



Otsuka's Economic and Health Impact in the United States

MAY 2022





Overview

ABOUT THIS REPORT

This report, which is a collaboration between Otsuka and Matrix Global Advisors (MGA), measures the economic and health impact of Otsuka in the United States. MGA is solely responsible for the results of the economic impact analysis presented in the report. In addition to Otsuka's contributions to improve clinical outcomes for patients and a strong commitment to the community, Otsuka's US operations directly result in high-quality jobs, tax revenues, and economic output and indirectly support additional jobs and economic activity. MGA measures the full impact of Otsuka expenditures in the US economy using a macroeconomic model of the United States built by IMPLAN. The analysis was funded by Otsuka and conducted using Otsuka data. Otsuka had no role in the determination of results.

ABOUT OTSUKA

Founded in Japan in 1921, Otsuka Pharmaceutical Co. Ltd. today has an international network of 183 companies and more than 45,000 employees across Asia-Pacific, America, Europe, and the Middle East. Operating in 28 countries and regions, Otsuka runs 177 manufacturing sites and has 45 affiliated research institutes. A leader in mental health and nephrology treatments, Otsuka offers both pharmaceuticals and digital healthcare solutions. This report focuses on the economic impact of Otsuka's US pharmaceutical subsidiaries, Otsuka America Pharmaceutical, Inc. and Otsuka Pharmaceutical Development & Commercialization, Inc., and the broader health and social impact of Otsuka in the US. More information about Otsuka can be found at www.otsuka-us.com.

ABOUT MATRIX GLOBAL ADVISORS (MGA)

MGA is an economic consulting firm in Washington, DC, specializing in fiscal, healthcare, and tax policy. Founded in 2007, MGA helps Fortune 500 companies, trade associations, healthcare providers, investment banks, and others understand and convey the economics of policy issues. Drawing on years of policy experience, the MGA team uses analytics to help identify, quantify, and solve economic policy problems. More information about MGA can be found at www.getMGA.com.



Otsuka in the United States

Otsuka Pharmaceutical Co. Ltd.'s first US commercial organization, Otsuka America Pharmaceutical, Inc. (OAPI), was established in 1989. With corporate offices in Rockville, Maryland, and Princeton, New Jersey, OAPI oversees commercial activities in the United States.

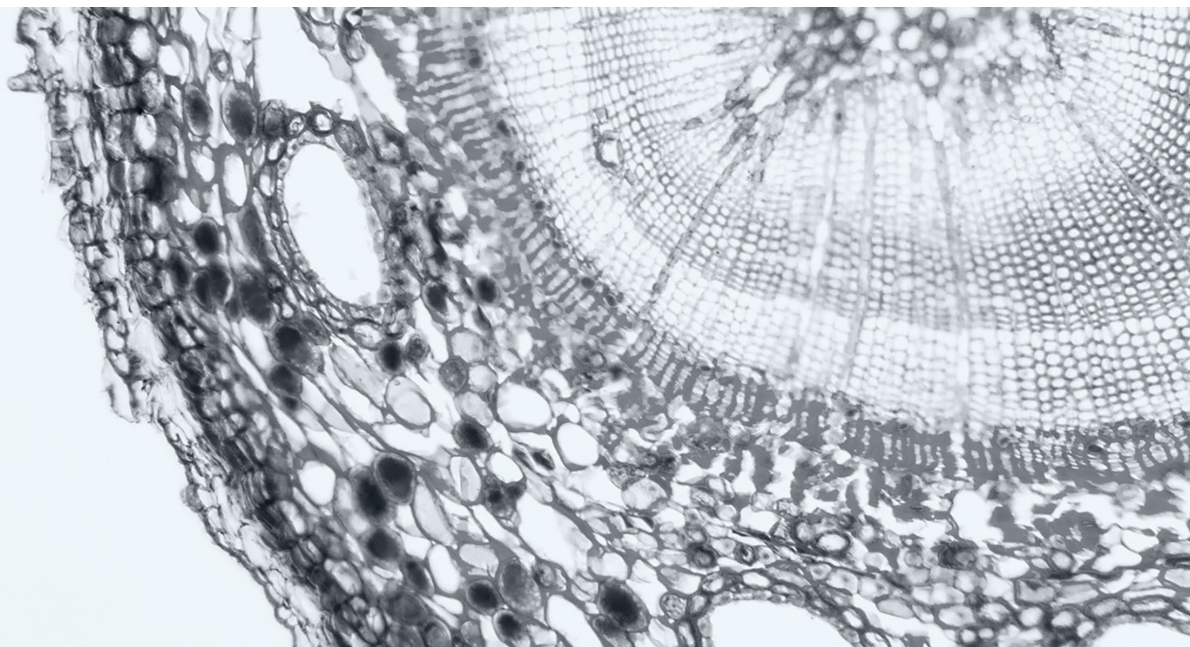
In 2007, Otsuka Pharmaceutical Development & Commercialization, Inc. (OPDC) was established, with headquarters in Princeton, New Jersey. OPDC develops promising drug candidates from clinical-trial

management through planning the strategy for drug approval, marketing, and lifecycle management.

Together, OAPI and OPDC (hereinafter "Otsuka") develop and commercialize medicines in the areas of mental health, nephrology, and digital innovation to address unmet healthcare needs. OAPI and OPDC have nearly 2,000 employees in the United States working in all aspects of bringing new medicines to market, from research and development to commercialization.

Modeling Otsuka's Economic Impact

For the economic impact analysis presented in this report, MGA uses Otsuka's 2020 US payroll and operating expenses as inputs to an IMPLAN model of the US economy. IMPLAN's regional input-output models are widely used across government, academia, nonprofit, and corporate settings. Drawing on publicly available historical economic data for a specific region, the models project economic indicators (for example, production and employment levels) by industry.

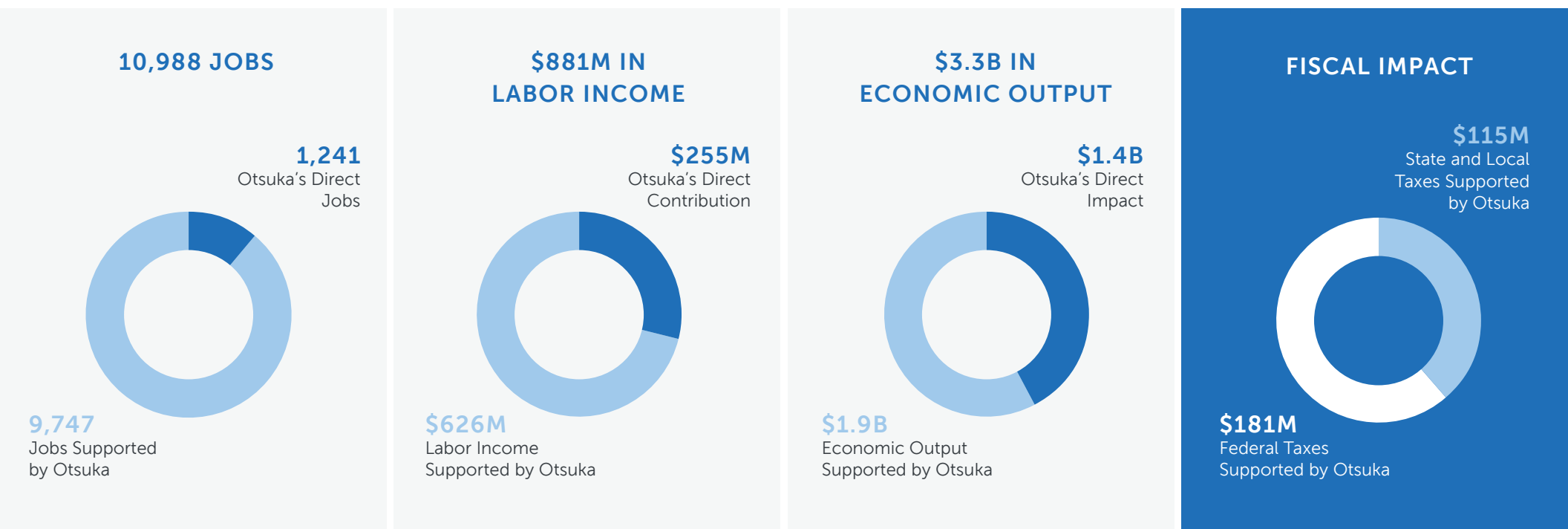


Otsuka's Economic Impact

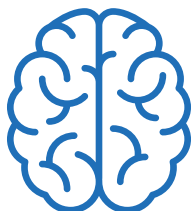
Beyond Otsuka's direct employment and spending in the United States, the company's operations support additional jobs, wages, and economic activity. Using a macroeconomic model of the United States constructed by IMPLAN, MGA estimates Otsuka's full economic impact by capturing the indirect income creation, spending, and re-spending that results from Otsuka's direct activity. MGA's analysis

finds that, in 2020, Otsuka supported nearly 11,000 US jobs, generated more than \$880 million in labor income (a measure of wages), and contributed \$3.3 billion in economic output. Otsuka also supports tax revenue in the United States. In 2020, tax receipts attributable to or supported by Otsuka's economic activity totaled nearly \$300 million. (**See Figure 1.**)

FIGURE 1.
Otsuka's Economic and Fiscal Impact in the United States

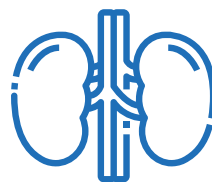


Otsuka's Therapeutic Areas of Focus



NEUROSCIENCE

In the US, 1 in 25 people has a serious mental illness.¹ In Otsuka's 30 years of experience working in the central nervous system (CNS) therapeutic area, the company continues to innovate and defy limitation by taking risks to overcome the complexities of treating mental health. Otsuka respects the value within every mind and is committed to making a difference in the lives of patients living with schizophrenia, major depressive disorder, bipolar disorder, and other CNS conditions.



NEPHROLOGY

An estimated 15 percent of Americans have chronic kidney disease.² For more than 20 years, Otsuka has been bringing its research and expertise to this therapeutic area. Otsuka has focused on developing novel drugs in areas of unmet need, such as autosomal dominant polycystic kidney disease (ADPKD) and hyponatremia, that have changed the treatment landscape. Otsuka's long-term perseverance has led to major breakthroughs, giving patients renewed hope and clinicians more treatment options. For example, Otsuka's treatment for ADPKD provided a first-in-class treatment option when it was approved in 2018 and remains the only available product.



DIGITAL INNOVATION

Digital technology has not only changed the world we live in, but it is also changing the face of healthcare. Otsuka is at the forefront of this transformative juncture in medicine, creating novel solutions that help address the challenges of those living with serious mental illness. Otsuka believes its investment and leadership in digital health will revolutionize patient care as we know it. Patients will be able to engage and communicate with their care teams in new ways, and clinicians will have data-driven insights that may help inform treatment decisions. By facilitating no-contact communication between patients and providers, digital medicine has been all the more important during the COVID-19 pandemic and can also provide a complementary offering to existing treatment and address unmet need.

¹ Centers for Disease Control (CDC), "About Mental Health," www.cdc.gov/mentalhealth/learn/index.htm.

² CDC, "Chronic Kidney Disease in the United States, 2021," www.cdc.gov/kidneydisease/publications-resources/ckd-national-facts.html.

Otsuka's Products

NEUROSCIENCE



OAPI co-promotes REXULTI with H. Lundbeck, A/S



OAPI co-promotes ABILIFY MAINTENA with H. Lundbeck, A/S



DIGITAL MEDICINE AND THERAPEUTICS

Combination of pharmacotherapies and digital medicine



Medication is only one element of a patient's complete care package

Otsuka continuously evaluates how its digital healthcare technology can provide ongoing support to patients, caregivers, and healthcare providers

NEPHROLOGY



Please see FULL PRESCRIBING INFORMATION including BOXED WARNING(S) for REXULTI, ABILIFY MYCITE, ABILIFY, ABILIFY MAINTENA, JYNARQUE, and SAMSCA at www.otsuka-us.com/products.

Otsuka's Pipeline

Otsuka's commitment to finding solutions for unmet medical needs is reflected in its pipeline. The company has therapeutics in all stages of development in nephrology, central nervous system (CNS) disorders, and other areas such as hospitalized influenza, multidrug-resistant tuberculosis, and Crohn's disease. As of May 2022, Otsuka is conducting three Phase 1 trials, six Phase 2 trials, and 13 Phase 3 trials.

OTSUKA US INVESTIGATIONAL PIPELINE PROGRAMS

CNS		STATUS
Brexiprazole*	Agitation in Alzheimer's disease (AD)	Phase 3
Brexiprazole*	Post-traumatic stress disorder	Phase 3
Brexiprazole*	Irritability in pediatric autism	Phase 3
Aripiprazole long-acting injectable*	2-month ready-to-use formulation Schizophrenia and bipolar mania	Pre-submission
AVP-786	Agitation in AD	Phase 3
AVP-786	Schizophrenia negative symptoms	Phase 2/3
AVP-786	Behavioral disturbances in traumatic brain injury	Phase 2
Centanafadine	Attention-deficit hyperactivity disorder	Phase 3
Centanafadine	Smoking cessation	Phase 2
Centanafadine	Binge eating disorder	Phase 2
OPC-214870	Epilepsy	Phase 2
OPC-224333	Epilepsy	Phase 1
CT-152	Major depressive disorder	Phase 3
SEP-363856 (ulotaront)»	Schizophrenia	Phase 3
SEP-4199»	Bipolar depression	Phase 3
SEP-378614»	TBD	Phase 1
SEP-380135»	TBD	Phase 1

NEPHROLOGY		STATUS
Tolvaptan	Pediatric autosomal dominant polycystic kidney disease	Phase 3
Tolvaptan	Pediatric autosomal recessive polycystic kidney disease	Phase 3
Sibeprenlimab [§]	Immunoglobulin A nephropathy	Phase 3

OTHER AREAS		STATUS
OPC167832 ^{II}	Pulmonary tuberculosis	Phase 2

Note: In general, Otsuka discloses compounds that are in Phase II or a later stage of development, although some compounds in Phase I are disclosed in these tables.

* Part of Otsuka/Lundbeck alliance
» Part of Otsuka/Sunovion alliance

§ Developed by Otsuka and Visterra
^{II} Supported by a grant from the Bill & Melinda Gates Foundation

Otsuka's Support for Patients

Otsuka offers a range of programs, featured below, that help patients in multiple ways, from financial assistance to mental health support to online resources.

COMMITMENT TO HEALTH EQUITY

Otsuka is committed to providing access to care and services for underserved patient communities to improve patient outcomes and support health equity. For example, Otsuka is supporting the development of studies on health equity issues and policy solutions for mental health by the historically black Morehouse College. Otsuka also will be driving health equity recommendations in chronic kidney disease task forces at the state level and is looking at strategies to reach out to under-represented communities through community building and education platforms.

ADDRESSING GAPS IN EARLY STAGES OF CARE

Otsuka is also focused on developing tools and services to bridge gaps in the early stages of care. For example, the company plans to work with advocacy partners to hold early screening events in communities. Otsuka also is looking at how digital interventions can help bridge gaps in early stages of care and drive early intervention.



A dedicated team committed to providing personalized access, affordability, and treatment-related support to patients, care partners, and their healthcare providers throughout their unique patient journey



Customer-centric support network of dedicated professionals and enhanced digital offerings striving to deliver efficient resolution to questions and challenges



Separate nonprofit organization providing eligible patients with prescribed Otsuka medication free of cost



Online educational resources across all of Otsuka's therapeutic areas for patients, families, and caregivers



A community created for young adults to celebrate their minds, reclaim their lives from mental illness, share their stories, and seek support



Neuroscience Experts and Cross-Sector Unconventional Stakeholders (NEXUS) convenes traditional and non-traditional mental health stakeholders who are bringing innovative solutions to address critical needs in mental health

Otsuka's Work in Patient Advocacy

Otsuka actively collaborates with patient advocacy organizations to share ideas and insights and work to better understand patient and caregiver needs. Otsuka's work with these organizations is focused not on Otsuka products but on sharing perspectives, resources, and community relationships.

For example, Otsuka served as the founding sponsor of the National Kidney Foundation's "Are You the 33% Campaign," helping to steer the strategic direction of the campaign from its launch. In addition, Otsuka has worked with the PKD Foundation to increase awareness of polycystic kidney disease among diverse populations. Otsuka also supports and collaborates with a host of advocacy organizations dedicated to supporting patients, advancing research, and conducting advocacy in mental illness, including but not limited to the Depression and Bipolar Support Alliance, National Alliance on Mental Illness, Mental Health America, and National Council for Mental Wellbeing.

Patient advocacy organizations Otsuka works with include:



Depression and Bipolar
Support Alliance



Mental Health America



PKD FOUNDATION
Polycystic Kidney Disease



**NATIONAL KIDNEY
FOUNDATION**

Prioritizing Healthcare Workers

Otsuka has made the mental health and wellbeing of healthcare workers a top priority. The company supports efforts led by professional organizations in both mental health and kidney health. For example, Otsuka has worked with the American Nephrology Nurses Association to identify and support the mental health needs of kidney health professionals.



Otsuka Pharmaceutical Affiliates

Otsuka has four pharmaceutical affiliates in the US with different focuses pertaining to meeting patient needs:



ASTEX PHARMACEUTICALS

A biotechnology company
focused on cancer and therapies
for CNS diseases



AVANIR PHARMACEUTICALS

A biopharmaceutical company
focused on developing therapies for
CNS diseases



MCQUADE CENTER FOR STRATEGIC RESEARCH & DEVELOPMENT (MSRD)

A US limited-liability company
started to identify and fund
innovative early-stage research and
development programs



VISTERRA

Committed to developing innovative
antibody-based therapies for the
treatment of patients with kidney
disease and other conditions

Otsuka Alliances

In addition to its affiliates, Otsuka works both internally and in collaboration with other companies to develop pharmaceuticals and digital innovations for nephrology and mental health.



CLICK THERAPEUTICS

The collaboration will leverage Click's ability to discover and validate a software application and deploy it commercially with Otsuka's expertise in developing approved prescription therapies



LUNDBECK

An alliance to deliver innovative medicines targeting psychiatric disorders worldwide



SUNOVION

The global collaboration agreement between Sunovion (together with its parent company Sumitomo Dainippon Pharma Co., Ltd.) and Otsuka is focused on working together on solutions to address areas of unmet medical need. Sunovion and Otsuka will leverage their complementary therapeutic area expertise and capabilities to fully explore the medical potential of the compounds in the collaboration

Otsuka's Corporate Social Responsibility (CSR) Priorities



MENTAL HEALTH
CARE EQUITY



CARE DISPARITIES
IN NEPHROLOGY



ADDRESSING SOCIAL
DETERMINANTS OF HEALTH



ACCESS TO DIGITAL
HEALTH SOLUTIONS



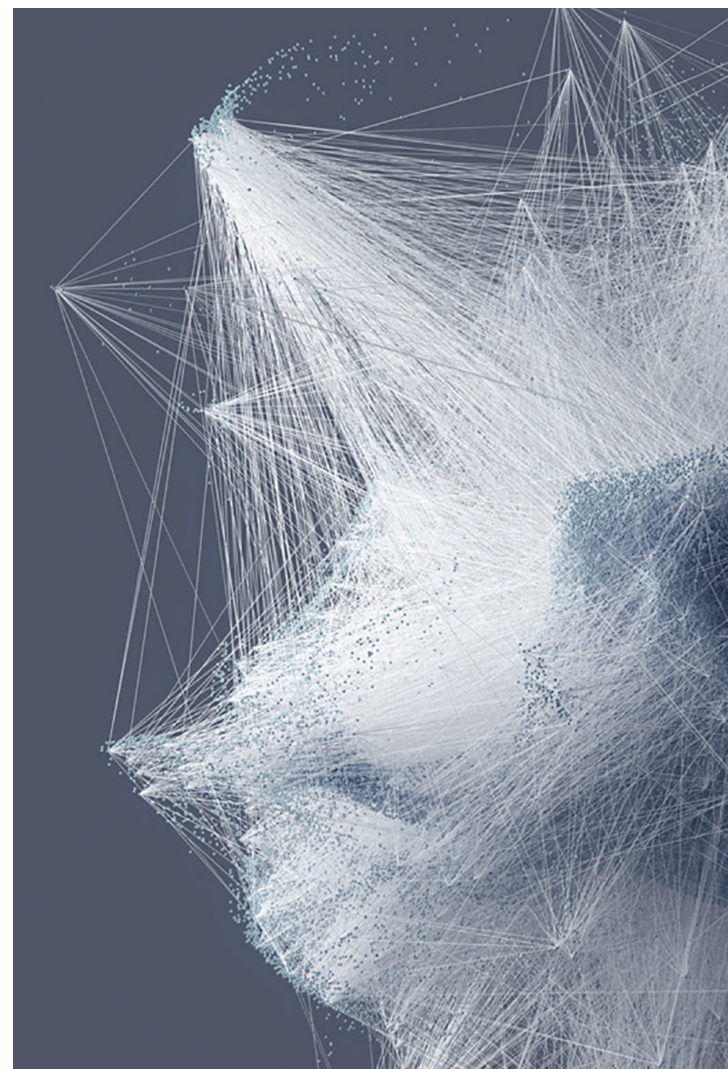
Otsuka's Commitment to Scientific Advancement to Address Unmet Needs


Otsuka is a science-driven, global healthcare company with the corporate philosophy of:

“Otsuka—people creating new products for better health worldwide.”

Otsuka remains one of the only pharmaceutical companies that continues to tackle the unmet needs in mental illness. We do this across a variety of areas. We are continuing to invest in developing pharmaceuticals (pills and long-acting injectables), digital medicine, and digital therapeutics. We also believe that the need for innovative approaches to treating mental illness has never been greater. We continue to believe in and prioritize the value of all minds, and are committed to the long-term investment required to bring mental health products to market.

Otsuka is also a company willing to stay the course in bringing products to market. Both within the areas of mental illness and nephrology, Otsuka has and continues to persevere in pursuing indications even if they require an extended period of time in clinical study. We know unmet needs across these disease areas are significant and the additional time is worth being able to bring new options to patients.





“We’re driven by a commitment to creating new products for better health worldwide. Our employees are at the helm of this mission and the patients we humbly serve are at the core.

– Kabir Nath, Senior Managing Director
Global Pharmaceutical Business
Otsuka

We defy limitation, so that others can too.

