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WHITE PAPER

Spotlight on Eating Disorders

An Analysis of Private Healthcare Claims

A FAIR Health White Paper, November 15, 2023

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Summary

Eating disorders are a diverse group of mental health conditions associated with severe disturbances in eating behaviors. In this white paper, FAIR Health delves into its repository of over 43 billion private healthcare claim records—the largest such database in the nation—to shed new light on eating disorders from 2018 to 2022. The study examines changes in the percentage of claim lines for eating disorders over time at national and regional levels, as well as states, age and gender, places of service, specialties and co-occurring mental health conditions.[1] Among the key findings:

- From 2018 to 2022, eating disorder claim lines increased 65 percent nationally as a percentage of all medical claim lines. All eating disorders studied increased during this period, but at different rates: avoidant/restrictive food intake disorder (ARFID) by 305 percent, binge-eating disorder by 81 percent, anorexia nervosa (anorexia) by 73 percent and bulimia nervosa (bulimia) by 3 percent. To put ARFID's greater increase in context, its diagnosis code was introduced relatively recently (in 2017) and it rose from a lower base than the other disorders.
- In 2022, binge-eating disorder was the eating disorder most commonly diagnosed without other accompanying eating disorders; 24.3 percent of all eating disorder patients were diagnosed with binge-eating disorder as the only eating disorder. This was closely followed by anorexia only, which accounted for 24.1 percent. Bulimia, without any other eating disorder, accounted for 6.2 percent of all eating disorder patients, and ARFID for 5.3 percent. Multiple eating disorders were diagnosed in 10.1 percent of patients.
- The increase in eating disorder claim lines as a percentage of all medical claim lines varied by US census region from 2018 to 2022. The largest increase was in the South (84 percent), where eating disorders accounted for the lowest percentages of medical claim lines among all regions in both 2018 and 2022. The smallest increase was in the Northeast (51 percent), where eating disorders accounted for the highest percentage of medical claim lines in 2018, but the second highest percentage in 2022, when the West had the highest percentage.
- In 2022, eating disorder claim lines as a percentage of all medical claim lines varied by state. The top five states, highest to lowest, were all states in northern latitudes: Rhode Island, Massachusetts, Minnesota, Montana and Oregon. The bottom five states, lowest to highest, were all states in southern latitudes: Mississippi, Arkansas, Louisiana, New Mexico and West Virginia.
- From 2018 to 2022, the age distribution of eating disorder claim lines changed. The largest share in 2018 was accounted for by the age group 19-24 and the second largest by the age group 14-18; in 2022, those positions were reversed, with the largest share associated with individuals 14-18 and the second largest with those 19-24.
- Different eating disorders had different age distributions in the period 2018-2022. For example, ARFID was the eating disorder that most affected the youngest age groups (0-9 and 10-13), while binge-eating disorder most affected older age groups (31-40, 41-50 and 51-65).
- In every year from 2018 to 2022, females accounted for more than 89 percent of eating disorder claim lines, compared to less than 11 percent for males. In 2022, the age group 0-9 was the only age group that had more males than females associated with eating disorder claim lines. Gender disparities for specific eating disorders in 2022 ranged from 94 percent female, 6 percent male, for anorexia to 68 percent female, 32 percent male, for ARFID.
- Telehealth utilization for treatment of eating disorders increased by over 10,000 percent from 2018 to 2022, making telehealth the most common place of service for eating disorders in 2022.

[1] A claim line is an individual service or procedure listed on an insurance claim.

During the same period, office-based healthcare utilization for eating disorders fell by 55 percent, and offices declined from the number one place of service in 2018 to number two in 2022.

- Among the top 10 specialties treating patients with eating disorders, the greatest increase from 2018 to 2022 was for services by psychiatric nurses, which rose by 108 percent. This increase was part of a larger trend of increases in the percentage of services for eating disorders rendered by nonphysician professionals.
- Patients with eating disorders in the period 2018-2022 were over five times as likely to have a mental health condition (that was not an eating disorder) and over four times as likely to have a substance use disorder as all patients who received medical services.
- In the period 2018-2022, 72 percent of patients with eating disorders were also diagnosed with one or more co-occurring mental health conditions that were not eating disorders. This ranged from 65 percent of ARFID patients to 78 percent of bulimia patients, the highest such percentage with one or more co-occurring mental health conditions. Over 20 percent of patients with eating disorders also had a substance use disorder.
- Forty-one percent of patients with an eating disorder also had a diagnosis for generalized anxiety disorder, and 39 percent had a diagnosis for major depressive disorder. They are not exclusive categories; one person could have both diagnoses.

Background

Eating disorders are a diverse group of mental health conditions associated with severe disturbances in eating behaviors.[2] They are serious illnesses that elevate mortality risk[3] and have become increasingly prevalent over the past 50 years.[4] Common eating disorders include anorexia nervosa (anorexia), bulimia nervosa (bulimia), binge-eating disorder and avoidant/restrictive food intake disorder (ARFID).[5] These are often characterized by a distorted body image (although ARFID typically is not), food/calorie restriction and/or excessive consumption, with potential compensatory behaviors, such as intense exercise or purging behaviors.[6] Anorexia has among the highest mortality rates of all psychiatric conditions[7,8,9] and resultant malnutrition from any eating disorder can lead to multiple physical health concerns, including low body mass index,[10] cardiovascular complications[11] and compromised bone health.[12] In addition, eating

[2] "Eating Disorders," National Institute of Mental Health (NIMH), last reviewed January 2023, https://www.nimh.nih.gov/health/topics/eating-disorders.
[3] Frédérique R. E. Smink, Daphne van Hoeken and Hans W. Hoek, "Epidemiology of Eating Disorders: Incidence, Prevalence and Mortality Rates," *Current Psychiatry Reports* 14, no. 4 (August 2012): 406-14, https://doi.org/10.1007/s11920-012-0282-y.
[4] Janet Treasure, Tiago Antunes Duarte and Ulrike Schmidt, "Eating Disorders," *The Lancet* 395, no. 10227 (March 14, 2020): 899-911, https://doi.org/10.1016/S0140-6736(20)30059-3.
[5] "Eating Disorders," NIMH.
[6] "Information by Eating Disorder," National Eating Disorders Association (NEDA), 2022, https://www.nationaleatingdisorders.org/information-eating-disorder.
[7] W. S. Agras, "The Consequences and Costs of the Eating Disorders," *Psychiatric Clinics of North America* 24, no. 2 (June 2001): 371-79, https://doi.org/10.1016/s0193-953x(05)70232-x.
[8] Smink et al., "Epidemiology of Eating Disorders."
[9] Patrick F. Sullivan, "Mortality in Anorexia Nervosa," *American Journal of Psychiatry* 152, no. 7 (July 1995): 1073-74, https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=d6f93ef295621a765281f675af63e3325d9e4d54.
[10] Katie M. O'Brien et al., "Predictors and Long-Term Health Outcomes of Eating Disorders," *PLoS ONE* 12, no. 7 (July 10, 2017): e0181104, https://doi.org/10.1371/journal.pone.0181104.
[11] Rebecka Peebles and Erin H. Sieke, "Medical Complications of Eating Disorders in Youth," *Child and Adolescent Psychiatric Clinics of North America* 28, no. 4 (2019): 593-615, https://doi.org/10.1016/j.chc.2019.05.009.
[12] Lauren Robinson, Nadia Micali and Madhusmita Misra, "Eating Disorders and Bone Metabolism in Women," *Current Opinion in Pediatrics* 29, no. 4 (August 2017): 488-96, https://doi.org/10.1097/MOP.0000000000000508.

disorders can have significant long-term negative influences on socioeconomic achievement. For example, they may lead to lower educational attainment,[13] lower personal income and odds of owning a home[14] and higher healthcare costs than the general population.[15]

Despite these negative outcomes, eating disorders have remained undertreated.[16] A proposed federal rule, issued in 2023 to amend regulations implementing the Mental Health Parity and Addiction Equity Act of 2008, confirmed that eating disorders are a mental health condition; therefore, according to the proposed rule, a health plan's coverage for eating disorders must be at parity with its coverage for medical-surgical treatment.[17]

Existing research has revealed that eating disorders frequently appear during adolescence and young adulthood.[18] These disorders have also been associated more with females than males.[19] Yet studies highlighting the underdiagnosis of males with eating disorders[20,21] and their presence among adults, including older adults,[22] have shown that they are not restricted to specific sociodemographic characteristics.[23] In addition, psychiatric comorbidities can complicate diagnosis and treatment.[24] A systematic literature review found common psychiatric comorbidities included depression, anxiety, attention-deficit/hyperactivity disorder, obsessive-compulsive disorder and personality disorders.[25]

The COVID-19 pandemic exacerbated eating disorders; inpatient stays associated with eating disorders increased when compared with other behavioral health conditions,[26] and hospital admissions among pediatric patients were particularly inflated.[27] Moreover, the pandemic may have contributed to otherwise healthy people developing eating disorder symptoms.[28] Reasons for the intensification of disordered

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[13] Millie Maxwell et al., "Life beyond the Eating Disorder: Education, Relationships, and Reproduction," *International Journal of Eating Disorders* 44, no. 3 (April 2011): 225-32, https://doi.org/10.1002/eat.20804.
[14] Jennifer Tabler and Rebecca L. Utz, "The Influence of Adolescent Eating Disorders or Disordered Eating Behaviors on Socioeconomic Achievement in Early Adulthood," *International Journal of Eating Disorders* 48, no. 6 (September 2015): 622-32, https://doi.org/10.1002/eat.22395.
[15] Daphne van Hoeken and Hans W. Hoek, "Review of the Burden of Eating Disorders: Mortality, Disability, Costs, Quality of Life, and Family Burden," *Current Opinion in Psychiatry* 33, no. 6 (November 2020): 521-27, https://doi.org/10.1097/YCO.0000000000000641.
[16] James I. Hudson et al., "The Prevalence and Correlates of Eating Disorders in the National Comorbidity Survey Replication," *Biological Psychiatry* 61, no. 3 (February 1, 2007): 348-58, https://doi.org/10.1016/j.biopsych.2006.03.040.
[17] Internal Revenue Service, Employee Benefits Security Administration and Centers for Medicare & Medicaid Services, "Requirements Related to the Mental Health Parity and Addiction Equity Act," *Federal Register* 88 FR 51552 (August 3, 2023), https://www.federalregister.gov/documents/2023/08/03/2023-15945/requirements-related-to-the-mental-health-parity-and-addiction-equity-act.
[18] "Eating Disorders," NIMH.
[19] "Eating Disorders," Office of the Assistant Secretary for Health (OASH) Office on Women's Health, last updated September 13, 2022, https://www.womenshealth.gov/mental-health/mental-health-conditions/eating-disorders.
[20] Eric Strother et al., "Eating Disorders in Men: Underdiagnosed, Undertreated, and Misunderstood," *Eating Disorders* 20 (2012): 346-55, https://doi.org/10.1080/10640266.2012.715512.
[21] Hudson et al., "The Prevalence and Correlates of Eating Disorders in the National Comorbidity Survey Replication."
[22] "Eating Disorders in Mid-Life and Beyond," NEDA, 2022, https://www.nationaleatingdisorders.org/eating-disorders-mid-life-beyond.
[23] Tomoko Udo and Carlos M. Grilo, "Epidemiology of Eating Disorders among US Adults," *Current Opinion in Psychiatry* 35, no. 6 (November 2022): 372-78, https://doi.org/10.1097/YCO.0000000000000814.
[24] Simonetta Marucci et al., "Anorexia Nervosa and Comorbid Psychopathology," *Endocrine, Metabolic & Immune Disorders—Drug Targets* 18, no. 4 (2018): 316-24, https://doi.org/10.2174/1871530318666180213111637.
[25] Victoria Arija Val et al., "Characterization, Epidemiology and Trends of Eating Disorders," *Nutrición Hospitalaria* 39, no. 2 (July 21, 2022): 8-15, http://dx.doi.org/10.20960/nh.04173.
[26] David A. Asch et al., "Trends in US Patients Receiving Care for Eating Disorders and Other Common Behavioral Health Conditions before and during the COVID-19 Pandemic," *JAMA Network Open* 4, no. 11 (November 2021): e2134913, https://doi.org/10.1001/jamanetworkopen.2021.34913.
[27] Daniel J. Devoe et al. "The Impact of the COVID-19 Pandemic on Eating Disorders: A Systematic Review," *International Journal of Eating Disorders* 56, no. 1 (January 2023): 5-25, https://doi.org/10.1002/eat.23704.
[28] Monica Shah, Muskaan Sachdeva and Hariclia Johnston, "Eating Disorders in the Age of COVID-19," *Psychiatry Research* 290 (2020): 113122, https://doi.org/10.1016/j.psychres.2020.113122.

eating during the pandemic could include the psychosocial pressure of non-pharmaceutical interventions to reduce COVID-19 transmission, particularly stay-at-home orders.[29,30] In addition, panic buying and the resulting lack of "safe" or routine food items on store shelves may have contributed to relapses in some cases.[31,32] To date, nationally representative data on changes in eating disorder diagnoses and concomitant changes in venues of care and specialty services before and during the pandemic remain somewhat scant.

In this white paper, FAIR Health delves into its repository of over 43 billion private healthcare claim records—the largest such database in the nation—to shed new light on eating disorders from 2018 to 2022. The study examines changes in the percentage of claim lines for eating disorders over time at national and regional levels, as well as states, age and gender, places of service, specialties and co-occurring mental health conditions.

[29] Shah, Sachdeva and Johnston, "Eating Disorders in the Age of COVID-19."
[30] Amy Capetta, "Why the Coronavirus Pandemic Is Triggering Eating Disorders, according to Psychologists," *Good Housekeeping*, November 20, 2020, https://www.goodhousekeeping.com/health/wellness/a34719708/coronavirus-eating-disorders-triggers-issues/.
[31] Rachel McMenemy, "Coronavirus and Eating Disorders: 'I Feel Selfish Buying Food,'" BBC News March 23, 2020, https://www.bbc.com/news/uk-england-51962964.
[32] Capetta, "Why the Coronavirus Pandemic Is Triggering Eating Disorders, according to Psychologists."

Methodology

FAIR Health retrieved all professional and facility claim lines from private health insurance claims in its repository (e.g., CMS-1500 and UB-04) from January 1, 2018, to December 31, 2022, including separately both non-longitudinal and longitudinal data, in which a diagnosis code for eating disorders, as listed in table 1, was present as one of the first four diagnosis codes.

Table 1. ICD-10-CM diagnosis codes for eating disorders

Code	Description	Category
F50.00	Anorexia nervosa, unspecified	Anorexia
F50.01	Anorexia nervosa, restricting type	
F50.02	Anorexia nervosa, binge-eating/purging type	
F50.2	Bulimia nervosa	Bulimia
F50.81	Binge-eating disorder	Binge-eating disorder
F50.82	Avoidant/restrictive food intake disorder (ARFID)	ARFID
F50.9	Eating disorder, unspecified	Other

The category “Other” includes such diagnoses as atypical anorexia nervosa, in which the criteria for anorexia nervosa are met except that the patient’s weight is within or above the normal range; and atypical bulimia nervosa, which exhibits some but not all of the features of bulimia nervosa.

The nonspecific diagnosis code F50.89 was not included. It is used to report such diagnoses as:

- Coprophagia, the compulsive consumption of feces;
- Pica/parorexia, a pathological compulsion to consume unusual foods or nonnutritive substances;
- Psychogenic dysorexia, eating in an atypical way; and
- Psychogenic cyclical vomiting.

The data were analyzed by such variables as year, region, state, age, gender, place of service and specialty. For the final output, places of service 19 and 22 (off-campus and on-campus outpatient hospital) were combined into one place of service (outpatient hospital). Likewise, places of services 02 and 10 (telehealth provided inside and outside patient home) were combined into one place of service (telehealth). Claim lines with modifiers listed in table 2 were recoded as telehealth irrespective of the billed place of service, as these modifiers are inherently telehealth.

Table 2. Telehealth modifiers

Modifier	Description
93	Synchronous telemedicine service rendered via telephone or other real-time interactive audio-only telecommunications system
95	Synchronous telemedicine service rendered via a real-time interactive audio and video telecommunications system
FQ	The service was furnished using audio-only communication technology.
FR	The supervising practitioner was present through two-way, audio/video communication technology.
G0	Telehealth services for diagnosis, evaluation or treatment of symptoms of an acute stroke
GQ	Via asynchronous telecommunications system
GT	Via interactive audio and video telecommunication systems

Additionally, to identify the presence of co-occurring mental health conditions or substance use disorders, FAIR Health retrieved all claim lines for eating disorders in which a mental health condition (that was not an eating disorder) or substance use disorder was present in any diagnosis field on the claim. To identify specific co-occurring mental health conditions, FAIR Health looked at the first six diagnosis codes on the claim line. Conditions were designated as co-occurring if they were present at or after the index date (first date of diagnosis) of the eating disorder. Persons without claim lines for mental health conditions or substance use disorders were assumed not to have those conditions, but it is possible that these individuals had such conditions and it was not diagnosed, or the diagnosis was not included in the eating disorder claim lines.

Limitations

The data used in this report comprise claims data for privately insured patients who are covered by insurers and third-party administrators who voluntarily participate in FAIR Health's data contribution program. Medicare Advantage (Medicare Part C) enrollees from contributing insurers are included, but not participants in Medicare Parts A, B and D.[33] In addition, data from Medicaid, CHIP and other state and local government insurance programs are not included, nor are data collected regarding uninsured patients.

This is an observational report based on the data FAIR Health receives from private payors regarding care rendered to covered patients.

The report was not subject to peer review.

[33] FAIR Health also receives the entire collection of claims for traditional Medicare Parts A, B and D under the Centers for Medicare & Medicaid Services Qualified Entity Program, but those data are not a source for this report.

Results

Overall Findings

From 2018 to 2022, claim lines for eating disorders increased 65 percent nationally as a percentage of all medical claim lines (figure 1). The greatest increase was from 2019 to 2020, the first year of the COVID-19 pandemic, when the percentage of claim lines increased from 0.06 percent in 2019 to 0.08 percent in 2020—a 39 percent rise. The increase from 2018 to 2019 by comparison was just two percent. After the first year of the pandemic, there was a slower rate of increase: from 2020 to 2021, the percentage of eating disorder claim lines rose by 10 percent (from 0.08 to 0.09 percent); from 2021 to 2022, it rose by 6 percent (0.09 to 0.10 percent).

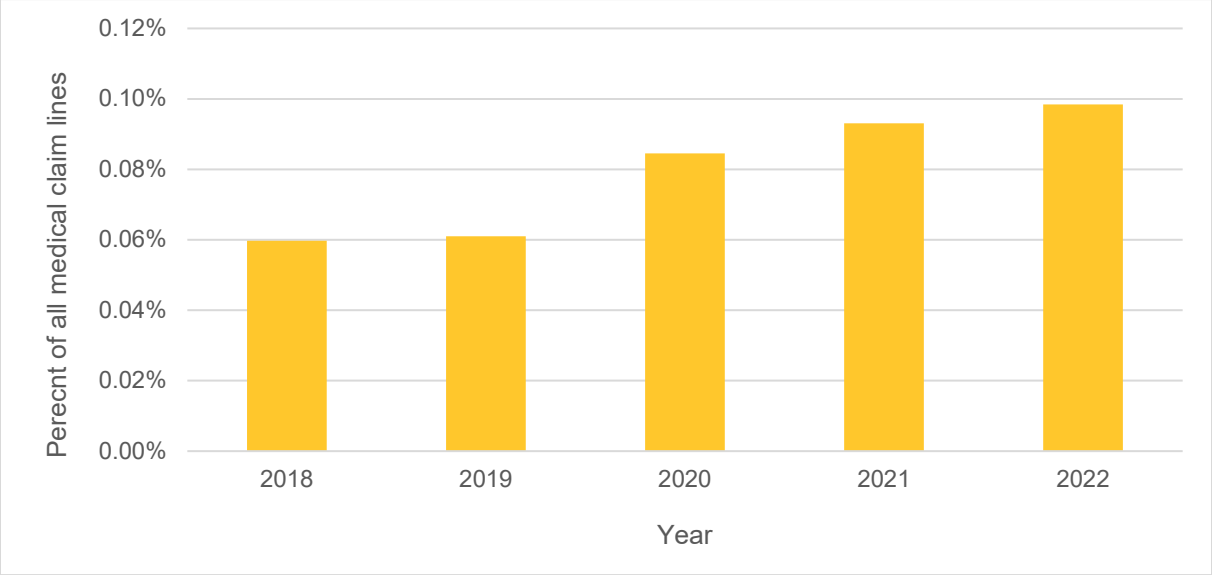

Figure 1. Eating disorder claim lines as a percentage of all medical claim lines, 2018-2022

In addition to analyzing eating disorders as a whole, FAIR Health separated them into five categories:

- *Anorexia* is a condition in which people avoid or severely restrict food; it is accompanied by a distorted body image and the extreme pursuit of thinness.[34]
- In *bulimia*, people recurrently consume unusually large amounts of food and feel a lack of control while doing so. Compensatory behaviors follow, such as provoked vomiting, use of laxatives or diuretics, fasting, excessive exercise or a combination of these behaviors.[35]
- *Binge-eating disorder*, like bulimia, is characterized by recurrent bouts of excessive eating but, unlike bulimia, without the compensatory behaviors described above.[36]
- *Avoidant/restrictive food intake disorder (ARFID)* is a condition in which people restrict the amount or type of food consumed. Unlike people with anorexia, however, people with ARFID do not typically have a distorted body image or an extreme desire to be thin.[37]
- *"Other" eating disorders* is a category that includes patients with eating disorder symptoms that do not meet the criteria for any of the preceding categories.

The percentage of claim lines for each of these eating disorders increased from 2018 to 2022, but at different rates (figure 2). The largest increases were found for ARFID, binge-eating disorder and anorexia. ARFID claim lines remained under 0.010 percent of medical claim lines throughout the study period; however, they increased 305 percent (from 0.002 percent in 2018 to 0.006 percent in 2022). Binge-eating disorder rose from 0.010 percent of medical claim lines in 2018 to 0.018 percent in 2022 (an 81 percent increase) and anorexia rose from 0.022 to 0.038 percent (a 73 percent increase). The percentage of medical claim lines for bulimia was relatively stable, rising slightly from 0.0089 percent in 2018 to 0.0091 percent in 2022 (a three percent increase). "Other" eating disorders rose from 0.018 percent of medical claim lines in 2018 to 0.028 percent in 2022—a 53 percent increase.

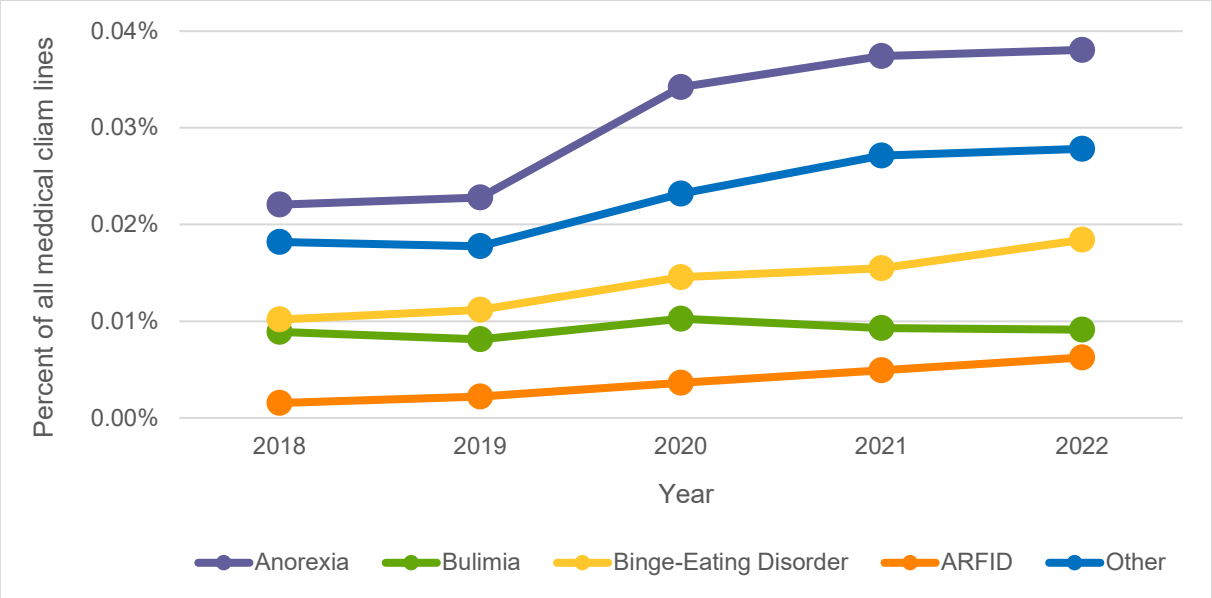

Figure 2. Claim lines for specific eating disorders as a percentage of all medical claim lines, 2018-2022

[34] "Eating Disorders," NIMH.
[35] "Eating Disorders," NIMH.
[36] "Eating Disorders," NIMH.
[37] "Eating Disorders," NIMH.

In 2022, binge-eating disorder was the eating disorder most commonly diagnosed without other accompanying eating disorders; 24.3 percent of all eating disorder patients were diagnosed with binge-eating disorder as the only eating disorder (figure 3). This was closely followed by anorexia only, which accounted for 24.1 percent. Bulimia, without any other eating disorder, accounted for 6.2 percent of all eating disorder patients and ARFID for 5.3 percent. Multiple eating disorders were diagnosed in 10.1 percent of patients and the remaining 30.0 percent were patients with "other" eating disorders. FAIR Health's finding that binge-eating disorder was the most common specific eating disorder to be diagnosed on its own is supported by previous research comparing it to anorexia and bulimia.[38]

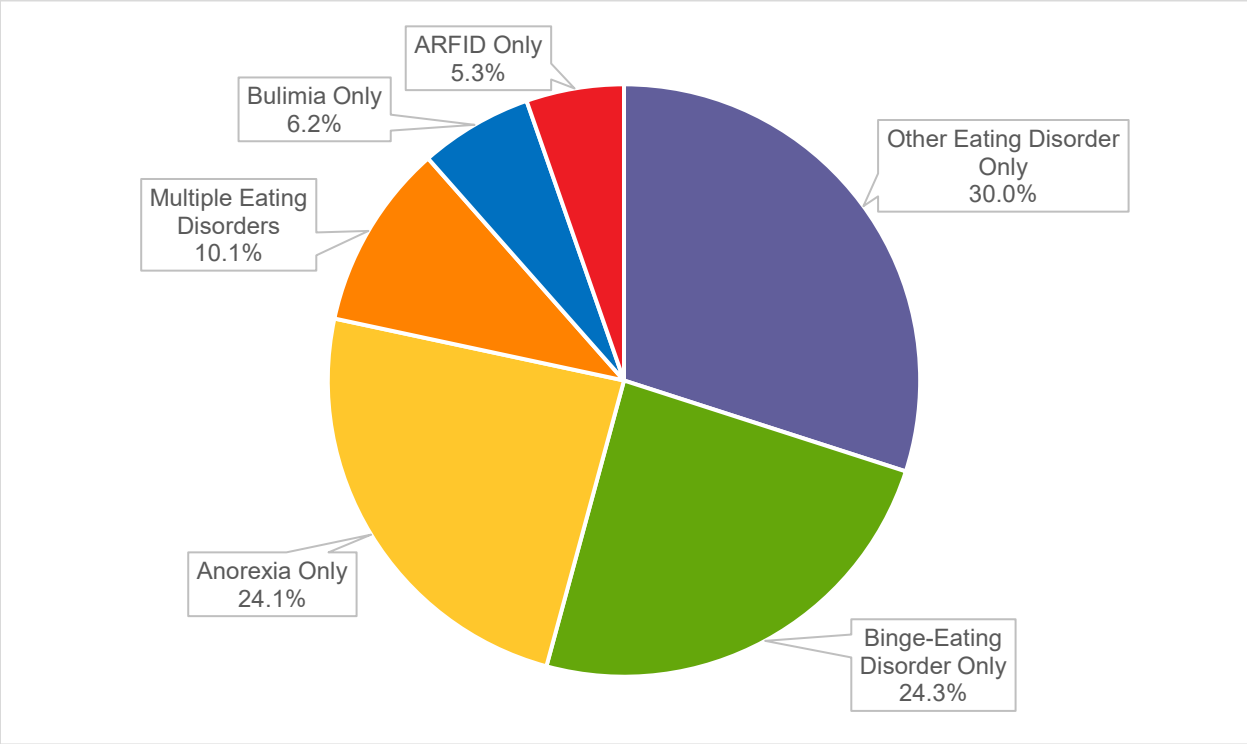

Figure 3. Distribution of eating disorders by percent of eating disorder patients, 2022

[38] Anna I. Guerdjikova et al., "Binge Eating Disorder," *Psychiatric Clinics of North America* 40, no. 2 (June 2017): 255-66, https://doi.org/10.1016/j.psc.2017.01.003.

Geography

The increase in the percentage of medical claim lines for eating disorders varied by US census region from 2018 to 2022 (table 3).[39] The largest increase was in the South (84 percent), where eating disorders had the lowest percentages of medical claim lines in both 2018 (0.034 percent) and 2022 (0.063 percent). The smallest increase was in the Northeast (51 percent). The region where eating disorders comprised the highest percentage of medical claim lines in 2018 was the Northeast (0.082 percent), followed by the West (0.069 percent). In 2022, however, these two regions switched places and the West had the highest percentage (0.127 percent), followed by the Northeast (0.124 percent).

Table 3. Eating disorder claim lines as a percentage of medical claim lines by US census region in 2018 as compared to 2022

Region	2018 Percent of All Medical Claim Lines	2022 Percent of All Medical Claim Lines	Percent Change
Midwest	0.060%	0.102%	71%
Northeast	0.082%	0.124%	51%
South	0.034%	0.063%	84%
West	0.069%	0.127%	83%

[39] The states in the US census regions are:

- **Midwest:** Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin;
- **Northeast:** Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont;
- **South:** Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia; and
- **West:** Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

In 2022, eating disorder claim lines as a percentage of all medical claim lines varied by state (figure 4). The top five states, highest to lowest, were Rhode Island, Massachusetts, Minnesota, Montana and Oregon. The bottom five states, lowest to highest, were Mississippi, Arkansas, Louisiana, New Mexico and West Virginia. In the top five states, eating disorders accounted for 0.181 percent of medical claim lines or more, whereas in the bottom five states, eating disorders accounted for 0.036 percent of medical claim lines or less, a difference of 80 percent. Previous research has suggested that anorexia is more common in the Northern Hemisphere at latitudes 40°-55° N[40]—a region that extends east and west from the border between Kansas and Nebraska up to and including the northernmost parts of the contiguous United States, as well as the southernmost tip of Alaska—and that bulimic symptoms are more common in northern rather than southern parts of the United States.[41] The top five states in figure 4 are all in the northern part of the country between 40° and 55° N, whereas the bottom five are all below that latitude range (although part of West Virginia extends north of 40° N).

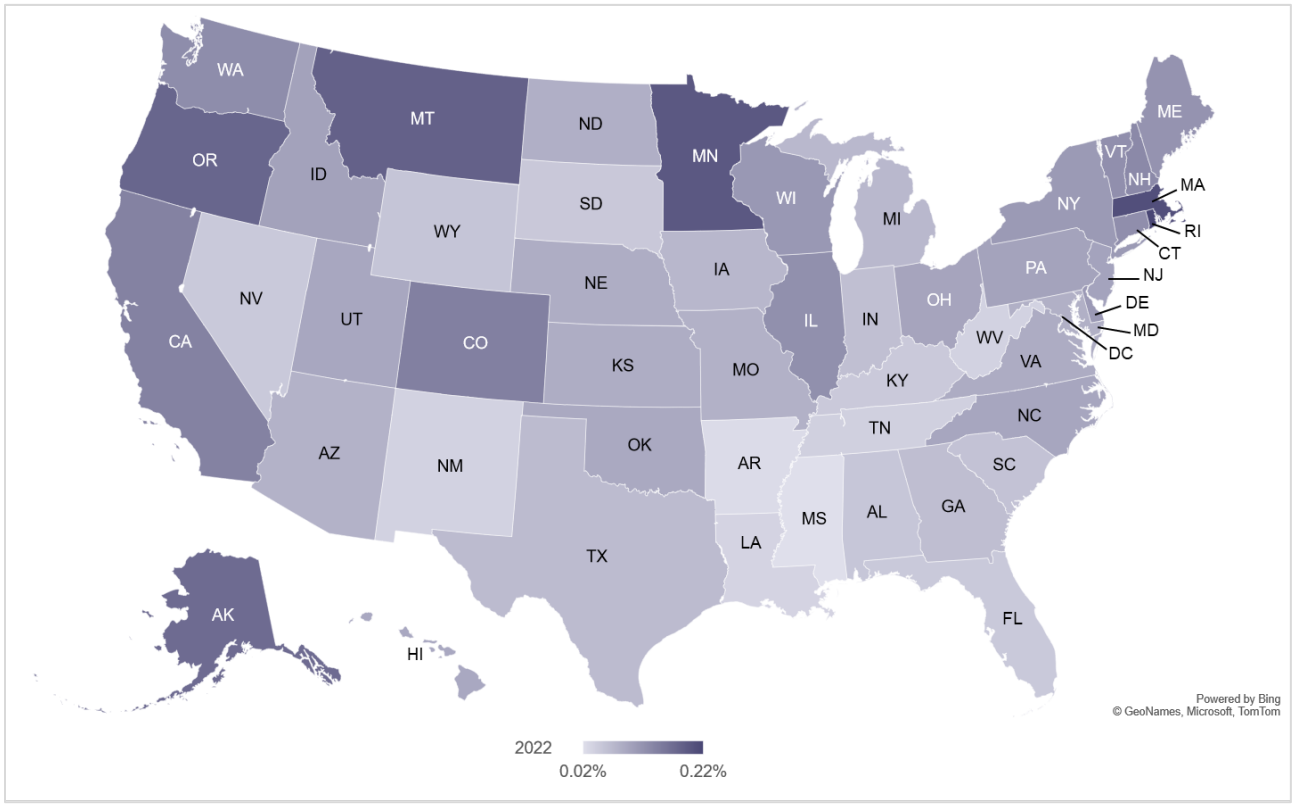

Figure 4. Eating disorder claim lines as a percentage of medical claim lines by state, 2022

[40] Emilio Gutierrez et al., "The Association of Anorexia Nervosa and Climate Revisited: A Bibliometric Perspective," *International Journal of Emergency Mental Health and Human Resilience* 19, no. 3 (2017): 1-7, https://www.omicsonline.org/open-access/the-association-of-anorexia-nervosa-and-climate-revisited-a-bibliometric-perspective-1522-4821-1000371.php?aid=93650.

[41] Rena R. Wing et al., "Effect of Ethnicity and Geographical Location on Body Weight, Dietary Restraint, and Abnormal Eating Attitudes," *Obesity Research* 1, no. 3 (May 1993): 193-98, https://doi.org/10.1002/j.1550-8528.1993.tb00611.x.

Age and Gender

In 2018, the largest share of eating disorder claim lines was associated with patients in the age group 19-24 (25 percent; figure 5). The age group 14-18 was in second place with 21 percent of claim lines. The smallest percentage of claim lines belonged to the over 65 age group (one percent).

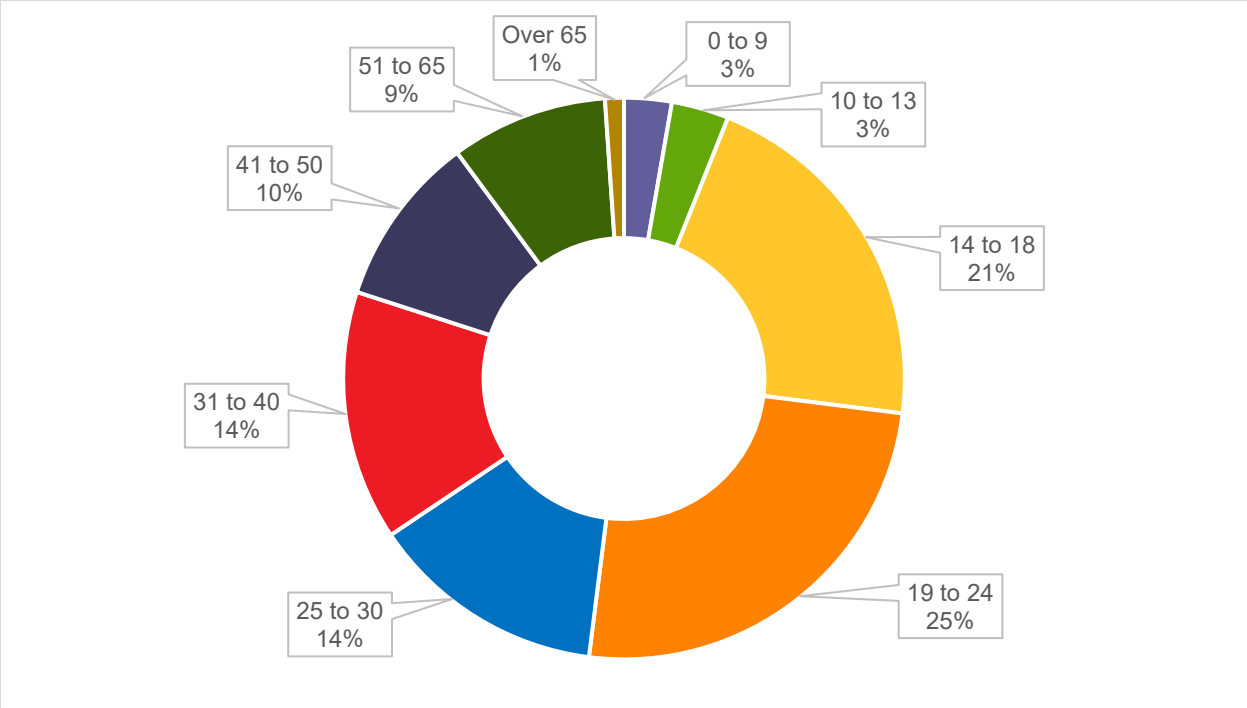

Figure 5. Age distribution of eating disorder claim lines, 2018

Figure 6 shows that in 2022, the age distribution of eating disorder claim lines had changed from that in 2018 (figure 5). The largest share in 2022 was in the age group 14-18 (28 percent) followed by 19-24 (23 percent). A shift during the COVID-19 pandemic toward younger patients being diagnosed with eating disorders was previously reported by other researchers.[42]

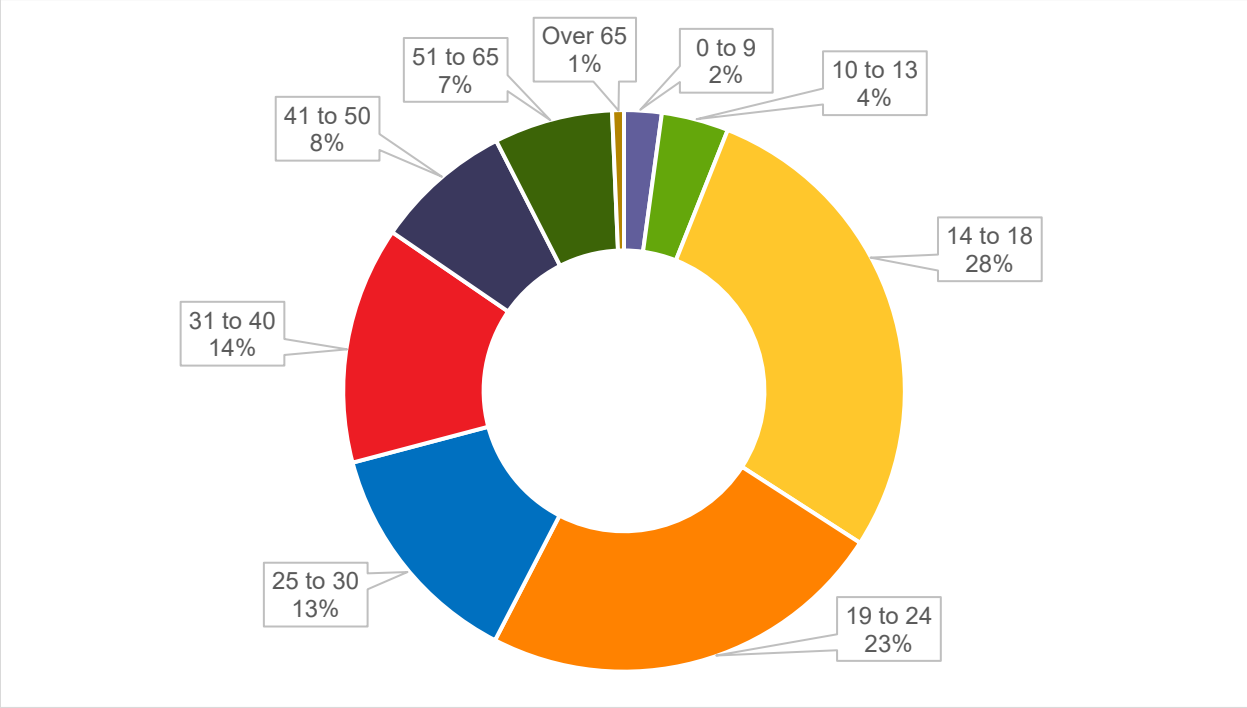

Figure 6. Age distribution of eating disorder claim lines, 2022

[42] Asch et al., "Trends in US Patients Receiving Care for Eating Disorders and Other Common Behavioral Health Conditions before and during the COVID-19 Pandemic."

When anorexia claim lines specifically are considered, the number one age group in most of the period 2018-2022 was 14-18, with 19-24 as the second most common age group (figure 7). The exception was in 2018, when the age group 19-24 was slightly more associated with anorexia than the age group 14-18. The age group 14-18 increased in its percentage of anorexia claim lines from 30.0 percent in 2018 to a peak of 41.8 percent in 2021, then fell to 40.1 percent in 2022. The percentage of anorexia claim lines attributed to both the youngest and oldest age groups fell from 2018-2022. The age group with the lowest percentage of claim lines for anorexia was that of individuals over 65.

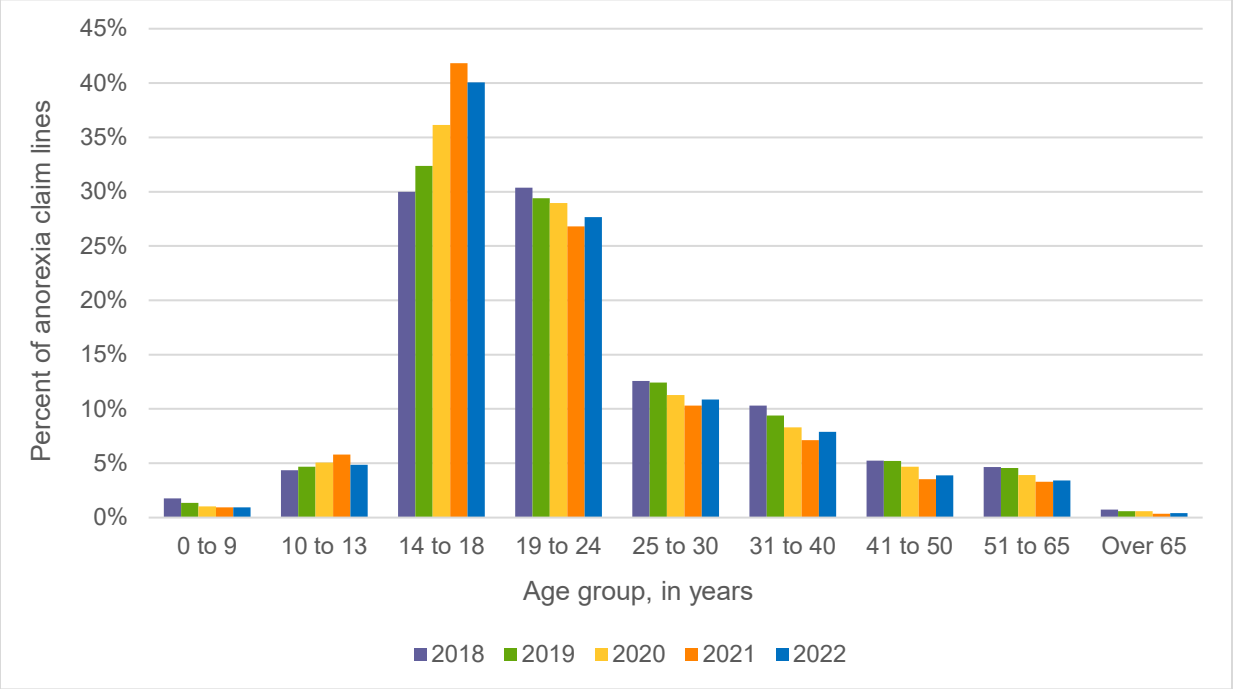

Figure 7. Distribution of anorexia claim lines by age, 2018-2022

When compared to anorexia (figure 7), the bulimia distribution differed (figure 8). In each year from 2018 to 2022, the peak age group for bulimia claim lines was 19-24, though the percentage of claim lines in this age group fell from 2018 (28.5 percent) to 2022 (24.3 percent). The age groups 14-18, 25-30 and 31-40 were also associated with a sizable portion of bulimia claim lines during the study period (over 10 percent in every year and over 15 percent in most years, apart from 2018 and 2019 for the age group 14-18). The age group with the lowest percentage of claim lines for bulimia was that of individuals over 65 in each year except 2018, when it accounted for a slightly higher percentage of claim lines than the age group 10-13 (0.8 percent versus 0.7 percent).

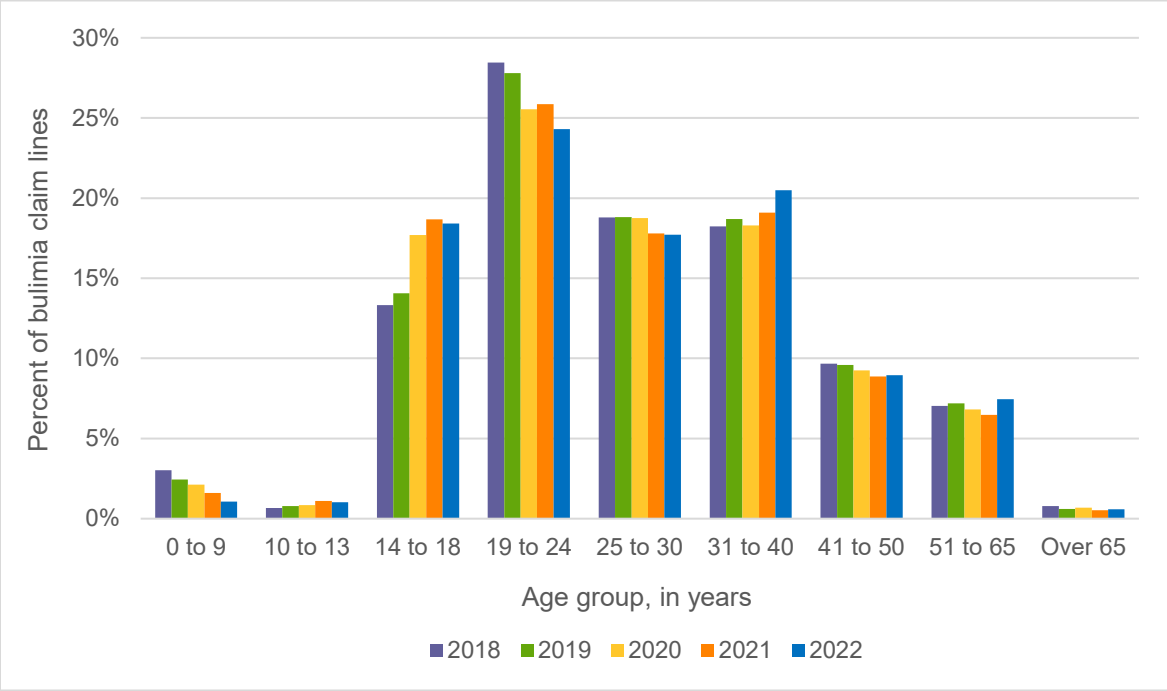

Figure 8. Distribution of bulimia claim lines by age, 2018-2022

For binge-eating disorder (figure 9), the distribution changed again, with higher percentages of claim lines associated with older age groups than for anorexia (figure 7) or bulimia (figure 8). The number one age group for binge-eating disorder claim lines in the period 2018-2022 was 31-40. In that age group, the percentage of claim lines for binge-eating disorder climbed steadily from 2018, when it was 23.3 percent, to 2022, when it reached 27.1 percent. The second largest percentage of claim lines was associated with the age group 41-50 across all years, though in this age group the percentage of claim lines fell from 2018 to 2022. The age group with the lowest percentage of binge-eating disorder claim lines was 0-9, followed closely by 10-13.

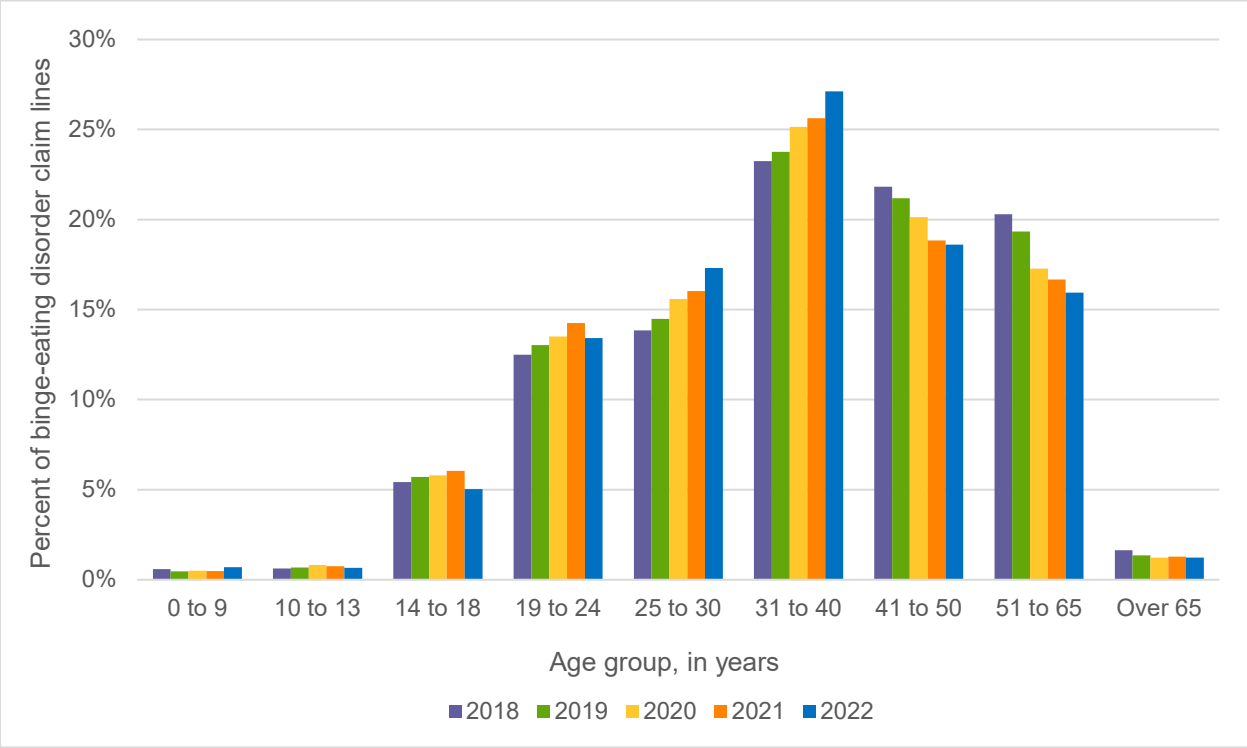

Figure 9. Distribution of binge-eating disorder claim lines by age, 2018-2022

In contrast to the first three eating disorders (figures 7-9), the distribution for ARFID was more skewed toward the youngest age groups (figure 10). The age group with the highest percentage of ARFID claim lines in the period 2018-2022 was 14-18, like anorexia (figure 7). However, unlike anorexia, the age group in second place for 2018 and 2019 was 0-9, while in third place in those years it was 10-13. From 2020 to 2022, the pattern changed and 19-24 made up the second highest group after 14-18. Under five percent of claim lines were associated with ARFID patients over age 30 and the lowest percentage of claim lines was associated with patients over 65. An earlier age of onset for ARFID relative to other eating disorders was reported by the National Institute of Mental Health.[43]

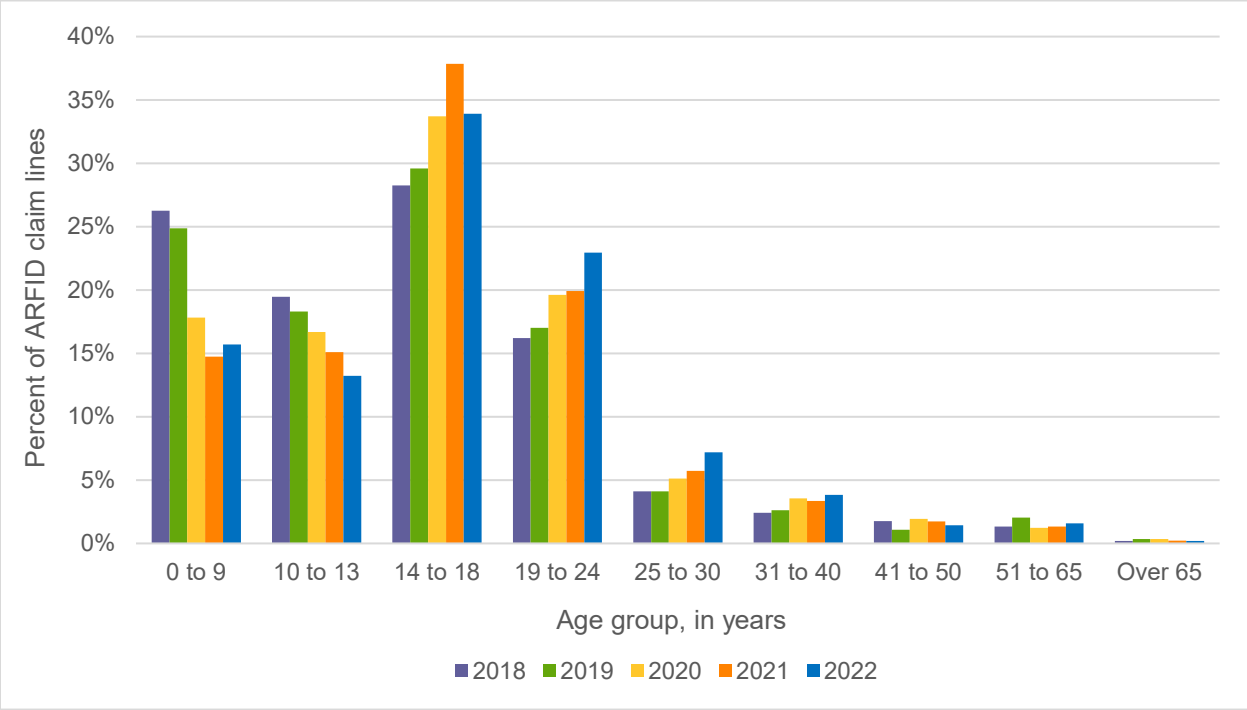

Figure 10. Distribution of ARFID claim lines by age, 2018-2022

[43] "Eating Disorders," NIMH.

Throughout the study period, claim lines for eating disorders were predominantly associated with females (figure 11). In every year from 2018 to 2022, females accounted for more than 89 percent of eating disorder claim lines. This is consistent with prior research findings that eating disorders are more common among females than males.[44,45]

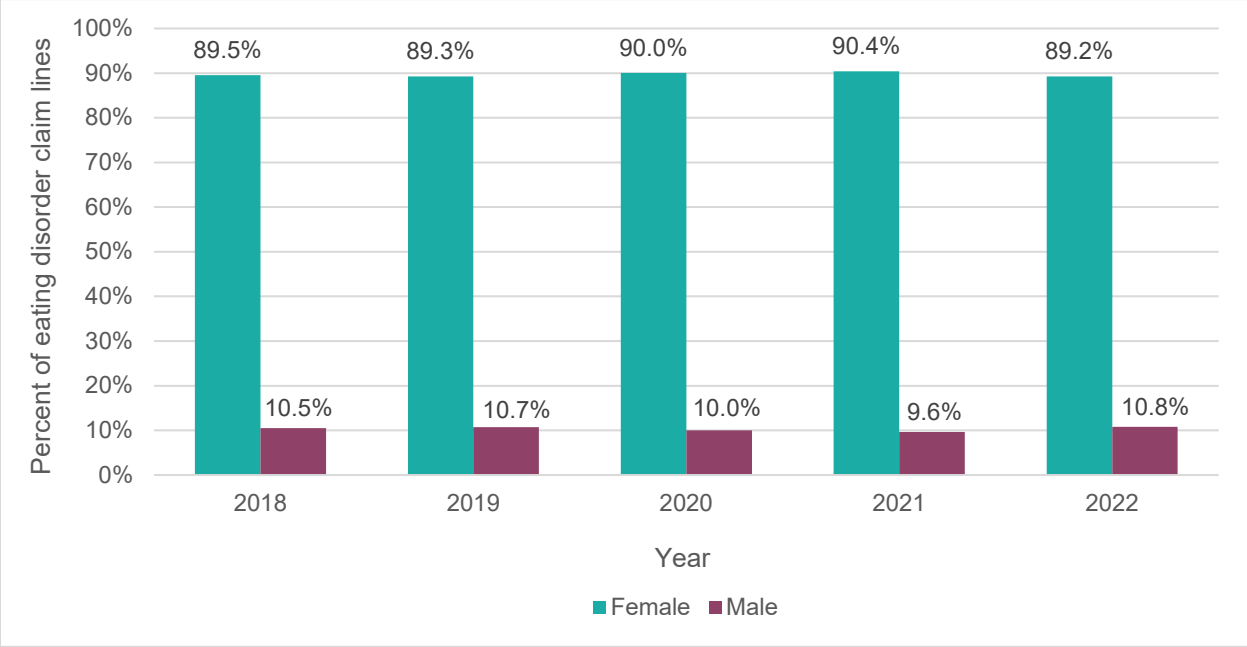

Figure 11. Gender distribution of eating disorder claim lines, 2018-2022

[44] Candy L. Suarez-Albor, Maura Galletta and Edna M. Gómez-Bustamante, "Factors Associated with Eating Disorders in Adolescents: A Systematic Review," *Acta Biomedica* 93, no. 3 (July 1, 2022): e2022253, https://doi.org/10.23750/abm.v93i3.13140.

[45] Jie Qian et al., "Prevalence of Eating Disorders in the General Population: A Systematic Review," *Shanghai Archives of Psychiatry* 25, no. 4 (August 2013): 212-23, https://doi.org/10.3969/j.issn.1002-0829.2013.04.003.

When the claim lines for eating disorders were broken down by age group in addition to gender, a similar pattern of female predominance was found in all except one age group (figure 12). In 2022, children aged from 0 to 9 years old had more males than females associated with eating disorder claim lines. In this age group, 64.8 percent of claim lines were associated with males, whereas 35.2 percent were associated with females. This pattern held when the eating disorders were broken down by type, but only for bulimia, ARFID and "other" eating disorders. For anorexia and binge-eating disorder, females still accounted for higher percentages of claim lines than males in the age group 0-9.

Across all eating disorders in the age group 10-13, there was a smaller gap between male and female shares of claim lines than in the older age groups. In the age group 10-13, males accounted for 19.5 percent of eating disorder claim lines. The gender gap in this age group was even smaller for binge-eating disorder (32.3 percent of claim lines associated with males) and almost nonexistent for ARFID (49.2 percent of claim lines associated with males).

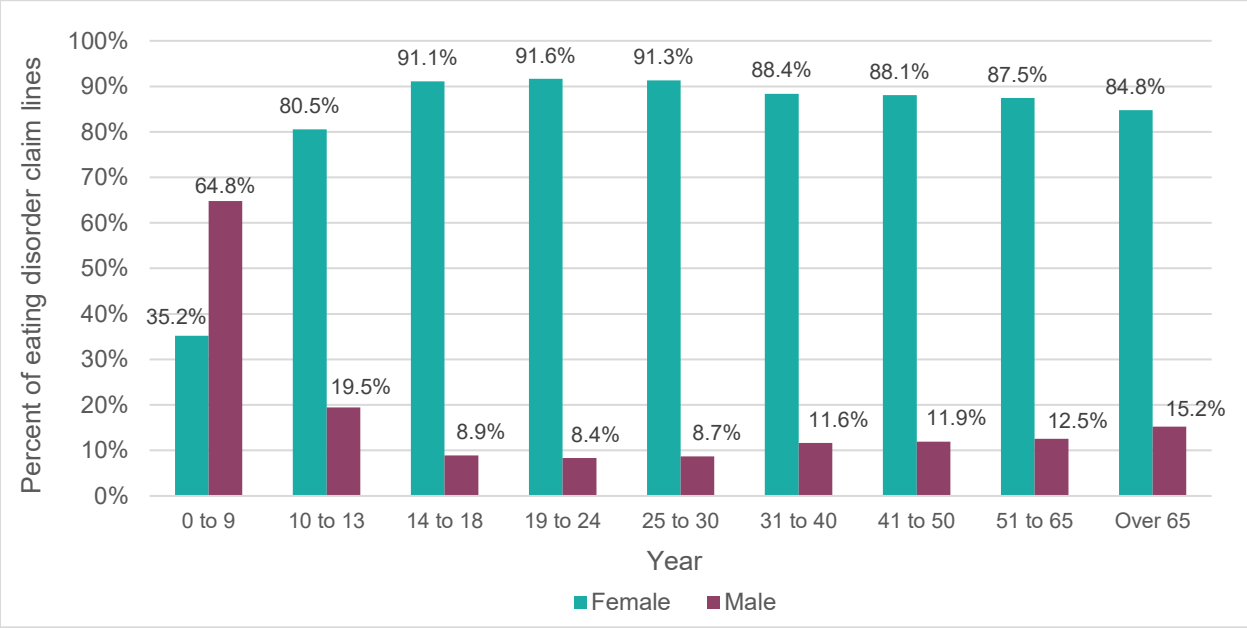

Figure 12. Gender distribution of eating disorder claim lines by age, 2022

The distribution of claim lines for each type of eating disorder by gender is shown in table 4. ARFID is unusual in that nearly a third (32 percent) of claim lines in 2022 were associated with males, more than for any other eating disorder studied. A similar male proportion was also found in previous studies of patients with ARFID compared with anorexia or bulimia.[46,47] Binge-eating disorder has previously been found to affect a higher proportion of males than either anorexia or bulimia,[48] and FAIR Health data show that 16 percent of binge-eating disorder claim lines were associated with males, while only 8 percent of bulimia claim lines were for males in 2022. The eating disorder most strongly associated with females in 2022 was anorexia, in which females accounted for 94 percent of claim lines and males accounted for 6 percent.

Table 4. Distribution of claim lines for types of eating disorders by gender, 2022

Eating Disorder	Male	Female
Anorexia	6%	94%
Bulimia	8%	92%
Binge-Eating Disorder	16%	84%
ARFID	32%	68%
Other	10%	90%

[46] Martin M. Fisher et al., "Characteristics of Avoidant/Restrictive Food Intake Disorder in Children and Adolescents: A 'New Disorder' in DSM-5," *Journal of Adolescent Health* 55 (2014): 49-52, https://doi.org/10.1016/j.jadohealth.2013.11.013.
[47] Jacqueline Zimmerman and Martin Fisher, "Avoidant/Restrictive Food Intake Disorder (ARFID)," *Current Problems in Pediatric and Adolescent Health Care* 47, no. 4 (April 2017): 95-103, https://doi.org/10.1016/j.cppeds.2017.02.005.
[48] Guerdjikova et al., "Binge Eating Disorder."

Places of Service and Specialties

Table 5 shows the top 10 places of service associated with eating disorder claim lines in 2018 and 2022. It also shows the percentage change between those two years. Telehealth utilization increased by over 10,000 percent from 2018 to 2022 and was the most common place of service for eating disorders in 2022. During the same period, office utilization fell by 55 percent and dropped from the number one place of service in 2018 to number two in 2022.

These findings are consistent with a more general trend FAIR Health has observed: the increased reliance on telehealth as a venue of care for mental health treatment, especially in the wake of the COVID-19 pandemic.[49,50]

Table 5. Distribution of top 10 places of service by percent of eating disorder claim lines in 2022 as compared to 2018

Place of Service	2018	2022	Percent Change
Telehealth	0.3%	35.7%	10181.2%
Office	59.2%	26.7%	-54.9%
Outpatient Hospital	12.7%	11.3%	-10.6%
Independent Laboratory	12.3%	9.0%	-26.7%
Inpatient Hospital	7.8%	8.5%	8.7%
Other Place of Service	0.5%	0.7%	36.3%
Inpatient Psychiatric Facility	0.8%	0.6%	-18.9%
Emergency Room – Hospital	0.5%	0.3%	-35.1%
Psychiatric Residential Treatment Center	0.2%	0.3%	83.8%
Psychiatric Facility-Partial Hospitalization	0.6%	0.2%	-59.8%

[49] "Monthly Telehealth Regional Tracker," FAIR Health, accessed October 10, 2023, https://www.fairhealth.org/fh-trackers/telehealth.
[50] FAIR Health, *The Evolution of Telehealth during the COVID-19 Pandemic: A Multiyear Retrospective of FAIR Health's Monthly Telehealth Regional Tracker*, A FAIR Health Brief, June 14, 2022, https://s3.amazonaws.com/media2.fairhealth.org/brief/asset/The%20Evolution%20of%20Telehealth%20during%20the%20COVID-19%20Pandemic-A%20FAIR%20Health%20Brief.pdf.

Among the top 10 specialties treating patients with eating disorders, the greatest increase from 2018 to 2022 was for services by psychiatric nurses, which rose by 108 percent (table 6). This increase was part of a larger trend in which the percentage of services for eating disorders rendered by nonphysician professionals rose considerably. For example, outside of the top 10 specialties, the following nonphysician specialties also increased:

- Licensed practical nurse: +236 percent;
- Registered nurse: +159 percent;
- Physician assistant +89 percent; and
- Nurse practitioner: +48 percent.

Meanwhile, the percentage of services rendered by physician professionals declined in the following specialties:

- Internal medicine: -40 percent; and
- Family practice: -26 percent.

This is consistent with a more general trend FAIR Health has observed in primary care—the increasing use of nonphysician medical professionals rendering services.[51] In addition, the pediatric medicine specialty had a 14 percent increase in eating disorder claim lines, which correlates with the findings presented in figures 5 and 6 that show a shift toward pediatric patients aged 14 to 18 as the predominant age group diagnosed with eating disorders in 2022 compared to 2018.

Table 6. Distribution of top 10 specialties by percent of eating disorder claim lines in 2022 as compared to 2018

Specialty	2018	2022	Percent Change
Social Worker	16.7%	19.3%	15.3%
Psychiatry	9.7%	9.4%	-3.7%
Laboratory	11.8%	9.1%	-23.0%
Psychology	10.7%	7.4%	-30.6%
Hospital	8.1%	7.4%	-9.0%
Single or Multispecialty Clinic or Group Practice	5.5%	6.4%	16.4%
Registered Dietitian/Nutrition Professional	4.2%	6.0%	43.9%
Other Suppliers	2.6%	4.3%	65.9%
Pediatric – Medicine	3.5%	4.0%	14.4%
Psychiatric Nurse	1.9%	4.0%	107.6%

[51] FAIR Health, *A Window into Primary Care: An Analysis of Private Healthcare Claims*, A FAIR Health White Paper, March 15, 2023, https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/A%20Window%20into%20Primary%20Care%20-%20A%20FAIR%20Health%20White%20Paper.pdf.

The top 10 specialties for eating disorder services as a percentage of the specialties' total services rendered in 2022 are shown in table 7. Registered dietitians/nutrition professionals were associated with the largest percentage (7.2 percent).

Table 7. Top 10 specialties by eating disorder services as percent of total services, 2022

Specialty	Eating Disorder Services as Percent of Total Services
Registered Dietitian/Nutrition Professional	7.2%
Other Suppliers	2.5%
Pediatric – Psychiatry	2.4%
Psychiatric Nurse	2.0%
Psychiatry	1.7%
Psychology	1.4%
Bariatric Medicine	1.0%
Social Worker	0.9%
Psychiatry – Geriatric	0.9%
Addiction Medicine	0.8%

Co-occurring Mental Health Conditions

The most common mental health condition that was not an eating disorder in patients with all eating disorders studied in the period 2018-2022 was generalized anxiety disorder (41 percent of patients), followed by major depressive disorder (39 percent), as shown in table 8. This is consistent with previous research that found depression and anxiety were prevalent among patients with eating disorders.[52] When co-occurring mental health conditions were broken down by eating disorder type, those same two mental health conditions were still the most common, though their ordering sometimes changed. For anorexia, ARFID and "other" eating disorders, generalized anxiety disorder came first, but for bulimia and binge-eating disorder, major depressive disorder was the most common co-occurring mental health condition.

In the FAIR Health dataset, the percentage of patients with ARFID who also had major depressive disorder was lower than for the four other types of eating disorder. Twenty-seven percent of patients who had ARFID also had major depressive disorder, while 41 percent of patients with anorexia and binge-eating disorder also had that condition. For bulimia, it was 47 percent of patients, and for "other" eating disorders it was 39 percent.

Analysis of FAIR Health data in the period 2018-2022 showed that 20.7 percent of patients with an eating disorder had a substance use disorder, compared to 4.8 percent of all patients who received medical services. In addition, 71.8 percent of patients with an eating disorder had a mental health condition (that was not an eating disorder), compared to 13.3 percent of all patients who received medical services. This indicates that patients with all studied eating disorders in this period were over four times as likely to have a substance use disorder and over five times as likely to have a mental health condition (that was not an eating disorder) as all patients who received medical services.

Table 8. Top 10 co-occurring mental health conditions (that were not eating disorders) in eating disorder patients, 2018-2022

Mental Health Condition	Percent of Eating Disorder Patients with Condition
Generalized Anxiety Disorder	41.0%
Major Depressive Disorder	38.6%
Adjustment Disorders	11.5%
Attention-Deficit/Hyperactivity Disorder	11.2%
Bipolar Disorder	8.4%
Post-traumatic Stress Disorder	6.9%
Mood (Affective) Disorders	6.9%
Obsessive-Compulsive Disorder	3.0%
Emotional and Behavioral Disorders	2.3%
Phobic Anxiety Disorders	2.0%

[52] Eng Joo Tan et al., "The Association between Eating Disorders and Mental Health: An Umbrella Review," *Journal of Eating Disorders* 11 (2023): 51, https://doi.org/10.1186/s40337-022-00725-4.

In the period 2018-2022, 32.9 percent of patients with eating disorders had one co-occurring mental health condition that was not an eating disorder, compared to 28.2 percent who had none (figure 13).

Approximately 39 percent of patients with eating disorders had two or more co-occurring mental health conditions that were not eating disorders. This number was even higher for those with anorexia (41 percent) and bulimia (46 percent).

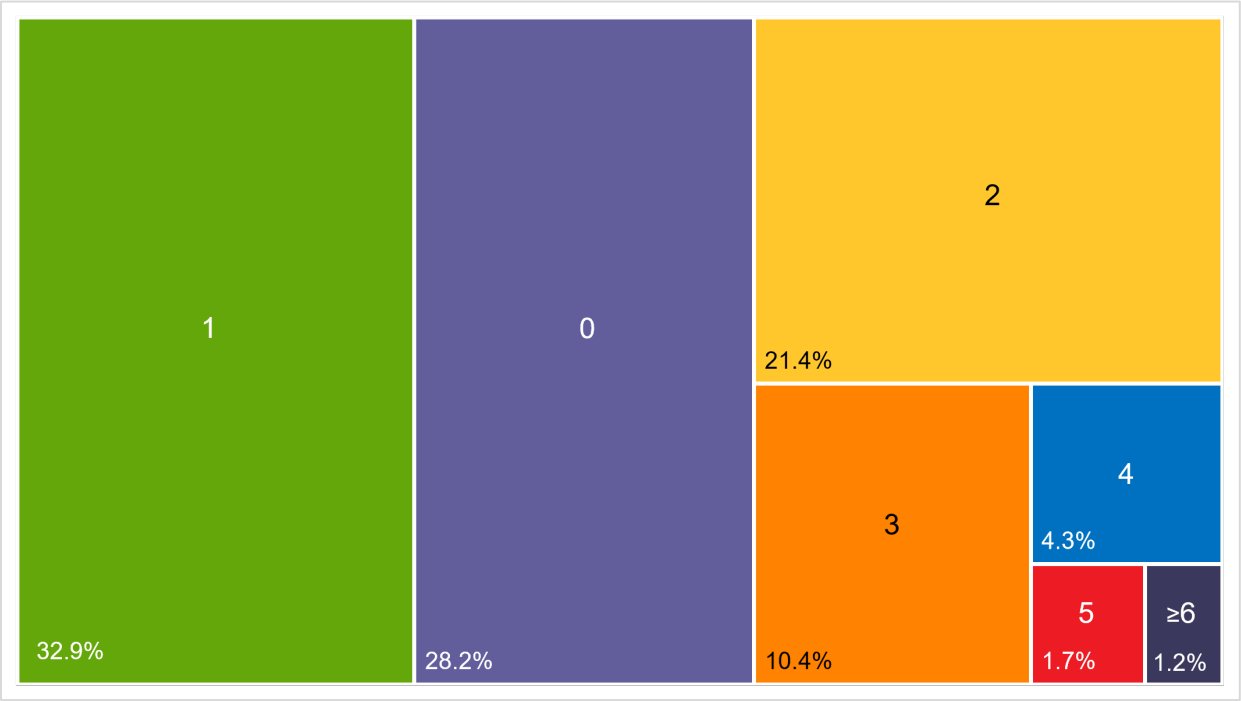

Figure 13. Number of mental health conditions (that were not eating disorders) co-occurring with eating disorders, 2018-2022

For anorexia, binge-eating disorder and “other” eating disorders, the number of co-occurring mental health conditions that were not eating disorders was first one, then zero, just as for eating disorders as a whole. But for two eating disorders, the numbers were different.

Among bulimia patients, the largest percentage had one co-occurring mental health condition (32.5 percent), but the second largest percentage had two (23.1 percent). The third largest had zero (21.9 percent), as shown in figure 14.

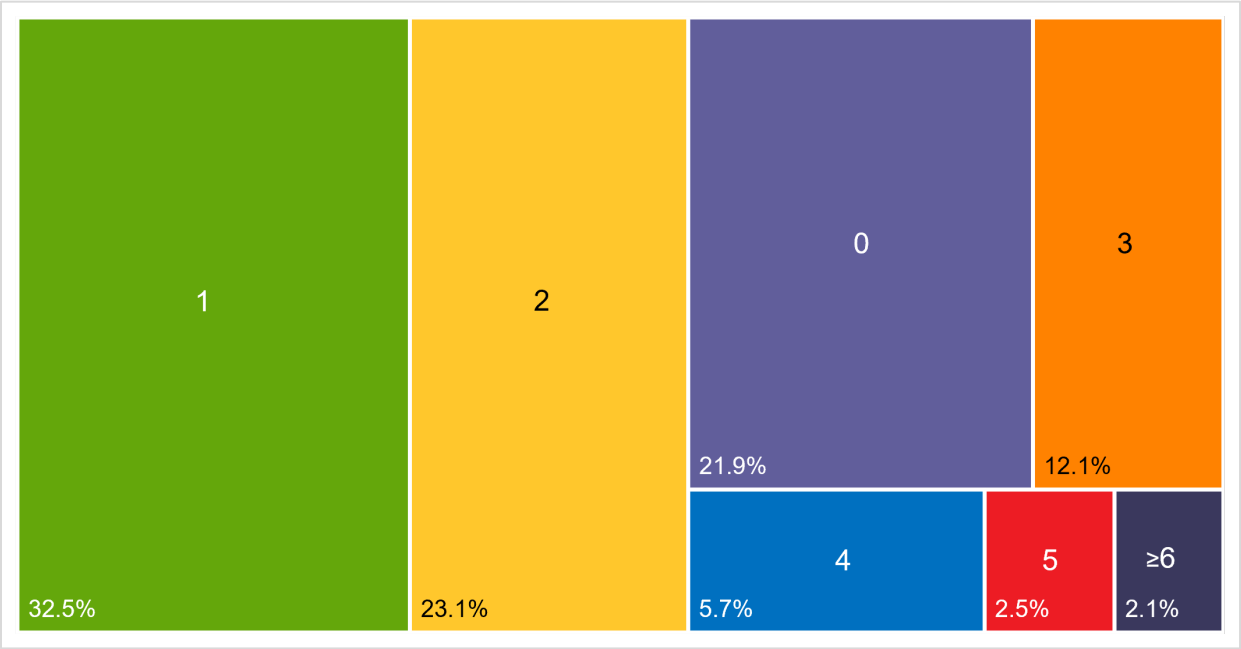

Figure 14. Number of mental health conditions (that were not eating disorders) co-occurring with bulimia, 2018-2022

For ARFID, the largest percentage of patients (35.0 percent) had zero co-occurring mental health conditions that were not eating disorders (figure 15). This was the only eating disorder with zero as the most common number of co-occurring mental health conditions; all other eating disorder patients had one co-occurring mental health condition as the most common. Among ARFID patients, the second largest number of co-occurring mental health conditions was one (29.8 percent).

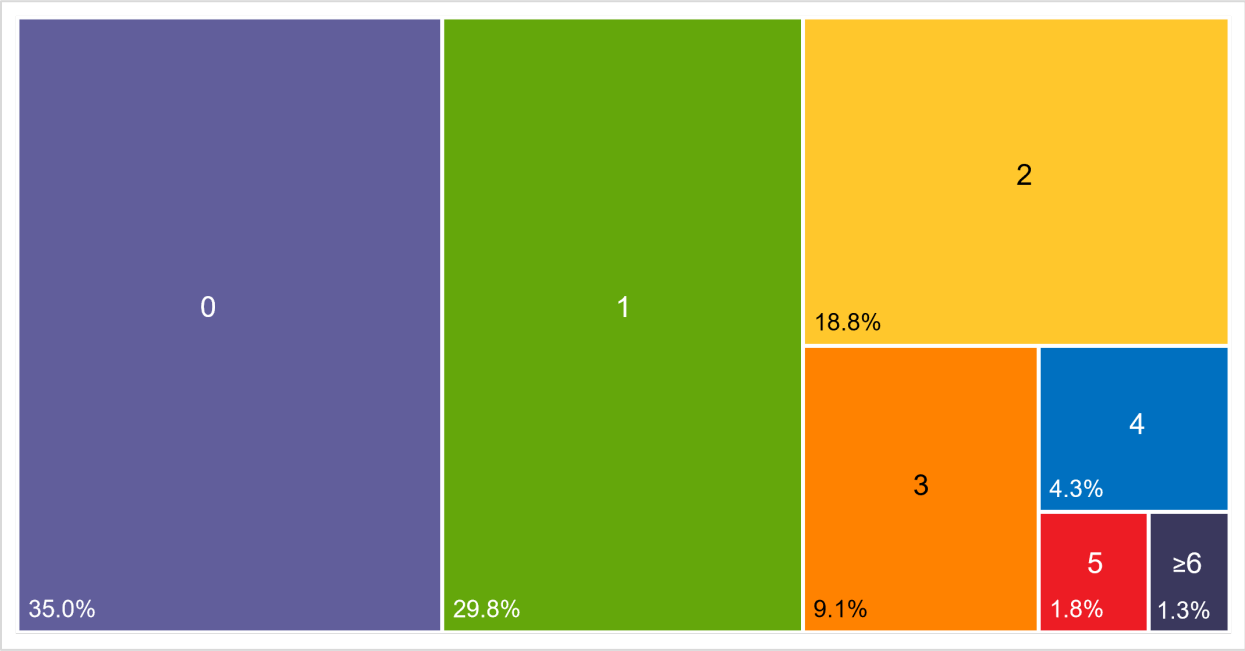

Figure 15. Number of mental health conditions (that were not eating disorders) co-occurring with ARFID, 2018-2022

Conclusion

This study of eating disorders makes several notable findings. From 2018 to 2022, eating disorder claim lines increased 65 percent nationally as a percentage of all medical claim lines. All eating disorders studied increased during this period, though at different rates. In 2022, binge-eating disorder and anorexia were the eating disorders most commonly diagnosed without other accompanying eating disorders, each accounting for approximately 24 percent of all eating disorder patients. Bulimia and ARFID each accounted for less than 10 percent.

The increase in eating disorder claim lines as a percentage of medical claim lines varied by region from 2018 to 2022. The largest increase was in the South, where eating disorders had the lowest percentages of medical claim lines in both 2018 and 2022. The smallest increase was in the Northeast, which was the region where eating disorders had the highest percentage of medical claim lines in 2018, though the West had the highest percentage in 2022. The five states where eating disorder claim lines accounted for the highest percentage of all medical claim lines in 2022 were all in northern latitudes; the five states where eating disorder claim lines accounted for the lowest percentage were all in southern latitudes.

From 2018 to 2022, the age distribution of eating disorder claim lines changed. The largest share in 2018 was accounted for by the age group 19-24 and the second largest by the age group 14-18; in 2022, those positions were reversed. Different eating disorders had different age distributions in the period 2018-2022. For example, ARFID was the eating disorder that most affected the youngest age groups, while binge-eating disorder most affected older age groups.

In every year from 2018 to 2022, females accounted for more than 89 percent of eating disorder claim lines. There was variation, however, by specific eating disorder, from 94 percent female for anorexia in 2022 to 68 percent female for ARFID that same year.

Telehealth utilization for the treatment of eating disorders increased by over 10,000 percent from 2018 to 2022, making telehealth the most common place of service for eating disorders in 2022. During the same period, offices declined from the number one place of service to number two. Among the top 10 specialties treating patients with eating disorders, the greatest increase from 2018 to 2022 was for services by psychiatric nurses, which rose by 108 percent. This increase was part of a trend of increases in the percentage of services for eating disorders rendered by nonphysician professionals.

Patients with eating disorders in the period 2018 to 2022 were over four times as likely to have a substance use disorder and over five times as likely to have a mental health condition (that was not an eating disorder) as all patients who received medical services. The most common mental health condition that was not an eating disorder in patients with all eating disorders studied in that period was generalized anxiety disorder, followed by major depressive disorder. The largest percentage of patients with eating disorders had one co-occurring mental health condition. ARFID was the only eating disorder with zero as the most common number of co-occurring mental health conditions.

The findings in this report have implications for stakeholders across the healthcare spectrum, including eating disorder patients and the providers who treat them, as well as payors and policy makers. FAIR Health hopes that these findings will also be starting points for further research on eating disorders.

About FAIR Health

FAIR Health is a national, independent nonprofit organization dedicated to bringing transparency to healthcare costs and health insurance information through data products, consumer resources and health systems research support. FAIR Health qualifies as a public charity under section 501(c)(3) of the federal tax code. FAIR Health possesses the nation's largest collection of private healthcare claims data, which includes over 43 billion claim records and is growing at a rate of over 2 billion claim records a year. FAIR Health licenses its privately billed data and data products—including benchmark modules, data visualizations, custom analytics and market indices—to commercial insurers and self-insurers, employers, providers, hospitals and healthcare systems, government agencies, researchers and others. Certified by the Centers for Medicare & Medicaid Services (CMS) as a national Qualified Entity, FAIR Health also receives data representing the experience of all individuals enrolled in traditional Medicare Parts A, B and D; FAIR Health includes among the private claims data in its database, data on Medicare Advantage enrollees. FAIR Health can produce insightful analytic reports and data products based on combined Medicare and commercial claims data for government, providers, payors and other authorized users. FAIR Health's free, award-winning, national consumer websites are fairhealthconsumer.org and fairhealthconsumidor.org. For more information on FAIR Health, visit fairhealth.org.

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