

YOUR VOICE HAS BEEN HEARD!



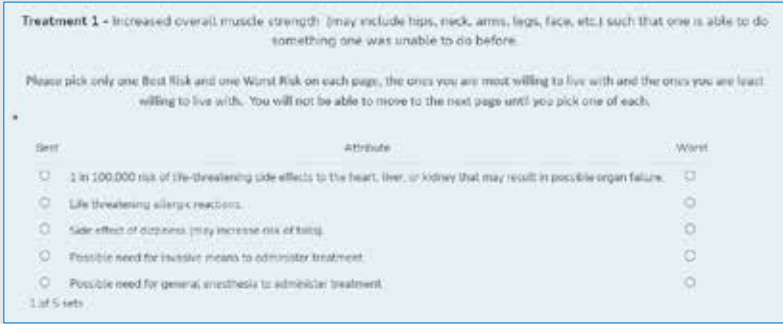
In the 2022 Cure SMA Risk/Benefit Survey, we asked individuals with SMA and their caregivers how willing they were to live with certain possible treatment risks in exchange for certain potential treatment benefits. We then compared the survey results to those from a similar 2017 survey. The survey results showed that the SMA community remains willing to tolerate a range of possible treatment risks in exchange for a variety of potential treatment benefits. These findings suggest that there are still important unmet SMA treatment needs.

WHAT WE DID

One of Cure SMA's top priorities is to relay the SMA community's treatment experiences and preferences to the FDA so the organization can make patient-centered decisions about new SMA drugs. In 2022, we carried out the Cure SMA Risk/Benefit Survey to learn about the SMA community's current views on treatment risks and benefits. We compared these results with those from a [similar survey](#) we conducted in 2017 to determine if community perspectives have changed as more treatment options have become available.

HOW WE DID IT

In the fall of 2022, we emailed community members with an invitation to participate in the Cure SMA Risk/Benefit Survey. The email contained a link to an online survey. In the survey, respondents were asked how willing they were to live with 11 different SMA treatment risks in exchange for the possibility of certain treatment benefits. Survey questions were structured like the example below (Figure 1).



Treatment 1 - Increased overall muscle strength (may include hips, neck, arms, legs, face, etc.) such that one is able to do something one was unable to do before.

Please pick only one Best Risk and one Worst Risk on each page, the ones you are most willing to live with and the ones you are least willing to live with. You will not be able to move to the next page until you pick one of each.

Best	Attribute	Worst
<input type="radio"/>	1 in 100,000 risk of life-threatening side effects to the heart, liver, or kidney that may result in possible organ failure.	<input type="radio"/>
<input type="radio"/>	Life-threatening allergic reactions.	<input type="radio"/>
<input type="radio"/>	Side-effect of dizziness (may increase risk of falls).	<input type="radio"/>
<input type="radio"/>	Possible need for invasive means to administer treatment.	<input type="radio"/>
<input type="radio"/>	Possible need for general anesthesia to administer treatment.	<input type="radio"/>

1 of 5 sets

Figure 1. Sample survey question.

Over the course of two months, we received 298 completed surveys. The surveys were completed either by individuals with SMA or by the caregivers of individuals with SMA. Survey respondents had to be at least 18 years old and reside within the U.S.

We combined survey responses and analyzed the data for trends in “risk tolerance,” which is the willingness to live with treatment risks in exchange for the possibility of treatment benefits. We wanted to understand which treatment risks the overall group of survey respondents were most and least willing to live with. We also wanted to know if risk tolerance varied between people with different types of SMA.

WHAT WE LEARNED

Survey Respondent Demographics

Demographic characteristics (or “demographics”) are traits that describe people within a group or population. When Cure SMA conducts a survey, we collect demographic information such as age, SMA type, and SMN2 copy number from survey respondents. These demographics help us understand the factors that shape the unique perspectives and lived experiences of people with SMA.

Key Takeaways

- In 2022, Cure SMA conducted the Cure SMA Risk/Benefit Survey.
- The goals of the survey were:
 - to understand the SMA community's current views on treatment risks and benefits.
 - to compare the results with a similar survey Cure SMA conducted in 2017.
 - to relay these findings to the FDA.
- We learned that people with SMA of all ages, and their caretakers, are willing to live with a range of potential side effects in exchange for a variety of possible treatment benefits.
- We also found that the type of SMA a person has may affect how willing they are to live with certain potential treatment side effects.
- The 2022 survey results were very similar to those of the 2017 survey.
- These findings suggest that there are still important unmet treatment needs for people with SMA.
- Cure SMA will present a summary of these survey results to the FDA to help inform decisions related to SMA drug development and approval.

At the beginning of the Cure SMA Risk/Benefit Survey, we asked demographic questions that could help us learn important information about who we were hearing from. For example, we found that among survey respondents, the age of people with SMA ranged from less than one year to older than 65 years (Figure 2). About 40% percent of those with SMA were infants and children, and the remaining 60% were teens and adults.

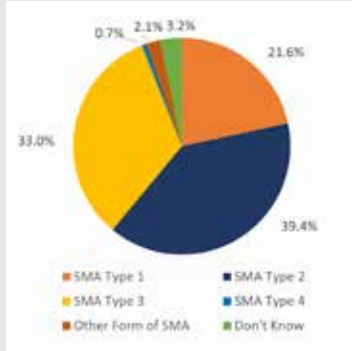


Figure 3. SMA type of individuals who responded to the survey, or whose caregiver responded.

We also discovered that SMA Type 2 was the most common SMA type among those who had responded to the survey, or whose caregivers had responded (Figure 3). Slightly fewer people had SMA Type 3, and even fewer had SMA Type 1. Less than 1% of people with the disease had SMA Type 4, and a very small percentage of individuals either had another form of SMA or did not know which type they had.

Finally, we found that almost one-third of people with SMA or their caregivers did not know their SMN2 copy number (Figure 4). Of those who did know, the majority had an SMN2 copy number of 3. Fewer people had an SMN2 copy number of 2 or 4, and just over 2% of people had a copy number of 1.

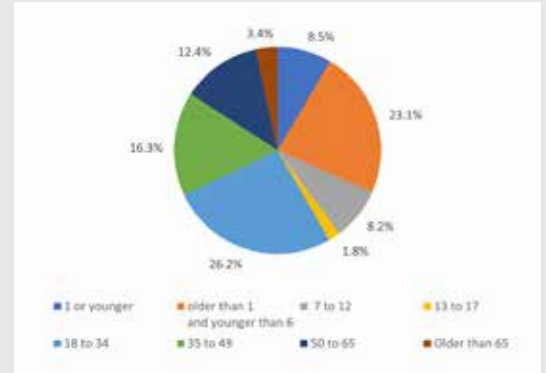


Figure 2. Age (in years) of individuals with SMA who responded to the survey, or whose caregiver responded.

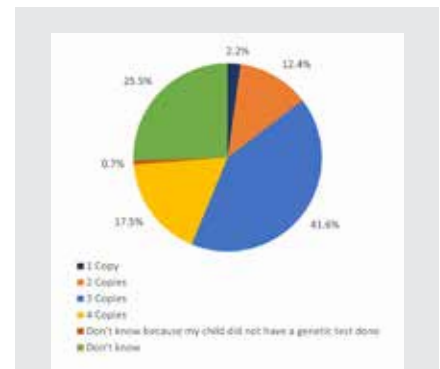


Figure 4. SMN2 copy number of individuals who responded to the survey, or whose caregiver responded.

SMA Treatment Risks

Respondents were generally most willing to live with these treatment risks	▲	Common side effects such as nausea, vomiting, loss of appetite, headaches, back pain, fatigue, etc.
	▲	Side effect of dizziness (may increase risk of falls).
	▲	Possible need for general anesthesia to administer treatment.
	▲	Possible need for invasive means to administer treatment (e.g., infusion, injections (using a needle) into veins, spinal canal, etc.).
Respondents were generally least willing to live with these treatment risks	▲	1 in 100,000 risk of serious side effects to the heart, liver, or kidney that may affect normal organ functioning and therefore require immediate medical attention.
	▲	Increased risks of respiratory or other infections as a result of medication.
	▲	1 in 100,000 risk of life-threatening side effects to the heart, liver, or kidney that may result in possible organ failure.
	▲	1 in 1,000 risk of serious side effects to the heart, liver, or kidney that may affect normal organ functioning and therefore require immediate medical attention.
	▲	Life-threatening allergic reactions.
	▲	1 in 1,000 risk of life-threatening side effects to the heart, liver, or kidney that may result in possible organ failure.
	▲	Worsening in "quality of life" (possibly due to drug's side effects, worsening condition, etc.).

Table 1. Survey respondents were asked how willing they would be to live with each of the above 11 treatment risks in exchange for the possibility of a range of potential treatment benefits.

Treatment Risk Tolerance

Next, we asked respondents how willing they were to live with each of 11 different potential SMA treatment risks in exchange for a variety of possible treatment benefits. We found that overall, respondents were most likely to be willing to live with four specific treatment risks (top four risks, Table 1). Likewise, we found that survey respondents were generally least likely to be willing to live with three specific treatment risks (bottom three risks, Table 1).

We then analyzed survey responses to determine if there was a relationship between the type of SMA respondents or the person in their care had and how willing they were to live with certain treatment risks. We discovered that respondents were slightly more or less willing to live with some risks depending on which type of SMA they or the person in their care had (Table 2). For example, persons with SMA Type 1 and their caregivers were more likely than SMA Type 2 and 3 respondents to be willing to live with the “side effect of dizziness, which may increase the risk of falls.”

Most Willing to Live With		
Type 1 (22%)	Type 2 (39%)	Type 3 (33%)
1. Side effect of dizziness (may increase risk of falls)	1. Common side effects such as nausea, vomiting, loss of appetite, headaches, back pain, fatigue, etc.	1. Common side effects such as nausea, vomiting, loss of appetite, headaches, back pain, fatigue, etc.
2. Common side effects such as nausea, vomiting, loss of appetite, headaches, back pain, fatigue, etc.	2. Side effect of dizziness (may increase risk of falls)	2. Possible need for general anesthesia to administer treatment
3. Possible need for general anesthesia to administer treatment	3. Possible need for invasive means to administer treatment [e.g., infusion, injections (using a needle) into veins, spinal canal, etc.]	3. Possible need for invasive means to administer treatment [e.g., infusion, injections (using a needle) into veins, spinal canal, etc.]
Least Willing to Live With		
Type 1 (22%)	Type 2 (39%)	Type 3 (33%)
1. Worsening in “quality of life” (possibly due to drug’s side effects, worsening condition, etc.)	1. Worsening in “quality of life” (possibly due to drug’s side effects, worsening condition, etc.)	1. 1 in 1,000 risk of life-threatening side effects to the heart, liver, or kidney that may result in possible organ failure
2. 1 in 1,000 risk of life-threatening side effects to the heart, liver, or kidney that may result in possible organ failure	2. 1 in 1,000 risk of life-threatening side effects to the heart, liver, or kidney that may result in possible organ failure	2. Worsening in “quality of life” (possibly due to drug’s side effects, worsening condition, etc.)
3. Life-threatening allergic reactions	3. Life-threatening allergic reactions	3. Life-threatening allergic reactions

Table 2. Treatment risk rankings by SMA type of affected individual.

Comparison with the 2017 Results

The 2022 Cure SMA Risk/Benefit Survey results were generally very similar to the 2017 survey results. However, there were a few exceptions:

- The general population of 2022 respondents were less likely to be willing to live with the “possible need for invasive means to administer treatment [e.g., infusion, injections (using a needle) into veins, spinal canal, etc.]” than was the general population of 2017 respondents.
- In 2022, SMA Type 1 respondents and their caregivers were much less likely to be willing to live with the possibility of “life-threatening allergic reactions” for the potential treatment benefit of “improvement in the ability to communicate” than were SMA Type 1 respondents in 2017.
- In 2022, SMA Type 2 respondents and their caregivers were somewhat more likely to be willing to live with the possibility of “life-threatening allergic reactions” for the potential treatment benefit of “lessening of symptoms’ severity (decrease in, tremors, muscle weakness, etc.)” than were SMA Type 2 respondents in 2017.

WHY IT MATTERS

The 2022 Cure SMA Risk/Benefit Survey results show that people with SMA and their caregivers are still willing to live with many different treatment risks in exchange for a variety of possible treatment benefits. In addition, we found that the type of SMA an individual has may affect his/her/their risk tolerance. Together these findings suggest that there are still unmet treatment needs in the SMA community, and that these needs may vary based on demographic factors like SMA type. Cure SMA will relay this important information to the FDA in hopes that it will support patient-centered decision making around SMA drug development and approval.

ABOUT THE SMA INDUSTRY COLLABORATION

The [Cure SMA Industry Collaboration](#) (SMA-IC) was established in 2016 to leverage the experience, expertise, and resources of pharmaceutical and biotechnology companies, as well as other nonprofit organizations involved in the development of spinal muscular atrophy (SMA) therapeutics to more effectively address a range of scientific, clinical, and regulatory challenges. Current members include Cure SMA, Biogen, Scholar Rock, Novartis Gene Therapies, Biohaven Pharmaceuticals, Epirium Bio, Genentech/Roche, and SMA Europe. Funding for this research was provided by the 2022 SMA-IC; members include Cure SMA, Biogen, Genentech/Roche, Scholar Rock, Novartis Gene Therapies, Biohaven Pharmaceuticals, Epirium Bio, and SMA Europe.