

Opioid IV and Injection Administrations Rising in Pain-Related ED Encounters

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Key Findings:

- Despite a small decrease in late 2017, parenteral opioid administrations – those given by IV or injection – have risen from 23.3% of pain-related ED encounters in January 2014 to 26.4% of such encounters in December 2023.
- Oral opioid and opioid combination medication administrations steadily decreased from 14.4% of pain-related ED encounters in January 2014 to 9.5% of encounters in January 2020 and have remained at a similar rate since.
- The percentage of ED pain encounters with an acetaminophen or ketorolac administration has increased steadily since 2014, while the percentage with an ibuprofen administration dropped to 6.4% in April 2020 and has remained lower than pre-pandemic levels since.

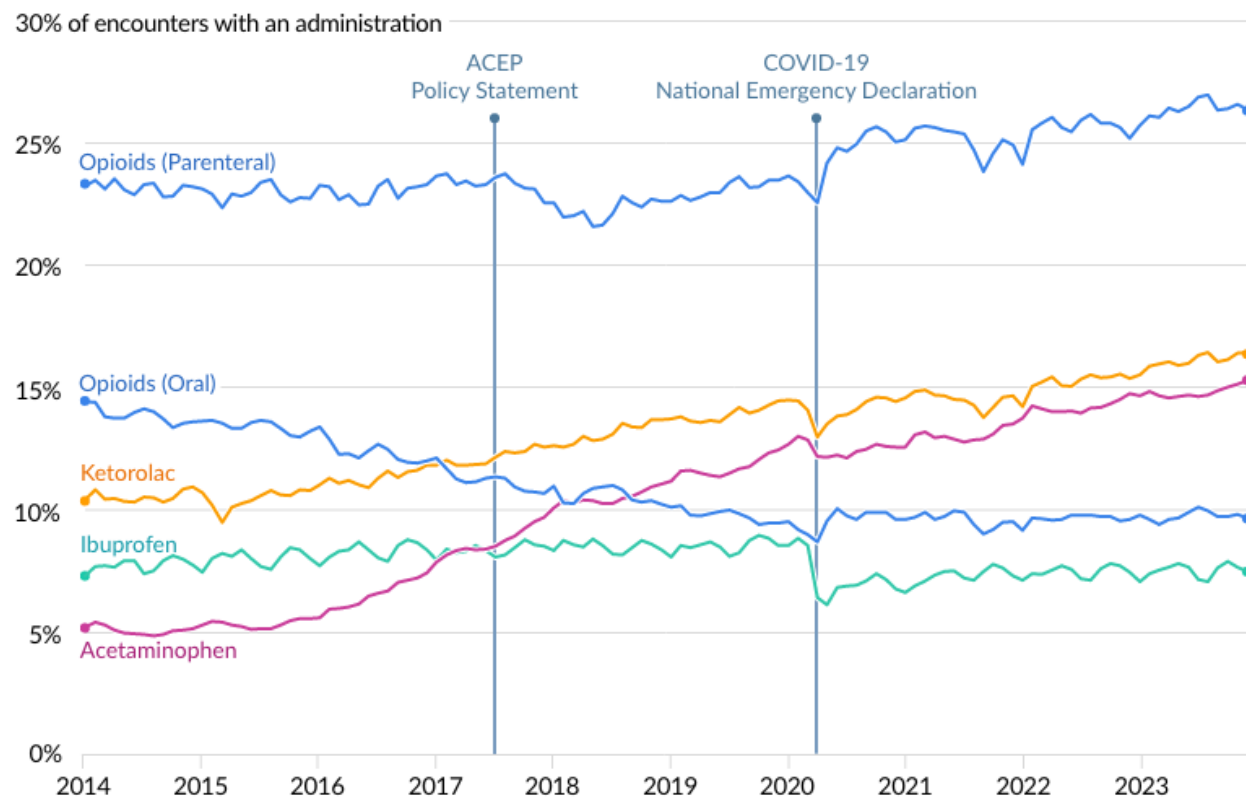
Pain is the most common complaint among patients who present to the emergency department (ED).¹ In 2017, the American College of Emergency Physicians (ACEP) released its policy statement on how to optimize the treatment of acute pain in the ED, which recommends starting with nonopioid medications given orally, or by intravenous injection if not tolerated orally.² Ibuprofen and ketorolac, non-steroidal anti-inflammatory drugs (NSAIDs), and acetaminophen are three nonopioid medications frequently given for acute pain management in the ED and are available in oral, IV, and intramuscular routes. To minimize the potential harms associated with opioid use, ACEP recommends opioid analgesics only in cases where nonopioid or nonpharmaceutical interventions are insufficient at managing pain and only after educating the patient on potential side effects or risk of opioid use disorder.²

To investigate whether the policy statement or the COVID pandemic correlated with changes in pain management prescribing in the ED, we studied the proportion of ED encounters for pain-related chief complaints that included a medication administration of acetaminophen, ibuprofen, ketorolac, or a parenteral or oral opioid from 2014 to 2023.

We found that the proportion of pain-related ED encounters that included a parenteral opioid administration decreased after the publication of ACEP's recommendation from 23.6% of encounters in July 2017 to 21.6% in May 2018. That rate increased slightly but remained steady until the COVID-19 pandemic in March 2020 led to an increase in the acuity of patients who were presenting to the ED.³ In April 2020, the rate of encounters with a parenteral opioid administration was 22.6%, and that rate remained higher than pre-pandemic levels at 26.4% of pain-related ED encounters in December 2023.

The rate of pain-related ED encounters with an oral opioid administration, including opioid combination medications, decreased prior to the ACEP's policy statement in 2017 and after the release of the statement. The rate of encounters with an oral opioid administration has remained steady since 2020.

Monthly Rate of Medication Administrations by Pain Medication Type in ED Pain Encounters



N=79,786,226 "Monthly Rate of Medication Administrations by Pain Medication Type in ED Pain Encounters," 2024. EpicResearch.org
Figure 1. The rate of ED pain encounters with a documented medication administration by pain medication type by month from January 2014 to December 2023.

Ibuprofen administrations occurred for around 8% of ED encounters from 2014 to the start of the COVID-19 pandemic and then dropped to 6.4% of encounters in April 2020, concurrent with early concerns about NSAIDs and COVID-19.⁴ The percentage of encounters with ibuprofen administrations has increased slightly since that initial pandemic drop, but it remains lower than pre-pandemic levels at 7.5% of encounters in December 2023.

Acetaminophen and ketorolac administrations have increased since 2017, and rates of administrations dropped only slightly for these two types of pain medications at the start of the pandemic. Rates of encounters with acetaminophen and ketorolac administrations quickly returned to pre-pandemic rates in late 2020 and continued to gradually increase to 15.3% and 16.5% of ED encounters respectively in December 2023.

A sensitivity analysis limiting to only ED encounters that resulted in hospital admissions showed similar rates of medication administrations across all medication types studied.

While nonopioid medication administrations have increased since the ACEP's policy statement in 2017, parenteral opioid administrations continue to be the most commonly administered pain medication for pain-related ED encounters. Ongoing monitoring of trends in ED administration of pain medications is warranted to evaluate ED clinical practice and the effort to balance effective pain management with patient and population concerns.

These data come from Cosmos, a collaboration of Epic health systems representing more than 238 million patient records from 1,345 hospitals and more than 28,000 clinics from all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. This study was done in collaboration with researchers from NYU Langone Health. Graphics by AJ Hinkens.

References

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3. Alban C, Barkley E, Cox C. Sicker Patients, More Admissions: How COVID-19 has Changed Emergency Care. Epic Research. <https://epicresearch.org/articles/sicker-patients-more-admissions-how-covid-19-has-changed-emergency-care>. Accessed on February 14, 2024.
4. World Health Organization. The use of non-steroidal anti-inflammatory drugs (NSAIDs) in patients with COVID-19. Published April 2020. [The use of non-steroidal anti-inflammatory drugs \(NSAIDs\) in patients with COVID-19 \(who.int\)](#). Accessed February 28, 2024.

Data Definitions

Term	Definition
Study period	1/1/2014 – 12/31/2023
Events of Interest	Encounters during the study period where: <ul style="list-style-type: none"> • The department contributing the data for a given encounter has at least 20,000 ED encounters associated with it that year. • The encounter is an ED Encounter. • The encounter occurs in a department located in the United States. • The encounter comes from a source contributing data for the entire study period. • The patient has a chief complaint related to pain.
Outcomes of interest	Percent of ED encounters with one of the following medication orders each month: <ul style="list-style-type: none"> • Acetaminophen • Ketorolac • Ibuprofen • Parenteral opioids • Oral opioids All medication order must have a type of “Administered Medication.”
Opioids	Any medications with the following simple generic names: <ul style="list-style-type: none"> • acetaminophen/codeine/caffeine • buprenorphine • buprenorphine HCl • butorphanol tartrate • cod/ASA/salicylmd/acetamin/caf • codeine phos/aspirin/caffeine • codeine phosphate • codeine phosphate/ASA/buffers • codeine sulfate • codeine/ASA/caffe/meprobamate • codeine/aspirin/phenobarbital • codeine/chlorzoxazone/acetamin

- codeine/codeine sulfate
- codeine/methocarbamol/acetamin
- codeine/methocarbamol/aspirin
- dezocine
- dihydrocodeine bitartrate
- fentanyl
- fentanyl citrat/dextrose 5%/PF
- fentanyl citrate
- fentanyl citrate/PF
- fentanyl citrate-0.9 % NaCl/PF
- fentanyl HCl
- fentanyl/bupivacaine/0.9% NaCl
- fentanyl/bupivacaine/NS/PF
- fentanyl/ropivacaine/NS/PF
- fentanyl/ropivacaine/sod Cl/PF
- hydrocodone bitartrate
- hydrocodone/acetaminophen
- hydromorphone HCl
- hydromorphone HCl in 0.9% NaCl
- hydromorphone HCl in D5W/PF
- hydromorphone HCl in water/PF
- hydromorphone HCl/0.9% NaCl/PF
- hydromorphone HCl/PF
- hydromorphone/bupiv/0.9NaCl/PF
- hydromorphone/bupivac/0.9%NaCl
- hydromorphone/ropiv/sod chl/PF
- hydromorphone/sod chlor,iso/PF
- levomethadyl acetate HCl
- levorphanol tartrate
- meperidine HCl
- meperidine HCl in 0.9 % NaCl
- meperidine HCl in 0.9% NaCl/PF
- meperidine HCl/atropine
- meperidine HCl/PF
- meperidine HCl/prometh HCl
- methadone HCl
- methadone in 0.9 % sod.chlorid
- morphine HCl
- morphine HCl/PF
- morphine in iso sod chlorid/PF
- morphine sulfate
- morphine sulfate in 0.9 % NaCl
- morphine sulfate liposomal/PF
- morphine sulfate/0.9% NaCl/PF
- morphine sulfate/D5W
- morphine sulfate/D5W/PF
- morphine sulfate/naltrexone
- morphine sulfate/PF
- morphine tartrate
- nalbuphine HCl
- oliceridine fumarate
- opium/belladonna alkaloids
- oxycodone HCl

	<ul style="list-style-type: none"> • oxycodone HCl/naloxone HCl • oxycodone HCl/naltrexone HCl • oxycodone myristate • oxycodone pectinate • oxymorphone HCl • pentazocine HCl • pentazocine HCl/acetaminophen • pentazocine HCl/aspirin • pentazocine HCl/naloxone HCl • pentazocine lactate • propoxyphene HCl • propoxyphene HCl/acetaminophen • propoxyphene nap/acetaminophen • propoxyphene napsylate • propoxyphene/aspirin/caffeine • remifentanil in 0.9 % NaCl/PF • sufentanil citrate • sufentanil/bupivacaine/NS/PF • tapentadol HCl • tramadol HCl <p>The route must be oral, intravenous, intramuscular, or subcutaneous.</p>
Oral Opioids	An Opioid medication with an oral route.
Parenteral opioids	Opioid medications with an intravenous, intramuscular, or subcutaneous route.
Ibuprofen	<p>Any medications with a simple generic name containing “ibuprofen” and not one of the following opioid combo orders:</p> <ul style="list-style-type: none"> • Hydrocodone/ibuprofen • Ibuprofen/codeine phosphate • Ibuprofen/oxycodone HCl <p>The route must be intravenous, intramuscular, subcutaneous, or oral. Identified medications must not belong to the opioids group as well.</p>
Acetaminophen	<p>Any medications with a simple generic name containing “acetaminophen” or “acetamino” and not one of the following opioid combo orders:</p> <ul style="list-style-type: none"> • Acetaminophen/Hydrocodone • Acetaminophen/codeine/caffeine • Acetaminophen/codeine/doxylam • Acetaminophen/codeine/prometh • Benzhydrocodone/acetaminophen • Oxycodone HCl/acetaminophen • P/ephed/codeine/acetaminoph/GG • PE/codeine/acetaminophen/cpm • PE/hydrod/acetaminophen/cp • p-ephed/codeine/acetaminophen • p-ephed/codeine/acetaminoph/cp • Phenyleph/codeine/acetaminophn • Tramadol HCl/acetaminophen <p>The route must be intravenous, intramuscular, subcutaneous, or oral. Identified medications must not belong to the opioids group as well.</p>
Ketorolac	<p>Any medications with one of the following simple generic names that are not contained in the Opioids medication list:</p> <ul style="list-style-type: none"> • Bupivacaine/ketorolac/ketamine • Cyclop/trop/propa/phen/key/wat

	<ul style="list-style-type: none"> • Cyclopent/tropic/phen/ketr/wat • Dexamet/moxiflox/ketor/NaCl/PF • Ketorolac tromethamine • Ketorolac tromethamine/PF • Ketorolac/norflurane/HFC 245fa • Phenylephrine/ketorolac • Ropivacaine/clonidine/ketorolac • Ropivacaine/ketorolac/ketamine • Tropic/proparacai/pe/ketor/wat <p>The route must be intravenous, intramuscular, or subcutaneous. Identified medications must not belong to the opioids group as well.</p>
Chief complaint related to pain	<p>An encounter with one of the following chief complaints: ABDOMINAL PAIN, CHEST PAIN, BACK PAIN , FLANK PAIN, LEG PAIN, KNEE PAIN, DENTAL PAIN, NECK PAIN, SHOULDER PAIN, ANKLE PAIN, ARM PAIN, HIP PAIN, HAND PAIN, FOOT PAIN, EYE PAIN, WRIST PAIN, RIB PAIN, GROIN PAIN, PELVIC PAIN, TOE PAIN, FACIAL PAIN, SICKLE CELL PAIN CRISIS, EXTREMITY PAIN, TESTICLE PAIN, PAIN, JAW PAIN, ELBOW PAIN, FINGER PAIN, PAIN WITH BREATHING, RECTAL PAIN, VAGINAL PAIN, BREAST PAIN, MUSCLE PAIN, JOINT PAIN, PENIS PAIN, TAILBONE PAIN, ORAL PAIN, MUSCULOSKELETAL PAIN, SIDE PAIN, MOUTH PAIN, BUTTOCKS PAIN, SCROTAL PAIN, INCISIONAL PAIN, NASAL PAIN, SUPRAPUBIC PAIN, HEEL PAIN, ACHILLES PAIN, TEMPOROMANDIBULAR JOINT PAIN, STERNUM PAIN, PAIN MANAGEMENT, CANCER PAIN, EYELID PAIN, FALL, HEADACHE, SORE THROAT, MOTOR VEHICLE CRASH, OTHER , HEAD INJURY, ABSCESS, CONSTIPATION, HAND INJURY, ARM INJURY, ANKLE INJURY, ASSAULT VICTIM, FOOT INJURY, LOWER EXTREMITY ISSUE, INSECT BITE, FACIAL SWELLING, FINGER INJURY, SHOULDER INJURY, ANIMAL BITE, URINARY RETENTION, KNEE INJURY, TRAUMA, MIGRAINE, HEAD LACERATION, WRIST INJURY, WOUND INFECTION, LEG INJURY, FINGER LACERATION, FACIAL LACERATION, FACIAL INJURY, BURN, EXTREMITY LACERATION, ABDOMINAL CRAMPING, TOE INJURY, ORAL SWELLING, EAR PROBLEM, RIB INJURY, FOOT SWELLING, EYE TRAUMA, DENTAL PROBLEM, MOTORCYCLE CRASH, INJURY, CYST, FOREIGN BODY, LIP LACERATION, FOREIGN BODY IN EAR, JOINT SWELLING, MOUTH LESIONS, MASS, ALLEGED SEXUAL ASSAULT, ARM SWELLING, SINUS PROBLEM, BLEEDING/BRUISING, DOG BITE, THROAT PROBLEM, HEMORRHOIDS, GUN SHOT WOUND, SINUSITIS, ABRASION, HERNIA, MOUTH INJURY, ELBOW INJURY, SHAKING, HIP INJURY, NOSE PROBLEM, HAND LACERATION, FOREIGN BODY IN SKIN, NECK INJURY, BACK INJURY, PUNCTURE WOUND, HAND SWELLING, FOREIGN BODY IN NOSE, LEG PROBLEM, EYE SWELLING, UPPER EXTREMITY ISSUE, RECURRENT SKIN INFECTIONS, ARM PROBLEM, BICYCLE CRASH, WOUND CARE, HAND PROBLEM, FOOT PROBLEM, HAND BURN, ALLEGED DOMESTIC VIOLENCE, NEPHROLITHIASIS, ANKLE SWELLING, GOUT, CHEST INJURY, CHEMICAL EXPOSURE, STAB WOUND, THREATENED MISCARRIAGE, RECTAL PROBLEMS, BLISTER, DENTAL INJURY, FECAL IMPACTION, AUTOMOBILE VERSUS PEDESTRIAN, HEAT EXPOSURE, KNEE PROBLEM</p>

Table 1: Monthly Rate of Medication Administrations by Pain Medication Type in ED Pain Encounters

Period	Acetaminophen		Ibuprofen		Ketorolac		Opioids Oral		Opioids Parenteral	
	Admin Rate	Margin of Error	Admin Rate	Margin of Error	Admin Rate	Margin of Error	Admin Rate	Margin of Error	Admin Rate	Margin of Error
2014-1	5.23%	0.02%	7.33%	0.03%	10.42%	0.04%	14.44%	0.05%	23.26%	0.07%
2014-2	5.42%	0.02%	7.71%	0.03%	10.83%	0.04%	14.41%	0.05%	23.50%	0.07%
2014-3	5.31%	0.02%	7.73%	0.03%	10.44%	0.03%	13.82%	0.04%	23.14%	0.06%
2014-4	5.11%	0.02%	7.67%	0.03%	10.48%	0.03%	13.75%	0.04%	23.54%	0.06%
2014-5	4.97%	0.02%	7.93%	0.02%	10.36%	0.03%	13.77%	0.04%	23.09%	0.06%
2014-6	4.94%	0.02%	7.94%	0.03%	10.34%	0.03%	13.99%	0.04%	22.89%	0.06%
2014-7	4.94%	0.02%	7.41%	0.02%	10.55%	0.03%	14.14%	0.04%	23.30%	0.06%
2014-8	4.87%	0.02%	7.51%	0.02%	10.51%	0.03%	14.03%	0.04%	23.36%	0.06%
2014-9	4.91%	0.02%	7.92%	0.02%	10.34%	0.03%	13.72%	0.04%	22.81%	0.06%
2014-10	5.06%	0.02%	8.16%	0.02%	10.49%	0.03%	13.38%	0.04%	22.82%	0.06%
2014-11	5.11%	0.02%	7.99%	0.03%	10.88%	0.03%	13.56%	0.04%	23.29%	0.06%
2014-12	5.17%	0.02%	7.77%	0.02%	10.97%	0.03%	13.62%	0.04%	23.21%	0.06%
2015-1	5.30%	0.02%	7.46%	0.02%	10.73%	0.03%	13.63%	0.04%	23.13%	0.06%
2015-2	5.44%	0.02%	8.03%	0.03%	10.20%	0.03%	13.67%	0.04%	22.92%	0.06%
2015-3	5.43%	0.02%	8.23%	0.02%	9.51%	0.03%	13.54%	0.04%	22.35%	0.06%
2015-4	5.31%	0.02%	8.12%	0.02%	10.11%	0.03%	13.36%	0.04%	22.94%	0.06%
2015-5	5.26%	0.02%	8.39%	0.02%	10.27%	0.03%	13.35%	0.04%	22.83%	0.06%
2015-6	5.14%	0.02%	8.02%	0.02%	10.40%	0.03%	13.58%	0.04%	22.99%	0.06%
2015-7	5.16%	0.02%	7.70%	0.02%	10.60%	0.03%	13.67%	0.04%	23.39%	0.06%
2015-8	5.15%	0.02%	7.58%	0.02%	10.79%	0.03%	13.61%	0.04%	23.52%	0.06%
2015-9	5.29%	0.02%	8.09%	0.02%	10.61%	0.03%	13.35%	0.04%	22.90%	0.05%
2015-10	5.47%	0.02%	8.48%	0.02%	10.59%	0.03%	13.05%	0.03%	22.60%	0.05%
2015-11	5.56%	0.02%	8.37%	0.02%	10.82%	0.03%	12.98%	0.04%	22.77%	0.06%
2015-12	5.57%	0.02%	8.04%	0.02%	10.81%	0.03%	13.23%	0.04%	22.75%	0.05%
2016-1	5.59%	0.02%	7.74%	0.02%	11.04%	0.03%	13.41%	0.04%	23.29%	0.06%
2016-2	5.95%	0.02%	8.09%	0.02%	11.31%	0.03%	12.89%	0.04%	23.21%	0.06%
2016-3	5.98%	0.02%	8.33%	0.02%	11.10%	0.03%	12.29%	0.03%	22.67%	0.05%
2016-4	6.05%	0.02%	8.37%	0.02%	11.21%	0.03%	12.32%	0.03%	22.89%	0.05%
2016-5	6.16%	0.02%	8.70%	0.02%	11.05%	0.03%	12.15%	0.03%	22.47%	0.05%
2016-6	6.50%	0.02%	8.38%	0.02%	10.92%	0.03%	12.42%	0.03%	22.52%	0.05%
2016-7	6.60%	0.02%	8.06%	0.02%	11.32%	0.03%	12.68%	0.03%	23.25%	0.05%
2016-8	6.69%	0.02%	7.90%	0.02%	11.60%	0.03%	12.49%	0.03%	23.50%	0.05%
2016-9	7.05%	0.02%	8.55%	0.02%	11.32%	0.03%	12.06%	0.03%	22.75%	0.05%
2016-10	7.14%	0.02%	8.80%	0.02%	11.57%	0.03%	11.97%	0.03%	23.15%	0.05%
2016-11	7.21%	0.02%	8.67%	0.02%	11.64%	0.03%	11.94%	0.03%	23.22%	0.05%
2016-12	7.42%	0.02%	8.37%	0.02%	11.83%	0.03%	12.01%	0.03%	23.31%	0.05%

2017-1	7.89%	0.02%	7.95%	0.02%	11.84%	0.03%	12.12%	0.03%	23.65%	0.05%
2017-2	8.16%	0.02%	8.42%	0.02%	12.06%	0.03%	11.70%	0.03%	23.75%	0.05%
2017-3	8.36%	0.02%	8.27%	0.02%	11.85%	0.03%	11.29%	0.03%	23.29%	0.05%
2017-4	8.44%	0.02%	8.31%	0.02%	11.83%	0.03%	11.13%	0.03%	23.45%	0.05%
2017-5	8.38%	0.02%	8.54%	0.02%	11.86%	0.03%	11.17%	0.02%	23.25%	0.04%
2017-6	8.41%	0.02%	8.35%	0.02%	11.90%	0.03%	11.29%	0.02%	23.31%	0.04%
2017-7	8.53%	0.02%	8.08%	0.02%	12.15%	0.03%	11.37%	0.02%	23.60%	0.04%
2017-8	8.76%	0.02%	8.18%	0.02%	12.39%	0.03%	11.31%	0.02%	23.75%	0.04%
2017-9	8.95%	0.02%	8.48%	0.02%	12.33%	0.03%	10.97%	0.02%	23.37%	0.04%
2017-10	9.27%	0.02%	8.80%	0.02%	12.41%	0.03%	10.77%	0.02%	23.16%	0.04%
2017-11	9.52%	0.02%	8.59%	0.02%	12.70%	0.03%	10.75%	0.02%	23.14%	0.04%
2017-12	9.71%	0.02%	8.54%	0.02%	12.58%	0.03%	10.69%	0.02%	22.58%	0.04%
2018-1	10.08%	0.02%	8.36%	0.02%	12.63%	0.03%	10.99%	0.02%	22.55%	0.04%
2018-2	10.39%	0.02%	8.77%	0.02%	12.57%	0.03%	10.31%	0.02%	21.99%	0.04%
2018-3	10.29%	0.02%	8.59%	0.02%	12.70%	0.03%	10.26%	0.02%	22.04%	0.04%
2018-4	10.42%	0.02%	8.50%	0.02%	13.03%	0.03%	10.69%	0.02%	22.21%	0.04%
2018-5	10.39%	0.02%	8.81%	0.02%	12.83%	0.03%	10.89%	0.02%	21.59%	0.04%
2018-6	10.28%	0.02%	8.55%	0.02%	12.90%	0.03%	10.96%	0.02%	21.66%	0.04%
2018-7	10.28%	0.02%	8.22%	0.02%	13.12%	0.03%	11.00%	0.02%	22.14%	0.04%
2018-8	10.47%	0.02%	8.17%	0.02%	13.56%	0.03%	10.83%	0.02%	22.83%	0.04%
2018-9	10.56%	0.02%	8.47%	0.02%	13.42%	0.03%	10.42%	0.02%	22.57%	0.04%
2018-10	10.74%	0.02%	8.77%	0.02%	13.38%	0.03%	10.34%	0.02%	22.39%	0.04%
2018-11	10.94%	0.02%	8.62%	0.02%	13.71%	0.03%	10.38%	0.02%	22.70%	0.04%
2018-12	11.08%	0.02%	8.37%	0.02%	13.71%	0.03%	10.26%	0.02%	22.62%	0.04%
2019-1	11.18%	0.02%	8.08%	0.02%	13.73%	0.03%	10.14%	0.02%	22.64%	0.04%
2019-2	11.60%	0.03%	8.55%	0.02%	13.82%	0.03%	10.19%	0.02%	22.87%	0.04%
2019-3	11.63%	0.02%	8.47%	0.02%	13.65%	0.03%	9.81%	0.02%	22.65%	0.04%
2019-4	11.50%	0.02%	8.58%	0.02%	13.58%	0.03%	9.76%	0.02%	22.81%	0.04%
2019-5	11.42%	0.02%	8.70%	0.02%	13.68%	0.03%	9.87%	0.02%	22.99%	0.04%
2019-6	11.38%	0.02%	8.51%	0.02%	13.62%	0.03%	9.95%	0.02%	22.97%	0.04%
2019-7	11.53%	0.02%	8.12%	0.02%	13.92%	0.03%	10.00%	0.02%	23.40%	0.04%
2019-8	11.68%	0.02%	8.25%	0.02%	14.19%	0.03%	9.86%	0.02%	23.63%	0.04%
2019-9	11.77%	0.02%	8.78%	0.02%	13.97%	0.03%	9.68%	0.02%	23.18%	0.04%
2019-10	12.08%	0.02%	8.98%	0.02%	14.08%	0.03%	9.41%	0.02%	23.21%	0.04%
2019-11	12.35%	0.02%	8.86%	0.02%	14.29%	0.03%	9.49%	0.02%	23.49%	0.04%
2019-12	12.47%	0.02%	8.56%	0.02%	14.46%	0.03%	9.48%	0.02%	23.49%	0.04%
2020-1	12.70%	0.02%	8.57%	0.02%	14.50%	0.03%	9.55%	0.02%	23.66%	0.04%
2020-2	13.02%	0.03%	8.84%	0.02%	14.46%	0.03%	9.22%	0.02%	23.42%	0.04%
2020-3	12.87%	0.03%	8.57%	0.02%	14.08%	0.03%	8.99%	0.02%	22.99%	0.04%
2020-4	12.20%	0.03%	6.42%	0.02%	12.99%	0.03%	8.70%	0.02%	22.58%	0.05%
2020-5	12.15%	0.03%	6.13%	0.02%	13.53%	0.03%	9.57%	0.02%	24.20%	0.05%

2020-6	12.25%	0.03%	6.84%	0.02%	13.86%	0.03%	10.06%	0.02%	24.82%	0.05%
2020-7	12.14%	0.02%	6.89%	0.01%	13.90%	0.03%	9.78%	0.02%	24.67%	0.04%
2020-8	12.39%	0.02%	6.92%	0.01%	14.13%	0.03%	9.63%	0.02%	24.95%	0.04%
2020-9	12.47%	0.03%	7.11%	0.02%	14.44%	0.03%	9.92%	0.02%	25.50%	0.04%
2020-10	12.70%	0.03%	7.40%	0.02%	14.61%	0.03%	9.93%	0.02%	25.68%	0.04%
2020-11	12.61%	0.03%	7.18%	0.02%	14.60%	0.03%	9.92%	0.02%	25.46%	0.04%
2020-12	12.56%	0.03%	6.79%	0.02%	14.44%	0.03%	9.63%	0.02%	25.04%	0.04%
2021-1	12.58%	0.03%	6.63%	0.01%	14.57%	0.03%	9.62%	0.02%	25.13%	0.04%
2021-2	13.08%	0.03%	6.90%	0.02%	14.86%	0.03%	9.72%	0.02%	25.61%	0.05%
2021-3	13.20%	0.03%	7.11%	0.01%	14.90%	0.03%	9.91%	0.02%	25.71%	0.04%
2021-4	12.96%	0.03%	7.35%	0.02%	14.70%	0.03%	9.62%	0.02%	25.63%	0.04%
2021-5	13.01%	0.02%	7.50%	0.01%	14.67%	0.03%	9.74%	0.02%	25.52%	0.04%
2021-6	12.91%	0.02%	7.53%	0.01%	14.54%	0.03%	9.98%	0.02%	25.46%	0.04%
2021-7	12.79%	0.02%	7.24%	0.01%	14.50%	0.03%	9.91%	0.02%	25.37%	0.04%
2021-8	12.86%	0.02%	7.15%	0.01%	14.30%	0.03%	9.42%	0.02%	24.71%	0.04%
2021-9	12.92%	0.02%	7.50%	0.01%	13.79%	0.03%	9.03%	0.02%	23.85%	0.04%
2021-10	13.10%	0.02%	7.78%	0.02%	14.20%	0.03%	9.22%	0.02%	24.58%	0.04%
2021-11	13.46%	0.03%	7.64%	0.02%	14.62%	0.03%	9.51%	0.02%	25.13%	0.04%
2021-12	13.54%	0.03%	7.31%	0.01%	14.68%	0.03%	9.54%	0.02%	24.93%	0.04%
2022-1	13.76%	0.03%	7.14%	0.01%	14.25%	0.03%	9.19%	0.02%	24.14%	0.04%
2022-2	14.27%	0.03%	7.39%	0.02%	15.06%	0.03%	9.69%	0.02%	25.55%	0.04%
2022-3	14.15%	0.03%	7.39%	0.01%	15.24%	0.03%	9.66%	0.02%	25.83%	0.04%
2022-4	14.03%	0.03%	7.54%	0.01%	15.44%	0.03%	9.58%	0.02%	26.06%	0.04%
2022-5	14.04%	0.02%	7.72%	0.01%	15.09%	0.03%	9.62%	0.02%	25.65%	0.04%
2022-6	14.06%	0.02%	7.58%	0.01%	15.07%	0.03%	9.79%	0.02%	25.45%	0.04%
2022-7	13.98%	0.02%	7.21%	0.01%	15.36%	0.03%	9.80%	0.02%	25.95%	0.04%
2022-8	14.18%	0.02%	7.15%	0.01%	15.54%	0.03%	9.80%	0.02%	26.17%	0.04%
2022-9	14.21%	0.02%	7.60%	0.01%	15.41%	0.03%	9.75%	0.02%	25.81%	0.04%
2022-10	14.34%	0.02%	7.81%	0.01%	15.46%	0.03%	9.75%	0.02%	25.81%	0.04%
2022-11	14.53%	0.02%	7.73%	0.01%	15.57%	0.03%	9.55%	0.02%	25.63%	0.04%
2022-12	14.77%	0.03%	7.45%	0.01%	15.40%	0.03%	9.63%	0.02%	25.21%	0.04%
2023-1	14.69%	0.03%	7.08%	0.01%	15.52%	0.03%	9.81%	0.02%	25.74%	0.04%
2023-2	14.86%	0.03%	7.41%	0.01%	15.90%	0.03%	9.62%	0.02%	26.11%	0.04%
2023-3	14.67%	0.02%	7.57%	0.01%	15.98%	0.03%	9.42%	0.02%	26.04%	0.04%
2023-4	14.57%	0.02%	7.68%	0.01%	16.07%	0.03%	9.61%	0.02%	26.45%	0.04%
2023-5	14.63%	0.02%	7.83%	0.01%	15.93%	0.03%	9.67%	0.02%	26.29%	0.04%
2023-6	14.69%	0.02%	7.67%	0.01%	16.00%	0.03%	9.93%	0.02%	26.49%	0.04%
2023-7	14.66%	0.02%	7.18%	0.01%	16.32%	0.03%	10.12%	0.02%	26.88%	0.04%
2023-8	14.70%	0.02%	7.08%	0.01%	16.46%	0.03%	9.98%	0.02%	26.97%	0.04%
2023-9	14.89%	0.02%	7.64%	0.01%	16.06%	0.03%	9.75%	0.02%	26.35%	0.04%
2023-10	15.03%	0.02%	7.92%	0.01%	16.17%	0.03%	9.74%	0.02%	26.42%	0.04%

2023-11	15.16%	0.02%	7.68%	0.01%	16.41%	0.03%	9.82%	0.02%	26.59%	0.04%
2023-12	15.30%	0.02%	7.50%	0.01%	16.46%	0.03%	9.67%	0.02%	26.39%	0.04%