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WCIRB Actuarial Committee Meeting

April 2, 2019

Agenda

1. First Quarter 2019 Diagnostics – Claims Working Group Feedback
2. AC19-04-04: Impact of the Geographic Practice Cost Index on Physician Fees
3. AC19-03-02: 12/31/2018 Experience – Review of Methodologies (Includes Item AC19-04-02)
4. AC19-04-01: 12/31/2018 Loss Adjustment Expense Experience Review
5. AC19-04-03: Early Indicators of High-Risk Opioid Use and Potential Alternative Measures

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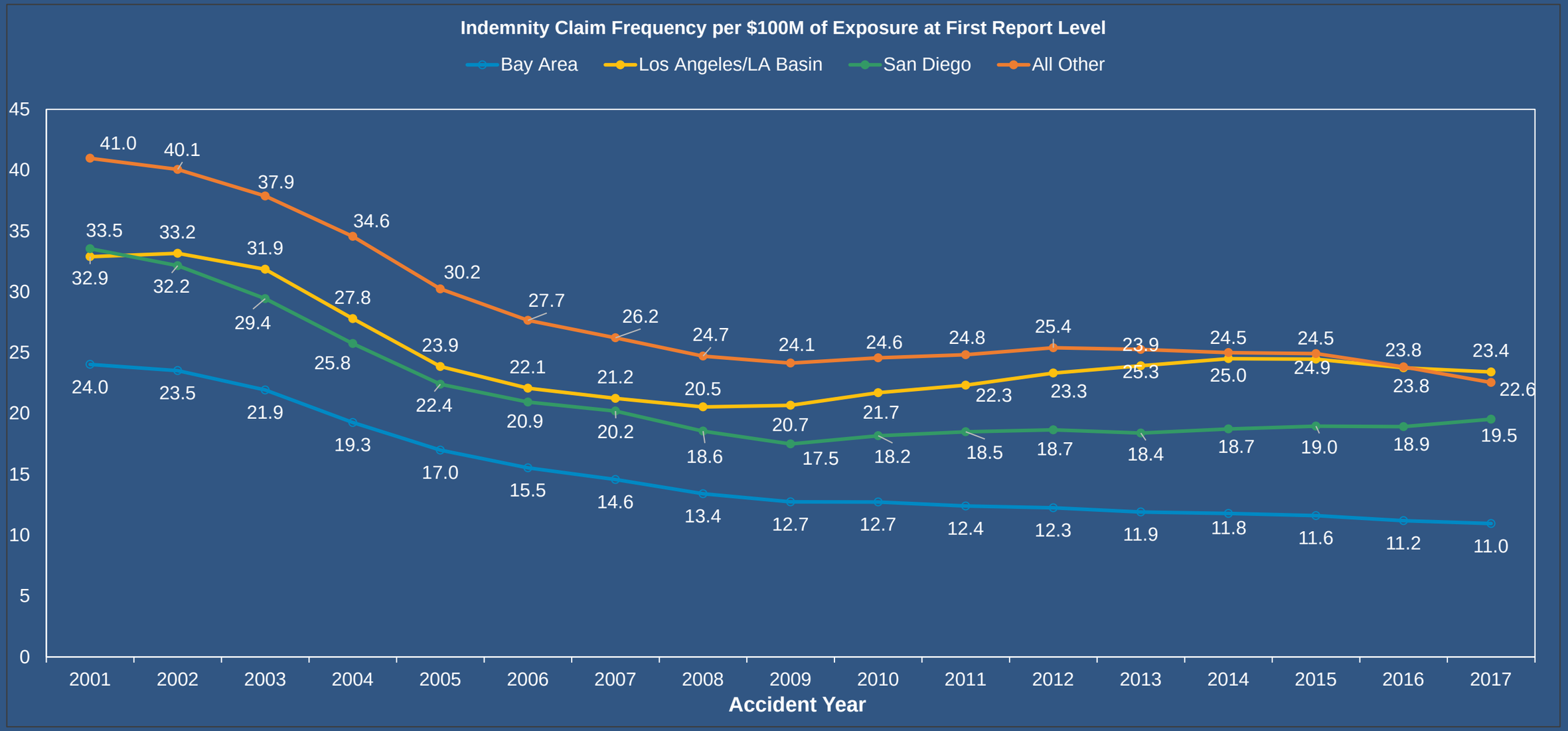
01

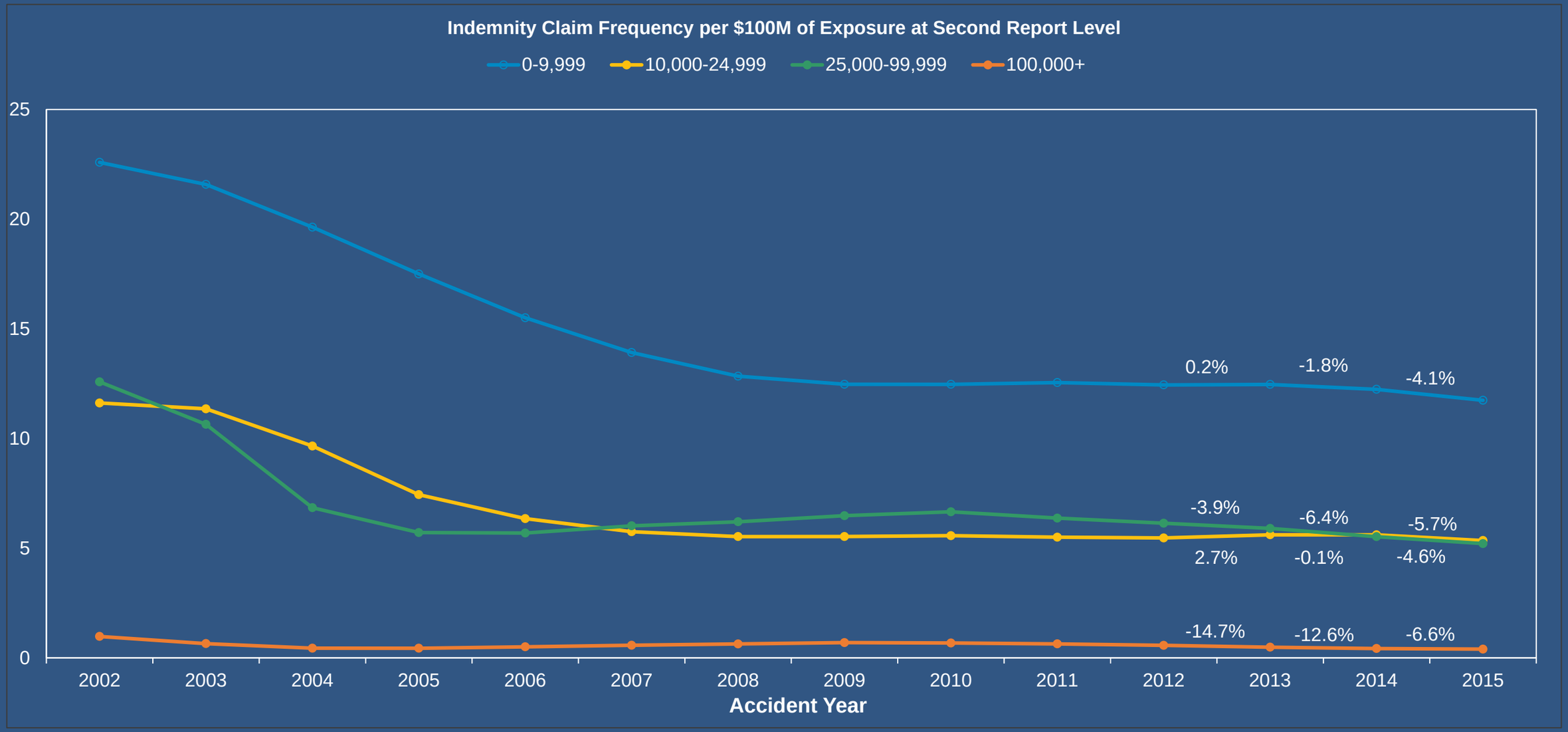
First Quarter 2019 Diagnostics – Claims Working Group Feedback

Indemnity Claim Frequency (Exhibit C21)



Source: WCIRB unit statistical data

Indemnity Claim Frequency by Incurred Medical Size



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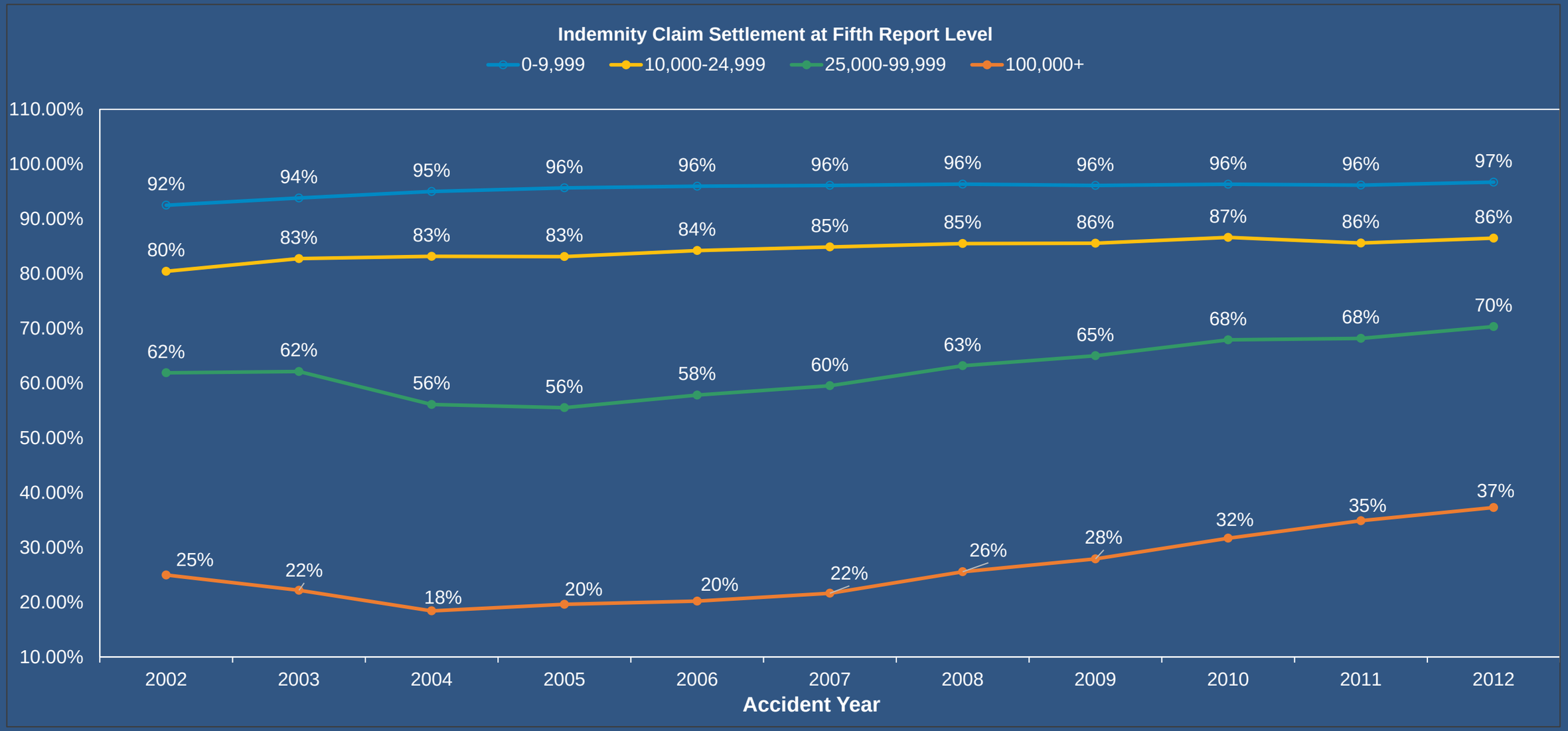
Source: WCIRB unit statistical data

Indemnity Claim Closure by Incurred Medical Size



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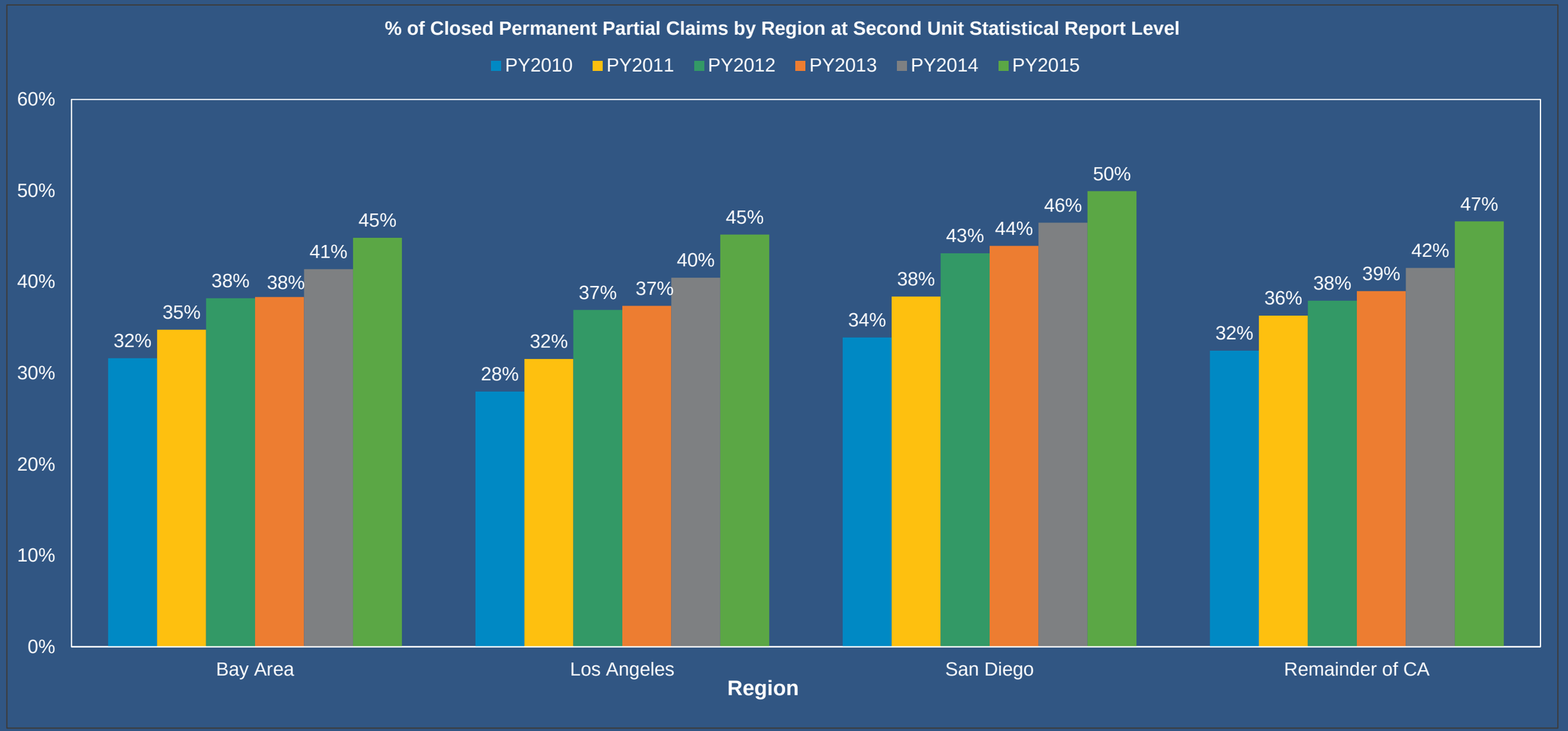
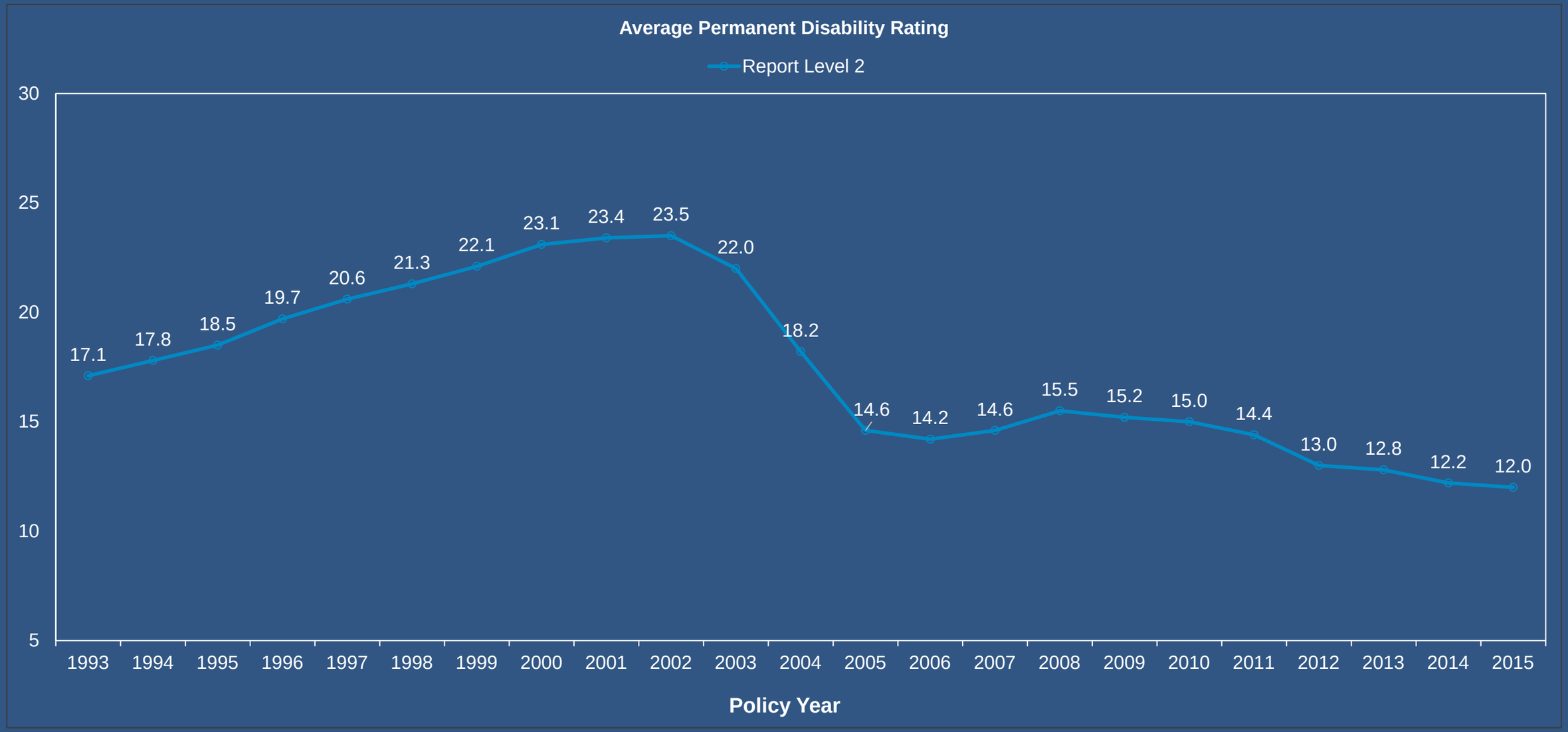
Source: WCIRB unit statistical data

Percentage of PPD Claims Closed by Region (Exhibit M5)



Source: WCIRB unit statistical data

Average Permanent Disability Rating



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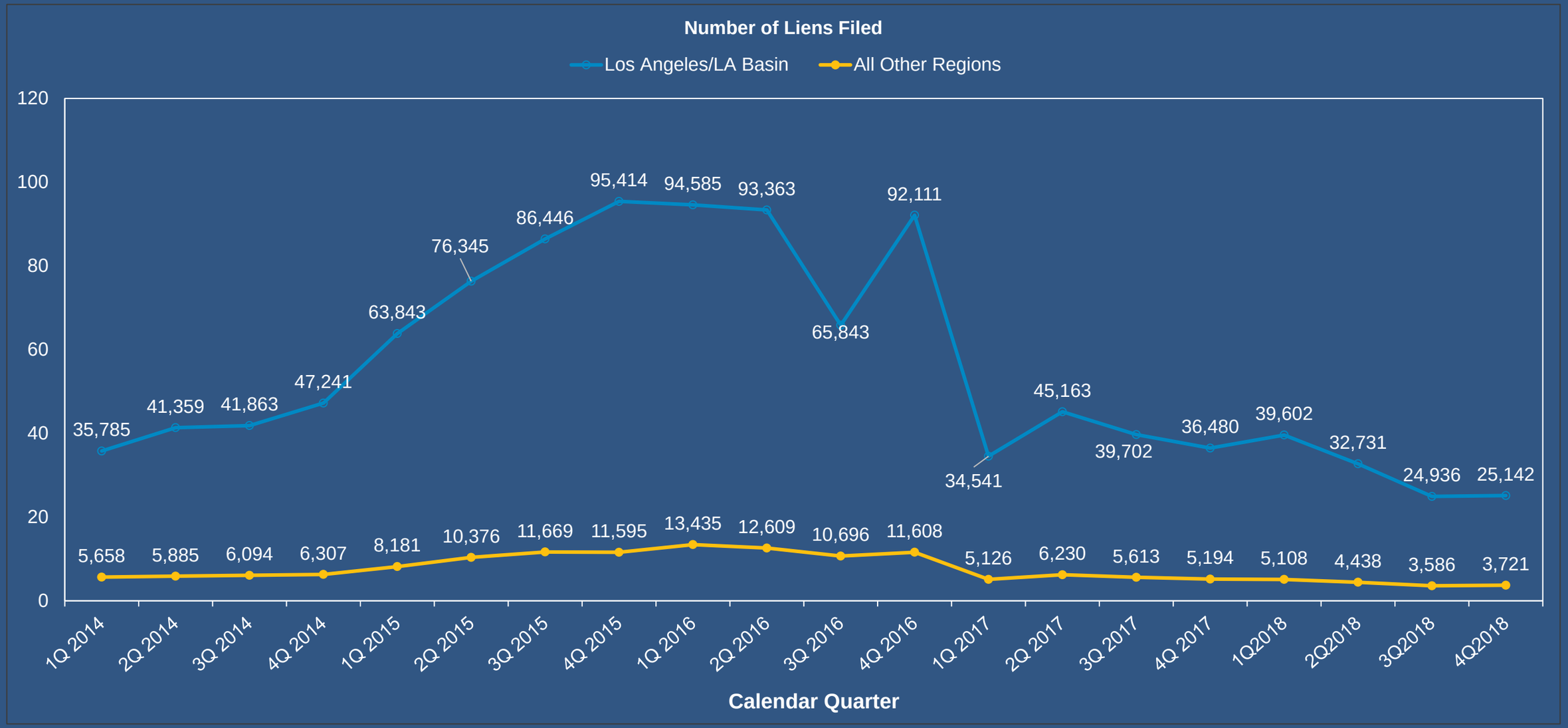
Source: WCIRB unit statistical data

Filed Lien Counts (Exhibit M9.2)



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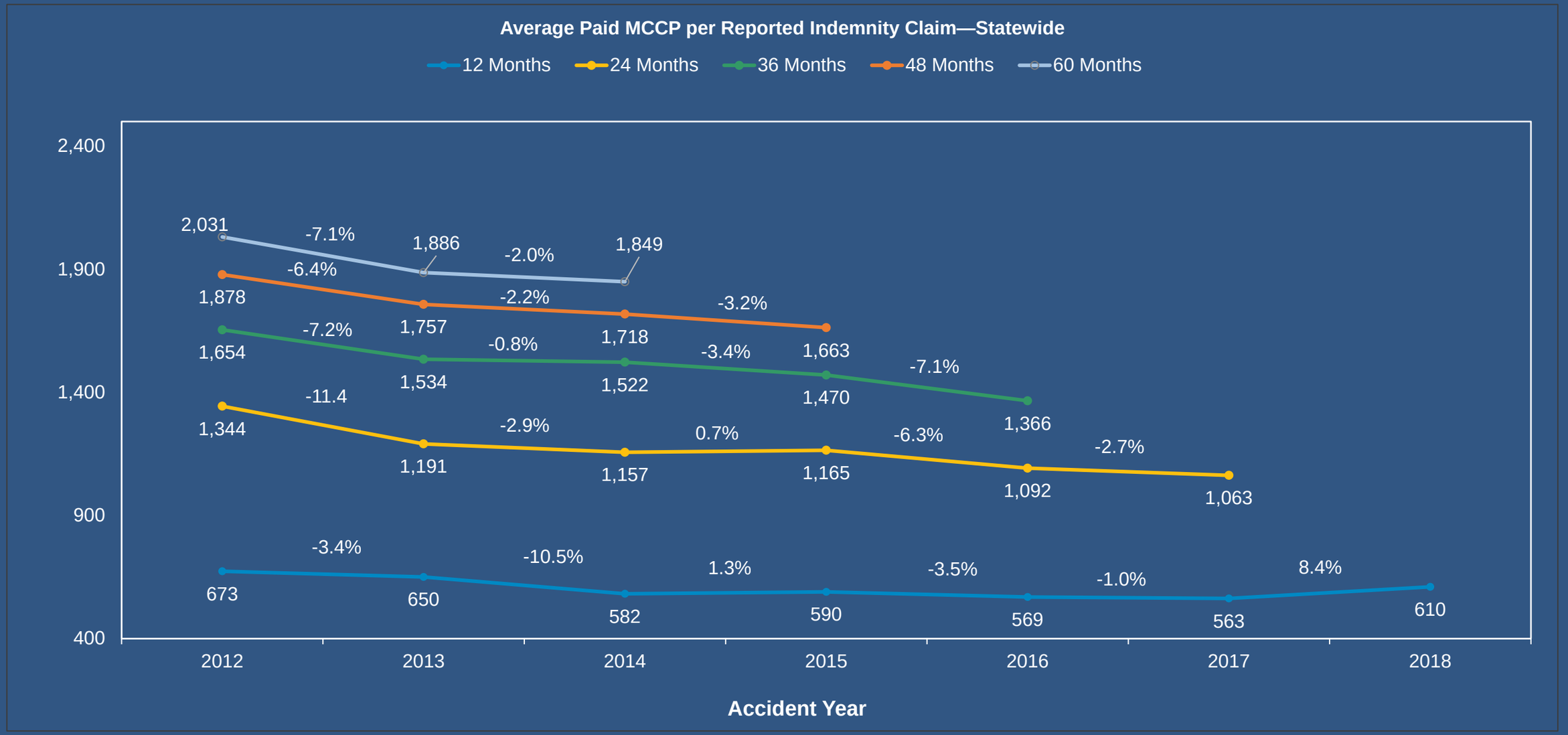
Source: DWC via Commission on Health and Safety & Workers' Compensation 2018 Annual Report

Paid MCCP per Indemnity Claim – Statewide (Exhibit E15, Updated)



Source: WCIRB aggregate financial data

02

Impact of the Geographic Practice Cost Index on Physician Fees

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Overview of the Geographic Practice Cost Index (GPCI)

- Starting in 2017, Medicare has transitioned California payment localities to Metropolitan Statistical Areas (MSA) over a 6-year period, pursuant to the Protecting Access to Medicare Act (PAMA).
- DWC adopted the GPCI, effective 1/1/2019, to replace the **statewide** geographic adjustment factor (GAF) as the Medicare's **MSA-based locality-specific** GFA.
  - Pre-2019: 1 GAF
  - 2019 and after: 32 GPCIs
- Intent of using the GPCI:
  - To reflect the variations in the costs of medical practice from area to area.
- Affect base maximum fees (BMFs) for Physician Fee Schedule based on Medicare schedule.
- WCIRB's preliminary analysis:
  - Transition to GPCIs is estimated to increase a one-year total medical paid by approximately 0.1%.

Source: Physician Fee Schedule Regulations. Title 8, California Code of Regulations, Division 1, Chapter 4.5, Subchapter 1 Administrative Director – Administrative Rules.
WCIRB Medical Transaction Data.

Analysis Approach

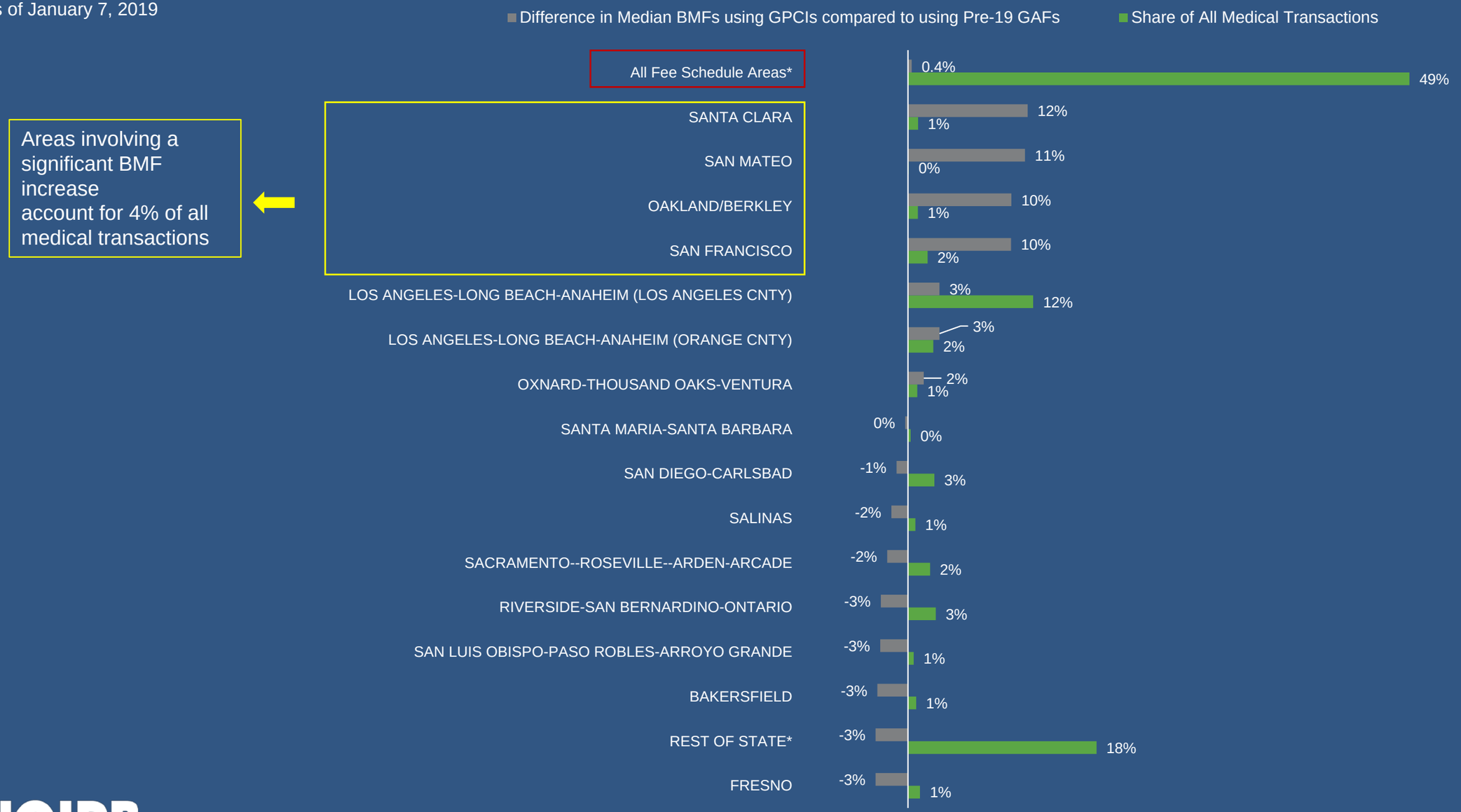
As of January 7, 2019

- Analyzed WCIRB's medical transaction data
  - Service dates from 7/1/2017 to 6/30/2018
  - Provider billing address zip codes (3-digit) mapped to 30 Medicare fee schedule localities
    - Made adjustments in the mapping due to the limited zip code information
  - No assumptions on the potential change in discounting from fee schedule
  - GPCIs affect 49% of all medical transactions and 35% of total medical paid
- Evaluated how changes in the fee schedule would affect the total medical paid:
  - Calculated BMFs for physician services using the pre-19 GAF
  - Prospectively calculated BMFs using GPCIs
  - BMFs per transaction using pre-19 GAF
  - BMFs per transaction using GPCIs
  - Medical paid and the number of transactions (reported in the data)

Source: WCIRB Medical Transaction Data

Impact of GPCIs by Fee Schedule Area

As of January 7, 2019



Areas involving a significant BMF increase account for 4% of all medical transactions

* 49% represents the total BMFs comparing GPCIs to pre-19 GAF.
Source: WCIRB Medical Transaction Data

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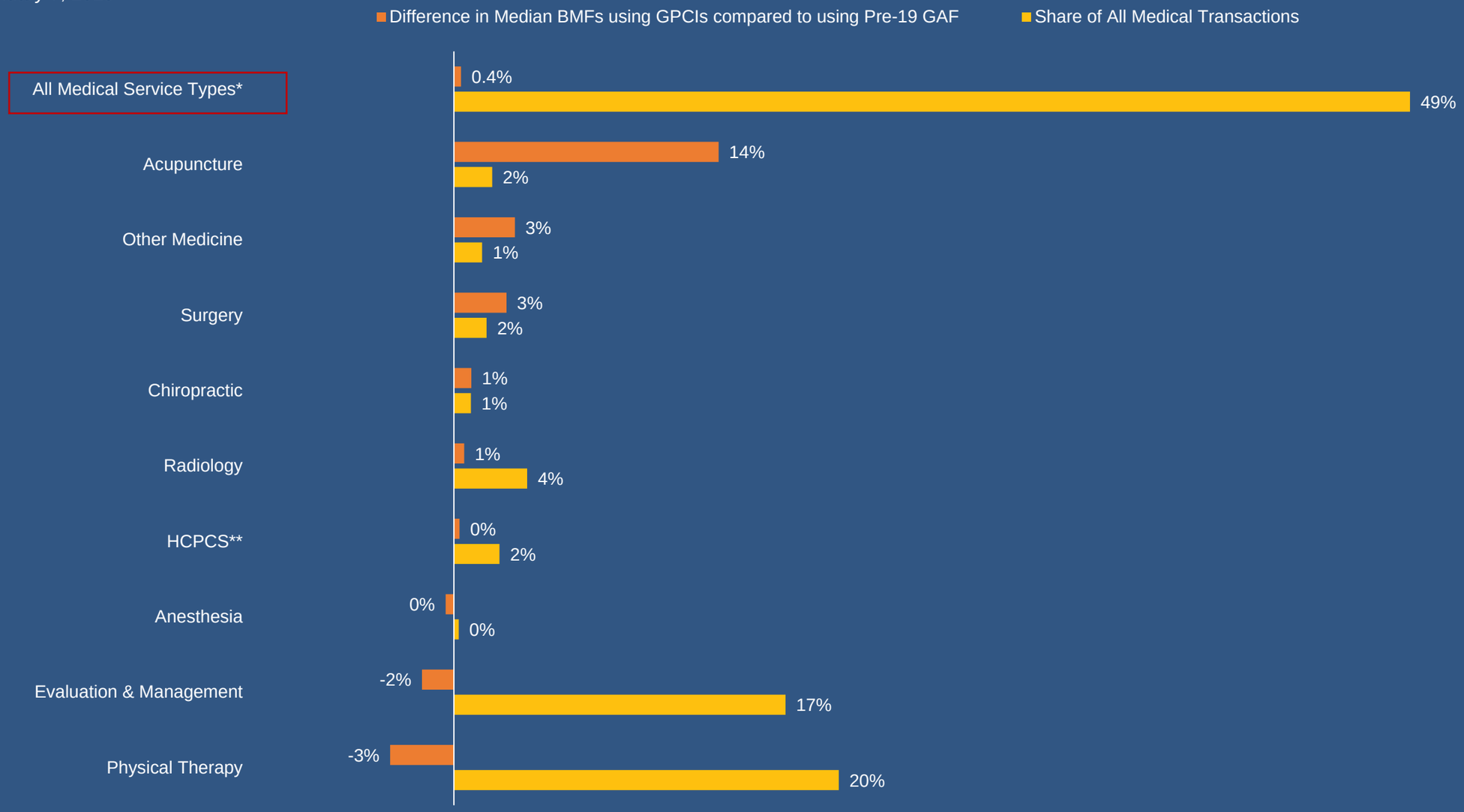
Impact of GPCIs by Medical Service Type

As of January 7, 2019



* 49% represents the total BMFs comparing GPCIs to pre-19 GAF.
** HCPCS services include Durable Medical Equipment, Supplies, Prosthetics, Services and Pathology & Laboratory testing.
Source: WCIRB Medical Transaction Data.

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Findings of the Preliminary Evaluation

As of January 7, 2019

- GPCIs increase the physician fee schedule maximum allowances for some urban areas while decrease those for the rural areas.
- Overall, the total fee schedule would increase by 0.4% using GPCIs as compared to pre-19 GAF.
- Because only 35% of total medical paid would be affected by GPCIs, WCIRB estimated that GPCIs would increase a one-year total medical paid by approximately 0.1% (0.4%*35%).

Source: WCIRB Medical Transaction Data.

03

12/31/2018 Experience – Review of Methodologies

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Updated Summary of 12/31/2018 Experience

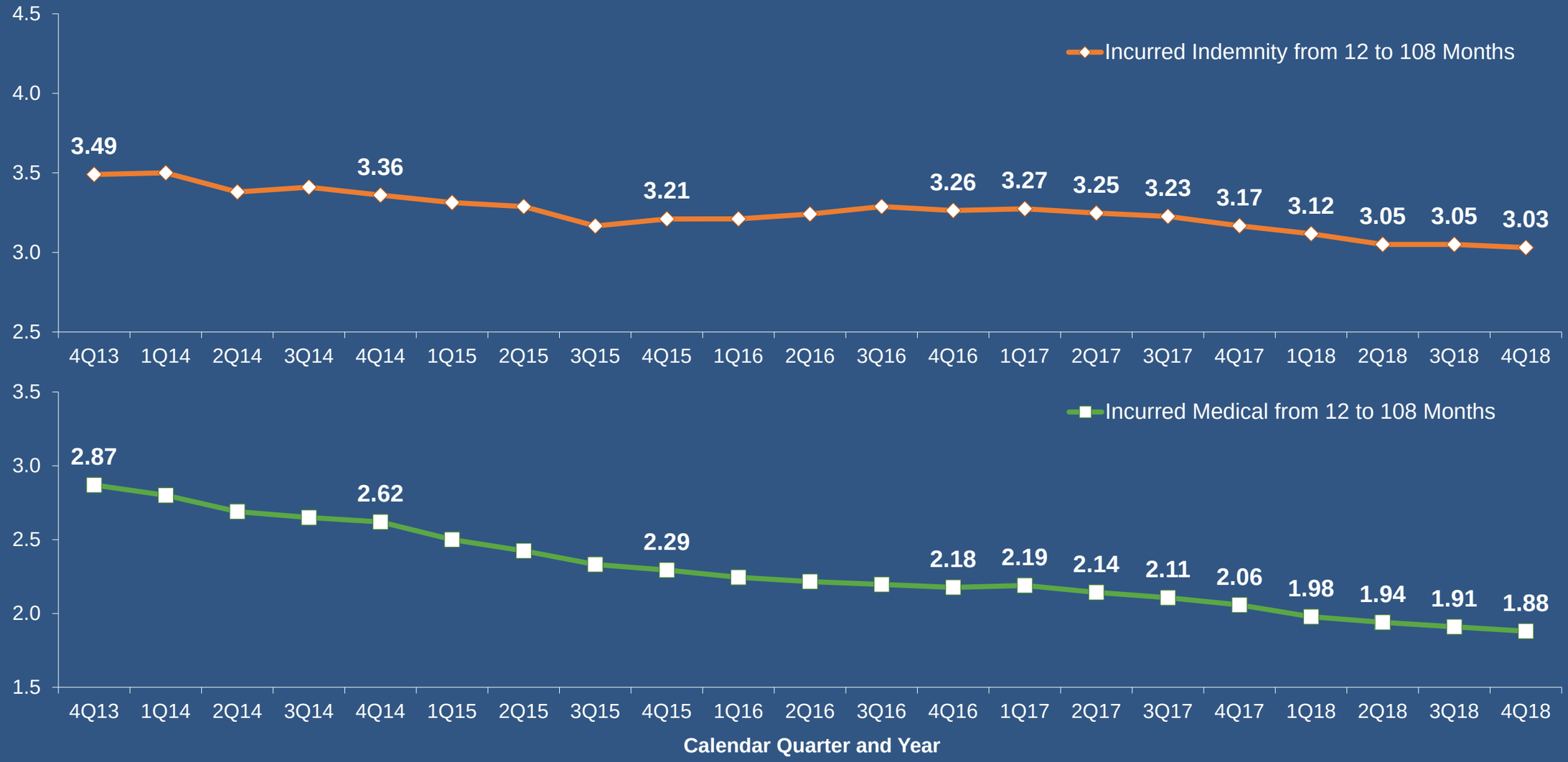
- Approximately 100% of market reflected
- Methodologies consistent with 1/1/2019 Filing
  - Reflects adjustment for SB 1160 (liens) based on 60% lien reduction
  - Incurred tail fit excludes most recent three calendar years
  - Reflects adjustments for SB 1160 (UR) and Drug Formulary in medical projection
- Projected loss ratio for 7/1/2019 to 12/31/2019 policy period: 0.532 (0.534 prior to Formulary impact)
- 5.5 point decrease from 1/1/2019 Filing projection based on 3/31/2018 experience (0.588, prior to Formulary impact)
- 2 point decrease from CDI Decision on 1/1/2019 Filing (0.556, prior to Formulary impact)

Approximate Change in Loss Ratio Projection

Factor	Approx. Change in Percentage Points From 1/1/2019 Filing
Lower Loss Development Emergence	-3.0
Inclusion of 2018 Accident Year	-0.5
Updated Wage Forecast	-0.5
Updated Frequency Trends	-0.5
Trend to July 1, 2019 Policy Period	-0.5
Medical Loss Development Methodology Adjustments	-0.3
Reflect Impact of Drug Formulary	-0.2
Total (to 4/2/2019 Agenda)	**-5.5**

Cumulative Incurred Development from 12 to 108 Months

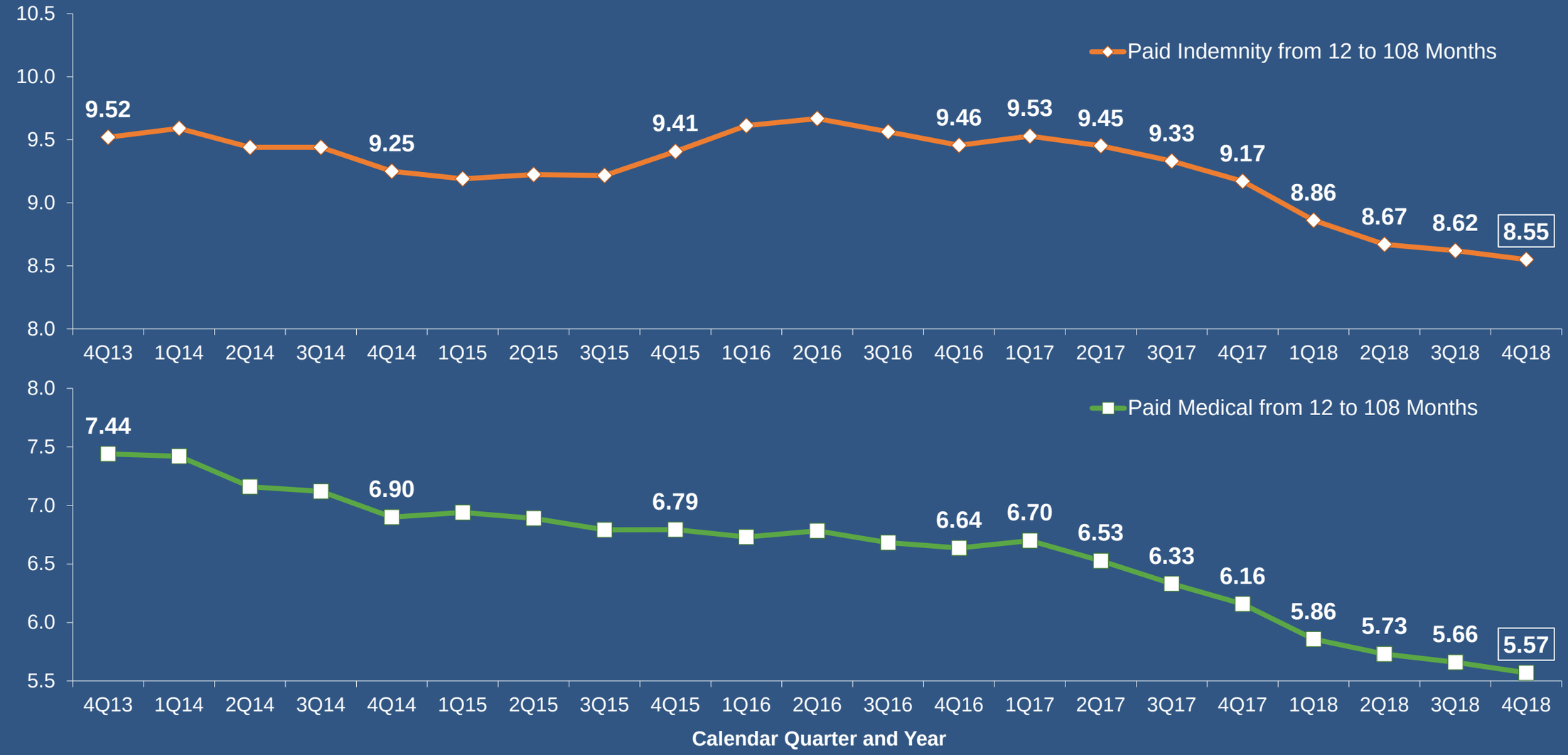
As of December 31, 2018



Source: WCIRB aggregate financial data

Cumulative Paid Development from 12 to 108 Months

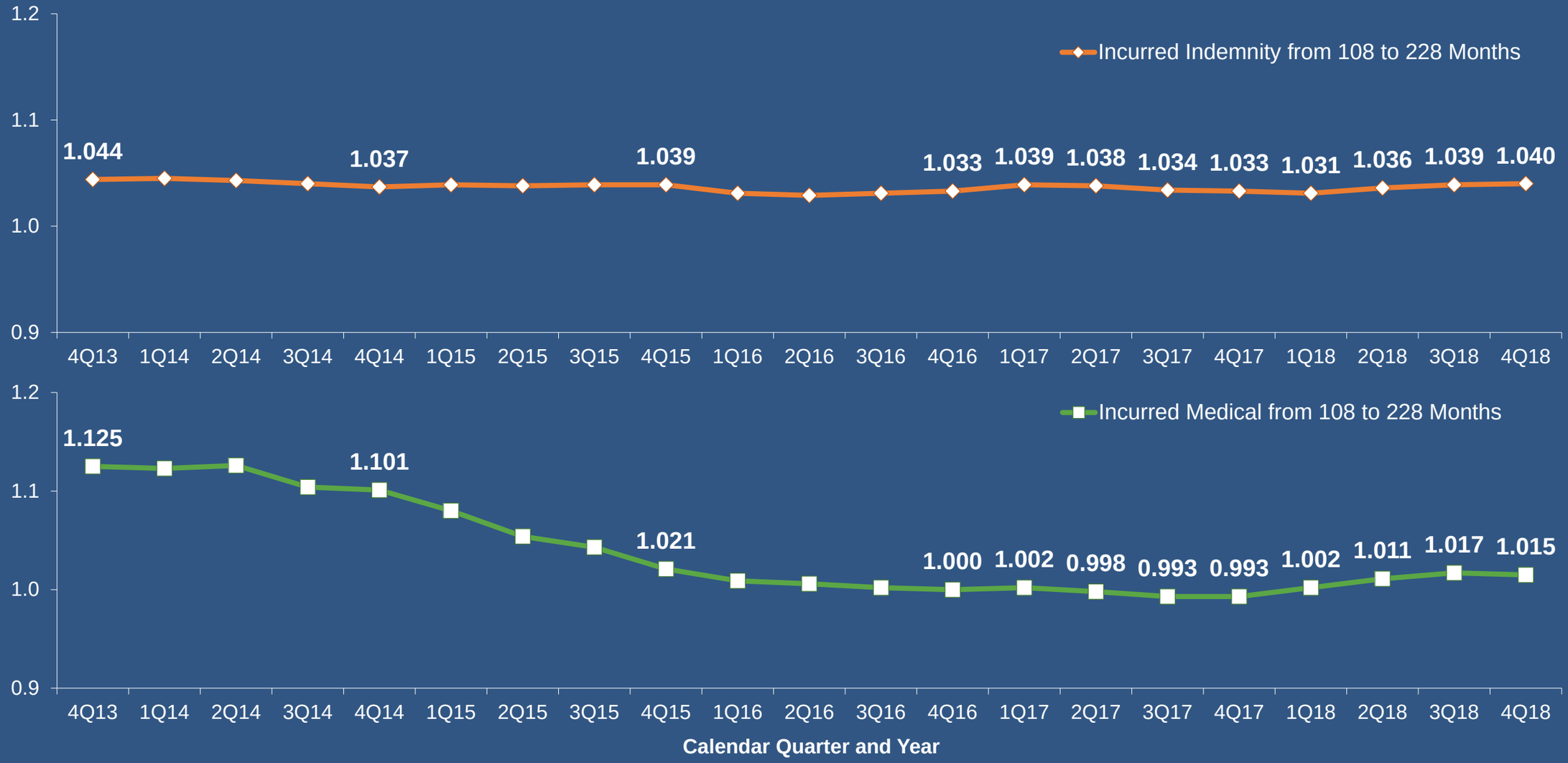
As of December 31, 2018



Source: WCIRB aggregate financial data

Cumulative Incurred Development from 108 to 228 Months

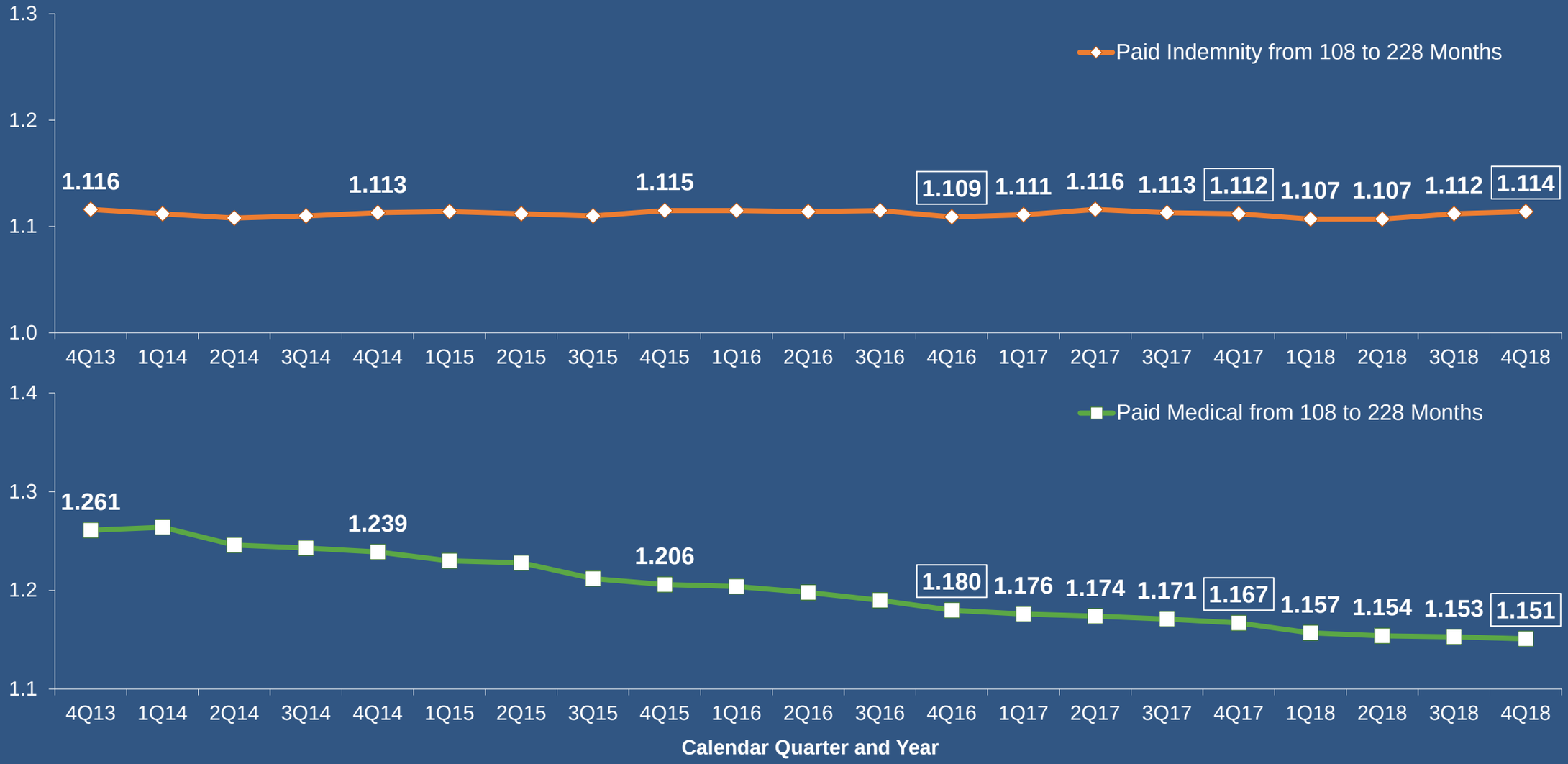
As of December 31, 2018



Source: WCIRB aggregate financial data

Cumulative Paid Development from 108 to 228 Months

As of December 31, 2018



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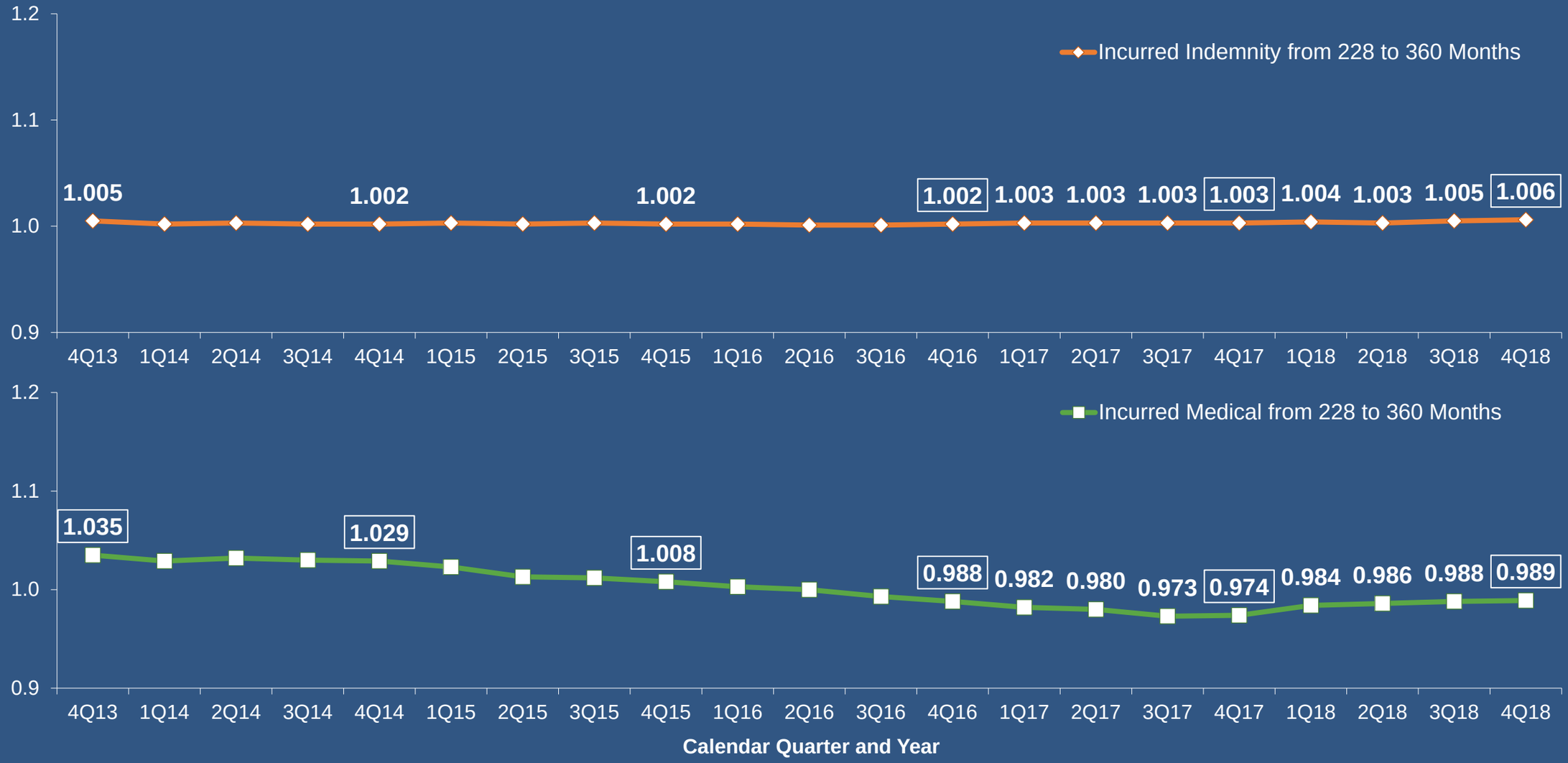
Source: WCIRB aggregate financial data

Cumulative Incurred Development from 228 to 360 Months

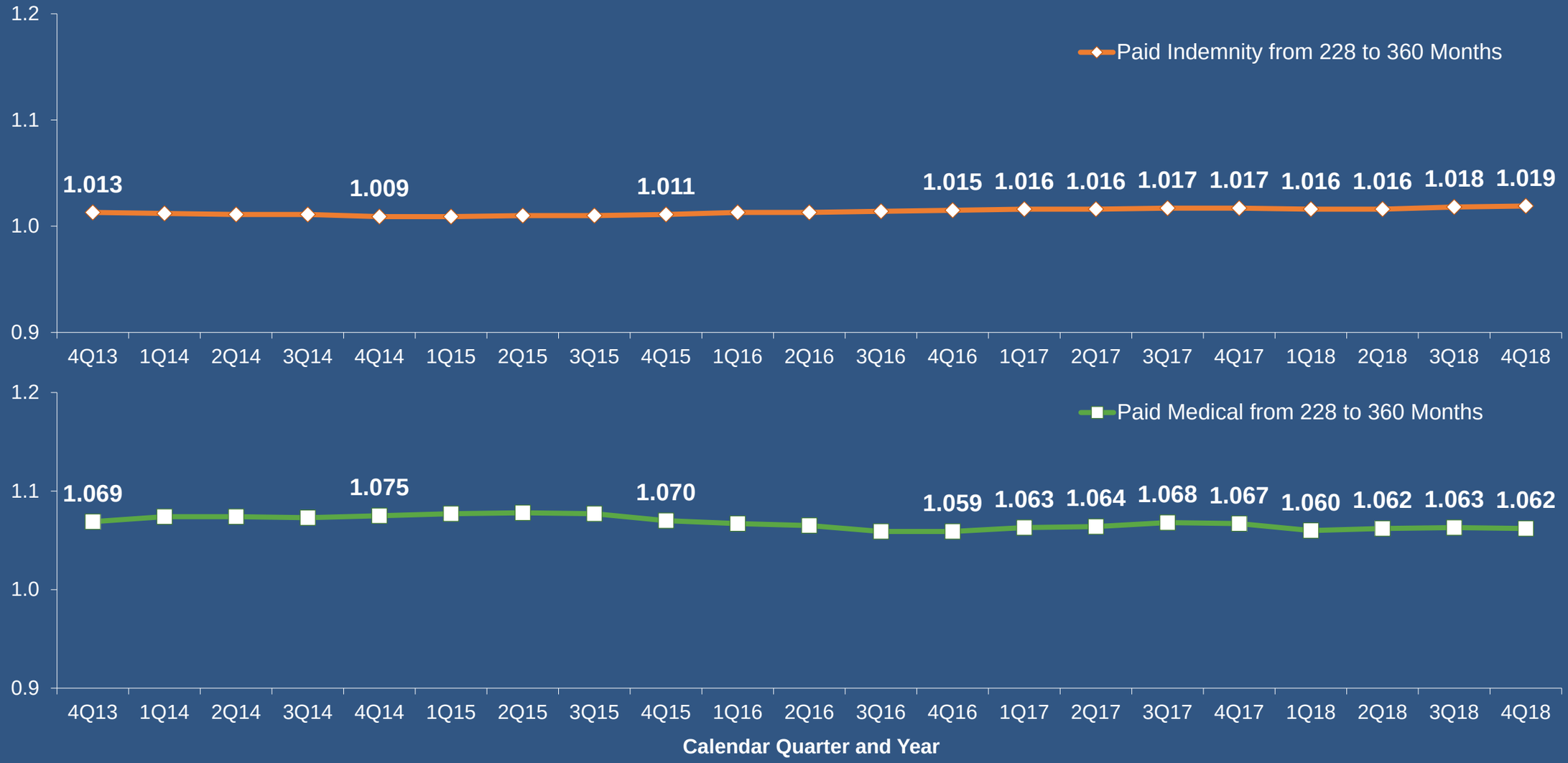
As of December 31, 2018



Source: WCIRB aggregate financial data

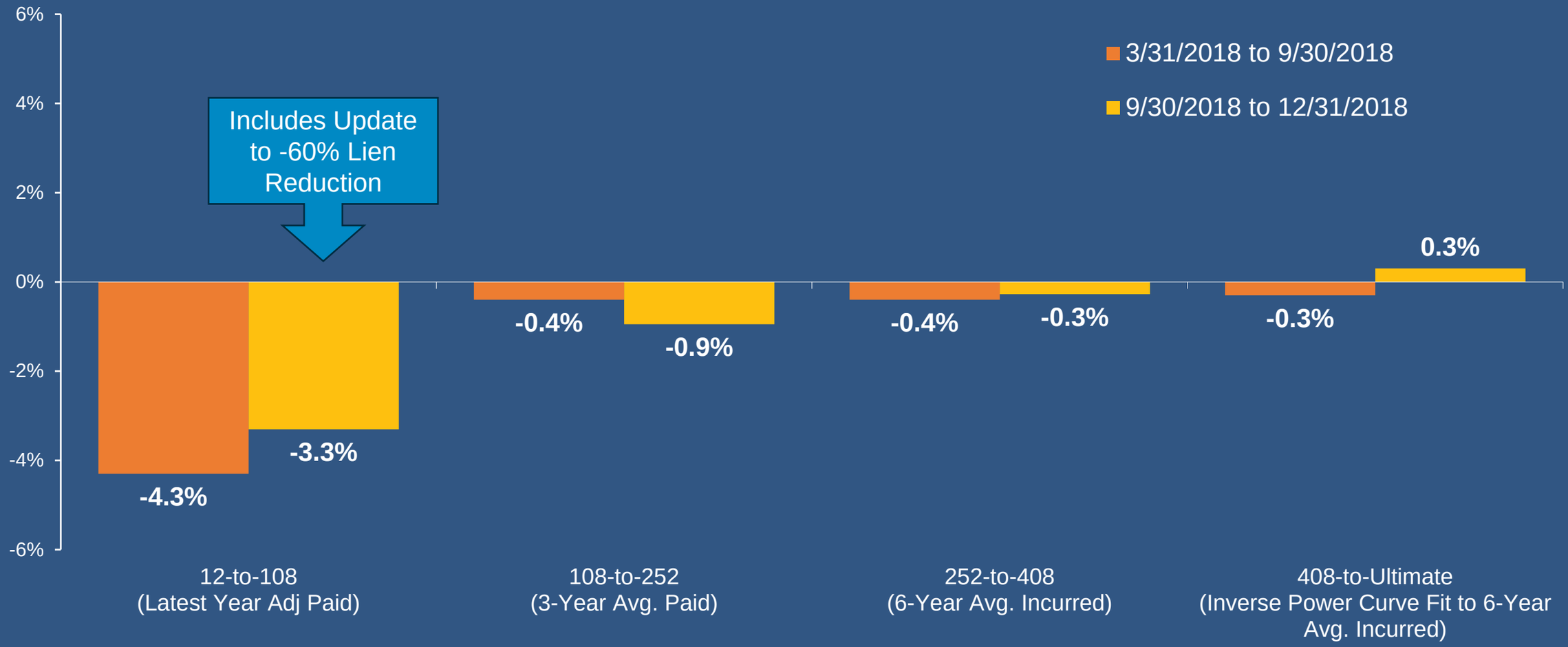
Cumulative Paid Development from 228 to 360 Months

As of December 31, 2018



Source: WCIRB aggregate financial data

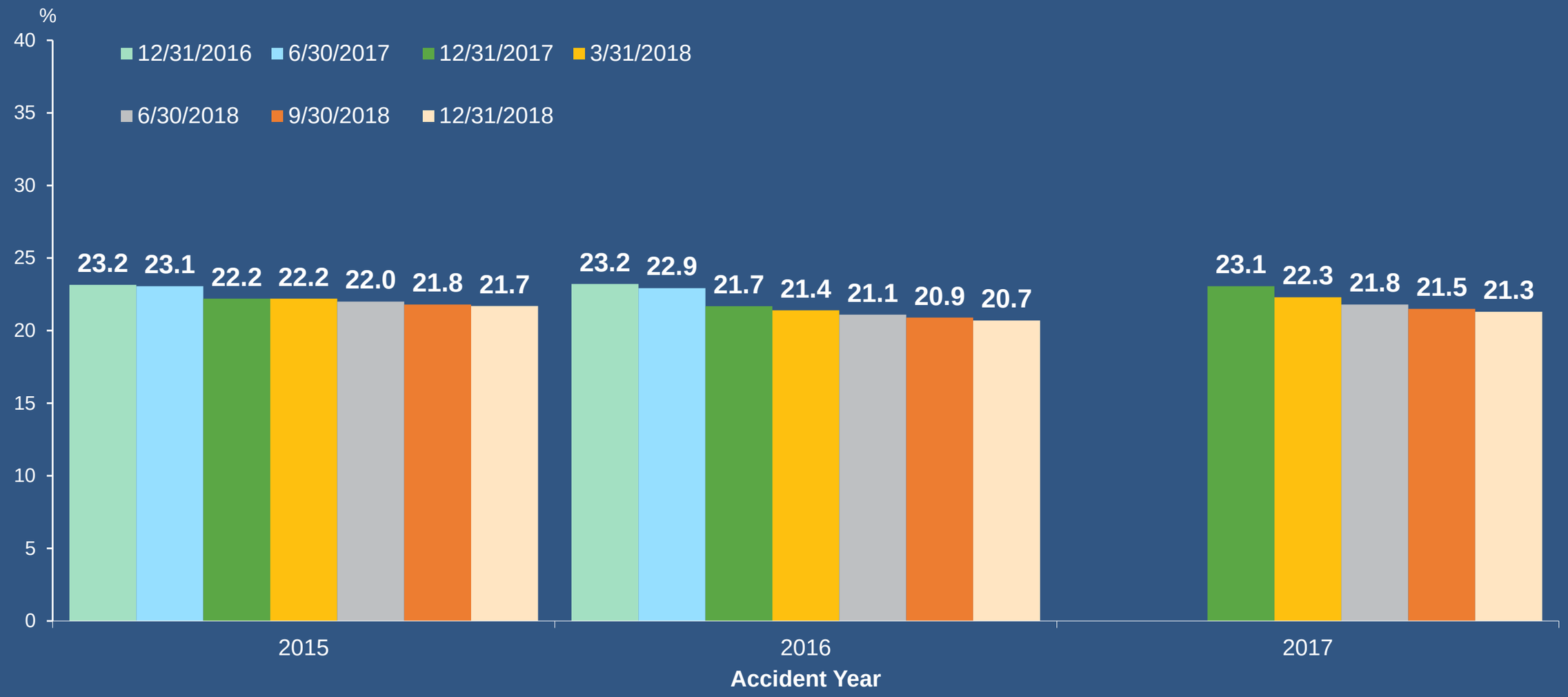
Change in Projected Medical Development Factor
3/31/2018 to 12/31/2018 Experience



Source: WCIRB aggregate financial data

Projected Ultimate Indemnity Loss Ratios (Exhibit 3.1)

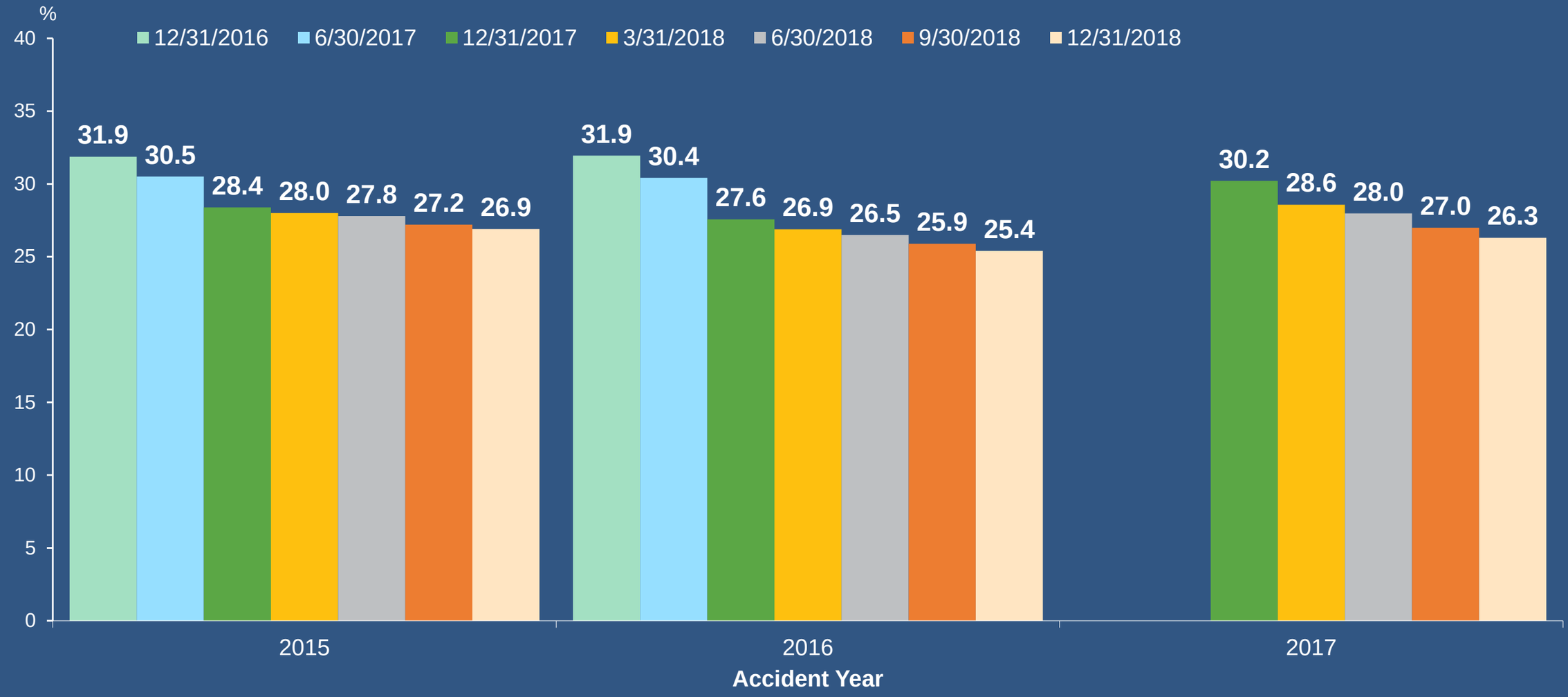
As of December 31, 2018



Note: All loss ratios are adjusted to the loss development methodology reflected in the 4/2/2019 Agenda and may not be comparable to the actual loss ratios projected at that time.
Source: WCIRB aggregate financial data

Projected Ultimate Medical Loss Ratios (Exhibit 3.2)

As of December 31, 2018



Note: All loss ratios are adjusted to the loss development methodology reflected in the 4/2/2019 Agenda and may not be comparable to the actual loss ratios projected at that time.
Source: WCIRB aggregate financial data

Alternative Loss Development Methodologies (Item AC19-04-02)
Incurred Methods

- Unadjusted Incurred Projections
  - Best with stable case reserve levels and incurred patterns
  - Can be distorted by changing reserve levels
  - ★ Incurred development more volatile and cyclical than paid development
  - Performed poorly during transition periods
  - ★ Greater variability across insurers than paid method
  - ★ Difficult to impute reform adjustments
  - Treatment of MCCP in medical reserves unknown
  - Recent incurred development has significantly decreased
- Incurred Adjusted for Changes in Case Reserve Levels
  - ★ Best with clear evidence of changing case reserve levels
  - Unclear how to impute reform impacts
  - Recent updates reduced reliance on assumptions and improved accuracy of adjustment
  - ★ Method can be very volatile with constantly shifting reserve levels (3-year average is used)
  - ★ Current projection not significantly different from reform and claim settlement rate-adjusted paid projection

Alternative Loss Development Methodologies (Item AC19-04-02)
Paid Methods

- Unadjusted Paid Projections
  - Best with stable payment patterns
  - Can be distorted by changing settlement rates or reforms
  - Generally outperformed unadjusted incurred during transition periods
  - Less variability in paid patterns across insurers than in incurred patterns
  - ★ Recent changes in paid development likely related to reforms and claim settlement changes
- Reform-Adjusted Paid
  - Best with clear evidence of reform impact on payment patterns
  - SB 1160 adjustments reflect impact of liens on medical development patterns
  - Current projection slightly below unadjusted paid projection
  - ★ Impact of recent pharmaceutical cost declines on later development unclear but significant (study later this year)
- Claim Settlement Rate-Adjusted Paid
  - Best with clear evidence of changes in claim settlement rates affecting loss development
  - ★ Improved projection during periods of significant settlement rate change
  - Primary assumptions of method reasonable based on recent review
  - ★ Claim settlement rates have increased significantly over last several years

Medical Age-to-Age Factors Indexed to 1990 – 12 to 24 Months

Source: WCIRB aggregate financial data

Medical Age-to-Age Factors Indexed to 1990 – 48 to 60 Months

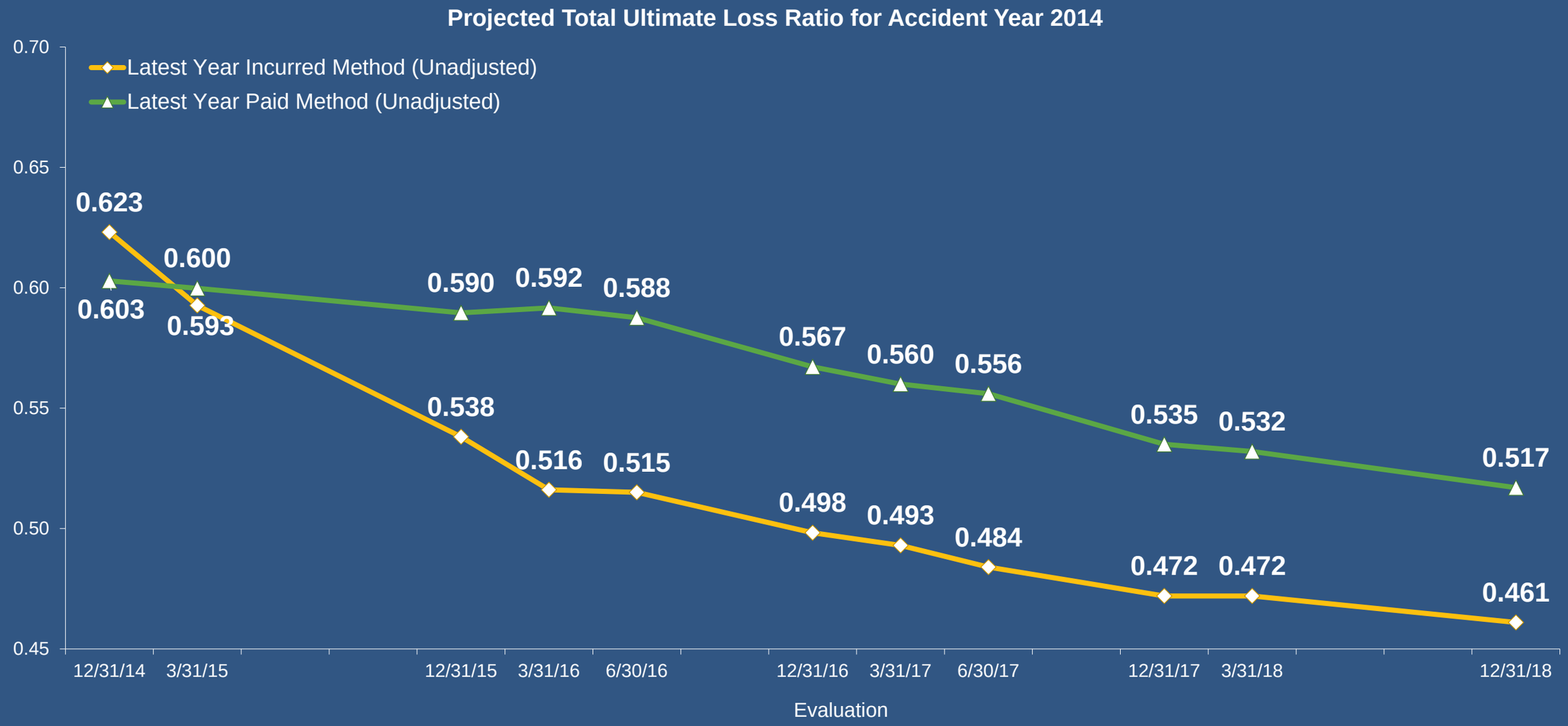
Source: WCIRB aggregate financial data

Medical Age-to-Age Factors Indexed to 1990 – 108 to 120 Months

Source: WCIRB aggregate financial data

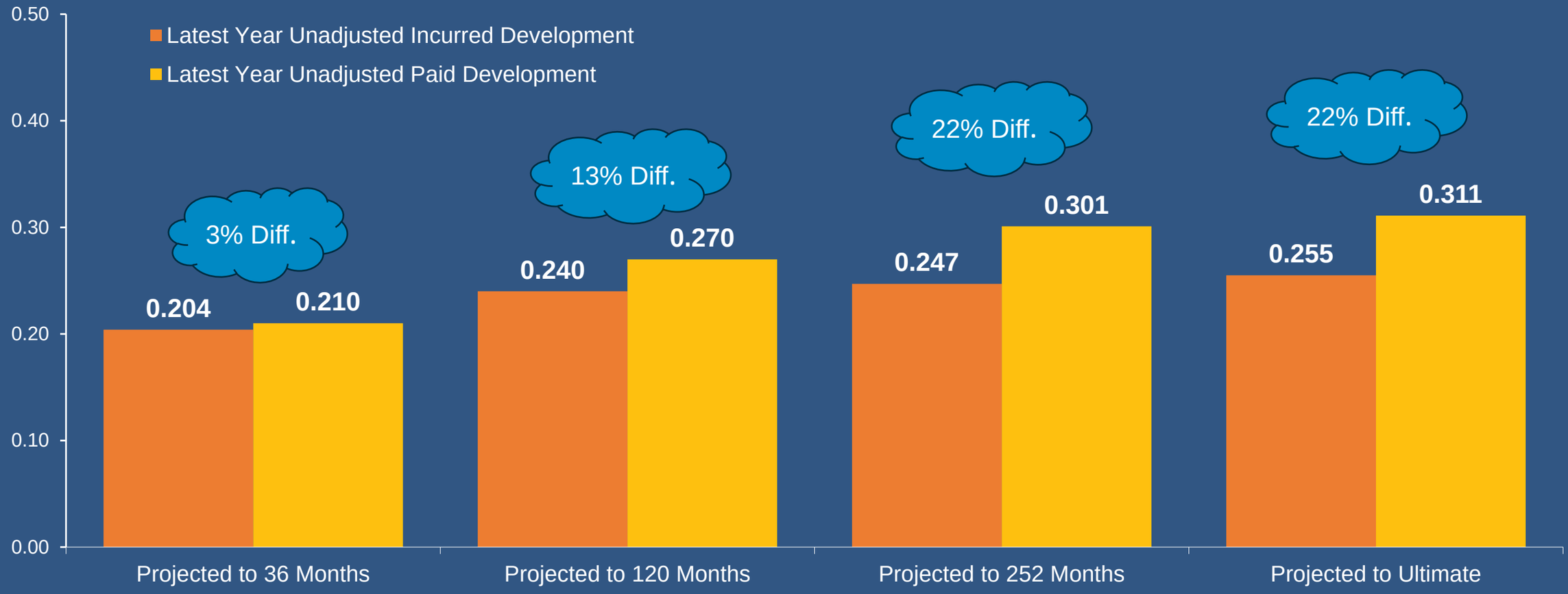
Paid vs. Incurred Methodology Comparison

As of December 31, 2018



Source: WCIRB aggregate financial data and projections

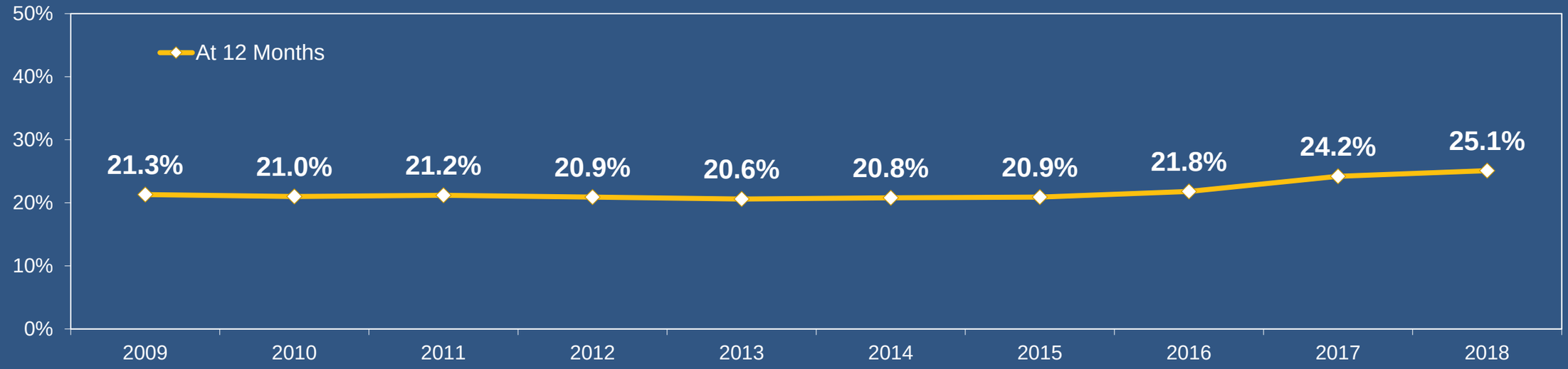
Comparison of Paid and Incurred Projections for AY 2018 Medical

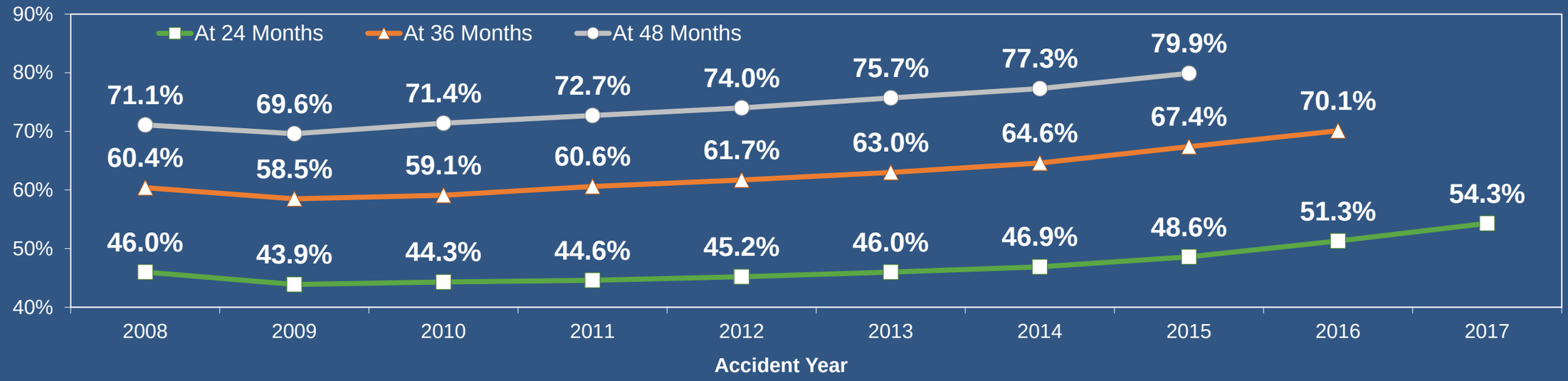


Source: WCIRB aggregate financial data. Paid projections are converted to an incurred basis using a 3-year average of incurred to paid ratios at the later maturity.

Ultimate Indemnity Claim Settlement Ratios (Exhibit 11.2)

As of December 31, 2018





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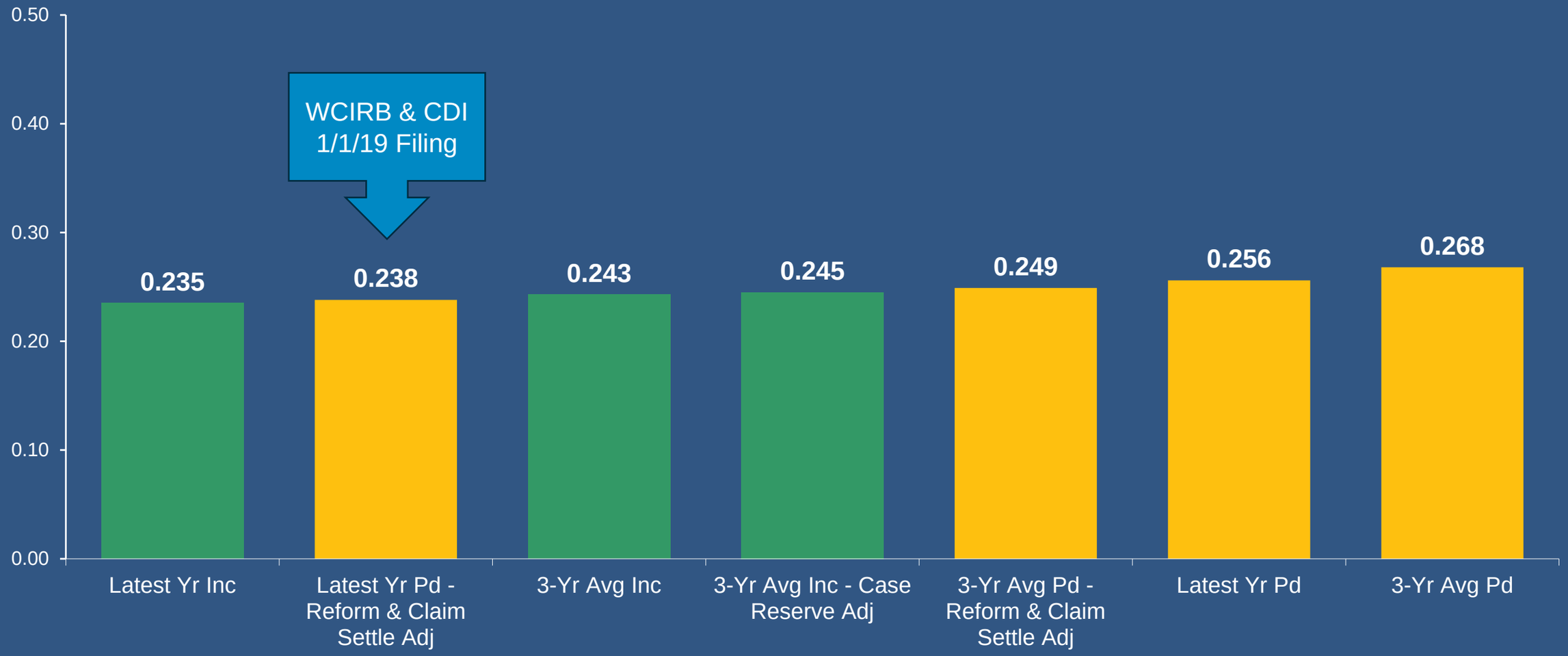
Source: WCIRB aggregate financial data and projections

Projected Indemnity On-Level Loss Ratios under Alternative Development Methods

As of December 31, 2018



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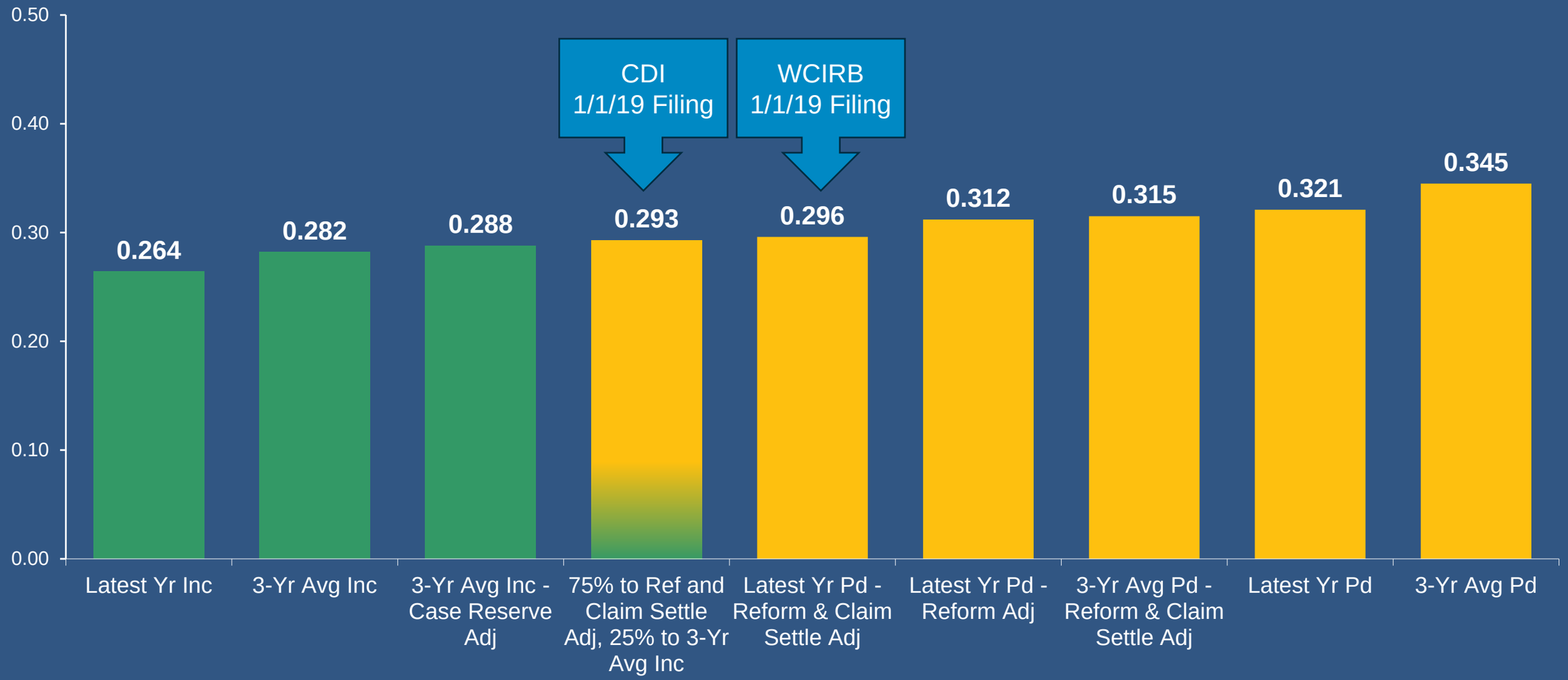
Source: WCIRB aggregate financial data and projections

Projected Medical On-Level Loss Ratios under Alternative Development Methods

As of December 31, 2018



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Source: WCIRB aggregate financial data and projections. For consistency of comparisons, medical loss ratios are prior to reflecting the impact of the Drug Formulary.

Impact of SB 1160 Reforms to Utilization Review

- SB 1160 provided that prospective UR is restricted on services within first 30 days of injury
  - Effective on claims occurring after January 1, 2018
- WCIRB prospective evaluation in Amended 1/1/2017 Filing
  - 0.1% reduction in total PP from less UR (-2.5% on MCCP costs)
  - 0.1% increase in total PP from more medical services (+0.3% on medical costs)
- Early retrospective evaluation
  - Medical services within first 30 days up modestly (from 12/5/2018 meeting)
  - AY 2018 average medical severity increased moderately
  - AY 2018 average MCCP severity increased following several years of decline
- **Staff recommends reflecting 0.3% increase in medical costs to on-level AYs prior to 2018**

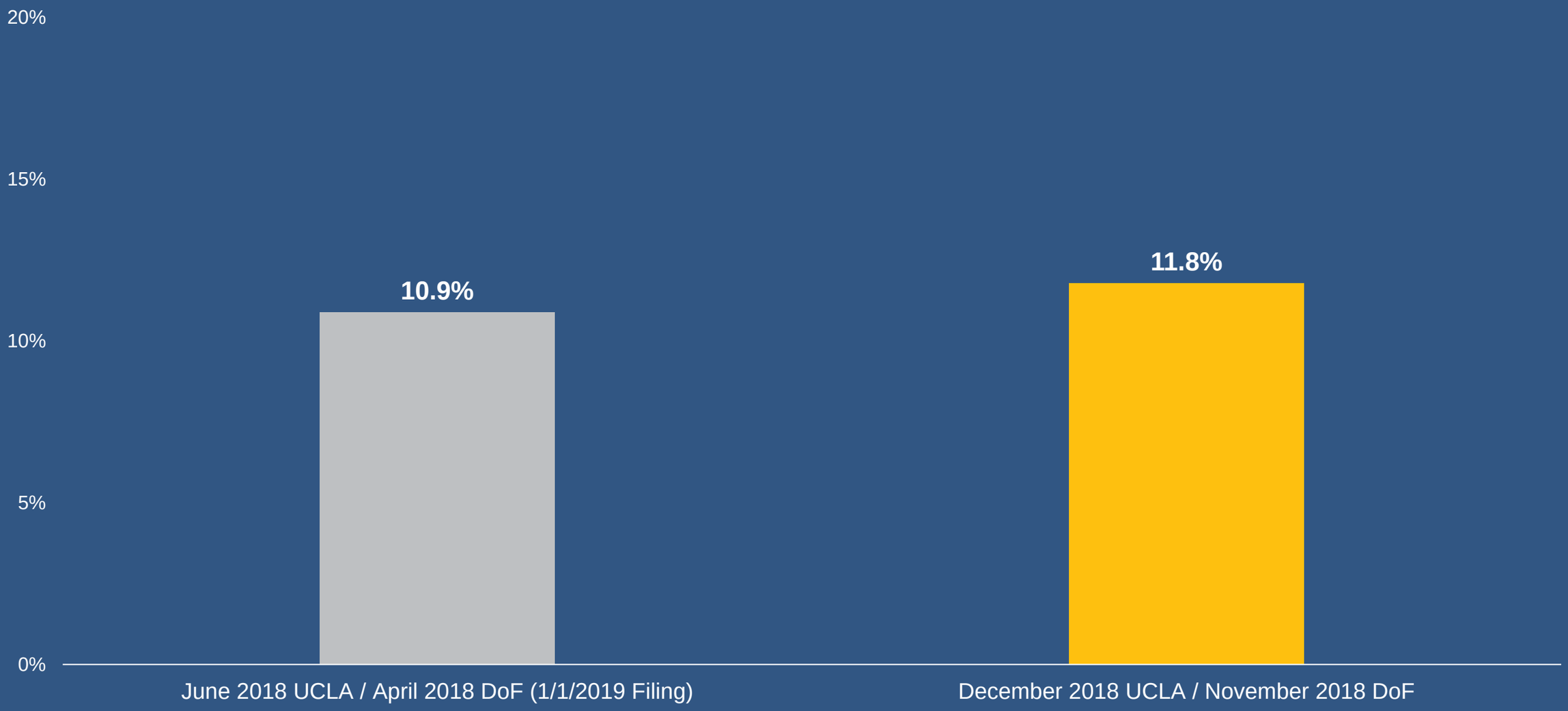
Impact of MTUS Drug Formulary

- New MTUS Drug Formulary effective in 2018
  - Listed exempt drugs no longer subject to prospective UR
  - Legislative intent to encourage usage of exempt drugs over more costly non-exempt drugs
  - Effective on all open claims, though outstanding claims given until 7/1/2018 to transition
- WCIRB prospective evaluation in 7/1/2018 Filing
  - 0.1% reduction in total PP from less UR (-2.6% on MCCP costs)
  - 0.4% reduction in total PP from changing prescription patterns (-1.0% on medical costs, based on CY 2016 pharmaceutical payments)
- Early retrospective evaluation
  - Pharmaceutical costs continued to decrease prior to Formulary effective date, updated estimate is -0.6% on medical costs using CY 2017
  - Pharmaceutical costs continuing to decrease in 2018, with some shift to exempt drugs (from 12/5/2018 meeting)
  - Unclear to what extent effect is Formulary vs. other trends continuing (opioids, IMR, etc.)
- Impact on medical costs both for outstanding claims and new claims
  - Pharmaceutical cost impact on development to be studied later this year
- **Staff recommends reflecting -0.6% reduction to projected medical loss ratio since results are still very preliminary**

Cumulative Wage Level Change Forecast (Exhibit 5.1)

2017 to 4/1/2020

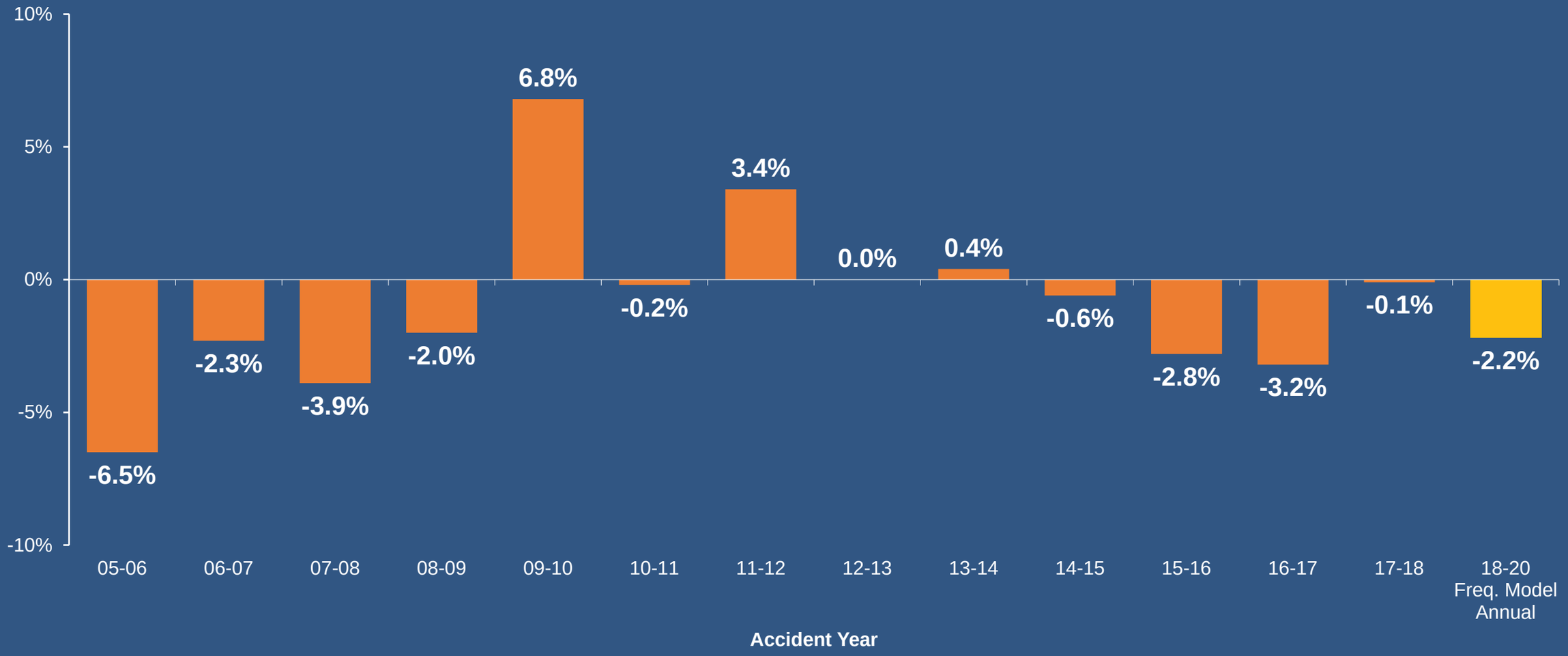
As of December/November 2018



Source: Average of UCLA Anderson School of Business and California Department of Finance forecasts

Projected Changes in Indemnity Claim Frequency (Exhibits 6.1 & 12)

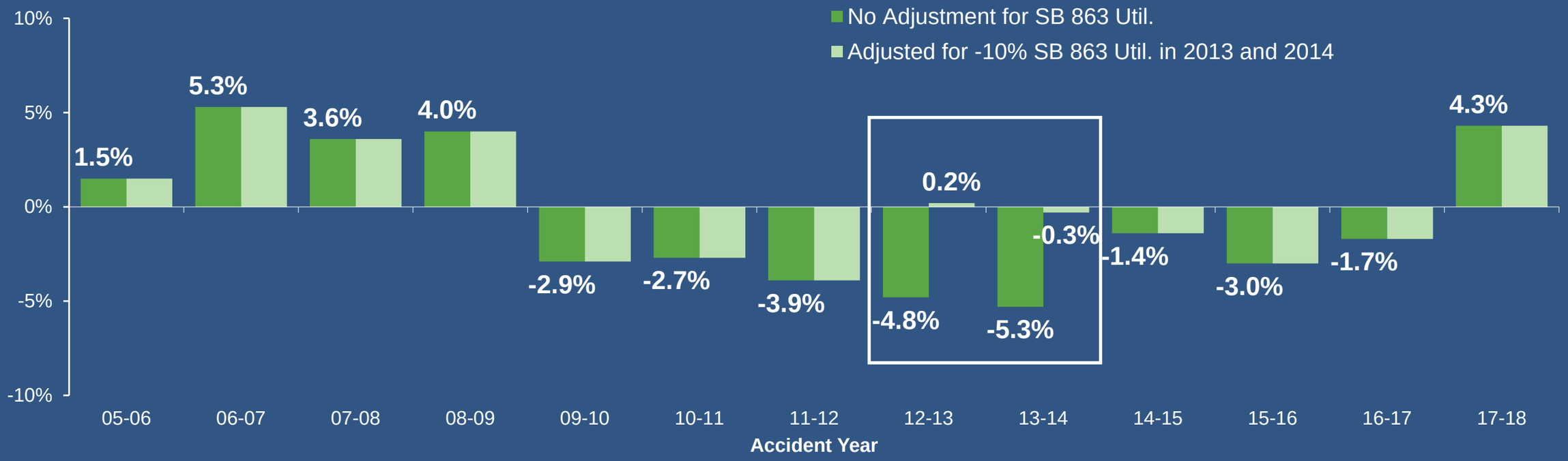
As of December 31, 2018



Source: 2018 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. Forecasts produced by the WCIRB Econometric Claim Frequency Model.

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

As of December 31, 2018



Annual Exponential Trend Based on:

1990 to 2018: +1.3% (no SB 863); +1.7% (w/ SB 863)

2005 to 2018: -1.4% (no SB 863); -0.4% (w/ SB 863)

2014 to 2018: -0.9% (no SB 863); -0.9% (w/ SB 863)

Agenda Selected: -0.5%

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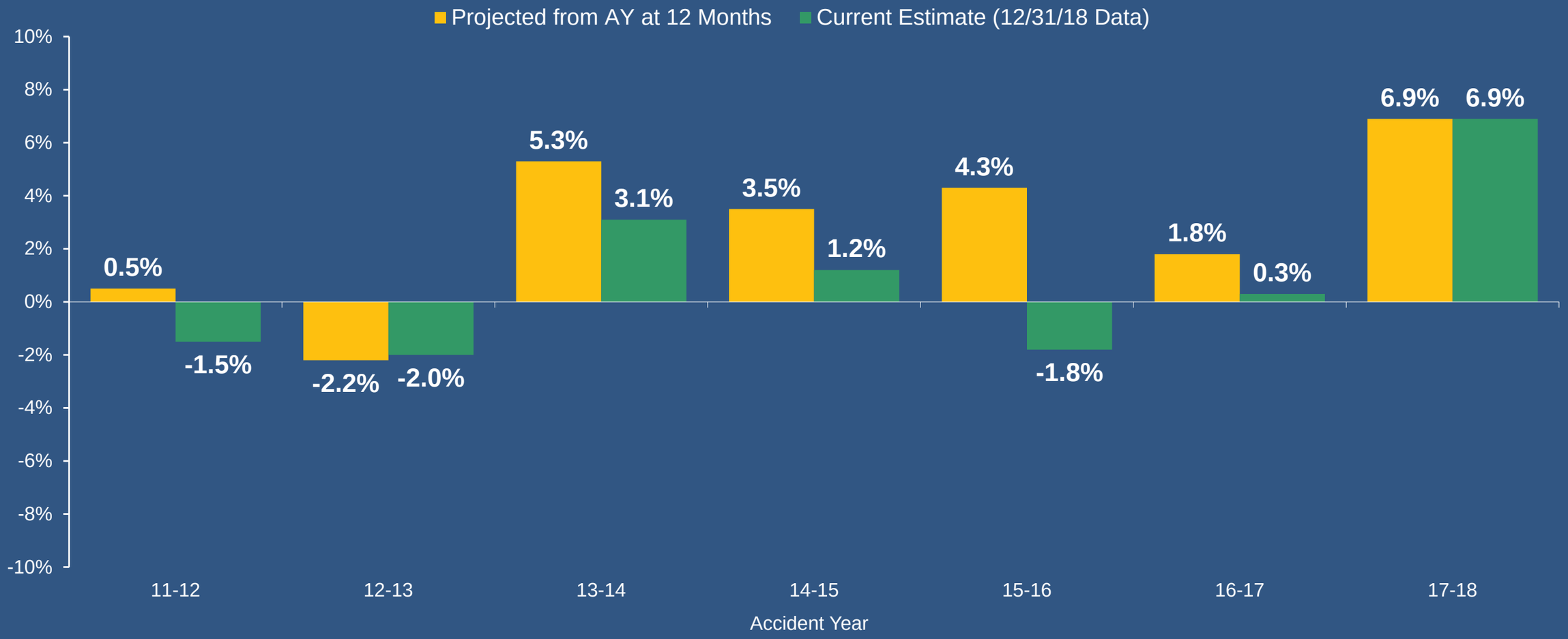
Source: WCIRB aggregate financial data and projections

Indemnity Severity Changes Projected from 12 Months Compared to Current

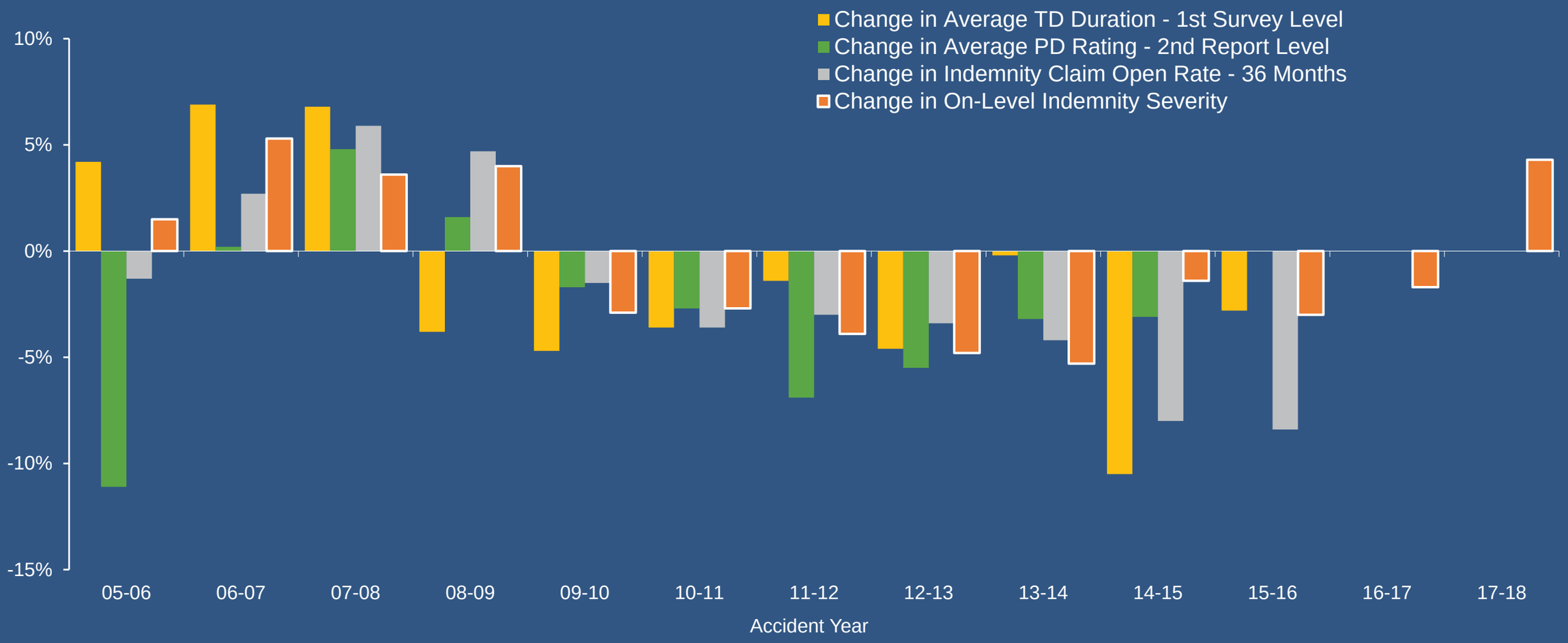
As of December 31, 2018



Source: WCIRB aggregate financial data

Factors Impacting Indemnity Cost Trends

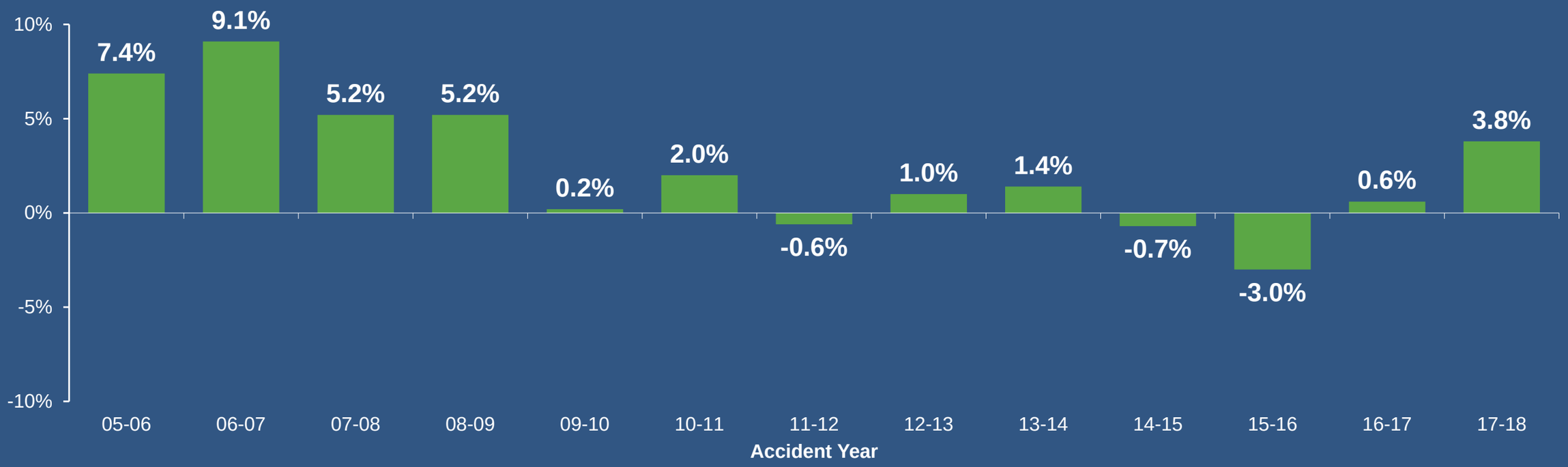
As of December 31, 2018



Source: WCIRB Permanent Disability Claim Survey, unit statistical data, and aggregate financial data.

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

As of December 31, 2018



Annual Exponential Trend Based on:

1990 to 2018 (Incl. MCCP): +5.7%

2005 to 2018: +1.8%

2014 to 2018: -0.1%

Agenda Selected: 2.5%

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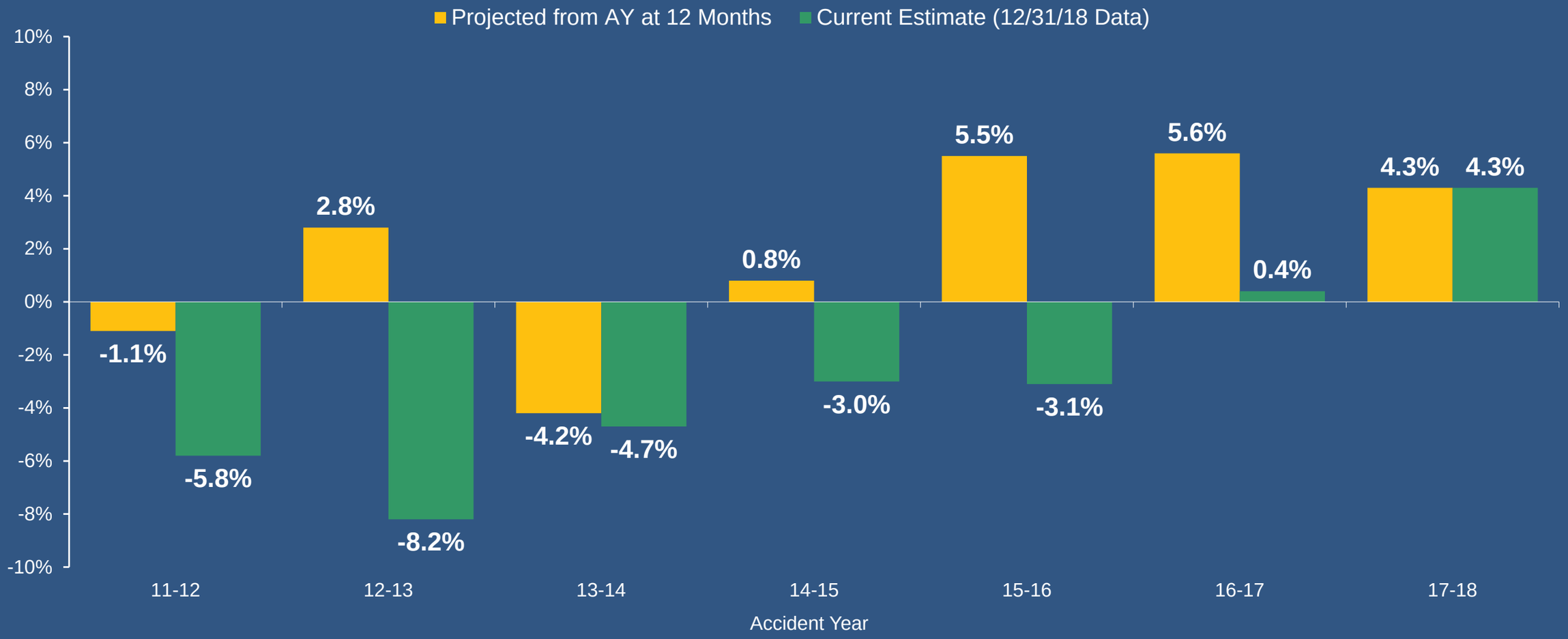
Source: WCIRB aggregate financial data and projections. Excludes MCCP costs.

Medical Severity Changes Projected from 12 Months Compared to Current

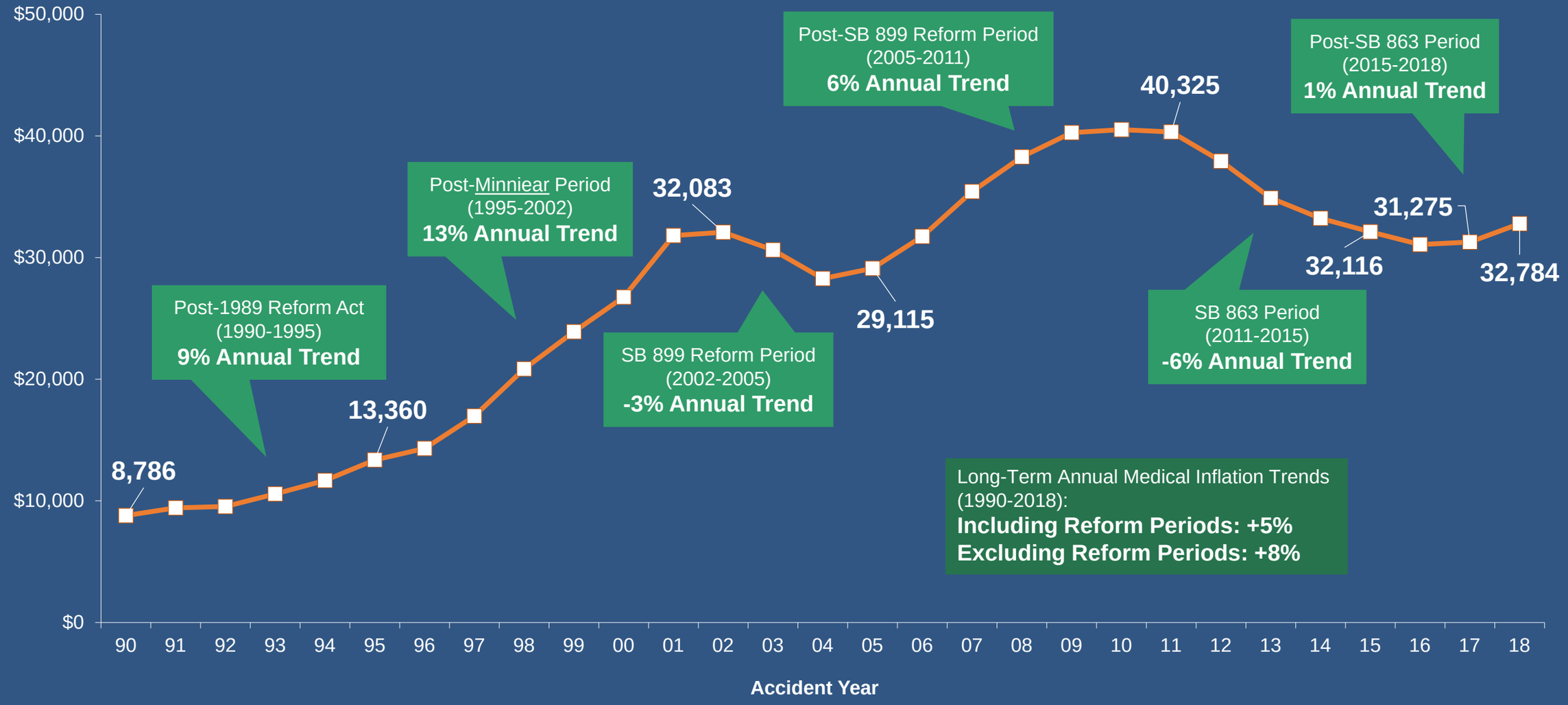
As of December 31, 2018



Source: WCIRB aggregate financial data

Ultimate Medical per Indemnity Claim (Exhibits 6.3 & 6.4)

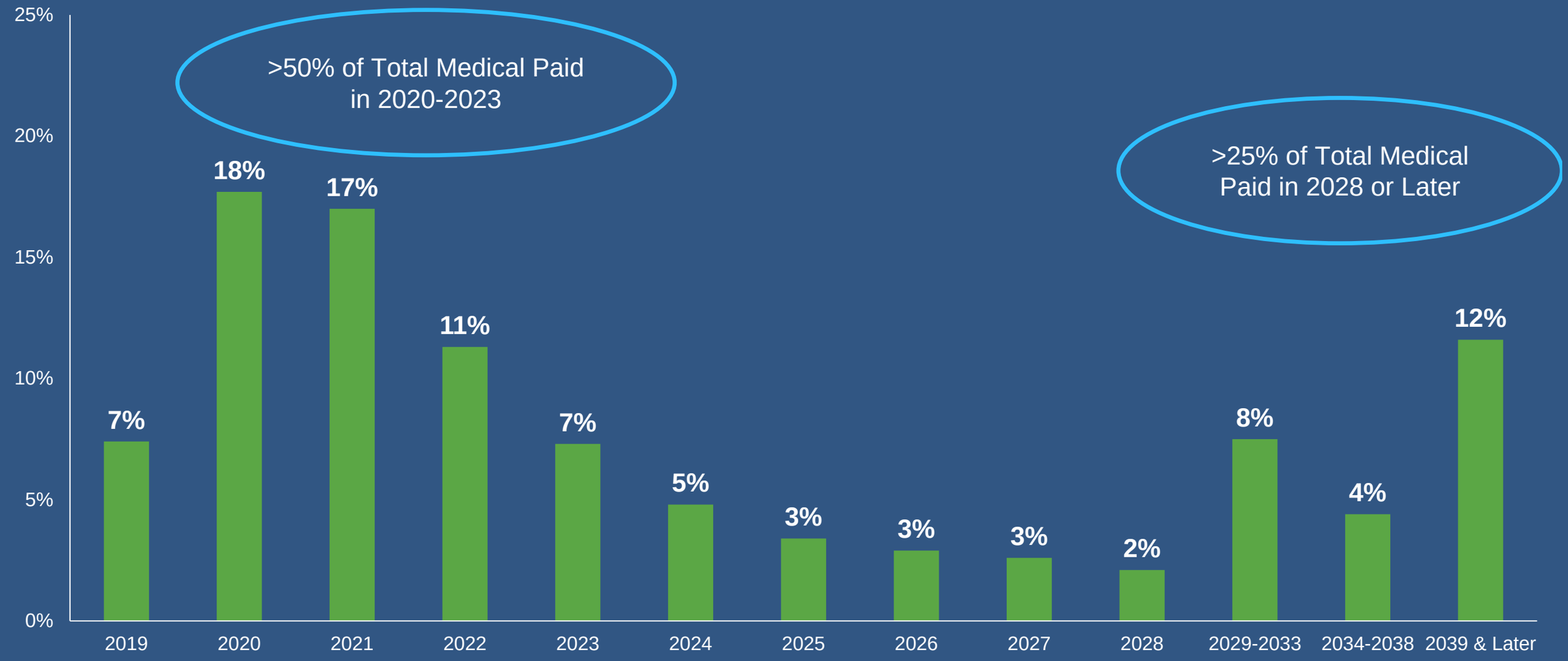
As of December 31, 2018



Source: WCIRB aggregate financial data and projections. Includes MCCP costs in all years for consistency.

Policy Year 2019 – Estimated Medical Paid by Year

As of December 31, 2018



Source: WCIRB aggregate financial data and projections of paid medical

Alternative Trending Methodologies (Item AC19-04-02)

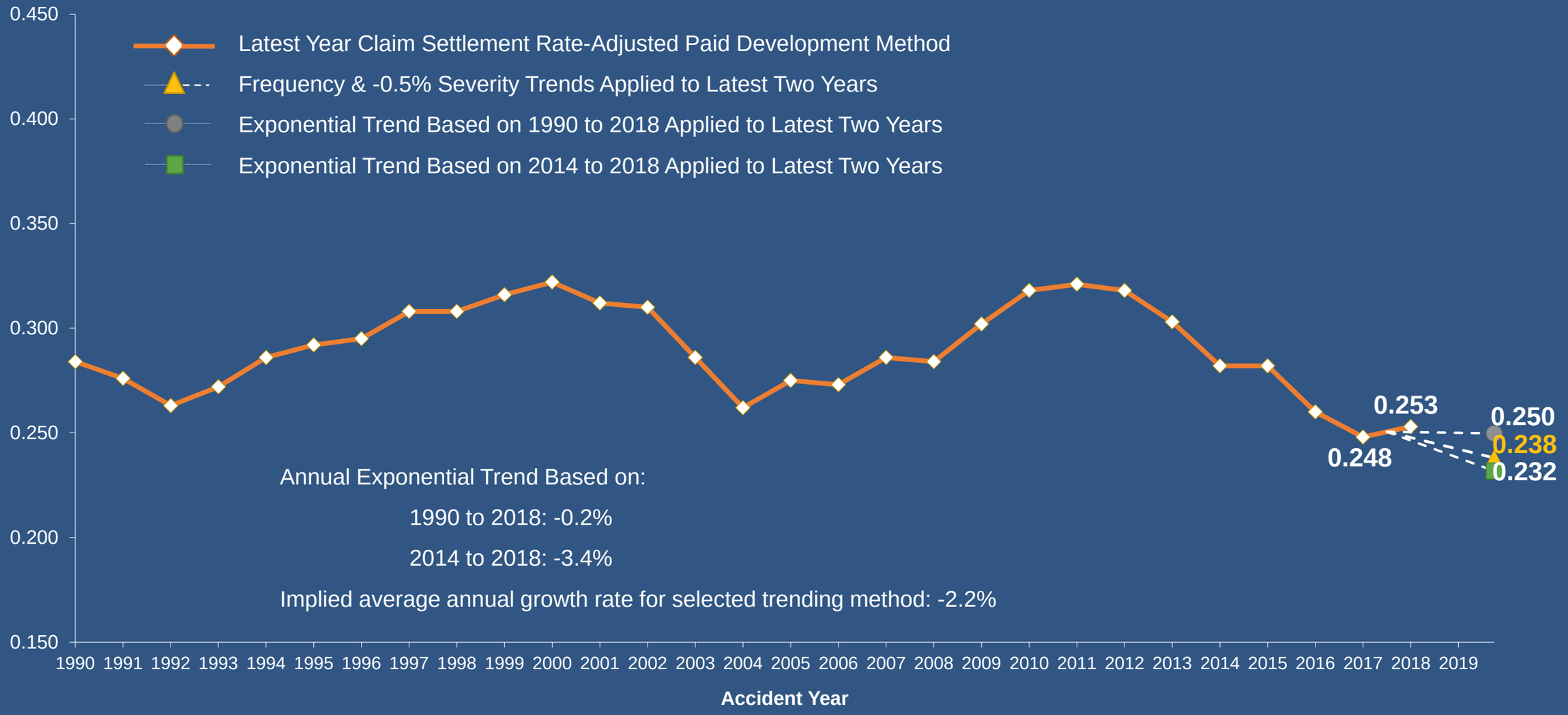
- Separate Frequency & Severity Trends Projections
  - Best during periods when loss ratios are volatile
  - Frequency and severity are affected by differing underlying forces
  - ★ Allows for separate assumptions and judgment about future trends
  - Assumes frequency & severity not highly correlated
  - Performed well during 2002-2004 reform and SB 863 transition periods but not recession period
  - ★ Also performed well in most recent study of trending methods
  - Recent modest frequency decreases consistent with model forecasts
  - On-level indemnity and medical severities relatively flat over last several years
  - Significant medical inflation has historically followed periods of reform
  - ★ Trending from two-year average generally outperformed latest year method in recent review

Alternative Trending Methodologies (Item AC19-04-02)

- 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 recent recession period
  - Did not perform well during 2002 to 2004 reform and SB 863 transition periods when trends moderate
  - 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
  - Trending from two-year average generally outperformed latest year method in recent review

Projected On-Level Indemnity Loss Ratios (Exhibit 7.1)

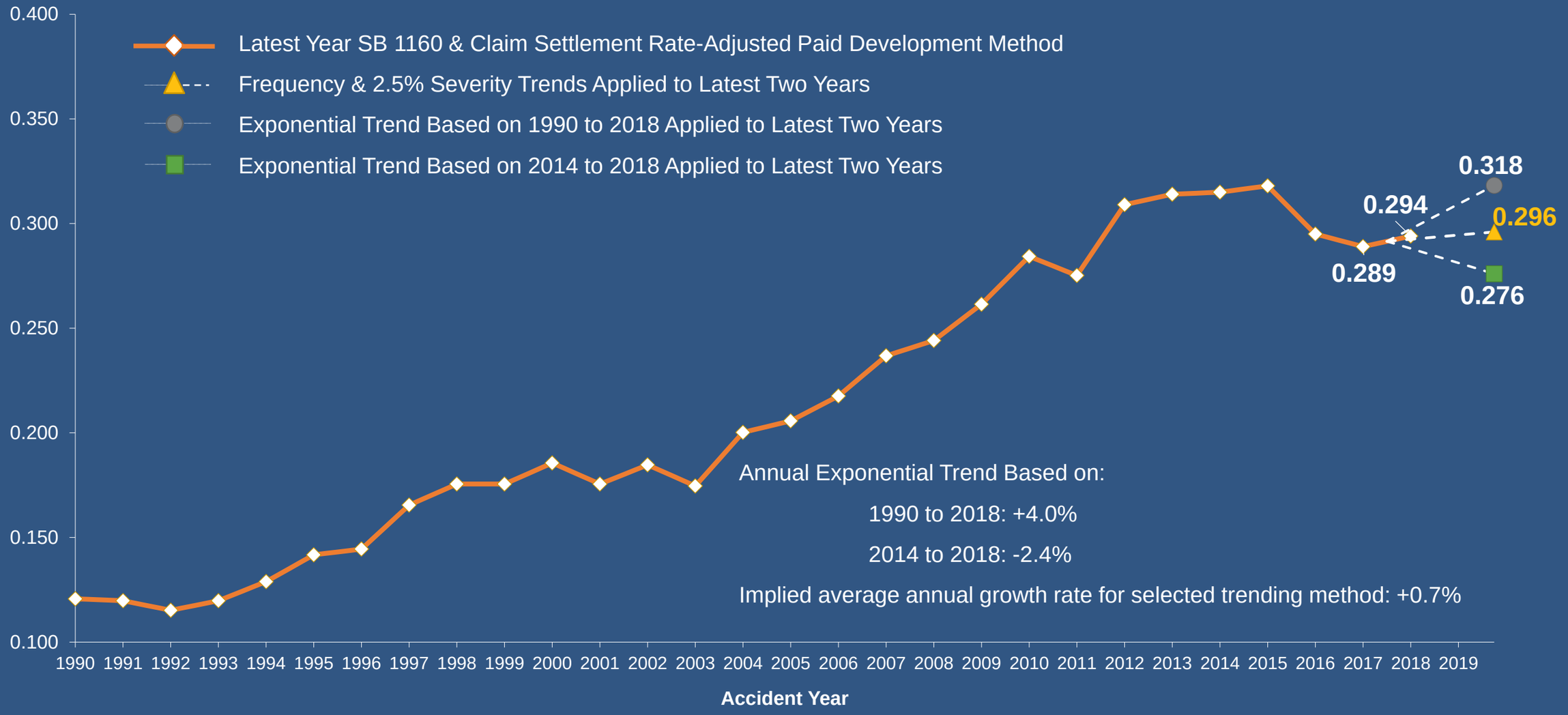
As of December 31, 2018



Source: WCIRB aggregate financial data and projections

Projected On-Level Medical Loss Ratios (Exhibit 7.3)

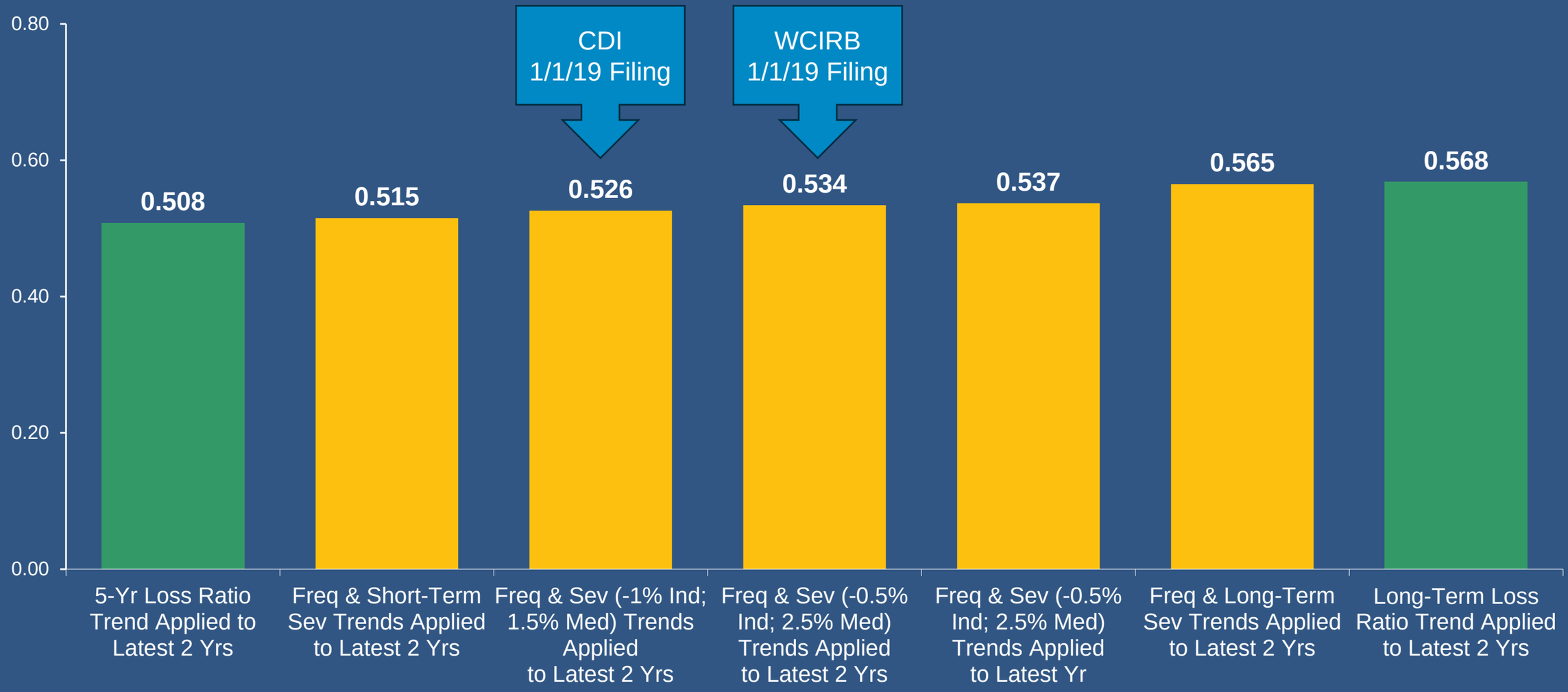
As of December 31, 2018



Source: WCIRB aggregate financial data and projections. 2010 and prior years adjusted to a level that excludes MCCP costs.

Projected On-Level Loss Ratios under Alternative Trending Methods

As of December 31, 2018



Source: WCIRB aggregate financial data and projections. For consistency of comparisons, loss ratios are prior to reflecting the impact of the Drug Formulary.

04

12/31/2018 Loss Adjustment Expense Experience Review

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Projections of ULAE to Loss

January 1, 2019 Filing Projection

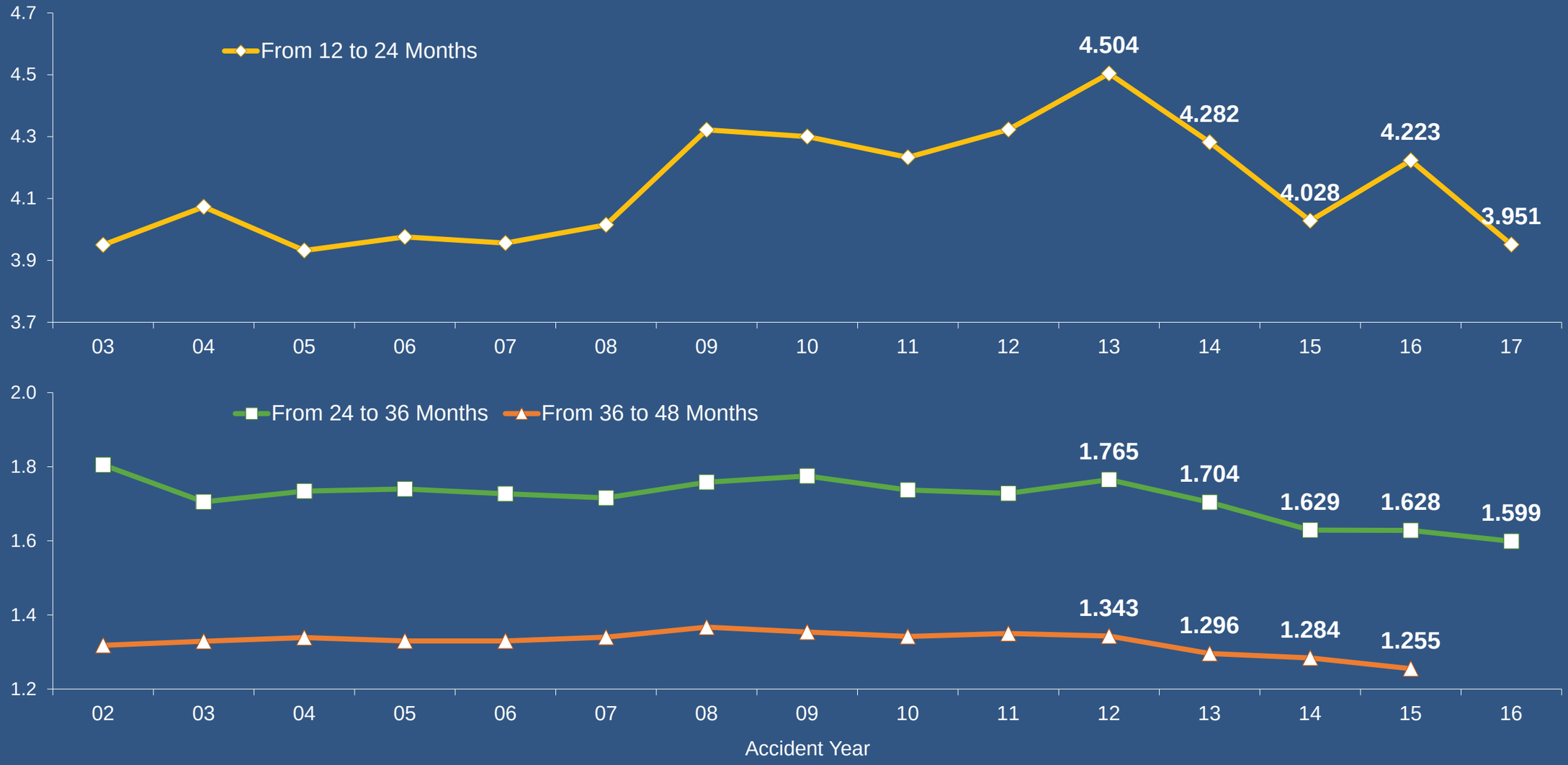
Method	ULAE Projection
Paid ULAE per Open Indemnity Claim	14.9%
Paid ULAE to Paid Losses	12.2%
Average of Two Projection Methods	**13.6%**

Updated Projection

Method	ULAE Projection
Paid ULAE per Open Indemnity Claim	16.6%
Paid ULAE to Paid Losses	13.3%
Average of Two Projection Methods	**15.0%**

Paid ALAE Development – Private Insurers (Exhibit 4.2)

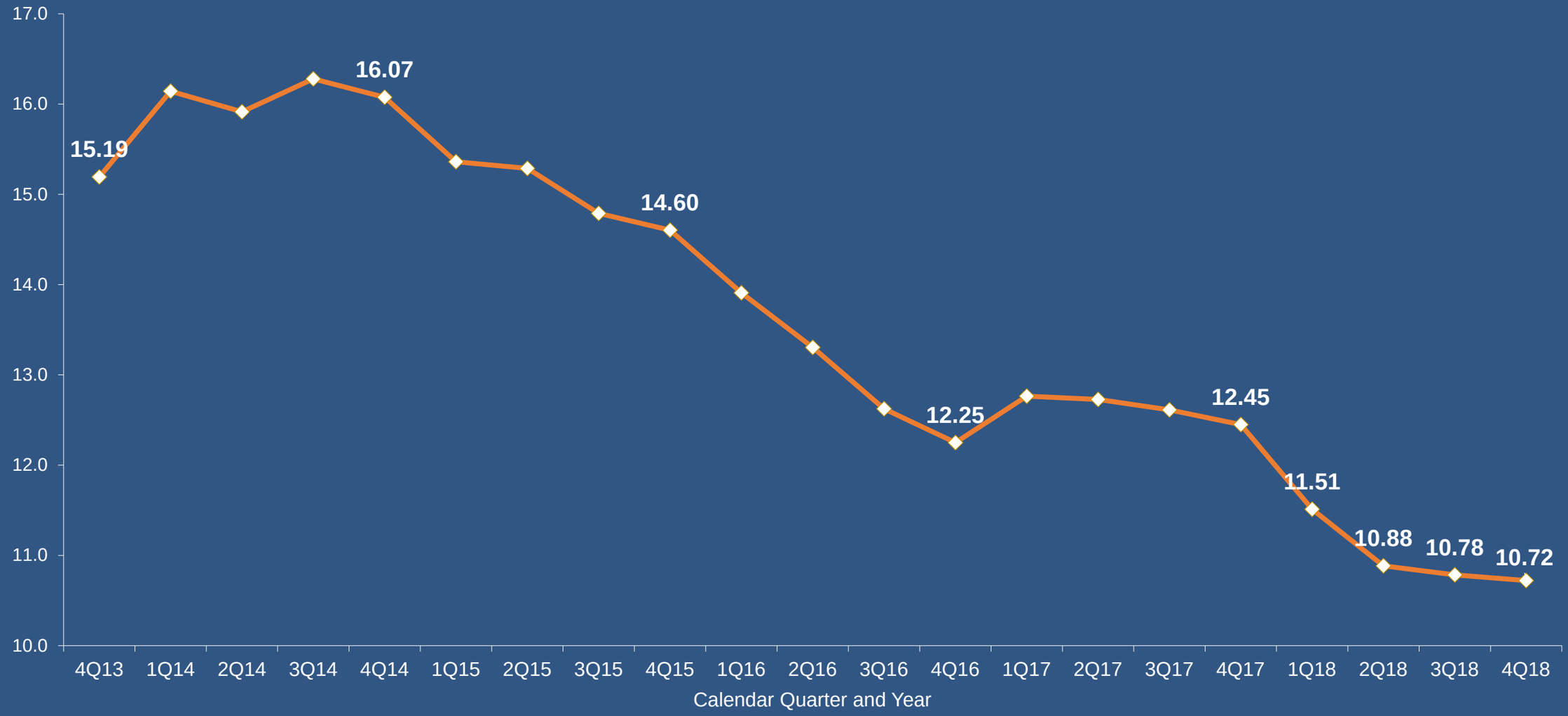
As of December 31, 2018



Source: WCIRB aggregate financial data. Excludes medical cost containment program costs and includes costs for independent medical review and independent bill review for all years.

Cumulative Paid ALAE Development from 12 to 90 Months

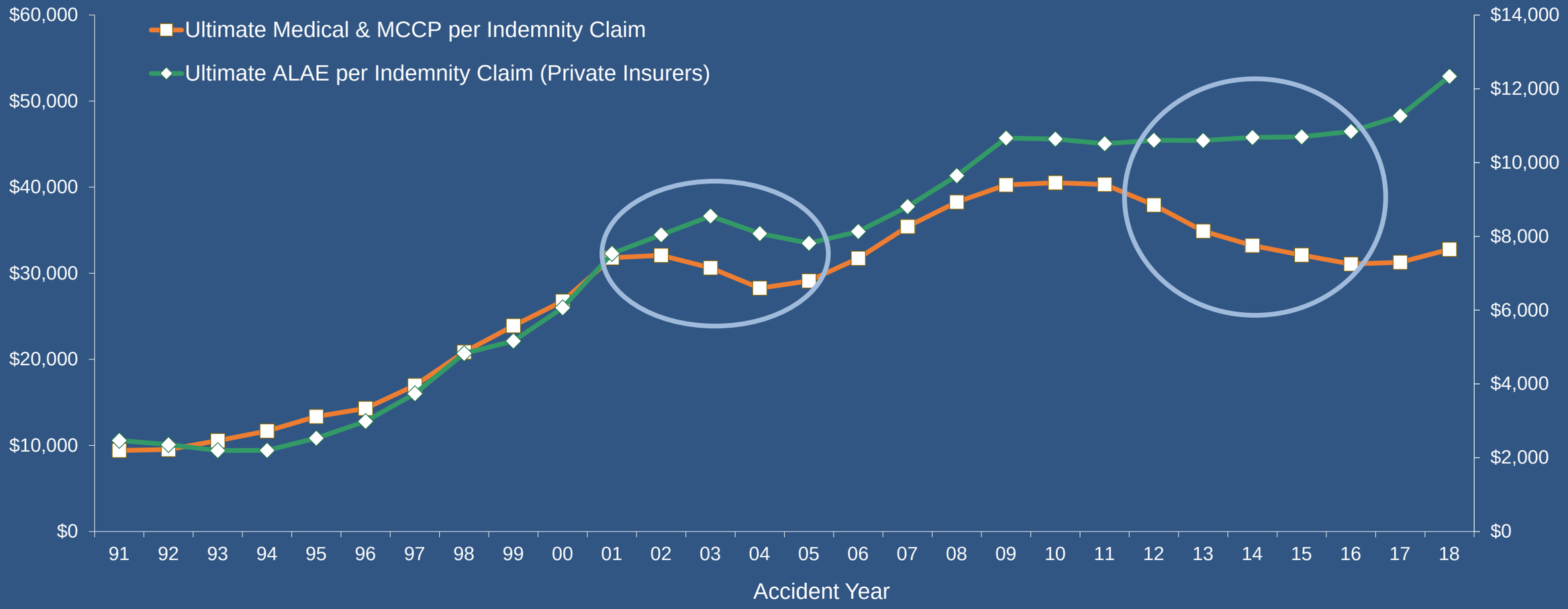
As of December 31, 2018



Source: WCIRB aggregate financial data. MCCP is excluded.

Ultimate Medical and ALAE per Indemnity Claim

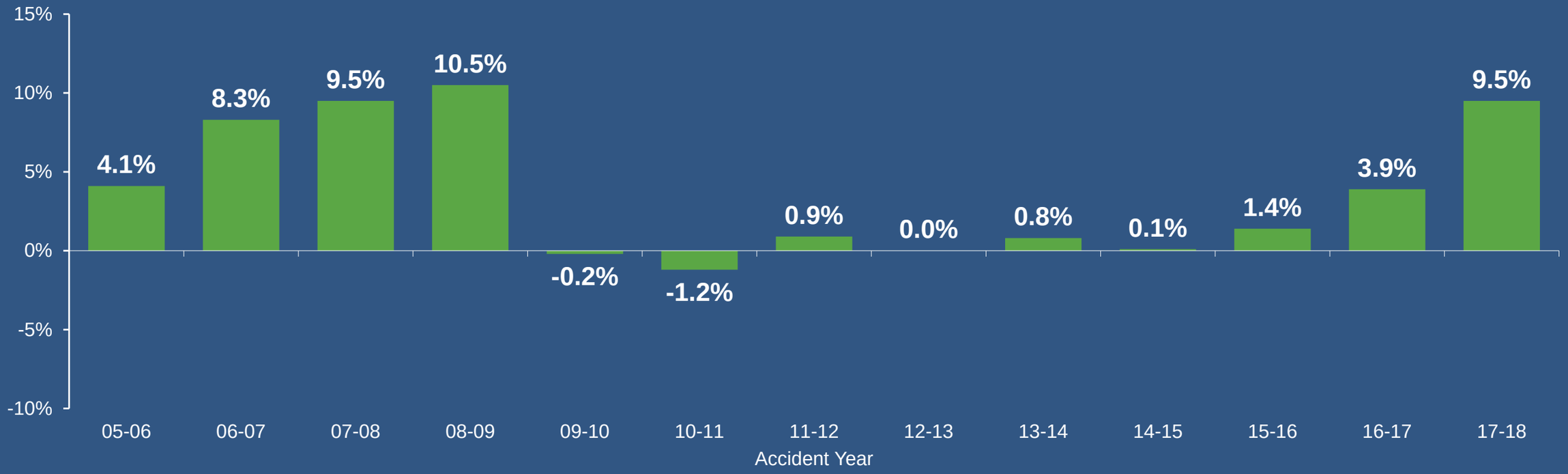
As of December 31, 2018



Source: WCIRB aggregate financial data and projections. MCCP costs are included in medical for all years for consistency.

Projected Changes in Ultimate ALAE Severity – Private Insurers (Exhibit 2.2)

As of December 31, 2018



Annual Exponential Trend Based on:

2005 to 2018: +2.7%

2014 to 2018: +3.5%

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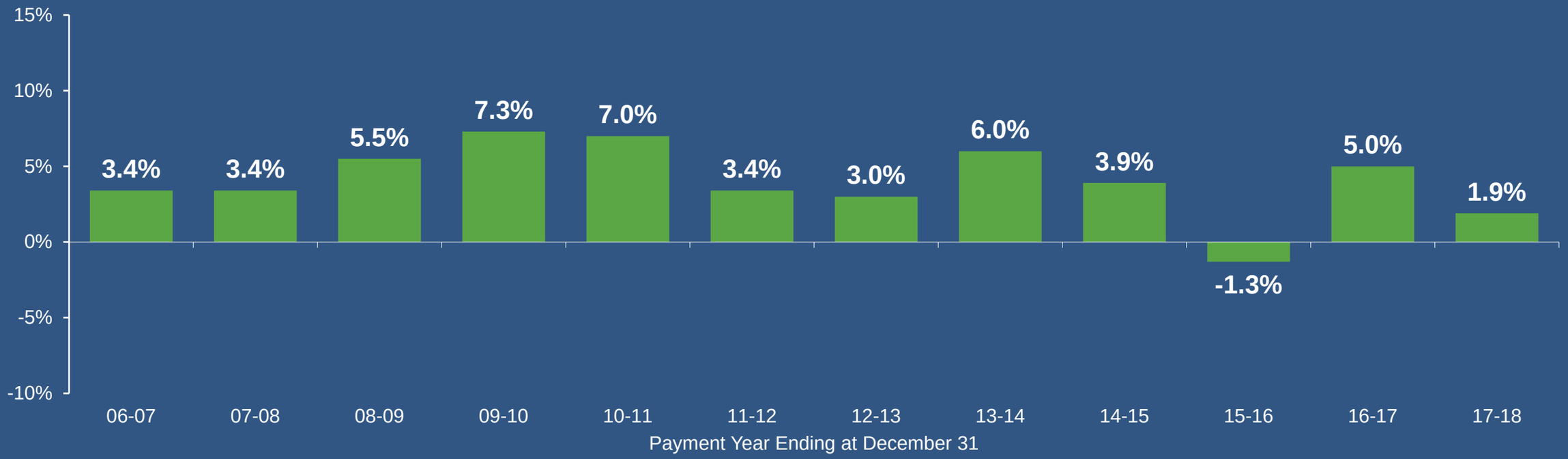
Source: WCIRB aggregate financial data and projections. Excludes MCCP costs.

Change in Incremental Paid ALAE per Open Indemnity Claim – Private Insurers (Exhibit 3)

As of December 31, 2018



Annual Exponential Trend Based on:

2006 to 2018: +4.3%

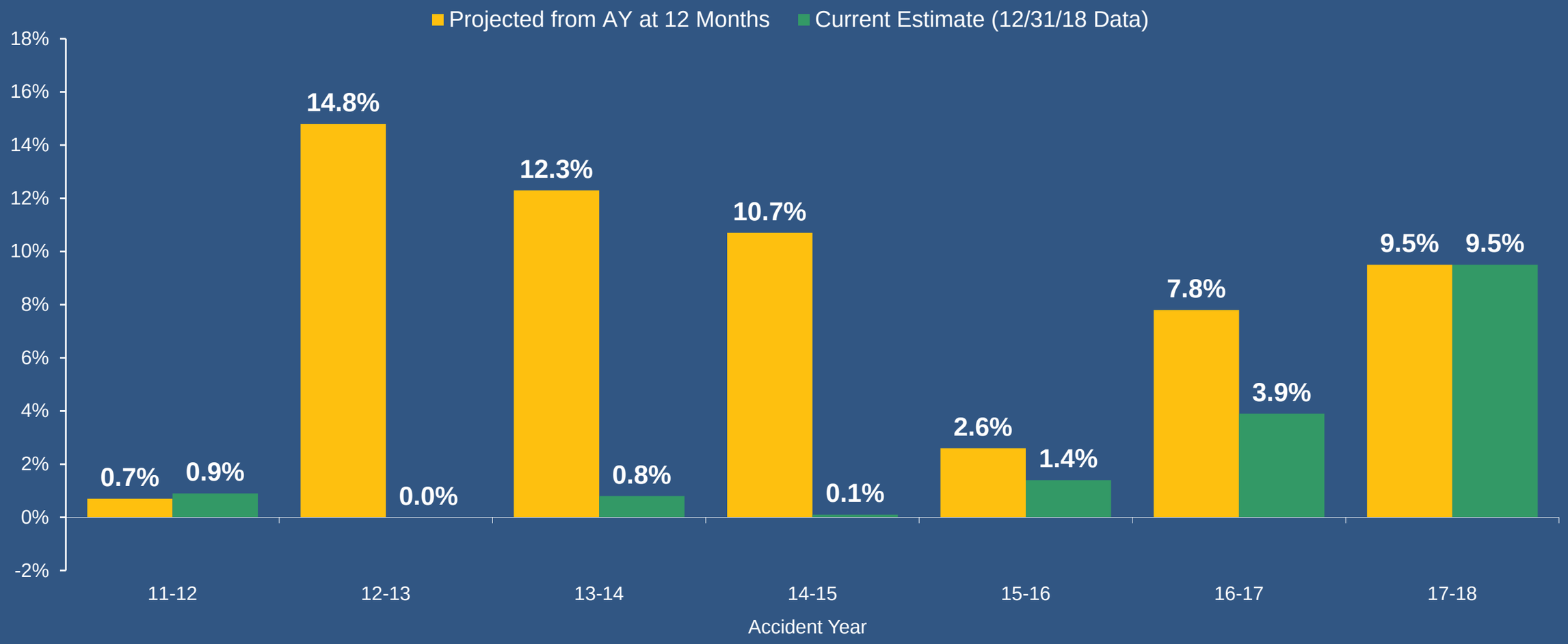
2013 to 2018: +2.2%

Agenda Selected ALAE Severity Trend: +3.5%

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

ALAE Severity Changes Projected from 12 Months Compared to Current

As of December 31, 2018



Source: WCIRB aggregate financial data for private insurers. Excludes MCCP costs.

ALAE Projection Methodology

- Accident Year Ultimate Indemnity Claim Counts
  - Latest year development
  - Projected using WCIRB frequency forecasts
- Accident Year Ultimate ALAE per Indemnity Claim
  - Data based on private insurers only
  - Latest year development with inverse power curve tail
  - Projected using average of ultimate ALAE per indemnity claim and incremental paid ALAE per open indemnity claim for both long-term and short-term periods
- Projected 7/1/2019 to 12/31/2019 Policy Period ALAE
  - (Projected # of ultimate indemnity claims) X (projected ultimate ALAE per indemnity claim)
  - Projection from latest two accident years
  - Initial projected ratio reduced for savings from SB 1160 & AB 1244 not yet significantly reflected in emerging ALAE costs (6.4% in 1/1/2019 Filing)

Adjustment for SB 1160 & AB 1244 Lien Reforms in ALAE

- 1/1/2019 Filing reflected -6.4% adjustment to projected ALAE ratio for SB 1160 & AB 1244 lien reforms
  - Based on 40% reduction in lien filings
  - Assumed savings not yet significantly reflected in emerging ALAE costs since liens paid much later
- Committee recommended 60% reduction in lien filings at 3/18/2019 meeting (-9.6% on ALAE)
- Some savings from reform now reflected in emerging ALAE costs and ALAE development
  - A significant portion likely yet to emerge
  - ALAE development also impacted by acceleration in claim settlement
- Staff reviewed approaches to appropriately adjust ALAE projection

Adjustment for SB 1160 & AB 1244 Lien Reforms in ALAE

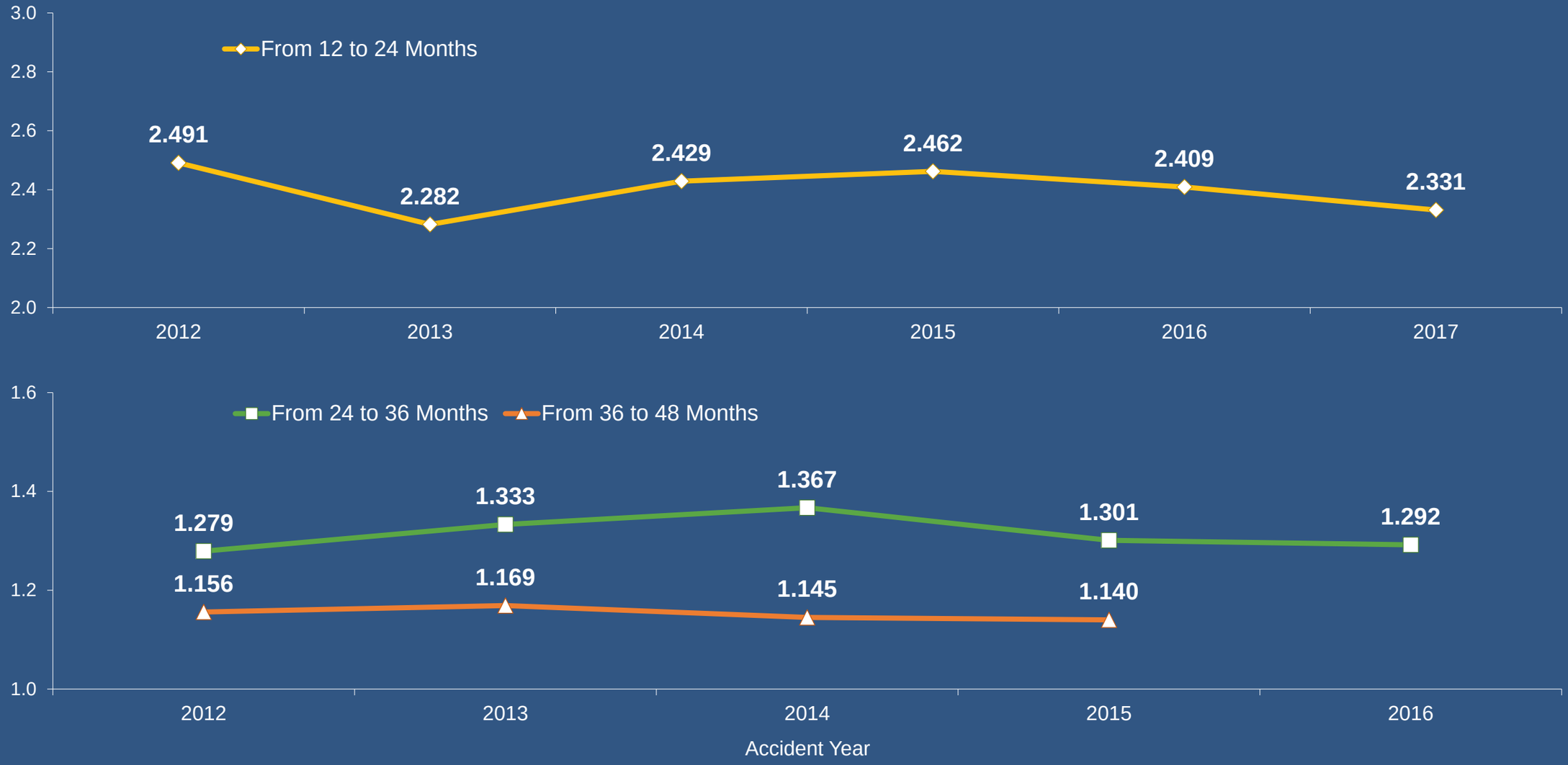
As of December 31, 2018

AY & Age	Estimated % of Ultimate ALAE Paid	Estimated % of 168 Mos. ALAE Paid
2018 (12 Months)	7%	8%
2017 (24 Months)	28%	32%
Average	17%	**20%**

- WCIRB medical transaction data shows most liens are paid by 168 months
- Staff recommends judgmentally tempering SB 1160 and AB 1244 savings based on average of 168-month paid %s from 2017 and 2018 (20%)
  - **Recommended -7.7% adjustment to ALAE ratio**
- Impact on paid ALAE development from reforms may be offset by claim settlement rate impact
  - Will study more in-depth for annual filing

Paid MCCP Development (Exhibit 7.1)

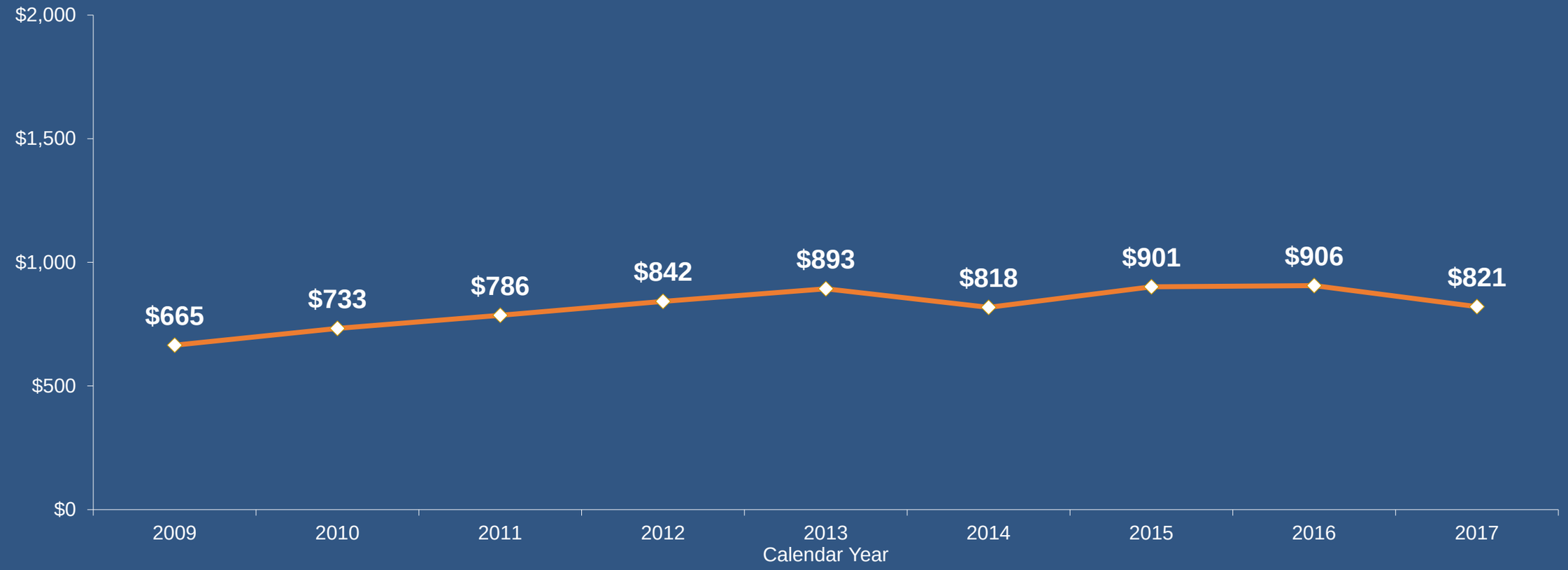
As of March 31, 2018



Source: WCIRB aggregate financial data. Excludes the cost of IMR and IBR from all years.

Calendar Year Paid MCCP per Indemnity Claims Inventory (Exhibit 5)

As of December 31, 2017



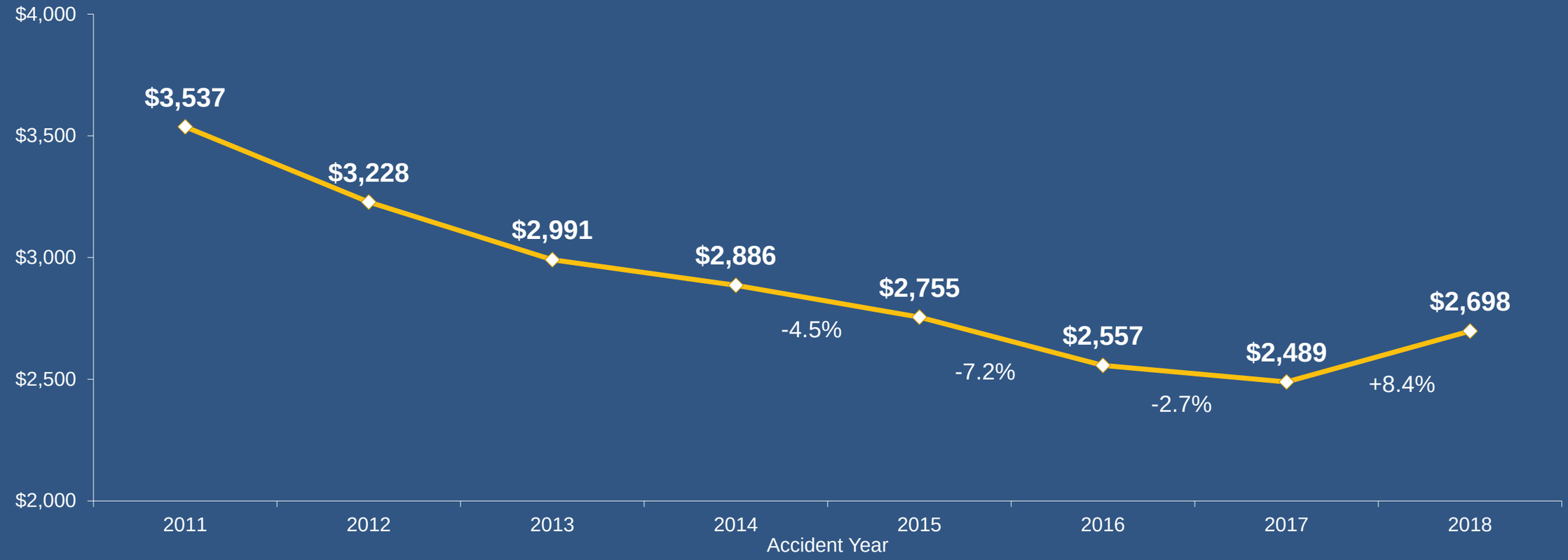
Annual Exponential Trend Based on:

2009 to 2017: +2.9%

Source: WCIRB aggregate financial data. Excludes the cost of IMR and IBR from all years.

Projected Ultimate MCCP per Indemnity Claim (Exhibit 6)

As of December 31, 2018



Annual Exponential Trend Based on:

2011 to 2018: -4.3%

2014 to 2018: -2.3%

Agenda Selected MCCP Severity Trend: -1.0%

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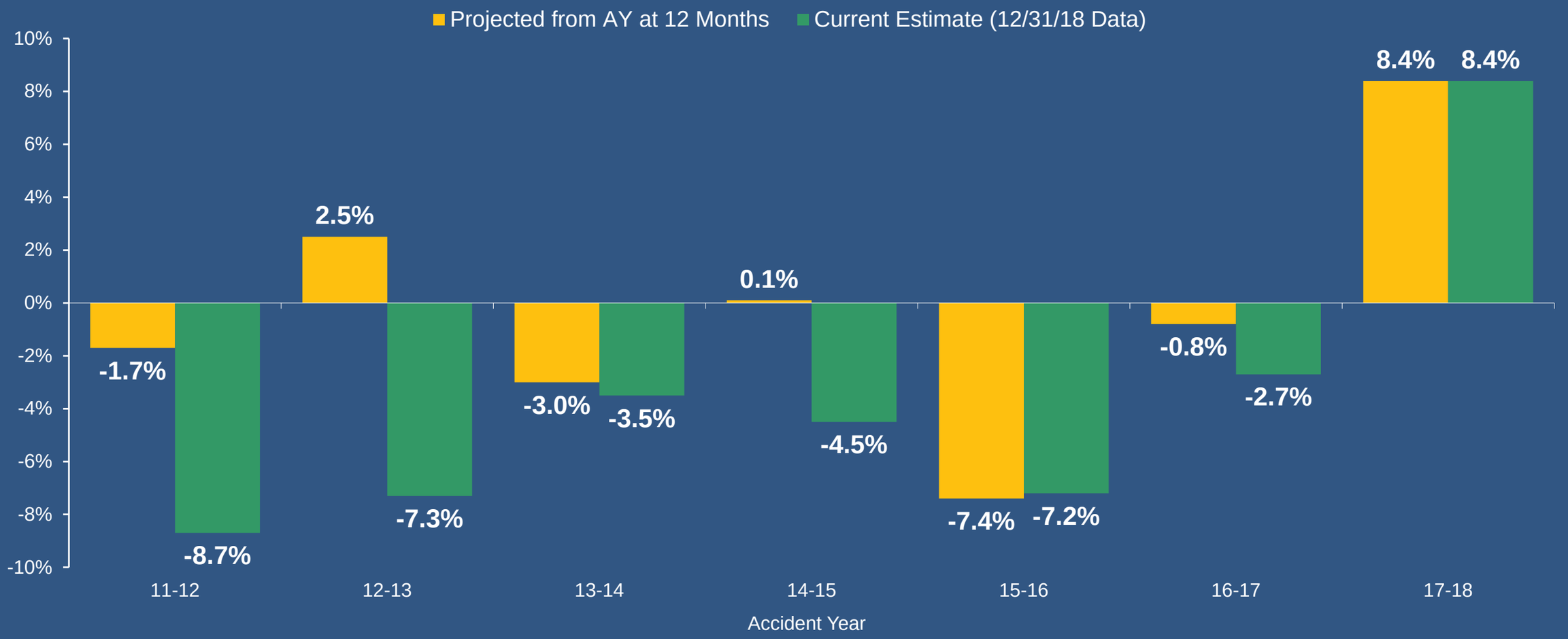
Source: WCIRB aggregate financial data and projections. Excludes the cost of IMR and IBR from all years.

MCCP Severity Changes Projected from 12 Months Compared to Current

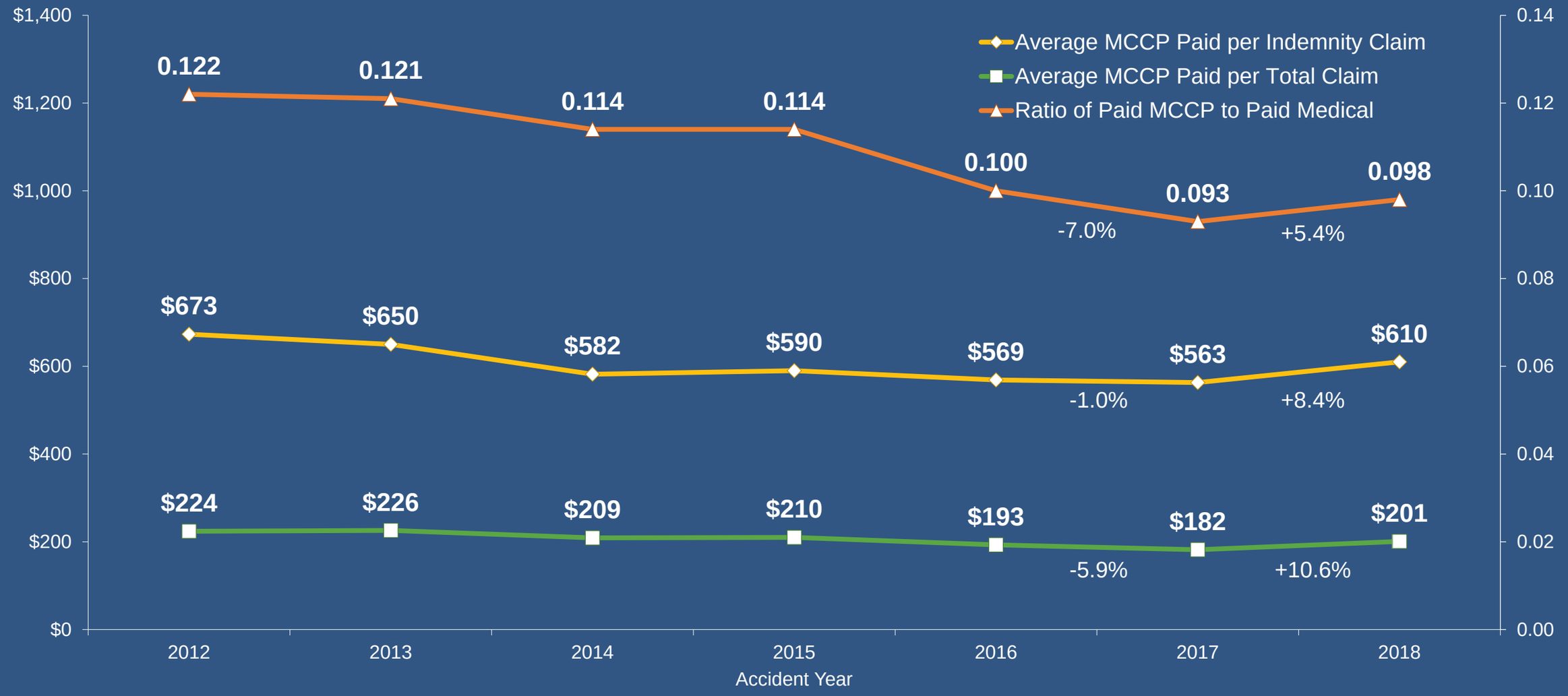
As of December 31, 2018



Source: WCIRB aggregate financial data

MCCP Cost Comparisons at 12 Months

As of December 31, 2018



Source: WCIRB aggregate financial data

Adjustment for SB 1160 UR Reforms in MCCP

- SB 1160 provided that prospective UR is restricted on services within first 30 days of injury
  - Effective on claims occurring after January 1, 2018
- WCIRB prospective evaluation in Amended 1/1/2017 Filing
  - 0.1% reduction in total PP from less UR (-2.5% on MCCP costs)
- Early retrospective evaluation
  - Medical services within first 30 days up modestly (from 12/5/2018 meeting)
  - AY 2018 average MCCP severity increased following several years of decline
- Considerations
  - 2018 MCCP increased rather than decreased as expected
  - Given first 30-day window, most of the reform should already be reflected in the emerging data
  - **Staff recommends no special adjustment to the MCCP projection for SB 1160**

Adjustment for Drug Formulary in MCCP

- New MTUS Drug Formulary effective in 2018
- WCIRB prospective evaluation in 7/1/2018 Filing
  - 0.1% reduction in total PP from less UR (-2.6% on MCCP costs)
- Early retrospective evaluation
  - Pharmaceutical costs continuing to decrease in 2018, with some shift to exempt drugs (from 12/5/2018 meeting)
  - MCCP development continues to decline modestly
- Impact on MCCP costs both for outstanding claims and new claims
- **Staff recommends reflecting -2.6% reduction to projected MCCP ratio since results are still very preliminary (similar to medical adjustment)**

Projections of ALAE and Total LAE to Loss

January 1, 2019 Filing Projection

Method	Projection Prior to Reform Adjustments	Projection After Reform Adjustments
Ultimate ALAE (Excl. MCCP) per Indemnity Claim	20.2%	18.9%
Ultimate MCCP per Indemnity Claim	4.0%	4.0%
Total LAE Ratio	N/A	**36.5%**

Updated Projection

Method	Projection Prior to Reform Adjustments	Projection After Reform Adjustments
Ultimate ALAE (Excl. MCCP) per Indemnity Claim	20.7%	19.1%
Ultimate MCCP per Indemnity Claim	4.1%	4.0%
Total LAE Ratio	N/A	**38.1%**

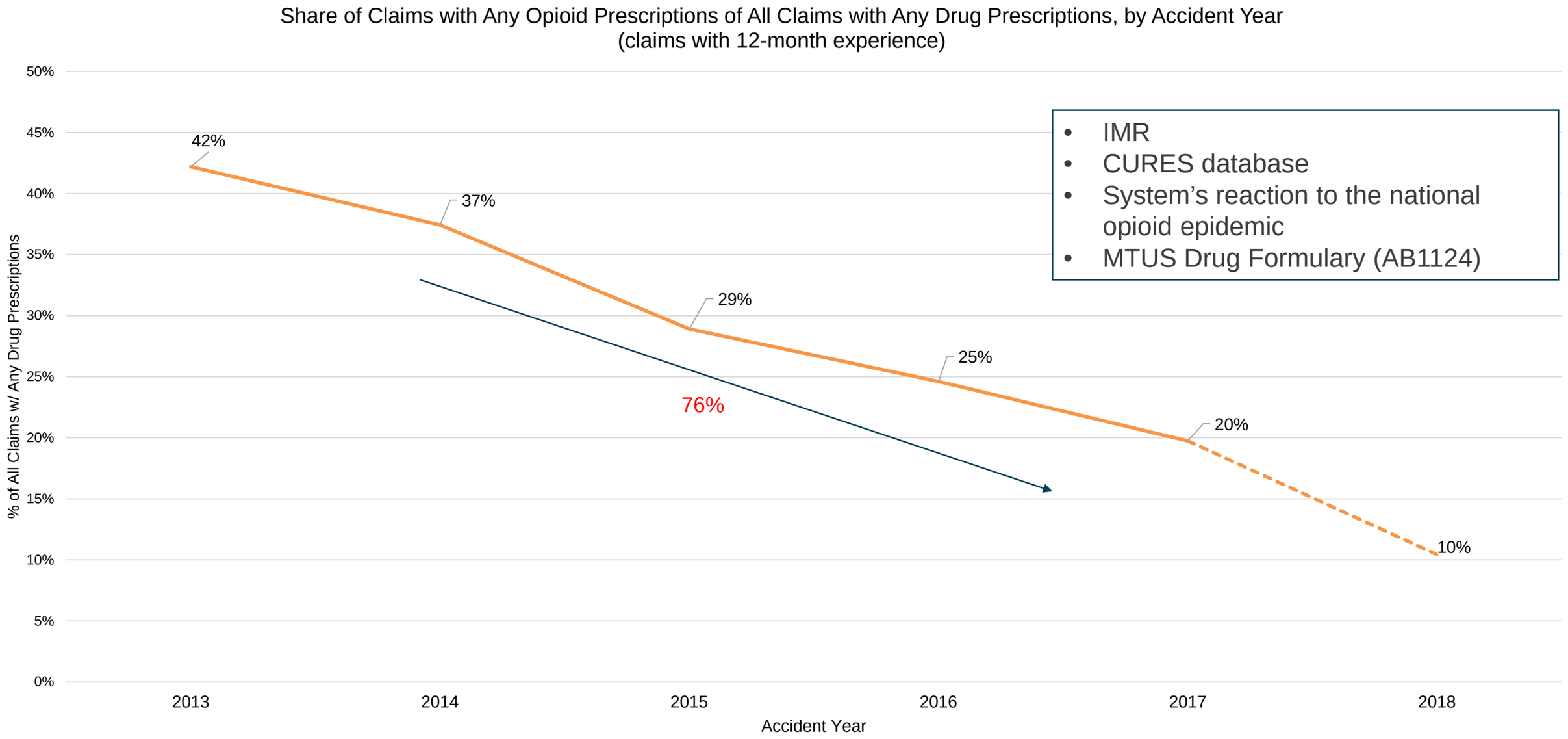
05

Early Indicators of High-Risk Opioid Use and Potential Alternative Measures

Presentation Outline

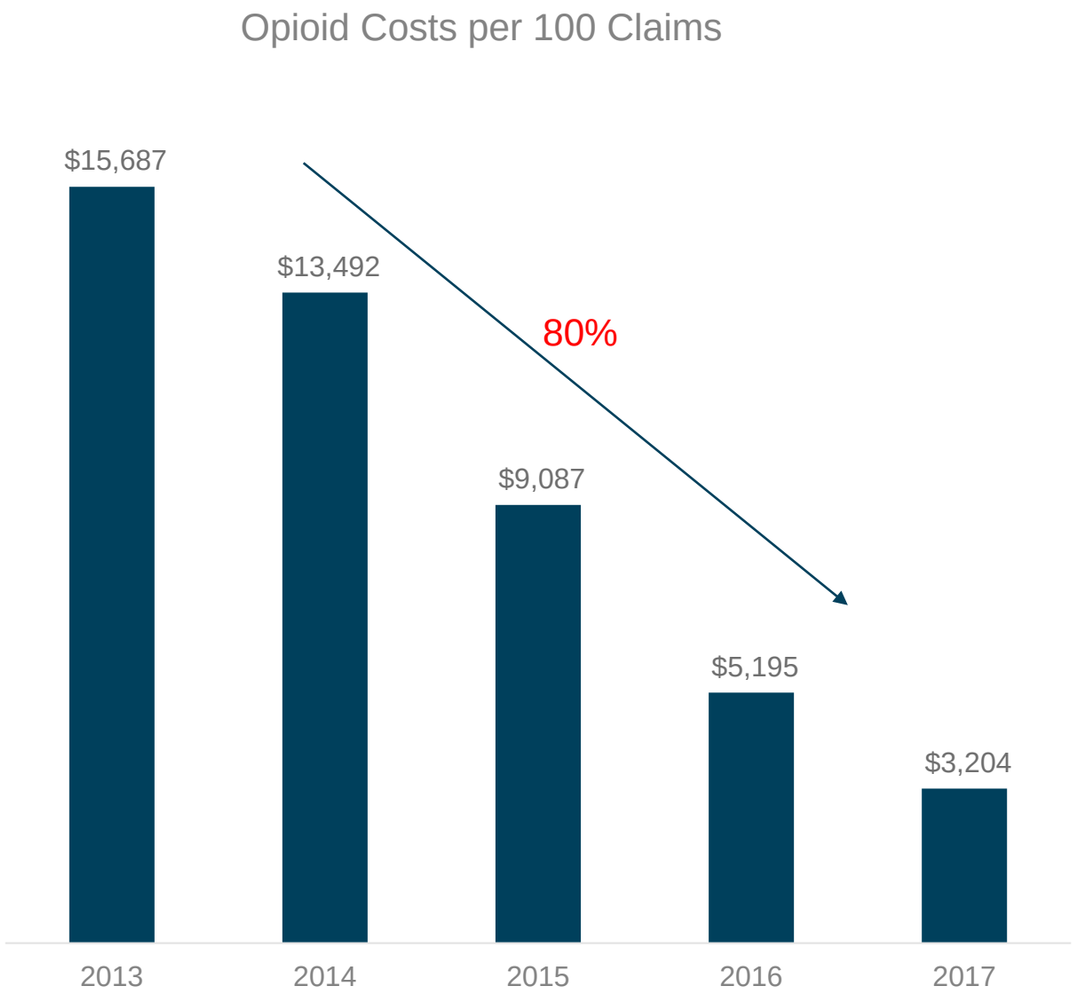
- Background
- Research Questions
- Research Methods
- Preliminary Findings
- Conclusions

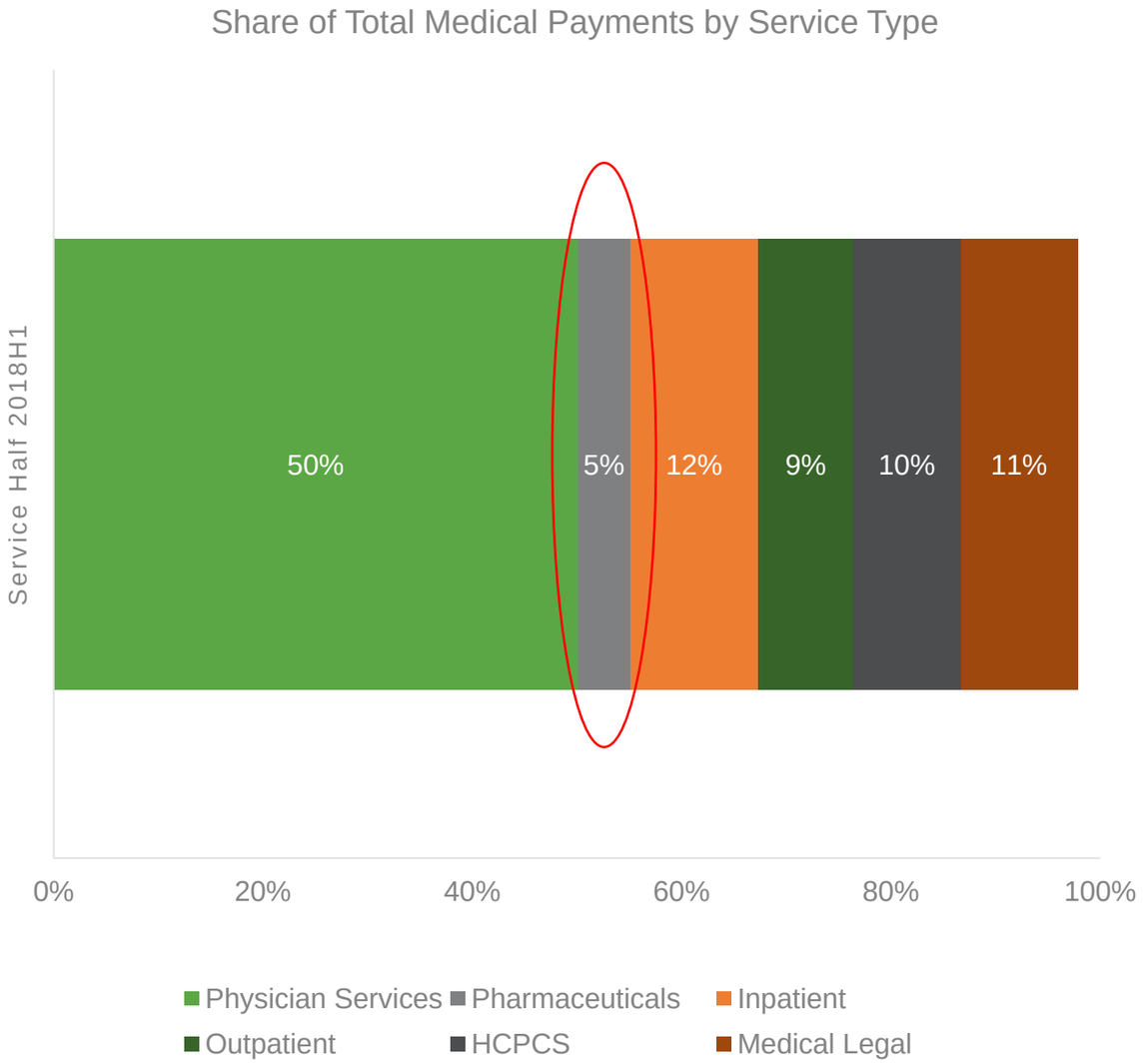
Fewer Newer Workers' Compensation Claims are Receiving Opioids in California



Source: WCIRB medical transaction data, and claims with 12-month experience were analyzed.

Cost Impact of Less Opioid Use on the Workers' Compensation System





Source: WCIRB 2018 State of the System; December 5, 2018 WCIRB Actuarial Committee Agenda and Minutes Item AC16-06-05.

Research Questions

- What are the **characteristics** of claims involving high-risk opioid use?

- For claims involving high-risk opioid use:
  - What are the **early indicators**?

- Comparing claims involving high-risk opioid use to claims involving lower doses of opioids:
  - What are the differences in the **utilization patterns of alternative medical treatments**, including both non-opioid drugs and medical services?

- Did the patterns of alternative treatments **change over time**?

Research Methods

- WCIRB's medical transaction data:
  - Claims that had accidents in 2013 and 2016 with 12-month experience

- Comparison groups:
  - High-risk opioid use: claims using 50 Morphine Milligram Equivalents (MME) or more per day for at least 30 consecutive days
  - Lower-dose opioid use: claims using < 50 MME daily or for < 30 consecutive days
  - Matched on **injured worker's age** and **injury mix** (incl. pain type and major surgery type)

- Analysis of early indicators:
  - Patterns of opioid use in the first six-month treatment after the injury

- Analysis of alternative measures:
  - Non-narcotic pain medication
  - Physician services – physical medicine, durable medical equipment, counseling, etc.
  - Medical service utilization measured by # of medical transactions per claim

- Analysis of changes in treatment patterns:
  - Medical service utilization compared between newer claims and older claims

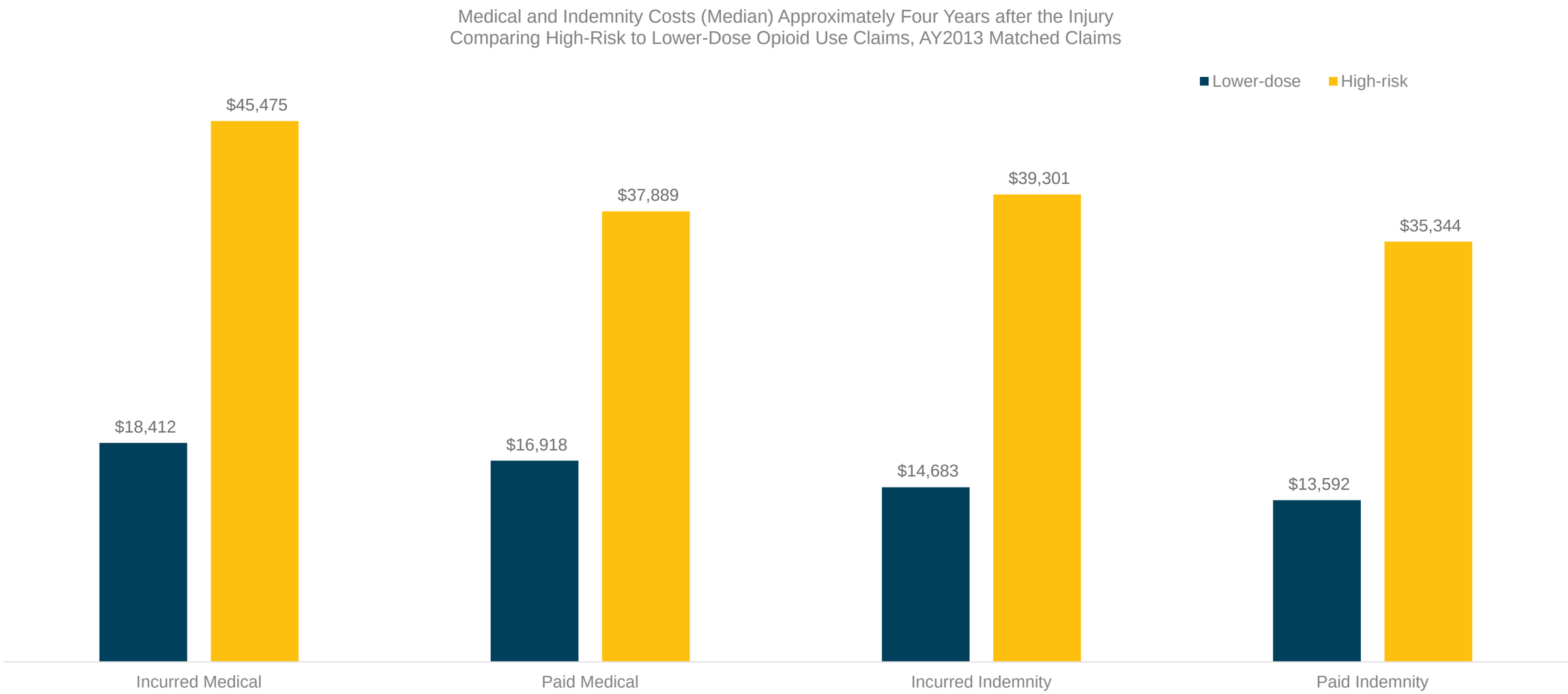
High-Risk Opioid Use Claims are Significantly Different from Lower-Dose Use Claims

	AY2013 Claims		AY2016 Claims	
	Lower-dose opioid use	High-risk opioid use	Lower-dose opioid use	High-risk opioid use
Claim count	67,787	**1,725 (2.5%)**	37,408	**531 (1.4%)**
Age at the time of injury, mean (SD)	41.8 (12.4)	43.5 (11.7)	43.2 (12.5)	44.5 (12.1)
Pain Type (%)				
None	63.8	48.8	58.1	42.9
Acute	7.9	10.5	10.7	14.7
Chronic	7.4	8.1	5.7	4.3
Both acute and chronic	20.9	32.6	25.4	38.0
Had a major surgery (%)	21.4	46.0	30.6	53.9
Type of first major surgery (leading six) (%)				
Endoscopy/Arthroscopy Procedure on the Musculoskeletal System	39.3	32.6	42.8	30.4
Surgical Procedure on the Spine and Spinal Cord	3.3	11.5	2.6	7.6
Surgical Procedure on the Shoulder	7.0	9.1	3.9	4.5
Surgical Procedure on the Vertebral Column	0.9	6.3	1.3	4.5
Surgical Procedure on the Leg and Ankle Joint	3.7	6.1	4.6	11.5
Surgical Procedure on the Femur and Knee Joint	1.9	4.3	2.3	9.5

Note: SD refers to standard deviation. % refers to claim share. P-values of all comparisons are smaller than 0.001 except for the age comparison (p=0.02).

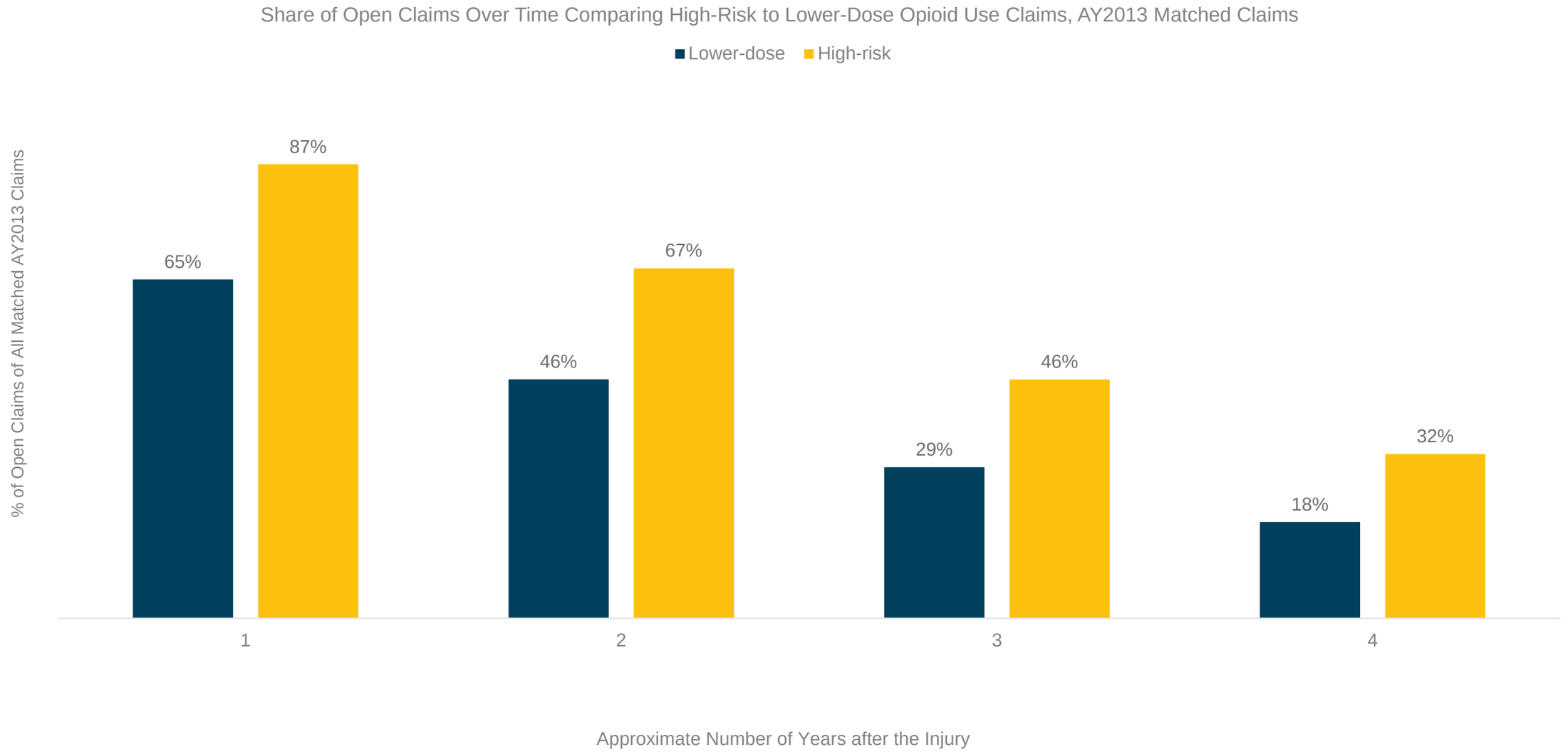
Source: WCIRB Medical Transaction Data

High-Risk Opioid Use Claims are Significantly More Costly than Similar Lower-Dose Use Claims (approximately Four Years after the Injury)



Source: WCIRB Unit Statistical Report data up to fourth report level (54 months from policy inception)

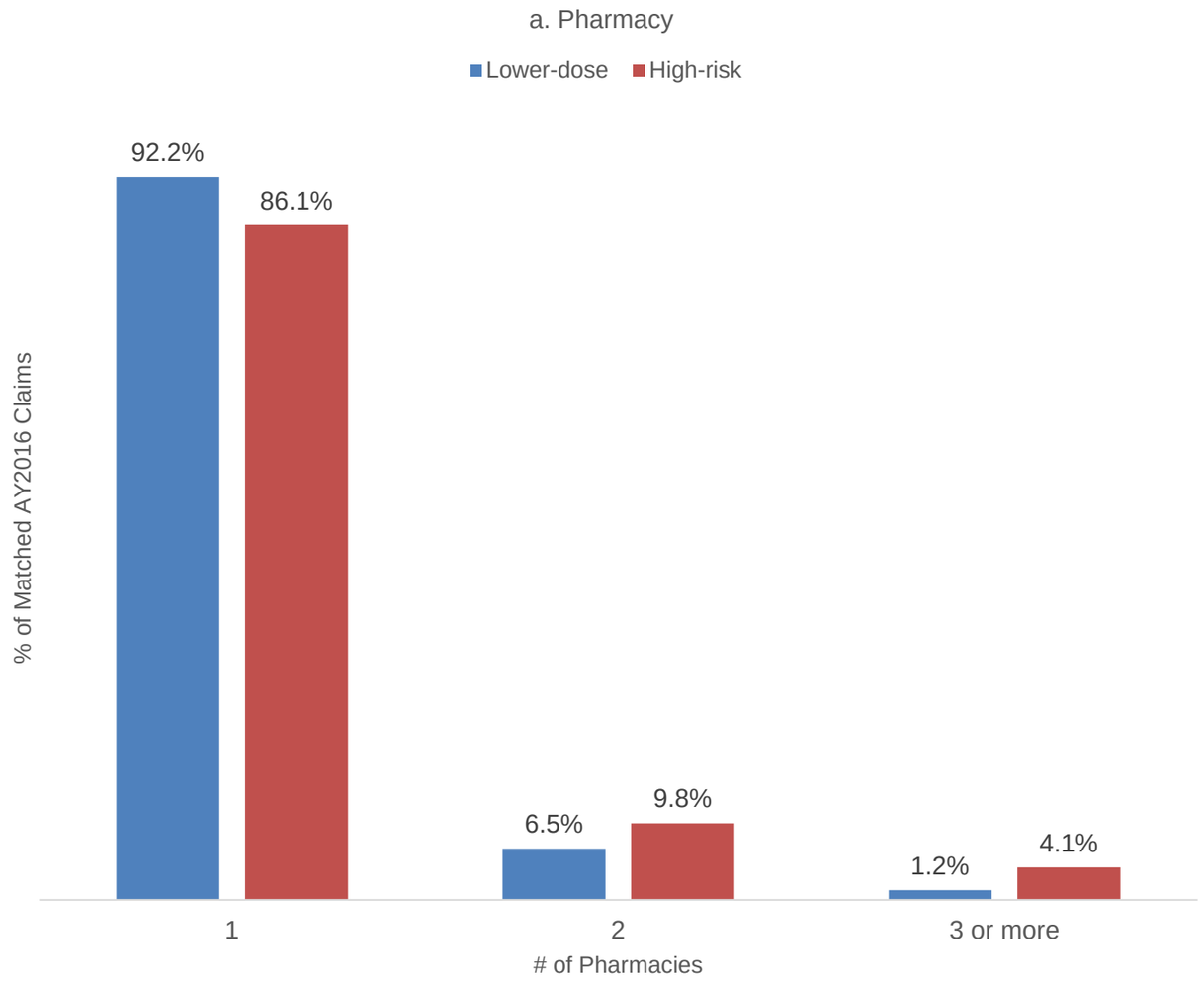
High-Risk Opioid Use Claims are More Likely to Remain Open than Similar Lower-Dose Use Claims

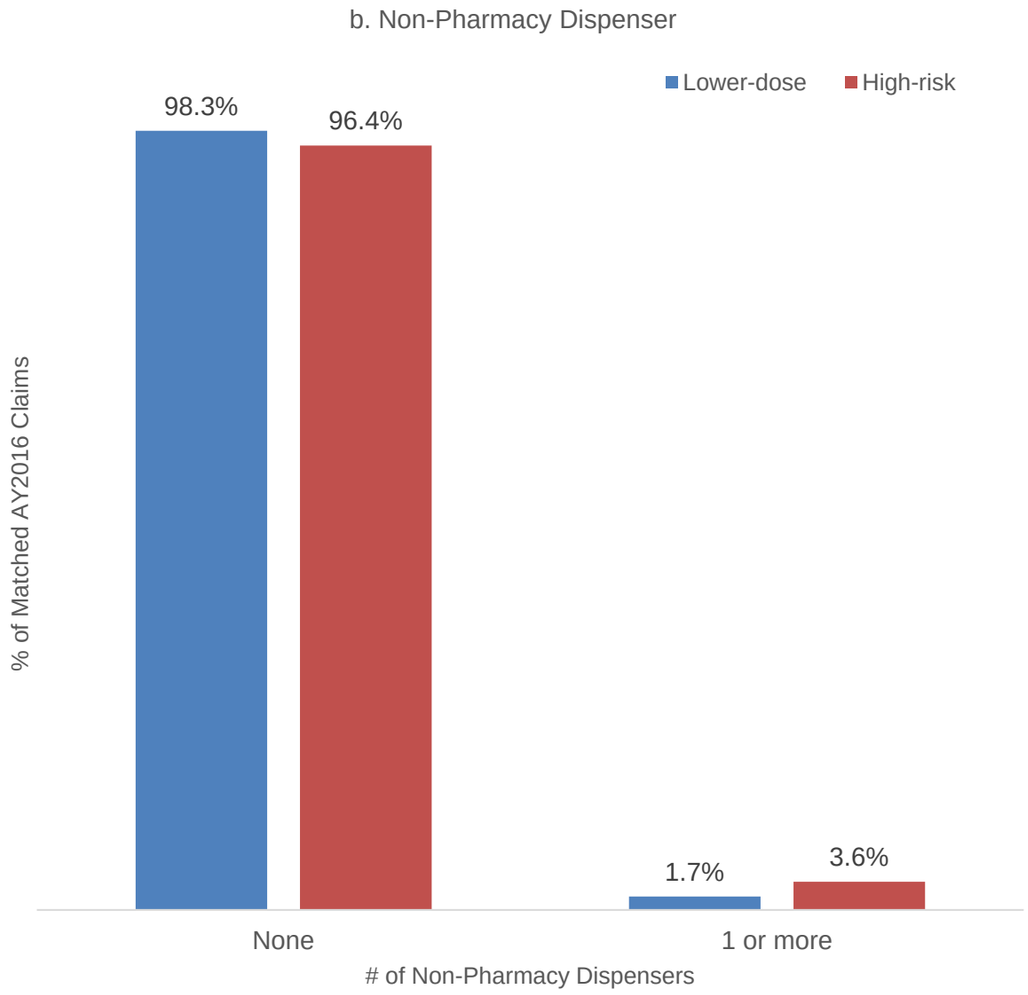


Source: WCIRB Unit Statistical Report data up to fourth report level (54 months from policy inception)

Early Indicator #1: Obtaining Similar Opioids from Multiple Dispensers (Pharmacy & Non-Pharmacy Dispenser)

- High-risk use claims: ~**2X more likely** to involve multiple pharmacies and non-pharmacy dispensers

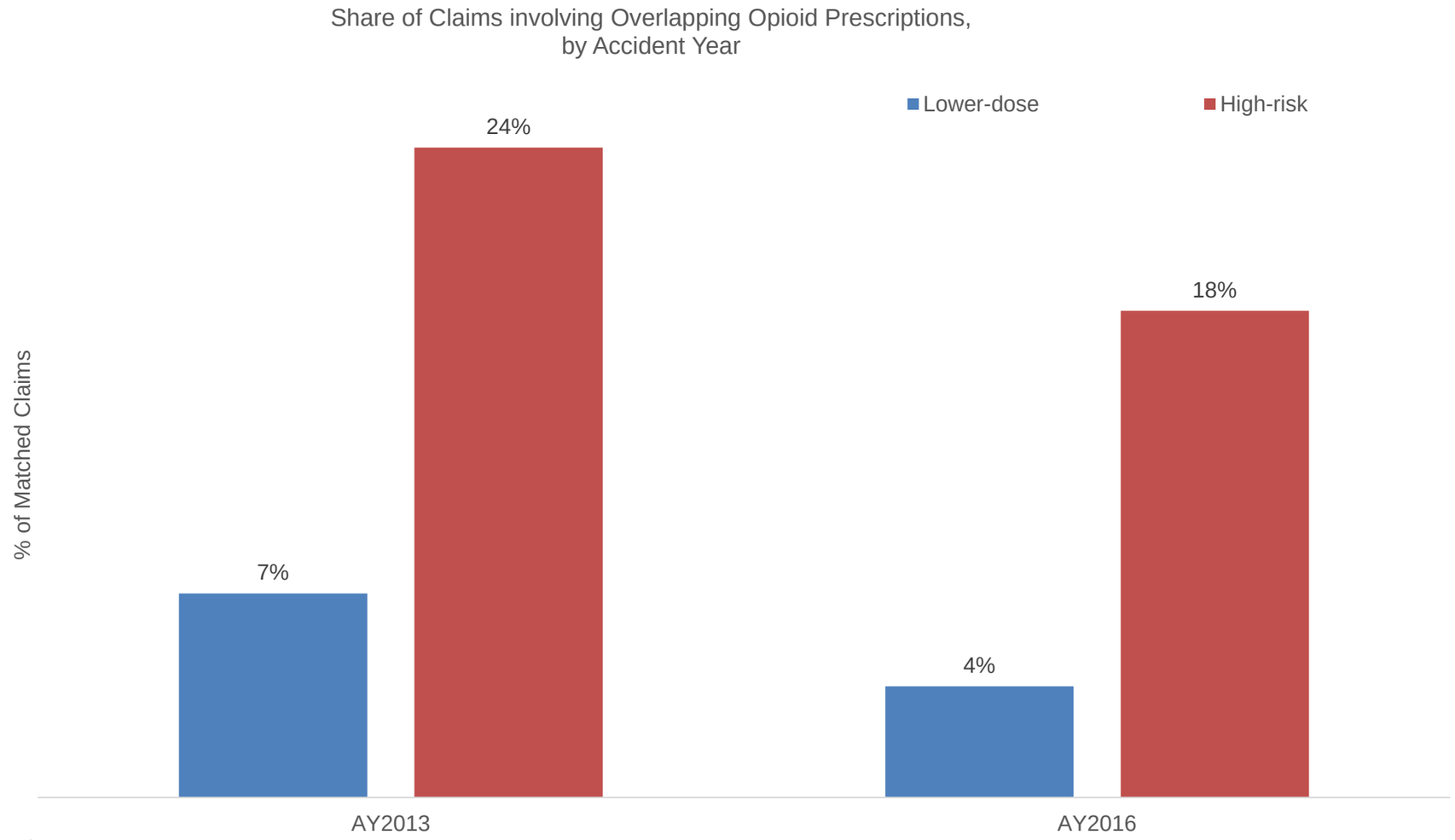




Source: WCIRB Medical Transaction Data

Early Indicator #2: Overlapping Opioid Prescriptions

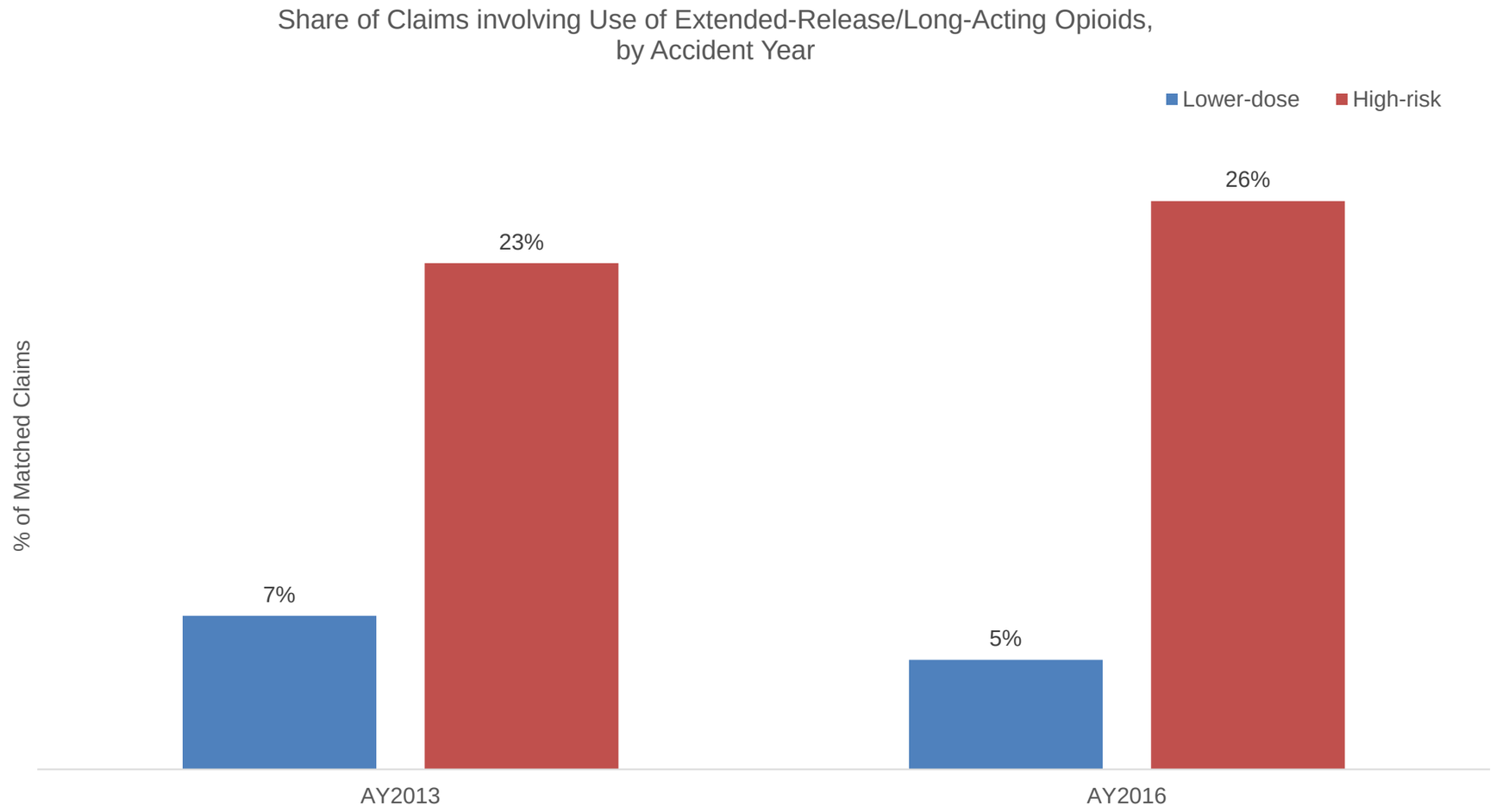
- Overlapping opioid prescriptions was shown to increase the risk of opioid overdose by 3X
- High-risk use claims: **~5X** more likely to have overlapping opioids



Source: WCIRB Medical Transaction Data

Early Indicator #3: Use of Extended-Release/Long-Acting Opioids

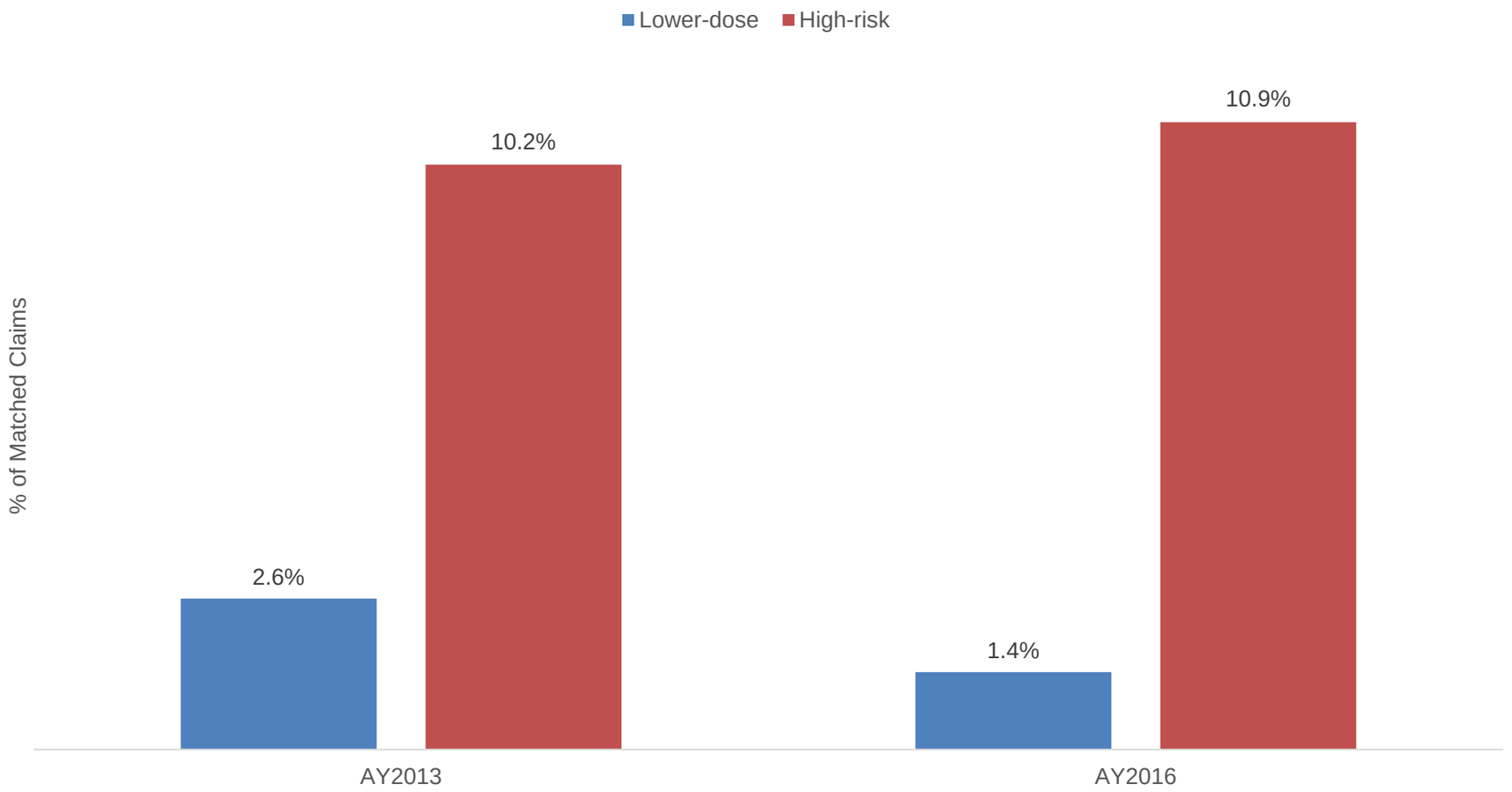
- Higher risk of opioid overdose among patients using ER/LA opioids
- High-risk use claims: ~**5X more likely** to use ER/LA opioids



Source: WCIRB Medical Transaction Data

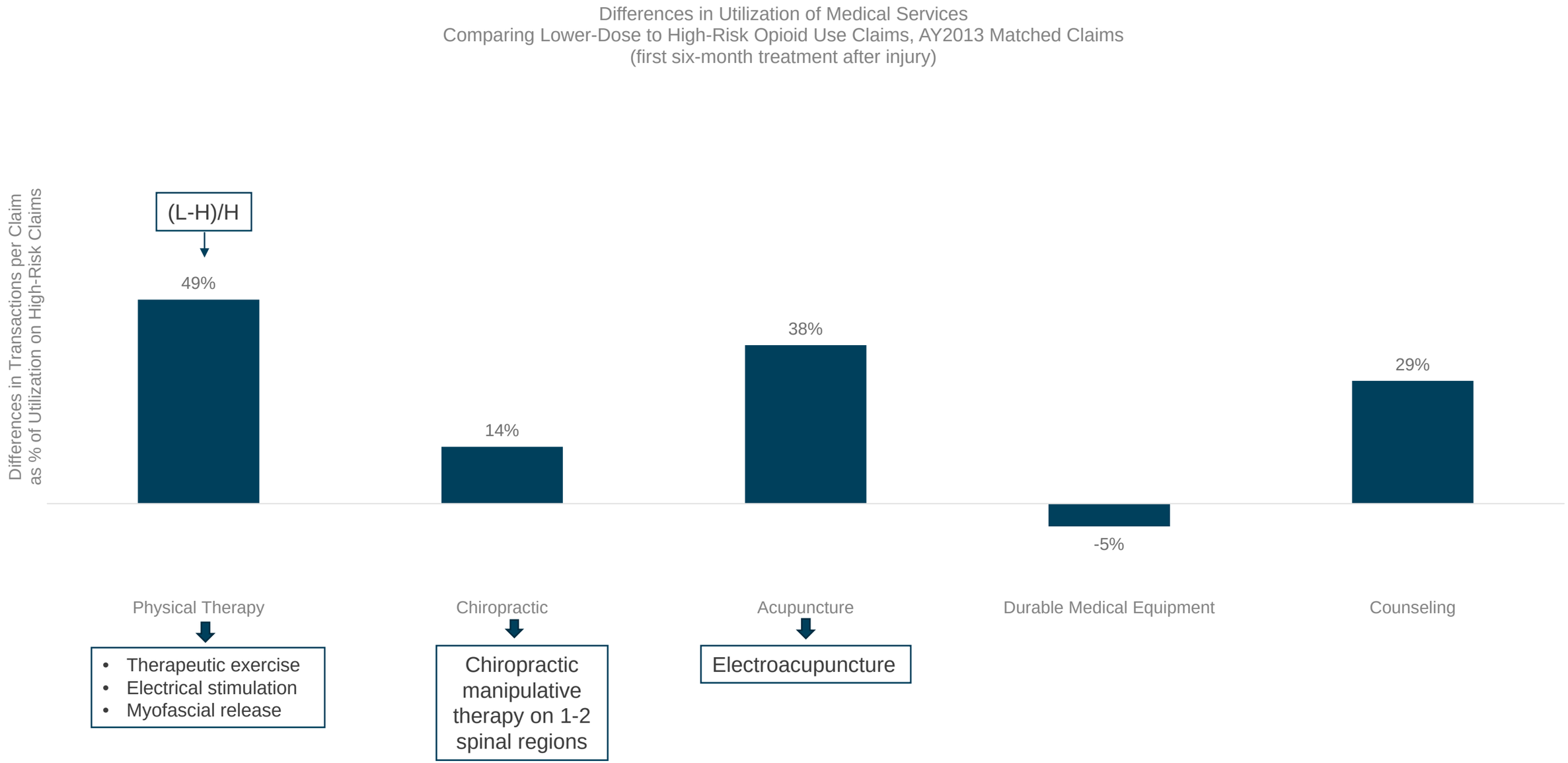
Early Indicator #4: Concurrent Use of Opioids and Benzodiazepines

- Higher risk of fatal drug overdose
- High-risk opioid use claims: **~7X more likely** to take opioids and Benzodiazepines together



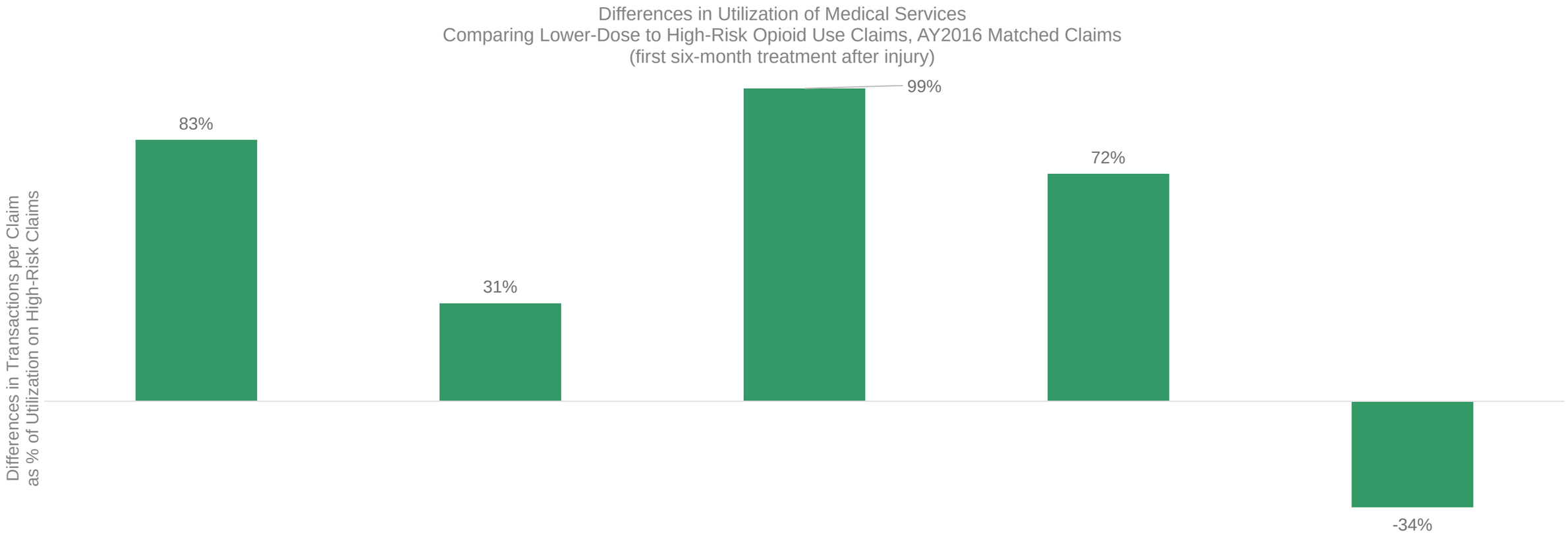
Source: WCIRB Medical Transaction Data

Alternative Non-Drug Treatments for AY2013 Matched Claims



Source: WCIRB Medical Transaction Data

Alternative Non-Drug Treatments for AY2016 Matched Claims



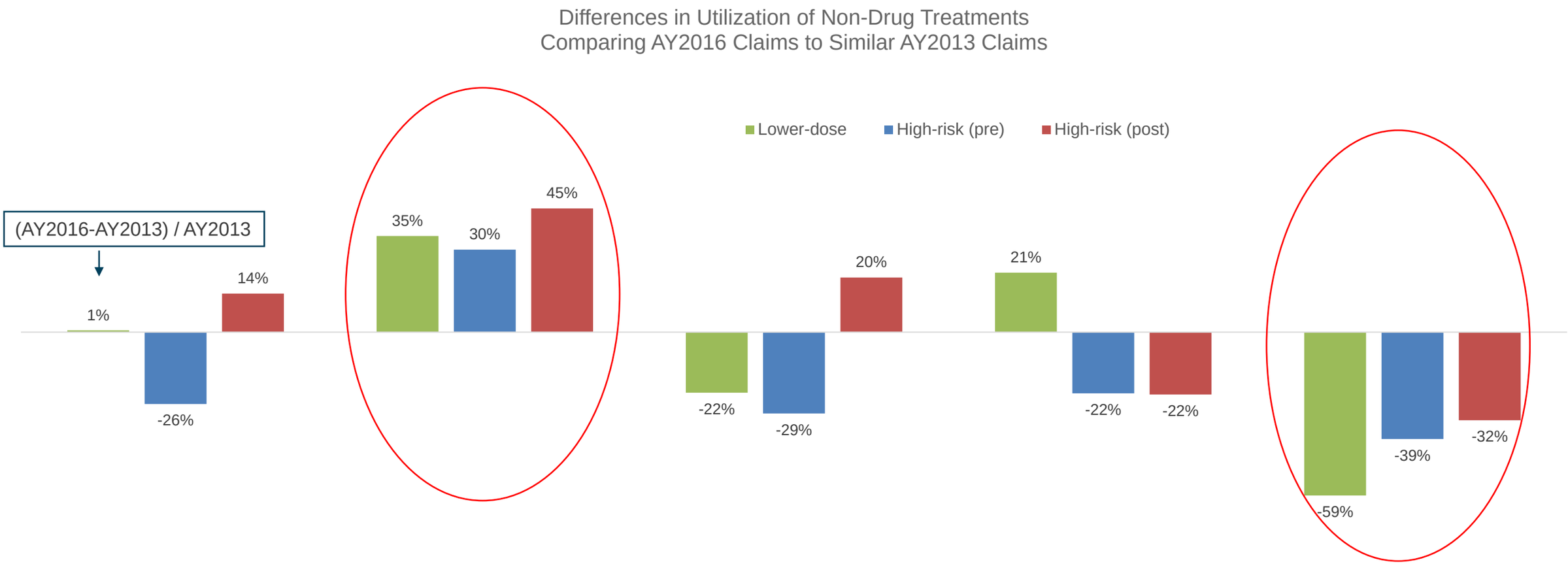
- Therapeutic exercise
- Manual therapy techniques
- Kinetic activities

Chiropractic manipulative therapy on 1-2 spinal regions

Electroacupuncture

Source: WCIRB Medical Transaction Data

Changes in Non-Drug Treatment Patterns Over Time:



Less:
- Electrical stimulation

More:
- Therapeutic exercise
- Kinetic activities
- Neuromuscular re-education

Electroacupuncture

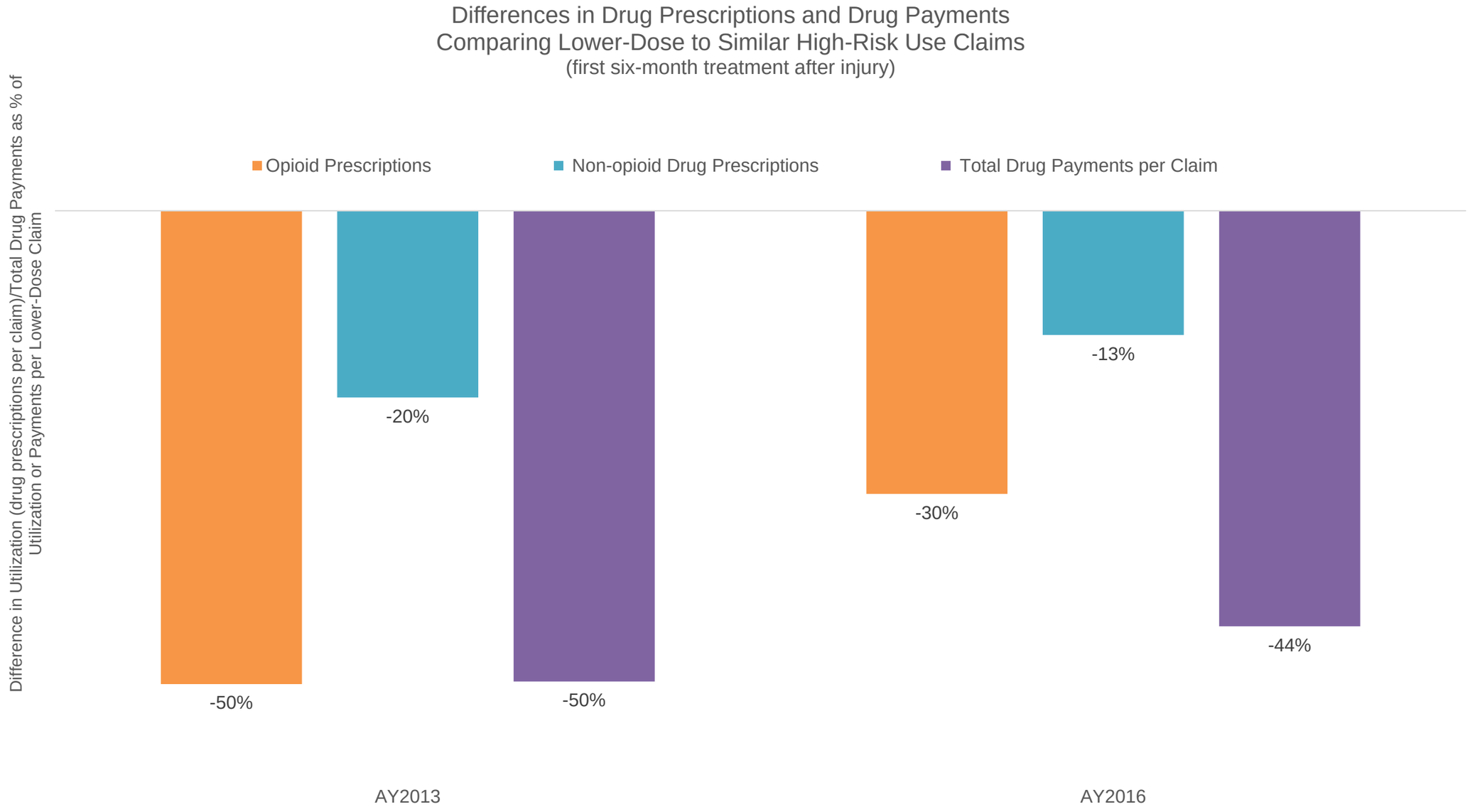
Newer and more complex equipment

Less:
- Biofeedback training

More:
- Psychotherapy

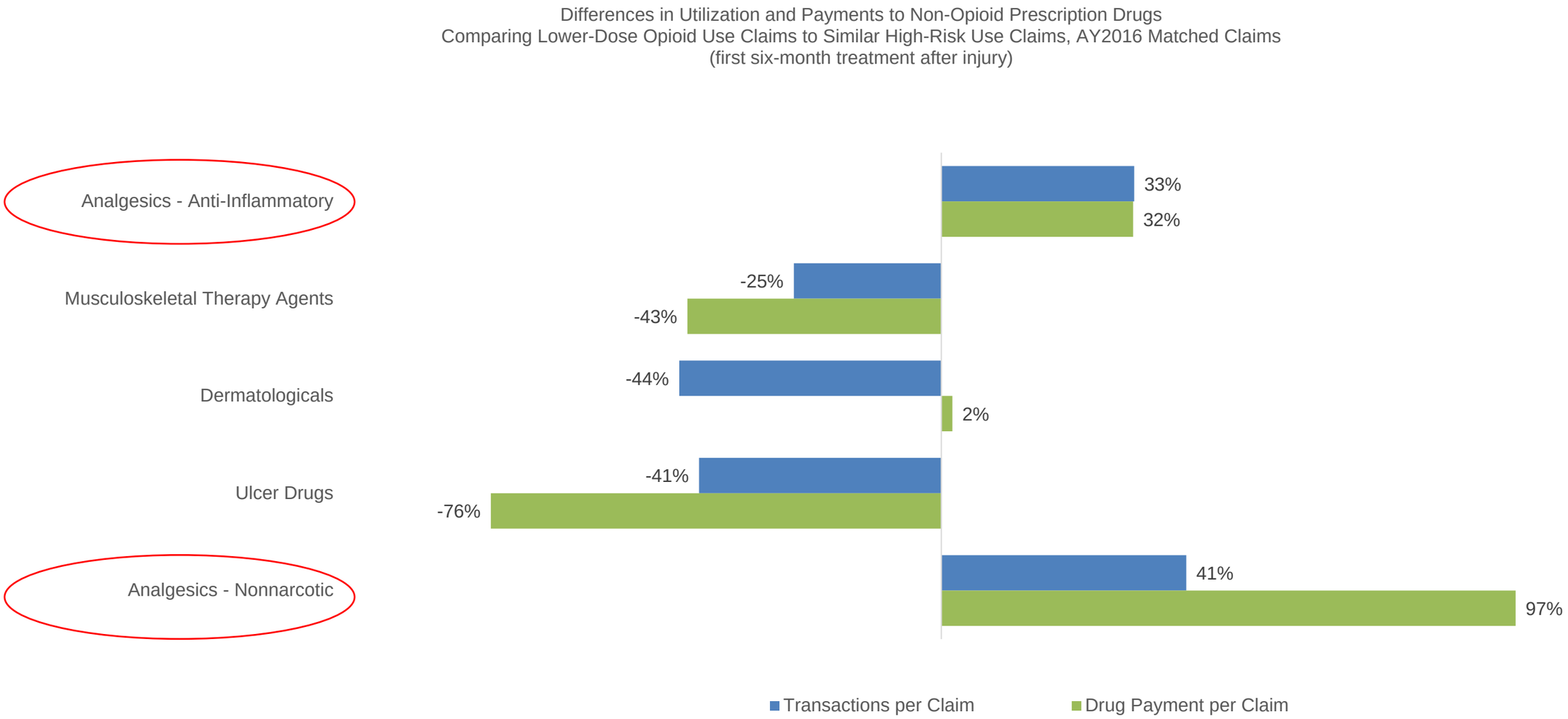
Source: WCIRB Medical Transaction Data

Alternative Drug Treatment: Reduced Opioid Use



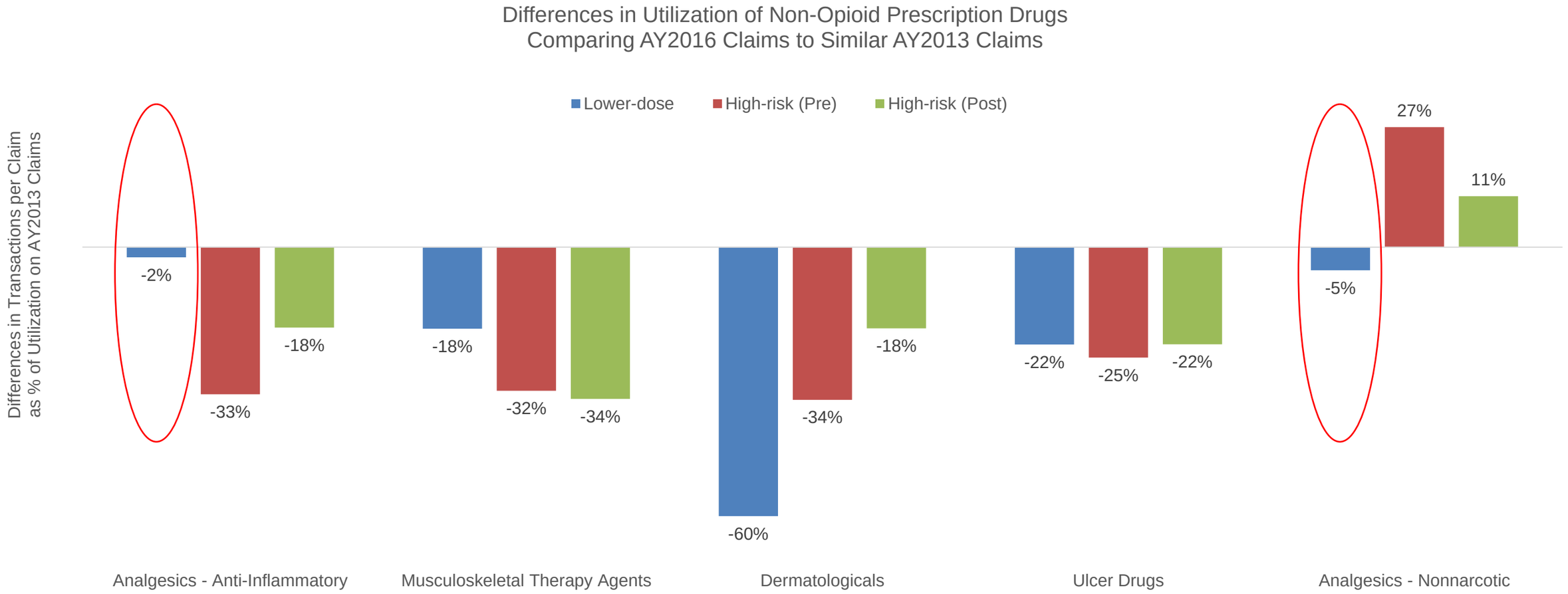
Source: WCIRB Medical Transaction Data

Non-Opioid Drug Treatments for AY2016 Matched Claims



Source: WCIRB Medical Transaction Data

Changes in Drug Treatment Patterns Over Time



Source: WCIRB Medical Transaction Data

Conclusions

- Newer claims are 50% less likely to involve high-risk opioid use (2.5% of AY2013 claims to 1.4% of AY2016 claims).

- A smaller group of claims still involve high dosages and extended use of opioids:
  - **2X** more costly and **2X** more likely to remain open (approximately four years after the injury)
  - Get similar opioids from multiple dispensers: **2X** more likely (multiple pharmacies and non-pharmacy dispensers)
  - Overlapping opioid prescriptions: **5X** more likely
  - Use of extended-release/long-acting opioids: **5X** more likely
  - Concurrent use of opioids and benzodiazepine: **7X** more likely

- **Physical therapy, acupuncture and chiropractic services** were found to be utilized consistently and significantly more on lower-dose use claims than high-risk use claims.

- **NSAIDs** and **non-narcotic analgesics** were also found to be used significantly more in lower-dose opioid use claims than high-risk use claims.

- Newer claims used:
  - Similar amount of physical therapy but **more therapeutic exercise, kinetic activities and neuromuscular re-education**
  - **More acupuncture** treatments
  - **Modest declines in NSAIDs and non-narcotics** but significantly less of almost all types of pharmaceuticals

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