Mathematica
Progress Together

Physician Practice Information Survey Methodology Report

Final Report

November 18, 2022

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Physician Practice Information Survey Methodology Report

November 18, 2022

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I. Introduction

This report presents how Mathematica will develop, field, and analyze data from a survey of physician practices and a survey of physicians in 2023–2024 to collect data on practice expense and patient care hours. The goal of the surveys is to collect data on practice expense and patient care hours from individually-owned practices and practices with complex ownership arrangements to calculate and report practice expenses per hour of patient care by physician specialty for up to 46 Medicare specialties. The practice survey will provide the components of physician expense (numerator), and the physician survey will provide the physician patient care hours (denominator). The survey will also collect data on Qualified Health Care Professionals (QHPs) (e.g., APRNs and PAs) from those practices who are able to provide it. If sufficient data is collected, practice expense per hour will be calculated. Survey data on practice expenses could also be used to update the Medicare Economic Index (MEI).

We expect the survey effort, from design through reporting of results, will span 24 months, from January 2023 through December 2024. In 2023, we will design and prepare the sample and survey for fielding in the first two quarters, conduct a pilot test of the survey process in Quarter 3, and launch the full survey in Quarter 4. In 2024, we will complete the survey in Quarter 2, process and weight the data in Quarter 3, and prepare and deliver summary statistics and survey documentation in Quarter 4. Appendix A presents the work plan, which contains a detailed timeline of key tasks discussed in this report.

Mathematica will seek approval for the study from an Institution Review Board (IRB). Mathematica works with Health Media Labs as its IRB oversight organization.

This survey methodology report comprises six sections that present our approach to (1) survey design, programming, and testing; (2) sample design, frame development, and sample selection; (3) preparing to field the surveys; (4) fielding the practice survey and physician survey; (5) data processing, weighting, and nonresponse adjustments; and (6) analysis and reporting of survey results.

This report and work plan constitute the Task 5 deliverable for the current project.

II. Survey Design, Programming, and Testing

A. Practice survey instrument

The purpose of the practice survey is to gather information from practices on their expenses to provide estimates of expenses by physician specialty.

1. Survey refinement

We will start with the version of the existing practice survey instrument the American Medical Association (AMA) shared with Mathematica for review. In collaboration with the AMA, we will revise it based on (1) the survey's intent and data requirements, (2) information learned from the AMA interviews with large and complex organizations, (3) our experience fielding practice surveys, and (4) best practices in survey design. This process will start in Quarter 4 of 2022 and will end in Quarter 1 of 2023. We assume Mathematica and the AMA will participate in four or five rounds of review of the instruments before finalizing them: about two rounds in Quarter 4 of 2022, two rounds in Quarter 1 of 2023, and one round after the pre-test in Quarter 2 of 2023.

2. Program and test instrument

We will create a document with programming specifications for how to program the survey instrument and walk through the specifications with the programmer before they begin work. We will program the survey using Confirmit software, a state-of-the-art survey software platform that enables us to quickly and efficiently build and launch single- or multi-mode, 508-compliant surveys. Surveys authored in one mode in Confirmit can be deployed across other modes—including web, computer-assisted personal interviewing, telephone, mobile, and paper—and respondents can seamlessly switch between survey modes if the need arises.

We will test the program using random data generator software as well as manually to follow all possible paths through the instrument, testing logic, reviewing data output, and confirming the instrument works as intended. We will share log-in information and web survey links so the AMA can test the survey programs.

Instrument programming and testing will occur in Quarter 2 of 2023.

3. Survey pre-test

We will pre-test the instrument with a convenience sample of 10 respondents to gather feedback on the intended respondents' experiences. We will target completing half of the pre-tests with individual ownership practices and the other half with practices with more complex ownership types. If needed, we will discuss conducting additional pre-tests beyond the 10 with the AMA. We will solicit the AMA's help in identifying and reaching out to potential pretest respondents. Potential pre-test respondents may include those who participated in the summer 2022 qualitative interviews conducted by the AMA, and individual ownership practices identified through AMA contacts. We will send each respondent a link to the survey, ask them to complete the survey, and then hold a brief call to gather feedback. We will probe to identify any questions or response items that caused confusion or were challenging to answer, navigation issues, and suggestions for making the survey clearer or easier to answer. We will include a question at the end of the survey to enable respondents to share feedback in written comment form. We will review the

feedback we obtain with the AMA and decide what changes to make to the instrument to improve users' experience and data quality.

The instrument pre-test will occur in Quarter 2 of 2023.

B. Physician survey instrument

The purpose of the physician survey is to gather information on hours spent in direct patient care by physicians and report direct patient care hours by physician specialty.

1. Survey development

We assume 50 percent of organizations will field the survey to their physicians for us because most of the organizations the AMA interviewed indicated we would get a better response if they sent the survey to their physicians, and they expressed a willingness to do so. This process will start in Quarter 4 of 2023 and end in Quarter 1 of 2024.

2. Program and test instrument

We will follow a similar process to the one we use for the practice survey. We will create a document with detailed programming specifications for how to program the instrument and walk through the specifications with the Confirmit programmer before they begin work. We will program the survey using Confirmit software. We will test the program using random data generator software, as well as manually, to follow all possible paths through the instrument, testing logic, reviewing data output, and confirming the instrument works as intended.

3. Survey pre-test

We will pre-test the instrument with a convenience sample of 10 respondents to gather feedback on the intended respondent's experience. We will solicit the AMA's help in reaching out to physicians from a variety of specialties. If needed, we will discuss conducting additional pre-tests beyond the 10 with the AMA. We will send each respondent a link to the survey, ask them to complete the survey, and then ask for their feedback by providing a question at the end of the survey to enable respondents to share feedback in written form. We will review the feedback we obtain with the AMA and decide what changes, if any, to make to the instrument to improve user experience and data quality.

The instrument programming and pre-test will occur in Quarter 2 of 2023.

III. Sample Design, Frame Development, and Sample Selection

To collect data on practice expense and patient care hours from a diverse set of practices and physicians, we will create a stratified sample of practices. In this section, we describe how we define *practice* and *practice specialties* for the purposes of this study, then describe all aspects of the sample design, including stratification, developing the sample frame, and allocating and selecting the sample. The sample discussed in this section is a probability sample of practices, from which we will obtain estimates of expenses. We intend to draw patient care hours from the physician survey described in prior sections. The sample will include all responding physicians from this probability sample of practices.

A. Defining *practices* and *practice specialties*

We define *practices* using Taxpayer Identification Numbers (TINs), entities to which physicians assign their rights to for billing and collecting payment from Medicare. TINs can be associated with multiple practice sites. This approach follows Centers for Medicare & Medicaid Services (CMS) (and many studies of physician practices) in identifying group practices using TINs. As such, the TIN is the sampling unit.

It is likely each TIN tracks the expenses of the group's physicians. Therefore, within each TIN, we expect a practice representative to provide information on expenses for physicians within their organization. For individual-ownership practices, this representative might be the physician who owns the practice or an office administrator;[1] for practices with more complex ownership, this would commonly be a chief financial officer or vice president of finance.

We are interested in the estimates of expenses and patient care hours for physicians who are specialists in one of up to 46 Medicare specialties. We will obtain the patient care hours from the physician survey and expenses from practices, as explained before. Because we will sample practices instead of physicians, we need a way to identify the distribution of the specialties of the physicians within the practices. Even though we will sample practices, knowing the distribution of specialties enables us to allocate the sample of practices in such a way that we can anticipate how many physicians within each specialty will be in the sample. For the purposes of this study, using our sample frame data (discussed later), we define *single-specialty practices* as those in which at least 75 percent of their physicians identify as members of a single specialty. The remaining practices are categorized as multispecialty practices.

1. Stratification

We intend to use stratification to ensure we can control the distribution of sampled cases, either to match the distribution of the population or to differ from it in a controlled way, to improve the precision of estimates, both overall and within subgroups defined by the stratification. In this study, we have to control the number of sampled practices with each (1) specialty distribution, (2) ownership type (individual ownership vs. more complex ownership types), (3) office working environment of most physicians in the practice (the extent to which a group practice's physicians are working in freestanding physician offices vs. facilities such as hospitals, ambulatory surgery centers, etc.); (4) practice size, (5) geographic region,

[1] Agency for Healthcare Research and Quality, with D. Jones, K. Peckham, S. Nelson, R. Machta, and E. Rich. "Comparative Health System Performance Initiative: Compendium of U.S. Health Systems, 2018 Group Practice Linkage File, Technical Documentation." Rockville, MD: AHRQ, 2020; and Washington, DC: Mathematica, 2020. Available at https://www.ahrq.gov/sites/default/files/wysiwyg/chsp/compendium/2018-chsp-tin-linkage-file-tech-doc.pdf.

and among practices with complex ownership, whether (6) the practice is part of a vertically integrated health system, and (7) private equity ownership. There are two types of stratification we could use: explicit and implicit stratification, in which explicit stratification is reserved for the most important variables.

With explicit stratification, the population is organized into mutually exclusive groups, from which separate random samples can be selected. In this way, it is possible to allocate a larger portion of the sample to small groups than would be allocated proportionally to ensure subgroups of interest have enough sample cases for analysis. This type of stratification is reserved for variables that must have a controlled sample allocation, such as ownership type and specialty distribution. Because there are 46 Medicare specialties plus a multispecialty category of practices, these variables alone will result in 2 x (46 + 1) = 94 explicit strata. In addition, we will evaluate whether to incorporate two additional variables for explicit stratification: (1) office working environment of most physicians in the practice (freestanding offices vs. offices in facilities such as hospitals), and/or (2) a two-level categorization of practice size. The latter will be considered even though we will employ practice size as a size measure in probability-proportional-to-size sample selection. When making decisions about the number of variables to consider for explicit stratification, we must take care not to have so many strata that it would be difficult to obtain samples of sufficient size for meaningful estimates. One possible way around this is to collapse the 46 Medicare specialties into a smaller number of specialties. Tables III.1 and III.2 provide population counts of practices and physicians within the proposed 94 explicit strata. Because the final ownership stratification will be based on the most recent OneKey data, the counts shown in these tables will change somewhat when we obtain those data. The OneKey data will indicate whether the practice has a corporate parent and, if so, whether it is within a health system. Our plan is to include all three variables in stratification (no corporate parent, corporate parent in a health system, corporate parent not in a health system), with explicit strata defined by whether or not the practice has a corporate parent, and implicit strata to control for health system or not among practices with corporate parents.

Implicit stratification consists essentially of sorting the practices uniquely within each explicit stratum by a set of designated variables. It is not possible to directly control the number of sample cases within implicit strata, but it does enable the sample distribution of implicit stratification variables to closely match the population distribution within explicit strata. For example, if we determine that ownership type (corporate parent or not) and specialty distribution define explicit strata, then we would sort the practices within each of the 94 explicit strata by the other variables in the list of candidate variables, then systematically sample practices from within each explicit stratum. The order of variables used for the implicit strata is important. Specifically, the sample distribution of variables listed first will more closely match that of the population than those listed later. We will work with the AMA to determine the final list of explicit and implicit stratification variables, and what variable order to use for the implicit stratification.

B. Developing the sample frame

The list of TINs, the sampling units in our study, and their associated National Provider Identifiers (NPIs), will come from the Medicare Data on Provider Practice and Specialty (MD-PPAS), a CMS data set obtained through Mathematica's Data Innovation Lab. When a physician or chief financial officer enters cost and hours information, it is likely this information is most easily obtained for cost center units identified by the TIN, which are available only on the MD-PPAS. However, the MD-PPAS does not have the detailed ownership information we need for this study. Moreover, the MD-PPAS data are likely to be

at least two years old at time of frame creation. Therefore, we will supplement the MD-PPAS data with an additional data set called OneKey, provided by a private data vendor (IQVIA). The OneKey data set provides near current data on physicians and practice sites with nearly all of the sampling information we need, including identifying practices with and without a corporate parent and, among those with a corporate parent, those that are or are not part of vertically integrated health systems. We cannot use OneKey as our main data set because the data identify practice sites (rather than the group practice itself), which do not coincide with the sampling unit we need for this study (the group practice defined according to the TIN). To identify the office working environment variable, we will bring in Medicare fee-for-service claims data which includes place of service codes. We will have to merge all three of these data sets by NPI.

1. Sample allocation

After we have created the sample frame and separated the frame into mutually exclusive units that identify explicit strata, we will identify the number of completed cases to target in each explicit stratum, and how many sample cases to release based upon completion rate assumptions. This process, called sample allocation, must balance several competing objectives in this study:

1. Ensure a sample of group practices with enough physicians per specialty to ensure estimates have sufficient precision to be meaningful. A prior AMA study sought a minimum of 100 physicians for each specialty; we will follow a similar guideline.
2. Within each specialty, minimize the cost of the survey by selecting fewer group practices.
3. Within each specialty, minimize the clustering effect by selecting more group practices.[2]
4. Though cross-specialty cost estimate comparisons are not a priority, after considering the first three constraints, minimize the degree to which the sample deviates from an allocation that is proportional to the population.[3]

The process of balancing these objectives is iterative and is as much art as science. We look at different allocation possibilities and evaluate the impact on estimated standard errors and design effects due to unequal weighting and clustering. The unit of analysis is the physician, but the sampling unit is the group practice (as identified by the TIN), so the number of group practices selected to obtain those physicians will affect any count of physicians. As Tables III.1 and III.2 make clear, the distribution of physicians in individual-ownership practices differs substantially from complex-ownership practices. In particular, in individual-ownership practices, only about one-third of physicians (118,149 of 324,656) work in multispecialty practices, whereas the vast majority of physicians in complex-ownership practices (271,879 of 311,197, or 87 percent) work in multispecialty practices. In addition, even though the number of physicians in the two practice types are close to equal, physicians own roughly 94 percent of the practices (92,235/(92,235+5,717)). Finally, the proportion of physicians in each specialty who practice in single-specialty practices varies widely by specialty (e.g., across the two ownership types, 75% of ophthalmologists work in single specialty practices compared to only 40% of orthopedic surgeons). We

[2] The clustering effect measures the effect in which costs and expenses are more similar among physicians within the same TIN than those from a different TIN. A high clustering effect occurs if we select a small number of TINs with a large number of physicians per TIN. This increases the design effect, which in turn reduces the effective sample size (ESS). The ESS is an estimate of the sample size required to achieve the same level of precision if that sample was a simple random sample.

[3] A sample that deviates from proportional allocation will result in a high unequal weighting effect, which in turn reduces the ESS.

must account for these distributions when deciding on a sample allocation. For example, consider clinical cardiac electrophysiology. There are a total of 2,277 clinical cardiac electrophysiologists, of whom 701 are in individual-ownership practices (Table III.1), mostly in multispecialty practices, and 1,576 in complex-ownership multispecialty practices (Table III.2). There are 84 single-specialty practices in this specialty, all individual-ownership practices (Table III.1), which include only 117 physicians. To obtain a mix of individual- and complex-ownership practices with this specialty, and given that many group practices will not participate, we had to ensure the sample included many multispecialty practices, and that a certain percentage of physicians in the sampled multispecialty practices have the specialty in question.

Our initial review of the data tries to balance these four objectives. This review leads us to target completing surveys from 3,243 group practices, of which 2,200 are individual-ownership practices and 1,043 are large, complex practices. With an assumed 30 percent response rate across all practices (though this will vary by specialty), we will have to sample about 10,800 practices overall to achieve the practice-level response target.

Assuming we select group practices with probability proportional to size (discussed in the sample selection section), this will mean the total sample of practices will provide access to expense data corresponding to more than 100,000 physicians, and we assume about 10 percent of them will provide patient care hours information in the physician survey.

Tables III.1 and III.2 present the population distributions of practices and physicians by specialty for individual- and complex-ownership practices, respectively. The number of physicians per specialty varies widely, but for four specialties (hospice and palliative medicine, nuclear medicine, osteopathic manipulative therapy, and sleep medicine), it is likely that the total number of physicians from this sample will be less than 100 per specialty because the total number of physicians within these specialties is so small and because of the way they are distributed across practices. We will continue working with AMA during the Quarter 1 of 2023 to reassess whether any revisions are necessary to meet the objectives listed above.

Table III.1. Population distribution of practices and physicians, by specialty, individual-ownership practices

Practice specialty	Number of practices[a]	Number of physicians in single-specialty practices that match their own specialty[b]	Number of physicians in single-specialty practices that do not match their own specialty[c]	Number of physicians in multispecialty practices	Total number of physicians
Single specialty					
Allergy & Immunology	1,017	1,972	39	565	2,576
Anesthesiology	2,816	20,751	299	2,382	23,432
Cardiology	2,492	4,178	207	3,680	8,065
Cardiothoracic Surgery	342	513	13	589	1,115
Clinical Cardiac Electrophysiology	84	117	1	583	701
Colon & Rectal Surgery	198	371	8	358	737
Critical Care Medicine	160	245	13	1,097	1,355
Dermatology	3,539	7,562	123	1,018	8,703
Emergency Medicine	1,314	14,189	1,108	4,595	19,892
Endocrinology	767	1,172	23	1,206	2,401
Family Medicine	12,475	21,271	959	22,599	44,829
Gastroenterology	1,935	6,037	258	1,805	8,100
General Practice	1,366	1,521	26	1,757	3,304
General Surgery	2,743	4,763	145	4,939	9,847
Geriatrics	194	205	2	432	639
Hand Surgery	154	214	8	820	1,042
Hospice & Palliative Medicine	32	34	0	236	270
Hospitalist	1,079	3,416	478	8,334	12,228
Infectious Disease	736	1,557	58	874	2,489
Internal Medicine	12,772	16,278	299	21,259	37,836
Interventional Cardiology	107	138	6	1,277	1,421
Interventional Pain Medicine	492	622	17	720	1,359
Interventional Radiology	95	119	2	761	882
Medical Oncology	605	2,284	208	2,817	5,309
Nephrology	1,280	4,634	221	1,005	5,860
Neurology	2,153	3,582	81	2,072	5,735
Neurosurgery	718	1,277	64	805	2,146
Nuclear Medicine	28	45	2	154	201
Obstetrics/Gynecology	4,469	11,977	134	5,332	17,443
Ophthalmology	5,607	12,689	32	944	13,665
Orthopedic Surgery	3,272	8,404	749	4,983	14,136

Practice specialty	Number of practices[a]	Number of physicians in single-specialty practices that match their own specialty[b]	Number of physicians in single-specialty practices that do not match their own specialty[c]	Number of physicians in multispecialty practices	Total number of physicians
Osteopathic Manipulative Therapy	148	160	0	327	487
Otolaryngology	1,802	4,262	105	1,262	5,629
Pain Medicine	629	744	20	1,088	1,852
Pathology	320	1,176	1	437	1,614
Pediatrics[d]	341	488	12	1,875	2,375
Physical Medicine & Rehabilitation	1,927	2,903	70	1,958	4,931
Plastic Surgery	1,910	2,415	16	704	3,135
Psychiatry	5,231	11,674	279	2,494	14,447
Pulmonary Disease	1,107	2,093	120	2,086	4,299
Radiation Oncology	395	996	9	1,180	2,185
Radiology	1,581	14,401	632	1,492	16,525
Rheumatology	761	1,423	26	896	2,345
Sleep Medicine	87	92	0	160	252
Urology	1,153	3,706	160	1,465	5,331
Vascular Surgery	470	790	14	727	1,531
Multispecialty	9,332	n/a	n/a	118,149	118,149
Total	**92,235**	**199,460**	**7,047**	**118,149**	**324,656**

[a] For all rows (practice specialties) except “multispecialty,” this column provides the number of single-specialty practices with at least 75 percent of physicians identifying the specialty given. For “multispecialty,” the column provides a count of multispecialty practices.

[b] For all rows (practice specialties) except “multispecialty,” this column provides the number of physicians who are in single-specialty practices where their specialty matches that of their practice. For example, of the 37,836 internists in individual-ownership practices, 16,278 are internal medicine specialists in internal medicine single-specialty practices.

[c] For all rows (practice specialties) except “multispecialty,” this column provides the number of physicians who are in single-specialty practices where their specialty does not match that of their practice. For example, of the 37,836 internists in individual-ownership practices, 299 are internal medicine specialists in single-specialty practices with a specialty other than internal medicine.

[d] We recognize that the count of pediatricians is considerably lower than the actual number of pediatricians, since these counts were created using Medicare Fee for Service claims data. We will work with AMA to evaluate how to adjust for this.

Table III.2. Population distribution of practices and physicians, by specialty, complex-ownership practices

Practice specialty	Number of practices[a]	Number of physicians in single-specialty practices that match their own specialty[b]	Number of physicians in single-specialty practices that do not match their own specialty[c]	Number of physicians in multispecialty practices	Total number of physicians
Single specialty					
Allergy & Immunology	7	24	0	918	942
Anesthesiology	414	7,113	98	10,549	17,760
Cardiology	71	576	89	11,611	12,276
Cardiothoracic Surgery	23	116	8	2,594	2,718
Clinical Cardiac Electrophysiology	0	0	0	1,576	1,576
Colon & Rectal Surgery	4	21	0	796	817
Critical Care Medicine	5	33	8	3,047	3,088
Dermatology	21	157	5	2,703	2,865
Emergency Medicine	547	11,525	548	14,176	26,249
Endocrinology	15	59	2	3,645	3,706
Family Medicine	323	2,330	283	38,552	41,165
Gastroenterology	30	165	8	5,798	5,971
General Practice	2	2	0	538	540
General Surgery	74	373	37	12,492	12,902
Geriatrics	2	10	0	1,146	1,156
Hand Surgery	3	8	0	543	551
Hospice & Palliative Medicine	0	0	0	598	598
Hospitalist	111	1,415	219	22,296	23,930
Infectious Disease	11	55	3	3,562	3,620
Internal Medicine	142	887	118	36,060	37,065
Interventional Cardiology	0	0	0	2,514	2,514
Interventional Pain Medicine	2	2	0	228	230
Interventional Radiology	3	10	1	1,114	1,125
Medical Oncology	48	350	23	6,788	7,161
Nephrology	25	145	2	2,957	3,104
Neurology	48	547	25	8,615	9,187
Neurosurgery	26	182	24	2,722	2,928
Nuclear Medicine	4	6	0	366	372
Obstetrics/Gynecology	144	1,011	21	14,232	15,264
Ophthalmology	45	373	2	3,383	3,758

Practice specialty	Number of practices[a]	Number of physicians in single-specialty practices that match their own specialty[b]	Number of physicians in single-specialty practices that do not match their own specialty[c]	Number of physicians in multispecialty practices	Total number of physicians
Orthopedic Surgery	75	580	71	7,529	8,180
Osteopathic Manipulative Therapy	0	0	0	155	155
Otolaryngology	37	274	16	3,395	3,685
Pain Medicine	3	10	0	734	744
Pathology	93	499	3	1,468	1,970
Pediatrics[d]	14	73	9	5,079	5,161
Physical Medicine & Rehabilitation	28	229	14	2,733	2,976
Plastic Surgery	13	68	2	1,435	1,505
Psychiatry	156	1,607	64	8,717	10,388
Pulmonary Disease	31	154	18	5,511	5,683
Radiation Oncology	114	473	3	2,141	2,617
Radiology	349	5,440	322	8,444	14,206
Rheumatology	10	38	0	2,360	2,398
Sleep Medicine	2	4	0	416	420
Urology	40	271	3	3,774	4,048
Vascular Surgery	14	52	2	1,869	1,923
Multispecialty	2,588	n/a	n/a	271,879	271,879
Total	**5,717**	**37,267**	**2,051**	**271,879**	**311,197**

Note: The counts with red text are estimates based on other information available for those specialties, because the Data Innovation Lab cannot provide counts fewer than 11.

[a] For all rows (practice specialties) except "multispecialty," this column provides the number of single-specialty practices with at least 75 percent of physicians identifying the specialty given. For "multispecialty," the column provides a count of multispecialty practices.

[b] For all rows (practice specialties) except "multispecialty," this column provides the number of physicians who are in single-specialty practices where their specialty matches that of their practice. For example, of the 37,065 internists in complex-ownership practices, 887 are internal medicine specialists in internal medicine single-specialty practices.

[c] For all rows (practice specialties) except "multispecialty," this column provides the number of physicians who are in single-specialty practices where their specialty does not match that of their practice. For example, of the 37,065 internists in complex-ownership practices, 118 are internal medicine specialists in single-specialty practices with a specialty other than internal medicine.

[d] We recognize that the count of pediatricians is considerably lower than the actual number of pediatricians, since these counts were created using Medicare Fee for Service claims data. We will work with AMA to evaluate how to adjust for this.

C. Sample selection

We will select group practices with probability proportional to size (PPS) within explicit strata, in which large practices are more likely to be selected for the sample than smaller ones, though all group practices have a chance of being selected. The number of physicians within the practice defines the size measure,

(such as solo physician practices, two or three physician practices, four or five physician practices, and practices with six or more physicians). Because smaller practices are more likely to be in the individual-ownership strata, we are more likely to select small practices in the PPS selection in the individual-ownership strata. Nevertheless, we will work with the AMA to evaluate whether to include extra explicit strata that account for group practice size. Although using practice size as an implicit stratification variable makes it more likely to include small practices, defining explicit strata based on this variable enables us to ensure a specific sample size for small practices.

The initial sample selection, called an augmented sample, will be a larger sample than needed. The first release of practices at the end of Quarter 2 of 2023 will be a subsample of 3,000 practices, in which the allocation is based on an optimistic completion rate. Through the first few weeks of data collection, we will monitor completion rates to assess whether some subpopulations (as defined by explicit strata) are lagging and put more resources and effort into those strata. We can release more cases in those strata in the subsequent release so that our final number of completes reaches the targeted number for each stratum. The second release of 7,000 practices will be at the beginning of Quarter 4 of 2023. In general, when we have multiple releases, we keep the timing of releases subsequent to the first as close to the beginning of data collection as possible to provide as much time to collect data as possible. Achieving this aim usually means there are no more than two releases in total.

Table III.3 provides an estimated distribution of selected and completed practices, with an estimate of the number of physicians in those practices, by practice specialty and practice ownership type, with counts of physician specialties in the completed practices. We will provide the AMA with summary distributions of drawn sample by practice specialty, practice size, practice ownership type, region, and physician specialty.

Although the presence of QHPs in a practice is not part of sample design, the survey will also collect data on QHPs (e.g., APRNs and PAs) from those practices who are able to provide it. If sufficient data is collected, practice expense per hour will be calculated.

Table III.3. Anticipated sample distribution of practices and physicians, by specialty

Practice specialty	Estimated number of practices selected	Target number of practice survey completes	Total number of physicians in completed practices[a]
Allergy & Immunology	83	25	304
Anesthesiology	257	77	3,491
Cardiology	173	52	1,598
Cardiothoracic Surgery	123	37	361
Clinical Cardiac Electrophysiology	87	26	198
Colon & Rectal Surgery	90	27	176
Critical Care Medicine	90	27	362
Dermatology	220	66	982
Emergency Medicine	207	62	3,211
Endocrinology	267	80	597
Family Medicine	783	235	7,535
Gastroenterology	140	42	1,273
General Practice	97	29	255
General Surgery	227	68	1,945
Geriatrics	137	41	161
Hand Surgery	100	30	117
Hospice & Palliative Medicine	33	10	70
Hospitalist	87	26	2,854
Infectious Disease	77	23	529
Internal Medicine	750	225	4,997
Interventional Cardiology	107	32	300
Interventional Pain Medicine	117	35	118
Interventional Radiology	100	30	160
Medical Oncology	83	25	1,074
Multispecialty	3,360	1,006	63,609[b]
Nephrology	100	30	704
Neurology	147	44	1,297
Neurosurgery	97	29	475
Nuclear Medicine	30	9	47
Obstetrics/Gynecology	287	86	3,091
Ophthalmology	330	99	1,435
Orthopedic Surgery	203	61	1,770
Osteopathic Manipulative Therapy	147	44	68
Otolaryngology	117	35	810
Pain Medicine	113	34	157
Pathology	67	20	383
Pediatrics	87	26	603
Physical Medicine & Rehabilitation	137	41	638

Practice specialty	Estimated number of practices selected	Target number of practice survey completes	Total number of physicians in completed practices[a]
Plastic Surgery	127	38	326
Psychiatry	340	102	2,314
Pulmonary Disease	93	28	777
Radiation Oncology	80	24	429
Radiology	177	53	2,146
Rheumatology	83	25	408
Sleep Medicine	87	26	71
Urology	80	24	833
Vascular Surgery	97	29	322
Total	**10,821**	**3,243**	**115,381**

Note: The counts with red text are estimates based on other information available for those specialties, because the Data Innovation Lab cannot provide counts fewer than 11.

[a] For all rows (practice specialties) except "multispecialty", this column includes the sum of a) the number of physicians in the listed single-specialty practices, b) an estimate of physicians in the listed specialty who are from single-specialty practices that are of another specialty, and c) an estimate of physicians in the listed specialty who are in multispecialty practices.

[b] All physicians will be included in estimates of expenses and patient hours for a specific specialty. However, when estimating the number of physicians in each specialty prior to sampling, it is difficult to know how the specialties are distributed among multispecialty practices without a time-consuming dive into the data among these practices. Using assumptions about the proportion of physicians in each specialty that are found in multispecialty practices and the proportion in single specialty practices that did not match the practice specialty, we were able to assign some of these physicians to specialties, but many could not be assigned. The count in this row corresponds to physicians in multispecialty practices who could not be assigned to a specialty.

IV. Survey Administration

A. Preparing to field surveys

We will take the following steps to prepare to field the practice survey and physician survey:

1. We will work with the AMA to identify and gather contacts and solicit endorsements from the medical specialty societies that represent the targeted physician specialties. Our goal will be to obtain endorsements from each of the identified medical specialty societies and include the list of medical society endorsements on the letterhead, which we will use for the invitation letter and email. The survey introduction and reminder emails and letters will also mention the endorsements.
2. We will draft invitation and reminder letters and emails as well as consult with the AMA on the type of mailing inserts to include, such as a one-page summary of critical survey items to enable respondents to preview the items and gather information as needed before responding to the survey online. In collaboration with the AMA, we will review the mailing materials used most recently to field the survey and suggest refinements to focus on heightening salience and visual appeal and boosting response. For example, we suggest including variations in wording in the letters by a respondent's primary specialty, practice ownership type, reasons why participation is important, and other particulars of the case and timing within the field period. The letter will also mention the offer of a specialty report and stipend for completing the survey, if applicable. We assume the letters will be signed and sent on AMA letterhead. We will identify a mailing vendor to handle the printing, assembly, and mailing of materials, and we will develop a detailed schedule of mailings for the vendor to follow. We will set up an incentive payment schedule and process for paying stipends to the individual-ownership practices that complete a survey. Mathematica will mail the stipends to practices, not the vendor.
3. We will develop a sample management system (SMS) to house the sample, including the initial sample for release and back-up sample if we need to release additional cases to reach targets. The SMS will include a hierarchical relationship of physicians linked to practices and all variables and fields needed to monitor and track the sample and surveys by practice ownership type, practice size, region, physician specialty, and status (complete, in process, or not started). We will program the release of mailing files for the invitation and reminder letters based on the current status of each case. We will update cases in the SMS in real time from their status in Confirmit (such as complete, partial complete, refusal, or untouched).
4. We will develop an adaptive design plan to guide the survey fielding. The plan will include the details of the data collection, timing and type of outreach, expected response over time, and the types of tracking and reporting we will do. It will describe the potential challenges we anticipate and mitigation strategies to address them, such as needing to release additional waves of sample to achieve targets by physician specialties. It will also present a plan for how to treat cases with missing data—that is, the level of response sufficient to constitute a survey complete as long as the response contains full data for a set of key items. We will develop this design plan in Quarters 1 and 2 of 2023 and share with the AMA for review. We will incorporate the AMA's comments in a revised version of the design plan.

B. Fielding the practice survey

We will field the practice survey as a single-mode, online survey in two waves. Wave 1 will run for seven months but will begin as a three-month pilot in June 2023. Wave 1 will include the release of roughly 3,000 practices to test the field procedures and responses by practice ownership type and specialty during the first three months. At the end of the pilot, we will review the responses and discuss the need for any modifications to the survey procedures with the AMA. Wave 1 will then continue through January 2024. Wave 2 will include the release of roughly 7,000 practices and will begin in October 2023. Wave 2 will continue through April 2024. We will field Waves 1 and 2 for seven months.

1. Contact strategy, cooperation, and incentives

We will obtain practice contact information from the OneKey data set and we will contact practices primarily by email and mail to participate. We will imbed a case-specific link in a respondent's email messages so they can click and open their individual survey. We will customize letters to contain the web address and a unique user name and password to access the survey. We will conduct telephone reminder calls in the latter months of the survey to encourage response. We expect to make up to two reminder calls to practices that have not completed a survey.

We will follow the contact schedule described in the adaptive design plan for when to send letters and emails and make reminder calls to practices. Table IV.1 presents a draft contact schedule for the Waves 1 and 2 samples.

We will offer an individual practice survey report showing practice-level data for each practice that completes the survey. We will also offer monetary incentives to individual-ownership practices that complete the survey. We will set up an incentive payment schedule and process for paying stipends to the individual-ownership practices that complete a survey. Mathematica will mail the stipends to the practices using information provided by the survey respondent at the close of the survey.

2. Monitoring and reporting response

We will monitor survey response weekly using the data from Confirmit and the SMS. Confirmit provides instantaneous access to survey data and sample paradata, enabling us to view incomplete responses, see how much time respondents spend in the survey, and identify specific questions on which respondents might stop and exit the survey more than expected. We will use this information to make real-time adjustments in sample management, contact procedures, and instrument design while the survey is in the field. Confirmit data are linked and shared with SMS to update sample statuses in the SMS in real time. We will use SMS data to generate reports to share with the AMA weekly that show cumulative survey responses by practice type, practice size, practice specialty, and region.

Table IV.1. Practice expense survey contact schedule

Data collection week	Activity	Pilot sample 2023	Main sample 2023–2024
0	Advance letter with insert	June	October
1	Invitation email	June	October
2			
3	Email reminder 1	July	October
4			
5	Reminder letter 1	July	November
6			
7	Email reminder 2	July	November
8			
9	Reminder letter 2	August	December
10			
11	Email reminder 3	August	December
12	Review initial pilot responses, assess procedures and adjust if needed		
13			
14	Email reminder 4	October	January
15			
16	Reminder letter 3	October	January
17			
18	Email reminder 5	October	February
19			
20	Reminder letter 4, begin reminder calls	November	March
21			
22	Email reminder 6	November	March
23			
24	Reminder letter 5	December	March
25			
26	Email reminder 7	December	April
27			
28	Email reminder 8	January	April
29			
30	End data collection	January	April

3. Potential challenges and mitigation strategies

Table IV.2 lists several potential challenges to fielding the practice survey along with plans to mitigate them. The adaptive design plan discussed before discusses these challenges further.

Table IV.2. Practice expense survey anticipated challenges and proposed mitigation strategies

Anticipated challenges	Proposed mitigation strategies
Lower than expected quality or match rate of contact information for organization leaders	• We assume we will conduct locating to obtain contact information for up to 20 percent of practices. If the number is higher, we can discuss with the AMA whether to conduct additional locating efforts as needed.
Differential or lower response among certain practice ownership types or specialties	• We will discuss with the AMA additional contact efforts to the groups with lower response rates and/or have the AMA send an email directly. • We can release more sample from the groups with lower response rates.
Higher rate of survey breakoffs or missing data leading to incomplete survey responses	• We can target cases missing a few critical items and call and/or email to try and complete the missing items. • We can discuss with the AMA whether we can impute missing responses based on responses from other similar practice types and sizes.

C. Fielding the physician survey

We will field the physician survey as a single-mode, online survey that will run over a seven-month time frame, starting in October 2023 and ending in April 2024. We will release the sample in three waves and field each wave for eight weeks. To identify physicians to survey, we will first contact practices that have completed the practice survey and ask if they would agree to send a link to the physician survey to all physicians in their practice. Practices that agree will receive a generic link to the survey with an invitation message that explains the importance of collecting information on physician-reported patient care hours and asked to send the message with link to all of their physicians. We will also send them a reminder message and ask that they send up to two reminder emails, the first after one week and the second after three weeks.

Practices that do not agree to share the survey link will be part of the physician sample that Mathematica will survey. We will pull a list of physicians affiliated with these practices via NPI-TIN linkages in MD-PPAS and loaded into our SMS. We will create a file of physician NPIs and send them to IQVIA to append email addresses for these physicians to the file and return it. We will then upload the emails from the physician file into the SMS and Confirmit and launch the physician survey. We assume we will complete this process three times over the course of the field period: (1) a first file pulled in October 2023 will include all practices that completed a survey by that point and did not agree to send the link or did not respond to our request, (2) a second file in January 2024 will include all practices that completed a survey (and did not agree to send the link or respond to our request) since we pulled the first file, and (3) a third file in early March 2024 that will include all practices that completed a survey (and did not agree to send the link or respond to our request) since we pulled the second file.

We will contact physicians by email and mail. The respondent's email messages will include an embedded case-specific link so they can click and open their individual survey. The personalized letters will contain the web address and a unique user name and password for respondents to access their survey.

We will follow the contact schedule described in the adaptive design plan for the timing of letters and emails. Table IV.3 presents a draft contact schedule for the physician survey.

Table IV.3. Physician survey contact schedule

Data collection week	Activity	Pilot and main sample dates 2023–2024 for release Waves 1, 2, and 3
0	Advance letter	October, January, and March
1	Invitation email	October, January, and March
2		
3	Email reminder 1 and reminder letter 1	October, January, and March
4		
5	Email reminder 2	November, February, and April
6	Reminder letter 2	November, February, and April
7		
8	Email reminder 3	November, February, and April

1. Monitoring and reporting response

We will monitor survey response weekly using the data from Confirmit and the SMS. Confirmit data are linked and shared with SMS to update sample statuses in the SMS in real time. We will use SMS data to generate reports to share with the AMA weekly that show cumulative survey responses by physician specialty, practice ownership type, and sample type (survey fielded by practice or by Mathematica).

2. Potential challenges and mitigation strategies

Table IV.4 describes several potential challenges to fielding the physician survey along with strategies to mitigate them.

Table IV.4. Physician survey anticipated challenges and proposed mitigation strategies

Anticipated challenges	Proposed mitigation strategies
Lower than expected agreement from practices to field the physician survey to their physicians	• We assume 50 percent of practices that completed the survey will agree to send the survey link to their physicians. If this number is lower, we will discuss with the AMA whether to field the survey to more physicians.
Lower than expected quality or match rate of contact information for physicians	• We assume we will need to locate contact information for up to 20 percent of physicians. If this number is higher, we will discuss with the AMA whether to expend additional locating resources.
Differential or lower response among certain physician specialties	• We can discuss with the AMA additional contact efforts to the groups with lower response rates, and/or have the AMA send an email directly to a targeted list of practices. • We can release more sample for the specialties with lower response rates.

V. Data Processing, Weighting, and Nonresponse Adjustments

A. Data processing

We plan to pull data three times during the field period. We will pull an initial data file of pilot data for the practice survey and physician survey of the first 50 or so responses in fall 2023. We will review the data output and confirm the data are populating correctly and there are no skip logic errors. We will pull a second interim data file mid-way through the field period, roughly in early 2024, to begin setting up the structure for analytic files and the variables needed for analysis. We will pull a final data file when the surveys have ended in May 2024 to review the final data set, clean the data, and prepare analytic files.

We will review all of the partially completed cases to determine if we can consider any complete using the criteria reviewed and agreed upon by the AMA. We will review all of the cases that never started the survey or provided insufficient data to be considered a complete to identify how to status them for sample weighting and nonresponse purposes. Some example statuses are partial complete (started the survey but did not complete it), refusal (told us they would not participate), effort-ended (we contacted them several times but received no response), and ineligible (practices that closed or merged with another practice).

B. Weights

We will determine the final analysis weights via a four-step process:

1. Calculate the initial sampling weights as the inverse of the probability of selection.
2. Adjust the sampling weights for two types of nonresponse (eligibility determination and cooperation among eligible practices).
3. For the physician survey, we must also account for nonresponse of physicians within sampled practices.
4. Trim the weights to reduce the variance and the risk associated with outlier weights and conduct post-survey calibration using raking[4] to ensure weighted marginal totals match frame totals for selected key variables.

The initial sampling weights for the practice survey are the inverse of the probability of selection and release. In our case, we calculate probability of selection based on the selection of practices into the initial augmented sample. We will then adjust the augmented sample weights to accommodate the cases actually released for data collection. The physician survey is a census of all physicians in sampled practices, so the physicians' survey sampling weight within practices is 1. The overall sampling weight for each physician in the survey will have the sampling weight of the sampled practice.

When data collection is complete, we will assign dispositions to all sampled practices and, for the survey, physicians within practices. The dispositions include (1) ineligible (practice is closed or merged), (2) nonresponse with eligibility unknown, (3) eligible nonrespondent, and (4) completed interview. For each sampled practice, we will obtain information on all physicians in the practice. Therefore, for the survey, physicians are either respondents or nonrespondents. For the purposes of weighting, we will assume a

[4] Raking, or iterative proportional fitting, is a method of adjusting weights in an iterative, sequential manner so weighted marginal totals on key variables of interest match those of the population one variable at a time. It is considered a type of post-stratification. For the rest of this report, we use the term *post-stratification*, even though it is a more general term than *raking.*

practice survey is complete if the practice supplies direct and indirect expense information for one or more physician specialties.

We will calculate nonresponse adjustments to the sampling weights in three phases. In the first phase, we classify sampled practices as those with eligibility known and nonresponding practices with eligibility unknown. Using auxiliary variables mostly from the OneKey data set, we will fit logistic models to estimate the probability that we know eligibility. In the logistic models, we will include covariates associated with both the binary indicator of eligibility determination and with outcomes of interest (for example, expenses per patient care hour). Weights are adjusted by the estimated propensity of having eligibility known, and sample members with unknown eligibility or that are ineligible are dropped. In the second phase, we classify the remaining sampled practices as responding practices and eligible nonresponding practices; in the same manner as in the first phase, we will fit logistic models to estimate the probability of responding to the survey that include covariates associated with the binary response indicator and outcomes of interest. Finally, the third phase involves adjusting for nonresponding physicians (to the survey) among respondent practices. Again, we will fit logistic models using covariates that are available for each physician from the OneKey and MD-PPAS data (for example, demographic information for the physician).

After calculating nonresponse adjustments to the weights, we will assess the distribution of the adjusted weights for unusually high values, which could make the survey estimates less precise. We will use the design effect attributed to the variation in the sampling weights as a statistical measure to determine both the need for and amount of trimming. The design effect attributed to weighting is a measure of the potential loss in precision caused by the variation in the sampling weights relative to a sample of the same size with equal weights. We also want to minimize the extent of trimming to avoid the potential for bias in the survey estimates. Therefore, the decision to trim requires us to balance increasing bias and decreasing variance. We do this by looking at box plots, design effects, and other summary statistics to evaluate how much trimming affected the variance of estimates. The final step is a series of post-stratification adjustments through which the weights sum to known totals obtained from the sample frame data on various dimensions. As an example, we might want to ensure the weighted number of solo practices matches the total number of solo practices in the sample frame. After post-stratification, we will check the survey weights again to determine the need for more trimming.

C. Nonresponse bias analysis

Because the weighted response rates will likely be less than 80 percent, we will conduct a nonresponse bias analysis at the end of data collection. We will examine all 10,000 selected sample cases to determine if there were systematic differences between respondents and nonrespondents for a variety of covariates (for example, if responding complex-ownership radiology practices differ systematically from nonresponding complex-ownership radiology practices). We will then examine whether the nonresponse adjustments to the weights appear to have eliminated all such differences. We should note there will be other sources of potential nonresponse bias in the outcomes of interest (such as patients' expenses or care hours) that we cannot measure. Furthermore, our assessment and amelioration of nonresponse bias is only as good as the auxiliary covariates available and the strength of their associations with the outcomes. Thus, we will work with the AMA to identify as many relevant practice and physician characteristics from the available data sources as possible.

We will provide the AMA with a data file layout and an analytic file of weighted survey data, with one observation per practice per specialty.

VI. Analysis and Reporting of Survey Results

The goal of conducing the practice and physician surveys is to develop and report estimates of mean practice expense per hour of patient care for each of up to 46 Medicare specialties. The key measures to use in developing the calculations are the practice expense data reported by specialty in the practice survey and the patient care hours data reported by specialty in the physician survey. We expect to receive guidance from the AMA on how it has calculated the estimates in the past, and to review and finalize the methodology for calculating mean practice expense per hour of patient care with the AMA. We will develop analytic programs to produce the estimates and run them using an interim data file to test the program and review the output. We will then refine the program, as needed, and rerun it with the final weighted data to produce a final set of estimates for the AMA's review and approval. We expect to conduct the analysis and reporting work in Quarters 2, 3, and 4 of 2024.

A. Analysis

The main objectives of the practice survey and physician survey are to obtain mean estimates of practice expense per patient care hour by specialty. To calculate estimates of practice expenses per patient care hour, we will have to combine estimates from the practice survey (expenses) and the physician survey among sampled practices (hours). This is a ratio of two random variables; the standard error of this estimate must account for this fact and for the complex sample design, which includes clustering of physicians within practices and unequal weighting.[5] We expect the AMA will provide Mathematica with the methodology it uses to calculate practice expenses per patient care hour so we can produce comparable and reliable estimates.

Although the sampling unit is the practice for the practice survey, the unit of analysis for both the practice survey and physician survey is the physician. Table VI.1 provides a summary of confidence interval half-widths for a continuous outcome variable within each of the 46 Medicare specialties.

The half-width is half the width of a 95 percent confidence interval. For example, if the outcome is interventional cardiology with sample mean expense of $1,000 and a standard deviation of $1,000, then this table indicates the true mean expense would be in the range from $859 to $1,141 ($1,000 – 0.141 x $1,000, $1,000 + 0.141 x $1,000) with 95 percent confidence. The level of precision varies across specialties, for which the half widths range from 0.042 (Internal Medicine and Rheumatology) to 0.333 (Nuclear Medicine) because the number of physicians obtained from the sampled practices will vary widely. It will be extremely difficult to obtain responses for 100 physicians for four specialties: Hospice & Palliative Medicine, Nuclear Medicine, Osteopathic Manipulative Therapy, and Sleep Medicine. The half-widths for these four specialties are all above 0.20.

[5] Software packages that account for the sample design do so using Taylor series linearization or by incorporating replicate weights. Taylor series linearization is a method that can be used for any sample statistic and is usually the default method for estimating the standard errors of each statistic. Alternatively, one can calculate a large number (say 50) of replicate weights and incorporate those weights in the software to mimic the selection of multiple samples that can be used to correctly estimate the standard errors of each statistic.

Table VI.1. Confidence interval half-widths for a continuous outcome variable for each of the 46 Medicare specialties, in terms of number of standard deviations

Specialty	Clustering effect	Half-width	Specialty	Clustering effect	Half-width
Allergy & Immunology	1.53	0.149	Medical Oncology	3.12	0.110
Anesthesiology	3.01	0.063	Nephrology	2.25	0.119
Cardiology	2.66	0.080	Neurology	2.69	0.086
Cardiothoracic Surgery	1.44	0.130	Neurosurgery	1.87	0.125
Clinical Cardiac Electrophysiology	1.34	0.170	Nuclear Medicine	1.21	0.333
Colon & Rectal Surgery	1.29	0.176	Obstetrics/Gynecology	2.96	0.060
Critical Care Medicine	1.63	0.137	Ophthalmology	1.70	0.069
Dermatology	1.93	0.079	Orthopedic Surgery	2.44	0.075
Emergency Medicine	3.24	0.067	Osteopathic Manipulative Therapy	1.03	0.256
Endocrinology	1.32	0.097	Otolaryngology	2.27	0.102
Family Medicine	2.60	0.038	Pain Medicine	1.18	0.180
Gastroenterology	2.43	0.091	Pathology	1.86	0.147
General Practice	1.39	0.149	Pediatrics	2.13	0.121
General Surgery	2.39	0.072	Physical Medicine & Rehabilitation	1.71	0.108
Geriatrics	1.15	0.174	Plastic Surgery	1.35	0.137
Hand Surgery	1.15	0.203	Psychiatry	2.19	0.061
Hospice & Palliative Medicine	1.30	0.280	Pulmonary Disease	2.34	0.113
Hospitalist	6.53	0.098	Radiation Oncology	1.18	0.136
Infectious Disease	2.08	0.130	Radiology	2.80	0.078
Internal Medicine	2.04	0.042	Rheumatology	1.75	0.136
Interventional Cardiology	1.42	0.141	Sleep Medicine	1.08	0.255
Interventional Pain Medicine	1.16	0.183	Urology	2.64	0.117
Interventional Radiology	1.22	0.179	Vascular Surgery	1.50	0.141

Note: These half-widths assume a continuous outcome in a 95 percent confidence interval. The half-width number listed is the number of standard deviations. The assumed design effect due to unequal weighting effect is 1.1.

B. Reporting and documentation

We will provide five types of reports to the AMA on the survey results and methods.

1. **Summary statistics report:** A Microsoft Excel spreadsheet with tabs of summary statistics of the survey data showing means, minimum, maximum, and frequency distributions of practice expenses and patient care hours by practice type, practice size, practice specialty, and physician specialty.
2. **Summary practice expense report:** An Excel spreadsheet with mean practice expense per patient care hour for each of the specialties overall and for each of the expense categories reported in the survey.
3. **Individual practice survey report:** An Excel spreadsheet showing practice-level data for practices that completed a survey. The report will show means for each specialty present in the practice, their practice-level survey data, and comparisons to the mean for other similar type and size practices.

Each practice that completes the survey will receive one of these reports with their practice-level data. We will submit a mock report to the AMA for review and approval before preparing all individual reports. Practices will receive final reports via email (or mail if no email exists) as a portable document format (pdf) file.

4. **Medical specialty society reports:** An Excel spreadsheet for each medical specialty society will be submitted to the AMA for review and approval before distributing. Medical specialty societies will receive final reports via email as a pdf file from the AMA.
5. **Survey methodology report:** A Microsoft Word document specifying the final sample selection and survey fielding procedures; the distribution of physicians spread across practice ownership types both in the population and in the final sample; and the number of practices interviewed by specialty, practice ownership type, size and region.

We will prepare one draft version of each type of report described for the AMA to review. We will revise each type of report and submit a revised version to the AMA for review and final approval.

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