Benchmarking of Budget Impact Results:
An Updated Systematic Review of US Budget Impact Analyses

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INTRODUCTION

- To inform drug formulary decision-making, US reimbursement authorities (e.g., US healthcare plans) commonly require budget impact analyses (BIAs) to estimates the financial impact of certain treatments among a target population after a new healthcare technology is adopted
- Results of BIAs from a US payer perspective are typically reported as budget impact (BI) per member per month (PMPM)
- However, unlike with cost-effectiveness analyses, which often rely on the use of established thresholds (e.g., $100,000 to $150,000/QALY gained in the US) to define what is an acceptable cost-effectiveness ratio, proper interpretation of BI PMPM is hampered by the lack of accepted pre-specified PMPM thresholds defining what is a financially acceptable BI
- As a result, author-provided interpretations regarding BIA acceptability could be misleading
- In this context, we updated a prior systematic review of published US BIAs[1] to establish PMPM benchmarks and assess how BIA authors qualitatively interpreted their own results

OBJECTIVES

- To update a previous systematic review of full-text, peer-reviewed BIAs for pharmacotherapy from a US payer perspective to establish BI PMPM benchmarks
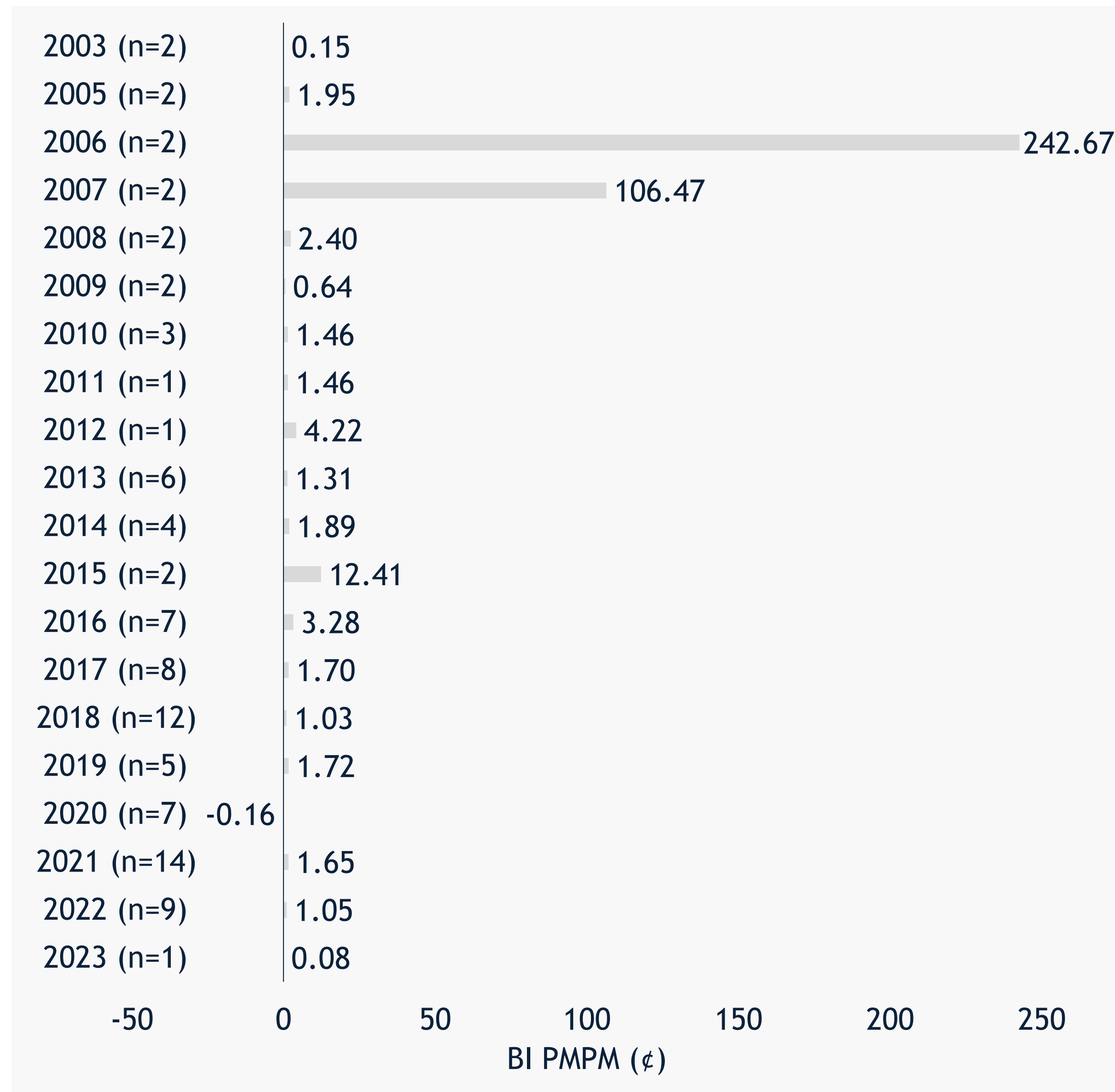- To assess the association between BI PMPM and authors' interpretation

METHODS

- Systematic PubMed/Embase searches (01/2003-3/2023) were conducted to identify full-text, peer-reviewed BIAs that reported BI PMPM associated with pharmacotherapies from a US payer perspective
- The key outcomes measure was the cumulative distribution of BI PMPM estimates
- Association between a BI PMPM reported by authors and these authors' interpretations were analyzed descriptively
- All BI PMPM estimates were inflation-adjusted to 2022 US dollars

RESULTS

- Of the 92 identified BIAs, 48 (52%) were published in or after 2018 **(Fig.1)**
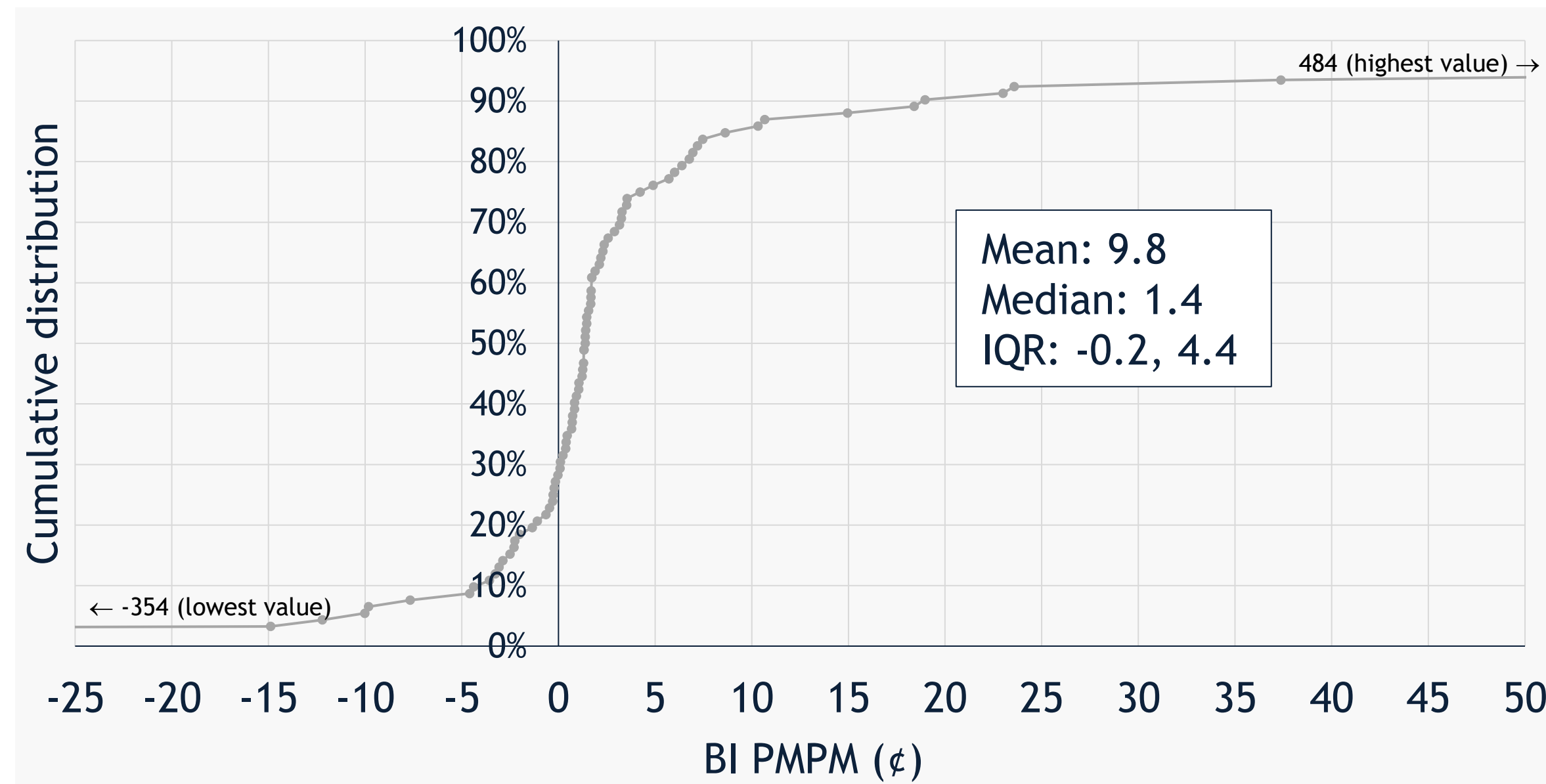
RESULTS (cont'd)

Figure 1. Median BI PMPM (¢) by Year of Publication (N=92)

Year	BI PMPM (¢)
2003 (n=2)	0.15
2005 (n=2)	1.95
2006 (n=2)	242.67
2007 (n=2)	106.47
2008 (n=2)	2.40
2009 (n=2)	0.64
2010 (n=3)	1.46
2011 (n=1)	1.46
2012 (n=1)	4.22
2013 (n=6)	1.31
2014 (n=4)	1.89
2015 (n=2)	12.41
2016 (n=7)	3.28
2017 (n=8)	1.70
2018 (n=12)	1.03
2019 (n=5)	1.72
2020 (n=7)	-0.16
2021 (n=14)	1.65
2022 (n=9)	1.05
2023 (n=1)	0.08

BI, budget impact; PMPM, per member per month
No study published in 2004 was identified

- Of the 92 base case BI PMPM, the median (interquartile range [IQR]) was ¢1.4 (¢-0.2, ¢4.4) **(Fig.2)**
- Of the 92 BI PMPM, 66 (72%) reported BI PMPM >¢0, among which the median (IQR) was ¢2.2 (¢1.3, ¢7.1) **(Fig.3)**

Figure 2. Cumulative Distribution of BI PMPM (¢, N=92)

Mean: 9.8
Median: 1.4
IQR: -0.2, 4.4

484 (highest value) →
← -354 (lowest value)

BI, budget impact; IQR, interquartile range; PMPM, per member per month

RESULTS (cont'd)

Figure 3. Cumulative Distribution of BI PMPM Among PMPM >¢0 (N=66)

Mean: 22.3
Median: 2.2
IQR: 1.3, 7.1

484 (highest value) →
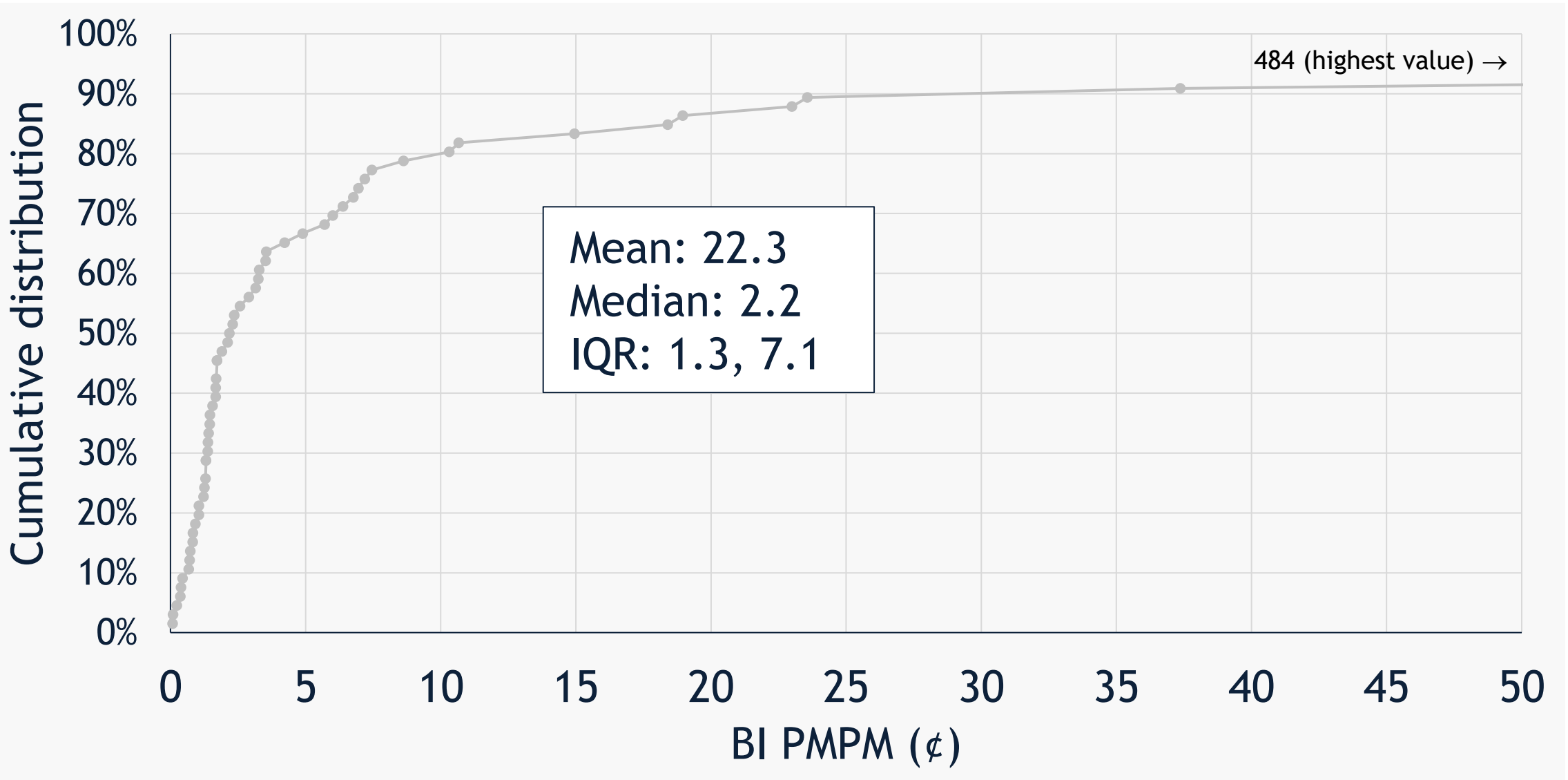
BI, budget impact; IQR, interquartile range; PMPM, per member per month

- Of the 66 BI PMPMC >¢0, 56 (84.8%) had interpretations by their authors
- Among the most common terms used to describe financial acceptability for PMPM>¢0, interpretation patterns by quartile (ordered here from lowest to highest) were ambiguous ("minimal": 29%/25%/12%/12%; "small": 29%/31%/19%/0%; "modest": 12%/19%/31%/18%) **(Fig. 4)**
- On the other hand, interpretations appeared to be more frequently provided for lower versus higher PMPM quartiles: Q1 (i.e., lowest quartile), 100%; Q4 (i.e., highest quartile), 71% **(Fig.4)**

Figure 4. Interpretation by BI PMPM Quartile Among PMPM >¢0 (N=66)

Legend:
- Not specified
- IV Considerable / Significant / Substantial / Exceed most benchmarks
- III Modest / Relatively modest
- III Moderate / Manageable / Affordable / Justifiable / Acceptable / Not significant
- II Small / Relatively small
- II Minimal / Relatively minimal
- II Limited / Relatively limited / Low / Relatively low / Negligible / Neutral / Mild / Slight / Gradual
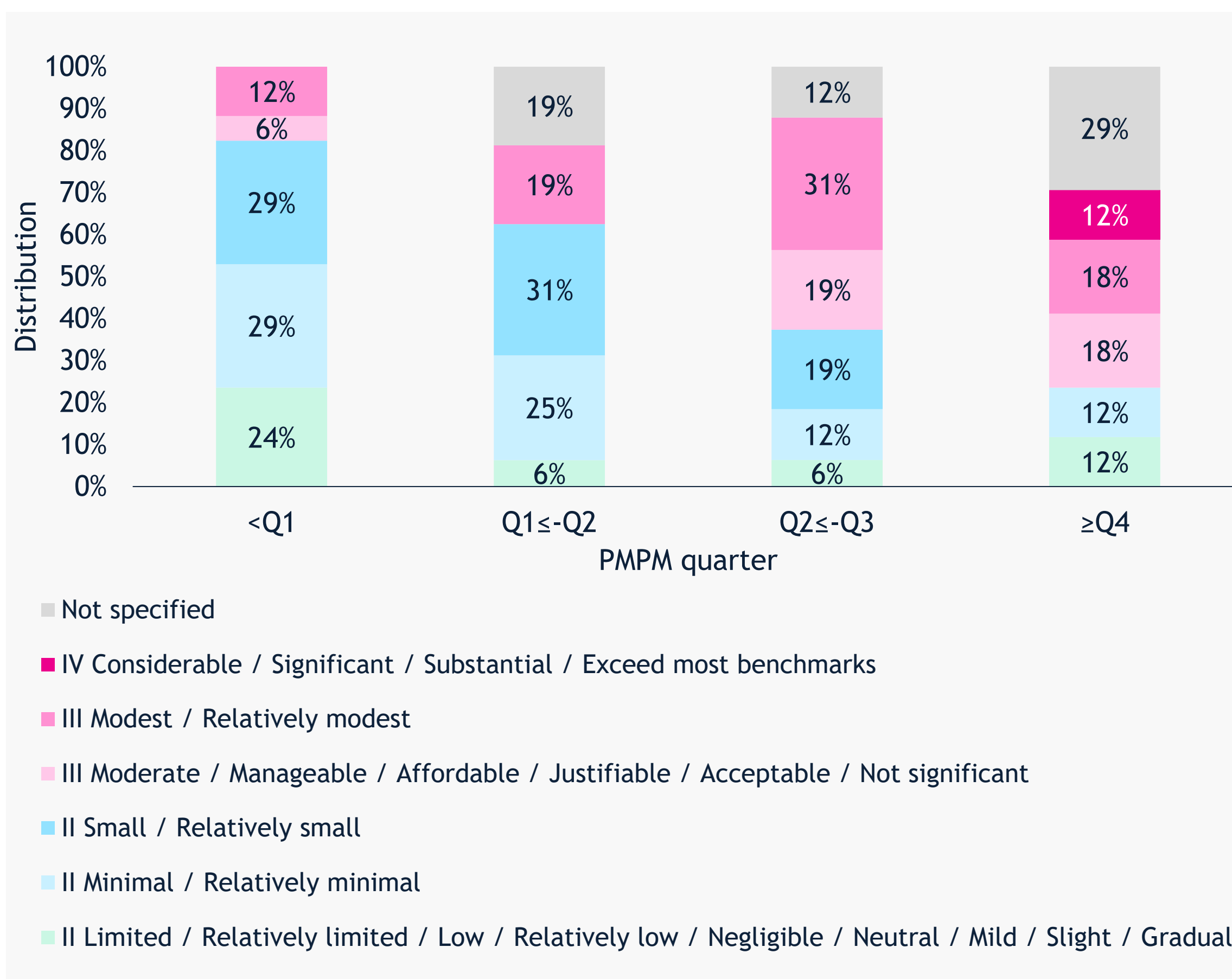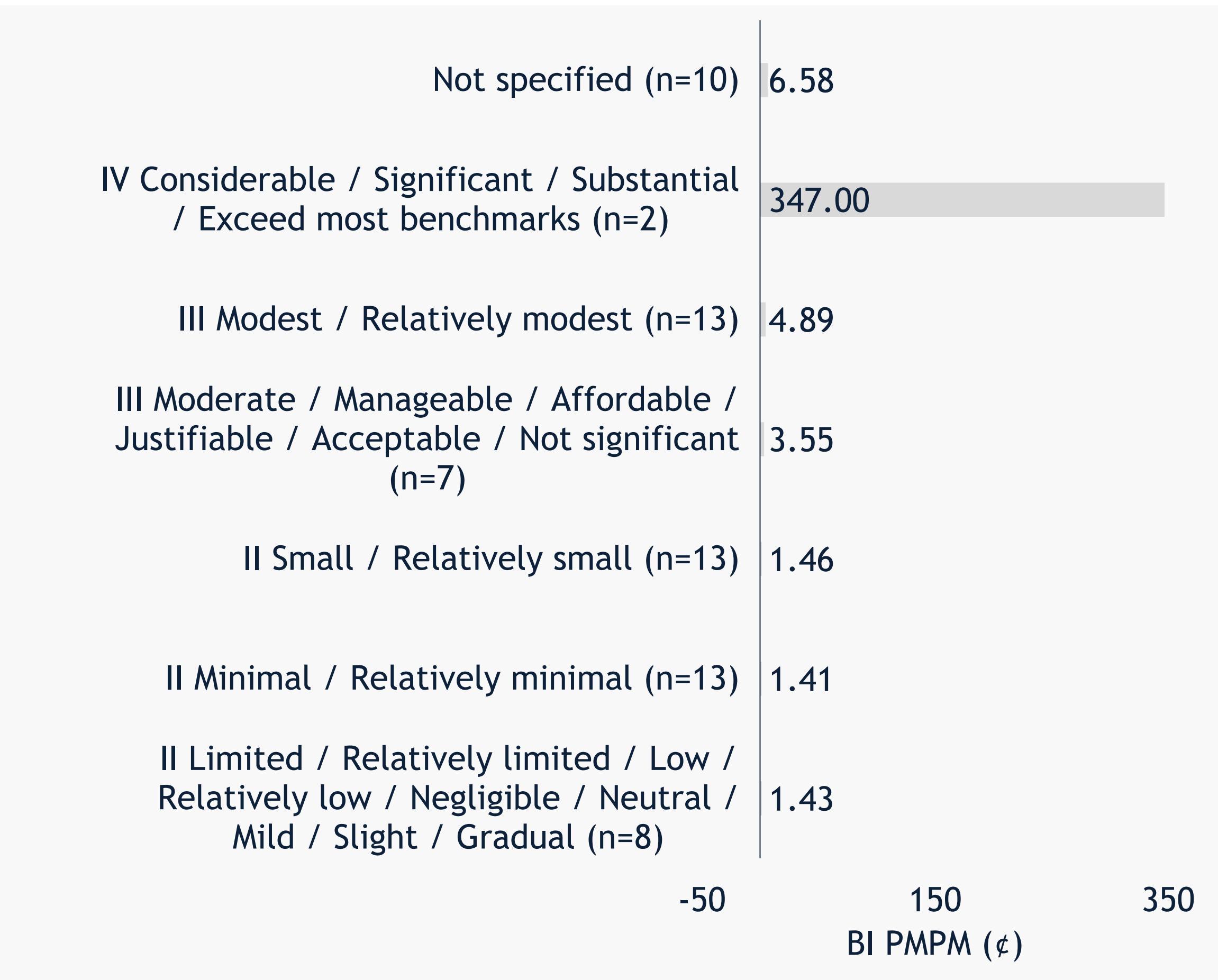
BI, budget impact; IQR, interquartile range; PMPM, per member per month

RESULTS (cont'd)

- When analyzed by interpretation term, the median PMPM was lowest for "minimal" (¢1.4), followed by "limited/etc." (¢1.6), "small" (¢1.5), "moderate/etc." (¢3.6), "modest" (¢4.9), no interpretation (¢6.6), and "considerable/etc." (n¢347.0) **(Fig.5)**

Figure 5. Median BI PMPM (¢) by Interpretation Among PMPM >¢0 (N=66)

Interpretation	BI PMPM (¢)
Not specified (n=10)	6.58
IV Considerable / Significant / Substantial / Exceed most benchmarks (n=2)	347.00
III Modest / Relatively modest (n=13)	4.89
III Moderate / Manageable / Affordable / Justifiable / Acceptable / Not significant (n=7)	3.55
II Small / Relatively small (n=13)	1.46
II Minimal / Relatively minimal (n=13)	1.41
II Limited / Relatively limited / Low / Relatively low / Negligible / Neutral / Mild / Slight / Gradual (n=8)	1.43

BI, budget impact; PMPM, per member per month

CONCLUSIONS

- We provide updated benchmarks for BI PMPM for US BIAs
- Additional research is needed to establish benchmarks to guide BI interpretation that account for other factors like therapeutic area, disease burden, and disease rarity
- Authors might want to refrain from providing potentially misleading qualitative judgments regarding BI acceptability

ACKNOWLEDGEMENTS

REFERENCE

1. Waldeck, M., Liu, R., Kumar, V.M. and Botteman, M., 2019. PNS54 SYSTEMATIC REVIEW AND BENCHMARKING OF US BUDGET IMPACT ANALYSES. Value in Health, 22, p.S295.