SPECIAL Report

New Drugs Listed in 2021

A Synopsis of the Key Drugs Listed in 2021 – their positioning and how they are going to impact the market landscape.

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Monitoring Pharmaceutical Industry for the Society

INDEX

SPECIAL Report

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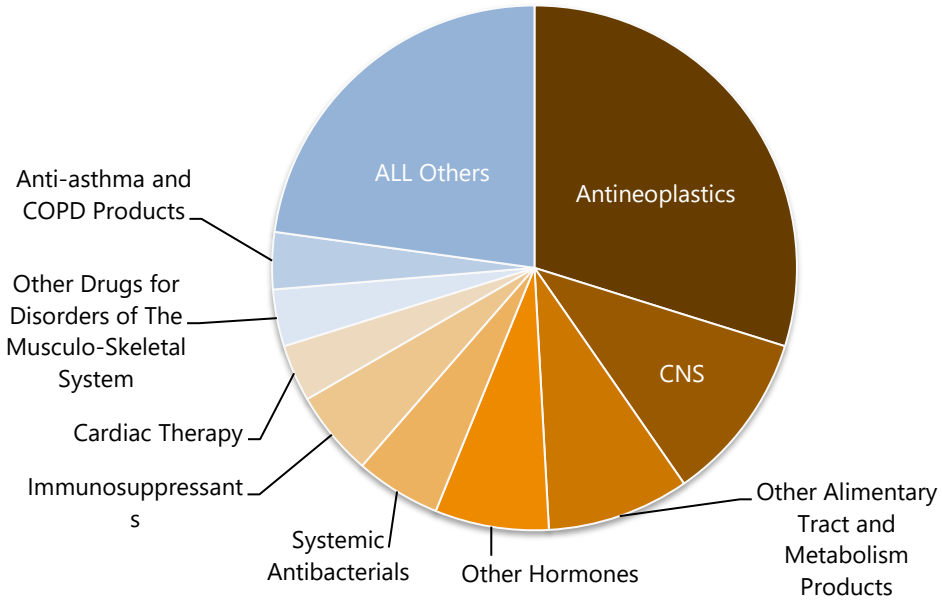
Overview of New Drugs[*1] Listed in 2021

In 2021, a total of 57 new drug entities were listed in Japan. This count was little larger than the count of new drugs listed a year ago in the 2020 (52 new drugs), however the combined peak sales estimate for 2021 was slightly higher (¥429 Billion vs. ¥405 Billion).

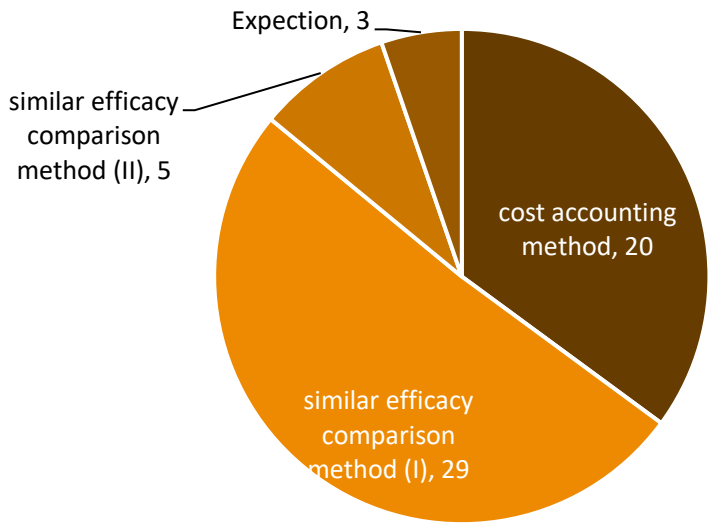
Oncology continues to be largest contributor for new drugs flow and a total of 17 new drugs from oncology were listed. It was followed by 6 from CNS and 5 Other Alimentary Tract and Metabolism Products (Figure 1).



Source: MHLW, Encise Research Center

Figure 1. New Drugs Listing in 2021 by Therapeutic Category

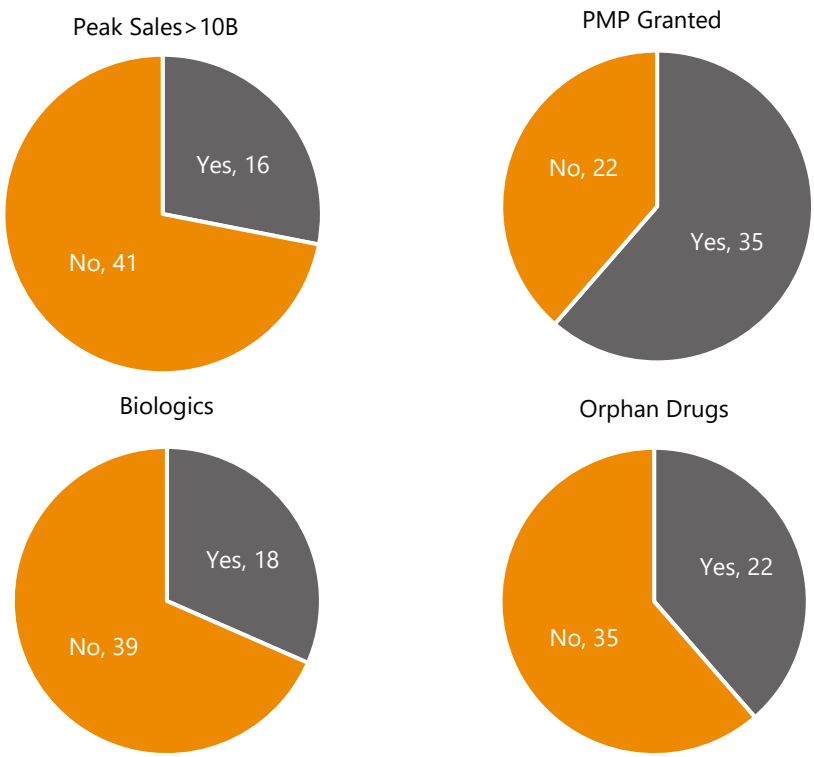
On pricing method front – maximum 29 drugs were priced by 'similar efficacy comparison method (I)', followed by 20 from the 'cost accounting method' (Figure 2).



Source: MHLW, Encise Research Center

Figure 2. New Drugs Listing by Price Method

Out of these 57 newly listed drug entities, 16 are expected to have over ¥10 Billion of peak sales potential and 35 have received 'price-maintenance premium'. Out of these 57, 18 are biologics and 22 are listed under orphan drug status. (Figure 3 to 6).



Source: MHLW, Encise Research Center

Figure 3 to 6.

New Drugs Listings by Different Categories

A more comprehensive overview of new drugs listing in past 10 years is provided under the appendix of this report (figure 7 to figure 12).

*1...The report includes all drugs approved under 'ethical drugs' and 'human cell therapy and gene therapy products' categories specified by the MHLW.

Drugs Containing New Active Ingredients & Listed Under over ¥10 Billion of Peak Sales Potential

The Debut of CGRP-Inhibitors for the Prevention of Migraine

Drug Profile - Emgality, Ajovy, and Aimovig					
Molecule Type	Biologics(mAb)	Molecule	Galcanezumab(genetical recombination)	Brand	Emgality
			Fremanezumab(genetical recombination)		Ajovy
			Erenumab(genetical recombination)		Aimovig
Launch Month	April 2021	Form	Injection	Standard Unit	120mg/mL/kit, 120mg/mL/syringe
	August 2021				225mg/1.5mL/syringe
	August 2021				70mg/mL/kit
Therapeutic Classes[*2] (2nd level)	Analgesics	Mechanism of Action (MOA)	Calcitonin gene related peptide (CGRP) antagonism		
Therapeutic Classes[*2] (3rd level)	Anti-migraine Preparations		Calcitonin gene related peptide (CGRP) antagonism		
			Inhibitory effect on calcitonin gene related peptide (CGRP) receptor binding		
Indication	Prevention of migraine attacks				
Manufecturer	Eli Lilly Japan	Marketer	Daiichi Sankyo	Originator/s	Eli Lilly and Company
	Otsuka Pharmaceutical		Otsuka Pharmaceutical		Rinat Neuroscience
	Amgen		Amgen		Amgen
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥45,165, ¥44,940	Peak Sales (Predicted[*3])	¥17.3 Billion
			¥41,356		¥13.7 Billion
			¥41,356		¥15.3 Billion
Total Sales of the Therapeutic Category (Anti-migraine Preparations)[*4]					¥20 Billion
Contribution of the Brands in the Category (Anti-migraine Preparations)[*4]					47%
Hospital (≥100 beds) Sales Ratio in the Category (Anti-migraine Preparations)[*4]					22%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

In 2021, three drugs from a new class were launched for the prevention of onset of migraine attacks. All of these are antibodies which are expected to prevent migraine attacks by inhibiting the binding of the Calcitonin gene-related peptide (CGRP) ligand to the CGRP receptor. They were initially launched in subcutaneous injectable formulations.

Emgality was the first one from the class, launched in April 2021, and hence it was priced by the cost-based method and categorized as 'H1' in the cost-effectiveness analysis (CEA) scheme. Ajovy and Aimovig followed Emgality and the both were launched in August 2021. They were placed into the 'H5' category of products which is considered similar to CEA-applicable products.

Calcitonin gene-related peptide (CGRP)-inhibition: CGRP is a peptide which is found in abundance in the sensory nerves that are present in the head and the neck area. CGRP is involved in the transmission of pain senses and its level is increased during the migraine attacks. It is considered to play a causative role in the induction of migraine attacks. CGRP inhibitors block the effect of CGRP and thereby found to be effective in the management of migraine. It is a new class of drugs and there are anti-CGRP antibodies as well as small molecules.
Emgality and Ajovy are 'anti-CGRP antibodies' while Aimovig is an 'anti-CGRP receptor antibody'. No small molecule CGRP-inhibitor is yet available in Japan.

Migraine in Japan: Migraine is a chronic disease characterized by episodic headache attacks. It is considered to be a common health condition, however severely affecting the quality of life of the patients during the migraine episodes. The prevalence in higher in youngers than elderly and in women than in men.
As per the Ministry of Health, Labour and Welfare (MHLW) survey, the total number of patients for 'Migraine and other headache syndromes' was 301,000 in Japan in 2020. And the prevalence was found to be predominantly in women (68.4% of the total cases). Some recent studies suggest that the percentage of people with migraine who did not receive medical attention is as high as 80% in Japan. This is because a large proportion of patients tend to endure symptoms and continue with everyday activities without treatment.

Competitive Landscape: The total market for 'Antimigraine Preparations' was ¥20.0 Billion in 2021 in Japan. A significant growth is expected in this market after the entry of CGRP-inhibitors, and other new candidates also likely to enter the market in future.

The acceptance of CGRP-inhibitors has been good so far. Some reports suggest that these drugs lead to reduced headaches in around 70% of the treatment patients at different degrees. The Japanese Headache Society (JHS) has issued provisional guidelines on the use of new migraine treatments targeting CGRP. The JHS provisions guidelines list down a number of criteria to be met by the patients to qualify for the use of CGRP-inhibitors (such as they should have average of at least four headache days per month, impaired activities of daily living despite the use of acute-phase treatments, inadequate response to conventional preventive drugs, etc.). The guidelines consider all three drugs equal and it completely leaves it on the doctor to select the drug.

While CGRP-inhibitors appears to have good acceptance, their high cost and subcutaneous injection pose certain hurdle in their rapid pick-up. However, Emgality Self-Injection was launched in May 2022 and Ajovy Auto-Injector was also approved in June 2022. These new formulations are expected to reduce the burden on patients (such as monthly visit scheduling, time required for commuting to clinics and hospitals, transportation costs, and waiting time at medical institutions etc.) and hence likely to increase their use. The overall landscape of migraine treatment is expected to change further due to a number of new innovative drugs and formulations underway. It is also important to note here that a very large proportion of eligible patients do not get any treatment at all. A number of Oral, CGRP receptor blockers, also available in the overseas and can be expected in the Japan market in the future.

Overseas Status: Apart from the three CGRP-inhibitors which are available in Japan, the US Food and Drug Administration (FDA) has also approved Vyepti (eptinezumab-jjmr, approved in February, 2020) an IV formulation CGRP-inhibitor.

A number of Small Molecule, Oral, CGRP receptor blockers, are also approved by the US FDA. They are called Gepants. Unlike monoclonal antibodies, they rapidly penetrate the brain and exert effect quickly. However, as they metabolized in the liver, potential risk for interactions and potential liver damage could be higher.

These Gepants include Ubrelvy (ubrogepant, approved in December 2019), Nurtec ODT (Rimegepant, approved in February 2020) and Qulipta (atogepant, approved in September 2021). Ubrelvy is approved only for the treatment of migraine-attacks (and not for prevention), Nurtec ODT is approved both for prevention and treatment, and Qulipta is for the prevention of migraine attacks.
In Japan, atogepant is reportedly under Ph 3 development by Abbvie. The status of other Gepants in Japan is not known.

Cibinqo – The latest JAK inhibitor for AD

Drug Profile - Cibinqo					
Molecule Type	Small Molecule	Molecule	Abrocitinib	Brand	Cibinqo
Launch Month	December 2021	Form	Tablet	Standard Unit	50mg/tablet, 100mg/tablet, 200mg/tablet
Therapeutic Classes[*2] (2nd level)	Nonsteroidal Products for Inflammatory Skin Disorders	Mechanism of Action (MOA)	Inhibitory effect on the Janus kinase (JAK)		
Therapeutic Classes[*2] (3rd level)	Other Nonsteroidal Products for Inflammatory Skin Disorders				
Indication	Atopic dermatitis which has shown an inadequate response to convenetional treatments				
Manufecturer	Pfizer	Marketer	Pfizer	Originator/s	Pfizer
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥2,678.4, ¥5,221.4, ¥7,832.3	Peak Sales (Predicted[*3])	¥16.6 Billion
Total Sales of the Therapeutic Category (Other Nonsteroidal Products for Inflammatory Skin Disorders)[*4]					¥10 Billion
Contribution of the Brands in the Category (Other Nonsteroidal Products for Inflammatory Skin Disorders)[*4]					75%
Hospital (≥100 beds) Sales Ratio in the Category (Other Nonsteroidal Products for Inflammatory Skin Disorders)[*4]					11%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Cibinqo (abrocitinib) was listed as a new molecular entity (NME) in December 2021 for Atopic Dermatitis (AD) with a projected peak sale of ¥16.6 billion.

Atopic Dermatitis (AD) in Japan: AD, also frequently known as eczema, is a common, chronic or chronically relapsing, severely pruritic, skin disease. It is one of the most frequently observed skin disease in dermatology clinics in Japan. It affects people from all ages; however, a significant proportion of new patients are children. Prevalence in children is estimated to be around 12-13% in mainland Japan. The overall prevalence reportedly increasing in recent years. As per Ministry of Health, Labor and Welfare study (2020), the estimated number of AD patients was 1.25 million. Some other studies, however, suggest the figure at about 4-5 million based on medical billing data.

Treatment Paradigm: AD is chronic in nature and tends to flare periodically. Sometimes, it is also accompanied by asthma or hay fever. So far, no cure is available but treatments and self-care measures can relieve itching and prevent new outbreaks.

The Japanese guidelines for atopic dermatitis 2021 outline the treatment from the perspective of evidence-based medicine consisting of three primary measures: (1.) topical corticosteroids and tacrolimus ointment as the main treatment for the inflammation, (2.) topical application of emollients to treat the cutaneous barrier dysfunction; and (3.) avoidance of apparent exacerbating factors, psychological counselling and advice about daily life.

The mainstays of AD treatment are topical steroids and the immunomodulator tacrolimus, however they have several limitations (e.g. range of treatments available in serious cases is limited, and steroids can be inappropriate in some patients).

Competitive Landscape: The AD field has been very agile in recent years. This includes launch of the first antibody Dupixent (dupilumab) in 2018 and thereafter entry of a number of JAK-inhibitors (See the table below). Cibinqo is the latest JAK inhibitor for AD in the list.

The JAK-inhibitors offer oral convenience but It will still take time for them to get popularity due to side effect concerns (e.g. deep vein thrombosis, gastrointestinal perforation, malignant tumors etc. also tuberculosis screening and other tests are also required before using them which pose a high hurdle for their penetration.)

Otsuka's first topical phosphodiesterase 4 (PDE4) inhibitor Moizerto Ointment (difamilast) is the latest AD drug to be launched (in June 2022, with an estimated peak sales potential of ¥5.3 Billion). It is designed to improve the symptoms of AD by suppressing the production of chemical mediators such as pro-inflammatory cytokines. It will compete directly with Corectim Ointment for market shares.

Table: Recently Launched Drugs for Atopic Dermatitis

Molecule	Brand	MOA	Marketer	Form	Launch/Approval	Sales in FY 2021* (¥ Billion)
Dupilumab	Dupixent	Anti-IL-4/IL-13 receptor antibody	Sanofi	Injection	Launch April 2018	49.0
delgocitinib	Corectim	JAK inhibitor	Torii Pharma	Ointment	Launch June 2020	5.3
Baricitinib	Olumiant	JAK inhibitor	Eli Lilly Japan	Tablet	AD indication December 2020	22.4
Upadacitinib Hydrate	Rinvoq	JAK inhibitor	Abbvie	Tablet	AD indication August 2021	9.3
Abrocitinib	Cibinqo	JAK inhibitor	Pfizer	Tablet	Launch December 2021	0.0
Difamilast	Moizerto	PDE4 inhibitor	Otsuka	Ointment	Launch June 2022	n/a
Nemolizumab	Mitchga	Anti-IL-31 receptor antibody	Maruho	Injection	Launch August 2022	n/a

Source: Encise Research Center, company reports

Potential New Candidates in Pipeline: In January, 2022 LEO Pharma announced to file Japanese NDA for its antibody drug tralokinumab for the treatment of adults with moderate-to-severe AD. Tralokinumab is already approved as Adbry in the US and Adtralza in Europe, is a monoclonal antibody that specifically binds to and blocks the interleukin (IL)-13 cytokine, a key driver of AD signs and symptoms.

A number of new late-stage candidates are under development. This includes drugs with new mechanisms of action, such as the anti-IL-31 receptor, which is a humanized monoclonal antibody Nemolizumab.

Darzquro – creates value by substantially shortening the administration time of Darzalex

Drug Profile - Darzquro					
Molecule Type	Biologics(mAb)	Molecule	Daratumumab(genetical recombination) and Vorhyaluronidase alfa(genetical recombination)	Brand	Darzquro
Launch Month	May 2021	Form	Injection	Standard Unit	15mL/vial
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Antibody-dependent cellular cytotoxicity (anti-CD38 human monoclonal antibody) Accelerating effect on drug penetration and dispersion		
Therapeutic Classes[*2] (3rd level)	Monoclonal Antibody Antineoplastics				
Indication	Multiple myeloma				
Manufecturer	Janssen Pharmaceutical	Marketer	Janssen Pharmaceutical	Originator/s	Janssen Biotech
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥434,209	Peak Sales (Predicted[*3])	¥37 Billion
Total Sales of the Therapeutic Category (Monoclonal Antibody Antineoplastics)[*4]					¥823 Billion
Contribution of the Brands in the Category (Monoclonal Antibody Antineoplastics)[*4]					82%
Hospital (≥100 beds) Sales Ratio in the Category (Monoclonal Antibody Antineoplastics)[*4]					98%

[*2]…Encise's Anatomical Therapeutic Chemical Classification
[*3]…as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]…therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Janssen's multiple myeloma (MM) drug Darzquro (daratumumab + vorhyaluronidase alfa) is expected to generate ¥37 billion yen at its peak. It combines the company's already-approved human anti-CD38 monoclonal antibody (mAb) Darzalex (daratumumab) with vorhyaluronidase alfa, a new molecular entity (NME). At listing, Darzquro earned a 5% utility premium as it substantially shortens the administration time via subcutaneous injection, at three to five minutes, versus Darzalex IV's three to seven hours. The drug later also obtained an additional indication of systemic light-chain (AL) amyloidosis.

Multiple Myeloma (MM): MM is a cancer that originates in plasma cells. The malignant cells accumulate in the bone marrow, where they displace and suppress healthy blood cells. MM is also characterized by bone pain, osteoporosis and destructive lytic bone lesions. Anemia is also a common symptom found in most MM patients.

In the recent years, the CD38 is identified as one of the most strongly and uniformly expressed antigens on the surface of malignant plasma cells and is an established diagnostic marker for MM.
As per the National Cancer Centre (NCC) data in Japan, the total number of newly diagnosed cases of MM in 2019 were 7,591 (all genders). However, the new drugs and medical advancements have significantly improved the treatment rates over the recent years. As per the NCC data, the 5-year relative survival rate (between 2009 and 2011) was estimated to be 42.8% (male 41.9%, female 43.6%), which was just 30.0% between 1993 and 1996.

Competitive landscape: CD38 antigen is well expressed on plasma cells and hence considered as an ideal target for the treatment of MM with anti-CD38 mAbs. Daratumumab and isatuximab are two key CD38 targeted therapies already approved. While daratumumab is anti-CD38 mAb, isatuximab targets completely different epitope of CD38 molecule. Isatuximab was approved in Japan as Sarclisa by Sanofi for the treatment of relapsed/refractory multiple myeloma in June 2020 and it was launched in August 2020. However, its Darzquro dose convenience which gives it an upper hand.
Other CD38 targeting candidates include Felzartamab (from MorphoSys, currently under Ph III for MM) and Mezagitamab (from Takeda, currently under Ph I for MM).

Overseas Status: In the US, the subcutaneous formulation of daratumumab is lunched as Darzalex Faspro™. It is a fixed-dose combination of daratumumab with hyaluronidase-fihj.

¥10.2 B Evrysdi for SMA

Drug Profile - Evrysdi					
Molecule Type	Small Molecule	Molecule	Risdiplam	Brand	Evrysdi
Launch Month	August 2021	Form	Dry Syrup	Standard Unit	60mg/bottle
Therapeutic Classes[*2] (2nd level)	Other Drugs for Disorders of the Musculo-skeletal System	Mechanism of Action (MOA)	Effect of an increased expression of SMN proteins		
Therapeutic Classes[*2] (3rd level)	All Other Musculoskeletal Products				
Indication	Spinal muscular atrophy (designated as an orphan drug)				
Manufecturer	Chugai Pharmaceutical	Marketer	Chugai Pharmaceutical	Originator/s	PTC Therapeutics
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥974,463.70	Peak Sales (Predicted[*3])	¥10.2 Billion
Total Sales of the Therapeutic Category (All Other Musculoskeletal Products)[*4]					¥82 Billion
Contribution of the Brands in the Category (All Other Musculoskeletal Products)[*4]					63%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Musculoskeletal Products)[*4]					60%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Evrysdi (risdiplam) was approved as the first oral drug to be taken at home for spinal muscular atrophy (SMA) in Japan in adults, children and babies. The approval was backed on two positive pivotal studies evaluating Evrysdi in Types 1, 2 and 3 SMA across infants and adults.

Spinal muscular atrophy (SMA): SMA is a genetic neuromuscular disease that causes muscle atrophy and muscle weakness due to degeneration of the motor neuron. It is the most frequently observed life-threatening genetic disease in infants. The causative gene for SMA is the survival motor neuron (SMN) gene. The disease develops because of insufficient production of functional SMN protein from SMN2 genes alone, in addition to the dysfunction of the SMN1 gene. The incidence of SMA from infancy to childhood is one to two in 100,000 individuals.

MOA - Evrysdi is a SMN2 splicing modifier designed to treat SMA caused by mutations in chromosome 5q that lead to SMN protein deficiency. Evrysdi is designed to treat SMA by increasing and sustaining the production of the SMN protein. SMN protein is found throughout the body and is critical for maintaining healthy motor neurons and movement.

Competitive Landscape: There are three drugs currently available for SMA in Japan. The Biogen's oligonucleotide Spinraza (nusinersen) was launched in August 2017 as the first drug for SMA. It was followed by Novartis Pharma's gene therapy Zolgensma (onasemnogene abeparvovec) in May 2020. Evrysdi is the third drug. Total market for 'All Other Musculoskeletal Products' was ¥82.3 Billion in FY 2021. These three players for SMA had 17.3% market share. Zolgensma and Spinraza both are injectables (Zolgensma is IV infusion while Spinraza is spinal infusion) while Evrysdi is the only oral drug. Evrysdi was launched in August 2021 and it has been picking up well.
Although, Evrysdi carries a peak sales forecast exceeding ¥10 billion as per the data submitted to the Central Social Insurance Medical Council (Chuikyo), it was not subject Ministry of Health, Labour and Welfare (MHLW)'s cost-effectiveness assessments (CEAs) scheme because it was approved only for the treatment of a state-designated intractable disease, meeting one of the CEAs exclusion criteria.

Overseas Status: Evrysdi was approved in the U.S. in August 2020 and in Europe in March 2021. In May 2022, the US Food and Drug Administration (FDA) expanded approval of Evrysdi to include its use in infants younger than 2 months old. The approval was backed on a small trial of six babies which showed that use of Evrysdi helped all six sit without support after one year of treatment, while four could stand and three could walk. Like in Japan, Evrysdi was the last of the three SMA drugs available in the US to gain FDA approval, but its use has been steadily grown since its launch in 2020.

Padcev – First-in-class ADC with Global Blockbuster Potential

Drug Profile - Padcev					
Molecule Type	Antibody Drug Conjugate	Molecule	Enfortumab Vedotin(genetical recombination)	Brand	Padcev
Launch Month	November 2021	Form	Injection	Standard Unit	30mg/vial
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Inhibition of cell division and microtubule function (selective binding to Nectin4)		
Therapeutic Classes[*2] (3rd level)	Monoclonal Antibody Antineoplastics				
Indication	Unresectable urothelial cancer exacerbated after cancer chemotherapy				
Manufecturer	Astellas Pharma	Marketer	Astellas Pharma	Originator/s	Agensys, Seattle Genetics
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥99,609	Peak Sales (Predicted[*3])	¥11.8 Billion
Total Sales of the Therapeutic Category (Monoclonal Antibody Antineoplastics)[*4]					¥823 Billion
Contribution of the Brands in the Category (Monoclonal Antibody Antineoplastics)[*4]					82%
Hospital (≥100 beds) Sales Ratio in the Category (Monoclonal Antibody Antineoplastics)[*4]					98%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Padcev is the first-in-class antibody-drug conjugate (ADC) that targets Nectin-4. It was Co-developed by Astellas with Seagen (ex. Seattle Genetics), and believed to carry several hundred billion global potential (Astellas estimates about ¥ 400 Billion).
The NDA of Padcev was backed on two global clinical studies - PIII EV-301 and PII EV-201 trials. EV-301 showed statistically significant extension in overall survival (OS), the primary endpoint, versus chemotherapy. EV-201 confirmed a positive objective response rate (ORR).

Urothelial Cancer: is the most common type of bladder cancer which account for nearly 90% of all cases. It may also occur in the renal pelvis (where urine collects inside the kidney), ureter (tube that connects the kidneys to the bladder) and urethra (the duct by which urine is conveyed out of the body from the bladder). Most of the bladder cancer patients are elderly. About 90% of people with bladder cancer are older than 55 years, and the average age for diagnosis is estimated to be around 73 years.

It is more common among men (4x more prone to get diagnosed to it than women). Smoking is considered as one of the major risk factors and it is accounts for nearly 47% of all cases.
In Japan, estimated over 24,000 people are diagnosed with urothelial cancer every year. There are no effective treatments for patients who see disease worsening after chemotherapy and immunotherapy.
Globally, estimated about 573,000 new cases and 212,000 deaths were reported in 2020.

About Enfortumab Vedotin: Enfortumab vedotin is an ADC that is directed against Nectin-4, a protein located on the surface of cells and highly expressed in urothelial cancer. Nonclinical data suggest the anticancer activity of enfortumab vedotin is due to its binding to Nectin-4 expressing cells followed by the internalization and release of the anti-tumor agent monomethyl auristatin E (MMAE) into the cell, which leads to cell cycle arrest (formation of non-reproducing cells) and apoptosis (in-programmed cell death).

Potential to extend the market: Padcev was initially approved for the 'unresectable urothelial cancer exacerbated after cancer chemotherapy' i.e. a late stage treatment. However, latest data from Padcev+Keytruda combination therapy in cisplatin-ineligible patients (from the cohort K of the phase 1b/2 EV-103 trial) raise hopes about its potential use in early stage of treatments.

Overseas Status: In 2018, the US Food and Drug Administration (FDA) had granted Padcev Breakthrough Therapy designation for the treatment of locally advanced or metastatic urothelial cancer who were previously treated with checkpoint inhibitors. In July 2021, FDA granted a regular approval to Padcev for locally advanced or metastatic urothelial cancer.

Polivy - A First in Class, ADC for DLBCL Treatment

Drug Profile - Polivy					
Molecule Type	Antibody Drug Conjugate	Molecule	Polatuzumab vedotin(genetical recombination)	Brand	Polivy
Launch Month	May 2021	Form	Injection	Standard Unit	30mg/vial, 140mg/vial
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Inhibitory effect on microtubule function (selectively binds to CD79b)		
Therapeutic Classes[*2] (3rd level)	Monoclonal Antibody Antineoplastics				
Indication	Relapsed or refractory diffuse large B-cell lymphoma (designated as an orphan drug)				
Manufecturer	Chugai Pharmaceutical	Marketer	Chugai Pharmaceutical	Originator/s	Genentech
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥298,825, ¥1,364,330	Peak Sales (Predicted[*3])	¥12 Billion
Total Sales of the Therapeutic Category (Monoclonal Antibody Antineoplastics)[*4]					¥823 Billion
Contribution of the Brands in the Category (Monoclonal Antibody Antineoplastics)[*4]					82%
Hospital (≥100 beds) Sales Ratio in the Category (Monoclonal Antibody Antineoplastics)[*4]					98%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Polivy is a first-in-class anti-CD79b antibody-drug conjugate (ADC). It was initially launched in May 2021 for relapsed/refractory DLBCL. Later, it was filed for first line use based on robust data from PhIII POLARIX study. If approved for first-line use, its peak sales potential is likely to exceed twice to its currently estimated peak sales potential of ¥12 Billion. In FY 2021, Polivy sales had already crossed ¥10 Billion.

Diffuse Large B-cell Lymphoma (DLBCL): DLBCL is the most common and an aggressive form of non-Hodgkin lymphoma (NHL). It is estimated that about one third of all NHL are found to be DLBCL. Further, it is estimated that nearly about 40% of the DLBCL will have a relapse or refractory disease after the frontline therapy. At this stage salvage therapy options are limited and survival is short. About 150,000 people worldwide are estimated to be diagnosed with DLBCL every year. The per Ministry of Health, Labour and Welfare (MHLW) survey, the total number of NHL patients in Japan in 2020 were about 124,000.

Current Treatment Options: Salvage chemotherapy or salvage therapy is used to treat patients with hematologic malignancy like NHL who experienced no therapeutic effects (refractory), or recurrence/relapse of the disease. Applicable treatment may vary depending on the type of cancer. Combination therapies of multiple drugs including anticancer agents are generally used.

ADC Technology in Polivy: Polivy was developed by Roche using Seagens' ADC technology. It comprises anti-CD79b humanized monoclonal antibody and a tubulin polymerization inhibitor which are attached together using a linker. The CD79b protein is said to be expressed specifically in the majority of B-cells, which makes it a promising target. Polivy binds to CD79b and destroys these B-cells through the delivery of an anti-cancer agent.

Filing as First Line: It was filed for the first line use in December 2021. The first line filing was based on robust data from PhIII POLARIX study. The study evaluated efficacy, safety, and pharmacokinetics of Polivy plus R-CHP (rituximab + cyclophosphamide + doxorubicin + prednisone) vs. R-CHOP (rituximab + cyclophosphamide + doxorubicin + vincristine + prednisolone) in people with previously untreated DLBCL.

Global Status: In the USA, Polivy was granted accelerated approval in in June 2019. In the EU, it won conditional marketing authorization in January 2020.

Retevmo - world's first selective, small-molecule RET kinase inhibitor for RET fusion-positive NSCLC.

Drug Profile - Retevmo					
Molecule Type	Small Molecule	Molecule	Selpercatinib	Brand	Retevmo
Launch Month	December 2021	Form	Capsule	Standard Unit	40mg/capsule, 80mg/capsule
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Inhibitory effect on RET		
Therapeutic Classes[*2] (3rd level)	Protein Kinase Inhibitor Antineoplastics				
Indication	RET fusion gene-positive unresectable, advanced or recurrent non-small cell lung cancer (designated as an orphan drug)				
Manufecturer	Eli Lilly Japan	Marketer	Eli Lilly Japan	Originator/s	Array BioPharmaArray BioPharma
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥3,680, ¥6,984.5	Peak Sales (Predicted[*3])	¥15.6 Billion
Total Sales of the Therapeutic Category (Protein Kinase Inhibitor Antineoplastics)[*4]					¥439 Billion
Contribution of the Brands in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					95%
Hospital (≥100 beds) Sales Ratio in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					74%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Retevmo is the world's first selective, small-molecule RET kinase inhibitor approved for the treatment of RET fusion-positive non-small cell lung cancer (NSCLC).
In Japan, it was initially approved in September 2021 and was launched in December for the treatment of RET fusion-positive unresectable, advanced/relapsed NSCLC. Later in February 2022, its label was extended for the treatment of RET fusion-positive unresectable thyroid cancer and RET fusion-positive unresectable medullary thyroid cancer.

Japan Statistics: RET fusion-positive NSCLC is estimated to affect ~4,500 people in Japan.

RET activation is considered to take place due to a chromosomal rearrangement (RET fusion gene), in which the kinase domain of RET fuses with the dimerization domain of partner genes (such as CCDC6, KIF5B, and NCOA4), resulting in the constant activation of the kinase in a ligand-independent manner. Retevmo selectively inhibits the activated RET.

Competitive Landscape: Retevmo was priced by referring to Pfizer's Xalkori (crizotinib) under the comparator method (I) and it was granted a 5% utility premium (II) for its new MOA and a 10% marketability premium (I) for its orphan designation. Xalkori posted ¥ 3.2 Billion in the FY 2021.
In the 'RET market' El-Lilly is neck and neck with Roche. Roche had acquired exclusive commercialisation rights of RET inhibitor Gavreto (pralsetinib) outside of the US, excluding Greater China from Blueprint Medicines in 2020 for $775 million. Gavreto was approved by the US Food and Drug Administration (FDA) for RET fusion-positive metastatic NSCLC and advanced or metastatic RET mutant medullary thyroid cancer, advanced or metastatic RET fusion-positive thyroid cancer. In Japan, as per Chugai's updates, it expected to be filed by 2024 for NSCLC (1st Line).
Sanofi's Caprelsa (vandetanib) was refused for its label extension in 'RET fusion gene-positive, unresectable, advanced/relapsed NSCLC' by an Ministry of Health, Labour and Welfare (MHLW) evaluation council for approval recommendation of new drugs. As the council found that it did not meet a criterion for a medical need. It is approved for unresectable medullary thyroid cancer, an orphan disease.

Overseas Status: Retevmo had received Accelerated approval from the US FDA as the first therapy for the patients with metastatic RET fusion-positive NSCLC, advanced or metastatic RET mutant medullary thyroid cancer, advanced or metastatic RET fusion-positive thyroid cancer in May 2020. It was granted conditional marketing authorisation in Europe in February 2021.

Twymeeg – The First in Class Oral Anti-Diabetics

Drug Profile - Twymeeg					
Molecule Type	Small Molecule	Molecule	Imeglimin hydrochloride	Brand	Twymeeg
Launch Month	September 2021	Form	Tablet	Standard Unit	500mg/tablet
Therapeutic Classes[*2] (2nd level)	Drugs Used in Diabetes	Mechanism of Action (MOA)	Enhancement of glucose-stimulated insulin secretion and improvement of insulin resistance by acting via a mitochondrial mechanism		
Therapeutic Classes[*2] (3rd level)	Other Drugs Used in Diabetes				
Indication	Type 2 diabetes mellitus				
Manufecturer	Sumitomo Pharma	Marketer	Sumitomo Pharma	Originator/s	Merck KGaA
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥34.40	Peak Sales (Predicted[*3])	¥14.3 Billion
Total Sales of the Therapeutic Category (Other Drugs Used in Diabetes)[*4]					¥2 Billion
Contribution of the Brands in the Category (Other Drugs Used in Diabetes)[*4]					8%
Hospital (≥100 beds) Sales Ratio in the Category (Other Drugs Used in Diabetes)[*4]					31%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Twymeeg is a First in Class from a New Class defined by World Health Organization (WHO) called Glimins. After a long time, a new Oral drug candidate from a completely new class has been successful in diabetes. It was launched in September 2021 in Japan ahead of the world.

Twymeeg is claimed to be the only oral candidate with dual mechanism of action - It 1. Increases insulin secretion (in response to glucose), and 2. reduces insulin resistance. As a Result, it is claimed to have the potential to slow down the disease progression, provide therapeutic options to patients who no longer respond to current treatments, and it also complements existing treatments and decrease cardiovascular risk factors.

By targeting the mitochondria, Twymeeg can simultaneously target the pancreas, muscles, and the liver, which are the key organs and tissues involved in type 2 diabetes pathophysiology.

Clinical studies: Twymeeg approval was backed on three Ph3 Pivotal studies (TIMES 1, TIMES 2 and TIMES 3) which were conducted in Japan. The safety and efficacy of Twymeeg was studies as monotherapy and as add-on therapy to other oral anti-diabetics as well as vs insulin. These three studies involved 1,142 patients and all three trials met their primary endpoints and other objective successfully.
The TIMES 2 trial evaluated the long-term safety and efficacy of Twymeeg as monotherapy as well as an add-on therapy to other oral anti-diabetics. In this study, Twymeeg demonstrated the decrease in HbA1c from baseline ranging from 0.92% to 0.12%. It also demonstrated robust efficacy in combination with dipeptidyl peptidase IV (DPP-IV) inhibitors.

Competitive Landscape: The total anti-diabetic market (¥642 Billion in FY 03/22) is growing and the number of diabetic patients (estimated to be over >10million) is also growing. DPP-IV inhibitors and metformin are used at the early stage where Twymeeg is likely to be primarily positioned.
DPP-IV-inhibitors forms the largest single group with 38% to value share in entire diabetic market. They are expected to be Rxed to about 2/3rd of all patients under treatment. In TIMES2 studies, Twymeeg showed maximum efficacy in combination with DPPIV inhibitors.

Similarity with Metformin: There is surprisingly a good structurer similarity between metformin and Twymeeg. Their clinical profile is also similar, with Twymeeg seems to score over metformin on safety and efficacy parameters. This makes Twymeeg very interesting candidates. Metformin is an old compound and it is still first-line choice for many doctors. However, estimated over 1/3rd of patients does not respond/tolerate to it and eventually moved to other oral drugs. Metformin, despite being very old candidate, is still growing. The number of pills sold of Metformin in Japan are just second to DPPIV inhibitors. More than 2 billion Pills of both DPPIV inhibitors and Metformin are sold in Japan.

The above perspectives make Twymeeg an interesting candidate with high market potential. However, it may take time for Twymeeg to penetrate the market as it doesn't address a 'well defined immediate need' despite offering a potential to be used in a broad spectrum of patients. In short-term, it may target metformin refractory patients and as add-on to DPPIV inhibitors, in long-term it may widen its use with other drugs and as monotherapy also.

It is to be noted here that the biggest Metformin brand is sold by Sumitomo Pharma (Metgluco). Sumitomo Pharma, in fact, has one of the most comprehensive anti-diabetic portfolio which it markets/co-market in Japan. It sells – Biguanides (metformin), Glinides, Sulphonylurea and DPP-IV Inhibitor. Hence, Twymeeg may also have some 'conflict' or 'cannibalization' with its existing portfolio, which may affect its promotion and eventually the market penetration.

Overseas Status: In Japan, while Twymeeg is primarily positioned for monotherapy and add-on therapy to a number of anti-diabetics, in the USA/EU it is only targeting a nice market of T2DM patients with chronic kidney disease (CKD) in stages 3b/4.

Upasita – A Japan Origin Drug for SHPT patients on haemodialysis.

Drug Profile - Upasita					
Molecule Type	Small Molecule	Molecule	Upacicalcet sodium hydrate	Brand	Upasita
Launch Month	August 2021	Form	Injection	Standard Unit	25μg/mL/syringe, 50μg/mL/syringe, 100μg/mL/syringe, 150μg/mL/syringe, 200μg/mL/syringe, 250μg/mL/syringe, 300μg/mL/syringe
Therapeutic Classes[*2] (2nd level)	Other Hormones	Mechanism of Action (MOA)	Calcium receptor activation		
Therapeutic Classes[*2] (3rd level)	Antiparathyroid Products				
Indication	Secondary hyperparathyroidism in patients on hemodialysis				
Manufecturer	Sanwa Kagaku Kenkyusho	Marketer	Sanwa Kagaku Kenkyusho	Originator/s	Ajinomoto Pharma
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥976, ¥1,392, ¥2,007, ¥2,494, ¥2,914, ¥3,291, ¥3,635	Peak Sales (Predicted[*3])	¥10.4 Billion
Total Sales of the Therapeutic Category (Antiparathyroid Products)[*4]					¥40 Billion
Contribution of the Brands in the Category (Antiparathyroid Products)[*4]					64%
Hospital (≥100 beds) Sales Ratio in the Category (Antiparathyroid Products)[*4]					32%

[*2]…Encise's Anatomical Therapeutic Chemical Classification
[*3]…as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]…therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Upasita was approved for the treatment of secondary hyperparathyroidism (SHPT) in patients on hemodialysis.

Secondary hyperparathyroidism (SHPT): SHPT is one of the complications that occur as chronic kidney disease (chronic kidney failure) progresses and is a pathological condition where excessive PTH is secreted by the parathyroid gland. Excessive secretion of parathyroid hormone (PTH) promotes efflux of phosphorus and calcium from the bone into the blood, thereby increasing the risk of developing bone fractures and arteriosclerosis due to calcification of the cardiovascular system and affecting the vital prognosis.

MOA- Upacicalcet is a calcimimetic agent. It acts directly on the parathyroid cell membrane calcium-sensing receptors and thereby suppresses excessive PTH secretion and lowers blood PTH levels.

Clinical Data: In Phase III clinical trials Upasita demonstrated impressive results and the data were presented at the American Society of Nephrology (ASN) Kidney Week in 2020.
The placebo-controlled, double blind comparative phase III study was designed to evaluate the efficacy and safety of Upasita in SHPT patients on dialysis receiving the drug for 24 weeks. The patients who have achieved a mean intact PTH concentration between 60 pg/mL and 240 pg/mL at week 22, 23, and 24, the primary endpoint of the study, was significantly higher for the Upasita group at 67% than 8% for the placebo group.

Competitive Landscape: The total market for 'Antiparathyroid Products' was ¥40.0 Billion in FY 2021. The three players (Orkedia, Parsabiv, Oxarol) had 74.5% market share.

Overseas Status: It was launched in Japan first and not yet approved by the US Food and Drug Administration (FDA) or European Medicines Agency (EMA).

Veklury – The First Approved drug for COVID-19 Continue to Expand its use

Drug Profile - Veklury					
Molecule Type	Small Molecule	Molecule	Remdesivir	Brand	Veklury
Launch Month	October 2021	Form	Injection	Standard Unit	100mg/vial
Therapeutic Classes[*2] (2nd level)	Antivirals for Systemic Use	Mechanism of Action (MOA)	Selective inhibition of RNA-dependent RNA polymerase		
Therapeutic Classes[*2] (3rd level)	Antivirals, Other				
Indication	SARS-CoV-2 infection				
Manufecturer	Gilead Sciences	Marketer	Gilead Sciences	Originator/s	Gilead Sciences
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥63,342	Peak Sales (Predicted[*3])	¥18.1 Billion
Total Sales of the Therapeutic Category (Antivirals, Other)[*4]					¥29 Billion
Contribution of the Brands in the Category (Antivirals, Other)[*4]					70%
Hospital (≥100 beds) Sales Ratio in the Category (Antivirals, Other)[*4]					46%

[*2]…Encise's Anatomical Therapeutic Chemical Classification
[*3]…as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]…therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Veklury's initial 'landmark approval' was grated in just three days after its filing under the 'exceptional approval' in May 2020 as the first drug for Coronavirus Disease 2019 (COVID-19), for severally ill patients. However, its NHI listing took place in August 2021. It was initially purchased by the Japanese government and supplied to medical institutions free of charge. After a transition period following the listing, it became available in the normal distribution channel.

Remdesivir was originally developed to treat hepatitis-C and was subsequently investigated for Ebola virus disease and Marburg virus infections before being evaluated for its use in treatment for COVID-19.

MOA: Remdesivir is an RNA synthase inhibitor. It inhibits the SARS-CoV-2 RNA-dependent RNA polymerase (RdRp). RdRp is essential for viral replication, and thus creation of virions that circulate in the body.

Remdesivir is a prodrug that distributes into cells where it is metabolized into the pharmacologically active remdesivir triphosphate (RDV-TP). RDV-TP acts as an analog of adenosine triphosphate (ATP) and competes with it for incorporation into nascent viral RNA. The incorporation of RDV-TP into nascent viral RNA results in delayed chain termination (position i+3) which disrupts the replication of SARS-CoV-2 viral RNA.

Expanding Label: In January 2021, the Ministry of Health, Labour and Welfare (MHLW) has revised the label of Veklury to allow its use not only in severe COVID-19 cases but also in moderately ill patients. A year later, in January 2022, it was allowed to be administered by nurses in patients recuperating at home or accommodation facilities at the instruction of doctors.

Later, in March 2022, it was also allowed by the MHLW for its use in mild COVID-19 with its label expanded to patients with risks factors for progression to severe disease. The label expansion was on the back of the results from the global PIII GS-US-540-9012 study, which enrolled COVID-19 patients not requiring oxygen. In the study, Veklury reduced the risk of COVID-19 related hospitalization or all-cause deaths by 87%.

Competitive Landscape: Veklury was the first drug to be approved for the treatment of COVID-19, and it was initially approved for the treatment of severely ill hospitalized patients. Later, it expanded its label to cover mild-to-moderate cases and for home use under nurse supervision, which increased its market potential multi-fold. However, as Veklury needs to be administered via IV-infusion only, it poses certain limits regarding its use.

As a large population is already vaccinated, the market need is gradually moving towards safer and more convenient drugs for mild-to-moderate cases, home use, prophylactic use etc. The novel oral anti-viral candidates appear fit to cater this market need. A number of oral anti-viral candidates are under development which mainly belongs to polymerase Inhibitors, protease Inhibitor, and nucleocapsid inhibitor classes. Lagevrio (Molnupiravir), and PaxlovidPACK (Nirmatrelvir with ritonavir) are already available in the Japan market, and some others look promising from their data.

However, Gilead is also working on an oral version of remdesivir (GS-5245), which could be a game changer. Once taken into the body, GS-5245 turns into the active metabolite of remdesivir, bringing the benefits of Veklury in oral forms. Gilead is planning to launch a global PIII study within 2022. Gilead is also working on an inhaled version of remdesivir. If successful, these new formulations will maintain Gilead's leadership into Covid-19 treatment.

Overseas Status: Veklury is available in many counties worldwide and it is considered as a forefront candidate for COVID-19 treatment. The US Food and Drug Administration (FDA) considers it to be a first-in-class medication. Veklury generated a total global sale of US$ 5,565 million in 2021 (98% YoY) as per Gilead reports. If successful in new formulations under development (like oral and inhalation), Veklury will maintain its strong market share in the market.

Vynmac – High Potential, Higher Dose of tafamidis for ATTR-CM

Drug Profile - Vynmac					
Molecule Type	Small Molecule	Molecule	Tafamidis	Brand	Vynmac
Launch Month	February 2022	Form	Capsule	Standard Unit	61mg/capsule
Therapeutic Classes[*2] (2nd level)	Cardiac Therapy	Mechanism of Action (MOA)	Inhibition of transthyretin (TTR) tetramer dissociation and degeneration		
Therapeutic Classes[*2] (3rd level)	All Other Cardiac Preparations				
Indication	Transthyretin cardiac amyloidosis (wild type and mutant type)				
Manufecturer	Pfizer	Marketer	Pfizer	Originator/s	FoldRx Pharmaceuticals
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥155,464	Peak Sales (Predicted[*3])	¥52.4 Billion
Total Sales of the Therapeutic Category (All Other Cardiac Preparations)[*4]					¥11 Billion
Contribution of the Brands in the Category (All Other Cardiac Preparations)[*4]					35%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Cardiac Preparations)[*4]					56%

[*2]…Encise's Anatomical Therapeutic Chemical Classification
[*3]…as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]…therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Vynmac carries ¥52.4 billion yen of the peak sales potential, which is highest among all product approved in 2021. It is in fact the first drug after the checkpoint inhibitor Keytruda (pembrolizumab; ¥ 54.4 billion initially projected peak sales potential, listed in February 2017) to cross the ¥50 billion peak sales potential mark. Vynmac was approved for the treatment for Transthyretin Amyloid Cardiomyopathy (ATTR-CM).

Competitive Landscape: Vynmac (61 mg of tafamidis) is basically a high-dose version of Vyndaqel (20 mg of tafamidis meglumine (12.2 mg as tafamidis)), which is also from Pfizer. Tafamidis the only drug currently approved for this indication. While Vyndaqel needs to be taken OD of four capsules, Vynmac showed its bioequivalence with a single capsule. Vyndaqel was initially launched in November 2013 for the treatment of transthyretin familial amyloid polyneuropathy (TTR-FAP), which later expanded its label for ATTR-CM, a sakigake-designated indication, in March 2019.
Vynmac was priced by referring to the Vyndaqel under the comparator method (I), with no launch premiums was granted. Its peak sales of ¥52.4 billion expected to reach when 4,100 patients are on treatment.

Transthyretin Amyloid Cardiomyopathy (ATTR-CM): It is an underdiagnosed and potentially fatal disease of the heart muscle. In ATTR-CM, a protein called transthyretin that normally circulates in the bloodstream malfunctions and builds up in the heart, nerves and other organs. When these amyloid deposits build up in the heart, the walls can become stiff, making the left ventricle unable to properly relax and fill with blood – called cardiomyopathy. Gradually, the heart can become unable to adequately squeeze to pump blood out of the heart and leads towards heart failure.

Hereditary ATTR-CM: It may run in families. In this case, there's a variant in the transthyretin gene, which results in amyloid deposits in the heart, nerves and sometimes the kidneys and other organs. Symptoms may start as early as age 20 and as late as 80. There are different variants of hereditary ATTR-CM in different part of the world and races. Genetic testing helps providing important information for developing a treatment plan.

Tafamidis meglumine MOA: Tafamidis meglumine is NSAID benzoxazole derivative that binds with high affinity and selectivity to TTR and stabilizes the tetrameric form of TTR.

Global Status: Vynmac (61 mg of tafamidis) was approved under brand name Vyndamax by the US Food and Drug Administration (FDA) in May 2019. Earlier, the US FDA had granted Vyndaqel Fast Track (in 2017), Breakthrough Therapy (in 2018) designations. Vyndaqel and Vyndamax both have received Orphan Drug designation in the US. As per Pfizer, the combined worldwide sales of Vyndaqel and Vyndamax was $2,015 million in 2021.

Profile of new drugs in 2021, excluding the drugs which are described above

Trelegy

Drug Profile - Trelegy					
Molecule Type	Small Molecule	Molecule	Fluticasone furoate, Umeclidinium bromide, and Vilanterol trifenatate	Brand	Trelegy
Launch Month	February 2021	Form	Inhalation	Standard Unit	14 inhalations/kit, 30 inhalations/kit
Therapeutic Classes[*2] (2nd level)	Anti-asthma and COPD Products	Mechanism of Action (MOA)	Beta receptor stimulating activity / Anticholinergic activity / Anti-inflammatory effect		
Therapeutic Classes[*2] (3rd level)	Anticholinergics in Combination with B2-Agonists				
Indication	Bronchial asthma (when a inhaled corcicosteroid, a long-acting inhaled anticholinergic, and a long-acting inhaled beta 2 stimulant need to be used concurrently)				
Manufecturer	GlaxoSmithKline	Marketer	GlaxoSmithKline	Originator/s	GlaxoSmithKline, Theravance
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥4,764.5, ¥10,098.9	Peak Sales (Predicted[*3])	¥13 Billion
Total Sales of the Therapeutic Category (Anticholinergics in Combination with B2-Agonists)[*4]					¥38 Billion
Contribution of the Brands in the Category (Anticholinergics in Combination with B2-Agonists)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (Anticholinergics in Combination with B2-Agonists)[*4]					28%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Lasvic

Drug Profile - Lasvic					
Molecule Type	Small Molecule	Molecule	lascufloxacin hydrochloride	Brand	Lasvic
Launch Month	March 2021	Form	Injection	Standard Unit	150mg/kit (dilute solution supplied)
Therapeutic Classes[*2] (2nd level)	Systemic Antibacterials	Mechanism of Action (MOA)	Inhibitory effect on nucleic acid (DNA) synthesis		
Therapeutic Classes[*2] (3rd level)	Fluoroquinolones				
Indication	<Bacterial strains> The genus Staphylococcus, the genus Streptococcus, Streptococcus pneumoniae, the genus Enterococcus, Moraxella (Branhamella) catarrhalis, Escherichia coli, the genus Klebsiella, the genus Enterobacter, Haemophilus influenzae, Legionella pneumophila, the genus Peptostreptococcus, the genus Veillonella, the genus Bacteroides, the genus Prevotella, the genus Porphyromonas, the genus Fusobacterium and Mycoplasma pneumoniae that are sensitive to Lasvic <Diseases> Pneumonia, lung abscess, secondary infection of chronic respiratory disease				
Manufecturer	Kyorin Pharmaceutical	Marketer	Kyorin Pharmaceutical	Originator/s	Kyorin, Kyorin Pharmaceutical
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥4,034	Peak Sales (Predicted[*3])	¥5 Billion
Total Sales of the Therapeutic Category (Fluoroquinolones)[*4]					¥18 Billion
Contribution of the Brands in the Category (Fluoroquinolones)[*4]					36%
Hospital (≥100 beds) Sales Ratio in the Category (Fluoroquinolones)[*4]					27%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Xarelto

Drug Profile - Xarelto					
Molecule Type	Small Molecule	Molecule	Rivaroxaban	Brand	Xarelto
Launch Month	July 2021	Form	Dry Syrup	Standard Unit	51.7mg/bottle, 103.4mg/bottle
Therapeutic Classes[*2] (2nd level)	Antithrombotic Agents	Mechanism of Action (MOA)	Inhibitory effect on blood coagulation / Selective inhibitory effect on factor Xa		
Therapeutic Classes[*2] (3rd level)	Direct Factor-Xa Inhibitors				
Indication	Treatment and prevention of reccurence of venous thromboembolism				
Manufecturer	Bayer Yakuhin	Marketer	Bayer Yakuhin	Originator/s	Bayer, Johnson & Johnson Pharmaceutical Research & Development
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥5,308.3, ¥9,333.1	Peak Sales (Predicted[*3])	¥4.75 Million
Total Sales of the Therapeutic Category (Direct Factor-Xa Inhibitors)[*4]					¥258 Billion
Contribution of the Brands in the Category (Direct Factor-Xa Inhibitors)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (Direct Factor-Xa Inhibitors)[*4]					31%

Musredo

Drug Profile - Musredo					
Molecule Type	Small Molecule	Molecule	Molidustat sodium	Brand	Musredo
Launch Month	April 2021	Form	Tablet	Standard Unit	5mg/tablet, 12.5mg/tablet, 25mg/tablet, 75mg/tablet
Therapeutic Classes[*2] (2nd level)	Anti-anaemic Preparations	Mechanism of Action (MOA)	Inhibitory effect on hypoxia inducible factor prolyl hydoxylase (HIF-PH)		
Therapeutic Classes[*2] (3rd level)	HIF-PH Inhibitors				
Indication	Renal anaemia				
Manufecturer	Bayer Yakuhin	Marketer	Bayer Yakuhin	Originator/s	Bayer Schering Pharma
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥44.3, ¥93.7, ¥165.1, ¥405.3	Peak Sales (Predicted[*3])	¥9.1 Billion
Total Sales of the Therapeutic Category (HIF-PH Inhibitors)[*4]					¥8 Billion
Contribution of the Brands in the Category (HIF-PH Inhibitors)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (HIF-PH Inhibitors)[*4]					35%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Adlumiz

Drug Profile - Adlumiz					
Molecule Type	Small Molecule	Molecule	Anamorelin hydrochloride	Brand	Adlumiz
Launch Month	April 2021	Form	Tablet	Standard Unit	50mg/tablet
Therapeutic Classes[*2] (2nd level)	Other Hormones	Mechanism of Action (MOA)	Ghrelin-like agonist		
Therapeutic Classes[*2] (3rd level)	Growth Hormones				
Indication	Cancer cachexia in the following malignancies: non-small cell lung cancer, gastric cancer, pancreatic cancer, and colorectal cancer				
Manufacturer	Ono Pharmaceutical	Marketer	Ono Pharmaceutical	Originator/s	Novo Nordisk
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥246.40	Peak Sales (Predicted[*3])	¥3.8 Billion
Total Sales of the Therapeutic Category (Growth Hormones)[*4]					¥69 Billion
Contribution of the Brands in the Category (Growth Hormones)[*4]					97%
Hospital (≥100 beds) Sales Ratio in the Category (Growth Hormones)[*4]					57%

Alunbrig

Drug Profile - Alunbrig					
Molecule Type	Small Molecule	Molecule	Brigatinib	Brand	Alunbrig
Launch Month	April 2021	Form	Tablet	Standard Unit	30mg/tablet, 90mg/tablet
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Inhibitory effect on anaplastic lymphoma kinase (ALK)		
Therapeutic Classes[*2] (3rd level)	Protein Kinase Inhibitor Antineoplastics				
Indication	ALK fusion gene positive, unresectable, advanced or recurrent non-small cell lung cancer				
Manufacturer	Takeda Pharmaceutical	Marketer	Takeda Pharmaceutical	Originator/s	ARIAD Pharmaceuticals
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥4,200.5, ¥11,598	Peak Sales (Predicted[*3])	¥5.1 Billion
Total Sales of the Therapeutic Category (Protein Kinase Inhibitor Antineoplastics)[*4]					¥439 Billion
Contribution of the Brands in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					95%
Hospital (≥100 beds) Sales Ratio in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					74%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Calquence

Drug Profile - Calquence					
Molecule Type	Small Molecule	Molecule	Acalabrutinib	Brand	Calquence
Launch Month	April 2021	Form	Capsule	Standard Unit	100mg/capsule
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Inhibitory effect on bruton's tyrosine kinase		
Therapeutic Classes[*2] (3rd level)	Protein Kinase Inhibitor Antineoplastics				
Indication	Relapsed or refractory chronic lymphocytic leukemia (including small lymphocytic lymphoma)				
Manufecturer	AstraZeneca	Marketer	AstraZeneca	Originator/s	Acerta Pharma
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥15,202.20	Peak Sales (Predicted[*3])	¥2.6 Billion
Total Sales of the Therapeutic Category (Protein Kinase Inhibitor Antineoplastics)[*4]					¥439 Billion
Contribution of the Brands in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					95%
Hospital (≥100 beds) Sales Ratio in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					74%

Orladeyo

Drug Profile - Orladeyo					
Molecule Type	Small Molecule	Molecule	Berotralstat hydrochloride	Brand	Orladeyo
Launch Month	April 2021	Form	Capsule	Standard Unit	150mg/capsule
Therapeutic Classes[*2] (2nd level)	All Other Haematological Agents	Mechanism of Action (MOA)	Selective inhibitory effect on plasma kallikrein		
Therapeutic Classes[*2] (3rd level)	Hereditary Angioedema Products				
Indication	Inhibition of an acute attack of hereditary angioedema (designated as an orphan drug)				
Manufecturer	Orphan Pacific	Marketer	Torii Pharmaceutical	Originator/s	BioCryst Pharmaceuticals
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥74,228.20	Peak Sales (Predicted[*3])	¥6.7 Billion
Total Sales of the Therapeutic Category (Hereditary Angioedema Products)[*4]					-
Contribution of the Brands in the Category (Hereditary Angioedema Products)[*4]					-
Hospital (≥100 beds) Sales Ratio in the Category (Hereditary Angioedema Products)[*4]					-

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Sulprep

Drug Profile - Sulprep					
Molecule Type	Small Molecule	Molecule	Anhydrous sodium sulfate, Potassium sulfate, and Magnesium sulfate hydrate	Brand	Sulprep
Launch Month	May 2021	Form	Liquid	Standard Unit	480mL/bottle
Therapeutic Classes[*2] (2nd level)	Drugs for Constipation and Bowel Cleansers	Mechanism of Action (MOA)	Intra-intestinal cleansing effect		
Therapeutic Classes[*2] (3rd level)	Bowel Cleansers				
Indication	Elimination of intestinal contents in pretreatment for colonoscopy				
Manufacturer	Nihon Pharmaceutical	Marketer	Takeda Pharmaceutical	Originator/s	Braintree
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥1,011.60	Peak Sales (Predicted[*3])	¥2 Billion
Total Sales of the Therapeutic Category (Bowel Cleansers)[*4]					¥7 Billion
Contribution of the Brands in the Category (Bowel Cleansers)[*4]					80%
Hospital (≥100 beds) Sales Ratio in the Category (Bowel Cleansers)[*4]					57%

Hunterase

Drug Profile - Hunterase					
Molecule Type	Biologics(not mAb)	Molecule	Idursulfase beta(genetical recombination)	Brand	Hunterase
Launch Month	April 2021	Form	Injection	Standard Unit	15mg/mL/vial
Therapeutic Classes[*2] (2nd level)	Other Alimentary Tract and Metabolism Products	Mechanism of Action (MOA)	Iduronate-2-sulfatase		
Therapeutic Classes[*2] (3rd level)	Other Alimentary Tract and Metabolism Products				
Indication	Mucopolysaccharidosis II (designated as an orphan drug)				
Manufacturer	Clinigen	Marketer	Clinigen	Originator/s	Green Cross
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥1,981,462	Peak Sales (Predicted[*3])	¥1.4 Billion
Total Sales of the Therapeutic Category (Other Alimentary Tract and Metabolism Products)[*4]					¥109 Billion
Contribution of the Brands in the Category (Other Alimentary Tract and Metabolism Products)[*4]					85%
Hospital (≥100 beds) Sales Ratio in the Category (Other Alimentary Tract and Metabolism Products)[*4]					66%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Lynspad

Drug Profile - Lynspad					
Molecule Type	Small Molecule	Molecule	Human alpha 1-proteinase inibitor	Brand	Lynspad
Launch Month	July 2021	Form	Injection	Standard Unit	1,000mg/vial (solution for dissolution supplied)
Therapeutic Classes[*2] (2nd level)	Anti-asthma and COPD Products	Mechanism of Action (MOA)	Augmentation of alpha 1 proteinase inhibitor		
Therapeutic Classes[*2] (3rd level)	All Other Anti-asthma and COPD Products				
Indication	Severe alpha-1-antitrypsin deficiency (designated as an orphan drug)				
Manufecturer	Orphan Pacific	Marketer	Orphan Pacific	Originator/s	Bayer
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥216,054	Peak Sales (Predicted[*3])	¥303 Million
Total Sales of the Therapeutic Category (All Other Anti-asthma and COPD Products)[*4]					¥8 Billion
Contribution of the Brands in the Category (All Other Anti-asthma and COPD Products)[*4]					96%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Anti-asthma and COPD Products)[*4]					66%

Zymso

Drug Profile - Zymso					
Molecule Type	Small Molecule	Molecule	Dimethyl sulfoxide	Brand	Zymso
Launch Month	April 2021	Form	Liquid	Standard Unit	50%/50mL/vial
Therapeutic Classes[*2] (2nd level)	Urologicals	Mechanism of Action (MOA)	Anti-inflammatory effect, analgesic activity		
Therapeutic Classes[*2] (3rd level)	All Other Urological Products				
Indication	Improvement of various symptoms of interstitial cystitis (Hunner type) (chronic pelvic pain, pressure, or discomfort perceived to be related to the bladder, lower urinary tract symptoms such as persistent urge to void or urinary frequency) (designated as an orphan drug)				
Manufecturer	Kyorin Pharmaceutical	Marketer	Kyorin Pharmaceutical	Originator/s	Kyorin Pharmaceutical
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥11,210.50	Peak Sales (Predicted[*3])	¥0.7 Billion
Total Sales of the Therapeutic Category (All Other Urological Products)[*4]					¥1 Billion
Contribution of the Brands in the Category (All Other Urological Products)[*4]					7%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Urological Products)[*4]					22%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Yescarta

Drug Profile - Yescarta					
Molecule Type	Regenerative Medical Product	Molecule	Axicabtagene ciloleucel	Brand	Yescarta
Launch Month	April 2021	Form	Injection	Standard Unit	Per patient
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	CAR-transfected T cell-dependent cytotoxicity		
Therapeutic Classes[*2] (3rd level)	All Other Antineoplastics				
Indication	Relapsed or refractory large B-cell lymphoma including diffuse large B-cell lymphoma, primary mediastinal large B-cell lymphoma, transformed follicular lymphoma, and high-grade B cell lymphoma (designated as an orphan regenerative medicine product)				
Manufacturer	Daiichi Sankyo	Marketer	Daiichi Sankyo	Originator/s	Cabaret Biotech
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥34,113,655	Peak Sales (Predicted[*3])	¥7.9 Billion
Total Sales of the Therapeutic Category (All Other Antineoplastics)[*4]					¥154 Billion
Contribution of the Brands in the Category (All Other Antineoplastics)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Antineoplastics)[*4]					90%

Isturisa

Drug Profile - Isturisa					
Molecule Type	Small Molecule	Molecule	Osilodrostat phosphate	Brand	Isturisa
Launch Month	June 2021	Form	Tablet	Standard Unit	1mg/tablet, 5mg/tablet
Therapeutic Classes[*2] (2nd level)	Other Hormones	Mechanism of Action (MOA)	Inhibitory effect on 11 beta-hydroxylase		
Therapeutic Classes[*2] (3rd level)	Other Hormones and Preparations with Similar Actions				
Indication	Cushing's syndrome (when a surgical procedure has not been curative or is difficult to be performed.)				
Manufacturer	Recordati Rare Diseases Japan	Marketer	Recordati Rare Diseases Japan	Originator/s	Novartis
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥3,335.9, ¥13,249	Peak Sales (Predicted[*3])	¥1.2 Billion
Total Sales of the Therapeutic Category (Other Hormones and Preparations with Similar Actions)[*4]					¥2 Billion
Contribution of the Brands in the Category (Other Hormones and Preparations with Similar Actions)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (Other Hormones and Preparations with Similar Actions)[*4]					31%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Vitrakvi

Drug Profile - Vitrakvi					
Molecule Type	Small Molecule	Molecule	Larotrectinib sulfate	Brand	Vitrakvi
Launch Month	July 2021	Form	Capsule/Liquid	Standard Unit	25mg/capsule, 100mg/capsule, 2% /mL
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Inhibitory effect on tropomyosin receptor tyrosine kinase (TRK)		
Therapeutic Classes[*2] (3rd level)	Protein Kinase Inhibitor Antineoplastics				
Indication	NTRK fusion gene positive, advanced or recurrent solid tumors				
Manufecturer	Bayer Yakuhin	Marketer	Bayer Yakuhin	Originator/s	Array BioPharma
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥4,042.5, ¥14,542.9, ¥2,908.6	Peak Sales (Predicted[*3])	¥2 Billion
Total Sales of the Therapeutic Category (Protein Kinase Inhibitor Antineoplastics)[*4]					¥439 Billion
Contribution of the Brands in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					95%
Hospital (≥100 beds) Sales Ratio in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					74%

Pemazyre

Drug Profile - Pemazyre					
Molecule Type	Small Molecule	Molecule	Pemigatinib	Brand	Pemazyre
Launch Month	June 2021	Form	Tablet	Standard Unit	4.5mg/tablet
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Selective fibroblast growth factor receptor (FGFR) inhibitor		
Therapeutic Classes[*2] (3rd level)	Protein Kinase Inhibitor Antineoplastics				
Indication	FGFR2 fusion gene positive, unresectable biliary tract cancer exacerbated after cancer chemotherapy (designated as an orphan drug)				
Manufecturer	Incyte Biosciences Japan	Marketer	Incyte Biosciences Japan	Originator/s	Incyte
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥25,631.20	Peak Sales (Predicted[*3])	¥0.7 Billion
Total Sales of the Therapeutic Category (Protein Kinase Inhibitor Antineoplastics)[*4]					¥439 Billion
Contribution of the Brands in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					95%
Hospital (≥100 beds) Sales Ratio in the Category (Protein Kinase Inhibitor Antineoplastics)[*4]					74%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Kesimpta

Drug Profile - Kesimpta					
Molecule Type	Biologics(mAb)	Molecule	Ofatumumab(genetical recombination)	Brand	Kesimpta
Launch Month	May 2021	Form	Injection	Standard Unit	20mg/0.4mL/kit
Therapeutic Classes[*2] (2nd level)	Other CNS Drugs	Mechanism of Action (MOA)	Human anti-CD20 monoclonal antibody		
Therapeutic Classes[*2] (3rd level)	Multiple Sclerosis Products				
Indication	Prevention of recurrence and inhibition of progression of physical disability in the following patients: relapsing remitting multiple sclerosis, active secondary progressive multiple sclerosis (designated as an orphan drug)				
Manufecturer	Novartis Pharma	Marketer	Novartis Pharma	Originator/s	Genmab
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥230,860	Peak Sales (Predicted[*3])	¥9.9 Billion
Total Sales of the Therapeutic Category (Multiple Sclerosis Products)[*4]					¥31 Billion
Contribution of the Brands in the Category (Multiple Sclerosis Products)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (Multiple Sclerosis Products)[*4]					65%

Izcargo

Drug Profile - Izcargo					
Molecule Type	Biologics(not mAb)	Molecule	Pabinafusp alfa(genetical recombination)	Brand	Izcargo
Launch Month	May 2021	Form	Injection	Standard Unit	10mg/vial
Therapeutic Classes[*2] (2nd level)	Other Alimentary Tract and Metabolism Products	Mechanism of Action (MOA)	Iduronate-2-sulfatase		
Therapeutic Classes[*2] (3rd level)	Other Alimentary Tract and Metabolism Products				
Indication	Mucopolysaccharidosis II (designated as an orphan drug)				
Manufecturer	Jcr Pharmaceuticals	Marketer	Jcr Pharmaceuticals	Originator/s	JCR Pharmaceuticals
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥251,030	Peak Sales (Predicted[*3])	¥8.5 Billion
Total Sales of the Therapeutic Category (Other Alimentary Tract and Metabolism Products)[*4]					¥109 Billion
Contribution of the Brands in the Category (Other Alimentary Tract and Metabolism Products)[*4]					85%
Hospital (≥100 beds) Sales Ratio in the Category (Other Alimentary Tract and Metabolism Products)[*4]					66%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Joyclu

Drug Profile - Joyclu					
Molecule Type	Small Molecule	Molecule	Diclofenac etalhyaluronate sodium	Brand	Joyclu
Launch Month	May 2021	Form	Injection	Standard Unit	30mg/3mL/syringe
Therapeutic Classes[*2] (2nd level)	Other Drugs for Disorders of the Musculo-skeletal System	Mechanism of Action (MOA)	Stimulation of the production of high molecular weight hyaluronic acid, inhibition of the production of matrix metalloproteinases, inhibition of cyclooxygenase		
Therapeutic Classes[*2] (3rd level)	All Other Musculoskeletal Products				
Indication	Osteoarthritis (knee joint, hip joint)				
Manufecturer	Seikagaku	Marketer	Ono Pharmaceutical	Originator/s	Seikagaku
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥4,394	Peak Sales (Predicted[*3])	¥6.9 Billion
Total Sales of the Therapeutic Category (All Other Musculoskeletal Products)[*4]					¥82 Billion
Contribution of the Brands in the Category (All Other Musculoskeletal Products)[*4]					63%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Musculoskeletal Products)[*4]					60%

Remitoro

Drug Profile - Remitoro					
Molecule Type	Biologics(not mAb)	Molecule	Denileukin diftitox(genetical recombination)	Brand	Remitoro
Launch Month	May 2021	Form	Injection	Standard Unit	300μg/vial
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	IL-2 dependent cytotoxicity		
Therapeutic Classes[*2] (3rd level)	All Other Antineoplastics				
Indication	Relapsed or refractory peripheral T-cell lymphoma Relapsed or refractory cutaneous T-cell lymphoma				
Manufecturer	Eisai	Marketer	Eisai	Originator/s	Ajinomoto, Japanese Foundation for Cancer Research
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥85,610	Peak Sales (Predicted[*3])	¥1.8 Billion
Total Sales of the Therapeutic Category (All Other Antineoplastics)[*4]					¥154 Billion
Contribution of the Brands in the Category (All Other Antineoplastics)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Antineoplastics)[*4]					90%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.
Source: Encise Research Center, MHLW disclosures

Nuwiq

Drug Profile - Nuwiq					
Molecule Type	Biologics(not mAb)	Molecule	Simoctocog alfa(genetical recombination)	Brand	Nuwiq
Launch Month	August 2021	Form	Injection	Standard Unit	250 IU/vial[*5], 500 IU/vial[*5], 1,000 IU/vial[*5], 2,000 IU/vial[*5], 2,500 IU/vial[*5], 3,000 IU/vial[*5], 4,000 IU/vial[*5]
Therapeutic Classes[*2] (2nd level)	Blood Coagulation System, Other Products	Mechanism of Action (MOA)	Haemostatic effect / Replacement of blood coagulation factor VIII		
Therapeutic Classes[*2] (3rd level)	Blood Coagulation Products				
Indication	Prevention of bleeding tendency in patients with blood coagulation factor VIII deficiency				
Manufecturer	Fujimoto Pharmaceutical	Marketer	Fujimoto Pharmaceutical	Originator/s	Octapharma
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥22,543, ¥41,865, ¥77,750, ¥144,395, ¥176,239, ¥207,405, ¥268,164	Peak Sales (Predicted[*3])	¥2.5 Billion
Total Sales of the Therapeutic Category (Blood Coagulation Products)[*4]					¥135 Billion
Contribution of the Brands in the Category (Blood Coagulation Products)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (Blood Coagulation Products)[*4]					80%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.
[*5]...solution for dissolution supplied

Source: Encise Research Center, MHLW disclosures

Uplizna

Drug Profile - Uplizna					
Molecule Type	Biologics(mAb)	Molecule	Inebilizumab(genetical recombination)	Brand	Uplizna
Launch Month	June 2021	Form	Injection	Standard Unit	100mg/10mL/vial
Therapeutic Classes[*2] (2nd level)	Other CNS Drugs	Mechanism of Action (MOA)	Cytotoxicity via CD19 binding		
Therapeutic Classes[*2] (3rd level)	All Other CNS Drugs				
Indication	Prevention of recurrence of neuromyelitis optica spectrum disorders (including neuromyelitis optica) (designated as an orphan drug)				
Manufecturer	Mitsubishi Tanabe Pharma	Marketer	Mitsubishi Tanabe Pharma	Originator/s	Duke University
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥3,495,304	Peak Sales (Predicted[*3])	¥5.9 Billion
Total Sales of the Therapeutic Category (All Other CNS Drugs)[*4]					¥179 Billion
Contribution of the Brands in the Category (All Other CNS Drugs)[*4]					81%
Hospital (≥100 beds) Sales Ratio in the Category (All Other CNS Drugs)[*4]					59%

Zicthoru

Drug Profile - Zicthoru					
Molecule Type	Small Molecule	Molecule	Diclofenac sodium	Brand	Zicthoru
Launch Month	May 2021	Form	Adhesive Skin Patch	Standard Unit	75mg/tape
Therapeutic Classes[*2] (2nd level)	Analgesics	Mechanism of Action (MOA)	Inhibition of prostaglandin biosynthesis		
Therapeutic Classes[*2] (3rd level)	Non-narcotics and Anti-pyretics				
Indication	Analgesia in various types of cancer				
Manufecturer	Hisamitsu Pharmaceutical	Marketer	Hisamitsu Pharmaceutical	Originator/s	Ciba-Geigy
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥156.50	Peak Sales (Predicted[*3])	¥3.4 Billion
Total Sales of the Therapeutic Category (Non-narcotics and Anti-pyretics)[*4]					¥79 Billion
Contribution of the Brands in the Category (Non-narcotics and Anti-pyretics)[*4]					70%
Hospital (≥100 beds) Sales Ratio in the Category (Non-narcotics and Anti-pyretics)[*4]					33%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Arikayce

Drug Profile - Arikayce					
Molecule Type	Small Molecule	Molecule	Amikacin sulfate	Brand	Arikayce
Launch Month	July 2021	Form	Inhalation	Standard Unit	590mg/8.4mL/vial
Therapeutic Classes[*2] (2nd level)	Systemic Antibacterials	Mechanism of Action (MOA)	Inhibitory effect on protein synthesis		
Therapeutic Classes[*2] (3rd level)	Aminoglycosides				
Indication	Pulmonary nontuberculous mycobacterial infection caused by Mycobacterium avium complex (MAC)				
Manufecturer	Insmed	Marketer	Insmed	Originator/s	Transave
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥42,408.40	Peak Sales (Predicted[*3])	¥17.7 Billion
Total Sales of the Therapeutic Category (Aminoglycosides)[*4]					¥5 Billion
Contribution of the Brands in the Category (Aminoglycosides)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (Aminoglycosides)[*4]					66%

Breyanzi

Drug Profile - Breyanzi					
Molecule Type	Regenerative Medical Product	Molecule	Lisocabtagene maraleucel	Brand	Breyanzi
Launch Month	May 2021	Form	Injection	Standard Unit	Per patient
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	CAR-transfected T cell-dependent cytotoxicity		
Therapeutic Classes[*2] (3rd level)	All Other Antineoplastics				
Indication	Relapsed or refractory large B-cell lymphoma including diffuse large B-cell lymphoma, primary mediastinal large B-cell lymphoma, transformed low-grade non-Hodgkin's lymphoma, and high-grade B cell lymphoma Relapsed or refractory follicular lymphoma (designated as an orphan regenerative medicine product)				
Manufecturer	Bristol-Myers Squibb, Celgene	Marketer	Bristol-Myers Squibb, Celgene	Originator/s	Juno Therapeutics
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥34,113,655	Peak Sales (Predicted[*3])	¥8.2 Billion
Total Sales of the Therapeutic Category (All Other Antineoplastics)[*4]					¥154 Billion
Contribution of the Brands in the Category (All Other Antineoplastics)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Antineoplastics)[*4]					90%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Verquvo

Drug Profile - Verquvo					
Molecule Type	Small Molecule	Molecule	Vericiguat	Brand	Verquvo
Launch Month	September 2021	Form	Tablet	Standard Unit	2.5mg/tablet, 5mg/tablet, 10mg/tablet
Therapeutic Classes[*2] (2nd level)	Cardiac Therapy	Mechanism of Action (MOA)	Stimulatory effect on soluble guanylate cyclase (sGC)		
Therapeutic Classes[*2] (3rd level)	Coronary Therapy Excluding Calcium Antagonists and Nitrites				
Indication	Chronic heart failure Limited to the patients who receive standard treatment for chronic heart failure				
Manufecturer	Bayer Yakuhin	Marketer	Bayer Yakuhin	Originator/s	Bayer HealthCare Pharmaceuticals
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥131.5, ¥230.4, ¥403.8	Peak Sales (Predicted[*3])	¥9.5 Billion
Total Sales of the Therapeutic Category (Coronary Therapy Excluding Calcium Antagonists and Nitrites)[*4]					¥5 Billion
Contribution of the Brands in the Category (Coronary Therapy Excluding Calcium Antagonists and Nitrites)[*4]					19%
Hospital (≥100 beds) Sales Ratio in the Category (Coronary Therapy Excluding Calcium Antagonists and Nitrites)[*4]					40%

Tazverik

Drug Profile - Tazverik					
Molecule Type	Small Molecule	Molecule	Tazemetostat hydrobromide	Brand	Tazverik
Launch Month	August 2021	Form	Tablet	Standard Unit	200mg/tablet
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Selective inhibitory effect on EZH2		
Therapeutic Classes[*2] (3rd level)	All Other Antineoplastics				
Indication	Relapsed or refractory EZH2 gene mutation-positive follicular lymphoma (only in cases where standard treatment is not possible)				
Manufecturer	Eisai	Marketer	Eisai	Originator/s	Epizyme
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥3,004.60	Peak Sales (Predicted[*3])	¥2.4 Billion
Total Sales of the Therapeutic Category (All Other Antineoplastics)[*4]					¥154 Billion
Contribution of the Brands in the Category (All Other Antineoplastics)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Antineoplastics)[*4]					90%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Hiyasta

Drug Profile - Hiyasta					
Molecule Type	Small Molecule	Molecule	Tucidinostat	Brand	Hiyasta
Launch Month	October 2021	Form	Tablet	Standard Unit	10mg/tablet
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Inhibitory effect on histone deacetylase		
Therapeutic Classes[*2] (3rd level)	All Other Antineoplastics				
Indication	Relapsed or refractory adult T cell leukemia lymphoma (designated as an orphan drug)				
Manufecturer	Huya Japan	Marketer	Meiji Seika Pharma	Originator/s	Chipscreen Biosciences
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥20,030.50	Peak Sales (Predicted[*3])	¥0.29 Billion
Total Sales of the Therapeutic Category (All Other Antineoplastics)[*4]					¥154 Billion
Contribution of the Brands in the Category (All Other Antineoplastics)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Antineoplastics)[*4]					90%

Revestive

Drug Profile - Revestive					
Molecule Type	Biologics(not mAb)	Molecule	Teduglutide(genetical recombination)	Brand	Revestive
Launch Month	August 2021	Form	Injection	Standard Unit	3.8mg/vial (solution for dissolution supplied)
Therapeutic Classes[*2] (2nd level)	Other Alimentary Tract and Metabolism Products	Mechanism of Action (MOA)	Recombinant analog of native human GLP-2		
Therapeutic Classes[*2] (3rd level)	Other Alimentary Tract and Metabolism Products				
Indication	Short bowel syndrome (designated as an orphan drug)				
Manufecturer	Takeda Pharmaceutical	Marketer	Takeda Pharmaceutical	Originator/s	Toronto General Hospital, University of Toronto
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥79,302	Peak Sales (Predicted[*3])	¥6 Billion
Total Sales of the Therapeutic Category (Other Alimentary Tract and Metabolism Products)[*4]					¥109 Billion
Contribution of the Brands in the Category (Other Alimentary Tract and Metabolism Products)[*4]					85%
Hospital (≥100 beds) Sales Ratio in the Category (Other Alimentary Tract and Metabolism Products)[*4]					66%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Lysakare

Drug Profile - Lysakare					
Molecule Type	Small Molecule	Molecule	L-Lysine hydrochloride and L-Arginine hydrochloride	Brand	Lysakare
Launch Month	September 2021	Form	Injection	Standard Unit	1L/pack
Therapeutic Classes[*2] (2nd level)	All Other Therapeutic Products	Mechanism of Action (MOA)	Competitive inhibition of positively charged peptide reabsorption in proximal tubules		
Therapeutic Classes[*2] (3rd level)	Detoxifying Agents for Antineoplastic Treatment				
Indication	Reduction of renal radiation exposure by lutetium (^{177}Lu) oxodotreotide				
Manufecturer	Fujifilm Toyama Chemical	Marketer	Fujifilm Toyama Chemical	Originator/s	Advanced Accelerator Applications
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥1,180	Peak Sales (Predicted[*3])	¥0.97 Million
Total Sales of the Therapeutic Category (Detoxifying Agents for Antineoplastic Treatment)[*4]					¥8 Billion
Contribution of the Brands in the Category (Detoxifying Agents for Antineoplastic Treatment)[*4]					30%
Hospital (≥100 beds) Sales Ratio in the Category (Detoxifying Agents for Antineoplastic Treatment)[*4]					88%

Givlaari

Drug Profile - Givlaari					
Molecule Type	Nucleic Acid	Molecule	Givosiran sodium	Brand	Givlaari
Launch Month	August 2021	Form	Injection	Standard Unit	189mg/mL/vial
Therapeutic Classes[*2] (2nd level)	Other Alimentary Tract and Metabolism Products	Mechanism of Action (MOA)	Inhibition of ALAS1 production by RNAi mechanism		
Therapeutic Classes[*2] (3rd level)	Other Alimentary Tract and Metabolism Products				
Indication	Acute hepatic porphyria (designated as an orphan drug)				
Manufecturer	Alnylam Japan	Marketer	Alnylam Japan	Originator/s	Alnylam Pharmaceuticals
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥5,006,201	Peak Sales (Predicted[*3])	¥3.7 Billion
Total Sales of the Therapeutic Category (Other Alimentary Tract and Metabolism Products)[*4]					¥109 Billion
Contribution of the Brands in the Category (Other Alimentary Tract and Metabolism Products)[*4]					85%
Hospital (≥100 beds) Sales Ratio in the Category (Other Alimentary Tract and Metabolism Products)[*4]					66%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Lutathera

Drug Profile - Lutathera					
Molecule Type	Small Molecule	Molecule	Lutetium (^{177}Lu) oxodotreotide	Brand	Lutathera
Launch Month	September 2021	Form	Injection	Standard Unit	7.4GBq/25mL/vial
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Somatostatin analogs labeled with ^{177}Lu accumulate in somatostatin receptor-positive tumors and emit beta-rays		
Therapeutic Classes[*2] (3rd level)	All Other Antineoplastics				
Indication	Somatostatin receptor-positive neuroendocrine tumors				
Manufecturer	Fujifilm Toyama Chemical	Marketer	Fujifilm Toyama Chemical	Originator/s	BioSynthema
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥2,648,153	Peak Sales (Predicted[*3])	¥2.2 Billion
Total Sales of the Therapeutic Category (All Other Antineoplastics)[*4]					¥154 Billion
Contribution of the Brands in the Category (All Other Antineoplastics)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Antineoplastics)[*4]					90%

Unituxin

Drug Profile - Unituxin					
Molecule Type	Biologics(mAb)	Molecule	Dinutuximab(genetical recombination)	Brand	Unituxin
Launch Month	September 2021	Form	Injection	Standard Unit	17.5mg/5mL/vial
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Antibody-dependent cytotoxicity and complement-dependent cytotoxicity (anti-GD2 monoclonal antibody)		
Therapeutic Classes[*2] (3rd level)	Monoclonal Antibody Antineoplastics				
Indication	Neuroblastoma after high dose chemotherapy (designated as an orphan drug)				
Manufecturer	Ohara Pharmaceutical	Marketer	Ohara Pharmaceutical	Originator/s	National Cancer Institute (USA)
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥1,365,888	Peak Sales (Predicted[*3])	¥2.3 Billion
Total Sales of the Therapeutic Category (Monoclonal Antibody Antineoplastics)[*4]					¥823 Billion
Contribution of the Brands in the Category (Monoclonal Antibody Antineoplastics)[*4]					82%
Hospital (≥100 beds) Sales Ratio in the Category (Monoclonal Antibody Antineoplastics)[*4]					98%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Recarbrio

Drug Profile - Recarbrio					
Molecule Type	Small Molecule	Molecule	Relebactam hydrate, Imipenem hydrate, and Cilastatin sodium	Brand	Recarbrio
Launch Month	November 2021	Form	Injection	Standard Unit	(1.25g)[*6]/vial
Therapeutic Classes[*2] (2nd level)	Systemic Antibacterials	Mechanism of Action (MOA)	Inhibition of beta-lactamase / Inhibition of cell wall synthesis / Inhibition of inactivation		
Therapeutic Classes[*2] (3rd level)	Other Beta-lactam Antibacterials, Excluding Penicillins, Cephalosporins				
Indication	<Bacterial strains> Escherichia coli, Citrobacter spp., Klebsiella spp., Enterobacter spp., Serratia spp., Pseudomonas aeruginosa, Acinetobacter spp., that are sensitive to Recarbrio Limited to strains that are resistant to carbapenems. <Diseases> Various infectious diseases (designated as an orphan drug)				
Manufecturer	MSD	Marketer	MSD	Originator/s	Merck Sharp & Dohme
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥22,447	Peak Sales (Predicted[*3])	¥1.1 Billion
Total Sales of the Therapeutic Category (Other Beta-lactam Antibacterials, Excluding Penicillins, Cephalosporins)[*4]					¥14 Billion
Contribution of the Brands in the Category (Other Beta-lactam Antibacterials, Excluding Penicillins, Cephalosporins)[*4]					32%
Hospital (≥100 beds) Sales Ratio in the Category (Other Beta-lactam Antibacterials, Excluding Penicillins, Cephalosporins)[*4]					72%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.
[*6]...Relebactam 250mg, Imipenem 500mg, and Cilastatin 500mg

Source: Encise Research Center, MHLW disclosures

Delytact

Drug Profile - Delytact					
Molecule Type	Regenerative Medical Product	Molecule	Teserpaturev	Brand	Delytact
Launch Month	November 2021	Form	Injection	Standard Unit	1mL/vial
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Selective cytocidal actions to tumor cells / Antitumor effect with induction of antitumor immunity		
Therapeutic Classes[*2] (3rd level)	All Other Antineoplastics				
Indication	Malignant glioma (designated as an orphan regenerative medicine product)				
Manufecturer	Daiichi Sankyo	Marketer	Daiichi Sankyo	Originator/s	University of Tokyo
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥1,431,918	Peak Sales (Predicted[*3])	¥1.2 Billion
Total Sales of the Therapeutic Category (All Other Antineoplastics)[*4]					¥154 Billion
Contribution of the Brands in the Category (All Other Antineoplastics)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Antineoplastics)[*4]					90%

Azilva

Drug Profile - Azilva					
Molecule Type	Small Molecule	Molecule	Azilsartan	Brand	Azilva
Launch Month	December 2021	Form	Granule	Standard Unit	1%/g
Therapeutic Classes[*2] (2nd level)	Agents Acting on the Renin-Angiotensin System	Mechanism of Action (MOA)	Angiotensin II receptor antagonism		
Therapeutic Classes[*2] (3rd level)	Angiotensin-II Antagonists, Plain				
Indication	Hypertension				
Manufecturer	Takeda Pharmaceutical	Marketer	Takeda Pharmaceutical	Originator/s	Takeda Pharmaceutical
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥73.60	Peak Sales (Predicted[*3])	¥0.25 Billion
Total Sales of the Therapeutic Category (Angiotensin-II Antagonists, Plain)[*4]					¥173 Billion
Contribution of the Brands in the Category (Angiotensin-II Antagonists, Plain)[*4]					50%
Hospital (≥100 beds) Sales Ratio in the Category (Angiotensin-II Antagonists, Plain)[*4]					23%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

F-Meno

Drug Profile - F-Meno					
Molecule Type	Small Molecule	Molecule	Progesterone	Brand	F-Meno
Launch Month	November 2021	Form	Capsule	Standard Unit	100mg/capsule
Therapeutic Classes[*2] (2nd level)	Sex Hormones and Products with Similar Desired Effects, Systemic Action Only	Mechanism of Action (MOA)	Replacement of progesterone		
Therapeutic Classes[*2] (3rd level)	Progestogens, Excluding G3A, G3F				
Indication	Inhibition of endometrial hyperplasia during the administration of follicular hormone for menopausal symptoms and ovarian absence				
Manufacturer	Fuji Pharma	Marketer	Fuji Pharma	Originator/s	unknown
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥229.70	Peak Sales (Predicted[*3])	¥1.2 Billion
Total Sales of the Therapeutic Category (Progestogens, Excluding G3A, G3F)[*4]					¥24 Billion
Contribution of the Brands in the Category (Progestogens, Excluding G3A, G3F)[*4]					22%
Hospital (≥100 beds) Sales Ratio in the Category (Progestogens, Excluding G3A, G3F)[*4]					23%

Rinvoq

Drug Profile - Rinvoq					
Molecule Type	Small Molecule	Molecule	Upadacitinib hydrate	Brand	Rinvoq
Launch Month	November 2021	Form	Tablet	Standard Unit	30mg/tablet
Therapeutic Classes[*2] (2nd level)	Immunosuppressants	Mechanism of Action (MOA)	Inhibitory effect on the Janus kinase (JAK)		
Therapeutic Classes[*2] (3rd level)	Other Immunosuppressants				
Indication	The following disease which has shown an inadequate response to conventional treatments: Atopic dermatitis				
Manufacturer	Abbive	Marketer	Abbive	Originator/s	Abbott Laboratories
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥7,459.40	Peak Sales (Predicted[*3])	¥10.3 Billion
Total Sales of the Therapeutic Category (Other Immunosuppressants)[*4]					¥178 Billion
Contribution of the Brands in the Category (Other Immunosuppressants)[*4]					64%
Hospital (≥100 beds) Sales Ratio in the Category (Other Immunosuppressants)[*4]					53%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Sogroya

Drug Profile - Sogroya					
Molecule Type	Biologics(not mAb)	Molecule	Somapacitan(genetical recombination)	Brand	Sogroya
Launch Month	December 2021	Form	Injection	Standard Unit	5mg/1.5mL/kit, 10mg/1.5mL/kit
Therapeutic Classes[*2] (2nd level)	Other Hormones	Mechanism of Action (MOA)	Growth hormone analog (stimulation of hepatic somatomedin production and secretion)		
Therapeutic Classes[*2] (3rd level)	Growth Hormones				
Indication	Adult growth hormone deficiency (limited to the patients with severe symptoms)				
Manufecturer	Novo Nordisk Pharma	Marketer	Novo Nordisk Pharma	Originator/s	Novo Nordisk
Price Maintenance Premium (PMP)	Not applied	Unit Price (at the time of first listing)	¥26,107, ¥52,214	Peak Sales (Predicted[*3])	¥4.7 Billion
Total Sales of the Therapeutic Category (Growth Hormones)[*4]					¥69 Billion
Contribution of the Brands in the Category (Growth Hormones)[*4]					97%
Hospital (≥100 beds) Sales Ratio in the Category (Growth Hormones)[*4]					57%

Nexviazyme

Drug Profile - Nexviazyme					
Molecule Type	Biologics(not mAb)	Molecule	Avalglucosidase alfa(genetical recombination)	Brand	Nexviazyme
Launch Month	November 2021	Form	Injection	Standard Unit	100mg/vial
Therapeutic Classes[*2] (2nd level)	Other Alimentary Tract and Metabolism Products	Mechanism of Action (MOA)	Acid alpha-glucosidase		
Therapeutic Classes[*2] (3rd level)	Other Alimentary Tract and Metabolism Products				
Indication	Pompe disease (designated as an orphan drug)				
Manufecturer	Sanofi	Marketer	Sanofi	Originator/s	Genzyme
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥196,940	Peak Sales (Predicted[*3])	¥3 Billion
Total Sales of the Therapeutic Category (Other Alimentary Tract and Metabolism Products)[*4]					¥109 Billion
Contribution of the Brands in the Category (Other Alimentary Tract and Metabolism Products)[*4]					85%
Hospital (≥100 beds) Sales Ratio in the Category (Other Alimentary Tract and Metabolism Products)[*4]					66%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Saphnelo

Drug Profile - Saphnelo					
Molecule Type	Biologics(mAb)	Molecule	Anifrolumab(genetical recombination)	Brand	Saphnelo
Launch Month	November 2021	Form	Injection	Standard Unit	300mg/2mL/vial
Therapeutic Classes[*2] (2nd level)	Immunosuppressants	Mechanism of Action (MOA)	Inhibitory effect on type I interferon		
Therapeutic Classes[*2] (3rd level)	Other Immunosuppressants				
Indication	Systemic lupus erythematosus which has shown an inadequate response to conventional treatments				
Manufacturer	AstraZeneca	Marketer	AstraZeneca	Originator/s	Medarex
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥96,068	Peak Sales (Predicted[*3])	¥4.5 Billion
Total Sales of the Therapeutic Category (Other Immunosuppressants)[*4]					¥178 Billion
Contribution of the Brands in the Category (Other Immunosuppressants)[*4]					64%
Hospital (≥100 beds) Sales Ratio in the Category (Other Immunosuppressants)[*4]					53%

Cosentyx

Drug Profile - Cosentyx					
Molecule Type	Biologics(mAb)	Molecule	Secukinumab(genetical recombination)	Brand	Cosentyx
Launch Month	February 2022	Form	Injection	Standard Unit	75mg/0.5mL/syringe
Therapeutic Classes[*2] (2nd level)	Immunosuppressants	Mechanism of Action (MOA)	Inhibitory effect on interleukin-17A (IL-17A)		
Therapeutic Classes[*2] (3rd level)	Interleukin Inhibitors				
Indication	The following diseases which have shown an inadequate response to conventional treatments: Psoriasis vulgaris, psoriatic arthritis, pustular psoriasis, ankylosing spondylitis, non-radiographic axial spondyloarthritis				
Manufacturer	Novartis Pharma	Marketer	Maruho	Originator/s	Alcon, Novartis
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥40,144	Peak Sales (Predicted[*3])	¥0.13 Billion
Total Sales of the Therapeutic Category (Interleukin Inhibitors)[*4]					¥189 Billion
Contribution of the Brands in the Category (Interleukin Inhibitors)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (Interleukin Inhibitors)[*4]					66%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

Raiatt Mibg

Drug Profile - Raiatt Mibg					
Molecule Type	Small Molecule	Molecule	3-Iodobenzylguanidine (^{131}I)	Brand	Raiatt Mibg
Launch Month	January 2022	Form	Injection	Standard Unit	1.85GBq/5mL/vial
Therapeutic Classes[*2] (2nd level)	Antineoplastics	Mechanism of Action (MOA)	Be taken up into tumor cells via a noradrenaline transporter-mediated reuptake mechanism, damage the cells with the beta rays emitted from ^{131}I, and inhibit tumor growth.		
Therapeutic Classes[*2] (3rd level)	All Other Antineoplastics				
Indication	Unresectable pheochromocytoma and paraganglioma with positive expression of MIBG (designated as an orphan drug)				
Manufecturer	Fujifilm Toyama Chemical	Marketer	Fujifilm Toyama Chemical	Originator/s	FUJIFILM RI Pharma
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥1,072,505	Peak Sales (Predicted[*3])	¥0.21 Billion
Total Sales of the Therapeutic Category (All Other Antineoplastics)[*4]					¥154 Billion
Contribution of the Brands in the Category (All Other Antineoplastics)[*4]					100%
Hospital (≥100 beds) Sales Ratio in the Category (All Other Antineoplastics)[*4]					90%

Alofisel

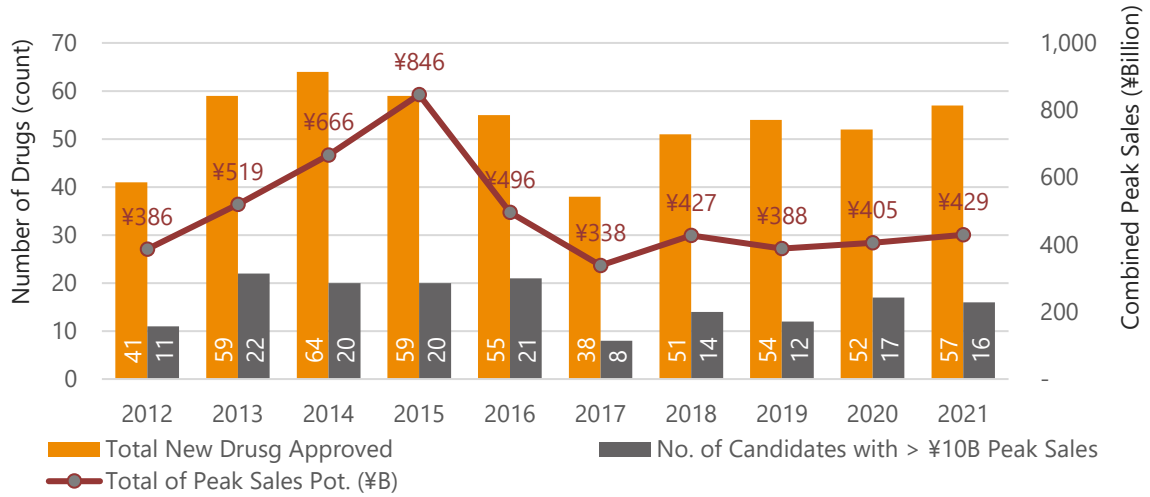
Drug Profile - Alofisel					
Molecule Type	Regenerative Medical Product	Molecule	Darvadstrocel	Brand	Alofisel
Launch Month	November 2021	Form	Injection	Standard Unit	4 vials/set
Therapeutic Classes[*2] (2nd level)	Intestinal Disorder Products	Mechanism of Action (MOA)	Immunoregulatory and anti-inflammatory effects		
Therapeutic Classes[*2] (3rd level)	Inflammatory Bowel Disorder Products				
Indication	For the treatment of complex perianal fistulas in adult patients with non-active/mildly active luminal Crohn's disease, when fistulas have shown an inadequate response to at least one conventional therapy. (designated as an orphan regenerative medicine product)				
Manufecturer	Takeda Pharmaceutical	Marketer	Takeda Pharmaceutical	Originator/s	Cellerix
Price Maintenance Premium (PMP)	Applied	Unit Price (at the time of first listing)	¥5,620,004	Peak Sales (Predicted[*3])	¥5.2 Billion
Total Sales of the Therapeutic Category (Inflammatory Bowel Disorder Products)[*4]					¥57 Billion
Contribution of the Brands in the Category (Inflammatory Bowel Disorder Products)[*4]					72%
Hospital (≥100 beds) Sales Ratio in the Category (Inflammatory Bowel Disorder Products)[*4]					55%

[*2]...Encise's Anatomical Therapeutic Chemical Classification
[*3]...as per documents submitted to the Central Social Insurance Medical Council (Chuikyo)
[*4]...therapeutic category sales based on ATC 3 level in year 03/2022.

Source: Encise Research Center, MHLW disclosures

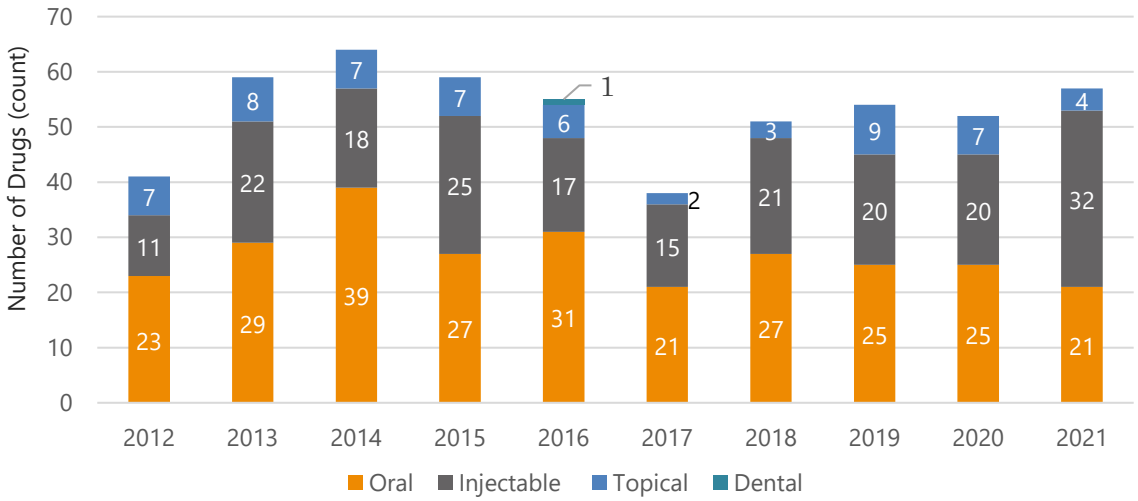
Appendix: New Drugs Approvals in Past 10 Years - Key Statistics (Figures only)

Figure 7. New Drugs vs Peak Sales



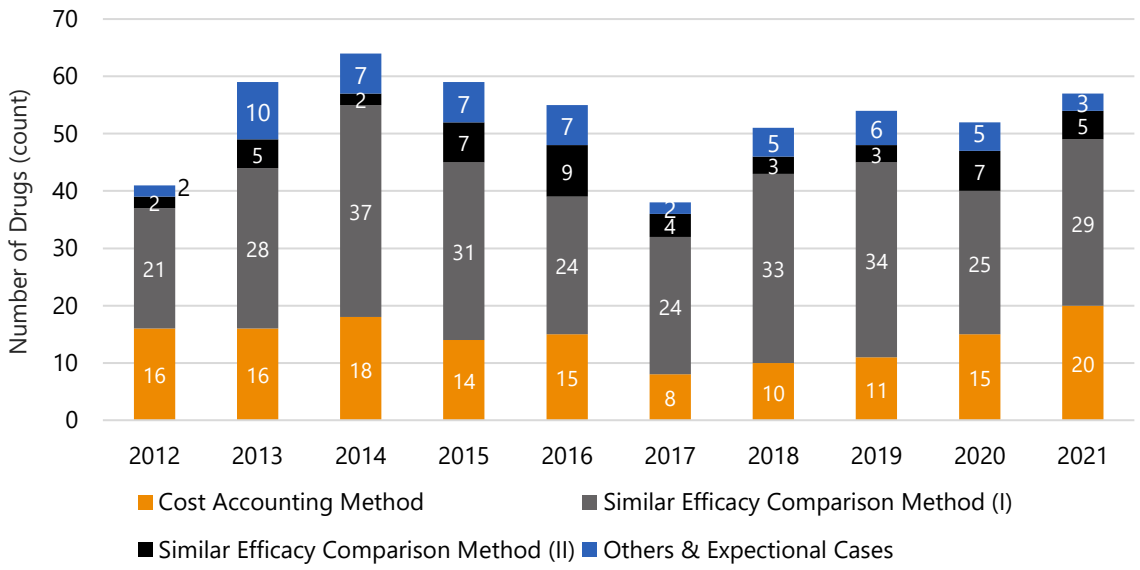
Source: MHLW, Encise Research Center

Figure 8. New Drugs Listing by Formulation Type



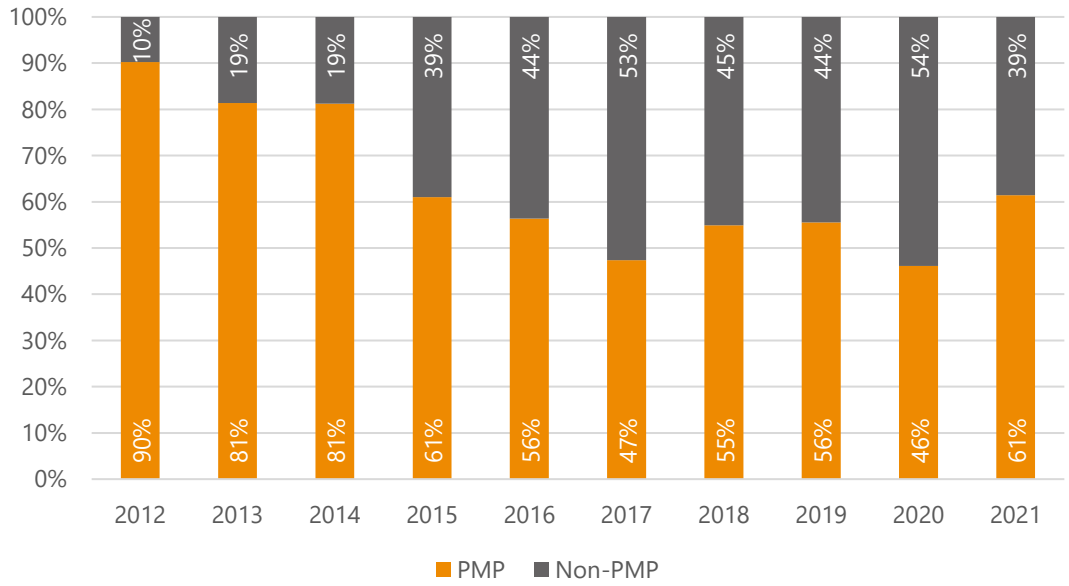
Source: MHLW, Encise Research Center

Figure 9. New Drugs Listing by Pricing Method



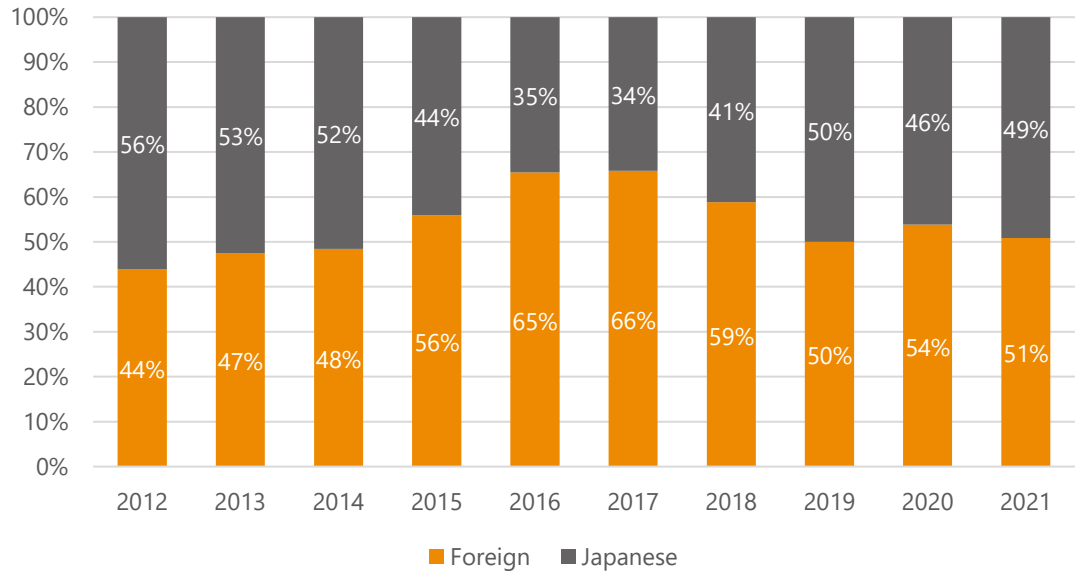
Source: MHLW, Encise Research Center

Figure 10. New Drugs Listing by PMP vs Non-PMP



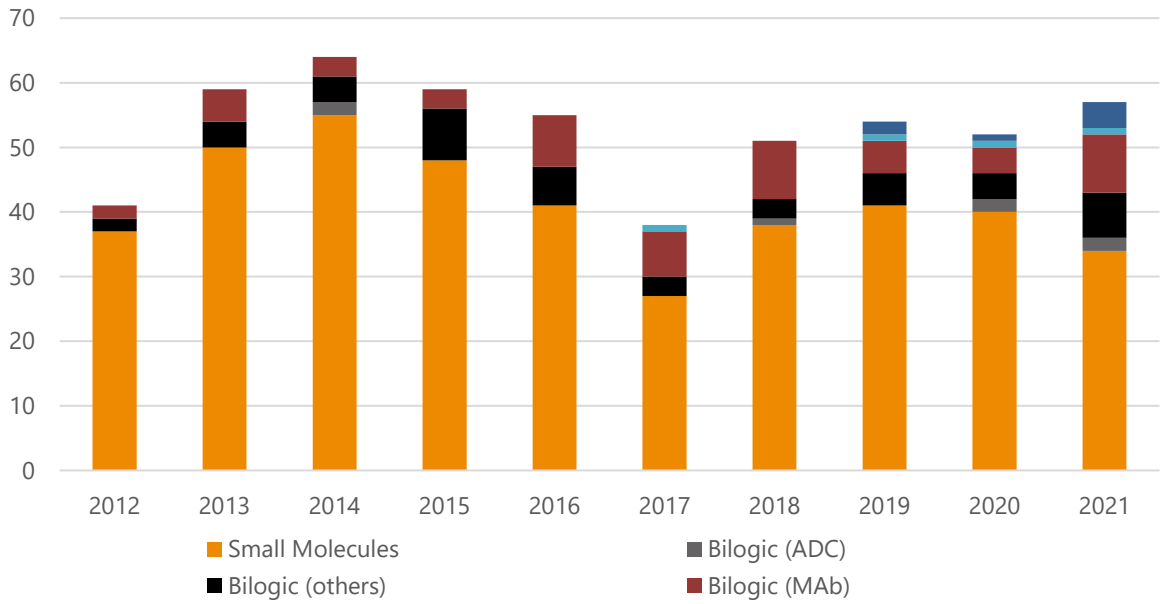
Source: MHLW, Encise Research Center

Figure 11. New Drugs Listing by Sponsor's Origin of Country



Source: MHLW, Encise Research Center

Figure 12. New Drugs Listing by Type of Molecule



Source: MHLW, Encise Research Center

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