	.22
Worries about not being able to do activities (other than school)	0.99	1	.32
Worries related to the things they need to do to stay safe (masks, social distancing, washing hands, staying home, etc.)	1.10	1	.30
Worries about changes in relationships with friends	1.07	1	.30
Worries related to school	6.99	1	.008*
Worries about themselves getting COVID-19	1.25	1	.26
Worries about passing the virus on to others	0.48	1	.49
Worries that life will never go back to "normal"	0.004	1	.95
Worries about death related to COVID-19	0.25	1	.61
Worries related to the COVID-19 vaccine	0.25	1	.62
Worries related to a household member's job or change in financial situation due to the pandemic	0.00	1	.99

Note. For the purpose of analyses, worries were based on yes or no responses, not sure responses were removed from the analyses. Racial/ethnic identity data was recoded as white only or BIPOC (black, indigenous, or people of color) because of the small numbers of children in the racial/ethnic non-white subgroup.

\*  $p < .01$

## APPENDIX E: VACCINE WORRIES CHILDREN EXPERIENCED

We asked caregivers who indicated that their child had worries or fears about the COVID-19 vaccine what their child has been worrying about. We received responses from 120 caregivers of Brains On! listeners ages 5–12. Below are sample responses of the worries and fears children had been experiencing between December 2020 and mid to late January 2021.

### *Worries about pain or fear of shots*

- *My child wants a vaccine invented that does not involve shots. He wants, "all of the doctors and scientists to come up with a way that is more kid friendly!"*
- *Scared that it is going to hurt.*
- *She said she'd rather wear a mask forever than get the vaccine. She is worried about the needle and getting a sore arm. Her grandmother got the vaccine recently and had tenderness in the arm.*
- *Getting the shot looks and feels scary.*
- *My child is scared of shots in general, and getting this shot makes her nervous.*
- *Simply that it might hurt. He understands that it will help to bring about the end of the pandemic, but is worried about having the vaccine himself.*

### *Worries about the uncertainty of the timing or scheduling of vaccinations*

- *She is worried about when there is a vaccine for children and it is her turn to get it.*
- *He worries about the timing/time frames when this will all be resolved. He asks frequently, when will the virus be fixed? When is the vaccine coming? When will I get the shot? We respond and say we don't know for sure, but he thinks often about time and is very aware of the months that keep passing by and wanting to know if things are progressing in a timely manner or not.*
- *Worried it will be a long time before she can get it. She has had dreams about getting the vaccine.*
- *When we will be vaccinated.*

### *Worries about whether the vaccine is safe and/or if it will work*

- *He is worried it is safe and it will work.*
- *I am kind of worried about the vaccine 'cause I don't think it's going to work.*
- *Worried about side effects and that it might not work.*
- *He is worried because some people have had bad reactions to the vaccine.*
- *I am a healthcare worker and, unfortunately, I was one of the very few who had an anaphylactic reaction. This was very tough for my daughter in that I was hospitalized and away from her. The good news is we talked about how extremely rare my reaction was and she has seen all of her grandparents thrive after their vaccines!*
- *My child has been concerned about the vaccine not working. They are worried that the vaccine won't kept their loved ones safe and protected.*

### *Worries about the distribution of and access to the vaccine*

- *Not getting to go back to in-person learning due to vaccine delays.*
- *Why it's taking so long... worries about Trump not giving enough vaccines to our city.*
- *Our child has been worrying about the distribution of the vaccine and everyone who needs the vaccine being able to get it.*



- Worries about some family members who've been quarantined/socially distant getting the vaccine at different times than others, extending the one we'll have to stay apart.
- My daughter worries about both my husband and I not getting the vaccine because of shortages.

#### Worries related to how the vaccines work

- A lot of curiosity around how it works and worry about two shots and why that is necessary.
- If she will have to get it every year. If it will make COVID go away forever.
- The virus mutating and "outsmarting" the vaccine.

#### Worries related to the development and experimental aspects of the vaccine

- I have doubt in it the first time the release it to the public and it might even get more people to get COVID cause it's the quickest the vaccine has ever been made and it might just not work.
- That the vaccine is being tested on them.
- Worried about how the vaccine has been tested.

#### Worries related to children's sense of agency or control in the decision to get a vaccine

- They don't want to receive the vaccine.
- They worry that they will have to take the vaccine, even if they do not want to.
- That it will be forced on us, that more people will blindly and dumbly follow our government.

#### Worries about others avoiding the vaccine

- He worries about family members and other people who are going to refuse the vaccine.

## **APPENDIX F: BRAINS ON! CORONAVIRUS EPISODES**

### **Understanding coronavirus and how germs spread**

*Released March 10th, 2020*

It's impossible to miss the news about coronavirus, but you probably still have lots of questions. What exactly is it? How does it spread? Can I protect myself? In this episode we'll break down what we know about this new virus and tell you how to stay safe. Plus, we'll listen to a podcast hosted by two chatty viruses to learn how these germs spread (and how our bodies fight back). We've also got a special message from some super tough hand washers.

### **Staying home: How social distancing helps fight coronavirus**

*Released March 24th, 2020*

Lots of schools are closed and people are staying home. In this episode we'll explain how all of this could help slow the spread of the new coronavirus. We'll explain some terms you're probably hearing too, like "social distancing" and "flattening the curve." Plus, we talk with a doctor who is on the front lines helping people get better, and two virus podcasters help answer your coronavirus questions like, "How did this virus start?" and "Can our pets get sick too?"

### **Virus Busters: How scientists are working to stop the coronavirus**

*Released April 7th, 2020*

Scientists around the world are working fast to fight the new coronavirus. They're developing medicines to help people who are sick. They're also working on vaccines to stop the virus from spreading. In this episode we'll explain how these treatments work and we'll give you some tips on keeping six feet from other people while taking a stroll outside. Oh, and Kara and Gilly stop by to drop some epic virus facts.

### **Coronavirus: How to be a helper from home**

*Released May 19th, 2020*

We're all doing our best to stay safe from coronavirus, but is there anything we can do for others as well? In this episode we look at some ways you can help from home, like by making masks, donating to food banks or writing letters. Two stars of the World Handwashing Federation stop by to explain the science of how water actually dries out our hands. Plus, Kara and Gilly interview science journalist Carl Zimmer on the weird world of viruses, including some viruses that help people!

### **Masks and mouth mist: What we know about the coronavirus now**

*Released July 28th, 2020*

In this episode, we find out why masks are an important tool in the fight against this new coronavirus. We'll also talk about this unusual time we're living through and how to deal with the uncertainty of it all. Plus: Kara and Gilly debut their first single. They're hoping it's a viral sensation (pun very much intended). And, of course, a new mystery sound and a Moment of Um that answers the question: Why do sharks have to keep moving to stay alive?

### **Past, present and future: Using time to understand this pandemic**

*Released October 6th, 2020*

If time feels weird to you lately, you're not alone. The pandemic has changed the pace of life for people around the world. We'll talk to a psychologist about how our sense of time works. We'll look

back into the past to see how a similar pandemic played out 100 years ago. Plus, we'll ask experts to tell us what they think life will be like six months from now.

## APPENDIX G: TOPICS FOR ADDITIONAL CHILD-FOCUSED RESOURCES

### *Kids emotions and mental health*

- *I would like to see more to help kids deal with their emotions and mental health throughout the pandemic. They can understand why and how, but it's much harder working through feelings and emotions.*
- *Emotional support for children during the pandemic/election/Capitol riots. My 11 yr old went through a deep depression during quarantine.*
- *How to deal with it now - the continued need not the initial. Especially emotional reactions to the sadness in the world.*
- *Sadness at missed milestones like birthdays and not seeing grandparents.*
- *I would like ones that discuss the mental health aspects of how tough this is on everyone and how they can help themselves cope and feel better.*
- *How to handle the emotions that came from all of this. The brains on episodes were great- I just wish there were more like them. 😊*
- *Stress with major life changes.*
- *Emotions that have come up around having to isolate from their friends and family members, ways to express "negative" emotions in a healthy way.*
- *Anxiety and feelings of social isolation—coping with missing out on community events, seeing friends, etc.*
- *Coping skills for social isolation.*
- *Dealing with feelings of loneliness and worry.*
- *How to handle fear about the pandemic.*
- *Mindfulness.*
- *How to cope with stress.*
- *Mental health struggles.*

### *Vaccine*

- *How vaccines are made/What are trials.*
- *Additional resources on vaccines and how they work.*
- *An easier way to explain the vaccine and how it will work.*
- *Vaccine mechanisms.*
- *The vaccines available and how they work.*
- *More about how the vaccine was discovered, how it works.*
- *How scientists do research to come up with a vaccine.*
- *My child is aware from our conversations that information about COVID is evolving. I think it would be helpful to have resources as new information arises. For instance, how does the vaccine work? How long will it be effective?*
- *When kids can get vaccines.*
- *Why children can't get the vaccine.*
- *Why some people don't want the vaccine.*

### Preventative measures

- Why staying home is important.
- Age-appropriate explanations of the rationale behind safety guidelines.
- Shows featuring characters wearing masks, maybe?
- It would be great to have more visuals to show my child why proper mask wearing is important.

### People not following guidelines

- Why do some people believe the pandemic is a hoax? Why is everyone not following the safety guidelines?
- How to understand some people have different opinions about the virus and safety measures and how to deal with that while staying safe.
- It's confusing for my kids when they see other people not following the rules. I've tried to explain it to them, but it's hard for them to believe it'll get better.
- Understanding other people's choices that don't reflect what you are doing/being told to do. My child has difficulty understanding why some family members don't mask and distance, and why some kids are allowed to play sports, go to friend's houses, etc.
- How to deal with social interactions where others—including family—are not being as cautious about the pandemic.

### Government-related topics

- My daughter is deeply interested in politics, especially since addressing the pandemic has become so political; but so far I have found \*no\* kids resources that explain current congressional issues/disagreements in a way that's meant for kids. I do my best to provide honest, age-appropriate, and even-handed explanations, but I could really use some help in this area.
- The role of the CDC, the role of the government.
- What governments can do to help control the spread.

### Infection

- A resource that explains how the virus makes people sick.
- Being asymptomatic.
- Why can't it get in your body through your skin?

### Transmission

- How viruses spread so quickly.
- Information about levels of contagiousness and timeframe of contagiousness.
- How viruses spread.
- Fact-based and science-based video content that is targeted to children relating to spread, viral Genesis, understanding and processing this type of information. To be specific content that doesn't express this in language for very young children but rather real language that explains the terms being used in a manner approachable and digestible by children in this question's age range. There seems to be content on either side of this gap, that addressed for very young children or that address for young adults but very little in between taking a child from having little exposure to epidemiological terms to a limited and basic understanding. Ultimately, mitigating fear and uncertainty with facts and science in a way they can understand.

### School

- *To explain how remote learning is a good thing. A brave thing, but not a permanent thing.*
- *Sadness at dealing with the intense frustrations of remote schooling.*
- *Why does my teacher treat me (remote learner) differently than those in-seat?*

### History of pandemics

- *History of pandemics. Human resilience.*
- *History of other pandemics and how the world adapted and moved on after those pandemics.*
- *Resources on pandemics and why they occur.*

### Variant

- *Information about variants and how that will change the things we are currently doing or not doing.*
- *What precautions need to be taken with the discovery of the new more contagious strain?*

### Other topics

- *Playing with other kids while social distancing.*
- *How to have fun despite pandemic. How to maintain relationships through social isolation. Staying fit through time at home.*
- *Reasons why different families/households have different levels of risk (one family might have someone who is medically fragile or elderly, for example).*
- *Relative risks of various kid-centered activities (play inside, play outside, sports, birthday parties, etc.).*
- *Why "Normal" isn't a real thing - life is always changing.*
- *Relation between racial/economic disparities and COVID prevalence; how other parts of the world are responding.*
- *How other children in other countries are going through the pandemic.*
- *A discussion about what the future may look like if we have COVID around forever.*
- *Handling hard choices how to determine if information you read on the internet is trustworthy.*
- *Why does it have a crown on it? Does coronavirus have brothers & sisters? How diseases go from animals to people?*
- *Also, how testing works.*
- *How immunity works.*
- *How hard doctors and nurses are working.*