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WCIRB Actuarial Committee Meeting

August 10, 2020

Agenda

1. AC20-08-05: Potential Impact of Medical Care Delays
2. AC20-04-04: COVID-19 Crisis
3. AC20-06-01: 3/31/2020 Experience – Review of Methodologies

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01

Potential Impact of Medical Care Delays

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Background

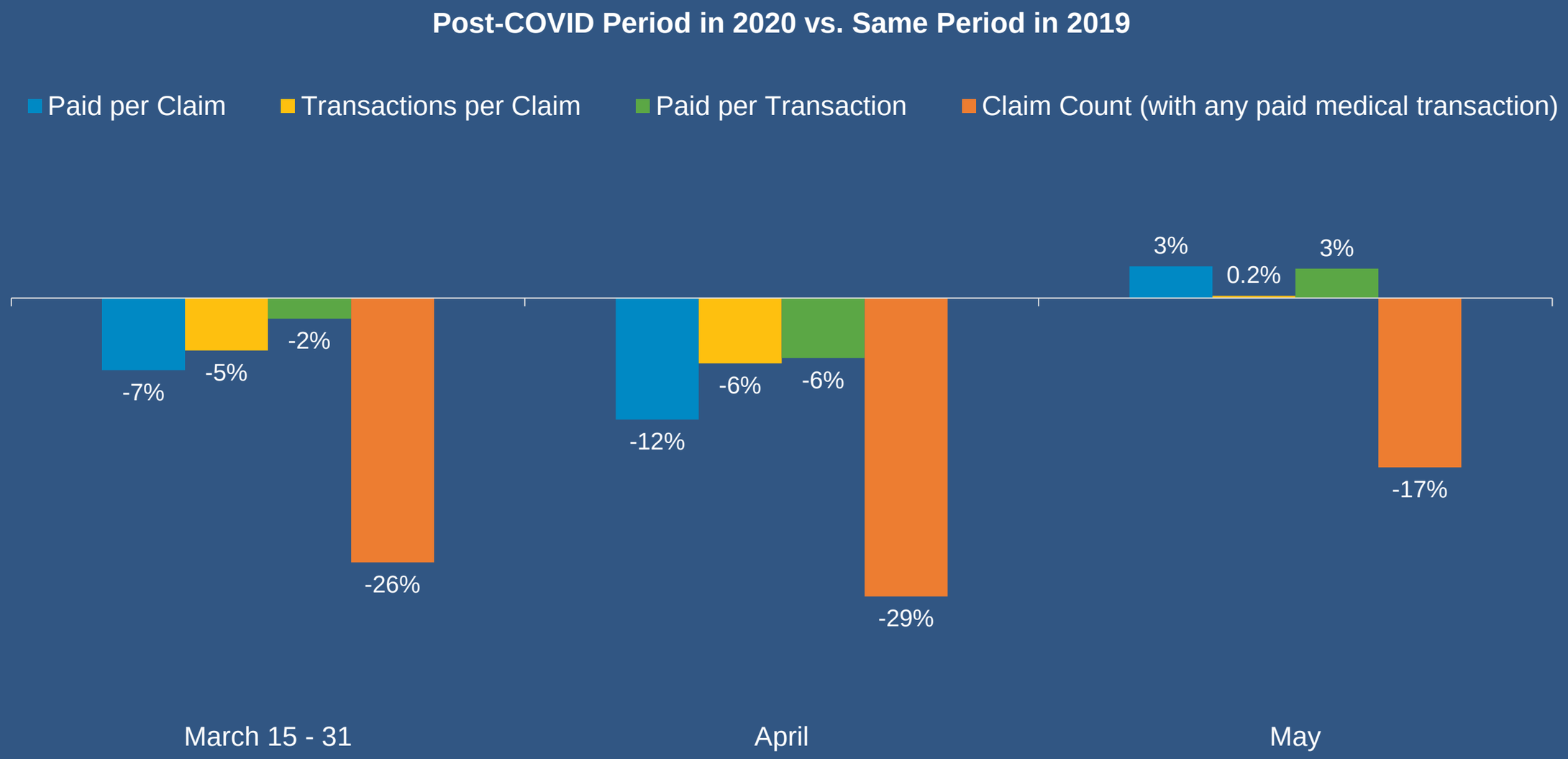
- Impact of COVID-19 pandemic on medical services
  - 3/19: Shelter-in-place order led to suspension of elective and preventive medical care
  - 4/27: Health services started to resume in California
  - Late March/April: Drops in medical treatments seen in the workers' comp system
    - Post-COVID medical treatment patterns based on WCIRB's medical data
- Impact of delays in medical services on future claim costs and outcomes
  - Evaluation based on the existing claims in the WCIRB's medical data

Summary of the Post-COVID Medical Treatment Patterns in 2020 Compared to 2019 (updated as of August 4, 2020)

- Overall medical services
  - March 15-31: significant drops in active claims and some declines in the average paid and service volumes
  - April: steeper declines
  - May: rebound started
- Pharmaceuticals: increased use of non-opioids
  - Mostly non-opioid pain medications and dermatologicals
- Utilization of inpatient and outpatient care dropped significantly
- Physical medicine was not heavily affected
- Telemedicine services surged since late March and continued to grow through May

Percent Changes in Overall Medical Treatment Patterns and Costs

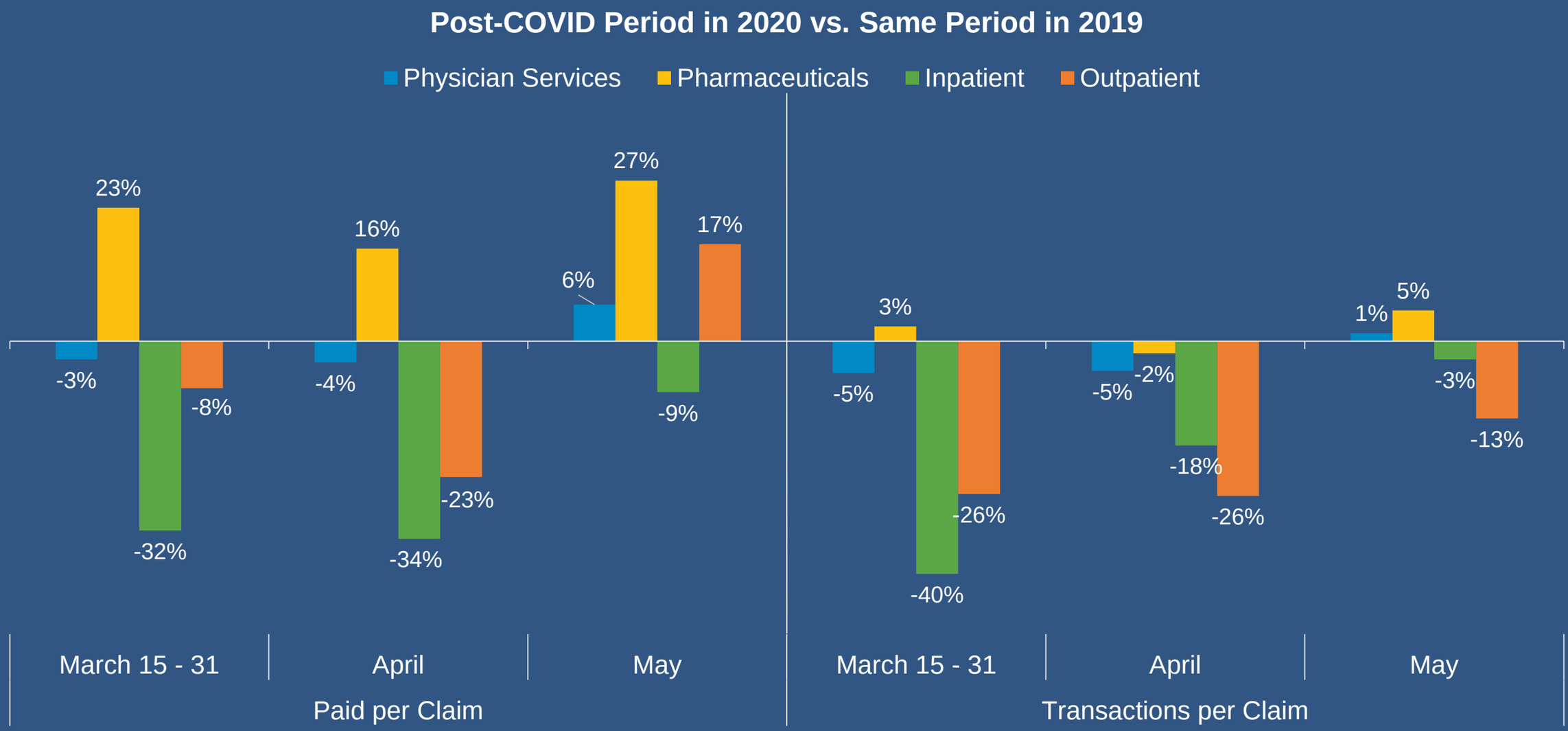
As of August 4, 2020



Source: WCIRB medical transaction data from insurers who submit data monthly.

Percent Change by Leading Types of Medical Services

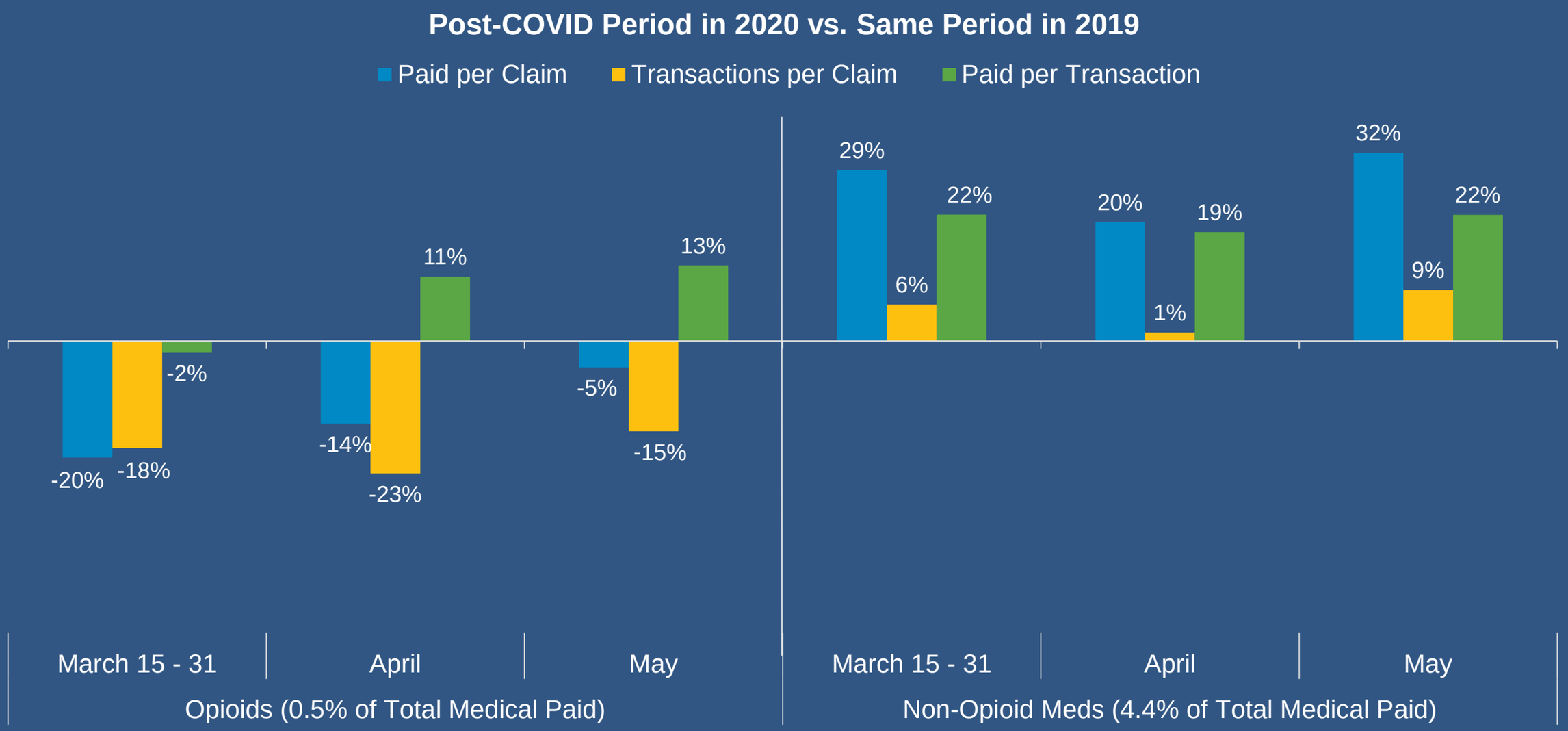
As of August 4, 2020



Source: WCIRB medical transaction data from insurers who submit data monthly.

Percent Change in Opioids vs. Non-Opioid Prescription Drugs

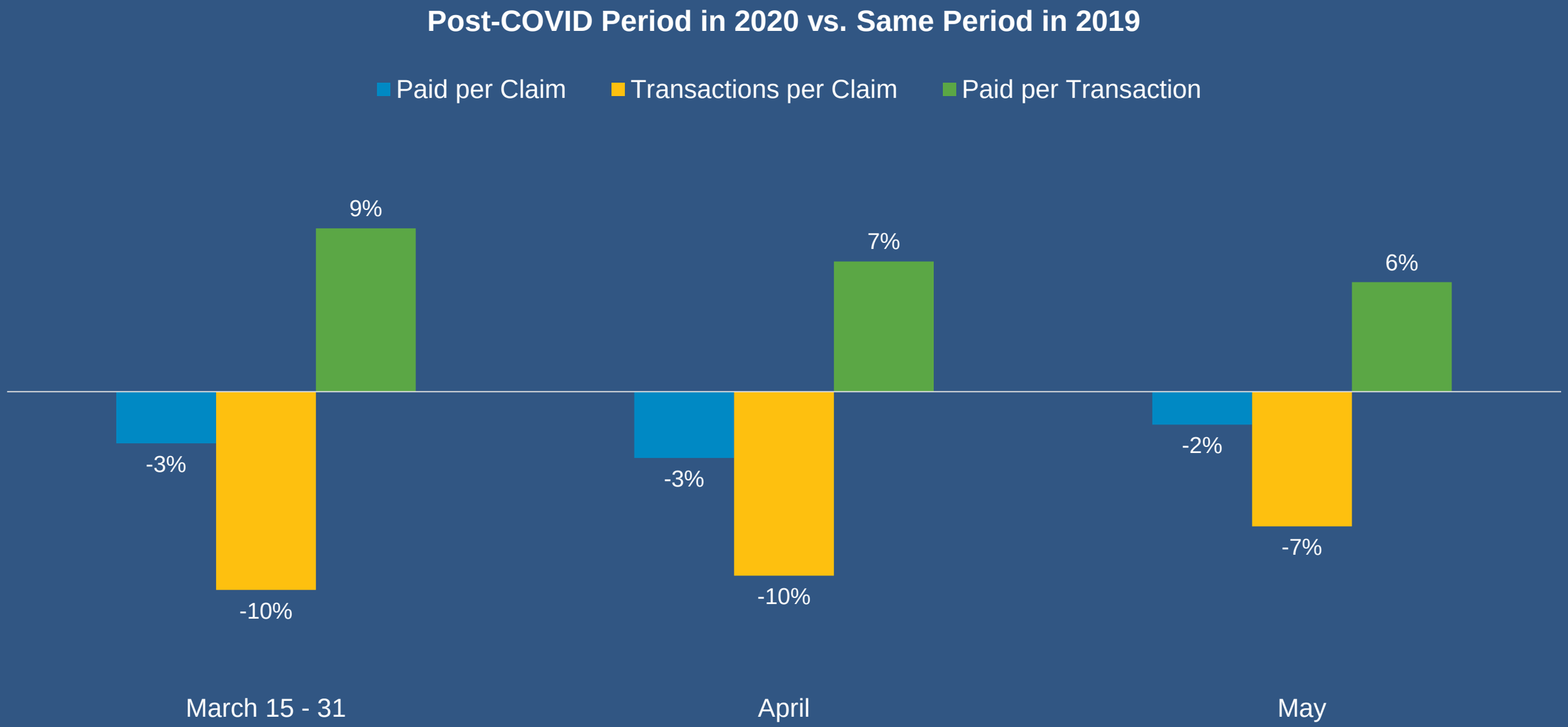
As of August 4, 2020



Source: WCIRB medical transaction data from insurers who submit data monthly.

Percent Change in Physical Therapy

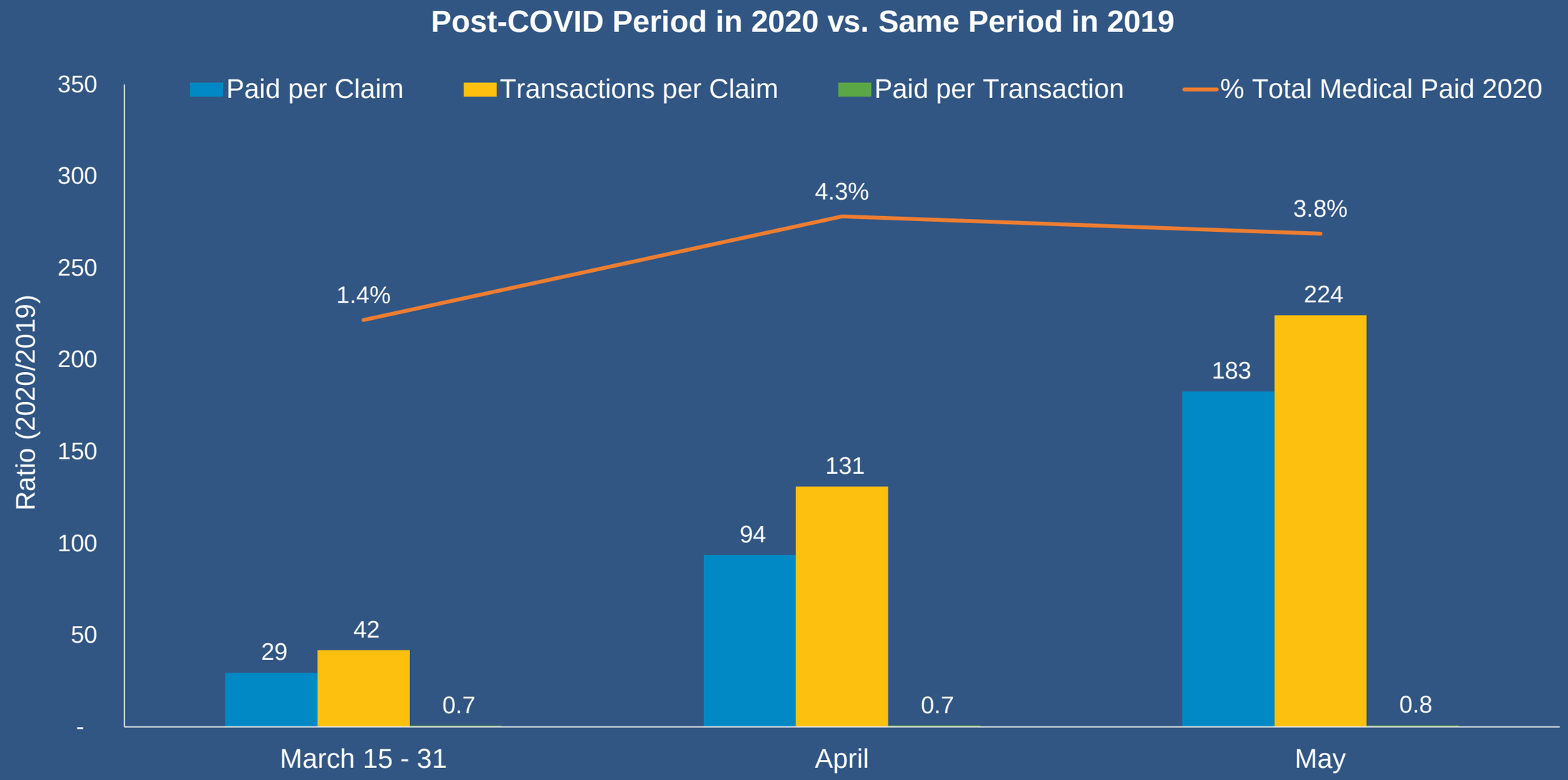
As of August 4, 2020



Source: WCIRB medical transaction data from insurers who submit data monthly.

Changes in Telemedicine Services

As of August 4, 2020



Source: WCIRB medical transaction data from insurers who submit data monthly.

Evaluating Potential Impact of Medical Treatment Delays – Preliminary

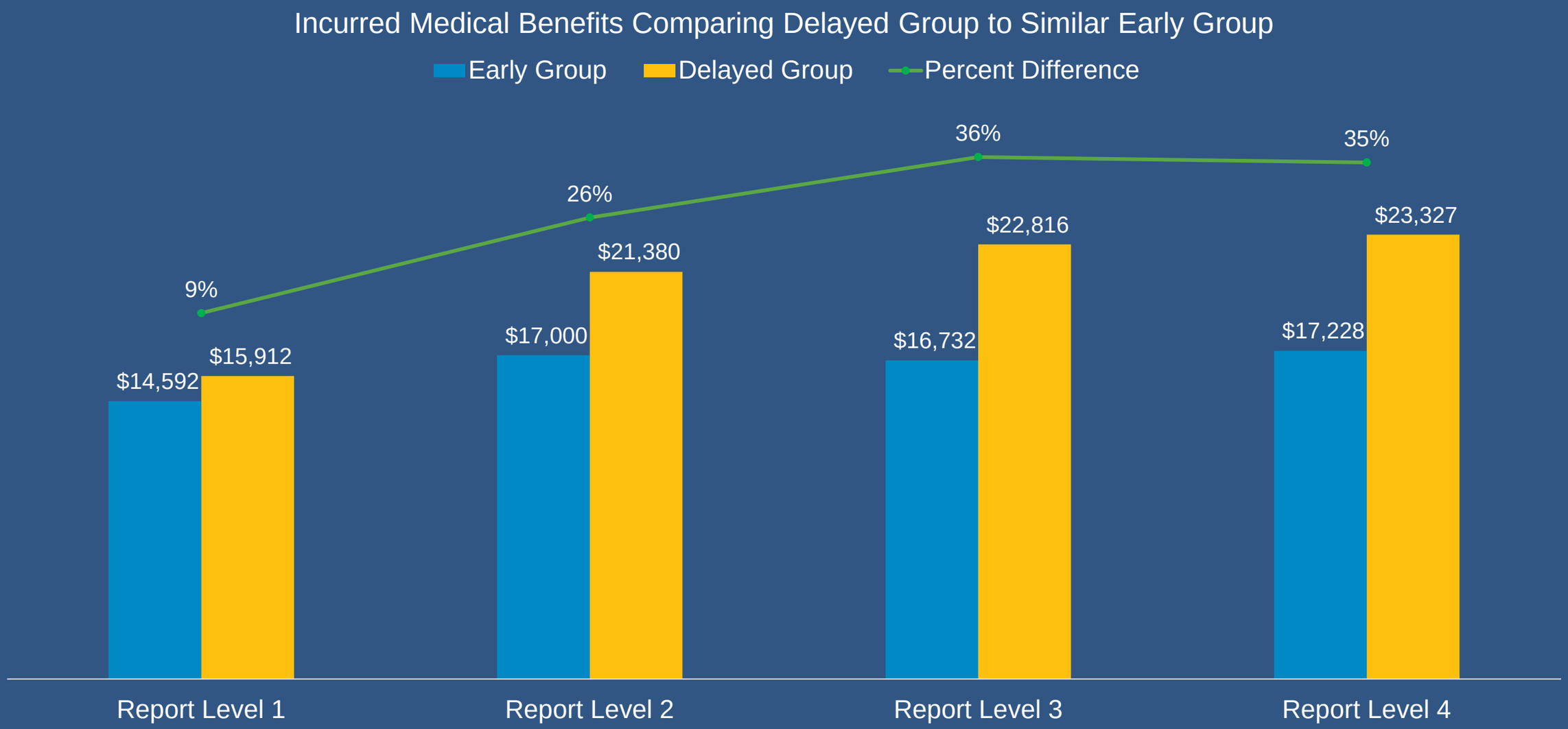
- Goal is to quantify the impact of delays in medical treatments on future claim costs and outcomes
- Strategy: create cohorts of similar claims, in which some received medical care early and others encountered medical care delays
  - Cohorts of claims with leading medical diagnoses
  - Early vs. delayed claims were defined using:
    - Time from injury to first medical service (threshold differs by diagnosis, for soft tissue: 7 days from the injury date)
  - Early and delayed claims matched on:
    - Demographics (age, gender, industry and region of provider)
    - Injury characteristics (ICD information, pain type, surgery and opioid use).
- Outcomes:
  - Long-term incurred/paid medical and indemnity costs, disability rating, claim closure rate, and temporary disability duration

Median Time (days) to Receive Medical Treatments For Soft Tissue Claims (post-matching)

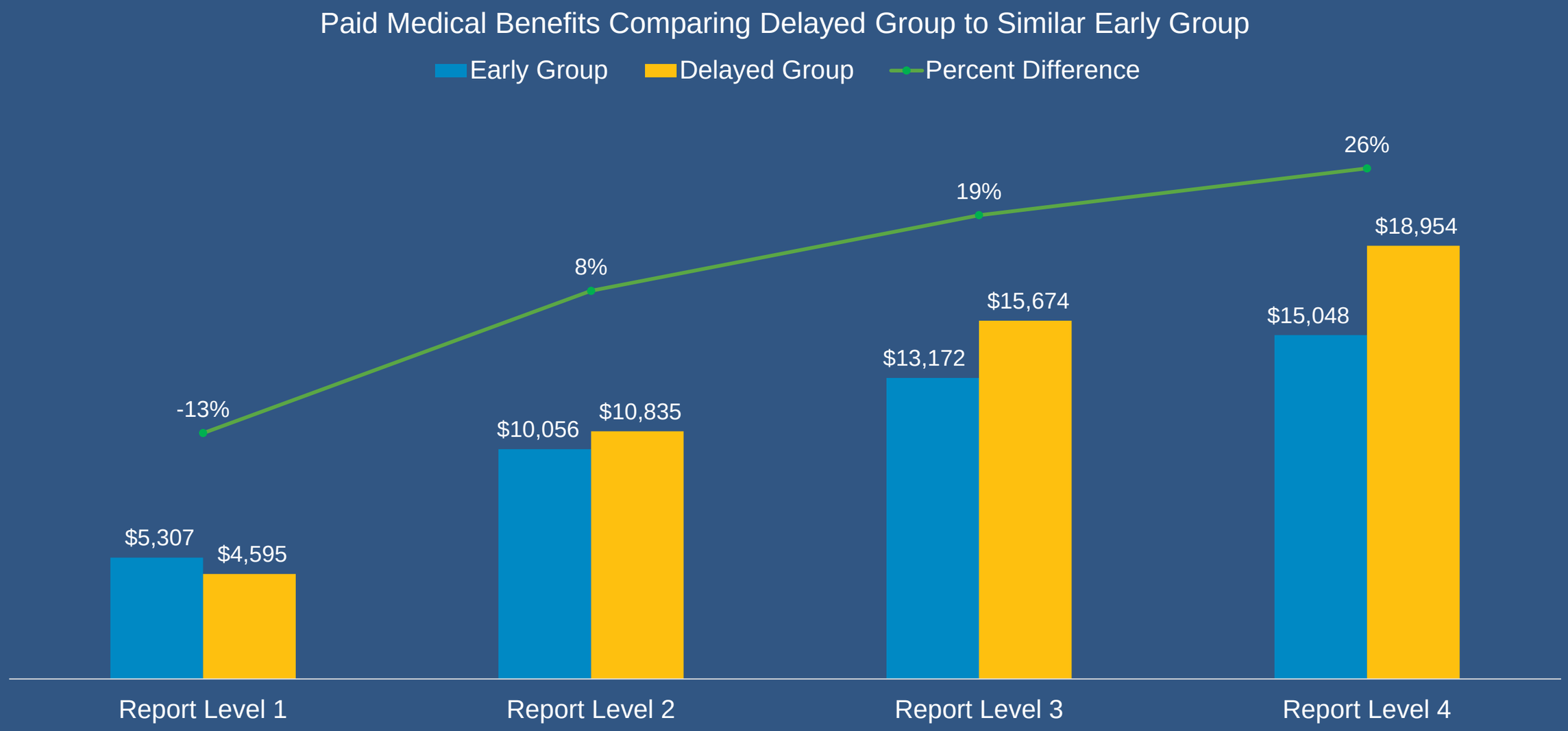
Early Primary Diagnosis	% of all Indemnity Claims	All Matched Claims	Early Group	Delayed Group	Difference in Median Time
Median time from Injury to First Medical Service					
Soft tissue injuries	11%	3	1	33	32
Median time from Injury to First Medical Treatment for the Diagnosis					
Soft tissue injuries	11%	17	5	53	48

Other diagnoses analyzed: Dislocation and sprain, Low back pain, Fracture, Minor wounds

Impact of delayed first medical service on long-term incurred medical on claims with soft tissue injuries



Impact of delayed first medical service on long-term paid medical on claims with soft tissue injuries



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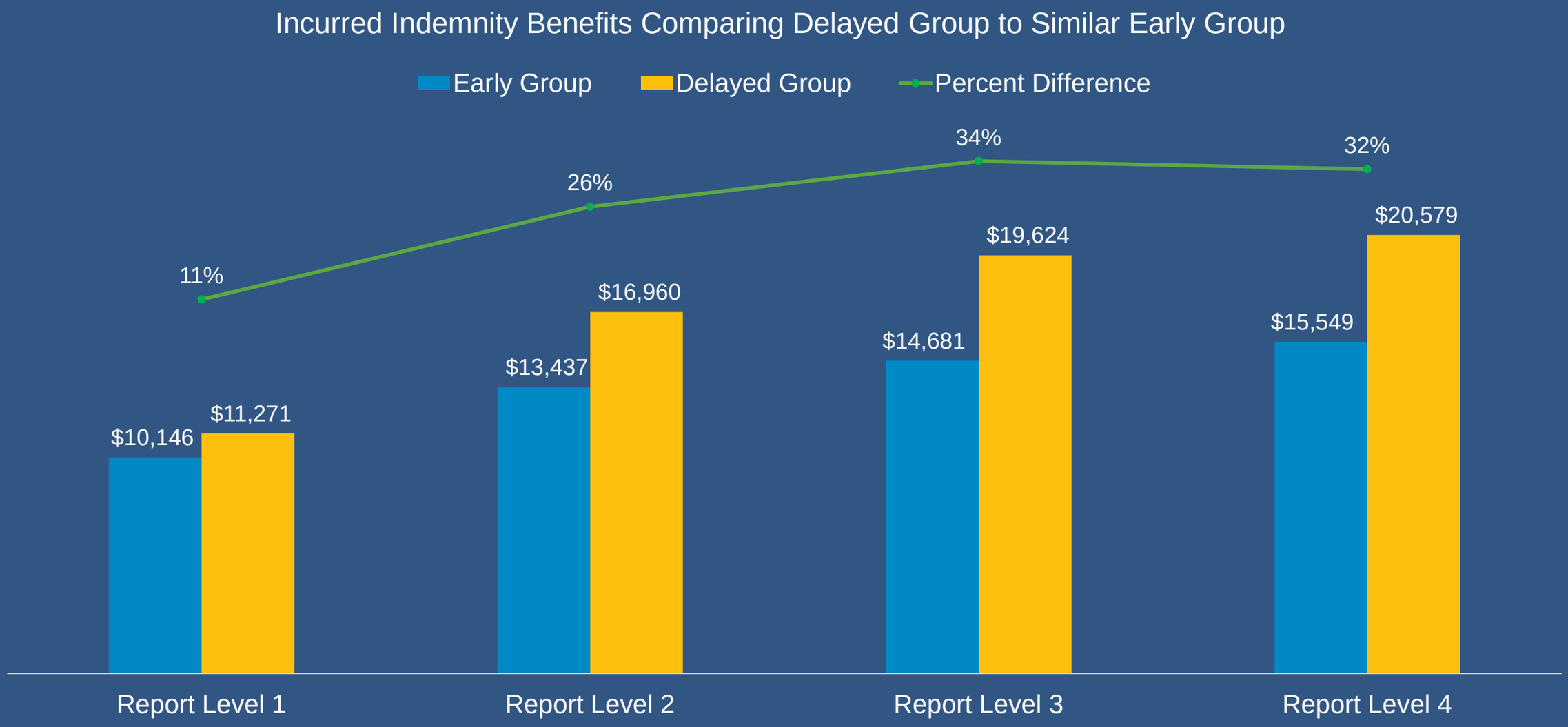
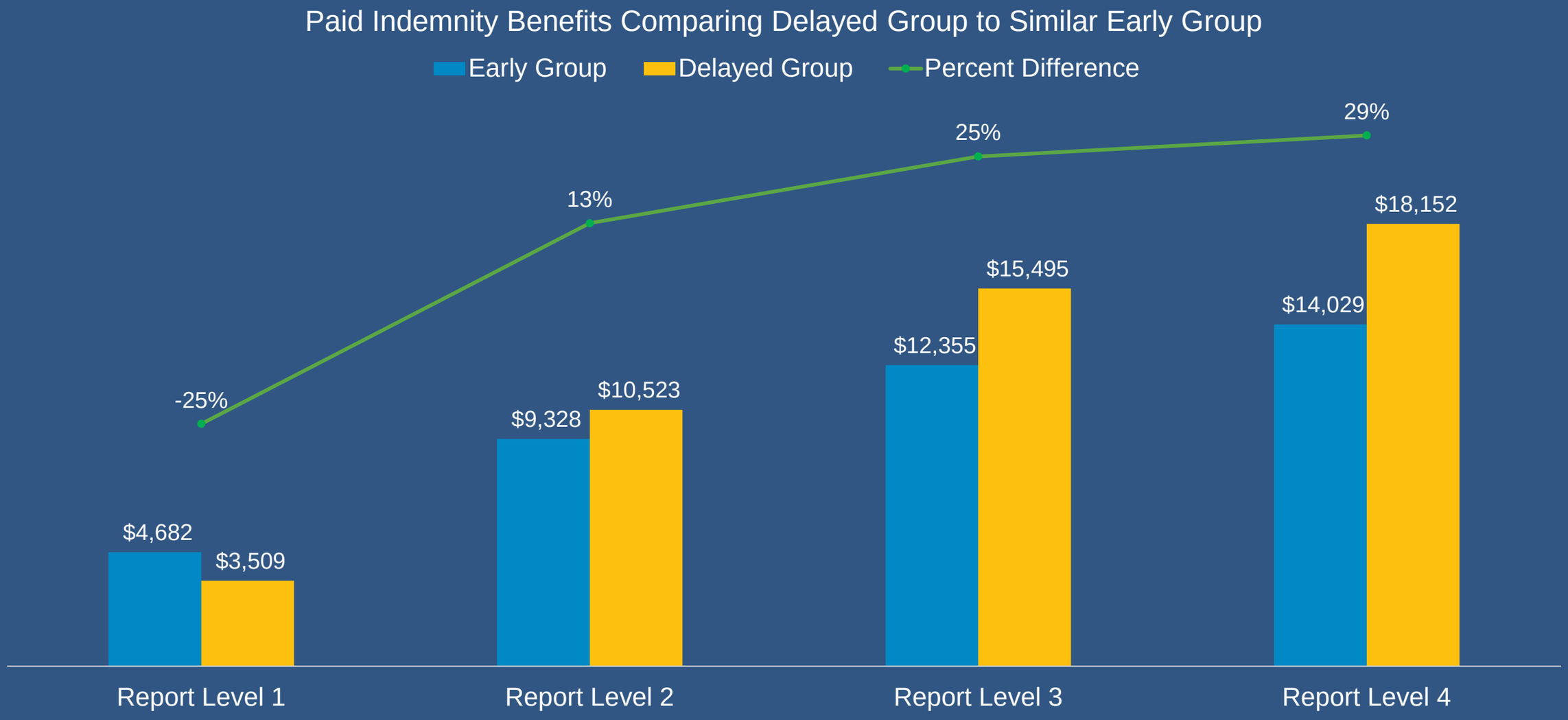
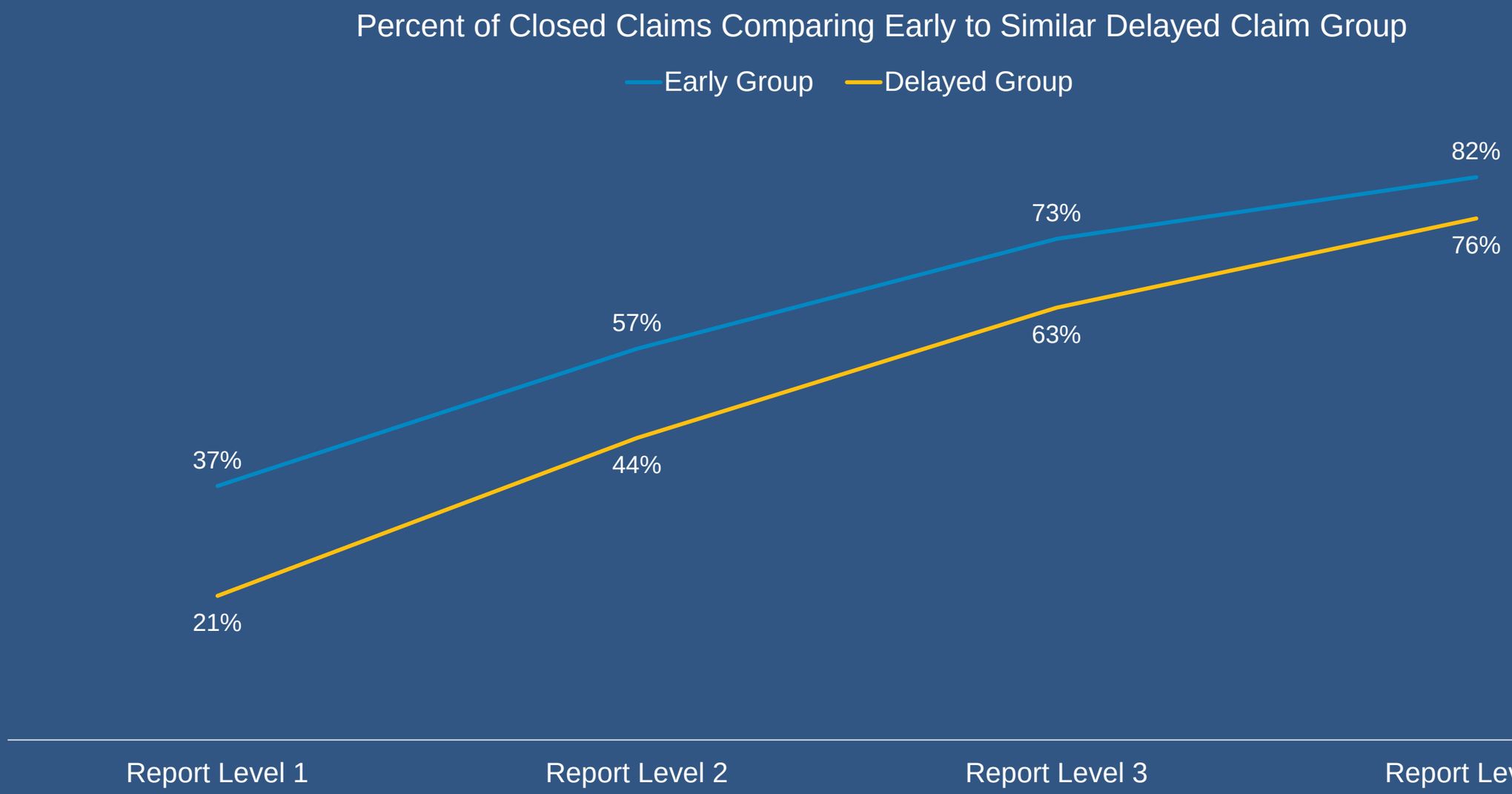
Impact of delayed first medical service on long-term incurred indemnity on soft tissue claims



Impact of delayed first medical service on long-term paid indemnity on soft tissue claims



Impact of delayed first medical service on claim closure rate for soft tissue claims



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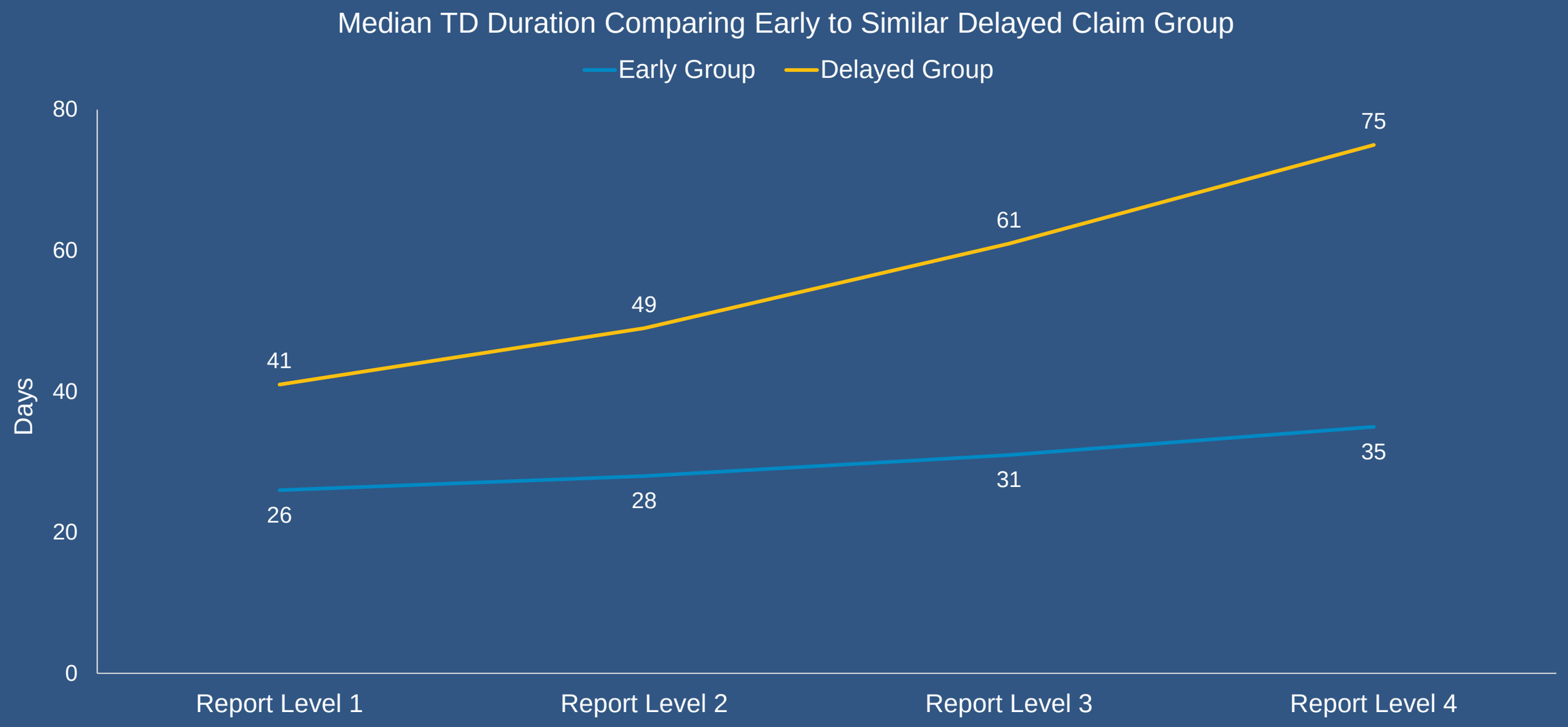
Impact of delayed first medical service on TD duration (days) for TD-only closed claims with soft tissue injuries



Summary of Preliminary Findings

- Soft tissue claims that had delayed 1st medical service for about a month tended to have:
  - Higher medical and indemnity costs (both incurred and paid)
  - Slower claim closure rate
  - Longer TD duration

- Claims with other leading diagnoses show similar patterns

02

COVID-19 Crisis

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Projection of 1/1/21 – 8/31/21 Policy Period COVID-19 Claim Cost
AY 2020 Projected COVID-19 Claim Costs - Staff Preliminary Analysis

(1)	AY 2020 Statewide Deaths Working Age Population:	7,800
(2)	AY 2020 Statewide Hospitalizations (ex deaths) Working Age Population:	41,200
(3)	WC Death and Hospitalization Claim Conversion Factor:	12%
(4)	AY 2020 Estimated WC Death Claims: (1) x (3)	940
(5)	AY 2020 Estimated WC Death Claim Costs: (4) x Avg Death Severity	$0.4 bb.
(6)	AY 2020 Estimated WC Hospitalization (ex. deaths) Claims: (2) x (3)	4,950
(7)	AY 2020 Estimated WC Hospitalization Claim Costs: (6) x Avg Hospitalization Severity	$0.7 bb.
(8)	Statewide AY 2020 COVID-19 Loss & LAE: (5) + (7) + (mild claim costs)	$1.1 bb.
(9)	Insured Market Share of COVID-19 Claims:	63%
(10)	**Projected AY 2020 Insured Market COVID-19 Loss & LAE: (8) x (9)**	**$0.7 bb.**

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Note. Numbers were updated as of August 11, 2020.

Estimate AY 2020 Statewide COVID-19 Deaths

- Projected statewide deaths up to Nov 1 based on the latest published projections from IHME and MIT-YYG and extended to end of 2020
  - Applied the forecasted incremental change from Oct to Nov to last two months of 2020 assuming a potential winter wave
- Adjusted to the working-age population (18-69 years) based on the CDPH's age distribution of deaths
- Plan to update the projection if 12/1 projection is published before the rate filing

	7/1/2020	8/1/2020	9/1/2020	10/1/2020	11/1/2020	12/1/2020	12/31/2020
Ca DPH (Actual)	6,090	9,356					
Ave. of MIT-YYG and IHME Projections			12,531	15,158	17,602		
Incremental Monthly Change				2,628	2,444	2,444	2,444
Estimated statewide COVID deaths						20,046	22,490
Estimated COVID deaths for the working-age population (18-69 years)							7,790

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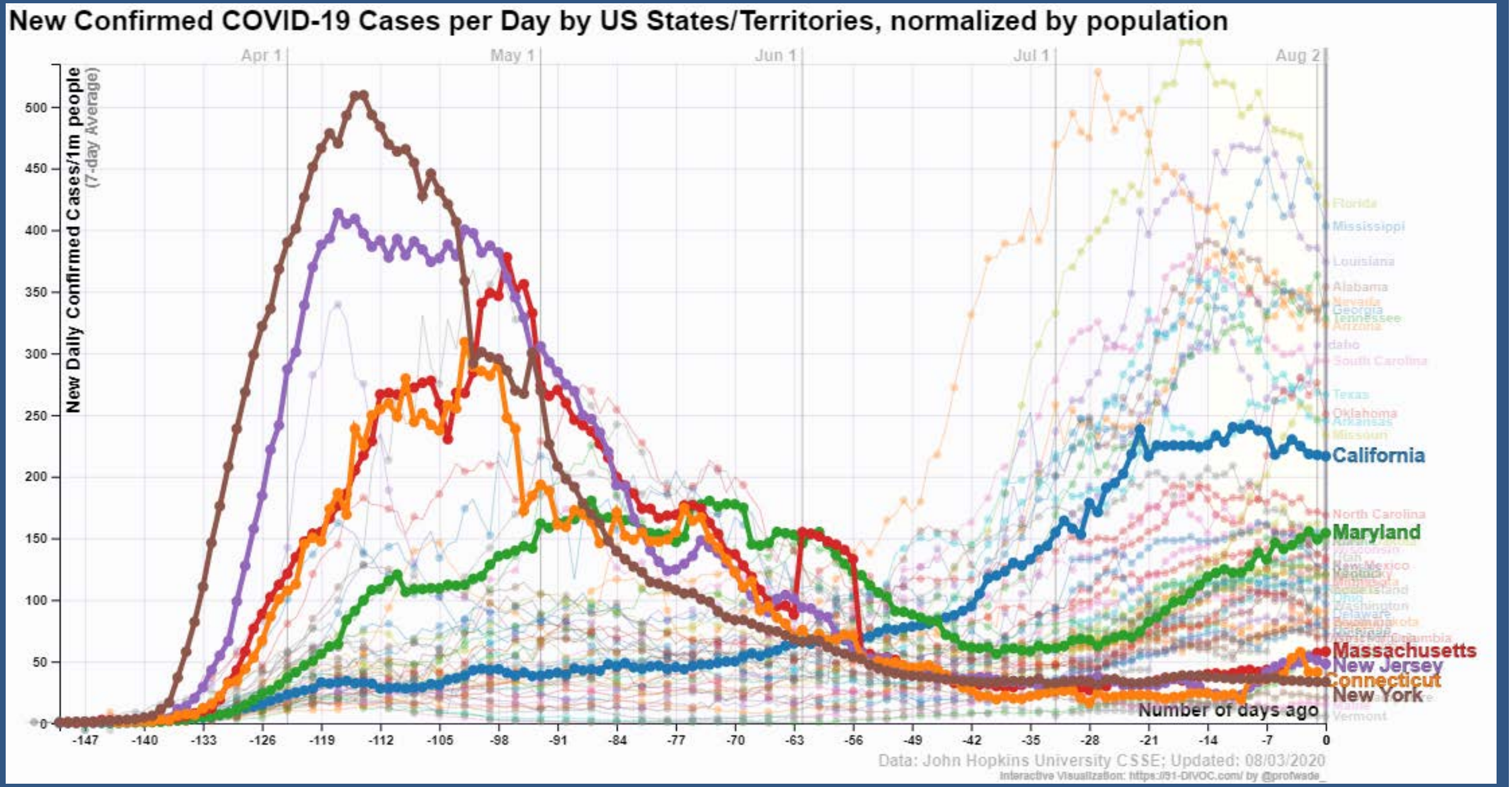
Source: CDPH: https://update.covid19.ca.gov/
MIT-YYG projection: https://covid19-projections.com/us-ca
IHME projection: https://covid19-projections.com/us-ca

Estimate 2020 Statewide COVID-19 Hospitalizations

- Limited reliable projections for 2020 statewide hospitalizations available
- The projection method used in the WCIRB May Evaluation assumed a continuous downward trend based on the CDC data (COVID-NET), which may not hold based on the current trajectory
- "Wave-based" method to project the total hospitalizations in 2020
  - Based on the cumulative hospitalizations per 100k (as of 7/28) reported by states that passed their first infection wave in April or early May
    - MA, MD, CT, NJ and NY
  - Applied the low-end hospitalization rate (172 per 100k) to project statewide hospitalizations
  - Adjusted to the working population (18-69 years) based on the CDC's age distribution of total hospitalizations
- Severe (no ICU) vs. Critical (ICU) hospitalizations in 2020
  - Total hospital cases segregated to Severe and Critical cases based on published sources
  - Approx. 30% of hospitalizations assumed to be Critical

State	Date of peak hospitalizations	Cumulative hospitalizations per 100,000 up to the peak	Cumulative hospitalizations per 100,000 to date (7/28)	Data Source
MA	4/21	58	172	COVID Tracking Project
MD	5/06	91	205	
NJ	4/15	Not reported	240	
CT	4/22	218	300	
NY	4/13	272	463	
CA	Latest-7/25	70	70	CDC COVID-NET


New Confirmed COVID-19 Cases per Day by US States/Territories, normalized by population
New Daily Confirmed Cases/1m people
(7-day Average)
Apr 1
May 1
Jun 1
Jul 1
Aug 2
500
450
400
350
300
250
200
150
100
50
0
-147
-140
-133
-126
-119
-112
-105
-98
-91
-84
-77
-70
-63
-56
-49
-42
-35
-28
-21
-14
-7
0
Number of days ago
Florida
Mississippi
Louisiana
Alabama
Georgia
Tennessee
Arizona
South Carolina
Texas
Oklahoma
California
North Carolina
Maryland
Massachusetts
New Jersey
Connecticut
New York
Vermont
Data: John Hopkins University CSSE; Updated: 08/03/2020
Interactive Visualization: https://91-DIVOC.com/ by @profwade_

Current vs. Projected COVID-19 Deaths and Hospitalizations

- Staff's Recommendation: using MA's cumulative hospitalization rate to project California's statewide hospitalizations

California Working Age Population (18-69 years)	Current (end of July/Early Aug)	Projected to 2020 Year End	% Change between Aug and Dec 2020
Total Deaths	3,230	7,790	+141%
Total Hospitalizations (incl. deaths)*	19,017	48,953	+157%
Mortality per 100k	12	29	+141%
Total Hospitalizations per 100k (incl. deaths)*	71	183	+157%
Mortality in the Hospital (deaths / total hospitalized)*	17%	15.9%	-7%

- If using the average of MA and MD to project statewide hospitalizations:

California Working Age Population (18-69 years)	Current (end of July/Early Aug)	Projected to 2020 Year End	% Change between Aug and Dec 2020
Total Hospitalizations (incl. deaths)*	19,017	53,638	+182%

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Note: Numbers with * were updated on August 11, 2020.
Source: CDC COVID-NET, COVID Tracking Project.

Estimate the Conversion Factor – COVID Claims Filed vs. California COVID Cases for the Working Age Population

Key Assumptions:

- Approximately 10% of claims filed are denied
- About 50% of mild claims will be filed
- Approximately 83% of California Infections (CDC 8/2/20) are of the working age population (18-69 yrs)

Mild Cases (18-69 yrs) =
Total Cases (18-69 yrs) - Total Hospitalizations (incl. Deaths) (18-69 yrs)

50% of Mild Cases + Total Hospitalizations (incl. Deaths)

COVID Claims Filed in WCIS (as of July 23, DWC): 22,261

/

COVID Cases (18-69 yrs) likely to File a WC Claim (as of July 25): 165,688*

= 13.4%*

Adjusting for approx. 10% claim denial rate:

= 12%*

Note: Number with * were updated on August 11, 2020.
Source: COVID Tracking Project, CDC COVID-NET.

Estimate Relativity for AY 2021 COVID Claims Compared to AY 2020

- Published Forecasts for COVID-19 in 2021 indicate 2021 is not significantly better or worse than 2020
  - More infection waves beyond 2020 and likely continue until July 2022 based on mathematical modeling
  - Outbreaks likely last 18-24 months and won't halt until >60% of the population is immune based on review of past global pandemics
  - Similar number of hospitalizations in 2021 compared to 2020 not unreasonable (based on a Health Affair article)
  - A worst-case scenario analysis in UK by the UK Academy of Medical Sciences
    - Hospital deaths during Jan/Feb 2021 more than doubled that of spring 2020
  - Yet no study accounted for the potential impact of a vaccine or existing/new treatments
- National and local public health experts anticipate repeated waves in the future

Source: https://www.healthaffairs.org/do/10.1377/hblog20200518.567886/full/ , https://science.sciencemag.org/content/368/6493/860 , https://www.cidrap.umn.edu/sites/default/files/public/downloads/cidrap-covid19-viewpoint-part1_0.pdf , https://www.nytimes.com/2020/05/08/health/coronavirus-pandemic-curve-scenarios.html

Published Information on Improved Treatments and Potential Vaccines

- Available Treatments For COVID-19
  - Dexamethasone (an anti-inflammatory steroid recommended for severe COVID infections)
    - Prelim report showed mortality reduced by 12% among ICU patients
  - Remdesivir (FDA approved for hospitalized patients)
    - Shown to reduce time to recovery by 4 days (15 vs. 11 days)
  - Convalescent plasma (FDA approved for severe or life threatening COVID-19)
  - Prone positioning reduces need for ventilators by 46%
- Treatments under clinical trial investigation (about 1,900 on-going trials)
  - Inhaled beta interferon: a U.K. trial showed an 80% mortality reduction among 100 hospitalized patients
  - Plasma-based therapy
- Potential vaccines
  - An effective vaccine by early 2021 highly likely
    - > 140 potential COVID vaccines in various stages of development (WHO)
  - A study on 2009 influenza pandemic (H1N1) shows the vaccines prevented about 4% of both deaths and hospitalizations, and 3% of total infections.
- Improved clinical guidelines for treating COVID-19

Source: https://pubmed.ncbi.nlm.nih.gov/32678530/, https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2767575, https://www.synairgen.com/wp-content/uploads/2020/07/200720-Synairgen-announces-positive-results-from-trial-of-SNG001-in-hospitalised-COVID-19-patients.pdf, https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19-management-in-hospitalized-adults

Projection of 1/1/21 – 8/31/21 Policy Period COVID-19 Claim Cost
AY 2021 Projected COVID-19 Claim Costs - Staff Preliminary Analysis

11) Estimated Relativity AY 2021 to AY 2020 COVID-19 Claims:	1.0
12) Judgmental Adjustment for Improved Treatment & Potential Vaccine:	25%
13) AY 2021 Insured Market COVID-19 Loss & LAE: (10) x (11) x {1 – (12)}	$0.52 bb.
14) AY 2021 Insured Market Projected Non-COVID-19 Loss & LAE:	$10.9 bb.
15) AY 2021 COVID-19 Adjustment Factor: (13) / (14)	**4.7%**

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Note. Numbers were updated as of August 11, 2020.

Projection of 1/1/21 – 8/31/21 Policy Period COVID-19 Claim Cost
AY 2022 Projected COVID-19 Claim Costs - Staff Preliminary Analysis

16)	Estimated Relativity AY 2022 to AY 2020 COVID-19 Claims: (Includes Judgmental Adjustment for Improved Treatment & Potential Vaccine)	0.33
17)	AY 2022 Insured Market COVID-19 Loss & LAE: (10) x (16)	$0.23 bb.
18)	AY 2022 Insured Market Projected Non-COVID-19 Loss & LAE:	$12.0 bb.
19)	AY 2022 COVID-19 Adjustment Factor: (17) / (18)	**1.9%**
20)	1/1/21-8/31/21 Policy Period COVID-19 Adjustment Factor {(15) x 67%} + {(19) x 33%}	**3.8%**

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Note. Numbers were updated as of August 11, 2020.

COVID-19 – Classification Advisory Pure Premium Rates Summary

- **Preliminary Staff Analysis – 1/1/21 – 8/31/21 Policy Period**
  - Projected COVID-19 Loss & LAE approximately 4% of total Loss & LAE
  - Approximately $0.06 per $100 of payroll
- **Application in Advisory Pure Premium Rates – Staff Preliminary Recommendation**
  - Apply additively not multiplicatively
  - Vary by industry sector between “high”, “medium” and “low” additive factors based on ratio of reported COVID-19 claims to estimated payroll in industry sector
  - “High” sectors include health care and agriculture with a ratio more than twice the statewide average
  - “Low” sectors include information and finance as well as others with a ratio less than half the statewide average
  - Balance overall adjustments to statewide average and may temper industry sector differential

Data Sources and Methodology for Industry Groupings

- **Data Sources:**
  - Projected 2020 employment by industry from the UCLA forecast
  - Estimated 2019 average wages by industry from the UCLA forecast
  - Ratio of WC Exclusions/Payroll based on historical test audits
  - Claim counts from First Record of Injury (FROI) from DWC
- **Methodology:**
  - Estimated the relative share of claims per billions of exposure for each industry using statewide data
  - Made selections of High/Medium/Low based on this
- **Key Assumptions:**
  - Ultimate costs will be proportional to the number of claims reported as of July 7 and the average severity will be the same across industries
  - No material differences in wage relativities across industries between 2019 and 2020
  - Impact within an industry will be reasonably homogenous
- **Cross Checks:**
  - Expected level of exposure from May analysis
  - Relative share of claims per million workers from statewide data
  - Relative share of total and indemnity claims from indemnity data call

Key Findings

Sector	Description	2020 Employment (M)	Estimated Payroll (B)	Ratio of COVID Claims to Payroll (B)	Relativity to Statewide Average	Recommended Category
62	**Health Care and Social Assistance**	**2.3**	**99.6**	**67.7**	**442%**	**H**
11	**Agriculture, Forestry, Fishing and Hunting**	**0.3**	**11.1**	**33.3**	**217%**	**H**
72	Accommodation and Food Services	1.2	25.2	22.2	145%	M
48	Transportation and Warehousing	0.6	33.2	19.7	128%	M
44	Retail Trade	1.5	46.5	18.4	120%	M
92	Public Administration	2.5	155.4	15.7	102%	M
22	Utilities	0.1	6.3	14.2	92%	M
81	Other Services (except Public Administration)	0.5	16.0	13.2	86%	M
61	Educational Services	0.4	18.2	12.5	82%	M
56	Administrative and Support and Waste Management and Remediation Services	1.0	42.8	10.6	69%	M
31	Manufacturing	1.2	99.6	9.1	59%	M
23	Construction	0.8	50.4	8.9	58%	M
42	Wholesale Trade	0.6	44.0	8.8	57%	M
21	Mining, Quarrying, and Oil and Gas Extraction	0.0	2.2	8.6	56%	M
53	**Real Estate and Rental and Leasing**	**0.3**	**19.2**	**6.2**	**41%**	**L**
71	**Arts, Entertainment, and Recreation**	**0.2**	**11.0**	**3.3**	**21%**	**L**
52	**Finance and Insurance**	**0.5**	**46.3**	**2.2**	**15%**	**L**
54	**Professional, Scientific, and Technical Services**	**1.2**	**127.4**	**0.8**	**5%**	**L**
51	**Information**	**0.6**	**83.9**	**0.7**	**4%**	**L**
55	**Management of Companies and Enterprises**	**0.2**	**26.0**	**0.0**	**0%**	**L**
Total		16.2	964.2	15.3		

Distribution of Recommended Groupings

	2020 Employment (M)	Estimated Payroll (B)	Ratio of COVID Claims to Payroll (B)	Relativity to Statewide Average
H	2.7	110.7	64.3	419%
M	10.4	539.8	13.4	88%
L	3.0	313.7	1.3	9%

Industries with Significant Changes in the Share of Claims
2020 Q2 Compared to Rolling Average of the Prior 4 Quarters (excluding COVID Claims

Increases	
11 & 21	Agriculture & Mining
31	Manufacturing

Decreases	
42	Wholesale Trade
61	Educational Services
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
8810	Office and Clerical

62 (Health Care and Social Assistance) has a large increase in total claim share, but a smaller increase when COVID claims are excluded.

Source: FROI records from WCIRB indemnity transaction data from insurers who submitted as part of the voluntary program.

03

3/31/2020 Experience – Review of Methodologies

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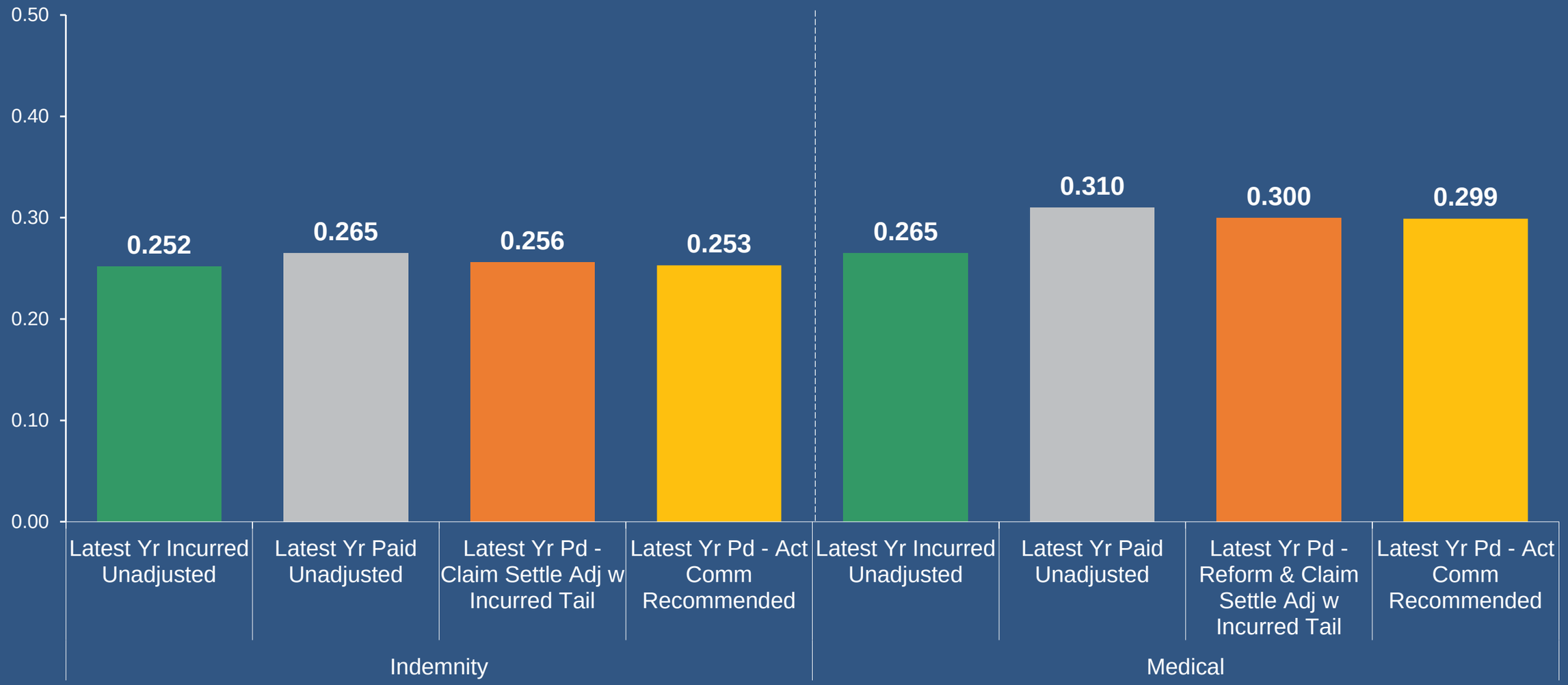
Updated Summary of 3/31/2020 Experience

- Includes Committee's recommended loss development methodology at 8/4/2020 meeting
- Includes Committee's preliminary recommendations on trending projection
  - Average wage change for 2020 judgmentally reduced by 0.8%
  - Claim frequency forecasts for 2020 through 2022 based on frequency model with increase in CT claim index based on average of prior two recessions
  - Indemnity severity trend of 0%; Medical severity trend of 2.5%
- Projected 1/1/2021 to 8/31/2021 policy period loss ratio (prior to COVID-19 claims): 0.572
- Comparable to projection reviewed at 8/4/20 meeting (0.571)

Impact of Recommended Loss Development Methodology on 2019 Ultimate Loss Ratios

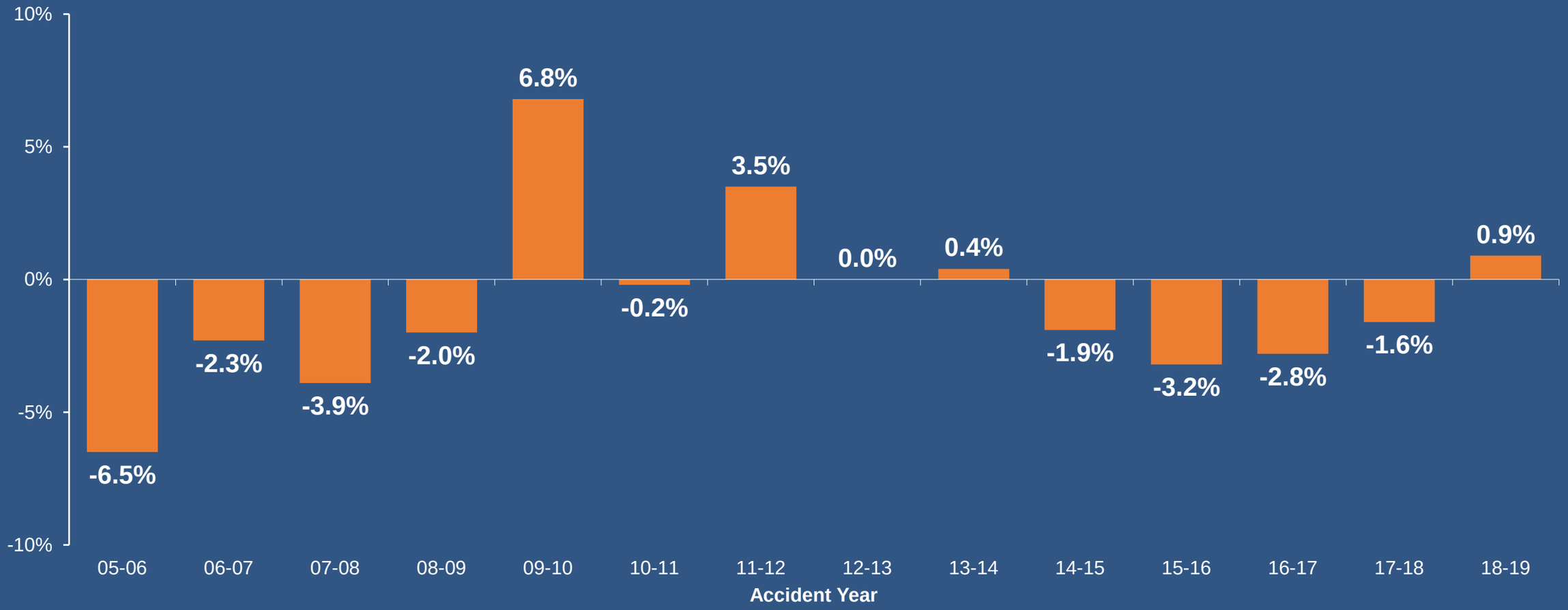
As of March 31, 2020



Source: WCIRB aggregate financial data and projections

Historical Changes in Indemnity Claim Frequency (Exhibit 12)

As of March 31, 2020



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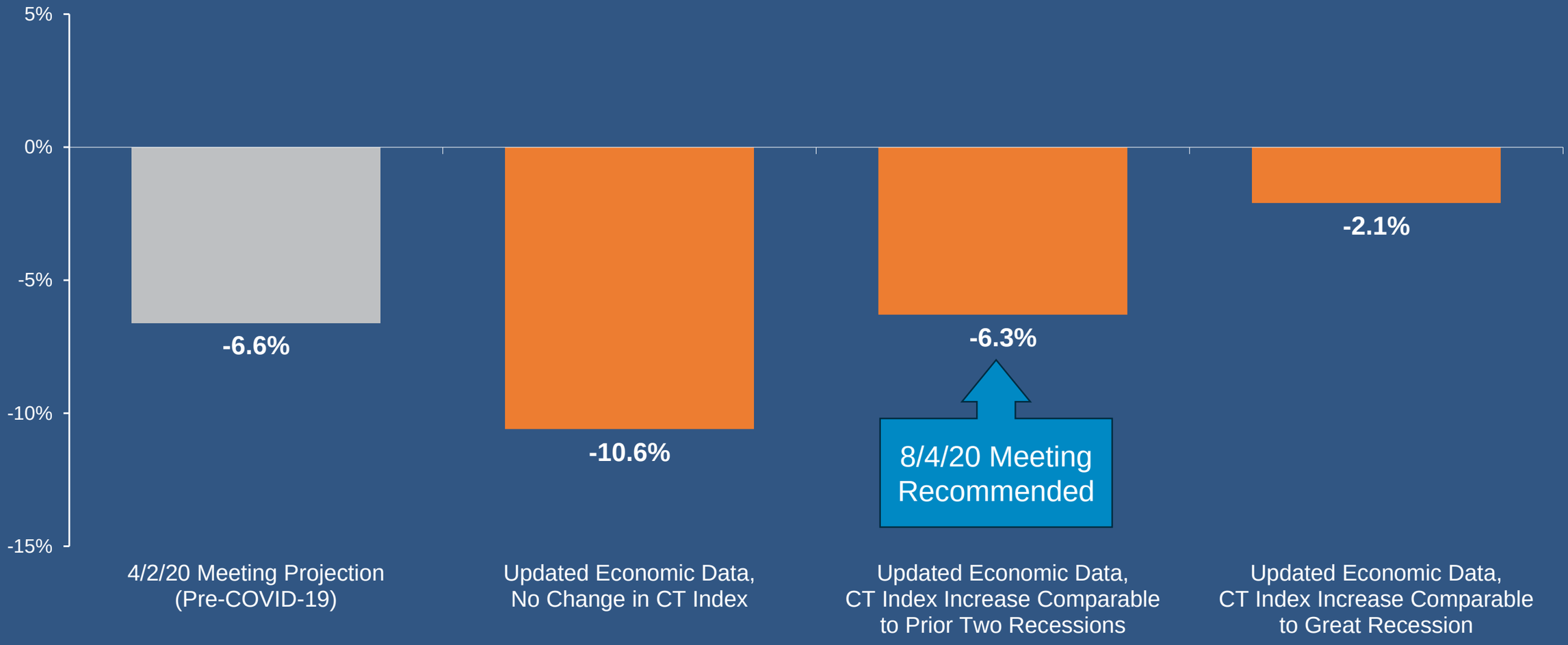
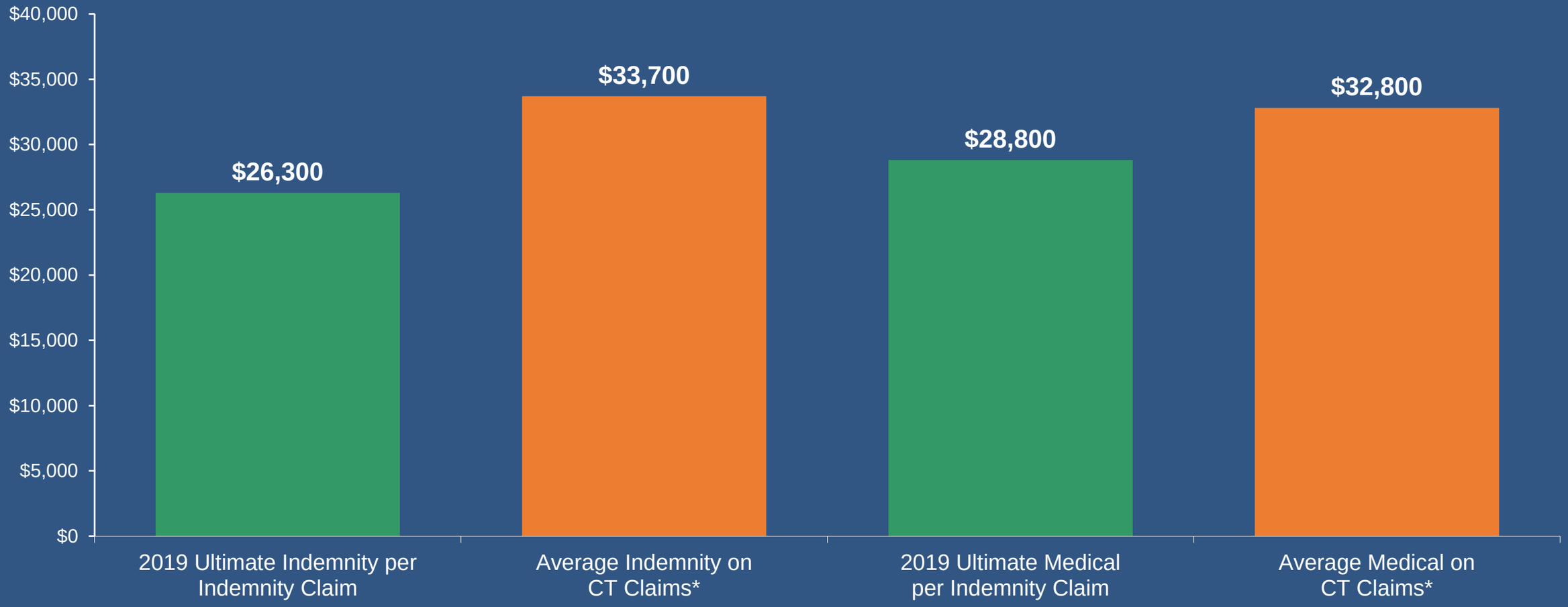
Source: 2019 is based on changes in aggregate indemnity claim counts compared to changes in statewide employment. All other estimates are based on unit statistical indemnity claim counts compared to reported insured payroll.

Frequency Model Forecasts of 2019 to 2022 Intra-Class Change



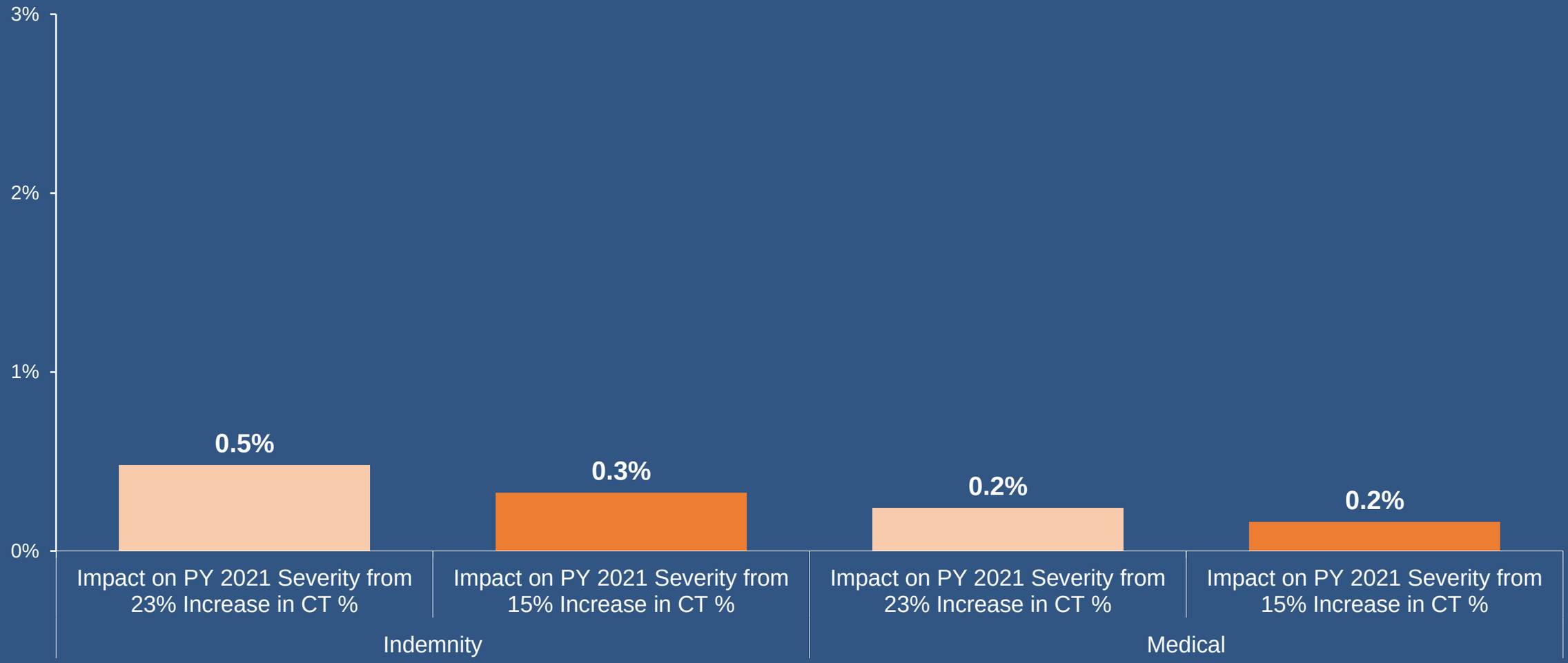
Source: WCIRB indemnity claim frequency model

Severity Projections – Potential Claim Mix Shifts



Source: WCIRB aggregate financial data, and 2018 report on CT claims
*Estimated based on incurred severity relativity to all indemnity claims at 10th report level

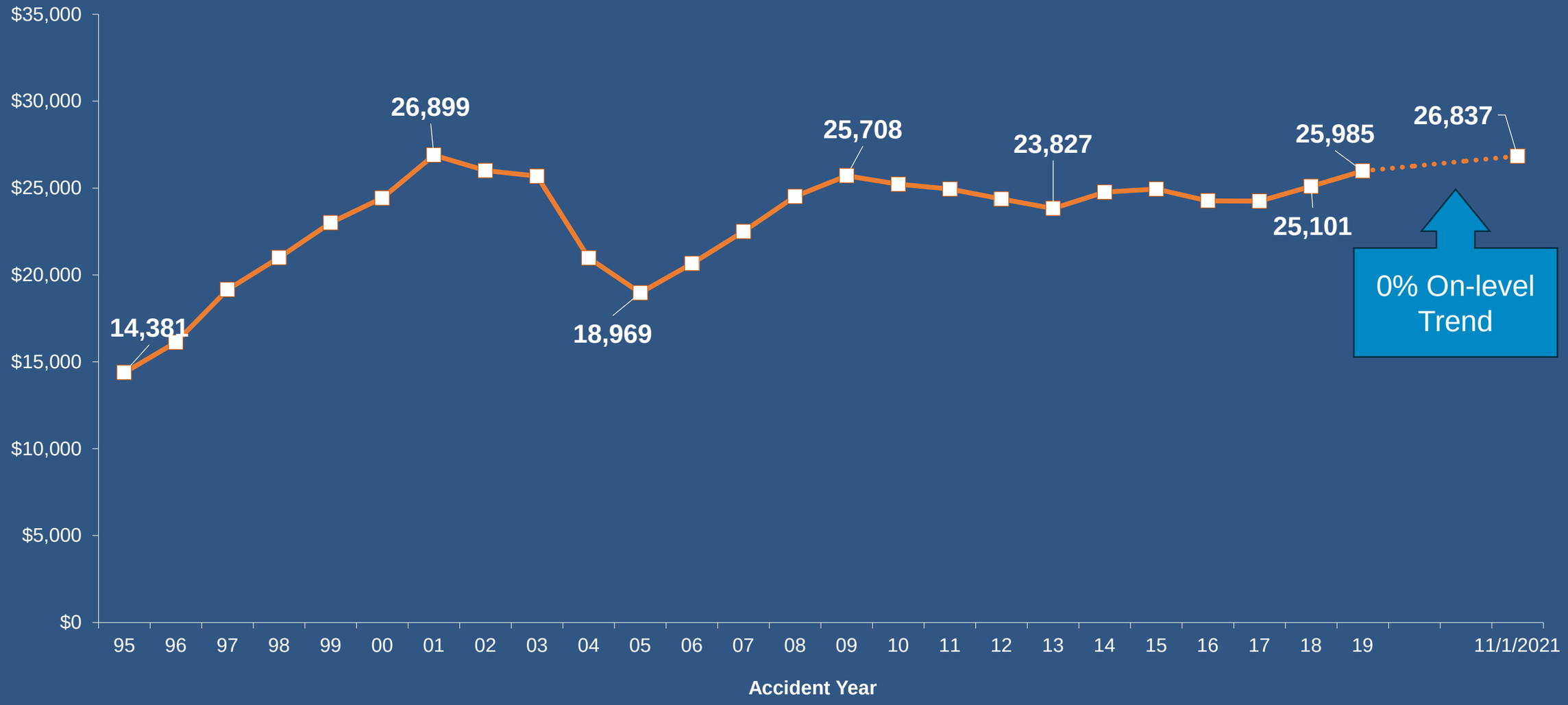
Potential Annualized Impact of Increased CT Claims on Severity Trend



Source: WCIRB aggregate financial data, and 2018 report on CT claims
*Estimated based on incurred severity relativity to all indemnity claims at 10th report level

Ultimate Indemnity per Indemnity Claim

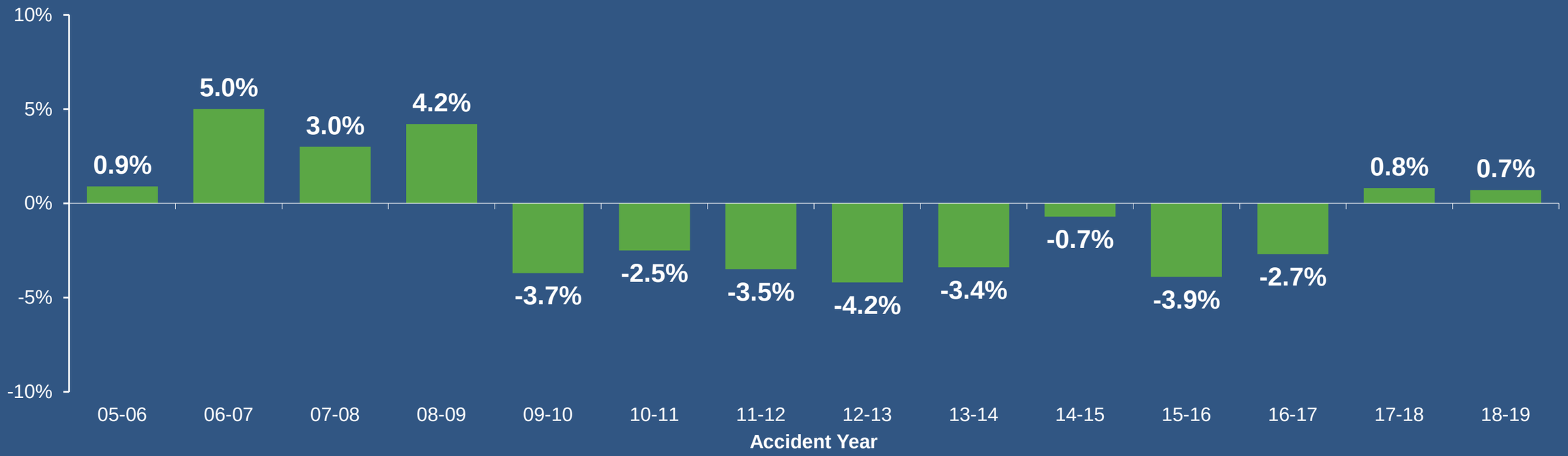
As of March 31, 2020



Source: WCIRB aggregate financial data and projections

Projected Changes in On-Level Indemnity Severity (Exhibit 6.2)

As of March 31, 2020



Annual Exponential Trend Based on:

1990 to 2019: 1.1%

2005 to 2019: -1.4%

2015 to 2019: -1.2%

8/10/2020 Agenda Selected: 0%

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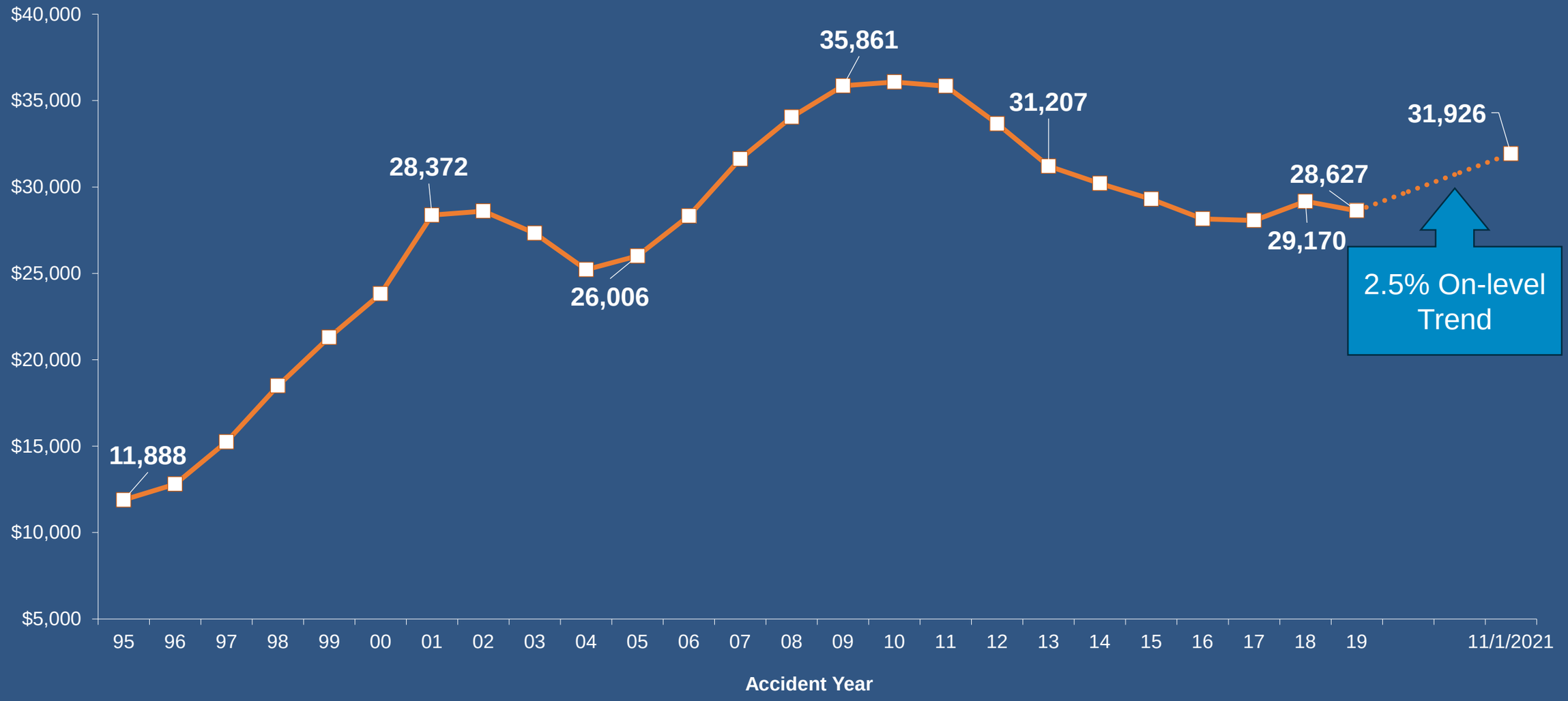
Source: WCIRB aggregate financial data and projections

Ultimate Medical per Indemnity Claim

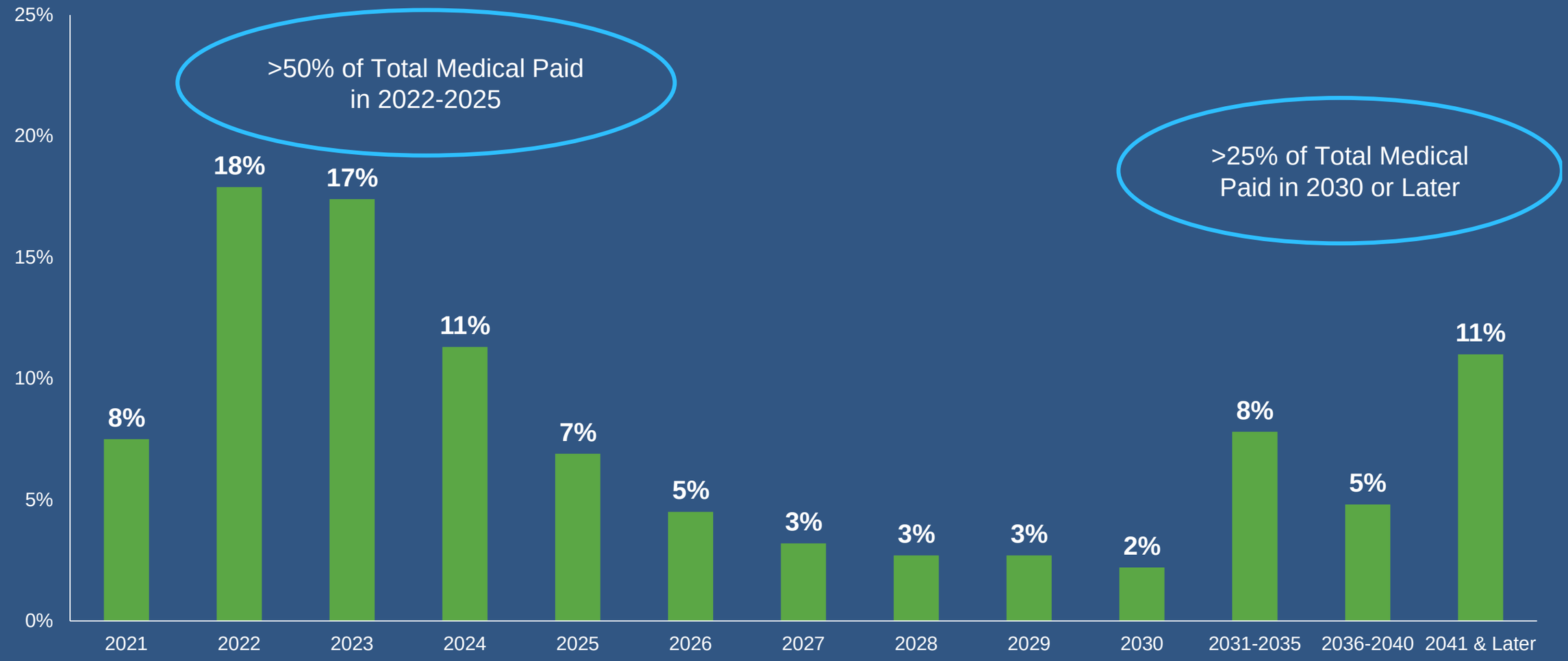
As of March 31, 2020



Source: WCIRB aggregate financial data and projections

Policy Year 2021 – Estimated Medical Paid by Year

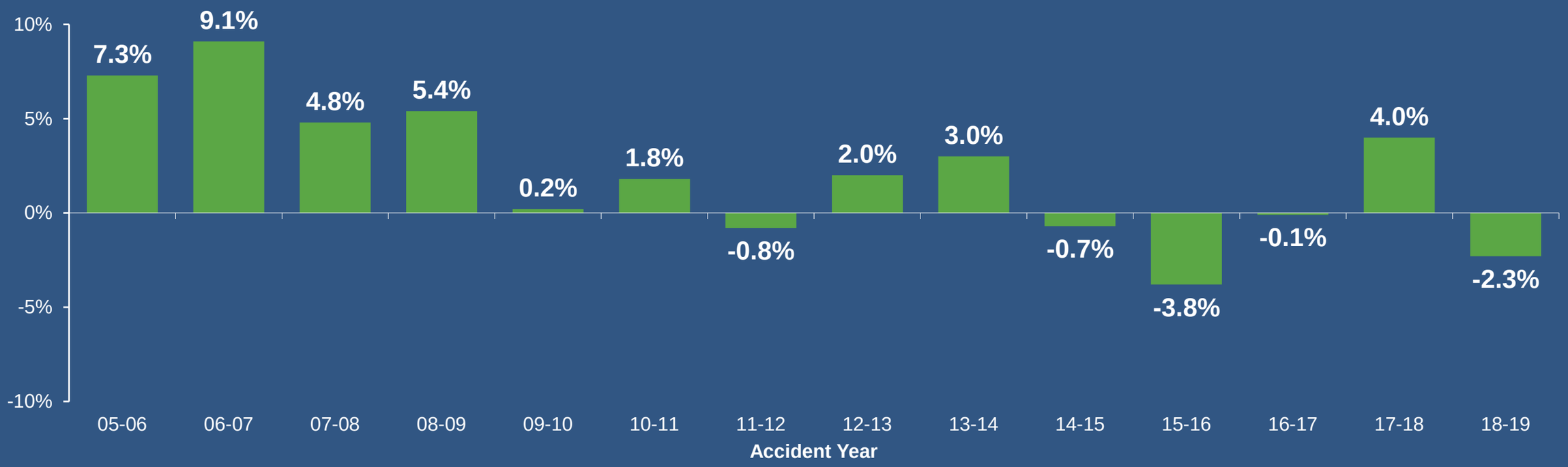
As of December 31, 2019



Source: WCIRB aggregate financial data and projections of paid medical

Projected Changes in On-Level Medical Severity (Exhibit 6.4)

As of March 31, 2020



Annual Exponential Trend Based on:

1990 to 2019 (Incl. MCCP): 5.5%

2005 to 2019: 1.6%

2015 to 2019: -0.1%

8/10/2020 Agenda Selected: 2.5%

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Source: WCIRB aggregate financial data and projections. Excludes MCCP costs.

Alternative Trending Methodologies (Item AC20-06-03)

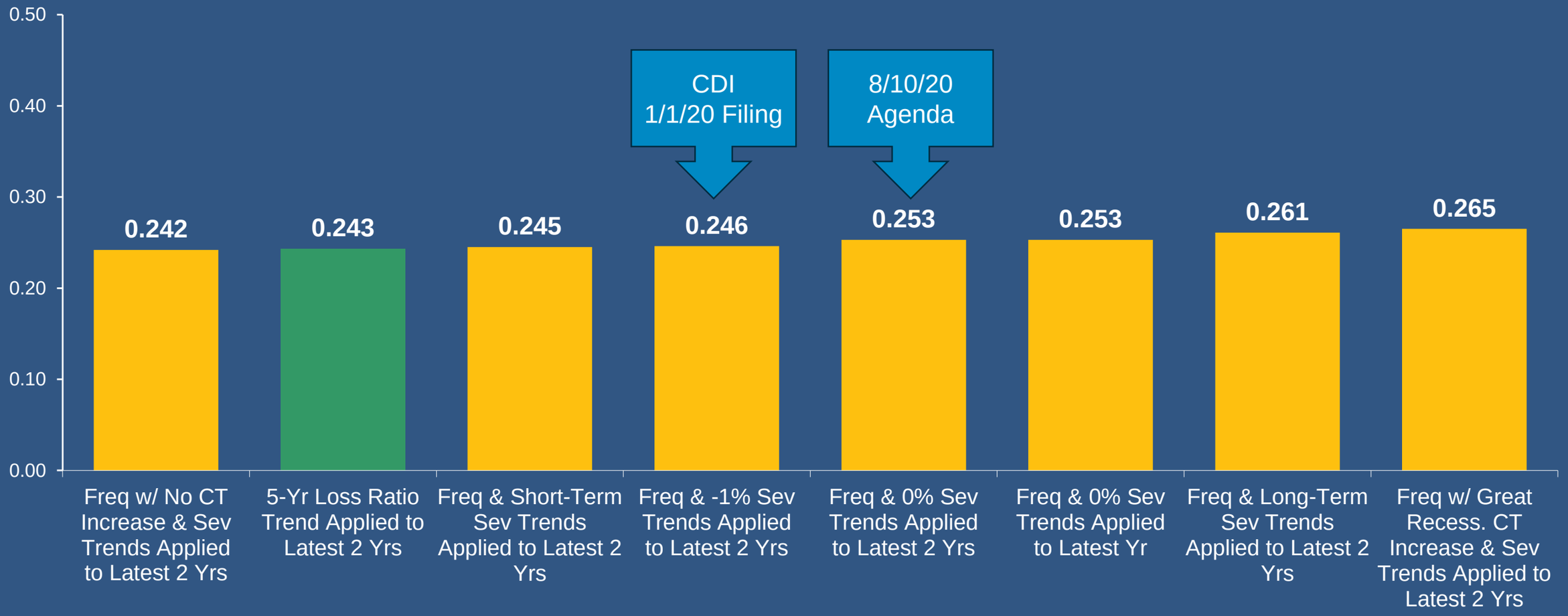
- Separate Frequency & Severity Trends Projections
  - Best during periods when loss ratios are volatile
  - ★ Frequency and severity are affected by differing underlying forces
  - ★ Allows for separate assumptions and judgment about future trends
  - Assumes frequency & severity not highly correlated
  - Performed well during 2002-2004 reform and SB 863 transition periods but not post-reform periods
  - Performed well in most recent study of trending methods
  - Trending from two-year average generally outperformed latest year method in recent review
  - ★ Frequency model can explicitly reflect impact of COVID-19 recession and potential CT claim increases
  - On-level indemnity and medical severities relatively flat over last several years

Alternative Trending Methodologies (Item AC20-06-03)

- Loss Ratio Trend Projections
  - Best during periods with stable loss ratio trends
  - Historical loss ratios fit reasonably well to exponential curve
  - Rely on accurate on-leveling adjustments
  - Performed well during post-2002 to 2004 reform period
  - ★ Did not perform well during 2002 to 2004 reform and SB 863 transition periods when trends change
  - Generally not as accurate as frequency & severity method in most recent trending study
  - Recent trends have moderated with SB 863 & SB 1160 reforms
  - ★ Current loss ratio projections consistent with separate frequency & severity projections when similar periods to select trends are used
  - ★ Unclear whether current loss ratio trends will continue into post-COVID-19 environment

Projected On-Level Indemnity Loss Ratios under Alternative Trending Methods

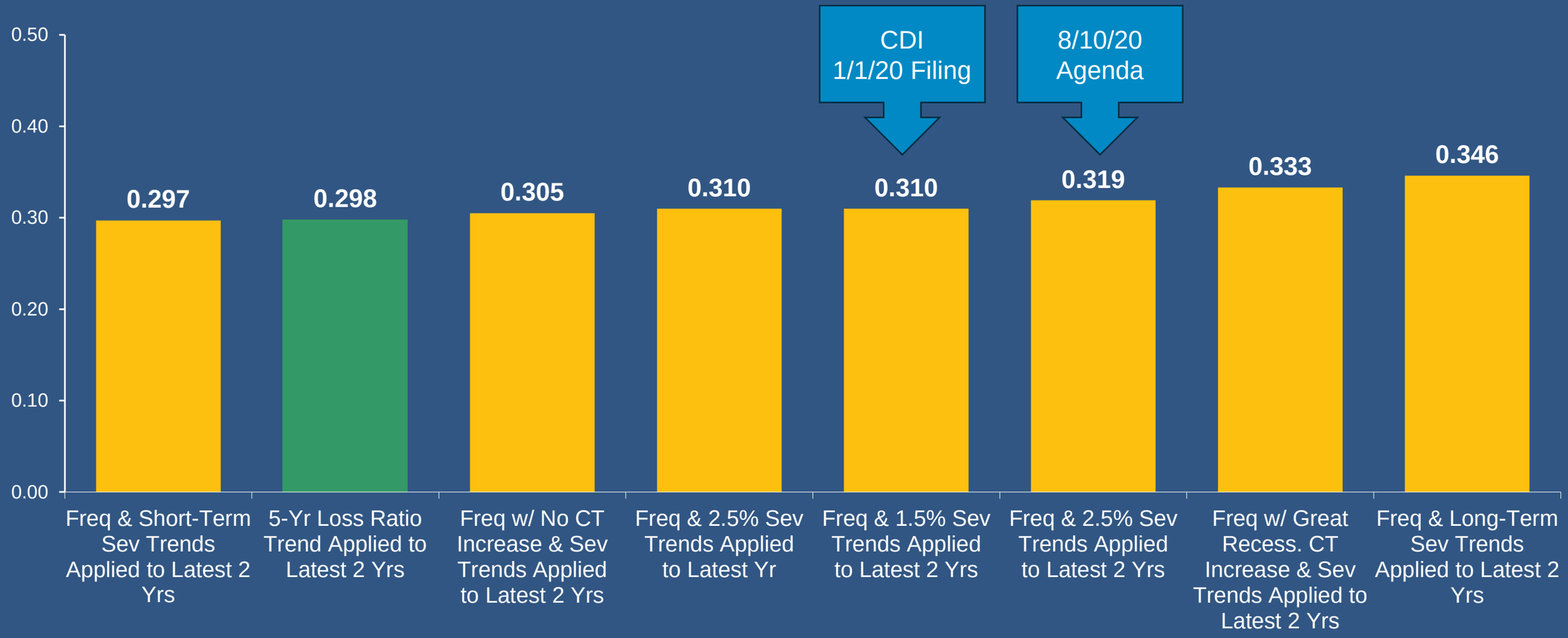
As of March 31, 2020



Source: WCIRB aggregate financial data and projections.

Projected On-Level Medical Loss Ratios under Alternative Trending Methods

As of March 31, 2020



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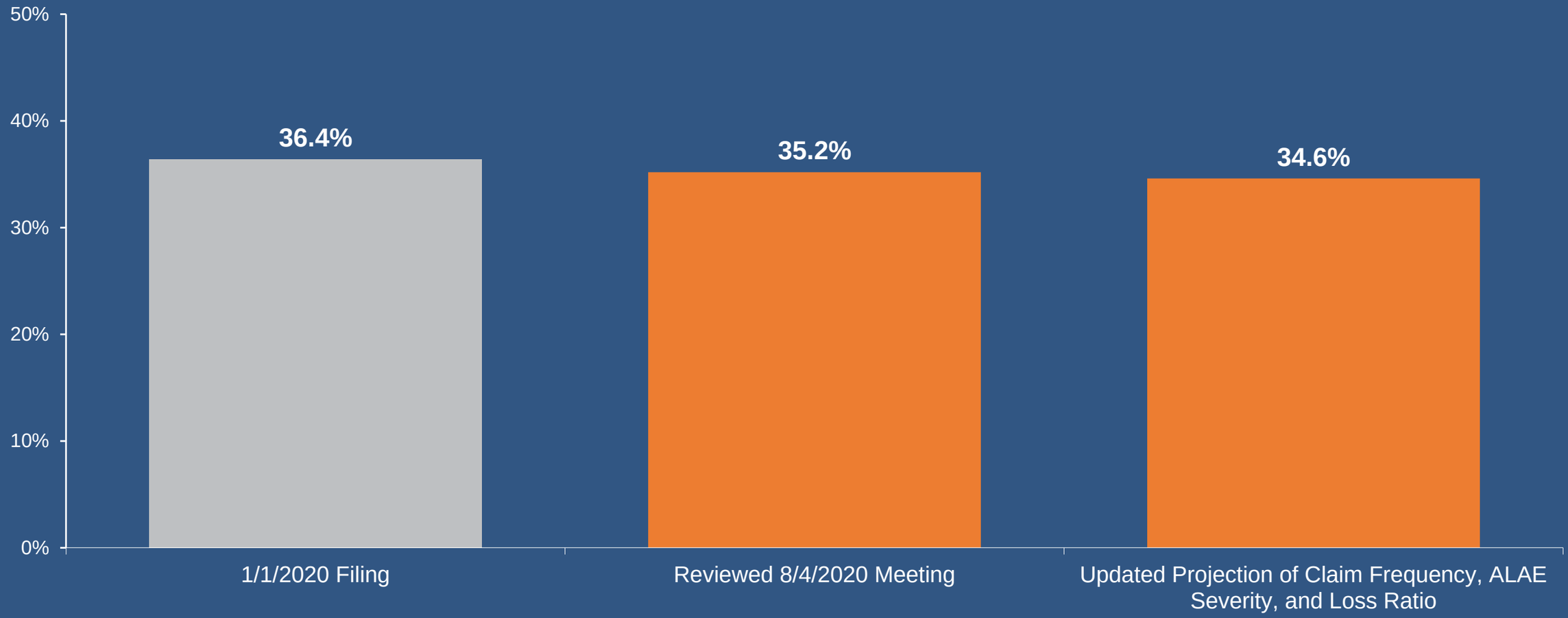
Source: WCIRB aggregate financial data and projections.

Updated LAE to Loss Ratio Projection



Source: WCIRB indemnity claim frequency model

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