

EXHIBIT F

**UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF OHIO  
EASTERN DIVISION**

<b>IN RE: NATIONAL PRESCRIPTION</b>	)	<b>MDL 2804</b>
<b>OPIATE LITIGATION</b>	)	
	)	<b>Case No. 1:17-md-2804</b>
	)	
<b>THIS DOCUMENT RELATES TO:</b>	)	<b>Judge Dan Aaron Polster</b>
	)	
<i>ALL THIRD PARTY PAYOR ACTIONS</i>	)	

**EXPERT REPORT OF PROFESSOR MEREDITH ROSENTHAL REGARDING  
ALLOCATION OF SETTLEMENT PROCEEDS**

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## I. EXECUTIVE SUMMARY

1. I have been asked by Class Counsel for the Third-Party Payor (“TPP”) plaintiffs in this matter to propose a method of allocation for the Settlement with Cencora, Inc. (f/k/a AmerisourceBergen Drug Company), Cardinal Health, Inc., and McKesson Corporation (hereafter, “Settling Distributors” or “Defendants”). I understand that the Settlement is intended to compensate TPPs for overcharges related to the alleged involvement of the Settling Distributors in failing to uphold their legal obligations on the distribution of opioids. In this report, I describe an allocation method that relies on data reasonably available to TPPs and reflects the impact of Defendants’ alleged misconduct. In particular, the proposed allocation takes as its point of departure either: (1) the total dollar value of opioid claims and of medical treatment for enrollees with opioid use disorder (“OUD”); or (2) the number of enrollees or beneficiaries covered by the TPP, with adjustments to reflect the disproportionate impact of Defendants’ conduct in specific states that were most vulnerable to opioid overuse.

2. Based on similar allocation approaches in other opioid matters and adapting methods developed in the academic literature, I propose and demonstrate the use of an allocation method that is feasible given data constraints faced by class members, that relies on methods used by economists to estimate impacts of opioid marketing and increased supply, and that ensures that TPPs that were impacted more by the alleged misconduct receive a larger share of the Settlement. In addition to proposing two alternate approaches to calculating allocation shares for TPPs with and without claims data, respectively, I have also described how these methods could be applied for plaintiffs that cover only prescription drugs or medical care, but not both. Because the class period (1996-2024) covers periods where most TPPs would not have access to complete claims data, I also propose an allocation methodology for years where claims data are missing.

3. I reserve the right to update my analyses and conclusions if additional information becomes available.

## II. QUALIFICATIONS

4. My name is Meredith B. Rosenthal. I am the C. Boyden Gray Professor of Health Economics and Policy at the Harvard T.H. Chan School of Public Health and an Academic Affiliate of Greylock McKinnon Associates (“GMA”), a consulting and litigation support firm. My principal research interests concern the economics of the health care industry, including pharmaceuticals.

5. At Harvard, I have taught undergraduate-, Masters-, and Ph.D.-level health economics and health policy courses. I have conducted research on a wide variety of health economics topics, with a focus on the financing and organization of the U.S. health care system. Specific topics that I have studied include the effect of payment incentives on provider behavior,<sup>1</sup> payment and delivery system reform,<sup>2</sup> and advertising of prescription drugs.<sup>3</sup> I have published more than 170 peer-reviewed journal articles, essays, and book chapters.

6. Since 1996, I have worked through GMA as an expert in health economics on litigation in health care markets and in the pharmaceutical industry. I have submitted written and oral testimony in litigation regarding allegations of foreclosure of generic entry, improper marketing of opioids in the National Opioid Litigation, fraudulent use of list prices, anticompetitive contracting, and violations of the false claims act. In addition, I have presented written testimony directly related to the allocation of the class settlement between TPPs and defendants in *In re*:

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<sup>1</sup> M. Rosenthal, “Risk Sharing and the Supply of Mental Health Services,” *Journal of Health Economics*, 19(6), November 2000, pp. 1047-65; M. Rosenthal, *et al.*, “From Concept to Practice: Early Experience with Pay-for-Performance,” *Journal of the American Medical Association*, 294(14), October 2005, pp. 1788-93; M. Rosenthal, *et al.*, “Impact of Financial Incentives for Prenatal Care on Birth Outcomes and Spending,” *Health Services Research*, 44(5), Part 1, October 2009, pp. 1465-79.

<sup>2</sup> M. Rosenthal, “Beyond Pay for Performance – Emerging Models of Provider-Payment Reform,” *New England Journal of Medicine*, 359(12), September 2008, pp. 1197-1200; M. Rosenthal, *et al.*, “Effect of a Multipayer Patient-Centered Medical Home on Health Care Utilization and Quality: The Rhode Island Chronic Care Sustainability Initiative Pilot Program,” *JAMA Internal Medicine*, September 2013, pp. 1907-13; S. Edwards, M. Abrams, M. Rosenthal, *et al.*, “Structuring Payment to Medical Homes After the Affordable Care Act,” *Journal of General Internal Medicine*, 2014, pp. 1410-13.

<sup>3</sup> M. Rosenthal, *et al.*, “Promotion of Prescription Drugs to Consumers,” *The New England Journal of Medicine*, 346(7), February 2002, pp. 498-505; M. Rosenthal, *et al.*, “Demand Effects of Recent Changes in Prescription Drug Promotion,” *Forum for Health Economics & Policy*, 6(1), January 2003, pp. 1-26; M. Mello, M. Rosenthal, and P. Neumann, “Direct-to-Consumer Advertising and Shared Liability for Pharmaceutical Manufacturers,” *Journal of the American Medical Association*, 289(4), January 2003, pp. 477-81; J. Donohue, *et al.*, “Effects of Pharmaceutical Promotion on Adherence to the Treatment Guidelines for Depression,” *Medical Care*, 42(12), December 2004, pp. 1176-85.

*McKinsey & Co., Inc. National Prescription Opiate Consultant Litig.*, No. 21-md-02996-CRB (SK) (N.D. Cal.).

7. I received an A.B. in International Relations from Brown University in 1990 and a Ph.D. in Health Policy (Economics Track) from Harvard University in 1998. A more complete description of my qualifications is found in my *Curriculum Vitae*, which is included as Attachment A to this report. Attachment A also includes a list of my testimony in the past four years and a list of my publications. Attachment B is a listing of the materials I relied upon in forming the opinions included in this report. GMA is currently compensated at a rate of \$950 per hour for my time. I may also receive additional compensation from GMA based on staff billings in this matter. Neither my nor GMA's compensation in this matter is contingent upon the outcome of this litigation. Should additional materials become available after the submission of this report and if asked to do so by counsel or the Court, I reserve the right to update my analysis.

### III. INTRODUCTION

8. Since 2017, more than 150 lawsuits have been brought by TPPs against Defendants, some as individual cases and others on behalf of TPP classes. The complaints allege that the Settling Distributors participated with opioid manufacturers and others in the misconduct that increased demand and flooded the market with prescription opioids. Settling Distributors are alleged to have willfully disregarded their legal duties regarding monitoring and controlling opioid diversion, leading to oversupply of opioids and the opioid epidemic that continues to this day. TPPs were (and continue to be) affected by the alleged misconduct as they pay for pharmaceuticals for their enrollees, including opioids and other prescription drugs, and medical care, including treatments for opioid use disorder and its complications.

9. The proposed settlement class definition for the TPP class is as follows:

All entities that, during the time period from January 1, 1996, to the date of entry of the Preliminary Approval Order:

- (i) paid and/or were reimbursed for opioid prescription drugs manufactured, marketed, sold, distributed, or dispensed by any of the Defendants and/or Opioid Supply Chain Members for purposes other than resale; and/or

- (ii) paid or incurred costs for treatment related to the misuse, addiction, and/or overdose of opioid drugs, on behalf of individual beneficiaries, insureds, and/or members.
- (iii) For clarity, included in the class are: (a) private contractors of Federal Health Employee Benefits plans, (b) plans for self-insured local governmental entities that have not settled claims in MDL No. 2804, (c) managed Medicaid plans, (d) plans operating under Medicare Part C and/or D, and (e) Taft-Hartley plans.

Excluded from the class are:

- (i) (a) all federal governmental entities and all state and local governmental entities whose claims have been released by a prior settlement with the Settling Distributors, (b) Pharmacy Benefit Managers (“PBMs”), (c) consumers, (d) fully insured plan sponsors, and (e) Excluded Insurers, including all related entities as listed in the definition of Excluded Insurers. For the avoidance of doubt, (i) entities that are administered or operated, but not owned, by an Excluded Insurer and (ii) entities that own an interest, even a controlling interest, in a PBM, are not excluded from the Class, unless they are an Excluded Insurer or are otherwise excluded; and
- (ii) (a) the Settling Distributors and their subsidiaries, affiliates, and controlled persons; (b) officers, directors, agents, servants, or employees of any Settling Distributor, and the immediate family members of any such persons; and (c) persons and entities named as Defendants in any of the Actions coordinated under or parallel to MDL No. 2804.

10. In the remainder of this report, I describe my approach to allocation, which builds on methods first used in peer-reviewed studies in economics and health policy.

#### **IV. PROPOSED METHOD OF ALLOCATION**

11. Conceptually, a fixed settlement to compensate TPPs for overcharges related to the alleged harms should be allocated in a way that reflects the relative burden borne by individual TPPs. This relative burden can be approximated by comparing TPPs’ estimated spending on

opioids with the health care sequelae of opioid addiction (e.g., emergency department visits for opioid overdose). In the following two sections, I describe two alternative methods for estimating opioid-related spending: (1) for those TPPs with claims data (i.e., electronic records of individual claims payment transactions for opioid-related services), and (2) for those TPPs without claims data.

#### **A. Claims-based Approach**

##### **TPPs with Complete Claims Data for the Class Period**

12. The first method of estimating opioid-related spending uses class member claims data for the damage period. These data can be tabulated to construct the two component estimates of opioid-related spending: (1) spending on prescription opioids, including medications for opioid use disorder and (2) the excess health care spending for people with OUD covered by the plan.

13. For the first part of the calculation, TPPs will begin by identifying the relevant claims for opioids based on drug names or National Drug Classification numbers (“NDCs”). TPP paid amounts (the amounts paid to pharmacies by the TPP after the consumer share has been netted out of the total transaction price) will be summed over all relevant claims.

14. For the second part of the calculation, TPPs will count the number of enrollee-years (e.g., if there are ten people per year with OUD in each of five years, that would be 50 OUD person-years) with OUD during the class period and multiply this number by a published estimate of the excess cost of OUD. Patients with OUD should be identified by the presence of a diagnosis code on any medical claim associated with OUD in the year of interest. That is, TPPs should count the unique number of members with any OUD diagnosis in each year and sum these for the number of enrollee-years with OUD.

15. The excess cost of OUD is estimated by researchers by identifying populations as similar as possible except for the presence of a diagnosis of OUD and comparing their annual spending. Davenport, et al. published a report through the Society of Actuaries in 2019 that estimated the medical cost of OUD (excluding prescription drugs, which are separately tabulated as described



above) to be approximately \$19,118 for patients with OUD in 2015 and 2016.<sup>4</sup> I adjust this figure by the Medical Care Consumer Price Index (MC-CPI) to generate the medical cost of OUD for the full class period of 1996 – 2024.<sup>5</sup>

16. TPPs prescription opioid expenditures and OUD expenditures will then be summed up and reported at the state level.

### **TPPs with Incomplete Claims Data for the Class Period**

17. There will be TPPs that can present some claims data but cannot present claims over the full period, especially during the earlier years of the class period. In this case, ARCOS<sup>6</sup> data on total opioid MMEs can be combined with TPP data to estimate TPP expenditures for these years. Figure 1 below shows the trajectory of total MMEs in the United States from 1997 to 2023,<sup>7</sup> calculated using ARCOS data.<sup>8</sup> The percentage change in total MMEs and a measure of medical price inflation sold from one year to the next will be used to interpolate or extrapolate opioid spending for TPPs' with incomplete claims data.

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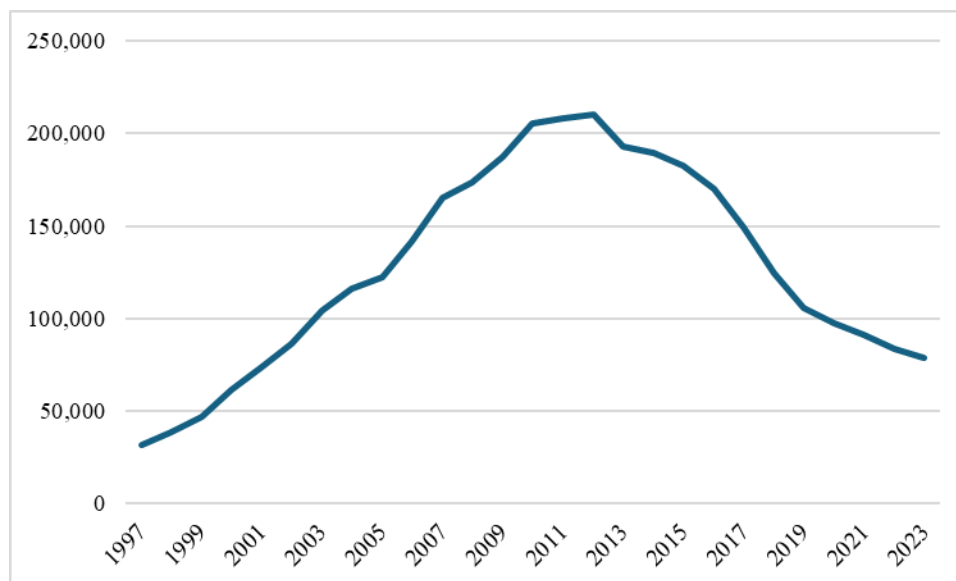
<sup>4</sup> S. Davenport, *et al.*, "Economic Impact of Non-Medical Opioid Use in the United States," *Society of Actuaries*, October 2019, p. 15 (<https://www.soa.org/globalassets/assets/files/resources/research-report/2019/econ-impact-non-medical-opioid-use.pdf>); Figure 8 details additional total spending of \$21,281 per patient with OUD when compared to non-OUD control patient, and net average prescription drug cost of \$2,163, additional spending total of patients diagnosed with OUD is \$19,118 ( $\$21,281 - \$2,163 = \$19,118$ ).

<sup>5</sup> Deflation calculation uses the U.S. Bureau of Labor Statistic's Medical Care Consumer Price Index for all Urban Consumers, seasonally adjusted; Series ID CUSR0000SAM.

<sup>6</sup> ARCOS Retail Drug Summary Reports. Conversion of grams to MMEs is explained in footnote 16 below.

<sup>7</sup> If the damage period ultimately includes part or all of 2024, it is my opinion that settlement shares calculated for the period through 2023 will be a reliable proxy for the longer time period.

<sup>8</sup> Data is unavailable for 1996. Based on the small growth from 1997 to 1998 in total MMEs, I assume that MMEs in 1996 are the same as 1997.

**Figure 1: Total MMEs (Millions), United States, 1997 – 2023<sup>9</sup>**

18. The specific procedure to calculate expenditures in missing years relies on the closest year of data available for a given TPP. First, I estimate the MMEs for missing year using the following calculation:

$$Q Adj_t = Expenditures_i * \left( \frac{ARCOS MME_{s_t}}{ARCOS MME_{s_i}} \right) \quad 1$$

Where  $t$  represents the year with missing TPP data, and  $i$  represents the nearest year of available data.<sup>10</sup> For example, a TPP missing data in 2010, but that has data for 2009 and 2011 would use their 2011 expenditures along with the 2011 ARCOS MMEs as the denominator, and the 2010 figure for the numerators.

19. Prices differ across years as well, however, so a price adjustment is needed to calculate (nominal) spending in the years for which claims data are missing. I again use the MC-CPI to adjust prices:

$$P Adj_t = Q Adj_t * \left( \frac{MC CPI_t}{MC CPI_i} \right) \quad 2$$

<sup>9</sup> ARCOS Retail Drug Summary Reports. The 2000 ARCOS report includes hydrocodone and oxycodone only. I estimate MMEs for the year 2000 of other opioids by taking the average of 1999 and 2001.

<sup>10</sup> When two years of available data are the same distance as the missing year, the claims administrator should use the latter of these.

Where  $P Adj_t$  comes from equation 1 above,  $i$  represents the MC-CPI for the year of available data, and  $t$  is the MC-CPI for the year with missing data.

20. This method can be applied to multiple years of missing data. Table 1 below illustrates these calculations for the hypothetical example.<sup>11</sup> Suppose that a TPP incurred costs related to opioids on behalf of its beneficiaries, from 1997 – 2000, but only has access to claims data starting in 2000. This hypothetical TPP reported OUD expenditures (prescription opioid spending and excess health care costs for beneficiaries with OUD) totaling \$10 million in that year (row [A]). According to Figure 1, total MMEs in 1999 represent 76.3% of the 2000 figure, 1998 is 83.2% of 1999, and 1997 is 82.3% of 1998. These percentages, calculated based on aggregate shipments from ARCOS via Equation 1, give us “quantity adjustments” to translate actual 2000 spending data into estimates for 1999, 1998, and 1997 (row [C]). The price adjustment from Equation 2 results in the hypothetical TPP’s total expenditures, which become \$4.7, \$5.9, \$7.3 and \$10.0 million respectively (row [E]).

**Table 1. Hypothetical Calculations of Opioid-related Spending for TPPs with Incomplete Claims (Figures in Millions)**

Year	1997	1998	1999	2000
[A] TPP Expenditures (\$)	-	-	-	10.0
[B] ARCOS Total MMEs	32,006	38,867	46,690	61,195
[C] Quantity-adjusted Expenditures (\$)	5.2	6.4	7.6	10.0
[D] MC-CPI	239.1	246.8	255.1	266.0
[E] Price-adjusted Expenditures (\$)	4.7	5.9	7.3	10.0

## B. Enrollment-based Approach

21. Some TPP class members may not have access to claims data at all, however. An alternative approach to allocation would instead focus on the size of the affected population, measured in the number of enrollees, and account for differential exposure to the challenged

<sup>11</sup> A full series of the ARCOS total MMEs and MC-CPI will be provided to the claims administrator to use for any missing years.

conduct. In my experience conducting academic research involving TPP data, enrollment data can often be found in reports and regulatory filings, even if electronic data are not available. Thus, an alternative method of estimating opioid-related spending for TPPs without claims data could use these enrollment data as the point of departure. My proposed alternative approach to estimating opioid-related spending from enrollment data is predicated on the fact that the impact of opioid manufacturers' marketing on TPPs is a function of: (1) the size of their covered populations over the class period (i.e., enrollment) and (2) their exposure to the harms caused by the challenged conduct and resulting oversupply. Following recent work exploring the impact of opioid marketing on downstream outcomes, I measure exposure as a function of the geographic location of enrollees given that the opioid epidemic disproportionately impacted states where conditions were favorable for overuse. Notably, while the economic literature that identifies the geographic correlates of the opioid epidemic focuses on the conduct of manufacturers (namely their marketing efforts), it follows that Defendants' alleged joint misconduct and failure to monitor and control opioid diversion impacted TPPs disproportionately in those areas most aggressively targeted by marketing.

### **Geographic Correlated of Opioid Oversupply**

22. I develop the enrollment-based approach by adapting a methodology used by Dennett and Gonsalves (2023), which in turn was built on two earlier economics papers. Dennett and Gonsalves examine the impact of opioid marketing on long-term health outcomes associated with opioid use and addiction.<sup>12</sup> They combine insights from two previous papers (described below) that developed proxies for exposure to opioid marketing and showed that early targeting of states with certain characteristics caused differences in long-term opioid impacts including increased opioid-related health care utilization and spending. The proxies these authors use derive from internal information on Purdue's marketing strategies made public during litigation. First, researchers found that a state's use of triplicate prescription programs, a strict set of prescription drug monitoring policies, was a deterrent to opioid marketing because physicians in states with triplicate prescribing were less likely to use opioids.<sup>13</sup> Second, other researchers

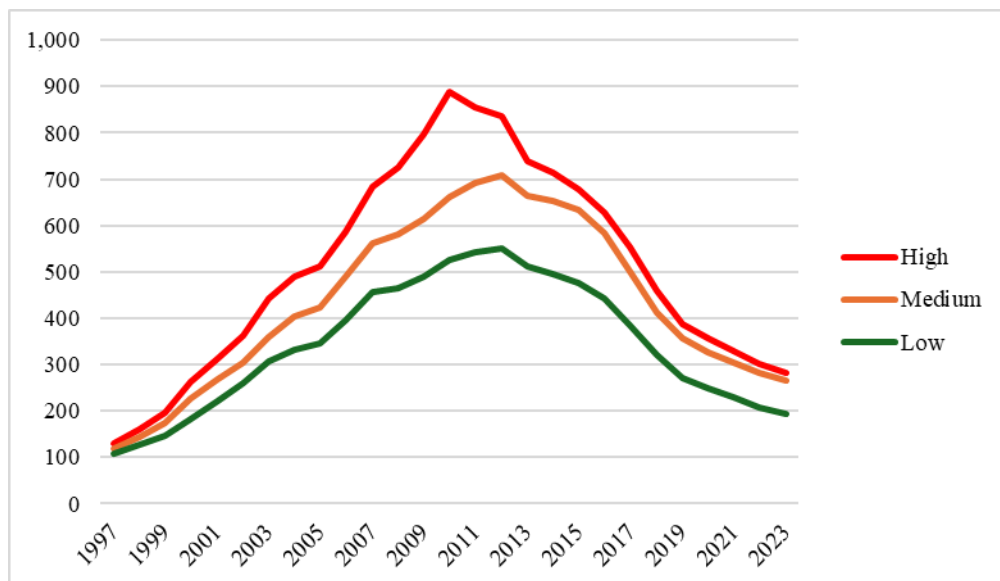
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<sup>12</sup> J.M. Dennett and G.S. Gonsalves, "Early OxyContin Marketing Linked to Long-Term Spread of Infectious Diseases Associated with Injection Drug Use," *Health Affairs*, 42(8), 2023, pp. 1081-90.

<sup>13</sup> A. Alpert, *et al.*, "Origins of The Opioid Crisis and Its Enduring Impacts," *Quarterly Journal of Economics*, 2022, 137(2), pp.1139-79.

found that cancer mortality was a predictor of opioid marketing because these drugs were initially indicated for cancer-related pain.<sup>14</sup> Dennett and Gonsalves combine both proxies to categorize states as low, middle, and high-exposure to opioid marketing. In their primary analysis and a series of robustness checks, they demonstrate that these categories are strong predictors of the long-term consequences of opioid marketing and independent of their dependent variables. Notably, in supplemental analyses, Dennett and Gonsalves demonstrate that their exposure variables are associated with trends in opioid shipments (wholesale quantities).<sup>15</sup> These results corroborate the assumption that the same factors that encouraged unlawful marketing of opioids were also predictive of distributor oversupply of opioids. I replicated this analysis using Drug Enforcement Agency data in Figure 2 below. Figure 2 charts the average milligrams of morphine equivalents (MMEs) per capita for states categorized as low, medium, and high exposure, respectively. As expected, there is a clear difference in the levels of MMEs supplied to states in the three exposure groups.

**Figure 2: Average Opioid MMEs per Capita, by State Exposure Level, 1997 – 2023<sup>16</sup>**



<sup>14</sup> C. Arteaga and V. Barone, “A Manufactured Tragedy: The Origins and Deep Ripples of The Opioid Epidemic,” Working Paper, October 10, 2023 ([https://viquibarone.github.io/baronevictoria/Opioids\\_ArteagaBarone.pdf](https://viquibarone.github.io/baronevictoria/Opioids_ArteagaBarone.pdf)).

<sup>15</sup> Dennett and Gonsalves, *op. cit.*, Supplemental Appendix, Figure S2.

<sup>16</sup> As per Dennett and Gonsalves, Appendix A, opioids included in this chart are those that are consistently reported in ARCOS data over the period: codeine, fentanyl base, hydrocodone, hydromorphone, meperidine, and morphine. The ARCOS report in 2000 includes only hydrocodone and oxycodone. I have estimated missing drug MMEs for the year 2000 by taking the average of 1999 and 2001. I use the gram to MME conversion factors used by Dennett and Gonsalves, Appendix A.

23. Based on the insights from this research, I propose the following approach to estimating opioid-related spending for TPPs that cannot access their own claims data. First, the claims administrator will request that TPPs with claims data report their prescription drug spending and enrollee-years with OUD by state as discussed in section IV.A above. These TPPs will also be required to report their current enrollment by state, based on electronic data that are available for claims adjudication.<sup>17</sup> Second, after calculating total opioid-related spending for each TPP using the claims approach, the claims administrator will calculate an average dollar amount of opioid-related spending per enrollee per year, separately for enrollees in low, middle and high exposure states to reflect the differing impact of the misconduct in these areas. The average opioid-related spending per enrollee per year (for each subgroup of states) for TPPs using the enrollment approach is to be estimated as follows: total estimated opioid-related spending TPPs in the claims-based approach for 1996 - 2023, divided by the product of 28 (the number of years that those spending figures reflect) and the sum of reported current enrollment for TPPs that are also reporting claims-based information.

24. Estimated spending on opioid-related expenses for TPPs that are only able to report enrollment will then be calculated as: the sum of (1) the number of enrollees in low-exposure states multiplied by the average opioid-related spending per enrollee per year in low-exposure states, (2) the number of enrollees in middle-exposure states multiplied by the average opioid-related spending per enrollee in middle-exposure states, and (3) the number of enrollees in high-exposure states multiplied by the average opioid-related spending per enrollee in high-exposure states.

25. To illustrate, imagine the following hypothetical. First, the claims administrator calculates total opioid-related spending and current enrollment for class members that are able to tabulate their claims based on the approach described above. These hypothetical amounts are shown in the first two rows of Table 2 below. The claims administrator then uses the enrollment by state data from these same class members (those that reported claims-based estimates of opioids and enrollee-years with OUD) to calculate the average dollar value of claims per enrollee

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<sup>17</sup> While current enrollment must be available to TPPs to adjudicate claims, these data are continuously updated as members enroll, disenroll, and change plans. Because not all TPPs save annual snapshots of this continuously changing eligibility record, I propose that the claim form request only a current enrollment snapshot, by state.

per year (dividing total claims by 28 – the number of years in the damage period – and the reported total enrollment) in low, middle, and high exposure states. These (hypothetical) amounts are shown in the last row of Table 2.

26. The dollar amounts used for allocation for members without claims data can then be calculated by multiplying the number of enrollee-years for each exposure category by the respective dollar value of claims per enrollee per year for the exposure category. These amounts would be summed for each TPP.

**Table 2. Hypothetical Calculations of Opioid-related Spending per Enrollee-year for TPPs Without Claims Data**

	Low exposure	Middle exposure	High exposure
Total Opioid-related Spending for TPPs with Claims Data from 1996 - 2023	\$100,000,000	\$200,000,000	\$800,000,000
Current Enrollment for TPPs With Claims Data	50,000	40,000	100,000
Opioid-Related Spending Per Enrollee-Year	\$71.42	\$ 178.57	\$285.71

### C. Calculating Shares for TPPs that Cover Only Prescription Drugs or Only Medical Care

27. Some TPP class members were only financially responsible for either prescription drug spending or medical care, but not both, during the class period. The claims-based methodology proposed above is readily adaptable to TPPs that only covered one of prescription drugs or medical care because there are separate calculations proposed for each, which are then combined to estimate total opioid-related spending. For TPPs with enrollment data only, the claims administrator can separately compute opioid-related prescription drug or OUD-associated medical spending per enrollee by state and apply these component measures to the reported enrollment data.

## D. Conclusion

28. For each class member that files a valid claim form, their share of the Settlement will be calculated as the sum of their total prescription opioid spending and total excess spending for enrollees with OUD estimated using one of the two methods described above, divided by the total estimated opioid-related spending for all class members that make a valid settlement claim (or have one made on their behalf). Table 3 below provides a hypothetical example if only three TPPs submitted valid claims to the Settlement. Each TPP's share of the settlement is their total opioid spending divided by the total opioid spending for all TPPs that submitted claims (here, \$440 million in total).

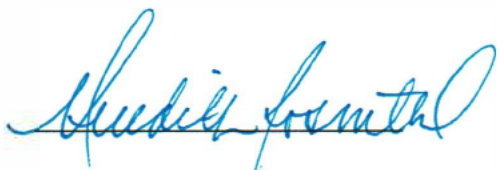
**Table 3. Hypothetical Share of Total Settlement for All TPPs**

	TPP 1	TPP 2	TPP 3
Total Prescription Opioid Spending	\$50,000,000	\$30,000,000	\$60,000,000
Total Excess Spending on OUD	\$100,000,000	\$80,000,000	\$120,000,000
Total Opioid-related Spending	\$150,000,000	\$110,000,000	\$180,000,000
Share of settlement	34%	25%	41%

29. In my opinion, the allocation approach I propose above is economically reasonable because it either directly reflects the dollar amount of opioid-related spending borne by each class member or indirectly captures this amount based on evidence of the disproportionate geographic impact of Defendants' alleged conduct.

30. Based on my expertise in health economics, experience working with industry data, and knowledge of this matter, I conclude that this two-part method offers a feasible and fair approach to settlement allocation in this matter.





Meredith Rosenthal, Ph.D.  
August 26, 2024

**ATTACHMENT A**

## CURRICULUM VITAE

Date: June 2024

**NAME:** Meredith B. Rosenthal

**ADDRESS:** Harvard T. H. Chan School of Public Health  
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**BIRTHPLACE:** Boston, Massachusetts

### EDUCATION:

1998 Health Policy (Economics track), Ph.D., Harvard University  
1990 International Relations (Commerce), A.B., Brown University

### ACADEMIC APPOINTMENTS:

2011-present C. Boyden Gray Professor of Health Economics and Policy  
Department of Health Policy and Management  
Harvard School of Public Health  
2006-2011 Associate Professor of Health Economics and Policy  
Department of Health Policy and Management  
Harvard School of Public Health  
1998-2006 Assistant Professor of Health Economics and Policy  
Department of Health Policy and Management  
Harvard School of Public Health

### ADMINISTRATIVE APPOINTMENTS:

2017-2018 Senior Associate Dean for Academic Affairs  
Harvard T. H. Chan School of Public Health  
2013-2017 Associate Dean for Diversity  
Harvard T. H. Chan School of Public Health  
2019-2023 Faculty Chair, Advanced Leadership Initiative  
Harvard University

### PROFESSIONAL SOCIETIES:

2014-present Elected Member, National Academy of Medicine (Institute of Medicine)  
2004-present American Society of Health Economists  
2000-present International Health Economics Association  
1995-present AcademyHealth  
*Planning Committee for 2008 Annual Research Meeting*

### OTHER PROFESSIONAL EXPERIENCE:

1996-present Academic Affiliate, Greylock McKinnon Associates  
1993-1994 Analyst, Health Economics Research, Inc./The Center for Health Economics Research  
1990-1993 Consultant, Price Waterhouse, Tax Economics Department

**SERVICE:**

- 2016-present Member, Massachusetts Center for Health Information and Analysis Oversight Council
- 2013-2017 Board Chair, Massachusetts Health Quality Partners
- 2007-2016 Member, Massachusetts Public Health Council
  
- 2005 Expert Testimony, House Committee on Education and Workforce, House Subcommittee on Employer-Employee Relations, Hearing on Examining Pay-for-Performance Measures and Other Trends in Employer-Sponsored Health Care
- 2003 Expert Testimony, Senate Special Committee on Aging, Hearing on Direct to Consumer Advertising of Prescription Drugs: Exploring the Consequences
- 2001 Chair, Massachusetts Special Commission on Physician Compensation

**HONORS AND DISTINCTIONS:**

- 2016 AcademyHealth Paper of the Year Award
- 2016 Harvard TH Chan School of Public Health Student Mentoring Award
- 2015 Harvard TH Chan School of Public Health Advancement of Women Faculty Mentoring Award
- 2014 Harvard School of Public Health Junior Faculty Mentoring Award
- 2011 Harvard School of Public Health Teaching Citation
- 2010 Academy of Management Best Theory to Practice Paper in Health Care Management
- 2006 Alfred P. Sloan Foundation Industry Studies Fellowship
- 2003 Labelle Lectureship in Health Policy, McMaster University

**MAJOR ADMINISTRATIVE RESPONSIBILITIES:**

- 2016-2018 University President's Task Force on Inclusion and Belonging
- 2012-2014 Harvard School of Public Health Faculty Council, Vice-Chair (2012)
- 2007-2014 Harvard School of Public Health Committee on Admissions and Degrees, Chair (2010)
- 2007 Co-Chair, Harvard School of Public Health Child Care Task Force
- 2006-2011 Harvard School of Public Health Committee on the Concerns of Women Faculty
- 2000-present Executive Committee on Higher Degrees in Health Policy, Harvard University
- 1999-present Admissions Committee, Ph.D. Program in Health Policy, Harvard University

**EDITORIAL ACTIVITIES:**

- 1997-present Referee: *Journal of Health Economics, Inquiry, Health Services Research, Health Affairs, Journal of the American Medical Association, New England Journal of Medicine, and others*
- 2012-2015 Member, *New England Journal of Medicine*, Perspective Advisory Board
- 2008-2014 Associate Editor, *Medical Care*, Research and Review
- 1997-1998 Assistant Editor, Evidence-based Health Policy and Management

**MAJOR RESEARCH INTERESTS:**

1. Market-oriented health policy
2. Physician payment incentives
3. Consumerism and consumer-directed health plans
4. Economics of the pharmaceutical industry

**RESEARCH SUPPORT:**

Past Funding:

- 2015-2021 Accelerating the Use of Evidence-based Innovations in Healthcare Systems, AHRQ, *Principal Investigator*
- 2016-2021 Identifying Cascades of Low-Value Care and the Organizational Practices that Prevent Them, AHRQ, *Co-Investigator*
- 2016-2018 Generic Drug Pricing: Actionable Research for Policy, Commonwealth Fund, *Principal Investigator*
- 2015-2017 Improving the Value of Health Care Choices, Arnold Foundation, *Principal Investigator*
- 2012-2017 Optimizing Ambulatory Patient Safety in Partnership with Primary Care Transformation, HMS Gift/CRICO, *Co-Principal Investigator*
- 2016-2017 Physician Payment in ACOs, Arnold Foundation, *Principal Investigator*
- 2013-2015 Understanding the Use and Impact of Price Data in Health Care, RWJF, *Co- Investigator*
- 2013-2015 Impact of Price Transparency Tools on Consumer Behavior, RWJF, *Co- Investigator*
- 2013-2015 Getting the Complete Picture: What Does the Body of Research on the Patient-Centered Medical Home Really Tell Us? CMWF, *Principal Investigator*
- 2013-2015 Prevalence and Variation in Over-Use of Health Services in Commercially Insured Patients, Peter G. Peterson Foundation, *Principal Investigator*
- 2013-2015 Measuring Overuse of Health Care: Are Providers and Patients ‘Choosing Wisely’?, CMWF, *Co-investigator*
- 2013-2014 Prevalence and Variation in Over-Use of Health Services in Medicare: Choosing Wisely, RWJF, *Co-investigator*

- 2012-2015 Evaluating Sequential Strategies to Reduce Readmission in Diverse Populations, AHRQ, *Co-investigator*
- 2010-2014 Factors Associated with Effective Implementation of a Surgical Safety Checklist, AHRQ (R18), *Co-investigator*
- 2010-2014 A Randomized Trial of Behavioral Economic Interventions to Reduce CVD Risk, NIA (RC4), *Co-investigator*
- 2008-2010 Rewarding Quality Diabetes Management, RWJF/Hudson Health Plan, *Principal Investigator*
- 2008-2009 Effects of High-Deductible Health Plans on Families with Chronic Conditions, RWJF/Harvard Pilgrim Healthcare Plan, *Co-Investigator*
- 2008-2008 Implications of Value-Based Purchasing for Health Disparities: A Synthesis of the Evidence, Office of Minority Health, Department of Health & Human Services, *Principal Investigator*
- 2008-2008 Payment Reform Opportunities for Medicaid Programs, University of Pittsburgh, *Principal Investigator*
- 2007-2009 Changes in Health Care Financing and Organization: How does Fragmentation of Care Contribute to the Costs of Care? RWJF/HCFO, *Co-investigator*
- 2006-2008 Evaluating the Impact of a Novel Pay for Performance Program in a Medicaid Managed Care Plan, The Commonwealth Fund, *Principal Investigator*
- 2006-2008 Sloan Industry Studies Fellowship for Meredith Rosenthal, Alfred P. Sloan Foundation, *Principal Investigator*
- 2005-2008 Incentive Formularies and the Costs and Quality of Care, Agency for Healthcare Research and Quality, *Co-investigator*
- 2005-2007 Strategies to Improve the Value of Health Benefit Spending for Low-Wage Workers, The Commonwealth Fund, *Principal Investigator*
- 2005-2007 Uptake and Impact of Health Risk Appraisals, RWJ Health Care Financing and Organization Initiative, *Principal Investigator*
- 2003-2007 The Patterns and Impact of Value Based Purchasing, Agency for Healthcare Research and Quality, *Co-investigator*
- 2002-2007 Coverage, Organization of Care, and Colorectal Screening, National Institutes of Health, *Co-investigator*

### **Current Funding**

2019-2022 Price, Spending and Utilization Impacts of Vertical Integration in Massachusetts, Laura and John Arnold Foundation

2018-2022 Generic cancer drugs: pricing and affordability, American Cancer Society

In this study there will be extensive conducting of empirical research using pharmaceutical data and analyzing economic and policy issues related to health care cost control.

Role: Co-Investigator

### **TEACHING EXPERIENCE**

2021-present Health Policy 2000: Core Course for the PhD Program in Health Policy

2016-present Health Policy and Management 260: Health Economics with Applications to Global Health Policy

2003-present Health Policy and Management 209: Economics for Health Policy

2013-2014 Global Health and Health Policy 50 (Harvard College): The Quality of Care in the United States

1999-2001 Health Policy and Management 507: Mental Health Economics and Policy in the United States

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#### **Peer-Reviewed Articles**

1. **Rosenthal MB**, Geraty RD, Frank RG, Huskamp HA. Psychiatric provider practice management companies: Adding value to behavioral health care? *Psychiatric Services*. 1999 Aug;50(8):1011-13.
2. **Rosenthal MB**. Risk sharing in managed behavioral health care. *Health Affairs*. 1999 Sept-Oct;18(5):204-13.
3. Huskamp HA, **Rosenthal MB**, Frank RG, Newhouse JP. The Medicare prescription drug benefit: How will the game be played? *Health Affairs*. 2000 Mar-Apr;19(2):8-23.
4. **Rosenthal MB**. Risk sharing and the supply of mental health services. *Journal of Health Economics*. 2000 Nov;19(6):1047-65.
5. Cutler DM, Epstein AM, Frank RG, Hartman RS, King C, Newhouse JP, **Rosenthal MB**, Vigdor ER. How good a deal was the tobacco settlement?: Assessing payments to Massachusetts. *Journal of Risk and Uncertainty*. 2000;21(2/3):235-61.
6. **Rosenthal MB**, Frank RG, Buchanan JL, Epstein AM. Scale and structure of capitated physician organizations in California. *Health Affairs*. 2001 Jul-Aug;20(4):109-19.
7. **Rosenthal MB**, Landon BE, Huskamp HA. Managed care and market power: Physician organizations in four markets. *Health Affairs*. 2001 Sept-Oct;20(5):187-93.
8. Frank RG, **Rosenthal MB**. Health plans and selection: Formal risk adjustment vs. market design and contracts. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*. 2001 Fall;38(3):290-8.

9. Cutler DM, Gruber J, Hartman RS, Landrum ME, Newhouse JP and **Rosenthal MB**. The economic impacts of the tobacco settlement. *Journal of Policy Analysis and Management*. 2002 Winter; 21(1):1-19.
10. **Rosenthal MB**, Berndt ER, Donohue JM, Frank RG, and Epstein AM. Promotion of prescription drugs to consumers. *New England Journal of Medicine*. 2002 Feb; 346(7):498-505.
11. **Rosenthal MB** and Newhouse JP. Managed care and efficient rationing. *Journal of Health Care Finance*. 2002 Summer;28(4):1-10.
12. **Rosenthal MB**, Frank RG, Buchanan JL, and Epstein AM. Transmission of financial incentives to physicians by intermediary organizations in California. *Health Affairs*. 2002 Jul-Aug;21(4):197-205.
13. Mello M, **Rosenthal MB**, and Neumann PJ. Direct-to-consumer advertising and shared liability for pharmaceutical manufacturers. *JAMA*. 2003 Jan 22-29;289(4):477-81.
14. **Rosenthal MB**, Fernandopulle R, Song HR, and Landon BE. Paying for quality: Providers' incentives for quality improvement. *Health Affairs*. 2004 March-April;23(2):127-41.
15. **Rosenthal MB** and Milstein A. Awakening consumer stewardship of health benefits: Prevalence and differentiation of new health plan models. *Health Services Research*. 2004 Aug;39(4):1055-70.
16. Donohue JM, Berndt ER, **Rosenthal MB**, Epstein AM, and Frank RG. Effects of pharmaceutical promotion on adherence to the treatment guidelines for depression. *Medical Care*. 2004 Dec;42(12):1176-85.
17. **Rosenthal MB**. Doughnut-hole economics. *Health Affairs*. 2004 Nov-Dec; 23(6):129-35.
18. **Rosenthal MB**, Frank RG, Li Z, and Epstein AM. Early experience with pay-for-performance: From concept to practice. *JAMA*. 2005 Oct 12;294(14):1788-93.
19. **Rosenthal MB**, Hsuan C. and Milstein A. A report card on the freshman class of consumer-directed health plans. *Health Affairs*. 2005 Nov-Dec;24(6):1592-1600.
20. **Rosenthal MB**, Zaslavsky AM and Newhouse JP. The geographic distribution of physicians revisited. *Health Services Research*. 2005 Dec;40(6):1931-52.
21. **Rosenthal MB** and Frank RG. What is the empirical basis for paying for quality in health care? *Medical Care Research and Review*. 2006 April;63(2):135-57.
22. **Rosenthal MB** and Daniels NB. Beyond competition: The normative implications of consumer-driven health plans. *Journal of Health Politics, Policy, and Law*. 2006 Jun;31(3):671-86.
23. Landon BE, **Rosenthal MB**, Normand S-LT, Spettell C, Lessler A, Underwood HR, Newhouse JP. Incentive formularies and changes in prescription drug spending. *American Journal of Managed Care*. 2007 June;13(6):360-69.
24. **Rosenthal MB**, Minden S, Manderscheid R, Henderson M. A typology of organizational and contractual arrangements for purchasing and delivery of behavioral health care. *Administration and Policy in Mental Health and Mental Health Services Research*. 2006 Jul;33(4):461-9.
25. **Rosenthal MB**, Landon BE, Normand S-LT, Frank RG, Epstein AM. Pay for performance in commercial HMOs. *New England Journal of Medicine*. 2006 Nov 2;355(18):1895-1902.
26. Mehrotra A, Epstein AM, **Rosenthal MB**. Do integrated medical groups provide higher-quality medical care than individual practice associations? *Annals of Internal Medicine*. 2006 Dec 5;145(11):826-33.



27. Donohue JM, Cevasco M, **Rosenthal MB**. A decade of direct-to-consumer advertising of prescription drugs. *New England Journal of Medicine*. 2007 Aug 16;357(7):673-81.
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35. Mello MM, **Rosenthal MB**. Wellness programs and lifestyle discrimination - the legal limits. *New England Journal of Medicine*. 2008 Jul;359(2):192-9.
36. Camillus JA, **Rosenthal MB**. Health care coalitions: From joint purchasing to local health reform. *Inquiry*. 2008 Summer;45(2):142-52.
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39. Bae, SJ, **Rosenthal MB**. Patients with multiple chronic conditions do not receive lower quality of preventive care. *Journal of General Internal Medicine*. 2008 Sept;23(12):1933-9.
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43. Huskamp HA, **Rosenthal MB**. Health risk appraisals: How much do they influence employees' health behavior? *Health Affairs*. 2009 Sept/Oct;28(5):1532-40.
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78. H Song, AT Chien, J Fisher, J Martin, AS Peters, K Hacker, **MB Rosenthal**, SJ Singer. Development and validation of the primary care team dynamics survey. *Health Services Research*. 2015 Jun;50(3):897-921.
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**Meredith Rosenthal**

**Recent Testimony (July 2020 - July 2024)**

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*In re Ranbaxy Generic Drug Application Antitrust Litigation*, United States District Court for the District of Massachusetts, MDL No. 19-md-2878-NMG.

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*State of New Hampshire v. Johnson & Johnson; Janssen Pharmaceuticals, Inc.; Ortho-McNeil-Janssen Pharmaceuticals Inc., et al.*, Merrimack Superior Court, Docket No. 217-2018-CV-00678.

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*In re: Avandia Marketing, Sales Practices and Products Liability Litigation*, United States District Court for the Eastern District of Pennsylvania, MDL No. 1871, Case No. 07-MD-1871.

*Government Employees Health Association v. Actelion Pharmaceuticals LTD., et al.*, United States District Court for the District of Maryland, Case No. 18-cv-3560-GLR.

*In re Seroquel XR Antitrust Litigation*, United States District Court for the District of Delaware, Case No. 20-1076-CFC.

*In re Actos Direct Purchaser Antitrust Litigation*, United States District Court for the Southern District of New York, Case No. 1:15-cv-03278-RA-SDA.

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**ATTACHMENT B**

## ATTACHMENT B: Materials Relied Upon

### Other Documents

Alpert A., *et al.*, “Origins of The Opioid Crisis and Its Enduring Impacts,” *Quarterly Journal of Economics*, 2022, 137(2), pp.1139–79.

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