




Mental Illness

More Than **160** Medicines in Development for a Wide Range of Mental Illnesses

Mental illness refers to a broad spectrum of health conditions affecting mood, thinking and behavior. These conditions include depression, bipolar disorder, schizophrenia, substance use disorder, anxiety disorders, eating disorders, obsessive compulsive disorder and post-traumatic stress disorder, among others. Each of these illnesses often varies in its degree of severity, ranging from mild to moderate to severe, and may occur together. In severe cases, mental illnesses can cause serious functional impairment and substantially interfere with or place limits on life activities -- these are considered serious mental illnesses (SMI).ⁱ Regardless of severity, mental illness can often get in the way of one's personal and professional relationships and limit one's quality of life.

In light of this, biopharmaceutical research companies have made tremendous strides towards understanding mental illnesses and developing innovative medicines. With over 160 medicines in development, biopharmaceutical researchers are seeking to leverage a growing scientific understanding of the brain to develop new treatments and bring therapeutic advances for patients who are not helped by current treatments, or for those who may experience negative side effects.

JUST THE FACTS



Nearly

1 in 5

U.S. adults live with a mental illness
(52.9 million in 2020).ⁱ

Young adults
aged 18-25 years had the highest
prevalence of mental illness in 2020

30.6%.ⁱ

Having a serious mental illness
reduces average life expectancy by

10 - 20 years.ⁱⁱ

The average expected lifetime societal costs
associated with being diagnosed with serious
mental illness by the age of 25 is

\$1.85M.ⁱⁱⁱ

Trends in Mental Illness

Mental illnesses continue to impose a heavy health and economic toll in the U.S. Not only are millions of individuals, families and communities impacted by mental illness, but the total spending from all public and private sources to treat mental and substance use disorders costs society nearly \$300 billion annually.^{iv} Furthermore, rates of mental illness diagnoses, severe complications from these illnesses, addiction and suicide continue to rise.

Due to the ongoing burden of mental illnesses, severe complications, most notably suicide, have been increasing among adults.

- In 2019, nearly 5% of adults (12 million) had serious thoughts of suicide.^v
- The national rate of adults experiencing suicidal ideation has increased every year since 2011.^v
- Though there have been some recent declines in adult suicide rates, suicide remains the 12th leading cause of death in the U.S. today.^{vi}

Evidence suggests more adolescents and young adults are experiencing serious psychological distress, major depression and suicidal thoughts and behaviors relative to the mid-2000s.

- In 2019, about one in six students reported making a suicide plan in the past year, a 44% increase since 2009.^{vii}

Too often, mental illnesses and substance use disorders, such as addiction, go hand in hand. In 2020 alone:

- Nearly 15% (40 million) of Americans aged 12 years or older reported having a substance use disorder in the past year—including alcohol use disorder and illicit drug use disorder.^{viii}
- 17 million American adults reported having both a mental illness and a substance use disorder.^v
- Nearly six million Americans had both a SMI and a substance use disorder.^v



Promise of the Pipeline

Researchers are working on cutting-edge medicines for patients with mental illness. Today there are **163** medicines^x in development by biopharmaceutical research companies to help the millions of Americans suffering from a mental illness. The promise of the pipeline is represented across a wide range of mental illnesses, including:

- **54** for depression, which affects 8.4% of adults and 17% of adolescents aged 12 to 17 in the U.S.^x Depression, otherwise known as major depressive disorder or clinical depression, is one of the most common mental illnesses in the U.S. It causes persistent feelings of sadness or loss of interest that can interfere with daily activities such as sleeping, eating or working. In order to be diagnosed with depression, the symptoms must be present for at least two weeks. There are several types of depression that manifest differently or develop under unique circumstances, such as: persistent depressive disorder, postpartum depression, psychotic depression and seasonal affective disorder.
- **35** for schizophrenia, which affects less than 1% of U.S. adults.^{xi} Schizophrenia is a mental disorder characterized by disruptions in thought processes, perceptions, emotional responsiveness and social interactions. Although schizophrenia is not as common as other mental disorders, the symptoms can be very disabling to daily life.
- **35** for anxiety disorders, with more than a third of adults in the U.S. reporting anxiety during their lifetime.^{xii} Most people occasionally experience anxiety related to specific life events, but anxiety disorders involve more than a temporary worry or fear. For a person with an anxiety disorder, the anxiety does not go away and can get worse over time. The symptoms can interfere with daily activities such as job performance, school, work and relationships. There are several types of anxiety disorders, including generalized anxiety disorder, panic disorder, phobia-related disorders (e.g., the fear of flying, heights or needles), social anxiety disorder and separation anxiety disorder.

- **33** for substance use disorders. Over 40 million Americans aged 12 and older—or 14.5% of the U.S. population—reported having a substance use disorder—including alcohol use disorder and illicit drug use disorder.^{ix} Treatment of substance use disorders is complicated by the fact that many people with these disorders also often struggle with other mental illnesses. Due to fundamental changes that occur in the brain, which disrupt the ability to control impulses in patients struggling with addiction, substance use disorders are regarded as mental illnesses. As stated previously, 17 million American adults reported having both a substance use disorder and another mental illness.^{ix} The presence of co-occurring substance use disorders and another mental illness can increase symptom severity, complicate treatment and create medication adherence challenges.
- **13** for bipolar disorder, which affect about 2.8% of adults and 2.9% of adolescents in the U.S.^{xiii} Bipolar disorder, also known as manic-depressive disorder, causes dramatic shifts in mood, energy, activity levels and the ability to carry out day-to-day tasks.
- **8** for attention-deficit/hyperactivity disorder (ADHD), which is one the most common childhood disorders with a lifetime prevalence of 11.0% in children aged 4 to 17 and 8.7% in adolescents aged 13 to 18. ADHD affects 4.4% of adults in the U.S.^{xiv} ADHD is marked by difficulty staying focused, paying attention, hyperactivity, and/or impulsivity that interferes with functioning or development.

Innovative Medicines in the Pipeline

The development of new and effective treatments for patients with mental illness can be very challenging. Despite certain challenges, researchers have many innovative medicines in development. Some of the **163** innovative potential new medicines include:

- An oral kappa opioid receptor (KOR) antagonist is in development as an adjunctive treatment for **major depressive disorder**. KOR antagonists play an important role in helping regulate stress and mood. Kappa opioid receptors are involved in anxiety-like, dysphoric, aversive and drug-seeking behavioral responses.^{xv} KOR antagonists block kappa-opioid receptors and reduce these responses, producing antidepressant and anti-addictive effects.
- A once-daily, two-week treatment in development for **postpartum depression** and **major depressive disorder** is a neuroactive steroid (a naturally occurring steroid that impacts behavior) GABA (gamma aminobutyric acid) receptor modulator. The GABA system is a critical neurotransmitter signaling pathway that is responsible for information flow within the intricate circuits of the brain and central nervous system. The GABA system contributes significantly to regulating central nervous system function and dysfunction known to be at the core of numerous psychiatric disorders.^{xvi}
- A medicine in development for **post-traumatic stress disorder** (PTSD) is an inhibitor of the transient receptor potential (TRP) channels 4 and 5. TRP channels are expressed in the brain and implicated in the innate fear function (innate fear helps humans avoid or escape dangerous situations). TRP channels are involved in anxiety-like behavior. For example, TRPC5 increases the activity of the hormone CCK (cholecystokinin), which increases neuronal anxiety.^{xvii} By inhibiting the activity of TRPC4/5 and therefore reducing CCK activity, depressive and anxiety behaviors are suppressed. The medicine is also in development for **major depressive disorder** and **borderline personality disorder**.
- A medicine in development for **schizophrenia** is an agonist of trace amine-associated receptor 1 (TAAR1). TAAR1 plays a significant role in regulating neurotransmission of dopamine, norepinephrine and serotonin in the central nervous system. Studies show that TAAR1 activation could reduce the side effects of currently marketed antipsychotics, such as movement disorders, weight gain and cardiometabolic disease.^{xviii}

Challenges to Developing New Medicines

Developing medicines to treat psychiatric conditions has some of the lowest probabilities of success in drug development. These challenges are due in part to a poor understanding of the underlying pathology of these diseases and treatment response as well as the extremely diverse nature of the diseases themselves, which often manifest differently in different people.^{xix}

Researchers are seeking to leverage a growing understanding of the brain to develop new treatments and bring therapeutic advances for patients who are not helped by current treatments, or for those who may experience negative side effects. Current studies are examining how existing treatments work in the brain and identifying biomarkers that can be used to improve diagnoses, measure disease progression, and assess a patient's response to therapies. Biomarkers are also being increasingly used to find new therapeutic targets through identification of the mechanisms contributing to mental illness.



Biomarkers

A biomarker (short for biological marker) is a measure used to evaluate how the body is functioning. Biomarkers have multiple applications in health care, including diagnosing diseases, understanding how a disease progresses and measuring how a body is responding to a treatment.

As more biomarkers are identified, they have the potential to greatly enhance the drug development process by providing researchers with new ways to measure disease activity, enable patient selection and stratification in clinical trials and improve the development of more personalized treatments – particularly where multiple biomarkers can inform the use of targeted drug combinations.

Biomarkers can also allow researchers to better understand how effective a treatment is against a disease with clinical endpoints that are difficult to define, providing clinicians with additional informative measurements and identify differences in responses between individuals or subpopulations.

Patient Perspective

The more than 160 medicines in development for mental illness today seek to employ the latest in scientific treatment advances to the benefit of patients for years to come. Patients facing a mental illness are grateful for the treatments available and in development:

"I am a proud mom to three beautiful girls, and they have brought so much joy and happiness to my life. But like many new mothers, I dealt with postpartum anxiety and depression following their births. It is a scary feeling, but thanks to innovative treatments and medications available, my life, and the lives of many others, has changed for the better."

– Camryn M., Texas

"Going to college can be a whirlwind of emotions from class loads to social pressures to finding your first job. Being a student during the pandemic added even more mental challenges for me like heightened levels of anxiety, depression, and even insomnia. I am grateful for the medications that are available to help, and I am hopeful that even more solutions can be found so all students can have a fulfilling college experience."

–Vishnu B., Michigan

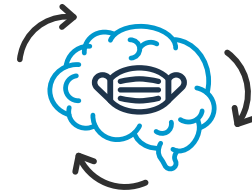
"I see a variety of patients from my work in mental health counseling and psychiatric care. While one medication may work for someone battling one mental health challenge, another patient with the same condition might not have the same results. It is imperative that new options continue to be found so that anyone who is suffering can find relief."

–Maya W., Florida

Impact of COVID-19 on Mental Illness

The COVID-19 pandemic negatively impacted the mental health of countless individuals and exacerbated existing burdens faced by people already suffering from mental illnesses. During the pandemic, about four in 10 American adults have reported symptoms of anxiety or depressive disorder.^{xx} This number has significantly increased from one in 10 adults reporting symptoms prior to the pandemic.

The pandemic has also widened the gender gap in terms of mental health stressors that adversely impact women. Research shows while the COVID-19 pandemic has had a negative impact on the mental health of all Americans, women often bear a disproportionate share. Gender roles, family caregiving responsibilities for children and elderly family members, combined with workforce participation all contribute to unique mental health challenges faced by women. One survey of 1,000 U.S. adults found that 64% of female respondents reported an increase in stress during the pandemic and 52% reported that their stress and anxiety has translated into a physical health concern (e.g., unhealthy eating and/or exercising habits.)^{xxiii}



Trends in Mental Illness During the Pandemic

- More than half of adults in the U.S. report their mental health has been negatively impacted by the pandemic, due to worry and stress over the virus—resulting in difficulty sleeping or eating and increases in alcohol consumption or substance use.^{xxi}
- Emergency room visits for drug overdoses and suicide attempts were 36% and 26% higher, respectively, compared to prior to the pandemic.^{xxii}
- During the first year of the pandemic, more than 17% of youth experienced a major depressive episode.^{ix}

Telehealth

Telehealth, when used appropriately, can play an important role in supporting access to health care. The expanded use of telehealth provides a tremendous opportunity to not only reduce the access barriers (e.g., limited distribution of behavioral health providers in rural areas), but it may also reduce the stigma that many experience in accessing an in-person treatment provider. While significant progress has been made in reducing barriers to telehealth access, safeguards are needed to ensure patient care and quality are maintained.



Health Equity: Access and Coverage

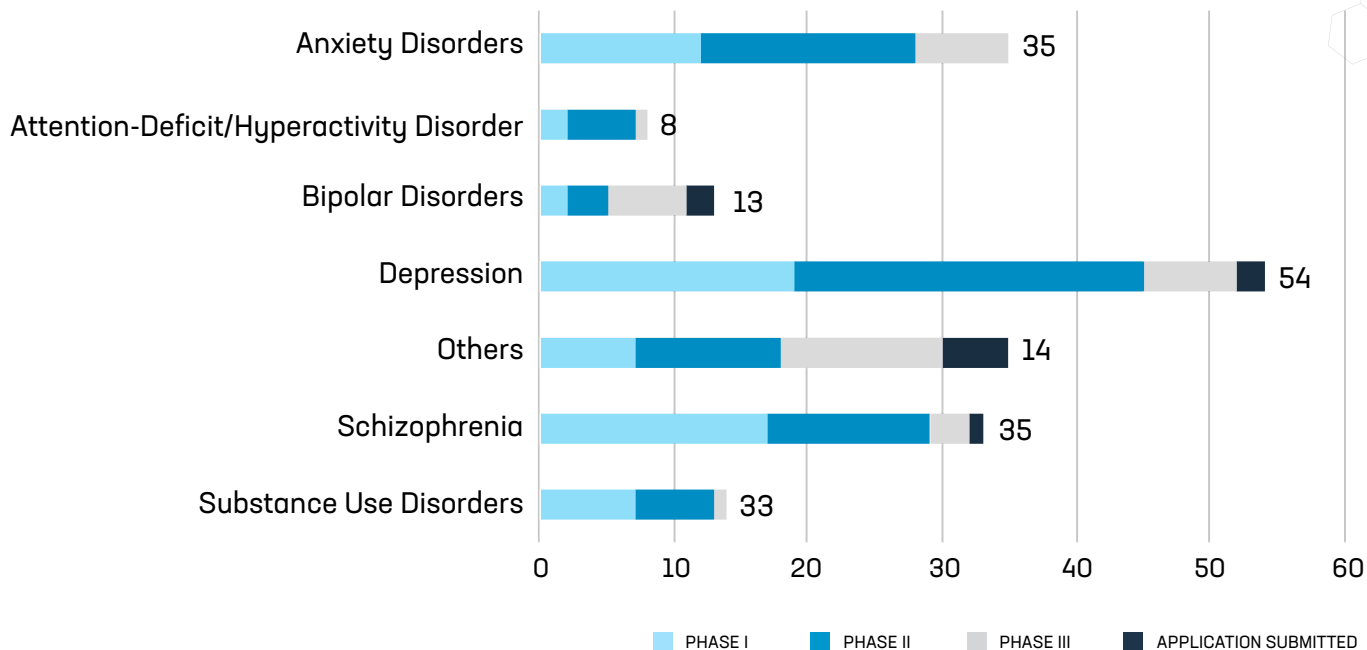
While mental illnesses can affect anyone at any time, not everyone has access to adequate mental health care. Fewer than half of all adults in the U.S. receive treatment for their mental illness, with racial and ethnic minorities receiving treatment at lower rates than non-Hispanic whites. African Americans and Hispanic Americans access mental health services at about half the rate of whites, and Asian Americans at about a third of the rate of whites.^{xxiv} Reasons for these discrepancies include limited access to treatment, attitudes toward seeking treatment, poor quality care, community stigma towards mental illnesses, under representation of minority health care providers, bias in the treatment setting, language barriers and inadequate health care coverage.

Although prevalence of certain mental illnesses are not generally higher among racial and ethnic minority groups, these groups are often less likely to receive treatment services.

As a result of these inequities, between 2016 and 2020, there have been an estimated 116,722 excess premature mental and behavioral health-related deaths among racial and ethnically minoritized groups and indigenous populations—amounting to \$278 billion in excess cost burden to society.^{xxv}



Medicines in Development for Mental Illness



* Some medicines may be in more than one category.

Mental Health Resources

If you or someone you know has a mental illness, is struggling emotionally or has concerns about their mental health, there are ways to get help. **Call 911 if you or someone you know is in immediate danger or go to the nearest emergency room.**

| Resource | Contact Information |
|-------------------------------|---|
| 988 Suicide & Crisis Lifeline | call or text 988 |
| Crisis Text Line | text "HELLO" to 741741 |
| Veterans Crisis Line | call 1-800-273-TALK (8255) and press or text 838255 |
| Disaster Distress Helpline | call or text 1-800-985-5990 |

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