CMA, Inc. Survey Four: Migraine Triggers,
Symptoms, & Comorbid Conditions

Chronic Migraine Awareness (CMA), Inc., is conducting a series of surveys on the migraine experience. The purpose of the survey series is to inform CMA, Inc. partners, sponsors, volunteers, and the public about various steps in the journey of people with migraine. For each survey, participants are recruited via a web link posted across all CMA, Inc. social media platforms. CMA and its volunteers share the link through posts to various social media outlets.

This survey was our fourth; data were collected from August 19, 2020 through September 16, 2020. This survey asked about respondents' various triggers for migraine attacks, migraine treatments, and conditions people were diagnosed with other than migraine. Specifically, questions covered:

- triggers of migraine attacks,
- most bothersome migraine symptom,
- effectiveness of *acute* treatment(s) at treating *most bothersome* migraine symptom (rating, time),
- effectiveness of *acute* treatment(s) at treating most *all* migraine symptoms (rating),
- effectiveness of *preventive* treatment(s) at treating most *all* migraine symptoms (rating), and
- other *diagnosed* conditions.

Each survey includes some basic demographic questions, as well as a question that aims to measure whether a person experiences chronic or episodic migraine. The latter measure simply asks on how many days the respondent had a headache or migraine attack in the last *month*; it is not aligned with the International Classification of Headache Disorders definition of migraine or chronic migraine. These demographic questions not only provide context for comparing the samples across the survey series, but also allow us to explore differences in responses to questions about the migraine experience.

Sample Demographics

A total of 245 responses were received on the fourth survey. Approximately 68% of respondents reported 15 or more headache or migraine days in the previous month (chronic) (**Table 1**). The mean number of days reported was 20 (*sd* = 9.41). A majority of the sample was 40 years old or older: about 35% were 40-49, 21% were 50-59, and 13% were 60 years old or older. Only about 8% were less than 30 years (**Table 1**). The vast majority of respondents were female (94%), with only 4% male, and other categories too few to report.

Of those who answered, 28% reported a total income of less than $25,000 in the previous year, 27% reported $25,000 to $49,999, 24% reported $50,000 to $99,000, 13% reported $100,000 to $149,999, and 7% reported a total income of $150,000 or greater (**Table 1**).

Table 1. Sample Demographics

	Count	Percentage
Migraine Frequency[1]		
Episodic	77	31.6
Chronic	167	68.4
Age		
Less than 30 years old	20	8.4
30-39 years old	53	22.4
40-49 years old	83	35.0
50-59 years old	50	21.1
60 years old or older	31	13.1
Gender		
Female	223	94.1
Male	9	3.8
Gender variant/non-binary	#	#
Other	#	#
Total Annual Household Income		
Less than $25,000	54	28.4
$25,000 to $49,999	52	27.4
$50,000 to $99,999	46	24.2
$100,000 to $149,000	24	12.6
$150,000 or more	14	7.4

[1] Defined as 15 or more headache or migraine days in last month.

Too few to report.

The demographics of this sample should be considered in making generalizations to the larger population of people with migraine. Any comparisons of findings between surveys should also take into account a comparison of the demographics across surveys.[1]

Treatments: Univariate Analysis

Respondents were asked how well they could identify the triggers of their migraine attacks before they were asked specifically about those triggers. The majority (87%) said they could identify all or some of their triggers. An additional 7% thought they had triggers but couldn't identify any of them, and about 6% reported no migraine triggers (**Table 2**).

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[1] See table A1 for comparison of demographics across all CMA surveys.

Those who reported the ability to identify all or some of their migraine triggers were asked a follow-up question about their specific migraine attack triggers. People could select multiple from the list of options. The top three categories of identified triggers were: weather (87%), sensory triggers like lights, sounds, or smells (84%), and stress (81%). Caffeine[2] was the least often reported of those listed (**Table 2**). Of the twelve *categories* of listed triggers, excluding "other" and the write-ins, respondents reported an average of 6.8 *categories* of triggers.

Table 2. Migraine Triggers and How Well Respondents Can Identify

	Count	Percentage
How well respondents can identify migraine triggers		
I know and can identify all my migraine triggers	41	16.8
I have migraine triggers and can identify some	171	70.1
I have migraine triggers, but can't identify any	18	7.4
I don't have any migraine triggers	14	5.7
Report triggers: Among those who have and can identify at least some[1]		
Weather (e.g., pressure, temperature, etc.)	181	87.0
Sensory triggers (e.g., lights, sounds, smells)	174	83.7
Stress	169	81.3
Sleep (e.g., too much or too little)	166	79.8
Dehydration	132	63.5
Hunger or skipped meals	125	60.1
Foods or food additives	118	56.7
Menstruation or hormonal changes	101	48.6
Exercise or exertion	92	44.2
Alcohol	85	40.9
Medications	40	19.2
Caffeine	37	17.8
Other[2]	17	8.2

[1] On this item, respondents could check all that apply. There were a total of 208 people with valid data. Totals will sum to (n) > 208 and (%) > 100%.

[2] Some responses were recoded into the existing survey categories and removed from the "other" count. The remaining could not be categorized and remain in this "other" category.

We also asked respondents to report their most bothersome migraine symptom. The majority reported head pain as their most bothersome symptom (MBS) (62%), followed by nausea or vomiting (7%), cognitive impairment (6%), and dizziness or vertigo (5%) (**Table 3**). A handful reported neck pain and light or sound sensitivity. All other symptoms were reported most bothersome by too few respondents.

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[2] We did not specify "too much" or "too little" caffeine.

Table 3. Most Bothersome Migraine Symptom

Symptom[1]	Count	Percentage
Head pain	148	61.9
Nausea/vomiting	17	7.1
Cognitive impairment	15	6.3
Dizziness/vertigo	13	5.4
Neck pain	8	3.3
Sound sensitivity	7	2.9
Light sensitivity	6	2.5
Other	6	2.9

[1] Too few respondents reported aura, fatigue, sensitivity to smell, numbness or tingling, mood changes, weakness, diarrhea or constipation to include in the table.

Of those who reported using an acute treatment for migraine (n = 224), respondents were split on their effectiveness at treating their MBS. About 39% reported that their acute migraine treatments were "very effective" or "moderately effective," 30% reported "somewhat effective," but 31% reported "not very effective" or "not at all effective" (**Table 4**). Just over half of those respondents reported their acute migraine treatments treated their MBS in less than three hours (51%), while the other half reported that it took three hours or more (49%).

Table 4. Among Those Who Use Migraine Treatments, *Acute* Treatment Effectiveness

Treatment effectiveness	Count	Percentage
Effectiveness of *acute* migraine treatments for your MBS		
Very effective	29	12.9
Moderately effective	58	25.9
Somewhat effective	68	30.4
Not very effective	45	20.1
Not at all effective	24	10.7
Time it takes for *acute* migraine treatment to relieve your MBS		
Less than 1 hour	21	9.4
1-2.9 hours	94	42.0
3-5.9 hours	55	24.6
6 hours or more	54	24.1
Effectiveness of *acute* migraine treatments for *all* your migraine symptoms		
Very effective	18	8.1
Moderately effective	50	22.4
Somewhat effective	72	32.3
Not very effective	53	23.8
Not at all effective	30	13.5

Table 4. Among Those Who Use Migraine Treatments, *Preventive* Treatment Effectiveness, Continued

Treatment effectiveness	Count	Percentage
Effectiveness of *preventive* migraine treatments for your migraine disease		
Very effective	7	3.6
Moderately effective	47	24.1
Somewhat effective	63	32.3
Not very effective	47	24.1
Not at all effective	31	15.9

MBS = Most bothersome symptom.

When asked how well their acute migraine treatments worked on *all migraine symptoms,* respondents were also split: about 30% reported their acute treatments were "very effective" or "moderately effective," 32% reported "somewhat effective," but 37% reported "not very effective" or "not at all effective" (**Table 4**).

We closed this series of questions by asking respondents how effective their *preventive* migraine treatments were at treating the migraine disease in general. Among those who reported using a preventive treatment, 40% percent of respondents said "not very effective" or "not at all effective" (**Table 4**).

In the final set of questions, we wanted to measure migraine comorbidities. First, we asked broadly whether respondents had been diagnosed with a condition other than migraine: 69% reported "yes" (n = 166) (**Table 5**).

We followed up with a question that attempted to capture the major disease categories of these other conditions to the best of respondents' knowledge. In addition to several provided categories, this question included an "other, write-in" option. The analysts reviewed these responses; they recoded any that could be placed into one of the existing categories, created new categories for any with responses > 5 (e.g., pulmonological), and the rest were left as "other." Since respondents could check all that apply, totals will sum to more than 166 (n) and 100%.

Among those who reported a condition other than migraine, the majority listed a mental health condition (70%). Nearly half (47%) reported a musculoskeletal condition and the next most common were gastroenterological (46%) and other neurological (41%) conditions. Of the nine survey categories of comorbid conditions, excluding other and the write-ins (e.g., pulmonological), respondents reported an average of 3.7 *categories* of conditions other than migraine (**Table 5**).

Table 5. Percentage of Respondents with a Condition Other than Migraine and Category of Reported Condition(s)

Condition	Count	Percentage
Diagnosed with condition other than migraine[1]		
Yes	166	69.2
No	74	30.8
Among those diagnosed with a condition other than migraine, category of reported condition:[2]		
Mental health	117	70.5
Musculoskeletal	78	47.0
Gastroenterological	77	46.4
Other neurological	68	41.0
Endocrine	64	38.6
Otolaryngological/respiratory	59	35.5
Vascular/cardiovascular	54	32.5
Rheumatological	54	32.5
Gynecological	40	24.1
Pulmonological	*7*	*4.2*
Other	28	16.9

[1] Three people reported having a condition other than migraine, but did not check any of the supplied categories or provide an "other" type of condition. They remain in this count under the assumption they did not want to report their other condition(s).
[2] On this item, respondents could check all that apply. There were a total of 166 people with valid data. Totals will sum to (n) > 166 and (%) > 100%.

Treatments: Bivariate Analysis

For the remainder of the report, we broke respondents' answers down by their migraine frequency (episodic or chronic) or age. First, we compared the responses to how well people could identify their triggers and found no notable difference in the distribution by migraine frequency. The distribution in respondents' ability to discern their migraine attack triggers was similar across those with episodic and chronic migraine (**Table 6**).

Table 6. How Well People Can Identify Their Migraine Triggers, by Migraine Frequency

	Migraine Frequency (%)	
	Episodic	Chronic[1]
How well respondents can identify migraine triggers		
I know and can identify all my migraine triggers	19.5	15.7
I have migraine triggers and can identify some	72.7	69.3
I have migraine triggers, but can't identify any	5.2	7.8
I don't have any migraine triggers	2.6	7.2

[1] Defined as 15 or more headache or migraine days in last month.

That said, t-tests indicated that people who were categorized as chronic reported, on average, one more *category* of triggers (from the 12 listed on the survey). Exclusive of "other" and the write-ins, people with episodic migraine reported 6.1 *categories* and people with chronic migraine reported 7.2 *categories* of listed migraine triggers ($p < 0.01$).

Differences in the distribution of responses to questions about acute and preventive migraine treatment effectiveness emerged when comparing groups by migraine frequency. On average, chi-square tests indicate that people who were episodic appear to find their acute and preventive migraine treatments more effective than people who were chronic (all $p < 0.001$). Similarly, people who were episodic reported that their acute migraine treatments worked faster at relieving their MBS ($p < 0.01$) (**Table 7**).

Table 7. Acute and Preventive Migraine Treatment Effectiveness, by Migraine Frequency

Treatment Effectiveness	Migraine Frequency (%)	
	Episodic	Chronic[1]
Effectiveness of acute migraine treatment(s) for MBS***		
Very effective	30.0	5.2
Moderately effective	38.6	20.1
Somewhat effective	17.1	36.4
Not very effective	11.4	24.0
Not at all effective	#	14.3
Average time for acute migraine treatment(s) to relieve MBS**		
Less than 1 hour	14.1	7.7
1 to 2.9 hours	53.5	36.1
3 to 5.9 hours	18.3	27.1
6 hours or longer	14.1	29.0
Effectiveness of acute migraine treatment(s) for all symptoms***		
Very effective	21.4	#
Moderately effective	28.6	19.6
Somewhat effective	28.6	34.0
Not very effective	17.1	26.8
Not at all effective	#	17.6
Effectiveness of preventive migraine treatment(s)***		
Very effective	12.3	#
Moderately effective	43.9	15.9
Somewhat effective	33.3	31.9
Not very effective	#	30.4
Not at all effective	#	21.7

[1] Defined as 15 or more headache or migraine days in last month.
Note: MBS = most bothersome symptom.
** $p < 0.05$
*** $p < 0.01$

Analyses showed that older respondents found their acute and preventive migraine treatments more effective, on average (chi-square tests, all $p < 0.01$). However, we caution that small numbers of respondents in the 60 years old and older category might make these analyses unreliable.

Table 8. Acute and Preventive Migraine Treatment Effectiveness, by Age

	Age (%)			
Treatment Effectiveness	< 40 yrs	40−49 yrs	50−59 yrs	60 yrs or >
Effectiveness of acute migraine treatment(s) for MBS***				
Very/moderately effective	28.8	29.0	52.0	62.1
Somewhat effective	39.4	34.2	26.0	#
Not very/not at all effective	31.8	36.8	22.0	31.0
Effectiveness of acute migraine treatment(s) for all symptoms***				
Very/moderately effective	15.2	26.3	40.8	58.6
Somewhat effective	42.4	26.3	36.7	#
Not very/not at all effective	42.4	47.4	22.5	24.1
Effectiveness of preventive migraine treatment(s)***				
Very/moderately effective	16.7	22.5	43.2	50.0
Somewhat effective	43.3	33.8	24.3	#
Not very/not at all effective	40.0	43.7	32.4	41.7

Note: Some previously reported categories were collapsed due to small numbers of respondents. MBS = most bothersome symptom.

Too few cases to report.

*** $p < 0.01$

Finally, we explore the frequency of other reported conditions by migraine frequency, but comparisons showed no differences. **Table 9** shows the distribution of other conditions between episodic and chronic respondents; the absence of a relationship is counter to prior research that has found higher rates of certain comorbidities in those with chronic migraine compared to episodic migraine.*

Table 9. Other Conditions than Migraine, by Migraine Frequency

	Migraine Frequency (%)	
	Episodic	Chronic[1]
Condition reported other than migraine		
Yes	64.0%	71.5%
No	36.0%	28.5%

[1] Defined as 15 or more headache or migraine days in last month.

Discussion

Triggers. The majority of respondents in this survey said they could identify all or some of their triggers. The top three categories of identified triggers were: weather, sensory triggers like lights, sounds, or smells, and stress. These were all reported by more than 80% of those who reported they could identify their migraine triggers.

There were no differences in how well respondents with episodic versus chronic migraine reported being able to identify their migraine triggers; however, those with chronic migraine reported slightly more categories of migraine triggers, on average.

Symptoms & treatments. By far, head pain was the most common MBS, reported by a majority of respondents. However, respondents were split on their effectiveness at treating their MBS. With acute migraine treatments, roughly equal proportions reported that their acute migraine treatments were "very/moderately effective" versus "somewhat effective" versus "not very/not at all effective." Just over half of those using acute migraine treatments reported they were effective at treating their MBS in less than 3 hours, while the other half reported that it took 3 hours or more.

Effectiveness of migraine preventive treatments appeared to be slightly lower; among those who reported using a preventive treatment, about 2 out of 5 respondents said it was "not very or not at all effective" at treating their migraine disease.

People who were episodic appeared to find their acute and preventive migraine treatments more effective than people who were chronic. Those who were episodic also reported that their acute migraine treatments worked faster at relieving their MBS.

Other conditions. We asked respondents whether they had been diagnosed with a condition other than migraine: most reported "yes." The majority of those listed a mental health condition. Nearly half reported a musculoskeletal or gastroenterological condition, and other neurological conditions were also common. Despite literature suggesting that those with chronic migraine experience a higher likelihood of comorbidities, our analyses did not show this; nor did we find any relationship between comorbidities and income or age.

It is worth noting that like the prior CMA, Inc. surveys, the sample is overwhelmingly female and a majority of people seem to have chronic migraine. Given the sampling and recruitment, this is not surprising; however, these rates are higher than what is typically found in population estimates of migraine.[1] While this should be kept in mind for the purposes of generalizability, it also highlights the uniqueness of the sample.

References

* Buse, D. C., Manack, A., Serrano, D., Turkel, C., & Lipton, R. B. (2010). Sociodemographic and comorbidity profiles of chronic migraine and episodic migraine sufferers. *Journal of Neurology, Neurosurgery & Psychiatry*, *81*(4), 428-432.

Appendix: Demographics

In past reports, we have tested for differences in the distribution of demographics across surveys. Since this survey series will continue to grow and differences will be both inevitable and unwieldy to report, we will not be testing for difference going forward. However, we will continue to show the survey demographics for comparison.

Like prior CMA, Inc. surveys, a majority of this fourth survey sample reported "chronic" migraine. For survey 1: mean = 20 days; survey 2: mean = 18 days; survey 3: mean = 19 days; survey 4: mean = 20 days.

Table A1. Comparison of Survey Demographics

	Survey 1	Survey 2	Survey 3	Survey 4
Migraine Frequency				
Episodic	27.6	35.0	32.3	31.6
Chronic[1]	72.4	65.0	67.7	68.4
Age				
Less than 20 years old	2.2	1.9	1.0	0.8
20-29 years old	13.6	12.3	8.0	7.6
30-39 years old	19.3	20.8	19.1	22.4
40-49 years old	35.1	32.5	37.5	35.0
50-59 years old	23.7	23.7	26.0	21.1
60 years old or older	6.1	8.8	8.3	13.1
Gender				
Female	94.3	95.9	93.4	94.1
Male	4.0	3.4	5.6	3.8
Gender variant/non-binary	#	#	#	#
Prefer not to answer	#	#	#	#
Total Annual Household Income				
Less than $25,000	21.2	20.4	18.6	28.4
$25,000 to $49,999	22.8	22.0	21.2	27.4
$50,000 to $99,999	34.9	27.1	30.1	24.2
$100,000 to $149,000	12.2	18.8	16.9	12.6
$150,000 or more	9.0	11.8	13.1	7.4

[1] Defined as 15 or more headache or migraine days in last month.
Too few cases to report.

Figure A1. Comparison of Survey Demographics