MENTAL ILLNESS

Biopharmaceutical Research Companies Are Developing **138** Medicines to Treat Mental Illness

Nearly one in five U.S. adults (46.6 million) and nearly half of adolescents (ages 13 to 18) are living with mental illnesses.[1] This group of conditions involve changes in mood, thinking and/or behavior, and can be associated with significant distress and problems functioning in everyday activities. Mental illnesses represent a wide spectrum of conditions including for example, depression, bipolar disorder, schizophrenia, substance use disorder, anxiety disorders, eating disorders, obsessive compulsive disorder and post-traumatic stress disorder as well as other lesser known conditions. Each of these illnesses often vary in degree of severity, ranging from mild to moderate to severe (substantially interfering with major life activities) and may also be co-occurring.[1]

Mental illnesses continue to exact a heavy human and economic toll in the U.S. Not only are millions of Americans and American families affected by mental illnesses, but the resulting lost wages, health care expenditures and disability benefits cost society more than $317 billion annually in the U.S.[2]

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.[1] 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.[3]

When treating mental illnesses, it is important to address both the physical and emotional health of patients for better health outcomes and cost-effectiveness. Combining mental health services with primary care can reduce costs, increase the quality of care and, ultimately, save lives.[1] Medications and psychotherapy both play a key role in treating mental illnesses.

Untreated or undertreated mental illnesses have serious consequences. Life expectancy of people with severe mental illness is decreased by 13-30 years relative to the general population. Much of this shortened life expectancy is attributable to medical conditions that could have been treated by a primary care provider.

MEDICINES IN DEVELOPMENT / 2019 REPORT

America's Biopharmaceutical Companies

MENTAL ILLNESS

JUST THE FACTS

46.6 MILLION

AMERICAN ADULTS HAD A MENTAL ILLNESS IN 2017

49.5%

OF ADOLESCENTS (AGED 13 TO 18) HAD A MENTAL ILLNESS IN 2017

11.2 MILLION

AMERICAN ADULTS HAD A SERIOUS MENTAL ILLNESS IN 2017

22.2%

OF ADOLESCENTS (AGED 13 TO 18) HAD A SERIOUS MENTAL ILLNESS IN 2017

"With nearly one in five U.S. adults and almost half of all adolescents impacted by mental illness, it's more important now than ever to improve access to mental health care. AUCD commends the biopharmaceutical industry's commitment to developing promising new treatment options that could improve the quality of life and health outcomes for the millions of Americans living with mental illness. As a person living with bipolar disorder, I appreciate research that is designed to improve the quality of life of people like me. People with mental health conditions today, and in the future, have the potential to live happier, healthier and more productive lives thanks to innovative research approaches that target a wide range of illnesses."

— Andrew J. Imparato, JD, Executive Director, Association of University Center on Disabilities (AUCD)

Promise of the Pipeline

Biopharmaceutical research and innovation is making strides in the world of mental illness by expanding the understanding of the underlying diseases and bringing about a new era in the treatment of mental illness. Now, more than ever, we understand that the appropriate treatment of mental health conditions, once they are first recognized, can change the trajectory of an individual's life for the better.

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 both to improve diagnoses and assess a patient's response to therapies. Biomarkers are also being used to increasingly find new therapeutic targets through identification of the pathologies or mechanisms contributing to mental illness.

While researchers are working on cutting-edge medicines for patients with mental illness, the development of new and effective treatments is difficult. Despite these challenges, today there are 138 medicines[5] in development by biopharmaceutical research companies with a promise to help the millions of Americans suffering from some type of mental illness.

The promise of the pipeline is represented across a wide range of mental illnesses—including against the more common illnesses described below:

- **40 for depression,** including major depressive disorder which affects 7.1% of adults and 13.3% of adolescents aged 12 to 17 in the U.S.[1] Depression, otherwise known as major depressive disorder or clinical depression, is a common but serious mood disorder. It causes severe symptoms that affect how a person feels, thinks, and handles 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, seasonal affective disorder and bipolar depression (bipolar disorder is different from depression but can be associated with very low moods that meet the criteria for major depression). Approximately one-third of adults with major depression have treatment resistant depression where available treatment provides little to no relief, representing a significant unmet need.[6]

- **38 for schizophrenia,** which affects less than 1% of U.S. adults.[1] Schizophrenia is a chronic and severe mental disorder that affects how a person thinks, feels and behaves. Although schizophrenia is not as common as other mental disorders, the symptoms can be very disabling and fall into three categories: positive, negative and cognitive. Positive symptoms are psychotic behaviors where the person loses touch with some aspects of reality. Negative symptoms are associated with disruptions to normal emotions and behaviors. Cognitive symptoms (conscious thought) can be subtle or severe.

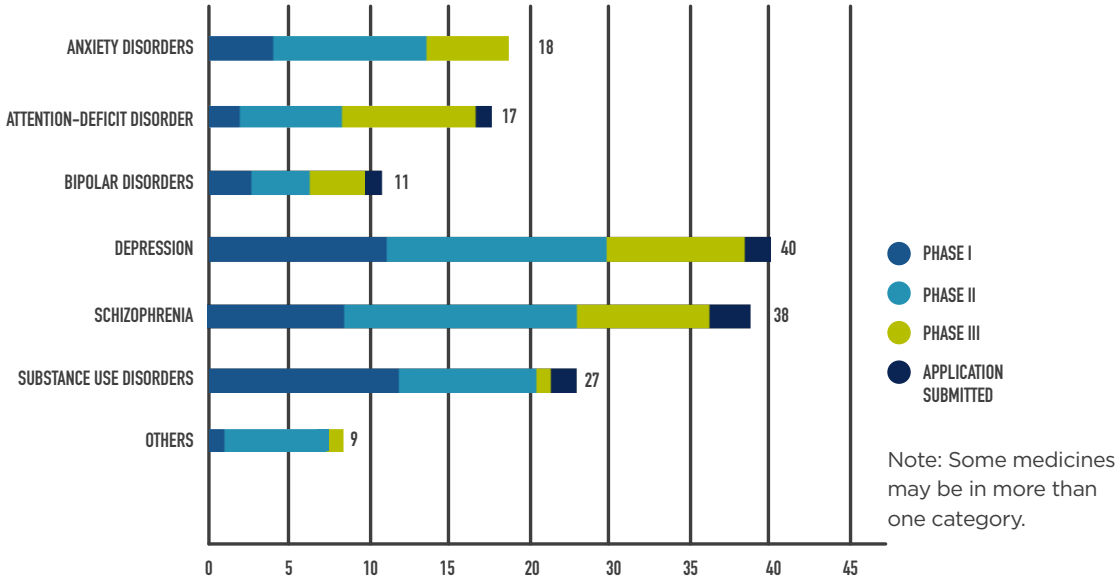
- **27 for substance use disorders.** Nearly 29 million Americans aged 12 and older—or 10.6% of the U.S. population—have reported using an illicit drug in the past month.[5] The treatment of substance use disorders is complicated by the fact that many people with these disorders also often struggle with 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. In fact, 8.5 million adults in the U.S. have both a substance use disorder and a mental illness.[7] The presence of co-occurring mental illness and substance use disorders can increase symptom severity, complicate treatment and create medication adherence challenges. Nearly 30.5 million Americans aged 12 and older—or 11.2% of the U.S. population—have reported illicit drug use in the past month.[7] More than 70,000 overdose deaths were reported in 2017, including 47,600 opioid overdose deaths.[8] The impact of opioid addiction alone in the U.S. is substantial, representing a significant unmet need.

- **18 for anxiety disorders** with more than a third of adults and adolescents in the U.S. reporting an anxiety during their lifetime.[1] Occasional anxiety is common in life. 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.

- **17 for attention-deficit/hyperactivity disorder (ADHD)** which affects 4.4% of U.S. adults and 8.7% of adolescents aged 13 to 18.[1] ADHD is a brain disorder marked by an ongoing pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development.

- **11 for bipolar disorders** which affect about 2.8% of adults and 2.9% of adolescents in the United States.[1] Bipolar disorder, also known as manic-depressive illness, is a brain disorder that causes unusual shifts in mood, energy, activity levels and the ability to carry out day-to-day tasks. There are four basic types of bipolar disorder, with moods ranging from periods of extremely energized behavior (known as manic episodes) to very sad or hopeless periods (known as depressive episodes).

Medicines in Development by Disease and Phase



Note: Some medicines may be in more than one category.

Innovative Approaches to Research

The development of new and effective treatments for patients with mental illness can be very challenging. The complexity of the diseases creates hurdles for researchers, with diagnoses often made based on symptoms rather than underlying pathology. There is a limited understanding of how current treatments work in the brain and a need for robust and qualified biomarkers to help clinicians diagnose accurately, measure disease progression and assess treatment response.

Despite these challenges, researchers have many innovative new approaches in development. Some of the 138 innovative potential new medicines include:

- A dopamine/norepinephrine reuptake inhibitor in development for **attention-deficit/hyperactivity disorder** (ADHD) with an extended treatment window, showed significant improvement in both inattentive and hyperactivity/impulsivity ADHD symptoms in clinical trials. The medicine has also been shown to have low potential for abuse.

- An oral fixed-dose combination of two therapeutics which target distinct receptors in the central nervous system is in development for the treatment of **treatment-resistant major depressive disorder**. The medicine offers a novel mechanism of action with one therapeutic increasing the therapeutic effect of the second, offering hope to the millions of patients who do not respond to standard antidepressant therapies.

- A neuroactive nasal spray developed from compounds called pherins, is being studied as a treatment for **social anxiety disorder**. It is administered in a rapid-onset therapeutic nasal spray that activates nasal chemosensory receptors that trigger neural circuits in the brain that suppress fear and anxiety. In clinical trials, it was shown to improve social performance and social interaction anxiety within 10 minutes of administration.

- A potential first-in-class treatment for cognition impairment associated with **schizophrenia** (CIAS) is an AMPA receptor modulator that mediates fast synaptic transmission in the central nervous system, a process which can be disrupted in a number of neurological and psychiatric diseases, including schizophrenia. By modulating AMPA receptors, the medicine enhances the signaling of the neurotransmitter glutamate, which is thought to be a key pathology of schizophrenia.

Sources:

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7.Key Substance Use and Mental Health Indicators in the United States: Results from the 2017 National Health Survey on Drug Use and Health. Substance Abuse and Mental Health Services Administration (September 2018)