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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2020
or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to .
Commission file number: 001-36732

PRA Health Sciences, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**46-3640387**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

4130 ParkLake Avenue, Suite 400, Raleigh, NC 27612
(Address of principal executive offices) (Zip Code)
(919) 786-8200
Registrant's telephone number, including area code

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered	Trading symbol
Common Stock, par value $0.01 per share	Nasdaq Global Select Market	PRAH

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. Yes ☒ No ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant was approximately $6.2 billion based on the closing sale price as reported by the Nasdaq Global Select Market on June 30, 2020.

Indicate the number of shares outstanding of each of the registrant's classes of common stock, as of the latest practicable date.

Class	Number of Shares Outstanding
Common Stock $0.01 par value	64,543,968 shares outstanding as of February 19, 2021

DOCUMENTS INCORPORATED BY REFERENCE

Pursuant to General Instructions G(3), certain information to be included in Part III of this Annual Report on Form 10-K will be filed in a Form 10-K/A within 120 days after the registrant's fiscal year ended December 31, 2020.

PRA HEALTH SCIENCES, INC.
ANNUAL REPORT ON FORM 10-K
FOR FISCAL YEAR ENDED December 31, 2020
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FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K, or this report, contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Such forward-looking statements reflect, among other things, our current expectations and anticipated results of operations, all of which are subject to known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements, market trends, or industry results to differ materially from those expressed or implied by such forward-looking statements. Therefore, any statements contained herein that are not statements of historical fact may be forward-looking statements and should be evaluated as such. Without limiting the foregoing, the words “anticipates,” “believes,” “estimates,” “expects,” “intends,” “may,” “plans,” “projects,” “should,” “targets,” “will,” and the negative thereof and similar words and expressions are intended to identify forward-looking statements. These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including those described in “Risk Factors” in Part I, Item 1A of this report, and speak only as of the date hereof. Unless legally required, we assume no obligation to update any such forward-looking information to reflect actual results or changes in the factors affecting such forward-looking information.

Market and Industry Data and Forecasts

This report includes data, forecasts, and information obtained from industry publications and surveys and other information available to us. Forecasts and other metrics included in this report to describe our industry are inherently uncertain and speculative in nature, and actual results for any period may materially differ. Estimates and forecasts involve uncertainties and risks and are subject to change based on various factors, including those described in the section titled "Risk Factors" included under Part I, Item 1A of this report. While we are not aware of any misstatements regarding the third-party industry data presented in this report, we have not independently verified any of the data from third-party sources, nor have we ascertained the underlying assumptions relied upon therein.

The ISR 2020 Market Report, as defined below, represents research opinion or viewpoints published by Industry Standard Research, or ISR, a market research firm. Such opinions or viewpoints should not be construed as statements of fact. The ISR 2020 Market Report speaks as of its original publication date (and not as of the date of this report) and the opinions expressed in the ISR 2020 Market Report are subject to change without notice. ISR does not endorse any vendor, product, or service depicted in its research publications.

Website and Social Media Disclosure

We use our website (www.prahs.com) as a channel of distribution of company information. The information we post through this channel may be deemed material. Accordingly, investors should monitor this channel, in addition to following our press releases, Securities and Exchange Commission, or SEC, filings, and public conference calls and webcasts. The contents of our website are not, however, a part of this report.

Part I

Item 1. Business

Overview

We are one of the world's leading global contract research organizations, or CROs, by revenue, providing outsourced clinical development and data solution services to the biotechnology and pharmaceutical industries. We believe we are one of a select group of CROs with the expertise and capability to conduct clinical trials across major therapeutic areas on a global basis. Our therapeutic expertise includes areas that are among the largest in pharmaceutical development, and we focus in particular on oncology, immunology, central nervous system, inflammation, respiratory, cardiometabolic, and infectious diseases. We believe that we further differentiate ourselves from our competitors through our investments in medical informatics and clinical technologies designed to enhance efficiencies, improve study predictability, and provide better transparency for our clients throughout their clinical development processes. Our Data Solutions segment allows us to better serve our clients across their entire product lifecycle by (i) improving clinical trial design, recruitment, and execution; (ii) creating real-world data solutions based on the use of medicines by actual patients in normal situations; and (iii) increasing the efficiency of biotechnology and pharmaceutical companies' commercial organizations through enhanced analytics and outsourcing services.

Our global clinical development platform includes more than 70 offices across North America, Europe, Asia, Latin America, South Africa, Australia, and the Middle East, and more than 18,100 employees worldwide. Since 2000, we have participated in over 4,200 clinical trials worldwide, worked on marketed drugs across several therapeutic areas, and conducted the pivotal or supportive trials that led to U.S. Food and Drug Administration, or FDA, or international regulatory approval of approximately 100 drugs.

We offer flexible clinical development service offerings, which include embedded and functional outsourcing services in addition to traditional, project-based clinical trial services. Our Strategic Solutions offerings provide Embedded Solutions™ and functional outsourcing services in which our teams are fully integrated within the client's internal clinical development operations and are responsible for managing functions across the entire breadth of the client's drug development pipeline. We believe that our Strategic Solutions offerings represent an innovative alternative to the traditional, project-based approach and allow our clients to maintain greater control over their clinical development processes. Our flexible clinical development service offerings expand our addressable market beyond the traditional outsourced clinical development market to include the clinical development spending that biopharmaceutical companies historically have retained in-house.

Over the past 30 years, we have developed strong client relationships and have performed services for more than 300 biotechnology and pharmaceutical clients. Our Strategic Solutions offerings have significantly expanded our relationships with large pharmaceutical companies in recent years, which has allowed us to pursue strategic alliances with these companies due to our global presence, broad therapeutic expertise, and flexible clinical development service offerings. Additionally, we believe that we have built a reputation as a strategic partner of choice for biotechnology and small- to mid-sized pharmaceutical companies as a result of our competitively-differentiated platform and our long-term track record of serving these companies.

CRO Industry

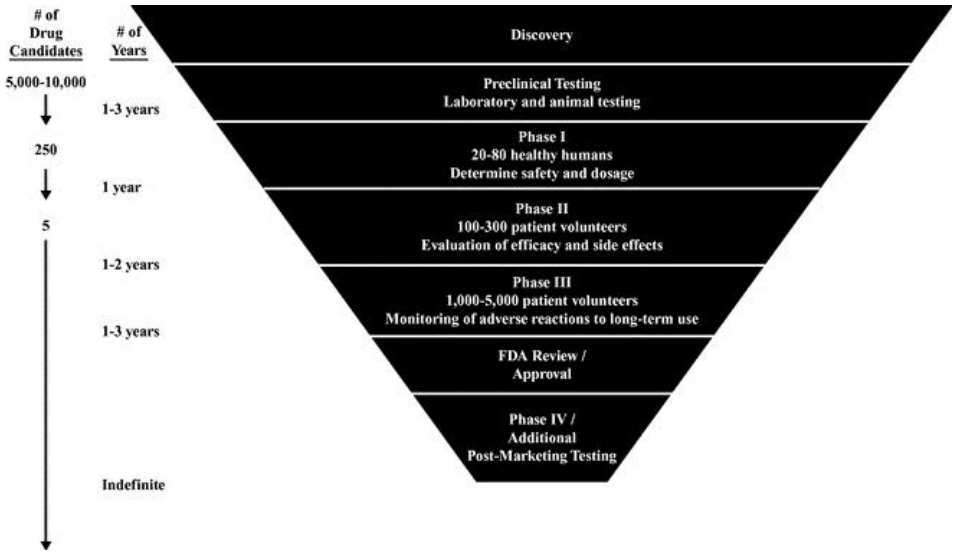
CROs provide drug development services, regulatory and scientific support, and infrastructure and staffing support to provide their clients with the flexibility to supplement their in-house capabilities or to provide a fully outsourced solution. The CRO industry has grown from providing limited clinical trial services in the 1970s to a full-service industry characterized by broad relationships with clients and by service offerings that encompass the entire drug development process. Today, CROs provide a comprehensive range of clinical services, including protocol design and management and monitoring of Phase I through Phase IV clinical trials, data management, laboratory testing, medical and safety reviews, and statistical analysis. In addition, CROs provide services that generate high quality and timely data in support of applications for regulatory approval of new drugs or reformulations of existing drugs as well as new and existing marketing claims. CROs leverage selected information technologies and procedures to efficiently capture, manage, and analyze the large streams of data generated during a clinical trial.

Drug development processes

Discovering and developing new drugs is an expensive and time-consuming process and is highly regulated and monitored through approval processes that vary by region. Before a new prescription drug reaches commercialization, it must undergo extensive pre-clinical and clinical testing and regulatory review, to verify that the drug is safe and effective.

A drug is first tested in pre-clinical studies, which can take several years to complete. When a new molecule is synthesized or discovered, it is tested for therapeutic value using various animal and tissue models. If the drug warrants further development, additional studies are completed and an investigational new drug application, or IND, is submitted to the FDA. Once the IND becomes effective, the drug may proceed to the human clinical trial phase which generally consists of the following interrelated phases, which may overlap:

Stages of Clinical Development



Market trends

ISR estimated in its "2020 CRO Market Size Projections: 2019-2024" report, or ISR 2020 Market Report, that the size of the worldwide CRO market was approximately $41 billion in 2019 and will grow at a 6.5% CAGR to $57 billion in 2024. This growth will be driven by an increase in the amount of research and development expenditure and levels of clinical development outsourcing by biopharmaceutical companies.

Increased R&D spending

ISR estimates in its 2020 Market Report that research and development, or R&D, expenditures by biopharmaceutical companies were approximately $323 billion in 2019 and will grow approximately 3.4% per year through 2024. Of this amount, approximately $134 billion was spent on development, including $95 billion on Phase I through IV clinical development. We believe biotechnology companies often contract these trials to CROs due to the general lack of existing infrastructure.

Higher outsourcing penetration

ISR estimates in its 2020 Market Report that approximately 43% of Phase I through IV clinical development spend is outsourced to CROs, and the levels of penetration are expected to increase to approximately 49% by 2024. We believe this increase in outsourcing is due to several factors, including the need to maximize R&D productively, the increasing burden of clinical trial complexity, and the desire to pursue simultaneous registration in multiple countries.

- Maximizing Productivity and Reducing Cost—Productivity within the biopharmaceutical industry has declined over the past several years and the cost of developing a new drug has significantly increased. The combined impact of declining R&D productivity and increased development costs has translated into significant pressure on margins and short-term earnings for biopharmaceutical companies. We believe that the need for these companies to maximize productivity and lower costs will lead them to partner increasingly with CROs that can improve efficiency, and increase flexibility and speed across their clinical operations.

- Increasing Clinical Trial Complexity—Over the last decade, the burden of clinical trial complexity has been increasingly difficult to manage due to requirements from regulatory authorities worldwide for greater amounts of clinical trial and safety data to support the approval of new drugs, and requirements for adherence to increasingly

complex and diverse regulations and guidelines. In an effort to minimize potential risks, these regulatory agencies also typically require a greater amount of post-approval information and monitoring of drugs on the market. To balance the conflicting demands of a growing market with the need to control R&D expenses, biopharmaceutical companies partner with CROs that can provide services designed to generate high-quality and timely data in support of regulatory approvals of new drugs or the reformulations of existing drugs, as well as support of post-approval regulatory requirements.

- Simultaneous Multi-Country Registration—Given their desire to maximize efficiency and global market penetration to achieve higher potential returns on their R&D expenditures, biopharmaceutical companies are increasingly pursuing simultaneous, rather than sequential, regulatory new drug submissions and approvals in multiple countries. However, most biotechnology and small- to mid-sized pharmaceutical companies do not possess the capability or capacity to simultaneously conduct large-scale clinical trials in more than one country. In addition, establishing and maintaining internal global infrastructure to pursue multiple regulatory approvals in different therapeutic categories and jurisdictions can be costly.

Our History and Corporate Information

Our qualified and experienced clinical and scientific staff has been delivering clinical drug development services to our clients for more than 30 years and our service offerings now encompass the spectrum of the clinical drug development process. See Note 4 to our audited consolidated financial statements found elsewhere in this Annual Report on Form 10-K for additional information with respect to our recent acquisitions.

Our Competitive Strengths

Global CRO platform

We are one of the largest CROs in the world by revenue focused on executing clinical trials on a global basis. Our global clinical development platform includes more than 70 offices across North America, Europe, Asia, Latin America, South Africa, Australia and the Middle East and over 18,100 employees worldwide. We are dedicated to the seamless execution of integrated clinical trials on multiple continents concurrently. We believe our global presence and scale are important differentiators as biopharmaceutical companies are increasingly focused on greater patient access for increasingly complex clinical trials and gaining regulatory approval for new products in multiple jurisdictions simultaneously.

Broad and flexible service offering

We believe that we are one of a select group of CROs capable of providing both traditional, project-based CRO services as well as embedded and functional outsourcing services. Our broad and flexible service offering allows us to meet the clinical research needs of a wide range of clients, from small biotechnology companies to large pharmaceutical companies. Through more than 30 years of experience, we have developed significant expertise executing complex drug development projects that span Phase I through Phase IV clinical trials. Our Product Registration offerings consist primarily of traditional, project-based CRO services, where we have gained the reputation as a strategic partner of choice to biotechnology and pharmaceutical companies. Our Strategic Solutions offerings primarily cater to the needs of large pharmaceutical companies that seek to maintain greater control over their clinical trial processes.

Therapeutic expertise in large segments of drug development

Our therapeutic expertise encompasses areas that are among the largest in pharmaceutical development, including oncology, immunology, central nervous system, inflammation, and infectious diseases. We have participated in more than 2,500 clinical trials in these key areas since 2005, accounting for a substantial majority of our total clinical trials during this period. We employ drug development experts with extensive experience across numerous therapeutic areas in preparing development plans, establishing study and protocol designs, identifying investigative sites and patients, and submitting regulatory filings. Our staff is highly experienced and includes approximately 950 Ph.Ds, 625 medical doctors, and 300 doctors of pharmacy worldwide.

Innovative approach to clinical trials using medical informatics

We are committed to being an industry leader in developing global, scalable, and sustainable drug development solutions. We continuously improve our systems and processes by investing in medical informatics, technology, analytics, and IT infrastructure. Our information system enables rapid, web-based delivery of clinical trial data to clients and project teams.

We believe our proprietary analysis and application of data are key differentiators and allow us to identify more productive investigative sites and speed patient enrollment, thereby decreasing drug development timelines. We have invested in, and acquired, large databases of aggregated patient medical data, which we refer to as medical informatics, to clearly understand patient distribution and location. Specifically, we have acquired data sources that give us significant amounts of information about patient populations in the U.S. to enhance enrollment; these include medical claims data, hospital master charge data, pharmacy data, laboratory data, and payor data. These investments in informatics gives us the capability to identify potential patient populations by location, diagnostic code, treating physician, medications, date diagnosed, last treatment, and other relevant metrics. Our medical informatics suite provides visibility to more than 90% of prescriptions dispensed to more than 300 million patients across all diagnoses, amounting to approximately 1.2 billion claims transactions.

Leading enabler of integrated health data and analytics

Symphony Health Solutions Corporation, or Symphony Health, supports our commitment to enhancing the future of clinical development with best-in-class technology solutions which enable deep, data-driven insights to optimize global clinical studies and drug commercialization.

Diversified and attractive client base

Over the past 30 years, we have developed strong client relationships and have performed services for more than 300 biotechnology and pharmaceutical clients. We have significantly expanded our relationships with large pharmaceutical companies in recent years, which has allowed us to pursue strategic alliances with these companies due to our global presence, broad therapeutic expertise, and flexible clinical development service offerings. Additionally, we believe that we have built a reputation as a strategic partner of choice for biotechnology and small- to mid-sized pharmaceutical companies as a result of our competitively differentiated platform and our long-term track record of serving these companies. Our client relationships are also broad and diversified, and in the year ended December 31, 2020, our top 10 clients represented 53% of revenue, with no client representing more than 10% of revenue and our largest single study accounting for approximately 1% of our revenue.

Innovative management team

We are led by a dedicated and experienced executive management team with an average of more than 20 years of experience across the global clinical research, pharmaceutical, and life sciences industries. This team has been responsible for building our global platform, successfully integrating our acquisitions, developing our advanced IT-enabled infrastructure, and realizing our significant growth in revenue and earnings over the past five years.

Our Growth Strategy

Leverage our strong market position within the biotechnology and small- to mid-sized pharmaceutical market

We believe our long-term track record serving biotechnology and small- to mid-sized pharmaceutical companies has resulted in our reputation as a strategic partner of choice for these companies. We believe that biotechnology and small- to mid-sized pharmaceutical companies rely on full service CROs to deliver fast, effective, and thorough support throughout the clinical development and regulatory processes, as these companies generally lack a global clinical development infrastructure. We intend to leverage our strong relationships with biotechnology and small- to mid-sized pharmaceutical companies to capture additional business from these companies. In particular, we believe the CRO strategic alliances that have become prevalent with large pharmaceutical companies over the past several years will increasingly be utilized by biotechnology and small- to mid-sized pharmaceutical companies. We believe we are well-positioned to take advantage of these opportunities given the depth of our relationships and our proven track record serving these customers.

Build deeper and broader relationships with large pharmaceutical companies

Large pharmaceutical companies have increasingly focused on partnering with multi-national CROs that offer a wide array of global therapeutic and service capabilities. We have invested significantly in our global scale and infrastructure over the past several years to enhance our status as a service provider for these companies.

Expand our leading therapeutic expertise in existing and new areas

We believe that our therapeutic expertise in all clinical phases of drug development is critical to the proper design and management of clinical trials and we intend to continue to capitalize on our strong market positions in several large therapeutic categories. We have established, and will continue to refine, our scientific and therapeutic business development initiatives,

which link our organization to key clinical opinion leaders and medical informatics data to more effectively leverage therapeutic expertise throughout our client engagement. Specifically, we believe that oncology, central nervous system, inflammation, and infectious diseases, which together represent the majority of all drug candidates currently in clinical development by biotechnology and pharmaceutical companies, will be significant drivers of our growth. In the area of oncology, we believe that the growth of targeted therapies, companion diagnostics, and personalized medicine will continue to drive drug development. With the aging demographics, we believe we will see significant growth in the area of dementia and Alzheimer's research and drug development, which is complemented by our specialty and focus in neurology. Additionally, we believe that development of niche therapeutic drugs (orphan drugs) will continue to see considerable growth moving forward and we have a dedicated staff focused on the design and conduct of trials for these drugs.

Continue to enhance our tech-enabled CRO engagement model

Our Data Solutions business provides us with rich data insights that allow us to customize our clinical studies to be as unique as the patients who they are designed around. By creatively harnessing the power of our technology and data assets, we are redefining the clinical development process for a more patient-centric future.

Continue to realize strategic benefits from recent acquisitions

We believe we will continue to realize strategic benefits from the acquisitions we have completed over the past five years, resulting in additional revenue growth and margin improvements. We believe that our strategic acquisitions are complementary to our customer base and expect to generate incremental revenue growth by cross-selling our full set of services to our existing and new customers, thereby expanding the scope of our customer relationships and generating additional revenue.

Pursue selective and complementary acquisition strategy

We are a selectively acquisitive company focused on growing our core service offerings, therapeutic capabilities and geographic reach into areas of high market growth. We have acquired 22 companies since 1997 and have established programs to help us identify acquisition targets and integrate them successfully. Our acquisition strategy is driven by our comprehensive commitment to serve client needs and we are continuously assessing the market for potential opportunities.

Service Offerings

We have two reportable segments: Clinical Research and Data Solutions. Our Clinical Research segment encompasses a broad array of services across the spectrum of clinical development programs. Our Data Solutions segment provides data, analytics, technology, and consulting solutions to the life sciences market. The offerings of our two segments complement each other and can provide enhanced value to our clients when delivered together, with each driving demand for the other.

For financial information regarding our segments, see Part II, Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations—Segment Results of Operations" and Note 21 to our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K.

Clinical Research

We perform a broad array of services across the spectrum of clinical development programs, from the filing of INDs and similar regulatory applications to conducting all phases of clinical trials. Our core service offerings include:

- Product Registration, which includes Phase IIb through III product registration trials and Phase IV trials, inclusive of post-marketing commitments and registries;
- Strategic Solutions, which provides Embedded Solutions and functional outsourcing services, in which our teams are fully integrated within the client's internal clinical development operations and responsible for managing functions across the entire breadth of the client's drug development pipeline; and
- Early Development Services, which includes Phase I through Phase IIa clinical trials and bioanalytical laboratory services.

We provide many back office services to clients as well, including processing the payments to investigators and volunteers. We also collaborate with third-party vendors for services such as imaging, central lab, and patient recruitment services.

Product Registration

Our Product Registration, or PR, offerings encompass the design, management, and implementation of study protocols for Phase II through Phase III clinical trials, which are the critical building blocks of product development programs, as well as Phase IV, or post-approval, clinical trials. We have extensive resources and expertise to design and conduct studies on a global basis, develop integrated global product databases, collect and analyze trial data, and prepare and submit regulatory submissions in the United States, Europe, and other jurisdictions.

A typical full-scale program or project may involve the following components:

- clinical program development, review and consultation, and lifecycle management planning;
- design of the clinical protocol and electronic case report forms, or CRFs;
- feasibility studies for investigator interest and patient access and availability;
- patient recruitment and retention services;
  - project management;
- investigator and site analysis for selection and qualification;
- investigator handbook and meetings;
- investigational site support and clinical monitoring;
- data management;
- patient medical and safety management;
- analysis and reporting;
- medical and scientific publications; and
- preparation of regulatory filings.

As described below, we offer a suite of product registration service offerings to our clients to address the several components involved in conducting a full-scale program or project.

Clinical Trial Management—Our clinical trial management services, used by biotechnology and pharmaceutical clients, may be performed exclusively by us or in collaboration with the client's internal staff or other CROs. With our broad clinical trial management capabilities, we conduct single site studies, multi-site U.S. and international studies, and global studies on multiple continents. Through our electronic trial master file, we can create, collect, store, edit, and retrieve any electronic document in any of our office locations worldwide, enabling our global project teams to work together efficiently regardless of where they are physically located and allowing seamless transfer of work to a more efficient locale.

Project Management—Our project management group manages the development process, setting specific targets and utilizing various metrics to ensure that a project moves forward in the right trajectory, resources are used optimally, and client satisfaction is met. This group also oversees the implementation of a work breakdown structure, communication plan, and a risk and contingency program for each study. We believe that the management structure of our service delivery model sets us apart in the industry. Each individual project is assigned a director of project delivery and key strategic accounts are also assigned a general partner. As a member of the senior management team, the general partner works with the director of project delivery, the project management group, and client representatives to ensure the highest level of client satisfaction. With over 500 project directors and project managers, we match our project management personnel to projects based on experience and study specific parameters.

Regulatory Affairs—Our team of global regulatory professionals has extensive experience working with biotechnology and pharmaceutical companies and regulatory authorities worldwide. Our regulatory affairs group is comprised of an internal network of local regulatory experts who are native speakers in countries across North America, Latin America, Western and Eastern Europe, Africa, and Asia Pacific. Regulatory team members and local regulatory experts act as clients' representatives for submissions and direct communications with regulatory authorities in all regions. The group's regulatory expertise enables rapid study start-up and facilitates competitive product development plans and effective submission strategies.

Therapeutic Expertise—Our therapeutic expertise group provides scientific and medical expertise and patient access and retention services worldwide across a broad range of therapeutic areas. Our broad experience throughout various therapeutic areas allows us to offer a more complete global service offering to our clients. Our diverse therapeutic expertise group leverages best-in-class data assets to assist our clients with the design and implementation of entire clinical development programs and our current and potential clients increasingly seek partners who can provide these capabilities. We provide clients with therapeutic expertise in the design and implementation of high-quality product development programs and help them achieve key development milestones in a cost and time effective manner. Our therapeutic expertise is used by both emerging biotechnology companies that lack clinical development infrastructure and pharmaceutical companies that have limited internal medical resources or are exploring new therapeutic areas.

Clinical Operations—Our clinical operations group provides clients with a full set of study site management and monitoring services in approximately 90 countries worldwide, through our highly experienced team of clinical research associates and specialists. This experience includes knowledge of local regulations, medical practices, safety, and individual therapeutic areas. We provide our clients with fully trained and locally based clinical teams led by experienced clinical team managers that initiate site start-up, monitor activities, and review data. Based in the Americas, Europe, Asia Pacific, and Africa, these teams work from a strategic foundation that combines reliance on proven, consistent processes with the flexibility to adapt innovative ideas and technologies. Given our expertise executing clinical trials around the world, we are positioned to meet our clients' diverse needs and expectations. Our study start-up services group, a unit within clinical operations, manages the key components of rapid site activation and investigational site set-up for clinical trials by utilizing our global and region specific expertise.

Data and Programming Services—Our global data and programming services group offers an innovative suite of technologies that gather and organize clinical trial data. We employ industry leading electronic data capture technologies and innovative delivery systems to produce high quality and standardized data and reports. We focus on evaluating a client's needs, presenting optimal solutions for each trial, and implementing the chosen solution effectively during project execution. To support these goals, we have built a group of technological experts in drug research that has a strong foundation in data management fundamentals and core programming abilities.

Safety and Risk Management—Our dedicated safety and risk management group helps clients design, implement, and operationalize the proper safety procedures for development through to post-marketing, facilitating clear assessment and communication of patient safety profiles. Our centralized drug safety centers are staffed with experienced drug safety associates responsible for integrating an effective risk minimization strategy for a drug product and generating useable information based on ongoing risk evaluation. Our team provides risk mitigation strategies at all stages of the drug development cycle and offers core signal detection capabilities.

Biostatistics and Medical Writing—Our global biostatistics and medical writing operations integrate our biostatistics, medical writing, pharmacokinetics, and regulatory publishing groups. With a staff of industry experienced and therapeutically trained biostatisticians and medical writers, we offer clients expertise in statistical analysis, data pooling, and regulatory reporting. This global team provides specialist consulting expertise and support to clients from the first stage of protocol design through post-marketing surveillance and Phase IV studies. For publishing, we use a specialized electronic system that enables us to seamlessly assemble, manage, and publish complex documents in compliance with applicable regulatory guidelines.

Quality Assurance Services—Our global quality assurance group is staffed by a team of experienced professionals in the Americas, Europe, and Asia Pacific. Our quality assurance department is entirely separate from and independent of the personnel engaged in the direction and conduct of clinical trials. The objective of the quality assurance group is the global promotion of ongoing quality awareness and continuous improvement of our processes. This group serves these efforts by performing audits on the processes and systems used in the management of clinical trials to ensure compliance with study protocol and applicable regulatory requirements. This group has performed audits for a wide range of medical indications and in all phases of clinical trials across the globe.

Real World Solutions (RWS)—Our global late-phase services group supports global and regional post-approval trials with management locations centralized in Pennsylvania, Germany, Mexico, and Singapore. Our experienced late-phase services team assists clients with the post-marketing process by helping identify trends and signals in large populations as well as planning and conducting safety surveillance studies, large-sample trials, registries, restricted access programs, risk management programs, diagnostic trials, and biomarker research. The team consists of industry leading strategic experts, operational specialists, and epidemiologists who work with clients to identify post-marketing research objectives and goals and translate them into comprehensive study designs.

Strategic Solutions

Our Strategic Solutions, or SS, offerings allow biotechnology and pharmaceutical companies to execute their internally-managed development portfolio with greater flexibility and to leverage their existing infrastructure to minimize redundancy. These offerings provide a broad spectrum of solutions that allow for the efficient management and execution of critical clinical development functions for pharmaceutical clients. These services are embedded or integrated within the client's internal clinical development operations to support the entire breadth of the client's drug development pipeline. By embedding our employees within our clients' infrastructure, we create a strategic and interdependent relationship that allows us to anticipate our clients' clinical trial demands and efficiently deploy our skilled clinical professionals to meet our clients' needs. Clinical functions supported by this service offering include study start-up activities, site monitoring, study management, data management, biostatistics, regulatory, and product safety. We focus our solutions primarily on our clients' Phase II through Phase IV development programs. While traditional, project-based CRO offerings target the outsourced component of biopharmaceutical industry spending, our Strategic Solutions offerings address the total Phase II through IV development market. We pioneered the embedded services model described below, and we have extensive experience helping customers re-align their operating model to more efficiently manage their development portfolio with greater flexibility and control.

Our Strategic Solutions offerings include:

Embedded Solutions—We believe we are the only company in the industry to offer a strategically scalable, fully-embedded clinical development solution. Our Embedded Solutions model is designed to merge clinical operations expertise, management, infrastructure, and support to create a flexible and integrated operating model. The goal of our Embedded Solutions model is to enable our clients' internally-managed development processes to be executed with greater flexibility. These solutions can be further enhanced by leveraging our systems and technology as required. In our Embedded Solutions model, we typically work with our partners to assist in redesigning existing systems and processes to drive greater efficiency, speed, and quality, and to implement innovative approaches and enhanced technology. We employ a strong joint governance structure and robust metrics to measure and ensure strong quality, cycle time, productivity, and service-level performance.

Functional Services Provider Solutions—Our functional services provider offering provides dedicated capacity management within a single operating platform and within one function or across multiple functions and geographies. While the customer provides direction and functional management, we provide resources and line management, training, and support. We also utilize business level metrics to help ensure that staff are deployed with the relevant experience and are producing consistent, repeatable results.

Staff Augmentation Solutions—Our staff augmentation solutions offering provides clients with the ability to address their dynamic staffing needs by supplying access to resources qualified to meet their clinical development needs. This allows clients to maintain flexibility while also reducing fixed costs. In order to rapidly attract and recruit qualified employees for these situations, we have assembled what we believe is the largest team in the industry focused on personnel recruitment. These individual professionals are hired as our employees and are managed by our teams, minimizing co-employment related issues. The customer has the ability to define the resources required according to the therapeutic- and disease-specific experience required. These resources can be on site at the customer's facility, at our offices, or regionally based.

Custom-Built Development Solutions—Our custom-built development solutions are designed to offer people, process, systems, and development expertise that enable the efficient internal development of a company's product portfolio with greater control and flexibility, accelerated development timelines, and substantially reduced costs. With the client's core leadership in control, we help to build the development team our clients need, while enabling them to maintain the flexibility to be nimble during the development lifecycle.

Commercialization Services—Through our commercialization services offering, we assist our clients in addressing the challenge of commercializing products. We do this by deploying professionals who are knowledgeable in launch preparation and product lifecycle management. We assist customers in managing the product lifecycle by working with them to create concise messaging, engage thought leadership and health care providers, generate consumer enthusiasm for the product, and prepare for post-marketing commitments. Our commercialization services offering utilizes our flexible service model and, as such, can be delivered as an Embedded Solution, through our functional service provider model, or through staff augmentation.

Early Development Services

Our Early Development Services, or EDS, offerings include a full range of services for Phase I and Phase IIa studies as well as bioanalytical analysis. We have conducted studies for major pharmaceutical companies in Europe, the United States, and Japan, as well as for many smaller and emerging biotechnology companies. We have also built direct relationships with a large base of available subjects, including healthy volunteers and patient populations with specific medical conditions.

Our services include offerings focused on the conduct and design of early stage patient population studies, and therapeutically focused in human abuse liability, or HAL, addiction, pain, psychiatric, neurological, pediatric, and infectious disease services. We are one of the largest providers of patient population for Phase I and confined Phase II to Phase III services in the United States, and are one of only a few CROs in the world that has the ability to design and conduct HAL studies, a regulatory-required study for central nervous system compounds. We believe this enables us to provide our clients with a full range of Phase I to Phase II clinical research services in specialized patient populations for both inpatient and outpatient settings.

EDS also supports a variety of additional services, ranging from protocol development to data management and pharmacy services, including manufacturing of investigational medicinal products. Our state-of-the-art laboratories provide pharmacokinetics, the branch of pharmacology concerned with the movement of drugs within the body, and pharmacodynamics, the branch of pharmacology concerned with the effects of drugs and the mechanism of their action analyses, including biomarkers, as needed. Our safety laboratory supports our own clinics and also acts as a central lab for medium sized Phase II trials. We also provide clinical study reports, statistical analysis, medical writing, and regulatory support.

We focus on high-end Phase I studies and specialize in more complex types of studies in which safety, intelligent design, and a wide range of pharmacodynamics assessments are critical factors. We believe our Phase I team is a leader in new developments, such as microdosing studies, pain models, HAL studies, and multi-purpose protocols with adaptive designs. We have developed extensive methodologies enabling us to conduct studies with pharmacokinetics and/or pharmacodynamics objectives.

We have more than 1,400 early development specialists working in five clinical pharmacology units located across four different countries, including the United States, the Netherlands, and countries in Central and Eastern Europe. We are equipped with the technologies and infrastructure for high-quality, efficient studies on a wide range of drugs and indications. Over the past five years, we have conducted approximately 650 high-level, complex early development clinical trials and more than 220 bioanalytical studies per year over the previous five years.

Phase I through IIa Studies—For in-house Phase I studies, we offer more than 400 beds worldwide and accommodate volunteers in our state-of-the-art clinical pharmacology units, some of which are hospital-based. At these centers, volunteers are under constant medical supervision by a team of highly experienced medical professionals. We have a pool of more than 100,000 study participants (both healthy volunteers and various specific patient populations).

In addition to in-house studies, we use an innovative “unit-on-demand” business model that brings a Phase I center to patients. This model establishes a Phase I study environment in central medical facilities that specialize in the treatment of the target patient population. Physicians can recruit high volumes of patients using extensive networks of referring specialists and general practitioners. The studies occur in single center and multi-national settings. We have also built an extensive patient network and database in areas including depression, schizophrenia, diabetes, and hepatitis C. In addition to conducting Phase I and IIa studies in subjects, these sites act as investigative sites in Phase IIb and III trials.

We also offer full pharmacy capabilities and we operate a manufacturing site that complies with applicable current Good Manufacturing Practice regulations and is designed for fast and flexible manufacturing of small batches of investigational medicinal product for studies. In addition, dedicated data management professionals who can process clinical data into specific deliverables are integrated in each clinical pharmacology unit.

Since a large proportion of drug compounds do not succeed in Phase I, we utilize IND trials that include “microdose” or “low-dose” studies to screen multiple candidates at an early stage and minimize the number of failing clinical product candidates. We have been closely involved in the field of microdose studies over the past 10 years and have conducted approximately 30 microdose studies.

Bioanalytical Laboratory—We offer clients two state-of-the-art bioanalytical laboratories located in Assen, the Netherlands, and Lenexa, Kansas, United States. These bioanalytical laboratories have been harmonized with respect to standard operating procedures, work instructions, and equipment. This provides a high level of consistency, continuity, and efficiency. It also provides our clients with the ability to run studies in either laboratory, depending on the requirements of the study, and ensures that they will receive the same high level of service. Both bioanalytical laboratories are located within close proximity to their respective Phase I clinical pharmacology unit, ensuring rapid sample processing for critical dose escalation decision making involving pharmacokinetic assays. Both facilities include laboratories for mass spectrometry and ultra- performance liquid chromatography, typically applied to small molecule analysis. For large molecules, such as biologicals and biomarkers, our laboratories operate a wide variety of specialized assays, including ligand binding assays with a variety of detection methodologies and immunogenicity. In our fully licensed isotope laboratory, bioanalytical support is provided for mass balance and microdosing studies. The laboratories, combined with expert and highly educated staff, provide a full range of analytical services throughout the development process.

Data Solutions

Our Data Solutions segment provides data, analytics, technology, and consulting solutions to the life sciences market. We have proprietary sources of data about pharmaceutical transactions that we purchase from pharmaceutical retailers, prescribers, payers, and institutional users. The data is anonymized and includes details on the patient, the location where they purchased the drug or therapy, and the payer. The details on the patient, although anonymous, are tracked in such a way as to allow analysis of therapies and purchasing over a long term. They also include demographic data such as age, gender, race, and diagnoses. The data is refreshed monthly.

The core service offerings of our Data Solutions segment include:

Market Intelligence Services

Targeting and Compensation - Prescription and drug sales data services used primarily to compensate sales representatives. This data includes dispensed prescription data, non-retail pharmacy drug purchasing data, and healthcare demographic and affiliations data.

Pharmaceutical Audit Suite - National-level prescription and sales data services used primarily for market research. Data subscriptions include all products and therapeutic areas and are primarily accessed on-line through our business intelligence tool.

Consulting & Services

Brand Analytics - Anonymized patient-level data sets and services that enable a variety of commercial analytics, including patient compliance, persistency, product switching, share and counts, and diagnosis. The most significant offering is PatientSource, a comprehensive patient-level data set, providing a detailed view of patient treatment activity in a client-defined disease category. PatientSource includes data regarding prescribers, patients and payer dynamics.

Managed Markets - A suite of prescription claims-based data products and analytic tools that leverage our exclusive claims lifecycle data to understand managed markets' influence on product demand.

Commercial Effectiveness - A professional services unit providing offerings that enable clients to optimize promotion spend and activities. Offerings include digital promotional measurement, advanced targeting, patient journey, and market landscape.

Scientific Studies/Clinical Hubs - A unit providing services that include clinically-oriented data hubs and health economics studies to pharmaceutical companies' medical affairs or health economics divisions. Our team provides real world evidence data to support the assessment of the clinical effectiveness of drugs.

Apps & Technology

Health Data Services - Technology-enabled products and services that allow clients to access and analyze effectively Symphony Health and integrated third-party data.

Clients and Suppliers

We serve a wide range of client types, including biotechnology and pharmaceutical companies. We have developed numerous strategic relationships in the last five years. For the year ended December 31, 2020, we derived 49% of our revenue from large pharmaceutical companies, 15% of our revenue from small- to mid-sized pharmaceutical companies, 16% of our revenue from large biotechnology companies, and 20% of our revenue from all other biotechnology companies. In 2020, our top five clients represented approximately 39% of revenue; this revenue was derived from a combination of fixed-fee contracts, fee-for-service contracts, and time and materials contracts. No individual client or project accounted for 10% or more of revenue for either of the years ended December 31, 2020, 2019, or 2018.

We utilize a number of suppliers in our business, including data suppliers, central laboratory services, drug storage and shipping, foreign language translation services, and information technology. In 2020, our largest individual supplier was paid $29.5 million. In addition, our top 10 suppliers together received payments during 2020 of approximately $169.6 million. We believe that we will continue to be able to meet our current and future supply needs.

Sales and Marketing

We have a proven sales team with the ability to build relationships with new clients and to grow within existing clients. Critical to our sales process is the involvement of our operations and global scientific and medical affairs teams who contribute their knowledge to project implementation strategies presented in client proposals. These teams also work closely with the sales team to build long-term relationships with biotechnology and pharmaceutical companies. Our therapeutic expertise team supports the sales effort by developing robust service offerings in its core therapeutic areas, which link our organization to key clinical opinion leaders, global investigator networks, and best-in-class vendors. We rely heavily on our past project performance, qualified teams, medical informatics data, and therapeutic expertise in winning new business.

Our approach to proposal development, led by seasoned proposal developers in conjunction with insight from our drug development experts, allows us to submit proposals that address client requirements in a creative and tailored manner. Proposal teams conduct research on competing drugs and conduct feasibility studies among potential investigators to assess their interest and patient availability for proposals and presentations. Our proprietary, automated estimation system allows for rapid and accurate creation of project budgets, which forms the initial basis for business management of budgets subsequent to award of the study.

Competition

Our Clinical Research business competes primarily with other full-service CROs and in-house research and development departments of pharmaceutical and established biotech companies. Our principal traditional CRO competitors are ICON plc, IQVIA Holdings Inc., Laboratory Corporation of America Holdings, PAREXEL International Corporation, PPD, Inc., and Syneos Health, Inc.

CROs compete on the basis of a number of factors, including reliability, past performance, expertise and experience in specific therapeutic areas, scope of service offerings, strengths in various geographic markets, technological capabilities, ability to manage large scale global clinical trials, and price.

The CRO industry remains highly fragmented, with several hundred smaller, limited service providers and a small number of full-service companies with global capabilities. We believe there are significant barriers to becoming a global provider offering a broad range of services and products. These barriers include:

- the cost and experience necessary to develop broad therapeutic expertise;
- the ability to manage large, complex international clinical programs;
- the ability to deliver high-quality services consistently for large drug development projects;
- the experience to prepare regulatory submissions on a global basis; and
- the infrastructure and knowledge to respond to the global needs of clients.

Our Data Solutions business competes with a diverse set of businesses. We generally compete with other information, analytics, technology, services and consulting companies, as well as with government agencies, private payers, and other healthcare companies that provide their data directly to others. Our offerings compete with a number of firms, including IQVIA Inc., OptumHealth, Cognizant Technology Solutions, Decision Resources Group, and ZS Associates.

Backlog

Our studies and projects are performed over varying durations, ranging from several months to several years. Backlog represents anticipated service revenue from contracted new business awards that either have not started or are in process but have not been completed for our Clinical Research segment. Canceled contracts and scope reductions are removed from backlog as they occur. Our backlog at December 31, 2020, 2019 and 2018 was approximately $5.4 billion, $4.7 billion, and $4.2 billion, respectively. Cancellations totaled $404.2 million, $360.4 million, and $378.8 million for the years ended December 31, 2020, 2019, and 2018, respectively.

We believe our backlog as of any date is not necessarily a meaningful indicator of our future results for a variety of reasons. First, studies vary in duration. For instance, some studies that are included in our backlog may be completed in 2021, while others may be completed in later years. Second, the scope of studies may change, which may either increase or decrease the amount of backlog. Third, studies may be terminated or delayed at any time by the client or regulatory authorities. Delayed contracts remain in our backlog until a determination of whether to continue, modify, or cancel the study is made.

We had $2,916.6 million, $2,663.6 million, and $2,644.8 million in net new business awards for our Clinical Research segment in the years ended December 31, 2020, 2019, and 2018, respectively. Net new business represents gross new business awards less cancellations for the period.

We exclude our Data Solutions segment from backlog and new business awards due to the short-term nature of its contracts.

For more details regarding risks related to our backlog, see “Risk Factors—Our backlog may not convert to service revenue at the historical conversion rate.”

Intellectual Property

We develop and use proprietary methodologies, analytics, systems, technologies, and other intellectual property throughout our business, including a number of patents as well as other proprietary information regarding our methodologies, technologies, systems, and analytics. We rely upon a combination of legal, technical, and administrative safeguards to protect our proprietary and confidential information and trade secrets, and patent, copyright, and trademark laws to protect other intellectual property rights. We also hold various federal trademark registrations and pending applications in the United States and other jurisdictions, including PRA Health Sciences, Nextrials, Parallel 6, Symphony Health, and Care Innovations. Trademarks and service marks generally may be renewed indefinitely so long as they are in use and/or their registrations are properly maintained, and so long as they have not been found to have become generic. The technology and other intellectual property rights owned and licensed by us are important to our business, although our management believes that our business, as a whole, is not dependent upon any one intellectual property or group of such properties.

Government Regulation

In the United States, the FDA governs the conduct of clinical trials of drug products in human subjects, the form and content of regulatory applications, including, but not limited to, IND applications for human clinical testing, and the development, approval, manufacture, safety, labeling, storage, record keeping, and marketing of drug products. The FDA has similar authority and similar requirements with respect to the clinical testing of biological products and medical devices. In the European Union, or EU, similar laws and regulations apply which may vary slightly from one member state to another and are enforced by the European Medicines Agency or respective national member states’ authorities, depending on the case.

Governmental regulation directly affects our business. Increased regulation leads to more complex clinical trials and an increase in potential business for us. Conversely, a relaxation in the scope of regulatory requirements, such as the introduction of simplified marketing applications for pharmaceutical and biological products, could decrease the business opportunities available to us.

We must perform our clinical drug and biologic services in compliance with applicable laws, rules and regulations, including "Good Clinical Practices," or GCP, which govern, among other things, the design, conduct, performance, monitoring, auditing, recording, analysis, and reporting of clinical trials. Before a human clinical trial may begin, the manufacturer or sponsor of the clinical product candidate must file an IND with the FDA, which contains, among other things, the results of preclinical tests, manufacturer information, and other analytical data. A separate submission to an existing IND must also be made for each successive clinical trial conducted during product development. Each clinical trial must be conducted in accordance with an effective IND. In addition, under GCP, each human clinical trial we conduct is subject to the oversight of an independent institutional review board, or IRB, which is an independent committee that has the regulatory authority to review, approve, and monitor a clinical trial. The FDA, the IRB, or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the study subjects are being exposed to an unacceptable health risk. In the EU, we must perform our clinical drug services in compliance with similar laws and regulations.

In order to comply with GCP and other regulations, we must, among other things:

- comply with specific requirements governing the selection of qualified investigators;
- obtain specific written commitments from the investigators;
- obtain IRB review and approval of the clinical trial;
- verify that appropriate patient informed consent is obtained before the patient participates in a clinical trial;
- ensure adverse drug reactions resulting from the administration of a drug or biologic during a clinical trial are medically evaluated and reported in a timely manner;
- monitor the validity and accuracy of data;
- verify drug or biologic accountability;
- instruct investigators and study staff to maintain records and reports; and
- permit appropriate governmental authorities access to data for review.

We must also maintain reports in compliance with applicable regulatory requirements for each study for auditing by the client and regulatory authorities.

A failure to comply with applicable regulations relating to the conduct of clinical trials or the preparation of marketing applications could lead to a variety of sanctions. For example, violations of GCP could result, depending on the nature of the violation and the type of product involved, in the issuance of a warning letter, suspension or termination of a clinical study, refusal of the FDA to approve a clinical trial or marketing applications or withdrawal of such applications, injunction, seizure of investigational products, civil penalties, criminal prosecutions, or debarment from assisting in the submission of new drug applications.

We monitor our clinical trials to test for compliance with applicable laws and regulations in the United States and the non-U.S. jurisdictions in which we operate. We have adopted standard operating procedures that are designed to satisfy regulatory requirements and serve as a mechanism for controlling and enhancing the quality of our clinical trials. In the United States, our procedures were developed to ensure compliance with GCP and associated guidelines. Within Europe, all work is carried out in accordance with the Guideline for Good Clinical Practice ICH E6 (R2) adopted by the European Medicines Agency as EMA/CHMP/ICH/135/95. In order to facilitate global clinical trials, we have implemented common standard operating procedures across our regions to assure consistency whenever feasible.

The Standards for Privacy of Individually Identifiable Health Information, or the Privacy Rule, and the Security Rule, issued under the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health, or HITECH, Act of 2009, collectively HIPAA, as well as applicable state privacy and security laws and regulations, restrict the use and disclosure of certain protected health information, or PHI, and establish standards to protect individuals' electronic PHI that is created, received, used, or maintained by certain entities. Under the Privacy Rule, "covered entities" may not use or disclose PHI without the authorization of the individual who is the subject of the PHI, unless such use or disclosure is specifically permitted by the Privacy Rule or required by law.

We are not a covered entity under HIPAA. However, in connection with our clinical development activities, we do receive PHI from covered entities subject to HIPAA. In order for those covered entities to disclose PHI to us, the covered entity must obtain an authorization from the research subject that meets the Privacy Rule requirements, or make such disclosure pursuant to an exception to the Privacy Rule's authorization requirement. We are both directly and indirectly affected by the

privacy provisions surrounding individual authorizations because many investigators with whom we are involved in clinical trials are directly subject to them as a HIPAA "covered entity" and because we obtain identifiable health information from third parties that are subject to such regulations. Because of amendments to the HIPAA data security and privacy rules, there are some instances where we may be a HIPAA "business associate" of a "covered entity," meaning that we may be directly liable for any breaches in PHI and other HIPAA violations. As part of our research activities, we require covered entities that perform research activities on our behalf to comply with HIPAA, including the Privacy Rule's authorization requirement, and applicable state privacy and security laws and regulations.

In Europe, the European Union General Data Protection Regulation, or the EU GDPR, requires organizations working with the personal data of EU citizens to have established processes related to its collection and use. Organizations must have objective evidence of compliance (Principle of Accountability) with the EU GDPR. The penalties for non-compliance are significant, including up to four percent of an organization's global annual revenue. There are also administrative penalties where transfers of personal data may be stopped. As PRA is a global organization, such a disruption in data transfers could pose significant operational challenges.

We maintain applicable registrations with the Drug Enforcement Administration, or DEA, that enable us to use controlled substances in connection with our research services. Controlled substances are those drugs and drug products that appear on one of five schedules promulgated and administered by the DEA under the Controlled Substances Act. This act governs, among other things, the distribution, recordkeeping, handling, security, and disposal of controlled substances. Our DEA registrations authorize us to receive, conduct testing on, and distribute controlled substances in Schedules II through V. A failure to comply with the DEA's regulations governing these activities could lead to a variety of sanctions, including the revocation or the denial of a renewal of our DEA registration, injunctions, or civil or criminal penalties.

Environmental Regulation and Liability

We are subject to various laws and regulations relating to the protection of the environment and human health and safety in the countries in which we do business, including laws and regulations governing the management and disposal of hazardous substances and wastes, the cleanup of contaminated sites, and the maintenance of a safe workplace. Our operations include the use, generation, and disposal of hazardous materials and medical wastes. We may, in the future, incur liability under environmental statutes and regulations for contamination of sites we own or operate (including contamination caused by prior owners or operators of such sites), the off-site disposal of hazardous substances, and for personal injuries or property damage arising from exposure to hazardous materials from our operations. We believe that we have been and are in substantial compliance with all applicable environmental laws and regulations and that we currently have no liabilities under such environmental requirements that could reasonably be expected to materially harm our business, results of operations, or financial condition.

Liability and Insurance

We may be liable to our clients for any failure to conduct their studies properly according to the agreed-upon protocol and contract. If we fail to conduct a study properly in accordance with the agreed-upon procedures, we may have to repeat a study or a particular portion of the services at our expense, reimburse the client for the cost of the services, and/or pay additional damages.

At our clinical pharmacology units, we study the effects of drugs on healthy volunteers. In addition, in our clinical business we, on behalf of our clients, contract with physicians who render professional services, including the administration of the substance being tested, to participants in clinical trials, many of whom are seriously ill and are at great risk of further illness or death as a result of factors other than their participation in a trial. As a result, we could be held liable for bodily injury, death, pain and suffering, loss of consortium, or other personal injury claims and medical expenses arising from a clinical trial. In addition, we sometimes engage the services of vendors necessary for the conduct of a clinical trial, such as laboratories or medical diagnostic specialists. Because these vendors are engaged as subcontractors, we are responsible for their performance and may be held liable for damages if the subcontractors fail to perform in the manner specified in their contract.

To reduce our potential liability, and as a requirement of the GCP regulations, informed consent is required from each volunteer and patient. In addition, our clients provide us with contractual indemnification for all of our service related contracts. These indemnities generally do not, however, protect us against certain of our own actions such as those involving negligence or misconduct. Our business, financial condition, and operating results could be harmed if we were required to pay damages or incur defense costs in connection with a claim that is not indemnified, that is outside the scope of an indemnity or where the indemnity, although applicable, is not honored in accordance with its terms.

We maintain errors, omissions, and professional liability insurance in amounts we believe to be appropriate. This insurance provides coverage for vicarious liability due to negligence of the investigators who contract with us, as well as claims by our clients that a clinical trial was compromised due to an error or omission by us. If our insurance coverage is not adequate, or if insurance coverage does not continue to be available on terms acceptable to us, our business, financial condition, and operating results could be materially harmed.

Seasonality

Although our business is not generally seasonal, our Clinical Research segment typically experiences a slight decrease in its revenue growth rate during the fourth quarter due to holiday vacations and a similar decrease in new business awards in the first quarter due to our clients' budgetary cycles and vacations during the year-end holiday period. Our Data Solutions segment usually experiences an increase in revenue during the fourth quarter as many pharmaceutical companies use a portion of funds remaining in their annual budgets to purchase its data offerings.

Human Capital Management

Our people are our biggest competitive differentiator. We believe health innovation is driven by an engaged, diverse, and supported team of people, and that anyone in our company can have a successful new idea. The key is to make sure every person's voice is heard. We also know that an engaged, supported team also takes better care of our clients, patients, and communities, so we can continue to do our best work well into the future.

As of December 31, 2020, we had over 18,100 employees, of which approximately 40% were in the United States, approximately 36% were in Europe, approximately 3% were in Canada, and approximately 21% were in Africa, Latin America, and Asia Pacific. Some of our employees located outside of the United States are represented by workers council or labor unions. We believe that our employee relations are satisfactory. Approximately 40% of employees hold a Master's level degree or higher. We have approximately 2,000 employees that hold a Ph.D., M.D., or other doctorate level degrees.

One of our major goals is to increase diversity among our management and employees, placing special emphasis on closing equality gaps in the organization. We believe that an inclusive workplace—without differences on gender, sexual orientation, culture, religion, age, ethnicity, and disability—is hugely beneficial to both business and society. As of December 31, 2020, approximately 74% of our employees, including 29% of our employees at the Vice President-level and above, were women.

A key challenge of our business is the recruitment and retention of employees. During 2020, we experienced an 18% total turnover of our workforce, with an average monthly turnover of 18%. In 2018, we started posting all job openings internally, and in 2020, 26% percent of those positions were filled with internal candidates. This strategy provided those employees with career growth opportunities and helped us maintain our institutional knowledge. In 2020, we also saw 34% of our external hires come from current employee referrals, a total of 1,759 for referred hires. This figure illustrates the strength of engagement of our workforce. We know that if employees are proud to be at PRA, they will refer their colleagues. Lastly, we are proud that 9% of our external hires were former employees who left in good standing and ultimately decided to return to PRA, reinforcing our strong culture and focus on our employees.

Available Information

We are subject to the informational requirements of the Exchange Act and, in accordance therewith, file reports, including annual, quarterly and current reports, proxy statements, and other information with the SEC. Copies of our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and our proxy statements for our annual meetings of stockholders, and any amendments or supplements to those reports, as well as Section 16 reports filed by our insiders, are available free of charge on our website as soon as reasonably practicable after we file the reports with, or furnish the reports to the SEC. Our website address is http://www.prahs.com, and our investor relations website is located at investor.prahs.com. Information on our website is not incorporated by reference herein. In addition, the SEC maintains an Internet site (http://www.sec.gov) containing reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC.

Item 1A. Risk Factors

You should consider carefully the risks and uncertainties described below together with the other information included in this Annual Report on Form 10-K, including our consolidated financial statements and related notes thereto. The occurrence of any of the following risks may materially and adversely affect our business, financial condition, results of operations, and future prospects, which could in turn materially affect the price of our common stock.

Business and Industry Risks

The potential loss, delay, or non-renewal of our contracts, or the non-payment by our clients for services that we have performed, could adversely affect our results.

We routinely experience termination, cancellation, and non-renewals of contracts by our clients in the ordinary course of business, and the number of cancellations can vary significantly from year to year. Most of our clients for traditional, project-based clinical trial services can terminate our contracts without cause upon 30 to 60 days' notice. For example, our cancellation percentage for traditional, project-based Phase I through IV trials for the years ended December 31, 2020 and 2019 was 18% and 16%, respectively. Our traditional, project-based clients may delay, terminate, or reduce the scope of our contracts for a variety of reasons beyond our control, including but not limited to:

- decisions to forgo or terminate a particular clinical trial;
- lack of available financing, budgetary limits, or changing priorities;
- actions by regulatory authorities;
- production problems resulting in shortages of the drug being tested;
- failure of the drug being tested to satisfy safety requirements or efficacy criteria;
- unexpected or undesired clinical results;
- insufficient patient enrollment in a trial;
- insufficient investigator recruitment;
- decisions to downsize product development portfolios;
- dissatisfaction with our performance, including the quality of data provided and our ability to meet agreed upon schedules;
- shift of business to another CRO or internal resources;
- product withdrawal following market launch; or
- shut down of our clients' manufacturing facilities.

In addition, our clients for our Strategic Solutions offerings may elect not to renew our contracts for a variety of reasons beyond our control, including in the event that we are unable to provide staff sufficient in number or experience as required for a project.

In the event of termination, our contracts often provide for fees for winding down the study, but these fees may not be sufficient for us to maintain our profit margins, and termination or non-renewal may result in lower resource utilization rates, including with respect to personnel who we are not able to place on another client engagement.

Clinical trials can be costly and a material portion of our revenue is derived from emerging biotechnology and small to mid-sized pharmaceutical companies, which may have limited access to capital. In addition, we provide services to such companies before they pay us for some of our services. There is a risk that we may initiate a clinical trial for a client, and the client subsequently becomes unwilling or unable to fund the completion of the trial. In such a situation, notwithstanding the client's ability or willingness to pay for or otherwise facilitate the completion of the trial, we may be legally or ethically bound to complete or wind down the trial at our own expense.

Because the contracts included in our backlog can generally be terminated without cause, we do not believe that our backlog as of any date is necessarily a meaningful predictor of future results. In addition, we may not realize the full benefits of our backlog of contractually committed services if our clients cancel, delay, or reduce their commitments under our contracts with them. In addition, the terminability of our contracts puts increased pressure on our quality control efforts, since not only can our contracts be terminated by clients as a result of poor performance, but any such termination may also affect our ability

to obtain future contracts from the client involved and others. We believe the risk of loss or delay of multiple contracts is even greater in those cases where we are party to broader partnering arrangements with global biopharmaceutical companies.

We bear financial risk if we underprice our fixed-fee contracts or overrun cost estimates, and our financial results can also be adversely affected by failure to receive approval for change orders or delays in documenting change orders.

Most of our traditional, project-based Phase I through IV contracts are fixed-fee contracts. We bear the financial risk if we initially underprice our contracts or otherwise overrun our cost estimates. In addition, contracts with our clients are subject to change orders, which we commonly experience and which occur when the scope of work we perform needs to be modified from that originally contemplated by our contract with the client. Modifications can occur, for example, when there is a change in a key trial assumption or parameter, a significant change in timing, or a change in staffing needs. Furthermore, if we are not successful in converting out-of-scope work into change orders under our current contracts, we bear the cost of the additional work. Such underpricing, significant cost overruns, or delay in documentation of change orders could have a material adverse effect on our business, results of operations, financial condition, or cash flows.

Our backlog may not convert to revenue at the historical conversion rate.

Backlog represents anticipated revenue from contracted new business awards, excluding reimbursable out-of-pocket costs or reimbursable investigator fees, that either have not started or are in process but have not been completed. Our backlog was $5.4 billion, $4.7 billion, and $4.2 billion at December 31, 2020, 2019, and 2018, respectively. Our revenue conversion rate is based on a financial and operational analysis performed by our project management teams and represents the level of effort expected to be expended at a specific point in time. Once work begins on a project, revenue is recognized over the duration of the project. Projects may be terminated or delayed by the client or delayed by regulatory authorities for reasons beyond our control. To the extent projects are delayed, the timing of our revenue could be affected. In the event that a client cancels a contract, we generally would be entitled to receive payment for all services performed up to the cancellation date and subsequent client authorized services related to terminating the canceled project. Generally, however, we have no contractual right to the full amount of the revenue reflected in our backlog in the event of a contract cancellation. The duration of the projects included in our backlog, and the related revenue recognition, range from a few months to many years. Our backlog may not be indicative of our future results, and we may not realize all the anticipated future revenue reflected in our backlog. A number of factors may affect the realization of our revenue from backlog, including: (i) the size, complexity, and duration of the projects; (ii) the cancellation or delay of projects; and (iii) changes in the scope of work during the course of a project.

Fluctuations in our reported backlog levels also result from the fact that we may receive a small number of relatively large orders in any given reporting period that may be included in our backlog. Revenue recognition on larger, more global projects could be slower than on smaller, less global projects for a variety of reasons, including but not limited to, an extended period of negotiation between the time the project is awarded to us and the actual execution of the contract, as well as an increased time frame for obtaining the necessary regulatory approvals.

The relationship of backlog to realized revenues is indirect and may vary over time. As we increasingly compete for and enter into large contracts that are more global in nature, there can be no assurance about the rate at which our backlog will convert into revenue. A decrease in this conversion rate would mean that the rate of revenue recognized on contracts may be slower than what we have experienced in the past, which could materially and adversely impact our revenue and results of operations on a quarterly and annual basis. Additionally, delayed projects will remain in backlog and will not generate revenue at the rate originally expected, which could impair our cash flows and results of operations in the short-term. Because of these large orders, our backlog in that reporting period may reach levels that may not be sustained in subsequent reporting periods.

We may be adversely affected by client concentration or concentration in therapeutic classes in which we conduct clinical trials.

We derive a substantial portion of our revenues from a limited number of large clients. In 2020, we derived 39% of our revenue from our top five clients. In addition, approximately 38% of our backlog as of December 31, 2020 is concentrated among five clients. If any large client decreases or terminates its relationship with us, our business, results of operations, or financial condition could be materially adversely affected.

Additionally, we conduct multiple clinical trials for different clients in single therapeutic classes, particularly in the areas of oncology and immunology. Conducting multiple clinical trials for different clients in a single therapeutic class involving drugs with the same or similar chemical action has in the past, and may in the future, adversely affect our business if some or all of the trials are canceled because of new scientific information or regulatory judgments that affect the drugs as a class or if industry consolidation results in the rationalization of drug development pipelines.

Our relationships with existing or potential clients who are in competition with each other may adversely impact the degree to which other clients or potential clients use our services, which may adversely affect our results of operations.

The biopharmaceutical industry is highly competitive, with companies each seeking to persuade payors, providers and patients that their drug therapies are more cost-effective than competing therapies marketed or developed by competing firms. In addition to the adverse competitive interests that biopharmaceutical companies have with each other, these companies also have adverse interests with respect to drug selection and reimbursement with other participants in the healthcare industry, including payors and providers. Biopharmaceutical companies also compete to be first to the market with new drug therapies. We regularly provide services to biopharmaceutical companies that compete with each other, and we sometimes provide services to such clients regarding competing drugs in development. Our existing or future relationships with our biopharmaceutical clients have in the past deterred, and may continue to deter, other biopharmaceutical clients from using our services or, in certain instances, have resulted in our clients seeking to place limits on our ability to serve their competitors and other industry participants. In addition, our further expansion into the broader healthcare market may adversely impact our relationships with biopharmaceutical clients, and such clients may elect not to use our services, reduce the scope of services that we provide to them, or seek to place restrictions on our ability to serve clients in the broader healthcare market with interests that are adverse to theirs. Any loss of clients or reductions in the level of revenues from a client could have a material adverse effect on our results of operations, business, and prospects.

The biopharmaceutical services industry is fragmented and highly competitive.

The biopharmaceutical services industry is fragmented and highly competitive and if we do not compete successfully, our business will suffer. We often compete for business with other biopharmaceutical services companies, universities, niche providers, and discovery and development departments within our clients, some of which are large biopharmaceutical services companies in their own right with greater resources than ours. As part of our business model, we and our competitors typically form preferred vendor relationships. Both for us and our competitors, these relationships generally are not contractual and are subject to change at any time. We may find reduced access to certain potential clients due to the preferred arrangements between vendors and our competitors, which may exist for extended periods of time.

Additionally, there are few barriers to entry for smaller specialized companies. Because of their size and focus, these companies might compete effectively against larger companies like us, which could have a material adverse impact on our business. The industry is also highly fragmented, with numerous smaller specialized companies and a handful of full-service companies with global capabilities similar to ours. Increased competition has led to price and other forms of competition, which may result in acceptance of less favorable contract terms that could adversely affect our operating results. As a result of competitive pressures, in recent years our industry has experienced consolidation. This trend is likely to produce more competition from the resulting larger companies for both clients and acquisition candidates.

Outsourcing trends in the biopharmaceutical industry and changes in aggregate spending and R&D budgets could adversely affect our operating results and growth rate.

We provide services to the biopharmaceutical industry, and our revenues depend on the outsourcing trends and R&D expenditures in the industry. Economic factors, including the success of fundraising efforts, the overall health of the capital markets, consolidations, regulatory developments, patent protection issues, and industry trends that affect biopharmaceutical companies in turn affect our business. Biopharmaceutical companies also continue to seek long-term strategic collaborations with global CROs with favorable pricing terms. Competition for these collaborations is intense and we may decide to forgo an opportunity or we may not be selected, in which case a competitor may enter into the collaboration and our business with the client, if any, may be limited. In addition, if the biopharmaceutical industry reduces overall R&D spending or outsourcing of clinical trials, or such outsourcing fails to grow at projected rates, our operations and financial condition could be materially and adversely affected. All of these events could adversely affect our business, results of operations, or financial condition.

Operational Risks

The effects of the COVID-19 outbreak could adversely affect our business, results of operations, and financial condition.

The global COVID-19 pandemic continues to rapidly evolve. The extent to which COVID-19 impacts our business and clinical trials depends on future developments that are highly uncertain and cannot be predicted with any degree of confidence, such as the following: the ultimate geographic spread and severity of the disease; the duration of the outbreak or future outbreaks; the effectiveness of vaccinations to prevent the contraction and spread of the virus; travel restrictions and the implementation of social distancing in the United States and other countries; business closures or business disruptions; and the effectiveness of other actions taken in the United States and other countries to contain and treat the disease and current and future outbreaks. We have experienced disruptions in our business due to the COVID-19 pandemic in the form of delays and

difficulties in enrolling patients, the temporary closure of certain clinical sites, and travel restrictions that have impacted our ability to manage our business as efficiently and effectively as we have in the past. We may experience additional disruptions due to the COVID-19 pandemic that could severely impact our business and clinical trials in our Clinical Research segment, including:

- further delays, difficulties, or a suspension in enrolling patients in our ongoing and planned clinical trials;
- further delays, difficulties, or a suspension in clinical site initiation, including difficulties in recruiting clinical site investigators;
- diversion of healthcare resources away from the conduct of clinical trials, including the diversion of hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;
- interruption of key clinical trial activities, such as clinical trial site monitoring, due to limitations on travel imposed or recommended by federal, state, or local governments; and
- limitations in employee resources that would otherwise be focused on our business and the conduct of our clinical trials, including because of sickness of employees or their families, the desire of employees to avoid contact with large groups of people, and governmental orders that limit the ability of our employees to leave their homes.

For our clinical trials that are planned to be conducted at sites in countries that are experiencing heightened impact from COVID-19, in addition to the risks listed above, we may also experience the following adverse impacts:

- delays in receiving approval from local regulatory authorities to initiate our planned clinical trials;
- delays in clinical sites receiving the supplies and materials needed to conduct our clinical trials;
- interruption in global shipping that may affect the transport of clinical trial materials, such as investigational drug product used in our clinical trials;
- changes in local regulations as part of a response to the COVID-19 outbreak that may require us to change the ways in which our clinical trials are conducted, which may result in unexpected costs, or to discontinue the clinical trials altogether;
- delays in necessary interactions with local regulators, ethics committees, and other important agencies and contractors due to limitations in employee resources or forced furlough of government employees; and
- refusal of the United States Food and Drug Administration to accept data from clinical trials in these affected geographies.

Our Data Solutions business is relatively more insulated from the effects of the virus due to a high portion of recurring license revenue in this segment. However, service offerings in this segment that rely on face-to-face interactions or are dependent on in-person gatherings, events, or conferences may experience significant disruption.

We also closed the majority of our physical office locations worldwide in March, requiring most of our workforce in both our Clinical Research and Data Solutions businesses to work remotely. While we have re-opened many of our offices in some capacity, we may have to close those offices once again if an outbreak recurs in the geographic locations of those offices. We are unsure as to how long offices will remain closed in locations where outbreaks continue to occur. While we believe that most of our employees are able to work remotely in an effective way, our operations could be disrupted if key members of our senior management or a significant percentage of our workforce are unable to continue to work because of illness, government directives, or otherwise. Having shifted to remote working arrangements, we also face a heightened risk of cybersecurity attacks or data security incidents and are more dependent on internet and telecommunications access and capabilities.

If we are unable to attract suitable investigators and patients for our clinical trials, our clinical development business may suffer.

The recruitment of investigators and patients for clinical trials is essential to our business. Patients typically include people from the communities in which the clinical trials are conducted. Our clinical development business could be adversely affected if we are unable to attract suitable and willing investigators or patients for clinical trials on a consistent basis. For example, if we are unable to engage investigators to conduct clinical trials as planned or enroll sufficient patients in clinical trials, we may need to expend additional funds to obtain access to resources or else be compelled to delay or modify the clinical trial plans, which may result in additional costs to us. These considerations might result in our being unable to successfully achieve our projected development timelines, or potentially even lead us to consider the termination of ongoing clinical trials or development of a product.

Our embedded and functional outsourcing solutions could subject us to significant employment liability.

With our embedded and functional outsourcing services, we place employees at the physical workplaces of our clients. The risks of this activity include claims of errors and omissions, misuse or misappropriation of client proprietary information, theft of client property and torts or other claims under employment liability, co-employment liability, or joint employment liability. We have policies and guidelines in place to reduce our exposure to such risks, but if we fail to follow these policies and guidelines we may suffer reputational damage, loss of client relationships and business, and monetary damages.

If we lose the services of key personnel or are unable to recruit and retain experienced personnel, our business could be adversely affected.

Our success substantially depends on the collective performance, contributions, and expertise of our senior management team and other key personnel, including qualified management, professional, scientific and technical operating staff, and qualified sales representatives for our contract sales services. There is significant competition for qualified personnel in the biopharmaceutical services industry, particularly those with higher educational degrees, such as a medical degree, a Ph.D., or an equivalent degree. The departure of any key executive, the payment of increased compensation to attract and retain qualified personnel, or our inability to continue to identify, attract, and retain qualified personnel or replace any departed personnel in a timely fashion, may impact our ability to grow our business and compete effectively in our industry and may negatively affect our ability to meet financial and operational goals. Furthermore, clients or other companies seeking to develop in-house capabilities may hire some of our senior management or key employees. We cannot assure you that a court would enforce the non-competition provisions in our employment agreements.

Our services could subject us to potential liability that may adversely affect our results of operations and financial condition.

Our Clinical Research business involves the testing of new drugs on patients in clinical trials. Our involvement in the clinical trial and development process creates a risk of liability for personal injury to or death of patients, particularly those with life-threatening illnesses, resulting from adverse reactions to the drugs administered during testing or after regulatory approval. For example, we may be sued in the future by individuals alleging personal injury due to their participation in clinical trials and seeking damages from us under a variety of legal theories. If we are required to pay damages or incur defense costs in connection with any personal injury claim that is outside the scope of indemnification agreements we have with our clients, if any indemnification agreement is not performed in accordance with its terms, or if our liability exceeds the amount of any applicable indemnification limits or available insurance coverage, our financial condition, results of operations, and reputation could be materially and adversely affected. We might also not be able to obtain adequate insurance or indemnification for these types of risks at reasonable rates in the future.

We also contract with physicians to serve as investigators in conducting clinical trials. Investigators are typically located at hospitals, clinics, or other sites and supervise the administration of the investigational drug to patients during the course of a clinical trial. If the investigators commit errors or make omissions during a clinical trial that result in harm to trial patients or if the investigators commit errors or make omissions in the administration of a drug to a patient, claims for personal injury or products liability damages may result. Additionally, if the investigators engage in fraudulent or negligent behavior, trial data may be compromised, which may require us to repeat the clinical trial or subject us to liability or regulatory action. We do not believe we are legally responsible for the medical care rendered by such third-party investigators, and we expect that we would vigorously defend any claims brought against us. However, it is possible we could be found liable for claims with respect to the actions of third-party investigators.

Some of our services involve direct interaction with clinical trial patients and operation of Phase I and IIa clinical facilities, which could create additional potential liability that may adversely affect our results of operations and financial condition.

We operate facilities where Phase I to IIa clinical trials are conducted, which ordinarily involve testing an investigational drug on a limited number of individuals to evaluate its safety, determine a safe dosage range, and identify side effects. Failure to operate such a facility in accordance with applicable regulations could result in disruptions to our operations. Additionally, we face risks associated with adverse events resulting from the administration of such drugs and the professional malpractice of medical care providers. We also directly employ nurses and other trained employees who assist in implementing the testing involved in our clinical trials, such as drawing blood from subjects. Any professional malpractice or negligence by such investigators, nurses, or other employees could potentially result in liability to us in the event of personal injury to or death of a subject in clinical trials. Damages and/or the related defense costs, particularly if they were to exceed the limits of any indemnification agreements and insurance coverage we may have, may adversely affect our financial condition, results of operations, and reputation.

Information Technology and Intellectual Property Risks

Our business depends on the continued effectiveness and availability of our information systems, including the information systems we use to provide our services to our clients, and failures of these systems may materially limit our operations.

Due to the global nature of our business and our reliance on information systems to provide our services, we have increased, and intend to continue to increase, our use of web-enabled and other integrated information systems in delivering our services. We also provide access to similar information systems to certain of our clients in connection with the services we provide them. As the breadth and complexity of our information systems continue to grow, we will increasingly be exposed to the risks inherent in the development, integration and ongoing operation of evolving information systems, including:

- disruption, impairment, or failure of data centers, telecommunications facilities, or other key infrastructure platforms;
- security breaches of, cyberattacks on, and other failures or malfunctions in our critical application systems or their associated hardware; and
- excessive costs, excessive delays, or other deficiencies in systems development and deployment.

The materialization of any of these risks may impede the processing of data, the delivery of databases and services, and the day-to-day management of our business and could result in the corruption, loss, or unauthorized disclosure of proprietary, confidential, or other data. While we have disaster recovery plans in place, they might not adequately protect us in the event of a system failure. Despite any precautions we take, damage from fire, floods, hurricanes, power loss, telecommunications failures, computer viruses, information system security breaches, and similar events at our various computer facilities could result in interruptions in the flow of data to our servers and from our servers to our clients. Corruption or loss of data may result in the need to repeat a trial at no cost to the client, but at significant cost to us, or result in the termination of a contract or damage to our reputation. Additionally, significant delays in system enhancements or inadequate performance of new or upgraded systems once completed could damage our reputation and harm our business. Finally, long-term disruptions in the infrastructure caused by events such as natural disasters, the outbreak of war, the escalation of hostilities and acts of terrorism, particularly involving cities in which we have offices, could adversely affect our business. Although we carry property and business interruption insurance, our coverage might not be adequate to compensate us for all losses that may occur.

A failure or breach of our IT systems or technology could result in sensitive customer information being compromised or otherwise significantly disrupt our business operations, which would negatively materially affect our reputation and/or results of operations.

In the current environment, there are numerous and evolving risks to cybersecurity and privacy, including criminal hackers, hacktivists, state-sponsored intrusions, industrial espionage, employee malfeasance, and human or technological error. High-profile security breaches at other companies and in government agencies have increased in recent years, and security industry experts and government officials have warned about the risks of hackers and cyberattacks targeting businesses such as ours. Computer hackers and others routinely attempt to breach the security of technology products, services, and systems, and to fraudulently induce employees, customers, or others to disclosure information or unwittingly provide access to systems or data. Unauthorized disclosure of sensitive or confidential data, whether through system failure or employee negligence, fraud, or misappropriation, could damage our reputation and cause us to lose clients. Similarly, unauthorized access to or through our information systems or those we develop for our clients, whether by our employees or third parties, including a cyberattack by computer programmers and hackers who may develop and deploy viruses, worms, or other malicious software programs, could cause several negative consequences, including the following: negative publicity, loss of client confidence, significant remediation costs, time-consuming and costly regulatory investigations, legal liability, and damage to our reputation. Any of these could contribute to a loss of customers or substantial costs for us, which could have a material adverse effect on our results of operations. In addition, our liability insurance might not be sufficient in type or amount to adequately cover us against claims related to security breaches, cyberattacks, and other related breaches.

We have experienced and expect to continue to experience actual or attempted cyberattacks of our IT systems or networks. However, to date, cybersecurity attacks directed at us have not had a material impact on our financial results. While we have certain cybersecurity safeguards in place designed to protect and preserve the integrity of our information technology systems, due to the evolving nature of security threats and the potential negative consequences of a cybersecurity attack outlined above, the impact of any future incidents cannot be reasonably predicted. Our clients are also increasingly requiring cybersecurity protections and mandating cybersecurity standards in our products, and we may incur additional costs to comply with such demands. In addition, our efforts to address a cybersecurity attack may not be successful, potentially resulting in the theft, loss, destruction, or corruption of information we store electronically, as well as unexpected interruptions, delays, or cessation of service. Any of these outcomes could cause serious harm to our business operations and materially adversely affect our financial condition and results of operations.

If we do not keep pace with rapid technological changes, our services may become less competitive or obsolete.

The biopharmaceutical industry generally, and drug development and clinical research more specifically, are subject to rapid technological changes. Our current competitors or other businesses might develop technologies or services that are more effective or commercially attractive than, or render obsolete, our current or future technologies and services. If our competitors introduce superior technologies or services and if we cannot make enhancements to remain competitive, our competitive position would be harmed. If we are unable to compete successfully, we may lose clients or be unable to attract new clients, which could lead to a decrease in our revenue and financial condition.

We rely on third parties to provide certain data and other information to us. Our suppliers or providers might increase our cost to obtain, restrict our use of, or refuse to license data, which could lead to our inability to access certain data or provide certain services and, as a result, materially and adversely affect our operating results and financial condition.

Our services are derived from, or include, the use of data we collect from third parties. We have several data suppliers that provide us a broad and diverse scope of information that we collect, use in our business, and sell. We generally enter into long-term contractual arrangements with many of our data suppliers. At the time we enter into a new data supply contract or renew an existing contract, suppliers may increase our cost to obtain and use the data provided by such supplier, increase restrictions on our ability to use or sell such data, or altogether refuse to license the data to us. Also, our data suppliers may fail to meet or adhere to our quality control standards or fail to deliver the data to us. Although no single supplier is material to our business, if suppliers that collectively provide a significant amount of the data we receive or use were to increase our costs to obtain or use such data, further restrict our access to or use of such data, fail to meet or adhere to our quality control standards, refuse to provide data, or fail to deliver data to us, our ability to provide data-dependent services to our clients may be adversely impacted, which could have a material adverse effect on our business, results of operations, financial condition, or cash flow.

We rely on third parties for important products, services and licenses to certain technology and intellectual property rights and we might not be able to continue to obtain such products, services and licenses.

We depend on certain third parties to provide us with products and services critical to our business. Such services include, among others, suppliers of drugs for patients participating in trials, suppliers of kits for use in our laboratories, suppliers of reagents for use in our testing equipment and providers of maintenance services for our equipment. The failure of any of these third parties to adequately provide the required products or services adequately, or to do so in compliance with applicable regulatory requirements, could have a material adverse effect on our business.

Some of our services rely on intellectual property, technology and other similar property owned and/or controlled by third parties. Our licenses to this property and technology could terminate or expire and we might not be able to replace these licenses in a timely manner. Also, we might not be able to renew these licenses on similar terms and conditions. Failure to renew these licenses, or renewals of these licenses on less advantageous terms, could have a material adverse effect on our business, results of operations, financial condition or cash flow.

We have only a limited ability to protect our intellectual property rights, both domestically and internationally, and these rights are important to our success.

Our success depends, in part, upon our ability to develop, use and protect our proprietary methodologies, analytics, systems, technologies and other intellectual property. We rely upon a combination of trade secrets, confidentiality policies, nondisclosure, invention assignment and other contractual arrangements, and copyright, trademark, patent and trade secret laws, to protect our intellectual property rights. Existing laws of the various countries in which we provide services or solutions offer only limited protection of our intellectual property rights, and the protection in some countries may be very limited. The laws of some foreign countries, especially certain developing countries with emerging economies in Asia, Eastern European and Latin America, do not protect intellectual property rights to the same extent as federal and state laws in the United States. Additionally, both in developed and developing countries, these laws are subject to change at any time and certain agreements may not be fully enforceable, which could further restrict our ability to protect our innovations.

Our intellectual property rights may not prevent competitors from independently developing services similar to, or duplicative of, ours. For instance, unauthorized parties may attempt to copy or reverse engineer certain aspects of our products that we consider proprietary or our proprietary information may otherwise become known or may be independently developed by our competitors or other third parties. Further, the steps we take in this regard might not be adequate to prevent or deter infringement or other misappropriation of our intellectual property by competitors, former employees or other third parties, and we might not be able to detect unauthorized use of, or take appropriate and timely steps to enforce, our intellectual property rights. Enforcing our rights might also require considerable time, money and oversight, and we may not be successful in

enforcing our rights. It may not be possible to enforce intellectual property rights effectively in some countries at all or to the same extent as in the United States and other countries, and many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions.

Depending on the circumstances, we might need to grant a specific client greater rights in intellectual property developed in connection with a contract than we otherwise generally do. In certain situations, we might forgo all rights to the use of intellectual property we create, which would limit our ability to reuse that intellectual property for other clients. Any limitation on our ability to provide a service or solution could cause us to lose revenue generating opportunities and require us to incur additional expenses to develop or license new or modified solutions for future projects.

Growth Risks

If we are unsuccessful at investing in growth opportunities, our business could be materially and adversely affected.

We continue to invest significantly in growth opportunities, including the development and acquisition of new data, technologies and services to meet our clients' needs. We also continue to invest significantly in growth opportunities in emerging markets, such as the development, launch and enhancement of services in emerging countries and regions, including India, China, Eastern Europe and Latin America. We believe healthcare spending in these emerging markets will continue to grow over the next five years, and we consider our presence in these markets to be an important focus of our growth strategy.

There is no assurance that our investment plans or growth strategy will be successful or will produce a sufficient or any return on our investments. Further, if we are unable to develop new technologies and services, clients do not purchase our new technologies and services, our new technologies and services do not work as intended, or there are delays in the availability or adoption of our new technologies and services, then we may not be able to grow our business or growth may occur more slowly than anticipated. Additionally, although we expect continued growth in healthcare spending in emerging markets, such spending may occur more slowly or not at all, and we may not benefit from our investments in these markets.

We plan to fund growth opportunities with cash from operations or from financings. There can be no assurance that those sources will be available in sufficient amounts to fund future growth opportunities when needed.

If we are unable to successfully identify, acquire, and integrate existing businesses, services, and technologies, our business, results of operations, and financial condition could be adversely impacted.

We anticipate that a portion of our future growth may come from acquiring existing businesses, services, or technologies. The success of any acquisition will depend upon, among other things, our ability to effectively integrate acquired personnel, operations, services, and technologies into our business and to retain the key personnel and clients of our acquired businesses. In addition, we may be unable to identify suitable acquisition opportunities or obtain any necessary financing on commercially acceptable terms. We may also spend time and money investigating and negotiating with potential acquisition targets but not complete the transaction. Any future acquisition could involve other risks, including, among others, the assumption of additional liabilities and expenses, difficulties and expenses in connection with integrating the acquired companies and achieving the expected benefits, issuances of potentially dilutive securities or interest-bearing debt, loss of key employees of the acquired companies, transaction costs, diversion of management's attention from other business concerns and, with respect to the acquisition of foreign companies, the inability to overcome differences in foreign business practices, language and customs. Our failure to identify potential acquisitions, complete targeted acquisitions and integrate completed acquisitions could have a material adverse effect on our business, financial condition and results of operations.

We may experience challenges with the acquisition, development, enhancement or deployment of technology necessary for our business.

We operate in businesses that require sophisticated computer systems and software for data collection, data processing, cloud-based platforms, analytics, statistical projections and forecasting, mobile computing, and other applications and technologies, particularly in our Data Solutions business. We seek to address our technology risks by increasing our reliance on the use of innovations by cross-industry technology leaders and adapt these for our biopharmaceutical and healthcare industry clients. Some of these technologies supporting the industries we serve are changing rapidly and we must continue to adapt to these changes in a timely and effective manner at an acceptable cost. We also must continue to deliver data to our clients in forms that are easy to use while simultaneously providing clear answers to complex questions. There can be no guarantee that we will be able to develop, acquire or integrate new technologies, that these new technologies will meet our clients' needs or achieve expected investment goals, or that we will be able to do so as quickly or cost-effectively as our competitors. Significant technological change could render certain of our services obsolete. Moreover, the introduction of new services embodying new technologies could render certain of our existing services obsolete. Our continued success will depend on our ability to adapt to changing technologies, manage and process ever-increasing amounts of data and information and improve the performance,

features and reliability of our services in response to changing client and industry demands. We may experience difficulties that could delay or prevent the successful design, development, testing, introduction or marketing of our services. New services, or enhancements to existing services, may not adequately meet the requirements of current and prospective clients or achieve any degree of significant market acceptance. These types of failures could have a material adverse effect on our operating results and financial condition.

Geopolitical and Regulatory Risks

Our business is subject to international economic, political and other risks that could negatively affect our results of operations and financial condition.

We have significant operations in non-U.S. countries that may require complex arrangements to deliver services on global contracts for our clients. Additionally, we have established operations in locations remote from our most developed business centers. As a result, we are subject to heightened risks inherent in conducting business internationally, including the following:

- conducting a single trial across multiple countries is complex, and issues in one country, such as a failure to comply with local regulations or restrictions, may affect the progress of the trial in the other countries;
- non-U.S. countries could enact legislation or impose regulations or other restrictions, including unfavorable labor regulations or tax policies, which could have an adverse effect on our ability to conduct business in or expatriate profits from those countries;
- tax rates in certain non-U.S. countries may exceed those in the United States and non-U.S. earnings may be subject to withholding requirements or the imposition of tariffs, exchange controls, or other restrictions, including restrictions on repatriation;
- certain non-U.S. countries are expanding or may expand their regulatory framework with respect to patient informed consent, protection, and compensation in clinical trials, which could delay or inhibit our ability to conduct trials in such jurisdictions or which could materially increase the risks associated with performing trials in such jurisdictions;
- the regulatory or judicial authorities of non-U.S. countries may not enforce legal rights and recognize business procedures in a manner to which we are accustomed or would reasonably expect;
- we may have difficulty complying with a variety of laws and regulations in non-U.S. countries, some of which may conflict with laws in the United States;
- changes in political and economic conditions may lead to changes in the business environment in which we operate, as well as changes in non-U.S. currency exchange rates;
- the adoption and expansion of trade restrictions, the occurrence or escalation of a “trade war,” or other governmental action related to tariffs or trade agreements or policies among the governments of the United States and other countries, such as China, could adversely impact demand for our services, our costs, our clients, and the U.S. economy;
- regulatory changes and economic conditions following “Brexit” (the United Kingdom’s exit from the European Union), including uncertainties as to its effect on trade laws, tariffs, and taxes, could create instability and volatility in the global financial and currency markets, conflicting or redundant regulatory regimes in Europe (such as the European Medicines Agency ("EMA") relocation from the United Kingdom to the Netherlands) and political instability;
- clients in non-U.S. jurisdictions may have longer payment cycles, and it may be more difficult to collect receivables in non-U.S. jurisdictions; and
- natural disasters, pandemics, or international conflict, including terrorist acts, could interrupt our services, endanger our personnel, or cause project delays or loss of trial materials or results.

These risks and uncertainties could negatively impact our ability to, among other things, perform large, global projects for our clients. Furthermore, our ability to deal with these issues could be affected by applicable U.S. laws and the need to protect our assets. In addition, we may be more susceptible to these risks as we enter and continue to target growth in emerging countries and regions, including India, China, Eastern Europe, and Latin America, which may be subject to a relatively higher risk of political instability, economic volatility, crime, corruption, and social and ethnic unrest, all of which are exacerbated in many cases by a lack of an independent and experienced judiciary and uncertainties in how local law is applied and enforced. The materialization of any such risks could have an adverse impact on our financial condition and results of operations.

Due to the global nature of our business, we may be exposed to liabilities under the Foreign Corrupt Practices Act and various non-U.S. anti-corruption laws, and any allegation or determination that we violated these laws could have a material adverse effect on our business.

We are required to comply with the U.S. Foreign Corrupt Practices Act, or FCPA, and other U.S. and non-U.S. anti-corruption laws, which prohibit companies from engaging in bribery, including corruptly or improperly offering, promising, or providing money or anything else of value to non-U.S. officials and certain other recipients. In addition, the FCPA imposes certain books, records, and accounting control obligations on public companies and other issuers. We operate in parts of the world in which corruption can be common and compliance with anti-bribery laws may conflict with local customs and practices. Our global operations face the risk of unauthorized payments or offers being made by employees, consultants, sales agents, and other business partners outside of our control or without our authorization. It is our policy to implement safeguards to prohibit these practices by our employees and business partners with respect to our operations. However, irrespective of these safeguards, or as a result of monitoring compliance with such safeguards, it is possible that we or certain other parties may discover or receive information at some point that certain employees, consultants, sales agents, or other business partners may have engaged in corrupt conduct for which we might be held responsible. Violations of the FCPA or other non-U.S. anti-corruption laws may result in restatements of, or irregularities in, our financial statements, as well as severe criminal or civil sanctions, and we may be subject to other liabilities, which could negatively affect our business, operating results, and financial condition. In some cases, companies that violate the FCPA may be debarred by the U.S. government and/or lose their U.S. export privileges. Changes in anti-corruption laws or enforcement priorities could also result in increased compliance requirements and related costs which could adversely affect our business, financial condition, and results of operations. In addition, the U.S. or other governments may seek to hold us liable for successor liability FCPA violations or violations of other anti-corruption laws committed by companies in which we invest or that we acquired or will acquire.

If we fail to perform our services in accordance with contractual requirements, government regulations, and ethical considerations, we could be subject to significant costs or liability and our reputation could be adversely affected.

We contract with biotechnology and pharmaceutical companies to perform a wide range of services to assist them in bringing new drugs to market. Our services include monitoring clinical trials, laboratory analysis, electronic data capture, patient recruitment, data analytics, technology solutions, and other related services. Such services are complex and subject to contractual requirements, government regulations, and ethical considerations. For example, we are subject to regulation by the FDA and comparable non-U.S. regulatory authorities relating to our activities in conducting pre-clinical and clinical trials. The clinical trial process must be conducted in accordance with regulations promulgated by the FDA under the Federal Food, Drug and Cosmetic Act, which requires the drug to be tested and studied in certain ways. In the United States, before human clinical testing may begin, a manufacturer must file an IND with the FDA. Further, an IRB for each medical center proposing to participate in the clinical trial must review and approve the protocol for the clinical trial before the medical center's investigators participate. Once initiated, clinical trials must be conducted pursuant to and in accordance with the applicable IND, the requirements of the relevant IRBs, and GCP regulations. Similarly, before clinical trials begin, a drug is tested in pre-clinical studies that are expected to comply with Good Laboratory Practice requirements. We are also subject to regulation by the DEA, which regulates the distribution, recordkeeping, handling, security, and disposal of controlled substances. If we fail to perform our services in accordance with these requirements, regulatory authorities may take action against us. Such actions may include injunctions or failure to grant marketing approval of products, imposition of clinical holds or delays, suspension or withdrawal of approvals, rejection of data collected in our studies, license revocation, product seizures or recalls, operational restrictions, civil or criminal penalties or prosecutions, damages, or fines. Clients may also bring claims against us for breach of our contractual obligations and patients in the clinical trials and patients taking drugs approved on the basis of those trials may bring personal injury claims against us. Any such action could have a material adverse effect on our results of operations, financial condition, and reputation.

Such consequences could arise if, among other things, the following occur:

Improper performance of our services. The performance of clinical development services is complex and time-consuming. For example, we may make mistakes in conducting a clinical trial that could negatively impact or obviate the usefulness of the trial or cause the results of the trial to be reported improperly. If the trial results are compromised, we could be subject to significant costs or liability, which could have an adverse impact on our ability to perform our services and our reputation would be harmed. Large clinical trials can cost tens of millions of dollars, and while we endeavor to contractually limit our exposure to such risks, improper performance of our services could have a material adverse effect on our financial condition, damage our reputation, and result in the cancellation of current contracts by the affected client or other current clients or failure to obtain future contracts from the affected client or other current or potential clients.

Investigation of clients. From time to time, one or more of our clients are investigated by regulatory authorities or enforcement agencies with respect to regulatory compliance of their clinical trials, programs, or the marketing and sale of their

drugs. In these situations, we have often provided services to our clients with respect to the clinical trials, programs, or activities being investigated, and we are called upon to respond to requests for information by the authorities and agencies. There is a risk that either our clients or regulatory authorities could claim that we performed our services improperly or that we are responsible for clinical trial or program compliance. If our clients or regulatory authorities make such claims against us and prove them, we could be subject to damages, fines, or penalties. In addition, negative publicity regarding regulatory compliance of our clients' clinical trials, programs, or drugs could have an adverse effect on our business and reputation.

If we fail to comply with certain healthcare laws, including fraud and abuse laws, we could face substantial penalties and our business, results of operations, financial condition, and prospects could be adversely affected.

Even though we do not order healthcare services or bill directly to Medicare, Medicaid, or other third-party payors, certain federal and state healthcare laws and regulations pertaining to fraud and abuse are and will be applicable to our business. We could be subject to healthcare fraud and abuse laws of both the federal government and the states in which we conduct our business. Because of the breadth of these laws and the narrowness of available statutory and regulatory exceptions, it is possible that some of our business activities could be subject to challenge under one or more of such laws. If we or our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines, imprisonment, and the curtailment or restructuring of our operations, any of which could materially adversely affect our ability to operate our business and our financial results.

The U.S. and international healthcare industry is subject to political, economic, and/or regulatory influences and changes, such as healthcare reform, all of which could adversely affect both our customers' business and our business.

Governments worldwide have increased efforts to expand healthcare coverage while at the same time curtailing and better controlling the increasing costs of healthcare. In recent years, the U.S. Congress enacted healthcare reform legislation that expanded health insurance coverage and imposed healthcare industry cost containment measures. More recently, there has been considerable discussion in the United States about repeal of or changes to current healthcare laws and litigation challenging such laws, and in 2019, U.S. tax reform legislation removed the financial penalty for individuals who do not have health insurance. At the same time, certain members of the U.S. Congress have proposed measures that would expand the role of government-sponsored coverage, including single payer or so-called "Medicare-for-All" proposals, the actual implementation or likelihood of which could have far-reaching implications for the healthcare industry. It is uncertain what changes, new legislation, or regulations will be adopted or how any such changes, new legislation, or regulations would impact our business. If cost-containment efforts or other measures substantially changing existing insurance models limit our customers' profitability, they may decrease R&D spending, which could decrease the demand for our services and materially adversely affect our growth prospects. Likewise, if a simplified or more relaxed drug approval process is adopted, the demand for our services may decrease.

The U.S. Congress has also considered and might adopt other legislation that could put downward pressure on the prices that biopharmaceutical companies can charge for prescription drugs. In addition, government bodies may have adopted or are considering the adoption of healthcare reform to control the increasing cost of healthcare. Cost-containment measures, whether instituted by healthcare providers or imposed by governments or through new government regulations, could result in greater selectivity in the number of pharmaceutical products available for purchase, resulting in third-party payers potentially challenging the price and cost-effectiveness of certain pharmaceutical products. In addition, in many major markets outside the United States, pricing approval is required before sales may commence. As a result, significant uncertainty exists as to the reimbursement status of approved healthcare products. Any of these factors could harm our customers' businesses, which, in turn, could materially adversely hurt our business.

In addition to healthcare reform proposals, the expansion of managed care organizations, which focus on reducing healthcare costs by limiting expenditures on pharmaceutical products and medical devices, could result in biopharmaceutical and medical device companies spending less on R&D, which could decrease the demand for our services. If this were to occur, we would have fewer business opportunities and our revenues could decrease, potentially materially.

Government bodies may also adopt healthcare legislation or regulations that are more burdensome than existing regulations. For example, product safety concerns and recommendations from the FDA's Drug Safety Oversight Board could change the regulatory environment for drug products, including the process for conducting clinical trials of drug and biologic product candidates, FDA product approval, and post-approval safety surveillance. These and other changes in regulation could increase our expenses or limit our ability to offer some of our services. Additionally, new or heightened regulatory requirements may have a negative impact on the ability of our customers to conduct and fund clinical trials for new medicines, which could reduce the demand for our services.

Current and proposed laws and regulations regarding the protection of personal data could result in increased risks of liability or increased cost to us or could limit our service offerings.

The confidentiality, collection, use, and disclosure of personal data, including clinical trial patient-specific information, are subject to governmental regulation generally in the country in which the personal data was collected or used. For example, U.S. federal regulations under HIPAA generally require individuals' written authorization, in addition to any required informed consent, before PHI may be used for research and such regulations specify standards for de-identifications and for limited data sets. We may also be subject to applicable state privacy and security laws and regulations in states in which we operate. We are both directly and indirectly affected by the privacy provisions surrounding individual authorizations because many investigators with whom we are involved in clinical trials are directly subject to them as a HIPAA "covered entity" and because we obtain PHI from third parties that are subject to such regulations. Because of amendments to the HIPAA data security and privacy rules, there are some instances where we may be a HIPAA "business associate" of a "covered entity," meaning that we may be directly liable for any breaches in PHI and other HIPAA violations. These amendments may subject us to HIPAA's enforcement scheme, which, as amended, can result in up to $1.5 million in annual civil penalties for each HIPAA violation.

In the EU and other jurisdictions, personal data includes any information that relates to an identified or identifiable natural person with health information carrying additional obligations, including obtaining the explicit consent from the individual for collection, use or disclosure of the information. In addition, we are subject to laws and regulations with respect to cross-border transfers of such data out of certain jurisdictions in which we operate, including the EU. If we are unable to transfer data between and among countries and regions in which we operate, it could affect the manner in which we provide our services or adversely affect our financial results. The United States, the EU and its member states, and other countries where we have operations continue to issue new privacy and data protection rules and regulations that relate to personal data and health information. For instance, the EU GDPR, which took effect in 2018, imposes stringent data protection requirements and provides for penalties up to the greater of €20 million or 4% of worldwide gross revenue for violations. Federal, state, and non-U.S. governments may propose, adopt, or have adopted additional legislation governing the collection, possession, use, or dissemination of personal data, such as personal health information, and personal financial data, as well as security breach notification rules for loss, theft, or unauthorized use of such data that results in significant harm to individuals. For instance, the California Consumer Privacy Act (the "CCPA"), which grants expanded rights to access and delete personal information and opt out of certain personal information sharing, among other things, became effective on January 1, 2020. Due to the geographic scope of our operations, the EU GDPR, the CCPA, and other privacy and security-related laws and regulations currently in effect or that may come into effect may increase our responsibility and liability in relation to personal data that we process, and we may be required to put in place additional mechanisms ensuring compliance with privacy laws and regulations.

Failure to comply with these data protection and privacy regulations and rules in various jurisdictions, or to resolve any serious privacy or security complaints, could subject us to regulatory sanctions, criminal prosecution, or civil liability. Additional legislation or regulation of this type might, among other things, require us to implement new security measures and processes or bring within the legislation or regulation de-identified health or other personal data, each of which may require substantial expenditures or limit our ability to offer some of our services. Additionally, if we violate applicable laws, regulations, or duties relating to the use, privacy, or security of personal data, we could be subject to civil liability or criminal prosecution, be forced to alter our business practices, and suffer reputational harm.

The biopharmaceutical industry has a history of patent and other intellectual property litigation, and we might be involved in costly intellectual property lawsuits.

The biopharmaceutical industry has a history of intellectual property litigation, and these lawsuits will likely continue in the future. Accordingly, we may face patent infringement suits by companies that have patents for similar business processes or other suits alleging infringement of their intellectual property rights. Legal proceedings relating to intellectual property could be expensive, take significant time, and divert management's attention from other business concerns, regardless of the outcome of the litigation. If we do not prevail in an infringement lawsuit brought against us, we might have to pay substantial damages, and we could be required to stop the infringing activity or obtain a license to use technology on unfavorable terms.

Financial and Tax Risks

Exchange rate fluctuations may affect our results of operations and financial condition.

During 2020, approximately 18% of our revenue and 37% of our operating expenses were denominated in currencies other than the U.S. dollar, particularly the Euro and the British pound. Because a portion of our revenue and expenses are denominated in currencies other than the U.S. dollar and our financial statements are reported in U.S. dollars, changes in non-U.S. currency exchange rates could significantly affect our results of operations and financial condition.

The revenue and expenses of our non-U.S. operations are generally denominated in local currencies and translated into U.S. dollars for financial reporting purposes. Accordingly, exchange rate fluctuations will affect the translation of non-U.S. results into U.S. dollars for purposes of reporting our consolidated results. We are subject to non-U.S. currency transaction risk for fluctuations in exchange rates during the period of time between the consummation and cash settlement of a transaction. We earn revenue from our service contracts over a period of several months and, in some cases, over several years. Accordingly, exchange rate fluctuations during this period may affect our profitability with respect to such contracts.

We may limit these risks through exchange rate fluctuation provisions stated in our service contracts, or we may hedge our transaction risk with non-U.S. currency exchange contracts or options. We have not, however, hedged any of our non-U.S. currency transaction risk, and we may experience fluctuations in financial results from our operations outside the United States and non-U.S. currency transaction risk associated with our service contracts.

Our effective income tax rate may fluctuate for different reasons, including the U.S. Tax Cuts and Jobs Act enacted in 2017, which may adversely affect our operations, earnings, and earnings per share.

Our effective income tax rate is influenced by our projected profitability in the various taxing jurisdictions in which we operate. The global nature of our business increases our tax risks. In addition, as a result of increased funding needs by governments resulting from fiscal stimulus measures, revenue authorities in many of the jurisdictions in which we operate are known to have become more active in their tax collection activities. Changes in the distribution of profits and losses among taxing jurisdictions may have a significant impact on our effective income tax rate, which in turn could have an adverse effect on our net income and earnings per share. The application of tax laws in various taxing jurisdictions, including the United States, is subject to interpretation, and tax authorities in various jurisdictions may have diverging and sometimes conflicting interpretations of the application of tax laws. Changes in tax laws or tax rulings in the United States or other tax jurisdictions in which we operate, could materially impact our effective tax rate.

We have a significant amount of goodwill and intangible assets on our balance sheet, and our results of operations may be adversely affected if we fail to realize the full value of our goodwill and intangible assets.

Our balance sheet reflects goodwill and intangibles assets of $1,691.0 million and $599.9 million, respectively, as of December 31, 2020. Collectively, goodwill and intangibles assets represented 55% of our total assets as of December 31, 2020. In accordance with generally accepted accounting principles, or GAAP, goodwill and indefinite-lived intangible assets are not amortized, but are subject to a periodic impairment evaluation. We assess the realizability of our indefinite-lived intangible assets and goodwill annually and conduct an interim evaluation whenever events or changes in circumstances, such as operating losses or a significant decline in earnings associated with the acquired business or asset, indicate that these assets may be impaired. In addition, we review long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of the assets might not be recoverable. If indicators of impairment are present, we evaluate the carrying value in relation to estimates of future undiscounted cash flows. Our ability to realize the value of the goodwill and intangible assets will depend on the future cash flows of the businesses we have acquired, which in turn depend in part on how well we have integrated these businesses into our own business. The carrying amount of the goodwill could be impaired if there is a downturn in our business or our industry or other factors that affect the fair value of our business, in which case a charge to earnings would become necessary. If we are not able to realize the value of the goodwill and intangible assets, we may be required to incur material charges relating to the impairment of those assets. Such impairment charges could materially and adversely affect our operating results and financial condition. See Note 3 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K for a further discussion of our goodwill and intangible asset impairment testing.

Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

Under Sections 382 and 383 of the U.S. Internal Revenue Code, if a corporation undergoes an “ownership change” (generally defined as a greater than 50 percentage point change, by value, in the aggregate stock ownership of certain stockholders over a three-year period), the corporation’s ability to use its pre-change net operating loss carryforwards to offset its future taxable income and other pre-change tax attributes may be limited. We have experienced at least one ownership change in the past. We may experience additional ownership changes in the future. In addition, future changes in our stock ownership could result in additional ownership changes. Any such ownership changes could limit our ability to use our net operating loss carryforwards to offset any future taxable income and other tax attributes. State and non-U.S. tax laws, as well as the results of examinations and audits by the IRS and other taxing authorities, may also limit our ability to utilize net operating loss carryforwards and other tax attributes.

Debt Financing Risks

Our substantial indebtedness could adversely affect our financial condition and prevent us from fulfilling our debt obligations and may otherwise restrict our activities.

As of December 31, 2020, we had total indebtedness of $1,278.8 million, which consisted of: $212.5 million principal amount of variable rate accounts receivable financing due in 2022, $975.0 million principal amount of variable rate first lien term loans due in 2024, or the First Lien Term Loan, and $91.3 million of borrowings under our revolving line of credit, or the Revolver. The First Lien Term Loan and Revolver are collectively known as the Senior Secured Credit Facility.

Specifically, our high level of debt could have important consequences to our business and financial condition, including:

- making it more difficult for us to satisfy our obligations with respect to our debt;
- limiting our ability to obtain additional financing to fund future working capital, capital expenditures, investments, or acquisitions or other general corporate requirements;
- requiring a substantial portion of our cash flows to be dedicated to debt service payments instead of other purposes, thereby reducing the amount of cash flow available for working capital, capital expenditures, investments, or acquisitions and other general corporate purposes;
- increasing our vulnerability to adverse changes in general economic, industry, and competitive conditions;
- exposing us to the risk of increased interest rates as certain of our borrowings, including borrowings under the Senior Secured Credit Facility and accounts receivable financing agreement, are at variable rates of interest;
- limiting our flexibility in planning for and reacting to changes in the industry in which we compete;
- placing us at a disadvantage compared to other, less leveraged competitors; and
- increasing our cost of borrowing.

If we do not comply with the covenants in our financing agreements, we may not have the funds necessary to pay all of our indebtedness that could become due.

The credit agreement governing the Senior Secured Credit Facility and the accounts receivable financing agreement, as amended, require us to comply with certain covenants. In particular, our credit agreement prohibits us from incurring any additional indebtedness, except in specified circumstances, or amending the terms of agreements relating to certain existing junior indebtedness, if any, in a manner materially adverse to the lenders under our credit agreement without their respective approval. Further, our credit agreement and the accounts receivable financing agreement contain customary covenants, including covenants that restrict our ability to acquire and dispose of assets, engage in mergers or reorganizations, pay dividends, or make investments. A violation of any of these covenants could cause an event of default under our financing agreements.

If we default on our financing agreements, all outstanding amounts could become immediately due and payable. If any of the holders of our indebtedness accelerate the repayment of such indebtedness, there can be no assurance that we will have sufficient assets to repay our indebtedness. If we were unable to repay those amounts, the holders of our secured indebtedness could proceed against the collateral granted to them to secure that indebtedness. Any acceleration of amounts due or the substantial exercise by the lenders of their rights under applicable security documents would likely have a material adverse effect on us.

We may not be able to generate sufficient cash to service all of our indebtedness, and may be forced to take other actions to satisfy our obligations under our indebtedness that may not be successful.

Our ability to satisfy our debt obligations will depend upon, among other things:

- our future financial and operating performance, which will be affected by prevailing economic conditions and financial, business, regulatory, and other factors, many of which are beyond our control; and
- the future availability of borrowings under our Senior Secured Credit Facility, which depends on, among other things, our compliance with the covenants in those facilities.

It cannot be assured that our business will generate sufficient cash flow from operations, or that future borrowings will be available under our Senior Secured Credit Facility or otherwise, in an amount sufficient to fund our liquidity needs. If our

cash flows and capital resources are insufficient to service our indebtedness, we may be forced to reduce or delay capital expenditures, sell assets, seek additional capital, or restructure or refinance our indebtedness. These alternative measures may not be successful and may not permit us to meet our scheduled debt service obligations. Our ability to restructure or refinance our debt will depend on the condition of the capital markets and our financial condition at such time. Any refinancing of our debt could be at higher interest rates and may require us to comply with more onerous covenants, which could further restrict our business operations. In addition, the terms of existing or future debt agreements may restrict us from adopting some of these alternatives. In the absence of such operating results and resources, we could face substantial liquidity problems and might be required to dispose of material assets or operations to meet our debt service and other obligations. We may not be able to consummate those dispositions for fair market value or at all and any proceeds that we could realize from any such dispositions may not be adequate to meet our debt service obligations then due.

Interest rate fluctuations may affect our results of operations and financial condition.

Because all of our debt is variable-rate debt, fluctuations in interest rates could have a material effect on our business. At times, we have utilized derivative financial instruments such as interest rate swaps to hedge our exposure to interest rate fluctuations. Our previously outstanding interest rate swaps matured in 2020 and we have not entered into a new interest rate swap agreement.

The interest rates of our term loans are priced using a spread over LIBOR.

LIBOR, the London Interbank Offered Rate, is the basic rate of interest used in lending between banks on the London interbank market and is widely used as a reference for setting the interest rate on loans globally. We typically use LIBOR as a reference rate in our term loans such that the interest due to our creditors pursuant to a term loan extended to us is calculated using LIBOR. Most of our term loan agreements contain a stated minimum value for LIBOR.

In 2017, the United Kingdom's Financial Conduct Authority, which regulates LIBOR, announced that it intends to phase out LIBOR by the end of 2021. It is unclear if at that time whether or not LIBOR will cease to exist, or if new methods of calculating LIBOR will be established such that it continues to exist after 2021 or if replacement conventions will be developed. The U.S. Federal Reserve, in conjunction with the Alternative Reference Rates Committee, a steering committee comprised of large U.S. financial institutions, is considering replacing U.S. dollar LIBOR with a new index calculated by short-term repurchase agreements, backed by Treasury securities ("SOFR"). SOFR is observed and backward-looking, which stands in contrast with LIBOR under the current methodology, which is an estimated forward-looking rate and relies, to some degree, on the expert judgment of submitting panel members. Given that SOFR is a secured rate backed by government securities, it will be a rate that does not take into account bank credit risk (as is the case with LIBOR). Whether or not SOFR attains market traction as a LIBOR replacement tool remains in question. As such, the future of LIBOR at this time is uncertain. At this time, due to a lack of consensus existing as to what rate or rates may become accepted alternatives to LIBOR, it is impossible to predict the effect of any such alternatives on our liquidity. However, if LIBOR ceases to exist, we may need to renegotiate our credit agreements that utilize LIBOR as a factor in determining the interest rate to replace LIBOR with the new standard that is established. Additionally, these changes may have an adverse impact on the value of or interest earned on any LIBOR-based marketable securities, loans, and derivatives that are included in our financial assets and liabilities.

Corporate Governance Risks

Provisions of our corporate governance documents and Delaware law could make any change in our board of directors or in control of our company more difficult.

Our amended and restated certificate of incorporation, our amended and restated bylaws and Delaware law contain provisions, such as provisions authorizing, without a vote of stockholders, the issuance of one or more series of preferred stock, that could make it difficult or expensive for a third party to pursue a tender offer, change in control, or takeover attempt that is opposed by our management and board of directors even if such a transaction would be beneficial to our stockholders. We also have a staggered board of directors that could make it more difficult for stockholders to change the composition of our board of directors in any one year. These anti-takeover provisions could substantially impede the ability of public stockholders to change our management or board of directors.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

We lease a facility for our corporate headquarters in Raleigh, North Carolina. We also lease more than 70 other offices in North America, Europe, Africa, Latin America, Australia, and Asia. We do not own any real estate. We believe that our properties, taken as a whole, are in good operating condition and are suitable for our business operations.

Item 3. Legal Proceedings

We are currently involved, as we are from time to time, in legal proceedings that arise in the ordinary course of our business. We believe that we have adequately accrued for these liabilities and that there is no other litigation pending that could materially harm our results of operations and financial condition. See "Contingent Losses" under Note 3 and "Legal Proceedings" under Note 14 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K for a further discussion of our current legal proceedings.

Item 4. Mine Safety Disclosures

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

Market Information for Common Stock

Our common stock trades on the Nasdaq under the symbol "PRAH."

Holders of Record

On February 19, 2021, we had approximately 265 common stockholders of record. This number does not include beneficial owners for whom shares are held by nominees in street name.

Recent Sales of Unregistered Securities

There were no unregistered sales of equity securities in 2020 that have not been previously reported in a quarterly report on Form 10-Q or current report on Form 8-K.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

On August 30, 2019, our board of directors authorized a share repurchase program, or the Repurchase Program, pursuant to which we may repurchase up to $500 million of common stock, effective immediately and through and including December 31, 2021, when the Repurchase Program will expire. Under the repurchase program, we are authorized to repurchase shares through open market purchases, privately-negotiated transactions, secondary offerings, block trades, or otherwise in accordance with all applicable securities laws and regulations, including through Rule 10b5-1 trading plans and pursuant to Rule 10b-18 under the Exchange Act.

No repurchases were made during the year ended December 31, 2020. As of December 31, 2020, we have remaining authorization to repurchase up to $200.0 million of common stock under the Repurchase Program.

Stock Performance Graph

This performance graph shall not be deemed "filed" for purposes of Section 18 of the Exchange Act, or incorporated by reference into any filing of the Company under the Exchange Act or the Securities Act, except to the extent we specifically incorporate it by reference into such filing.

The following graph shows a comparison from November 13, 2014 (the date our common stock commenced trading on the Nasdaq) through December 31, 2020 of the cumulative total return for our common stock, the Nasdaq Composite Index, and the Nasdaq Health Care Index.

The graph assumes that $100 was invested at the market close on November 13, 2014 in the common stock of PRA Health Sciences, Inc., the Nasdaq Composite Index, and the Nasdaq Health Care Index, and assumes reinvestments of dividends, if any. The stock price performance of the following graph is not necessarily indicative of future stock price performance.

Item 6. Selected Financial Data

Not applicable.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

You should read the following discussion and analysis of our financial condition and results of operations together with the consolidated financial statements and the related notes included elsewhere in "Financial Statements and Supplementary Data." Some of the information contained in this discussion and analysis or set forth elsewhere in this Annual Report, including information with respect to our plans and strategy for our business, includes forward-looking statements that involve risks and uncertainties. You should read the "Risk Factors" section of this Annual Report on Form 10-K for a discussion of important factors that could cause actual results to differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Our discussion and analysis below is focused on our financial results and liquidity and capital resources for the years ended December 31, 2020 and 2019, including year-over-year comparisons of our financial performance and condition for these years. Discussion and analysis of the year ended December 31, 2018 specifically, as well as the year-over-year comparison of our financial performance and condition for the years ended December 31, 2019 and 2018, are located in Part II, Item 7 - Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2019, filed with the SEC on February 21, 2020.

Overview

We are one of the world's leading global CROs, by revenue, providing outsourced clinical development services to the biotechnology and pharmaceutical industries. We believe we are one of a select group of CROs with the expertise and capability to conduct clinical trials across major therapeutic areas on a global basis. Our therapeutic expertise includes areas that are among the largest in pharmaceutical development, and we focus in particular on oncology, immunology, central nervous system inflammation, respiratory, cardiometabolic, and infectious diseases. We believe that we further differentiate ourselves from our competitors through our investments in medical informatics and clinical technologies designed to enhance efficiencies, improve study predictability, and provide better transparency for our clients throughout their clinical development processes. Our Data Solutions segment allows us to better serve our clients across their entire product lifecycle by (i) improving clinical trial design, recruitment, and execution; (ii) creating real-world data solutions based on the use of medicines by actual patients in normal situations; and (iii) increasing the efficiency of healthcare companies' commercial organizations through enhanced analytics and outsourcing services.

Overview of the Impact of COVID-19 to our Business

The novel coronavirus COVID-19, or COVID-19, which surfaced in Wuhan, China, in December 2019, has been declared a pandemic and has spread to multiple global regions, including the United States and Europe. The impact of this pandemic has been and will likely continue to be extensive in many aspects of society, which has resulted in and will likely continue to result in significant disruptions to the global economy, as well as businesses around the world. In an effort to halt the outbreak of COVID-19, a number of countries, including the United States, have placed significant restrictions on travel and many businesses have announced extended closures.

The disruptions caused by COVID-19 did not have a material impact on our financial results to start the year; however, as the global spread of the virus began to accelerate late in the first quarter of 2020, we began to experience an adverse impact to our financial results, which continued through the fourth quarter of 2020. We believe that we will continue to experience disruptions to our business due to the COVID-19 pandemic into 2021.

As the COVID-19 pandemic continues to evolve rapidly, we cannot at this time accurately predict the effects of these conditions on our operations. Uncertainties remain as to the duration of the pandemic, the geographic location of specific outbreaks, and the length and scope of the travel restrictions and business closures imposed by the governments of impacted countries. The COVID-19 outbreak has had, and a continuing outbreak or future outbreaks may have, several important impacts on our business:

- **Workforce**: In response to the outbreak and business disruption, we have prioritized the health and safety of our employees and we closed the majority of our physical office locations worldwide in March. Although we have begun limited re-openings of some of our offices, most of our workforce is able to work remotely in an effective way.
- **Backlog**: We have not experienced any material COVID-19 related trial cancellations. Although business development activities began to normalize during the second and third quarters, the year ended December 31, 2020 was impacted by COVID-19. Late in the first quarter, we experienced bid-defense meeting

postponements due to travel restrictions and delays in study award decision-making. This has had an impact on new business awards in both the Clinical Research and Data Solutions segments, particularly during the first quarter of 2020.

- **Clinical Research segment**: During March 2020, we began to experience global site closures, including some of our clinic facilities, which has led to a decline in site-based monitoring and the enrollment of patients. We have been able to implement remote monitoring activities through the use of our technology platforms in an effort to mitigate the impact of these site closures. Limitations on travel and business closures recommended by federal, state, and local governments, has impacted and could continue to impact, among other things, our ability to enroll patients in clinical trials, recruit clinical site investigators, and obtain timely approvals from local regulatory authorities.
- **Data Solutions segment**: Our Data Solutions segment is and has been relatively more insulated from the effects of the virus, due to its high proportion of recurring license revenue. However, service offerings in this segment that rely on face-to-face interactions or are dependent on in-person gatherings, events, or conferences may experience significant disruption.
- **Mitigation strategies**: In light of the current situation, we have initiated proactive cost management strategies. These include, among other things, hiring restrictions, reductions in third-party costs, and certain compensation adjustments. We have also implemented proactive cash conservation initiatives, including delaying some capital expenditures and halting voluntary debt repayments.
- **Liquidity position:** We believe that we have a strong liquidity position, which includes cash on hand and access to our revolving credit facility. We are currently subject to two debt covenants in our Senior Secured Credit Facility:

	Requirement:	As of December 31, 2020
Total indebtedness to EBITDA	≤ 4.25x	1.15x
Interest expense to EBITDA	≥ 3.00x	13.01x

We continue to monitor the rapidly evolving situation and guidance from international and domestic authorities, including federal, state and local public health authorities and may take additional actions based on their recommendations. In these circumstances, there may be developments outside our control requiring us to adjust our operating plan. As such, given the dynamic nature of this situation, we cannot reasonably estimate the impacts of COVID-19 on our financial condition, results of operations, or cash flows in the future.

How We Assess the Performance of Our Business

We are managed through two reportable segments, (i) Clinical Research and (ii) Data Solutions. Our chief operating decision maker uses segment profit as the primary measure of each segment's operating results in order to allocate resources and in assessing the Company's performance. In addition to our GAAP financial measures, we review various financial and operational metrics. For our Clinical Research segment we review new business awards, cancellations, and backlog.

Our gross new business awards for the years ended December 31, 2020 and 2019 were $3,320.8 million and $3,024.0 million, respectively. New business awards arise when a client selects us to execute its trial and is documented by written or electronic correspondence or for our Strategic Solutions offering when the amount of revenue expected to be recognized is measurable. The number of new business awards can vary significantly from year to year, and awards can have terms ranging from several months to several years. For our Strategic Solutions offering, the value of a new business award is the anticipated service revenue to be recognized in the corresponding quarter of the next fiscal year. For the remainder of our business, the value of a new award is the anticipated service revenue over the life of the contract, which does not include reimbursement activity or investigator fees.

In the normal course of business, we experience contract cancellations, which are reflected as cancellations when the client provides us with written or electronic correspondence that the work should cease. During the years ended December 31, 2020 and 2019, we had $404.2 million and $360.4 million, respectively, of cancellations for which we received correspondence from the client. The number of cancellations can vary significantly from year to year. The value of the cancellation is the remaining amount of unrecognized service revenue, less the estimated effort to transition the work back to the client.

Our backlog consists of anticipated service revenue from new business awards that either have not started or are in process but have not been completed. Backlog varies from period to period depending upon new business awards and contract modifications, cancellations, and the amount of service revenue recognized under existing contracts. Our backlog at December 31, 2020 and 2019 was $5.4 billion and $4.7 billion, respectively.

Industry Trends

ISR estimated in its 2020 Market Report that the size of the worldwide CRO market was approximately $41 billion in 2019 and will grow at a 6.9% CAGR to $57 billion in 2024. This growth will be driven by an increase in the amount of research and development expenditures and higher levels of clinical development outsourcing by biopharmaceutical companies.

Sources of Revenue

Total revenue is comprised of revenue from the provision of our services, and revenue from reimbursable expenses and reimbursable investigator grants, that are incurred while providing our services. We do not have any material product revenue.

Costs and Expenses

Our costs and expenses are comprised primarily of our direct costs, selling, general and administrative costs, depreciation and amortization, and income taxes. In addition, we monitor and measure costs as a percentage of revenue, excluding reimbursement revenue from reimbursable expenses, rather than total revenue, as we believe this is a more meaningful comparison and better reflects the operations of our business.

Direct Costs (Exclusive of Depreciation and Amortization)

For our Clinical Research segment, direct costs consist primarily of labor-related charges. They include elements such as salaries, benefits, and incentive compensation for our employees. In addition, we utilize staffing agencies to procure primarily part time individuals to perform work on our contracts. Labor-related charges as a percentage of the Clinical Research segment's total direct costs were 97.2% and 96.4% for the years ended December 31, 2020 and 2019, respectively. The cost of labor procured through staffing agencies is included in these percentages and represents 3.2% and 3.1% of the Clinical Research segment's total direct costs for the years ended December 31, 2020 and 2019, respectively. Our remaining direct costs are items such as travel, meals, postage and freight, patient costs, medical waste, and supplies. The total of all these items as a percentage of the Clinical Research segment's total direct costs was 2.8% and 3.6% for the years ended December 31, 2020 and 2019, respectively.

Historically, direct costs have increased with an increase in revenue. The future relationship between direct costs and revenue may vary from historical relationships. Several factors will cause direct costs to decrease as a percentage of revenue. Deployment of our billable staff in an optimally efficient manner has the greatest impact on our ratio of direct cost to revenue. The most effective deployment of our staff is when they are fully engaged in billable work and are accomplishing contract related activities at a rate that meets or exceeds budgeted targets. We also seek to optimize our efficiency by performing work using the employee with the lowest cost. Generally, the following factors may cause direct costs to increase as a percentage of revenue: our staff are not fully deployed, as is the case when there are unforeseen cancellations or delays; our staff are accomplishing tasks at levels of effort that exceed budget, such as rework; and pricing pressure from increased competition.

For our Data Solutions segment, direct costs consist primarily of data costs. Data costs as a percentage of the Data Solutions segment's total direct costs were 76.2% and 73.3% for the years ended December 31, 2020 and 2019, respectively. Labor-related charges, such as salaries, benefits, and incentive compensation for our employees, were 18.8% and 20.2% of the Data Solutions segment's total direct costs for the years ended December 31, 2020 and 2019, respectively. Our remaining direct costs are items such as travel, meals, and supplies, and were 5.0% and 6.5% of the Data Solutions segment's total direct costs for the years ended December 31, 2020 and 2019, respectively.

Reimbursable Expenses

We incur out-of-pocket costs that are reimbursable by our customers. As is customary in our industry, we also routinely enter into separate agreements on behalf of our clients with independent physician investigators in connection with clinical trials. We do not pay independent physician investigators until funds are received from the applicable clients. We include these out-of-pocket costs and investigator fees as reimbursable expenses in our consolidated statements of operations. Reimbursable expenses are not included in our backlog because they are pass-through costs to our clients.

We believe that the fluctuations in reimbursable expenses are not meaningful to our economic performance given that such costs are passed through to the client. The reimbursable expenses are included in our measure of progress for our long-term contracts.

Selling, General and Administrative Expenses

Selling, general and administrative expenses consist of administration payroll and benefits, marketing expenditures, and overhead costs such as information technology and facilities costs. These expenses also include central overhead costs that are not directly attributable to our operating business and include certain costs related to insurance, professional fees and property.

Transaction-Related Costs

Transaction-related costs include fees associated with our secondary offerings, stock-based compensation expense related to the transfer restrictions on vested options, costs associated with acquisition related earn-out liabilities, and expenses associated with our acquisitions.

Loss on Modification or Extinguishment of Debt

Loss on modification or extinguishment of debt consists of costs incurred in connection with debt refinancing or incremental borrowings under our credit facilities and the write-off of previously unamortized debt financing costs that were expensed as a result of voluntary debt repayments.

Depreciation and Amortization

Depreciation represents the depreciation charged on our fixed assets. The charge is recorded on a straight-line method, based on estimated useful lives of three to seven years for computer hardware and software and five to seven years for furniture and equipment. Leasehold improvements are depreciated over the lesser of the life of the lease term or the useful life of the improvements. Amortization expense consists of amortization recorded on acquisition-related intangible assets. Customer relationships, backlog, databases, and finite-lived trade names are amortized on an accelerated basis, which coincides with the period of economic benefit we expect to receive. All other finite-lived intangibles are amortized on a straight-line basis. In accordance with GAAP, we do not amortize goodwill and indefinite-lived intangible assets.

Income Taxes

Because we conduct operations on a global basis, our effective tax rate has and will continue to depend upon the geographic distribution of our pre-tax earnings among several different taxing jurisdictions. Our effective tax rate can also vary based on changes in the tax rates of the different jurisdictions. Our effective tax rate is also impacted by tax credits and the establishment or release of deferred tax asset valuation allowances and tax reserves, as well as significant non-deductible items such as portions of transaction-related costs.

Foreign subsidiaries are taxed separately in their respective jurisdictions. We have foreign net operating loss carryforwards in some jurisdictions. The carryforward periods for these losses vary from four years to an indefinite carryforward period depending on the jurisdiction. Our ability to offset future taxable income with the net operating loss carryforwards may be limited in certain instances, including changes in ownership.

Business Combinations

We have completed and will continue to consider strategic business combinations to enhance our capabilities and offerings in certain areas. In January 2020, we acquired Care Innovations, Inc., or Care Innovations, which expanded our ability to serve customers with technologies that enhance our mobile health platform and provide expanded remote patient monitoring support. This acquisition expands our capabilities to deliver virtual and decentralized trials.

This transaction was accounted for as a business combination and the acquired results of operations are included in our consolidated financial information since the acquisition date.

See Note 4 to our audited consolidated financial statements found elsewhere in this Annual Report on Form 10-K for additional information with respect to this acquisition.

Exchange Rate Fluctuations

The majority of our foreign operations transact in the Euro, or EUR, or British pound, or GBP. As a result, our revenue and expenses are subject to exchange rate fluctuations with respect to these currencies. We have translated these currencies into U.S. dollars using the following exchange rates:

	Average Rate		Closing Rate	
	2020	2019	2020	2019
U.S. dollars per:				
Euro	1.14	1.12	1.23	1.12
British pound	1.28	1.28	1.37	1.32

Results of Operations

Consolidated Results of Operations for the Year Ended December 31, 2020 Compared to the Year Ended December 31, 2019

	Years Ended December 31,	
	2020	2019
(in thousands)		
Revenue	$ 3,183,365	$ 3,066,262
Operating expenses:		
Direct costs (exclusive of depreciation and amortization)	1,649,001	1,539,541
Reimbursable expenses	665,761	650,080
Selling, general and administrative expenses	453,032	394,925
Transaction-related costs	(44,465)	1,835
Depreciation and amortization expense	131,630	114,898
Loss on disposal of fixed assets	317	1,058
Income from operations	328,089	363,925
Interest expense, net	(43,130)	(51,987)
Loss on modification or extinguishment of debt	(450)	(3,928)
Foreign currency losses, net	(25,499)	(2,257)
Other (expense) income, net	(1)	174
Income before income taxes	259,009	305,927
Provision for income taxes	61,966	62,808
Net income	197,043	243,119
Net income attributable to noncontrolling interest	—	(99)
Net income attributable to PRA Health Sciences, Inc.	$ 197,043	$ 243,020

Revenue increased by $117.1 million, or 3.8%, from $3,066.3 million during the year ended December 31, 2019 to $3,183.4 million during the year ended December 31, 2020. Revenue for the year ended December 31, 2020 benefited from an increase in billable hours and a favorable impact of $4.4 million from foreign currency exchange rate fluctuations. Although we saw an increase in billable hours during the year ended December 31, 2020, our billable hours, particularly in the second quarter, were impacted by the inaccessibility of investigator sites and an inability to screen and enroll patients due to the continued disruption from the COVID-19 pandemic. The growth in revenue and the increase in billable hours were due largely to the increase in our backlog as we entered the year, the type of services we are providing on our active studies, which was driven by the life cycles of projects that were active during the period, the growth in new business awards as a result of higher demand for our services across the industries we serve, more effective sales efforts, and the growth in the overall CRO market.

Direct costs increased by $109.5 million, or 7.1%, from $1,539.5 million during the year ended December 31, 2019 to $1,649.0 million during the year ended December 31, 2020. Salaries and related benefits in our Clinical Research segment

increased $107.3 million as we continued to hire billable staff to support our portfolio of studies and to support growth in our business. Data costs in our Data Solutions segment increased by $19.9 million due to increased costs on the renewal of existing contracts and the addition of new sources of data to expand our data offerings. Both of these increases were offset by a decrease in travel and other project-related costs of $10.1 million due to the impact the COVID-19 pandemic had on our operations and a favorable impact of $8.8 million from foreign currency exchange rate fluctuations. Direct costs as a percentage of revenue increased from 50.2% during the year ended December 31, 2019 to 51.8% during the year ended December 31, 2020.

Reimbursable expenses increased by $15.7 million from $650.1 million during the year ended December 31, 2019 to $665.8 million during the year ended December 31, 2020. We believe that the fluctuations in reimbursable costs from period to period are not meaningful to our underlying performance over the full terms of the relevant contracts.

Selling, general and administrative expenses increased by $58.1 million, or 14.7%, from $394.9 million during the year ended December 31, 2019 to $453.0 million during the year ended December 31, 2020. The increase in selling, general and administrative expenses is primarily due to an increase in salaries and related benefits, including stock-based compensation expense, due to increased headcount and additional office space added prior to March 2020 when COVID-19 began to have an adverse impact on our operations. Selling, general and administrative expenses as a percentage of revenue increased from 12.9% during the year ended December 31, 2019 to 14.2% during the year ended December 31, 2020.

Transaction-related costs are primarily related to changes in the fair value of contingent consideration and other expenses incurred in conjunction with our recent acquisitions and fees associated with our secondary offerings. During the year ended December 31, 2020, we recorded a $44.5 million decrease in the fair value of the earn-out liability associated with the acquisition of Care Innovations, as it was determined that the two 2020 financial targets would not be met. Specifically, the revenue and earnings before interest, taxes, depreciation, and amortization of the acquired business were expected to be lower than initial forecasts. The initial growth estimates for the service offering were negatively impacted by changes in market conditions, which negatively impacted Care Innovations' ability to contract and deliver services on new commercial opportunities within the one-year earn-out period. During the year ended December 31, 2019, we incurred transaction-related costs of $1.8 million. These costs consisted of $0.6 million of third party costs incurred in connection with our secondary offering and $1.3 million of expenses related to the acquisition of Care Innovations.

Depreciation and amortization expense increased by $16.7 million, or 14.6%, from $114.9 million during the year ended December 31, 2019 to $131.6 million during the year ended December 31, 2020. Depreciation and amortization expense as a percentage of revenue was 3.7% during the year ended December 31, 2019 and 4.1% during the year ended December 31, 2020. The increase in depreciation and amortization expense is due to the amortization of the intangible assets acquired in connection with the acquisition of Care Innovations as well as an increase in depreciation expense due to an increase in our depreciable asset base.

Interest expense, net decreased by $8.9 million from $52.0 million during the year ended December 31, 2019 to $43.1 million during the year ended December 31, 2020. A decline in the weighted average interest rate on the unhedged portion of our debt resulted in an $8.2 million decrease in interest expense during the year ended December 31, 2020.

Loss on modification or extinguishment of debt was $0.5 million during the year ended December 31, 2020 compared to $3.9 million during the year ended December 31, 2019. The loss on modification or extinguishment of debt during the year ended December 31, 2020 is related to new fees incurred that were expensed as a result of the amendment of our accounts receivable financing agreement. The loss on modification or extinguishment of debt during the year ended December 31, 2019 is related to previously capitalized unamortized debt financing costs as well as new fees incurred that were expensed as a result of the refinancing of our credit facilities during the year.

Foreign currency losses, net increased by $23.2 million from $2.3 million during the year ended December 31, 2019 to $25.5 million during the year ended December 31, 2020. Foreign currency gains and losses are due to fluctuations in the U.S. dollar, gains or losses that arise in connection with the revaluation of short-term inter-company balances between our domestic and international subsidiaries, and gains or losses from foreign currency transactions, such as those resulting from the settlement of third-party accounts receivables and payables denominated in a currency other than the local currency of the entity making the payment. The increase in foreign currency losses, net during the year ended December 31, 2020 is primarily due to movement of the U.S. dollar versus the British pound, Euro, Canadian dollar, and the Russian ruble.

Provision for income taxes decreased by $0.8 million from $62.8 million during the year ended December 31, 2019 to $62.0 million during the year ended December 31, 2020. Our effective tax rate was 23.9% for the year ended December 31, 2020 compared to 20.5% during the year ended December 31, 2019. The increase in the effective tax rate was primarily driven by increases in stock-based compensation, taxes on settled interest rate swaps, and the liability related to uncertain tax positions.

These increases were offset by the effect of a decrease in the fair value of the earn-out liability related to the stock acquisition of Care Innovations, which was not included in taxable income, but instead decreased the tax basis of the acquired company.

Segment Results of Operations for the Year Ended December 31, 2020 Compared to the Year Ended December 31, 2019

Clinical Research

	Years Ended December 31,	
	2020	2019
(in thousands)		
Revenue	$ 2,923,045	$ 2,812,969
Segment profit	801,357	796,823
Segment profit %	27.4 %	28.3 %

Revenue increased by $110.1 million, or 3.9%, from $2,813.0 million during the year ended December 31, 2019 to $2,923.0 million during the year ended December 31, 2020. Revenue for the year ended December 31, 2020 benefited from an increase in billable hours and the reimbursable portion of revenue. Although we saw an increase in billable hours during the year ended December 31, 2020, our billable hours, particularly during the second quarter, were impacted by the inaccessibility of investigator sites and an inability to screen and enroll patients due to the continued disruption from the COVID-19 pandemic. The growth in revenue and the increase in billable hours were due largely to the increase in our backlog as we entered the year, the type of services we are providing on our active studies, which was driven by the life cycles of projects that were active during the period, the growth in new business awards as a result of higher demand for our services across the industries we serve, and more effective sales efforts and the growth in the overall CRO market.

Segment profit increased by $4.5 million, or 0.6%, from $796.8 million during the year ended December 31, 2019 to $801.4 million during the year ended December 31, 2020 primarily due to an increase in revenue. Segment profit as a percentage of revenue decreased from 28.3% during the year ended December 31, 2019 to 27.4% for the same period in 2020. Segment profitability was impacted by the COVID-19 pandemic as we retained staff to ensure we could meet client deliverables.

Data Solutions

	Years Ended December 31,	
	2020	2019
(in thousands)		
Revenue	$ 260,320	$ 253,293
Segment profit	67,246	79,818
Segment profit %	25.8 %	31.5 %

Revenue increased by $7.0 million, or 2.8%, from $253.3 million during the year ended December 31, 2019 to $260.3 million during the year ended December 31, 2020. The increase in revenue was related to an increase in the volume of data services provided during the year ended December 31, 2020, offset by a decrease in the amount of consulting and in-kind services provided during the year ended December 31, 2020.

Segment profit decreased by $12.6 million, or 15.8%, from $79.8 million during the year ended December 31, 2019 to $67.2 million during the year ended December 31, 2020. The decrease in segment profit is attributable to increased costs on the renewal of existing contracts and the addition of new sources of data to expand our data offerings. Segment profit as a percentage of revenue decreased from 31.5% during the year ended December 31, 2019 to 25.8% for the same period in 2020 primarily due to the factors noted above.

Inflation

Our long-term contracts, those in excess of one year, generally include an inflation or cost of living adjustment for the portion of the services to be performed beyond one year from the contract date. As a result, we expect that inflation generally will not have a material adverse effect on our operations or financial condition. Historically our projection of inflation contained within our contracts has not significantly impacted our operating income. Should inflation be in excess of the estimates within our contracts, our operating margins would be negatively impacted if we were unable to negotiate contract modifications with our clients.

Liquidity and Capital Resources

We assess our liquidity in terms of our ability to generate cash to fund our operating, investing, and financing activities. Our principal source of liquidity is operating cash flows. As of December 31, 2020, we had approximately $506.3 million of cash and cash equivalents of which $79.2 million was held by our foreign subsidiaries. Our expected primary cash needs on both a short and long-term basis are for capital expenditures, expansion of services, geographic expansion, debt repayments, and other general corporate purposes. We have historically funded our operations and growth, including acquisitions, with cash flow from operations, borrowings, and issuances of equity securities. We expect to continue expanding our operations through internal growth and strategic acquisitions and investments. We expect these activities will be funded from existing cash, cash flow from operations and, if necessary or appropriate, borrowings under our existing or future credit facilities. Our sources of liquidity could be affected by our dependence on a small number of industries and clients, compliance with regulations, international risks, and personal injury, environmental, or other material litigation claims.

Cash Collections

Cash collections from accounts receivable were $3,272.4 million during the year ended December 31, 2020, including $487.0 million of funds received from customers to pay independent physician investigators, or investigators, as compared to $3,087.3 million during the year ended December 31, 2019, including $325.3 million of funds received from customers to pay investigators. The increase in cash collections is related to our increase in revenue, driven by an increase in new business awards and backlog.

Discussion of Cash Flows

Cash Flow from Operating Activities

During the year ended December 31, 2020, net cash provided by operations was $427.2 million, compared to $253.6 million in 2019. Cash provided by operating activities increased over the prior year primarily due to improvements in cash flows from working capital changes. The changes in working capital were driven by an improvement in our days sales outstanding as compared to the prior year. Additionally, the prior year included the impact of a cash outflow associated with an acquisition-related earn-out payment.

Cash Flow from Investing Activities

Net cash used in investing activities was $233.9 million during the year ended December 31, 2020, compared to $73.2 million in 2019. The increase in cash outflows is primarily attributable to the acquisition of Care Innovations.

Cash Flow from Financing Activities

Net cash provided by financing activities was $77.4 million during the year ended December 31, 2020 compared to net cash used in financing activities of $90.7 million for the same period of 2019. During the year ended December 31, 2020, our long-term debt balance, including borrowings under our revolving line of credit, increased by $20.0 million compared to a $172.3 million increase for the same period in 2019. Additionally, there was a $12.5 million increase in cash inflow from proceeds from stock issued under our employee stock purchase plan and stock option exercises during the year ended December 31, 2020 compared to the same period in 2019. The prior year included a $300.0 million cash outflow for the repurchase and retirement of common stock as well as a $4.1 million outflow for the acquisition of a non-controlling interest.

Share Repurchase Program

On August 30, 2019, our board of directors approved the Repurchase Program, authorizing the repurchase of up to $500.0 million of our common stock in an open market purchase, privately-negotiated transactions, secondary offerings, block trades, or otherwise in accordance with all applicable securities laws and regulations, including through Rule 10b5-1 trading plans and pursuant to Rule 10b-18 under the Exchange Act. The Repurchase Program does not obligate us to repurchase any particular amount of our common stock, and it may be modified, suspended, or terminated at any time at the board of directors' discretion. The Repurchase Program expires on December 31, 2021.

Concurrent with the September 2019 secondary offering, we repurchased from the underwriter, and subsequently retired, 3,079,765 shares at a price of $97.41 per share, for an aggregate purchase price of approximately $300.0 million.

No share repurchases were made during the year ended December 31, 2020. As of December 31, 2020, we have remaining authorization to repurchase up to $200.0 million of our common stock under the Repurchase Program.

Indebtedness

On October 28, 2019, we entered into a credit agreement providing for senior secured credit facilities, or the Senior Secured Credit Facility, totaling $1,750.0 million.

Senior Secured Credit Facility

The Senior Secured Credit Facility provides senior secured financing of up to $1,750.0 million, consisting of:

- the First Lien Term Loan in an aggregate principal amount of $1,000.0 million; and
- the Revolver in an aggregate principal amount of up to $750.0 million.

The Revolver includes borrowing capacity available for letters of credit up to $25.0 million and for up to $20.0 million of borrowings on same-day notice, referred to as swingline loans.

The Senior Secured Credit Facility provides that we have the right at any time to request incremental term loans and/or revolving commitments in an aggregate principal amount of up to (a) $500.0 million, plus (b) all voluntary prepayments and corresponding voluntary commitment reductions of the Senior Secured Credit Facility, other than from proceeds of long-term indebtedness, prior to the date of any such incurrence, plus (c) an additional amount which, after giving effect to the incurrence of such amount, we would not exceed a consolidated net first lien secured leverage to consolidated EBITDA ratio of 3.0 to 1.0 pro forma for such incremental facilities, minus (d) the sum of (i) the aggregate principal amount of new term loan commitments and new revolving credit commitments incurred and (ii) the aggregate principal amount of certain other indebtedness incurred. The lenders under these facilities are not under any obligation to provide any such incremental commitments or loans, and any such addition of or increase in commitments or loans is subject to certain customary conditions precedent.

Interest Rate and Fees

Borrowings under the First Lien Term Loan and the Revolver bear interest at a rate equal to, at our option, either (a) LIBOR for the relevant interest period, plus an applicable margin; provided that, solely with respect to the First Lien Term Loan, LIBOR shall be deemed to be no less than 0.00% per annum or (b) an adjusted base rate, or the ABR, plus an applicable margin.

The applicable margin on our First Lien Term Loan is based on our ratio of total debt to EBITDA per the table below:

Pricing Level	Total indebtedness to EBITDA Ratio	Letter of Credit Fees	ABR Margin Rate	Adjusted LIBOR Margin Rate	Commitment Fees
I	> 3.25x	2.00%	1.00%	2.00%	0.35%
II	< 3.25x but > 2.50x	1.75%	0.75%	1.75%	0.30%
III	< 2.50x but > 1.75x	1.50%	0.50%	1.50%	0.25%
IV	< 1.75x but > 1.00x	1.25%	0.25%	1.25%	0.20%
V	< 1.00x	1.00%	—%	1.00%	0.15%

In addition to paying interest on outstanding principal under the Revolver, we are required to pay a commitment fee to the lenders under the Revolver in respect of the unutilized commitments thereunder. The commitment fee rate will be based on the ratio of total indebtedness to EBITDA on a given date. We are also required to pay customary letter of credit fees.

As of December 31, 2020 and 2019, the interest rate on the First Lien Term Loan was 1.40% and 3.21%, respectively.

Prepayments

The Senior Secured Credit Facility requires us to prepay outstanding term loans, subject to certain exceptions, with:

- 100% of the net cash proceeds of the incurrence or issuance of certain debt; and
- 100% of the net cash proceeds of $5.0 million of certain non-ordinary course asset sales and casualty and condemnation events, subject to reinvestment rights and certain other exceptions.

The foregoing mandatory prepayments will be applied first to accrued interest and fees and second, to the scheduled installments of principal of the Senior Secured Credit Facility in direct order of maturity.

We may voluntarily repay outstanding loans under the Senior Secured Credit Facility at any time without premium or penalty, subject to reimbursements of the lenders' redeployment costs actually incurred in the case of a prepayment of LIBOR borrowings other than on the last day of the relevant interest period.

Amortization and Final Maturity

The First Lien Term Loan is a floating rate term loan with scheduled, fixed quarterly principal payments of $6.3 million to be made quarterly until October 28, 2024.

We have the option of one-, two-, three-, or six-month borrowing terms under the Revolver. Principal amounts outstanding under the Revolver are due and payable in full at maturity, on or about October 28, 2024.

Guarantee and Security

All obligations of the borrower under the Senior Secured Credit Facility are unconditionally guaranteed by us and all our material, wholly-owned U.S. restricted subsidiaries with customary exceptions, including where providing such guarantees is not permitted by law, regulation, or contract or would result in material adverse tax consequences.

All obligations of the borrower under the Senior Secured Credit Facility, and the guarantees of such obligations, are secured, subject to permitted liens and other exceptions, by substantially all of the assets of the borrower and each guarantor, including but not limited to: (i) a perfected pledge of all of the capital stock issued by the borrower and each guarantor and (ii) perfected security interests in substantially all other tangible and intangible assets of the borrower and the guarantors (subject to certain exceptions and exclusions).

Certain Covenants and Events of Default

The Senior Secured Credit Facility contains a number of covenants that, among other things, restrict, subject to certain exceptions, our ability to:

- create any liens;
- make investments and acquisitions;
- incur or guarantee additional indebtedness;
- enter into mergers or consolidations and other fundamental changes;
- conduct sales and other dispositions of property or assets;
- enter into sale-leaseback transactions or hedge agreements;

- prepay subordinated debt;
- pay dividends or make other payments in respect of capital stock;
- change the line of business;
- enter into transactions with affiliates;
- enter into burdensome agreements with negative pledge clauses and clauses restriction; and
- subsidiary distributions.

Our Senior Secured Credit Facility contains customary events of default (subject to exceptions, thresholds, and grace periods), including, without limitation: (i) nonpayment of principal or interest; (ii) failure to perform or observe covenants; (iii) inaccuracy or breaches of representations and warranties; (iv) cross-defaults with certain other indebtedness; (v) certain bankruptcy related events; (vi) impairment of certain security interests in collateral, guarantees, or invalidity or unenforceability of certain Senior Secured Credit Facility documents; (vii) monetary judgment defaults; (viii) certain ERISA matters; and (ix) certain change of control events.

The Senior Secured Credit Facility requires us to maintain a consolidated total debt to consolidated EBITDA ratio of 4.25 to 1.0 and consolidated EBITDA to fixed charges no less than 3.0 to 1.0 for any four consecutive fiscal quarters for which financial statements have been provided to the administrative agent as required by the Senior Secured Credit Agreement. Following a qualified material acquisition, the Senior Secured Credit Facility allows us to increase its Consolidated Total Debt to Consolidated EBITDA Ratio to 5.25 to 1.00; provided that (i) such ratio in respect of each quarter shall be reduced by 0.25 to 1.00, (ii) in no event shall such ratio be lower than 4.25 to 1.00, and (iii) such an increase pursuant to this shall be permitted no more than once during any period of 24 consecutive months.

The Senior Secured Credit Facility also contains certain customary affirmative covenants and events of default, including a change of control.

Accounts Receivable Financing Agreement

We entered into an accounts receivable financing agreement with PNC Bank, National Association, as administrative agent and lender on March 22, 2016. On December 18, 2020, we amended our accounts receivable financing agreement. The amendment increased the agreement's borrowing capacity and extended the termination date to December 16, 2022, unless terminated earlier pursuant to its terms.

We may borrow up to $250.0 million under the accounts receivable financing agreement, secured by liens on our accounts receivables and other assets. We are liable for customary representations, warranties, covenants, and indemnities. In addition, we have guaranteed the performance of the obligations and will guarantee the obligations of any additional servicer that may become party to the accounts receivable financing agreement. As of December 31, 2020, the outstanding balance was $212.5 million.

Interest Rate and Fees

Loans under the accounts receivable financing agreement will accrue interest at either a reserve-adjusted LIBOR, no less than 0.14%, or a base rate, plus 1.25%. As of December 31, 2020 and December 31, 2019, the interest rate on the accounts receivable financing agreement was 1.40% and 3.22%, respectively. We may prepay loans upon one business day prior notice and may terminate the accounts receivable financing agreement with 15 days' prior notice.

Covenants and Events of Default

The accounts receivable financing agreement contains various customary representations and warranties and covenants, and default provisions that provide for the termination and acceleration of the commitments and loans under the accounts receivable financing agreement in circumstances including, but not limited to, failure to make payments when due, breach of representations, warranties or covenants, certain insolvency events, or failure to maintain the security interest in the trade receivables, and defaults under other material indebtedness.

Contractual Obligations and Commercial Commitments

The following table summarizes our future minimum payments for all contractual obligations and commercial commitments for years subsequent to the year ended December 31, 2020:

	Payments Due by Period				
	Less than 1 year	1 - 3 years	3 - 5 years	More than 5 years	Total
			(in thousands)		
Principal payments on long-term debt [1]	$ 25,000	$ 262,500	$ 991,300	$ —	$ 1,278,800
Interest payments on long-term debt [1]	18,051	31,908	11,556	—	61,515
Service purchase commitments [2]	154,282	123,957	67,863	763	346,865
Operating leases	46,202	72,051	38,030	75,995	232,278
Less: sublease income	(168)	(127)	—	—	(295)
Uncertain income tax positions [3]	—	—	—	—	—
Total	$ 243,367	$ 490,289	$ 1,108,749	$ 76,758	$ 1,919,163

(1) Principal payments are based on the terms contained in our credit agreements. Principal payments include payments on the senior secured credit facility and the accounts receivable financing agreement. Interest payments are based on the interest rate in effect on December 31, 2020.
(2) Service purchase commitments are defined as agreements to purchase goods or services that are enforceable and legally binding and that specify all significant terms, including fixed or minimum quantities to be purchased.
(3) As of December 31, 2020, our liability related to uncertain income tax positions was approximately $31.0 million; the entire amount has been excluded from the table as we are unable to predict when these liabilities will be paid due to the uncertainties in timing of the settlement of the income tax positions.

Off-Balance Sheet Arrangements

We have no off-balance sheet arrangements. The term “off-balance sheet arrangement” generally means any transaction, agreement, or other contractual arrangement to which an entity unconsolidated with us is a party, under which we have any obligation arising under a guarantee contract, derivative instrument or variable interest, or a retained or contingent interest in assets transferred to such entity or similar arrangement that serves as credit, liquidity, or market risk support for such assets.

Critical Accounting Policies and Estimates

In preparing our financial statements in conformity with GAAP, management is required to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Our actual results could differ from those estimates. We believe that the following are some of the more critical judgment areas in the application of our accounting policies that affect our financial condition and results of operations. We have discussed the application of these critical accounting policies with our board of directors.

Revenue Recognition

Revenue is generated from contracts with customers. Revenue is recognized when control of the performance obligation is transferred to the customer, in an amount that reflects the consideration we expect to be entitled to receive in exchange for those services. Our long-term arrangements for clinical research services are considered a single performance obligation because we provide a highly-integrated service. Revenue is recognized based on the proportion of total contract costs incurred to date to the estimated total contract costs through completion. We use the cost-to-cost measure of progress for these contracts because it best depicts the transfer of control to the customer as the performance obligation is fulfilled. The accounting for these long-term contracts involves significant judgment, particularly as it relates to the process of estimating total contract costs, which includes direct costs, reimbursable out-of-pocket expenses, reimbursable investigator fees, and the contract profit. The contracts provide for the right to payment for the work performed to date, which is invoiced to the customer as work progresses, either based on units performed or the achievement of billing milestones. We review the estimated total contract costs to determine if these estimates are still accurate and, if necessary, we adjust the total estimated costs. During our contract review process, we review each contract's performance to date, current cost trends, and circumstances specific to each study. The original or current cost estimates are reviewed and if necessary the estimates are adjusted and refined to reflect any changes in the anticipated performance under the study. As the work progresses, original estimates might be deemed incorrect due to, among other things, revisions in the scope of work or patient enrollment rate, and a contract modification might be negotiated with the customer to cover additional costs. If not, we bear the risk of costs exceeding our original estimates. We assume that actual costs incurred to date under the contract and historical experience are a valid basis for estimating future costs. Should our assumption of future cost trends fluctuate significantly, future margins could be reduced. In the past, we have had to commit unanticipated resources to complete projects, resulting in lower margins on those projects. Should our actual costs exceed our estimates on fixed price contracts, future margins could be reduced, absent our ability to negotiate a contract modification. We accumulate information on each project to refine our bidding process. Historically, the majority of our estimates and assumptions have been materially correct, but these estimates might not continue to be accurate in the future. Clinical research services delivered under fee-for-service arrangements are recognized over time. Revenue from time and materials contracts is recognized as hours are incurred.

Our Data Solutions segment provides data reports and analytics to customers based on agreed-upon specifications. If a customer requests more than one type of data report or series of data reports within a contract, each distinct type of data report is a separate performance obligation. When multiple performance obligations exist, the transaction price is allocated to performance obligations on a relative standalone selling price basis. In cases where we contract to provide a series of data reports, or in some cases data, we recognize revenue over time using the 'units delivered' output method as the data or reports are delivered. Certain Data Solutions arrangements include upfront customization or consultative services for customers. Under these arrangements, we contract with a customer to carry out a specific study, ultimately resulting in delivery of a custom report or data product. These arrangements are a single performance obligation given the integrated nature of the service being provided. We typically recognize revenue under these contracts over time, using an output-based measure, generally time elapsed, to measure progress and transfer of control of the performance obligation to the customer.

Income Taxes

Changes in judgment as to recognition or measurement of tax positions can materially affect the estimate of our effective tax rate and, consequently, our operating results. We consider many factors when evaluating and estimating our tax positions and tax benefits, which may require periodic adjustments and may not accurately anticipate actual outcomes.

We have to use estimates and judgments in calculating certain tax liabilities and determining the recoverability of certain deferred tax assets, which arise from net operating losses, tax credit carry forwards, and temporary differences between the tax and financial statement recognition of revenue and expense. We are also required to reduce our deferred tax assets by a valuation allowance if, based on the weight of available evidence, it is more likely than not that some portion or all of the recorded deferred tax assets will not be realized in future periods.

In evaluating our ability to recover our deferred tax assets, in full or in part, we consider all available positive and negative evidence, including our past operating results, the existence of cumulative losses in the most recent fiscal years and our forecast of future taxable income on a jurisdiction-by-jurisdiction basis. In determining future taxable income, assumptions include the amount of state, federal, and international pretax operating income, international transfer pricing policies, the reversal of temporary differences, and the implementation of feasible and prudent tax planning strategies. These assumptions require significant judgment about the forecasts of future taxable income and are consistent with the plans and estimates we use to manage the underlying businesses. Based on our analysis of the above factors, we determined that a valuation allowance of $8.5 million was required as of December 31, 2020 relating to certain state net operating loss carryforwards, foreign net operating loss carryforwards, certain foreign deferred tax assets, and state tax credit carryforwards. Changes in our assumptions could result in an adjustment to the valuation allowance, up or down, in the future.

In addition, the calculation of our tax liabilities involves dealing with uncertainties in the application of complex tax regulations in a multitude of jurisdictions. We determine our liability for uncertain tax positions globally under the provisions in the Financial Accounting Standards Board's, or FASB, Accounting Standards Codification, or ASC, 740, “Income Taxes.” As of December 31, 2020, we had recorded a liability for uncertain tax positions of $31.0 million. If events occur such that payment of these amounts ultimately proves to be unnecessary, the reversal of liabilities would result in tax benefits being recognized in the period when we determine the liabilities are no longer necessary. If our calculation of liability related to uncertain tax positions proves to be more or less than the ultimate assessment, a tax expense or benefit to expense, respectively, would result. The total liability reversal that could affect the tax rate is $31.0 million.

Stock-Based Compensation

In accordance with the ASC 718, "Stock Compensation", as modified and supplemented, we estimate the value of employee stock options on the date of grant using either the Black-Scholes model for all options with a service condition or a lattice model for options with market and performance conditions. The determination of fair value of stock-based payment awards on the date of grant using an option-pricing model is affected by the stock price of similar entities as well as assumptions regarding a number of highly complex and subjective variables. These variables include the expected stock price volatility over the term of the awards, and actual and projected employee stock option exercise behaviors. The Black-Scholes and lattice models require extensive actual employee exercise behavior data and the use of a number of complex assumptions including expected volatility, risk-free interest rate, expected dividends, and expected life. In developing our assumption, we take into account the following:

- Since the Company does not have sufficient history to estimate the expected volatility of its common stock price, expected volatility is based upon a blended approach that utilizes the volatility of the Company's common stock for periods in which the Company has sufficient information and the volatility for selected reasonably similar publicly traded companies for which historical information is available.
- The risk-free interest rate assumption is based upon observed interest rates appropriate for the term of our employee stock options.
- The dividend yield assumption is based on the history and expectation of dividend payouts.
- For those options valued using the Black-Scholes model, the expected life is based upon the guidance provided by the FASB. For those options with a market condition valued under the lattice model, the expected life varies depending on the target stock price that triggers vesting.
- We account for forfeitures as they occur.

Long-Lived Assets, Goodwill and Indefinite-Lived Intangible Assets

As a result of our acquisitions we have recorded goodwill and other identifiable finite and indefinite-lived acquired intangibles. The identification and valuation of these intangible assets at the time of acquisition require significant management judgment and estimates.

We review long-lived asset groups for impairment whenever events or changes in circumstances indicate that the carrying amount of the asset group might not be recoverable. If indicators of impairment are present, we evaluate the carrying value of property and equipment in relation to estimates of future undiscounted cash flows. As a result of our acquisitions we have recorded goodwill and other identifiable finite and indefinite-lived acquired intangibles. The identification and valuation of these intangible assets at the time of acquisition require significant management judgment and estimates. In connection with

acquisitions, valuations were completed and value was assigned to identifiable finite-lived and indefinite-lived intangible assets and goodwill, based on the purchase price of the transactions.

We test goodwill for impairment on at least an annual basis by comparing the carrying value to the estimated fair value of our reporting units. On October 1, 2020, we reviewed goodwill for impairment and our analysis indicated that the fair value of goodwill exceeded the carrying value and, therefore, no impairment exists. When evaluating for impairment, we may first perform a qualitative assessment to determine whether it is more likely than not that a reporting unit or indefinite-lived intangible asset is impaired. If we do not perform a qualitative assessment, or if it determines that it is not more likely than not that the fair value of the reporting unit or indefinite-lived intangible asset exceeds its carrying amount, we will calculate the estimated fair value of the reporting unit's or indefinite-lived intangible asset. Our decision to perform a qualitative impairment assessment for an individual reporting unit in a given year is influenced by a number of factors, inclusive of the size of the reporting unit's goodwill, the significance of the excess of the reporting unit's estimated fair value over carrying value at the last quantitative assessment date, the amount of time in between quantitative fair value assessments, and the date of acquisition.

If we do not perform a qualitative assessment, goodwill impairment is determined by using a quantitative assessment that compares the fair value of each goodwill reporting unit to its carrying amount, and to the extent the carrying amount exceeds the fair value, an impairment of goodwill is recognized for the excess up to the amount of goodwill allocated to the reporting unit. To determine the fair value of each reporting unit, we generally use a discounted cash flow technique corroborated by market multiples when available and as appropriate. During the fourth quarter of 2020, as part of our annual impairment analysis, we performed updated quantitative assessments for all reporting units, and for our indefinite-lived trade name intangible asset balances. It was concluded that the estimated fair value of the Data Solutions, EDS, PR, and SS operating segments exceeded their carrying values by a significant margin.

Recent Accounting Standards

For information on new accounting standards and the impact, if any, on our financial position or results of operations, see Note 2 to our audited consolidated financial statements found elsewhere in this Annual Report on Form 10-K.

Dividend History

We have not declared or paid dividends during 2020, 2019, and 2018.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Market risk is the potential loss arising from adverse changes in market rates and prices, such as foreign currency exchange rates, interest rates, and other relevant market rate or price changes. In the ordinary course of business, we are exposed to various market risks, including changes in foreign currency exchange rates and interest rates, and we regularly evaluate our exposure to such changes. Our overall risk management strategy seeks to balance the magnitude of the exposure and the cost and availability of appropriate financial instruments.

Interest Rate Risk

In January 2018, we entered into two interest rate swaps with a notional value of $250.0 million and $375.0 million that matured in September 2020 and December 2020, respectively, to hedge our variable rate debt. We have not entered into new interest rate swap agreements as of December 31, 2020.

As of December 31, 2020, there were no amounts outstanding under our Senior Secured Credit Facility and accounts receivable financing agreement that were covered by an interest rate swap and therefore subject to variable interest rates. Each quarter percentage point increase or decrease in the variable rate would result in our interest expense changing by approximately $3.2 million per year under our variable rate debt.

Foreign Currency Exchange Risk

Since we operate on a global basis, we are exposed to various foreign currency risks. First, our consolidated financial statements are denominated in U.S. dollars, but a significant portion of our revenue is generated in the local currency of our foreign subsidiaries. Accordingly, changes in exchange rates between the applicable foreign currency and the U.S. dollar will affect the translation of each foreign subsidiary's financial results into U.S. dollars for purposes of reporting consolidated financial results. A hypothetical change of 10% in average exchange rates used to translate all foreign currencies to U.S. dollars would have impacted income before income taxes and equity in income of unconsolidated joint ventures by approximately $31.5 million for the year ended December 31, 2020. The process by which each foreign subsidiary's financial results are translated into U.S. dollars is as follows: income statement accounts are translated at average exchange rates for the period; balance sheet asset and liability accounts are translated at end of period exchange rates; and equity accounts are translated at historical exchange rates. Translation of the balance sheet in this manner affects the stockholders' equity account, referred to as the cumulative translation adjustment account. This account exists only in the foreign subsidiary's U.S. dollar balance sheet and is necessary to keep the foreign balance sheet stated in U.S. dollars in balance. Accumulated currency translation adjustments recorded as a reduction to stockholders' equity were $98.8 million and $149.3 million at December 31, 2020 and 2019, respectively. We do not have significant operations in countries in which the economy is considered to be highly-inflationary.

In addition, two specific risks arise from the nature of the contracts we enter into with our clients, which from time to time are denominated in currencies different than the particular subsidiary's local currency. These risks are generally applicable only to a portion of the contracts executed by our foreign subsidiaries providing clinical services. The first risk occurs as revenue recognized for services rendered is denominated in a currency different from the currency in which the subsidiary's expenses are incurred. As a result, the subsidiary's earnings can be affected by fluctuations in exchange rates.

The second risk results from the passage of time between the invoicing of clients under these contracts and the ultimate collection of client payments against such invoices. Because the contract is denominated in a currency other than the subsidiary's local currency, we recognize a receivable at the time of invoicing for the local currency equivalent of the foreign currency invoice amount. Changes in exchange rates from the time the invoice is prepared until payment from the client is received will result in our receiving either more or less in local currency than the local currency equivalent of the invoice amount at the time the invoice was prepared and the receivable established. This difference is recognized by us as a foreign currency transaction gain or loss, as applicable, and is reported in foreign currency losses, net in our consolidated statements of operations. Historically, fluctuations in exchange rates from those in effect at the time contracts were executed have not had a material effect on our consolidated financial results.

Item 8. Financial Statements and Supplementary Data

Management's Report on Internal Control Over Financial Reporting

Management of PRA Health Sciences, Inc. (the "Company") is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of consolidated financial statements for external reporting purposes in accordance with accounting principles generally accepted in the United States of America. Internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company, (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with accounting principles generally accepted in the United States of America, and that receipts and expenditures are being made only in accordance with authorizations of management and directors of the Company, and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the Company's assets that could have a material effect on the consolidated financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements in the consolidated financial statements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2020. In making these assessments, management used the framework established by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in *Internal Control — Integrated Framework (2013)*. Based on management's assessment and the criteria in the COSO framework, management has concluded that the Company's internal control over financial reporting as of December 31, 2020 was effective.

The Company's independent registered public accounting firm has issued a report on the Company's internal control over financial reporting. This report appears in this Annual Report on Form 10-K.

/s/ Colin Shannon	/s/ Michael J. Bonello
Colin Shannon President, Chief Executive Officer and Chairman of the Board of Directors (Principal Executive Officer)	Michael J. Bonello Executive Vice President and Chief Financial Officer (Principal Financial Officer)

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of PRA Health Sciences, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of PRA Health Sciences, Inc. and subsidiaries (the "Company") as of December 31, 2020 and 2019, and the related consolidated statements of operations, comprehensive income, changes in stockholders' equity, and cash flows, for each of the three years in the period ended December 31, 2020, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 24, 2021, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Revenue Recognition - Clinical Research - Refer to Note 3 to the Financial Statements

Critical Audit Matter Description

The Company recognizes long-term clinical research revenue over the contract term ("over time") as the work progresses, due to the Company's right to payment for work performed to date. The long-term arrangements for clinical research services are considered a single performance obligation because the Company provides a highly-integrated service. Revenue is recognized based on the proportion of total contract costs incurred to date to the estimated total contract costs through completion. The Company uses the cost-to-cost measure of progress for these contracts because it best depicts the transfer of control to the customer as the performance obligation is fulfilled. The accounting for these long-term contracts involves significant judgment, particularly as it relates to the process of estimating total contract costs, which includes direct costs, reimbursable out-of-pocket expenses, reimbursable investigator fees, and profit. The contracts provide for the right to payment for the work performed to date, which is invoiced to the customer as work progresses, either based on units performed or the achievement of billing milestones.

Given the judgments necessary to estimate total costs for the performance obligation used to recognize revenue for certain long-term clinical research contracts, auditing such estimates required extensive audit effort due to the volume and complexity of

long-term clinical research contracts and the high degree of auditor judgment applied when performing audit procedures and evaluating the results of those procedures.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures related to management's estimates of total costs for the performance obligation used to recognize revenue for certain long-term clinical research contracts included the following, among others:

- We tested the effectiveness of controls over long-term contract revenue, including those over the estimates of total costs for performance obligations.
- We selected a sample of long-term clinical research contracts and performed the following:
  - Evaluated whether the contracts were properly included in management's calculation of long-term contract revenue based on the terms and conditions of each contract, including whether continuous transfer of control to the customer occurred as progress was made toward fulfilling the performance obligation.
  - Compared the transaction price to the consideration expected to be received based on current rights and obligations under the contracts and any modifications that were agreed upon with the customers.
  - Tested management's identification of the distinct performance obligation.
  - Tested the accuracy and completeness of the total costs incurred to date for the performance obligation.
  - Evaluated the estimates of total cost for the performance obligation by:
    - Comparing the cost incurred to date to the cost management estimated to be incurred to date.
    - Evaluating management's ability to achieve the estimates of total cost by performing corroborating inquiries with the Company's project managers and financial analysts, and comparing the estimates to management's work plans and cost estimates.
  - Tested the mathematical accuracy of management's calculation of revenue for the performance obligation.
- Performed data analytics to assess contract balances.
- We evaluated management's ability to estimate total costs accurately by comparing actual costs and margins to management's historical estimates for performance obligations that have been fulfilled.

/s/ Deloitte & Touche LLP

Raleigh, North Carolina
February 24, 2021

We have served as the Company's auditor since 2013.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of PRA Health Sciences, Inc.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of PRA Health Sciences, Inc. and subsidiaries (the "Company") as of December 31, 2020, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2020, of the Company and our report dated February 24, 2021 expressed an unqualified opinion on those financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying "Management's Report on Internal Control Over Financial Reporting." Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP

Raleigh, North Carolina
February 24, 2021

PRA HEALTH SCIENCES, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(in thousands, except share amounts)

	December 31,	
	2020	2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 506,303	$ 236,232
Restricted cash	—	38
Accounts receivable and unbilled services, net of allowance for credit losses of $3,064 as of December 31, 2020	843,905	658,517
Prepaid expenses and other current assets	99,006	88,141
Income taxes receivable	11,300	2,639
Total current assets	1,460,514	985,567
Fixed assets, net	194,620	180,716
Operating lease right-of-use assets	178,144	186,343
Goodwill	1,691,007	1,502,756
Intangible assets, net	599,885	638,577
Deferred tax assets	14,725	10,282
Deferred financing fees	2,677	3,377
Other assets	36,929	36,812
Total assets	$ 4,178,501	$ 3,544,430
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current portion of borrowings under credit facilities	$ 91,300	$ 88,800
Current portion of long-term debt	25,000	25,000
Accounts payable	56,935	55,293
Accrued expenses and other current liabilities	317,183	302,705
Income taxes payable	3,192	2,094
Current portion of operating lease liabilities	39,631	37,603
Advanced billings	732,782	505,714
Total current liabilities	1,266,023	1,017,209
Deferred tax liabilities	63,451	78,511
Long-term debt, net	1,158,668	1,140,178
Long-term portion of operating lease liabilities	158,983	172,370
Other long-term liabilities	52,191	46,171
Total liabilities	2,699,316	2,454,439
Commitments and contingencies (Note 14)		
Stockholders' equity:		
Preferred stock (100,000,000 authorized shares; $0.01 par value)		
Issued and outstanding -- none	—	—
Common stock (1,000,000,000 authorized shares; $0.01 par value)		
Issued and outstanding -- 64,538,729 and 63,491,550 at December 31, 2020 and 2019, respectively	645	635
Additional paid-in capital	1,137,028	1,006,182
Accumulated other comprehensive loss	(98,813)	(160,108)
Retained earnings	440,325	243,282
Total stockholders' equity	1,479,185	1,089,991
Total liabilities and stockholders' equity	$ 4,178,501	$ 3,544,430

The accompanying notes are an integral part of the consolidated financial statements.

PRA HEALTH SCIENCES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share amounts)

	Years Ended December 31,		
	2020	2019	2018
Revenue	$ 3,183,365	$ 3,066,262	$ 2,871,922
Operating expenses:			
Direct costs (exclusive of depreciation and amortization)	1,649,001	1,539,541	1,500,226
Reimbursable expenses	665,761	650,080	570,405
Selling, general and administrative expenses	453,032	394,925	371,795
Transaction-related costs	(44,465)	1,835	35,817
Depreciation and amortization expense	131,630	114,898	112,247
Loss on disposal of fixed assets	317	1,058	120
Income from operations	328,089	363,925	281,312
Interest expense, net	(43,130)	(51,987)	(57,399)
Loss on modification or extinguishment of debt	(450)	(3,928)	(952)
Foreign currency losses, net	(25,499)	(2,257)	(1,043)
Other (expense) income, net	(1)	174	(371)
Income before income taxes and equity in income of unconsolidated joint ventures	259,009	305,927	221,547
Provision for income taxes	61,966	62,808	67,232
Income before equity in income of unconsolidated joint ventures	197,043	243,119	154,315
Equity in income of unconsolidated joint ventures, net of tax	—	—	143
Net income	197,043	243,119	154,458
Net income attributable to noncontrolling interest	—	(99)	(553)
Net income attributable to PRA Health Sciences, Inc.	$ 197,043	$ 243,020	$ 153,905
Net income per share attributable to common stockholders:			
Basic	$ 3.11	$ 3.77	$ 2.40
Diluted	$ 3.04	$ 3.68	$ 2.32
Weighted average common shares outstanding:			
Basic	63,352	64,506	64,123
Diluted	64,758	66,004	66,341

The accompanying notes are an integral part of the consolidated financial statements.

PRA HEALTH SCIENCES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(in thousands)

	Years Ended December 31,		
	2020	2019	2018
Net income	$ 197,043	$ 243,119	$ 154,458
Other comprehensive income (loss):			
Foreign currency translation adjustments net of tax $(2,520), $(2,504), and $4,670	50,529	9,083	(41,042)
Unrealized (losses) gains on derivative instruments, net of income taxes of $(1,386), $(2,897), and $1,007	(3,719)	(3,031)	2,152
Reclassification adjustments:			
Losses on derivatives included in net income, net of income taxes, $(1,846), $3,017, and $1,649	14,485	3,156	4,828
Comprehensive income	258,338	252,327	120,396
Comprehensive income attributable to noncontrolling interest	—	(175)	(680)
Comprehensive income attributable to PRA Health Sciences, Inc.	$ 258,338	$ 252,152	$ 119,716

The accompanying notes are an integral part of the consolidated financial statements.

PRA HEALTH SCIENCES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY
(in thousands)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Loss (Note 17)	Retained Earnings	Non-controlling Interest	Total
	Shares	Amount					
Balance at January 1, 2018	63,624	$ 636	$ 905,423	$ (136,470)	$ 100,595	$ 5,710	$ 875,894
Exercise of common stock options and employee stock purchase plan purchases	1,626	16	30,535	—	—	—	30,551
Stock award distributions net of shares for tax withholding	145	2	(5,339)	—	—	—	(5,337)
Stock-based compensation	—	—	29,916	—	—	—	29,916
Net income	—	—	—	—	153,905	553	154,458
Other comprehensive loss, net of tax	—	—	—	(34,189)	—	127	(34,062)
Balance at December 31, 2018	65,395	654	960,535	(170,659)	254,500	6,390	1,051,420
Impact from adoption of ASU 2018-02, Reclassification of certain tax effects from accumulated other comprehensive income	—	—	—	1,419	(1,419)	—	—
Balance at January 1, 2019	65,395	654	960,535	(169,240)	253,081	6,390	1,051,420
Exercise of common stock options, employee stock purchase plan purchases and other	879	9	45,790	—	—	—	45,799
Stock award distributions net of shares for tax withholding	298	3	(117)	—	—	—	(114)
Stock-based compensation	—	—	45,834	—	—	—	45,834
Acquisition of non-controlling interest	—	—	1,290	—	—	(6,565)	(5,275)
Repurchase and retirement of common stock	(3,080)	(31)	(47,150)	—	(252,819)	—	(300,000)
Net income	—	—	—	—	243,020	99	243,119
Other comprehensive income, net of tax	—	—	—	9,132	—	76	9,208
Balance at December 31, 2019	63,492	635	1,006,182	(160,108)	243,282	—	1,089,991
Exercise of common stock options, stock award distributions, employee stock purchase plan purchases and other	1,003	10	58,848	—	—	—	58,858
Stock-based compensation	—	—	69,413	—	—	—	69,413
Net income	—	—	—	—	197,043	—	197,043
Issuance of restricted stock for acquisition	44	—	2,585	—	—	—	2,585
Other comprehensive income, net of tax	—	—	—	61,295	—	—	61,295
Balance at December 31, 2020	64,539	$ 645	$ 1,137,028	$ (98,813)	$ 440,325	$ —	$ 1,479,185

The accompanying notes are an integral part of the consolidated financial statements.

PRA HEALTH SCIENCES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Years Ended December 31,		
	2020	**2019**	**2018**
Cash flows from operating activities:			
Net income	$ 197,043	$ 243,119	$ 154,458
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization expense	131,630	114,898	112,247
Amortization of debt issuance costs and discount	1,691	1,814	2,111
Amortization of terminated interest rate swaps	4,559	6,538	7,146
Stock-based compensation expense	69,413	45,834	29,143
Non-cash transaction related stock-based compensation expense	—	—	773
Unrealized foreign currency losses (gains)	30,858	(6,467)	(3,307)
Loss on modification or extinguishment of debt	450	519	952
Loss on disposal of fixed assets	317	1,058	120
Change in fair value of acquisition-related contingent consideration	(44,500)	—	34,538
Equity in income of unconsolidated joint ventures	—	—	(143)
Deferred income taxes	(20,294)	(23,907)	11,665
Other reconciling items	8,953	606	30
Changes in operating assets and liabilities, net of acquired assets and assumed liabilities:			
Accounts receivable and unbilled services	(172,222)	(89,304)	(17,017)
Prepaid expenses and other assets	(6,443)	(13,660)	(18,931)
Accounts payable and other liabilities	11,089	21,584	31,579
Income taxes	(61)	(31,029)	5,241
Advanced billings	214,695	65,213	14,216
Payment of acquisition-related contingent consideration	—	(83,249)	(35,029)
Net cash provided by operating activities	427,178	253,567	329,792
Cash flows from investing activities:			
Purchase of fixed assets	(66,808)	(74,294)	(55,880)
Proceeds from the sale of fixed assets	32	26	43
Cash (paid) received for interest on interest rate swap	(8,300)	667	181
Return of joint venture capital contribution	—	418	—
Cash received from the sale of marketable securities	—	—	183
Acquisition of Care Innovations, Inc., net of cash acquired	(158,824)	—	—
Net cash used in investing activities	(233,900)	(73,183)	(55,473)
Cash flows from financing activities:			
Proceeds from issuance of long-term debt	—	1,300,000	—
Repayment of long-term debt	(25,000)	(1,216,533)	(224,394)
Proceeds from accounts receivable financing agreement	42,500	30,000	60,000
Repayment on accounts receivable financing agreement	—	(30,000)	(10,000)
Borrowings on line of credit	100,000	233,800	—
Repayments of line of credit	(97,500)	(145,000)	(91,500)
Payment for debt issuance costs	(920)	(4,541)	—
Acquisition of noncontrolling interest	—	(4,138)	—
Proceeds from stock issued under employee stock purchase plan and stock option exercises	58,349	45,819	31,382
Taxes paid related to net shares settlement of equity awards	—	(114)	(5,337)
Repurchase and retirement of common stock	—	(300,000)	—
Payment of acquisition-related contingent consideration	—	—	(79,663)
Net cash provided by (used in) financing activities	77,429	(90,707)	(319,512)
Effects of foreign exchange changes on cash, cash equivalents, and restricted cash	(674)	1,884	(2,988)
Change in cash, cash equivalents, and restricted cash	270,033	91,561	(48,181)
Cash, cash equivalents, and restricted cash, beginning of year	236,270	144,709	192,890
Cash, cash equivalents, and restricted cash, end of year	$ 506,303	$ 236,270	$ 144,709

The accompanying notes are an integral part of the consolidated financial statements.

(1) Basis of Presentation

Description of Business

PRA Health Sciences, Inc. and its subsidiaries, or the Company, is a full-service global contract research organization providing a broad range of product development and data solution services to pharmaceutical and biotechnology companies around the world. The Company's integrated services include data management, statistical analysis, clinical trial management, and regulatory and drug development consulting.

Basis of Presentation

The accompanying consolidated financial statements have been prepared in accordance with generally accepted accounting principles in the United States, or GAAP.

(2) Recent Accounting Standards

Recently Implemented Accounting Standards

Goodwill simplification

In January 2017, the Financial Accounting Standards Board, or FASB, issued ASU No. 2017-04, "Intangibles-Goodwill and Other: Simplifying the Test for Goodwill Impairment," in order to simplify the subsequent measurement of goodwill by eliminating the Step 2 goodwill impairment test. Under the amendments in this ASU, an entity should perform its annual or interim goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount. An entity will then recognize an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value; however, the loss recognized should not exceed the total amount of goodwill allocated to that reporting unit. The amendments to ASU No. 2017-04 are effective for fiscal years beginning after December 15, 2019. The adoption of ASU No. 2017-04 did not have a material impact on the Company's consolidated financial statements.

Cloud computing

In August 2018, the FASB issued ASU No. 2018-15, "Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract," in order to expand on the FASB's guidance of capitalized costs incurred in a cloud computing arrangement. The amendments in this update require an entity (customer) in a hosting arrangement that is a service contract to follow the guidance in Subtopic 350-40 to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. The amendments to ASU No. 2018-15 are effective for the reporting period beginning after December 15, 2019, and interim periods therein. The adoption of ASU No. 2018-15 did not have a material impact on the Company's consolidated financial statements.

Financial Instruments - Credit Losses

In June 2016, the FASB issued ASU No. 2016-13, "Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments." The provisions of ASU 2016-13 modify the impairment model to utilize an expected loss methodology in place of the currently used incurred loss methodology and require consideration of a broader range of reasonable and supportable information to inform credit loss estimates. The guidance is effective for the reporting period beginning after December 15, 2019, and the interim periods therein. The adoption of ASU 2016-13 did not have a material impact on the Company's consolidated financial statements.

Recently Issued Accounting Standards

Income Taxes

In December 2019, the FASB issued ASU No. 2019-12, "Simplifying the Accounting for Income Taxes". The provisions of ASU 2019-12 include eliminating certain exceptions related to the approach for intra-period tax allocation, the methodology for calculating income taxes in an interim period, and the recognition of deferred tax liabilities for outside basis

differences. The guidance is effective for the reporting period beginning after December 15, 2020, and the interim periods therein. The Company is currently assessing the potential impact of ASU 2019-12 on the Company's consolidated financial statements.

(3) Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements include the accounts and operations of the Company, its subsidiaries, and investments in which the Company has control. Amounts pertaining to the non-controlling ownership interests held by third parties in the operating results and financial position of the Company's majority-owned subsidiaries are reported as non-controlling interests. Intercompany accounts and transactions have been eliminated in consolidation.

Variable Interest Entities

The accounting guidance issued by the FASB concerning a variable interest entity, or VIE, addresses the consolidation of business enterprise to which the usual condition of consolidation (ownership of a majority voting interest) does not apply. This guidance focuses on controlling financial interests that may be achieved through arrangements that do not involve voting interests. The guidance requires an assessment of who the primary beneficiary is and whether the primary beneficiary should consolidate the VIE. The primary beneficiary is identified as the variable interest holder that has both the power to direct the activities of the variable interest entity that most significantly impacts the entity's economic performance and the obligation to absorb losses or the right to receive benefits from the entity that could potentially be significant to the variable interest entity. Application of the VIE consolidation requirements may require the exercise of significant judgment by management.

Accounts Receivable Financing Agreement

On March 22, 2016, the Company entered into a receivable financing agreement, which the Company refers to as the "Accounts Receivable Financing Agreement," to securitize certain of its accounts receivable. This agreement was subsequently amended on May 31, 2018 and December 18, 2020. Under the accounts receivable financing agreement, certain of the Company's U.S. accounts receivable and unbilled services balances are sold by certain of its consolidated subsidiaries to another of its consolidated subsidiaries, a wholly-owned bankruptcy-remote special purpose entity, or SPE. The SPE in turn may borrow up to $250.0 million from a third-party lender, secured by liens on the receivables and other assets of the SPE.

The Company retains the servicing of the securitized accounts receivable portfolio and has a variable interest in the SPE by holding the residual equity. The Company determined that the SPE is a VIE and it is the primary beneficiary because (i) the Company's servicing responsibilities for the securitized portfolio gives it the power to direct the activities that most significantly impact the performance of the VIE, and (ii) its variable interest in the VIE gives it the obligation to absorb losses and the right to receive residual returns that could potentially be significant. As a result, the Company has consolidated the VIE within its financial statements.

Refer to Note 10, Debt, for additional information regarding the Accounts Receivable Financing Agreement.

Risks and Other Factors

The Company's revenues are dependent on research and development expenditures of the pharmaceutical and biotechnology industries. Any significant reduction in research and development expenditures by the pharmaceutical and biotechnology industries could have a material adverse effect on the Company and its results of operations.

Clients of the Company generally may terminate contracts without cause upon 30 to 60 days' notice. While the Company generally negotiates deposit payments and early termination fees up front, such terminations could significantly impact the future level of staff utilization and have a material adverse effect on the Company and the results of future operations.

A novel strain of coronavirus (COVID-19) was first identified in Wuhan, China in December 2019, and subsequently declared a global pandemic by the World Health Organization on March 11, 2020. As a result of the outbreak, during the year ended December 31, 2020, the Company experienced disruptions in its global operations as the COVID-19 virus continued to

spread and impact countries in which the Company operates. During the year ended December 31, 2020, the Company's operations continued to be impacted by limited accessibility to investigator sites and limited ability to screen and enroll patients due to travel restrictions. A prolonged outbreak could continue to interrupt the operations of the Company and its customers and suppliers.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. In particular, the Company's primary method of revenue recognition requires estimates of costs to be incurred to fulfill existing long-term contract obligations. Actual results could differ from those estimates. Estimates are also used when accounting for certain items such as allowance for credit losses, depreciation and amortization, asset impairment, certain acquisition-related assets, and liabilities including contingent consideration, income taxes, fair value determinations, and contingencies.

Reportable Segments

The Company is managed through two reportable segments, Clinical Research and Data Solutions. Clinical Research, which primarily serves biopharmaceutical clients, provides outsourced clinical research and clinical trial related services. Data Solutions provides data and analytics, technology solutions and real-world insights, and services to companies in the pharmaceutical industry.

The Clinical Research segment is solely focused on the execution of clinical trials on a global basis. The Company has considered whether the delivery of the different types of capabilities in various stages of clinical development constitute separate products or lines of service in accordance with Accounting Standards Codification, or ASC, Topic 280, "Segment Reporting," or ASC 280, and has concluded that there are substantial similarities and overlaps in the capabilities delivered at each stage of clinical development, with the primary differences between the Early Development Services, or EDS, compared to the Product Registration, or PR, and Strategic Solutions, or SS, relating to the points during the life cycle of a clinical trial at which such capabilities are delivered. After review and analysis of the operating characteristics of each service offering and using the aggregation characteristics under ASC 280, the Company has concluded that the services provided are similar across most characteristics.

The Company's operations consist of two reportable segments. This represents management's view of the Company's operations based on its management and internal reporting structure. The Company considered the guidance in ASC 350, "Intangibles—Goodwill and Other," which notes that a reporting unit is an operating segment or one level below an operating segment. PR, EDS, and SS are the business units that are one level below the Company's Clinical Research operating segment, and the Company determined that they meet the definition of "components," as discrete financial information exists and this information is regularly reviewed by management. The Data Solutions operating segment does not have any material components.

Business Combinations

Business combinations are accounted for using the acquisition method and, accordingly, the identifiable assets acquired, the liabilities assumed, and any non-controlling interest in the acquiree are recorded at their estimated fair values on the date of the acquisition. Goodwill represents the excess of the purchase price over the estimated fair value of the net assets acquired, including the amount assigned to identifiable intangible assets.

Contingent Losses

The Company provides for contingent losses when (1) it is probable that an asset has been impaired or a liability has been incurred at the date of the consolidated financial statements and (2) the amount of the loss can be reasonably estimated. Disclosure in the notes to the consolidated financial statements is required for loss contingencies that do not meet both these conditions if there is a reasonable possibility that a loss may have been incurred. The Company expenses, as incurred, the costs of defending legal claims against the Company.

Cash Equivalents

The Company considers all highly-liquid investments purchased with an original maturity of three months or less to be cash equivalents. As of December 31, 2020 and 2019, substantially all of the Company's cash and cash equivalents were held in or invested with large financial institutions. Certain bank deposits may at times be in excess of the Federal Deposit Insurance Corporation insurance limits.

The following table provides a reconciliation of cash, cash equivalents, and restricted cash reported within the consolidated balance sheets that sum to the total of the same amounts shown in the consolidated statements of cash flows (in thousands):

	December 31,		
	2020	2019	2018
Cash and cash equivalents	$ 506,303	$ 236,232	$ 144,221
Restricted cash	—	38	488
Total cash, cash equivalents, and restricted cash	$ 506,303	$ 236,270	$ 144,709

Accounts Receivable and Unbilled Services

Accounts receivable represent amounts for which invoices have been sent to clients based upon contract terms. Unbilled services represent amounts earned for services that have been rendered but for which customers have not been billed. Unbilled services where the Company's right to bill is conditioned on something other than the passage of time are contract assets and are separately disclosed in Note 5, Accounts Receivable, Unbilled Services, and Advanced Billings.

Allowances for Credit Losses

On January 1, 2020, the Company adopted ASC 326, "Credit Losses," or ASC 326. The adoption of ASC 326 did not require the Company to make significant changes to its current methodology. The Company maintains an allowance for credit losses resulting from the inability of its customers to make required payments. The Company performs credit reviews of each customer, monitors collections and payments from customers, and determines the allowance based upon historical experience and specific customer collection issues. The Company ages billed accounts receivable and assesses exposure by customer type, by aged category, and by specific identification. After all attempts to collect a receivable have failed, the receivable is written off against the allowance or, to the extent unreserved, to bad debt expense.

Advanced Billings

Advanced billings, also referred to as contract liabilities, consist of advanced payments and billings on a contract in excess of revenue recognized. These amounts represent consideration received or unconditionally due from a customer prior to transferring services to the customer under the terms of the service contract. These balances are reported net of contract assets on a contract-by-contract basis at the end of each reporting period.

In order to determine revenue recognized in the period from advanced billings liabilities, the Company first allocates revenue from the customer contract to the individual advanced billings liability balance outstanding at the beginning of the period until the revenue exceeds that balance.

Fixed Assets

Fixed assets and software purchased or developed for internal use are recorded at cost and are depreciated on a straight-line basis over the following estimated useful lives:

Furniture, fixtures and equipment	5-7 years
Computer hardware and software	3-7 years
Leasehold improvements	Lesser of the life of the lease or useful life of the improvements

Internal Use Software

The Company accounts for internal use software in accordance with the guidance in ASC 350-40, “Internal-Use Software," which requires certain direct costs and interest costs incurred during the application stage of development to be capitalized and amortized over the useful life of the software.

Derivative Financial Instruments

Historically, the Company has utilized interest rate swaps to manage changes in market conditions related to debt obligations. All derivatives are measured at fair value and recognized as either assets or liabilities on the consolidated balance sheets. Derivatives that are not determined to be effective hedges are adjusted to fair value with a corresponding effect on earnings. Changes in the fair value of derivatives that are designated and determined to be effective as part of a hedge transaction have no immediate effect on earnings and depending on the type of hedge, are recorded either as part of accumulated other comprehensive loss, and will be included in earnings in the period in which earnings are affected by the hedged item, or are included in earnings as an offset to the earnings impact of the hedged item. Amounts previously recorded in accumulated other comprehensive loss related to these interest rate swaps will be reclassified into earnings over the term of the previously hedged borrowing using the swaplet method. The Company has elected the accounting policy that cash flows associated with interest rate derivative contracts are classified as cash flows from investing activities.

Contingent Consideration

The consideration for the Company’s acquisitions may include potential future earn-out payments that are contingent upon the occurrence of particular events. These payments might be based on the achievement of future revenue or earnings milestones. The Company records a contingent consideration obligation for such contingent payments at fair value on the acquisition date. The Company estimates the fair value of contingent consideration obligations through valuation models designed to estimate the probability of such contingent payments based on various assumptions and incorporating estimated success rates. Estimated payments are discounted using present value techniques to arrive at an estimated fair value at the balance sheet date. Changes in the fair value of the contingent consideration obligations, excluding adjustments that qualify as measurement period adjustments, are recognized within the Company’s consolidated statements of operations. Changes in the fair value of the contingent consideration obligations can result from changes to one or multiple inputs, including adjustments to the discount rates, changes in the amount or probability of achieving certain revenue or earnings targets. These fair value measurements are based on significant inputs not observable in the market. Substantial judgment is employed in determining the appropriateness of these assumptions as of the acquisition date and for each subsequent period. Accordingly, changes in assumptions or actual results could have a material impact on the amount of contingent consideration expense the Company records in any given period.

Fair Value Measurements

The Company records certain assets and liabilities at fair value. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants at the measurement date. A three-level fair value hierarchy that prioritizes the inputs used to measure fair value is described below. This hierarchy requires entities to maximize the use of observable inputs and minimize the use of unobservable inputs. The three levels of inputs used to measure fair value are as follows:

- Level 1—Quoted prices in active markets for identical assets or liabilities.
- Level 2—Observable inputs other than quoted prices included in Level 1, such as quoted prices for similar assets and liabilities in active markets; quoted prices for identical or similar assets and liabilities in markets that are not active; or other inputs that are observable or can be corroborated by observable market data.
- Level 3—Unobservable inputs that are supported by little or no market activity. This includes certain pricing models, discounted cash flow methodologies, and similar techniques that use significant unobservable inputs.

The carrying amount of financial instruments including cash and cash equivalents, accounts receivable, unbilled services, accounts payable, and advanced billings approximate fair value due to the short maturities of these instruments.

Recurring Fair Value Measurements

There were no financial assets or liabilities that measured at fair value on a recurring basis as of December 31, 2020.

The following table summarizes the fair value of the Company's financial assets that are measured on a recurring basis as of December 31, 2019 (in thousands):

	Level 1	Level 2	Level 3	Total
Liabilities:				
Interest rate swaps	$ —	$ 2,976	$ —	$ 2,976
Total	$ —	$ 2,976	$ —	$ 2,976

Interest rate swaps are measured at fair value using a market approach valuation technique. The valuation is based on an estimate of net present value of the expected cash flows using relevant mid-market observable data inputs and based on the assumption of no unusual market conditions or forced liquidation.

The following table summarizes the changes in Level 3 financial liabilities measured on a recurring basis (in thousands):

	Contingent consideration - Accrued expenses and other current liabilities
Balance at December 31, 2019	$ —
Initial estimate of Care Innovations contingent consideration	44,500
Change in fair value recognized in transaction-related costs	(44,500)
Balance at December 31, 2020	$ —

The fair value of the Care Innovations, Inc., or Care Innovations, earn-out payments as of the acquisition date was $44.5 million, which was valued using a Monte Carlo simulation. It was based on the achievement of certain 2020 financial targets that were not ultimately achieved. As the fair value was based on significant inputs not observed in the market, it represented a Level 3 measurement. During the third quarter of 2020, the Company determined that the 2020 financial targets would not be met; therefore the Company released the contingent consideration liability. Specifically, the revenue and earnings before interest, taxes, depreciation, and amortization of the acquired business were expected to be lower than initial forecasts. The initial growth estimates for the service offering were negatively impacted by changes in market conditions, which negatively impacted Care Innovations' ability to contract and deliver services on new commercial opportunities within the one-year earn-out period. Refer to "Note 4 - Business Combinations" for additional information regarding the Care Innovations acquisition.

Non-recurring Fair Value Measurements

Certain assets and liabilities are carried on the accompanying consolidated balance sheets at cost and are not remeasured to fair value on a recurring basis. These assets include finite-lived intangible assets, which are tested when a triggering event occurs, and goodwill and identifiable indefinite-lived intangible assets, which are tested for impairment annually on October 1 or when a triggering event occurs.

As of December 31, 2020, assets carried on the balance sheet and not remeasured to fair value on a recurring basis totaling approximately $2,290.9 million were identified as Level 3. These assets are comprised of goodwill of $1,691.0 million and identifiable intangible assets, net of $599.9 million.

Refer to Note 10, Debt, for additional information regarding the fair value of long-term debt balances.

Impairment of Long-Lived Assets

The Company reviews the recoverability of its long-lived asset groups, including furniture and equipment, computer hardware and software, leasehold improvements, ROU assets, and other finite-lived intangibles, when events or changes in circumstances occur that indicate the carrying value of the asset group may not be recoverable. The assessment of possible impairment is based on the Company's ability to recover the carrying value of the asset group from the expected future pre-tax cash flows (undiscounted and without interest charges) of the related operations. If these cash flows are less than the carrying value of such asset, an impairment loss is recognized for the difference between estimated fair value and carrying value. The Company's primary measure of fair value is based on discounted cash flows. The measurement of impairment requires the Company to make estimates of these cash flows related to long-lived assets, as well as other fair value determinations.

Goodwill and Other Intangibles

Goodwill and indefinite-lived intangible assets are tested for impairment annually or more frequently if an event or circumstance indicates that an impairment loss may have been incurred. Separate intangible assets that have finite useful lives are amortized over their estimated useful lives or over the period in which economic benefit is received. The Company's primary finite-lived intangibles are customer relationships and acquired databases, which are amortized on an accelerated basis, which coincides with the period of economic benefit received by the Company.

The Company reviews the carrying value of goodwill to determine whether impairment may exist on an annual basis or whenever it has reason to believe goodwill may not be recoverable. The annual impairment test of goodwill is performed during the fourth quarter of each fiscal year. The Company did not have an impairment for any of the years presented.

When evaluating for impairment, the Company may first perform a qualitative assessment to determine whether it is more likely than not that a reporting unit or indefinite-lived intangible asset is impaired. If the Company does not perform a qualitative assessment, or if it determines that it is not more likely than not that the fair value of the reporting unit or indefinite-lived intangible asset exceeds its carrying amount, the Company will calculate the estimated fair value of the reporting unit or indefinite-lived intangible asset. The Company's decision to perform a qualitative impairment assessment for an individual reporting unit in a given year is influenced by a number of factors, inclusive of the size of the reporting unit's goodwill, the significance of the excess of the reporting unit's estimated fair value over carrying value at the last quantitative assessment date, the amount of time in between quantitative fair value assessments, and the date of acquisition.

If the Company does not perform a qualitative assessment, goodwill impairment is determined by using a quantitative assessment that compares the fair value of each goodwill reporting unit to its carrying amount, and to the extent the carrying amount exceeds the fair value, an impairment of goodwill is recognized for the excess up to the amount of goodwill allocated to the reporting unit. To determine the fair value of each reporting unit, the Company generally uses a discounted cash flow technique corroborated by market multiples when available and as appropriate. During the fourth quarter of 2020, as part of the Company's annual impairment analysis, the Company performed updated quantitative assessments for all reporting units and for its indefinite-lived trade name intangible asset balances. It was concluded that the estimated fair value of the Data Solutions, EDS, PR, and SS operating segments significantly exceeded their carrying values and therefore no impairment existed.

Revenue Recognition

All revenue is generated from contracts with customers. Revenue is recognized when control of the performance obligation is transferred to the customer, in an amount that reflects the consideration the Company expects to be entitled to receive in exchange for those services. Revenue recognition is determined through the application of the following steps:

- identification of the contract, or contracts, with a customer;
- identification of the performance obligations in the contract;
- determination of the transaction price;
- allocation of the transaction price to the performance obligations in the contract; and
- recognition of revenue when, or as, the Company satisfies a performance obligation.

Clinical Research

The Company generally enters into contracts with customers to provide clinical research services with payments based on either fixed-service fee, time and materials, or fee-for-service arrangements. The Company is also entitled to reimbursement

for investigator fees and out-of-pocket costs associated with these services. At contract inception, the Company assesses the services promised in the contracts with customers to identify the performance obligations in the arrangement.

The long term arrangements for clinical research services are considered a single performance obligation because the Company provides a highly-integrated service. Revenue is recognized based on the proportion of total contract costs incurred to date to the estimated total contract costs through completion. The Company uses the cost-to-cost measure of progress for these contracts because it best depicts the transfer of control to the customer as the performance obligation is fulfilled. The accounting for these long term contracts involves significant judgment, particularly as it relates to the process of estimating total contract costs, which includes direct costs, reimbursable out-of-pocket expenses, reimbursable investigator fees, and the contract profit. The contracts provide for the right to payment for the work performed to date, which is invoiced to the customer as work progresses, either based on units performed or the achievement of billing milestones.

A single performance obligation requires the inclusion of investigator fees and out-of-pocket costs in both the contract revenue value and in the cost used to measure progress in transferring control to the customer. As part of the client proposal and contract negotiation process, the Company develops a detailed project budget for the direct costs and reimbursable costs based on the scope of the work, the complexity of the study, the geographical locations involved, and historical experience. The inclusion of investigator fees and out-of-pocket costs in the measurement of progress under these long-term fixed-service fee contracts as part of a single performance obligation can create a timing difference between amounts the Company is entitled to receive in reimbursement for costs incurred and the amount of revenue recognized related to such costs on individual projects, which is recognized as unbilled services. The magnitude of this timing difference is dependent on the relative size and progress of the direct service portion of the arrangement compared to the progress of the reimbursable investigator fees and reimbursable out-of-pocket costs relative to their respective forecasted costs over the life of the project.

The estimated total contract costs are reviewed and revised periodically throughout the life of the contract, with adjustments to revenue resulting from such revisions being recorded on a cumulative basis in the period in which the revisions are identified.

The Company establishes pricing based on the Company’s internal pricing guidelines, discount agreements, if any, and negotiations with the client. The transaction price is the contractually defined amount that includes adjustment for variable consideration such as reimbursable costs, discounts, and bonus or penalties, which are estimable. The estimated amount of variable consideration will be included in the transaction price only to the extent that it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved.

A majority of the Company’s long-term contracts undergo modifications over the contract period. During the modification process, the Company recognizes revenue to the extent it incurs costs, provided that a contractual understanding has been reached.

Fixed-service fee arrangements for Phase I and Phase IIa clinical services and bio-analytical services are short-term contracts for accounting purposes, as these contracts are cancelable and the termination penalties for exiting these contracts are not substantive. The Company generally bills for services on a milestone basis. The transaction price, representing the value of the services to be provided over the contract term inclusive of all costs for which the Company is a principal, is the contractually defined amount that includes adjustment for variable consideration, such as reimbursable expenses and discounts, which are estimable. When multiple performance obligations exist, the transaction price is allocated to the performance obligations on a relative standalone selling price basis. Given the highly integrated nature of the services provided, most contracts represent a single performance obligation. Due to the Company's right to payment for work performed, revenue is recognized over time as services are delivered.

Clinical research services delivered under fee-for-service arrangements are recognized over time. The services are accounted for as a single performance obligation that is a series of distinct services with substantially the same pattern of transfer to the customer. Clinical research services provided in these types of arrangements are typically linked to the delivery of resources billed at contractual rates, such rates being dependent on the role and the tenure of the resource provided. The fee-for-service is typically billed one month in arrears, which generally results in an unbilled services asset at period-end. In addition, out-of-pocket costs are reimbursed by the customer. Fees are allocated to each distinct month of service using time elapsed as a measure of progress toward the satisfaction of the performance obligation and variable consideration is allocated to the period in which it is incurred.

Revenue from time and materials contracts is recognized as hours are incurred.

The Company may offer volume discounts to certain of its large customers based on annual volume, which is variable consideration that is considered in the transaction price. The Company records an estimate of the volume rebate as a reduction of the transaction price based on the estimated total rebates to be earned by the customers for the period.

Data Solutions

The Company provides data reports and analytics to customers based on agreed-upon specifications, including the timing of delivery, which is typically either weekly, monthly, or quarterly. If a customer requests more than one type of data report or series of data reports within a contract, each distinct type of data report is a separate performance obligation. The contracts provide for the Company to be compensated for the value of each deliverable. The transaction price is determined using list prices, discount agreements, if any, and negotiations with the customers, and generally includes any out-of-pocket expenses. Typically, the Company bills in advance of services being provided with the amount being recorded as advanced billings.

When multiple performance obligations exist, the transaction price is allocated to performance obligations on a relative standalone selling price basis. In cases where the Company contracts to provide a series of data reports, or in some cases data, the Company recognizes revenue over time using the "units delivered" output method as the data or reports are delivered. Expense reimbursements are recorded to revenue as the expenses are incurred as they relate directly to the services performed.

Certain Data Solutions arrangements include upfront customization or consultative services for customers. These arrangements often include payments based on the achievement of certain contractual milestones. Under these arrangements, the Company contracts with a customer to carry out a specific study, ultimately resulting in delivery of a custom report or data product. These arrangements are a single performance obligation given the integrated nature of the service being provided. The Company typically recognizes revenue under these contracts over time, using an output-based measure, generally time elapsed, to measure progress and transfer of control of the performance obligation to the customer. Expense reimbursements are recorded to revenue as the expenses are incurred as they relate directly to the service performed.

The Company's Data Solutions segment enters into contracts with some of its larger data suppliers that involve non-monetary terms. The Company will issue purchase credits to be used toward the data supplier's purchase of the Company's services based on the fair value of the data obtained. In exchange, the Company receives monetary discounts on the data received from the data suppliers. The fair value of the revenue earned from the customer purchases is recognized as services are delivered as described above. At the end of the contract year, any unused customer purchase credits may be forfeited or carried over to the next contract year based on the terms of the data supplier contract. For the years ended December 31, 2020, 2019 and 2018, the Company recognized service in kind revenue of $17.4 million, $20.5 million and $21.8 million, respectively, from these transactions, which is included in revenue in the accompanying consolidated statements of operations. The cost of data acquired under these arrangements is included in direct costs.

Significant Judgments and Estimates

Accounting for the Company's long term contracts requires estimates of future costs to be incurred to fulfill the contract obligations.

Due to the nature of the work required to be performed by the Company to fulfill performance obligations, the estimation of total revenue and cost at completion is complex, subject to many variables, and requires significant judgment. The Company's long-term contracts may contain incentive fees, penalties, or other provisions that can either increase or decrease the transaction price. The Company estimates variable consideration at the most likely amount to which the Company expects to be entitled. The Company includes estimated amounts in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. The Company's estimates of variable consideration and determination of whether to include estimated amounts in the transaction price are based largely on an assessment of the anticipated performance and information that is available to the Company. Judgment is also required to identify performance obligations and in determining the relative standalone selling price of those obligations, specifically for the Data Solutions segment. The estimates and assumptions are evaluated on an ongoing basis and adjusted, as needed, using historical experience and contract specific factors. Actual results could differ significantly from these estimates.

Performance Obligations

Revenue recognized for the years ended December 31, 2020 and 2019 from reimbursable expenses and services completed in prior periods was $50.2 million and $83.4 million, respectively. This primarily relates to adjustments attributable to changes in estimates such as estimated total contract costs, and from contract modifications on long-term fixed price contracts executed in the current period, which result in changes to the transaction price.

The Company does not disclose the value of the transaction price allocated to unsatisfied performance obligations on contracts that have an original contract term of less than one year. These contracts are short in duration and revenue recognition generally follows the delivery of the promised services. The total transaction price for the undelivered performance obligation on contracts with an original initial contract term greater than one year is $6.2 billion as of December 31, 2020. This amount includes reimbursement revenue and investigator fees and contracts are generally cancelable by the customer and often subject to modification as the services progress. The Company expects to recognize revenue over the remaining contract term of the individual projects, with contract terms generally ranging from one to five years.

Credit Risk and Expected Credit Losses

Financial instruments that potentially subject the Company to credit risk consist of cash and cash equivalents, accounts receivable, unbilled services, and derivatives. As of December 31, 2020, substantially all of the Company's cash was held in or invested with large financial institutions. Accounts receivable include amounts due from pharmaceutical and biotechnology companies. The Company establishes an allowance for credit losses. In management's opinion, there is no additional material risk of credit risk beyond amounts provided for expected losses.

Accounts receivable and unbilled receivables from individual customers that were equal to or greater than 10% of consolidated accounts receivable and unbilled receivables at the respective dates were as follows:

	December 31,	
	2020	2019
Customer A	10.1 %	11.2 %
Customer B	*	15.6 %
Customer C	14.1 %	*
Customer D	11.4 %	*

* Less than 10%

There were no individual customers for which revenue was greater than 10% of consolidated revenue in the years ended December 31, 2020, 2019, and 2018.

Foreign Currency

The assets and liabilities of the Company's foreign subsidiaries are translated into U.S. dollars at exchange rates in effect as of the end of the period. Equity activities are translated at the spot rate effective at the date of the transaction. Revenue and expense accounts and cash flows of these operations are translated at average exchange rates prevailing during the period the transactions occurred. Translation gains and losses are included as an adjustment to the accumulated other comprehensive loss account in stockholders' equity. In addition, gains or losses related to the Company's intercompany loans payable and receivable denominated in a foreign currency other than the subsidiary's functional currency that are deemed to be of a long-term investment nature are remeasured to cumulative translation adjustment and recorded in accumulated other comprehensive loss in the consolidated balance sheets.

Translation gains and losses from foreign currency transactions, such as those resulting from the settlement and revaluation of foreign receivables and payables, are included in the determination of net income. These amounts are included in foreign currency losses, net in the consolidated statements of operations.

Income Taxes

The Company uses the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases. Deferred tax assets are recognized for future deductible temporary differences, along with net operating loss carryforwards and credit carryforwards, if it is more likely than not that the tax benefits will be realized. To the extent a deferred tax asset cannot be recognized under the preceding criteria, a valuation allowance is established to reduce the deferred tax asset to the amount that is more likely than not to be realized. Deferred tax liabilities are recognized for future taxable temporary differences. Deferred tax assets and liabilities are measured using enacted tax rates in effect for the year in which those temporary differences are expected to be recovered or settled.

There are uncertainties related to the interpretation of tax regulations in the jurisdictions in which the Company transacts business. The judgments and estimates made at a point in time may change based on the outcome of tax audits, as well as changes to, or further interpretations of, regulations. Income tax expense is adjusted in the period in which these events occur, and these adjustments are included in the Company's consolidated statements of operations. If such changes take place, there is a risk that the Company's effective tax rate may increase or decrease in any period. A company must recognize the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by the taxing authorities, based on the technical merits of the position. The tax benefits recognized in the financial statements from such a position are measured based on the largest benefit that has a greater than fifty percent likelihood of being realized upon ultimate resolution.

Stock-Based Compensation

The primary types of stock-based compensation utilized by the Company are restricted share awards and restricted share units, or collectively RSAs/RSUs, and stock options.

The Company accounts for its stock-based compensation for stock options at the grant date, based on fair value of the award, and recognizes it as expense over the employees' requisite service period. The fair value of each stock option issued during these periods was estimated on the date of grant using the Black-Scholes option pricing model for service condition awards with the following weighted average assumptions:

	Years Ended December 31,		
	2020	2019	2018
Risk-free interest rate	0.4 %	1.8 %	2.8 %
Expected life, in years	6.0	6.1	6.3
Dividend yield	N/A	N/A	N/A
Volatility	36.2 %	30.7 %	28.9 %

The risk-free interest rate is based on the United States Treasury yield curve in effect at the time of the grant. The expected life represents the period of time the grants are expected to be outstanding. Since the Company does not have sufficient history to estimate the expected volatility of its common share price, expected volatility is based on a blended approach that utilizes the volatility of the Company's common stock for periods in which the Company has sufficient information and the volatility for selected reasonably similar publicly traded companies for which the historical information is available. Forfeitures are accounted for as they occur.

The Company accounts for its stock-based compensation for RSAs/RSUs based on the closing market price of the Company's common stock on the grant date, and recognizes it as expense over the employees' requisite service period.

Net Income Per Share

The calculation of net income per share, or EPS, is based on the weighted average number of common shares or common stock equivalents outstanding during the applicable period. The dilutive effect of common stock equivalents is excluded from basic earnings per share and is included in the calculation of diluted earnings per share, unless the effect of inclusion would be anti-dilutive.

Debt Issuance Costs

Debt issuance costs relating to the Company's long-term debt are recorded as a direct reduction of long-term debt; these costs are deferred and amortized to interest expense using the effective interest method, over the respective terms of the related debt. Debt issuance costs relating to the Company's revolving credit facilities are recorded as an asset; these costs are deferred and amortized to interest expense using the straight-line method.

Compensated Absences

The Company accrues for the costs of compensated absences to the extent that the employee's right to receive payment relates to service already rendered, the obligation vests or accumulates, payment is probable, and the amount can be reasonably estimated. The Company's policies related to compensated absences vary by jurisdiction and obligations are recorded net of estimated forfeiture due to turnover when reasonably predictable.

Operating Leases

On January 1, 2019, the Company adopted ASC 842 using the revised modified retrospective approach. The revised modified retrospective approach recognizes the effects of initially applying the new leases standard as a cumulative effect adjustment to retained earnings as of the adoption date. Under this election, the provisions of ASC 840 apply to the accounting and disclosures for lease arrangements in the comparative periods in an entity's financial statements. In addition, the Company elected the package of practical expedients permitted under the transition guidance within ASC 842, in which the Company need not reassess (i) the historical lease classification, (ii) whether any expired or existing contract is or contains a lease, or (iii) the initial direct costs for any existing leases. The adoption of ASC 842 did not impact the Company's recognition of lease costs as compared to the application of ASC 840 as lease expenses for operating leases were recognized on a straight line basis under ASC 840.

All leases entered into after January 1, 2019 are accounted for under ASC 842. Under ASC 842, a contract is or contains a lease when (i) explicitly or implicitly identified assets have been deployed in the contract and (ii) the customer obtains substantially all of the economic benefits from the use of that underlying asset and directs how and for what purpose the asset is used during the term of the contract. The Company also considers whether its service arrangements include the right to control the use of an asset. The Company determines if an arrangement is a lease at inception of the contract, which is the date on which the terms of the contract are agreed to and the agreement creates enforceable rights and obligations. The commencement date of the lease is the date that the lessor makes an underlying asset available for use by a lessee.

At the lease commencement date, a lease liability is recognized based on the present value of the lease payments not yet paid, discounted using the discount rate for the lease at lease commencement. When readily determinable, the discount rate used to calculate the lease liability is the rate implicit in the lease. As the Company's leases typically do not provide an implicit rate, the Company uses its incremental borrowing rate based on the lease term and economic environment at the lease commencement date. The lease term used to calculate the lease liability includes options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. With limited exceptions, the nature of the Company's facility leases is such that there are not economic or other conditions that would indicate that it is reasonably certain at lease commencement that the Company will exercise options to extend the term.

The Company determines if its lease obligations are operating or finance leases at the lease commencement date and considers whether the lease grants an option to purchase the underlying asset that it is reasonably certain to exercise, the remaining economic life of the underlying asset, the present value of the sum of the remaining lease payments and any residual value guaranteed, and the nature of the asset.

The initial measurement of the lease liability is determined based on the future lease payments, which may include lease payments that depend on an index or a rate (such as the consumer price index or other market index). The Company initially measures payments based on an index or rate by using the applicable rate at lease commencement and subsequent changes in such rates are recognized as variable lease costs. Variable payments that do not depend on a rate or index are not included in the lease liability and are recognized as they are incurred. The Company's contracts that include a lease component generally include additional services that are transferred to the lessee (e.g., common-area maintenance services), which are nonlease components. Contracts typically also include other costs and fees that do not provide a separate service to the lessee, such as costs paid by the lessee to reimburse the lessor for administrative costs or payment for the lessor's costs for property taxes, insurance related to the leased asset, and other lessor costs. The Company elected the practical expedient to account for

the lease and nonlease components as a single lease component. At the lease commencement date, the Company recognizes a ROU asset representing its right to use the underlying asset over the lease term. If significant events, changes in circumstances, or other events indicate that the lease term has changed, the Company would reassess lease classification, remeasure the lease liability by using revised inputs as of the reassessment date, and adjust the ROU asset. These reassessment events are typically related to the exercise of optional renewals or significant new investments in leasehold improvements. The costs of services and costs related to reimbursements of the lessor's cost are generally variable rent obligations, which are excluded from the future lease payments included in the lease liability. For leases with a term of one year or less, or short-term leases, the Company has elected to not recognize the lease liability for these arrangements and the lease payments are recognized in the consolidated statements of operations on a straight-line basis over the lease term. For certain equipment leases, such as vehicles, the Company applies a portfolio approach to account for the operating lease ROU assets and liabilities.

The total expense for the operating lease liability is recognized on a straight-line basis over the lease term, beginning on the lease commencement date. The Company classifies the lease costs within operating expenses consistent with the classification policies for all other operating costs.

Transaction-related Costs

Transaction-related costs consist primarily of: (i) the change in the fair value of acquisition-related contingent consideration; (ii) costs incurred in connection with due diligence performed in connection with acquisitions; (iii) third-party fees incurred in connection with secondary offerings and share repurchases; and (iv) stock-based compensation expense related to the release of the transfer restrictions on vested options.

(4) Business Combinations

Care Innovations, Inc.

In January 2020, the Company acquired all of the outstanding equity interests of Care Innovations, an entity that provides digital health services. The purchase price was $208.6 million, which consisted of $161.5 million of cash, $2.6 million of restricted stock, and $44.5 million of estimated contingent consideration in the form of a potential earn-out payment. With this acquisition, the Company expanded its ability to serve customers with technologies that deliver enhancements to the Company's mobile health platform and provide expanded remote patient monitoring support to expand the Company's ability to deliver virtual and decentralized trials. This business is included with the Company's PR reporting unit.

The earn-out payment, which was capped at $50.0 million, was contingent on the achievement of two 2020 financial targets. The fair value of the contingent consideration was based on significant inputs not observed in the market and thus represented a Level 3 fair value measurement. During the year ended December 31, 2020, as a result of changes in market conditions within the earn-out period, the Company determined that the two 2020 financial targets would not be met; therefore the Company released the contingent consideration liability. Accordingly, a $44.5 million adjustment to the contingent consideration was recorded within transaction-related costs in the consolidated statements of operations.

The acquisition of Care Innovations was accounted for as a business combination and, accordingly, the assets acquired and the liabilities assumed have been recorded at their respective fair values as of the acquisition date. The consideration paid was allocated as follows: (i) $33.5 million to definite-lived intangible assets primarily consisting of developed technology with a weighted average amortization period of five years, (ii) $175.3 million to goodwill, and (iii) $(0.2) million to other net assets. The acquisition costs are included in transaction-related costs in the consolidated statement of operations and were immaterial.

Since the acquisition date, goodwill increased by $1.0 million, primarily as a result of adjustments to acquired income tax balances. The Company has not disclosed post-acquisition or pro-forma revenue and earnings attributable to Care Innovations as they did not have a material effect on the Company's consolidated results.

(5) Accounts Receivable, Unbilled Services, and Advanced Billings

Accounts receivable and unbilled services include service revenue, reimbursement revenue, and amounts associated with work performed by investigators. Accounts receivable and unbilled services were (in thousands):

	December 31,	
	2020	2019
Accounts receivable	$ 661,036	$ 512,061
Unbilled services	185,933	149,194
Total accounts receivable and unbilled services	846,969	661,255
Less allowance for credit losses	(3,064)	(2,738)
Total accounts receivable and unbilled services, net	$ 843,905	$ 658,517

Unbilled services as of December 31, 2020 and 2019 included $93.2 million and $76.0 million, respectively, of contract assets where the Company's right to bill is conditioned on criteria other than the passage of time. There were no impairment losses on contract assets during the years ended December 31, 2020 and 2019.

A rollforward of the allowance for credit losses is as follows (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Beginning balance	$ 2,738	$ 2,049	$ 1,433
Charged to income from operations	1,607	1,294	605
Write-offs, recoveries and the effects of foreign currency exchange	(1,281)	(605)	11
Ending balance	$ 3,064	$ 2,738	$ 2,049

Advanced billings were as follows (in thousands):

	December 31,	
	2020	2019
Advanced billings	$ 732,782	$ 505,714

Advanced billings increased by $227.1 million and $64.4 million during the years ended December 31, 2020 and 2019, respectively, primarily due to the timing of customer payments. During the years ended December 31, 2020 and 2019, the Company recognized revenue of $476.4 million and $413.1 million related to advanced billings recorded as of January 1, 2020 and 2019, respectively.

(6) Fixed Assets

The carrying amount of fixed assets is as follows (in thousands):

	December 31,	
	2020	2019
Computer hardware and software	$ 249,459	$ 207,931
Leasehold improvements	95,538	82,482
Furniture and equipment	58,744	48,305
Total fixed assets	403,741	338,718
Accumulated depreciation	(209,121)	(158,002)
Total fixed assets, net	$ 194,620	$ 180,716

All U.S. fixed assets are included as collateral for the payment and performance in full of the term loans pledged by the Company and its subsidiaries.

Depreciation expense was $55.4 million, $46.3 million, and $40.6 million for the years ended December 31, 2020, 2019, and 2018, respectively.

(7) Leases

The Company's material lease obligations are operating leases for office and other facilities in which the Company conducts business. The facility leases generally provide an initial lease term ranging from three to 20 years and include one or more optional extensions. The Company's leases have remaining lease terms of one year to 20 years. The leases typically include rent escalation clauses and for some markets the leases frequently include periodic market adjustments to the base rent over the term of the lease. In certain instances, the Company subleases space that has been exited or is no longer required. The Company's sublease income is immaterial.

The components of lease expense were as follows (in thousands):

	Years Ended December 31,	
	2020	2019
Lease cost:		
Operating lease cost	44,887	41,573
Short-term lease cost	1,326	2,591
Variable lease cost	7,410	7,626
Sublease income	(192)	(178)
Net lease cost	$ 53,431	$ 51,612

Total lease expense, net of sublease income, for the year ended December 31, 2018 was $39.6 million.

Supplemental cash flow information related to leases was as follows (in thousands):

	Years Ended December 31,	
	2020	2019
Cash paid for amounts included in the measurements of lease liabilities, all included in operating cash flows	$ 45,840	$ 41,594
Right-of-use assets obtained in exchange for lease obligations	23,901	32,423

Other supplemental information related to leases was as follows:

	As of December 31, 2020	As of December 31, 2019
Weighted average remaining lease term	8.1 years	7.7 years
Weighted average discount rate	4.1%	4.3%

Maturities of operating lease liabilities were as follows as of December 31, 2020 (in thousands):

2021	$ 46,202
2022	40,229
2023	31,822
2024	21,644
2025	16,386
Thereafter	75,995
Total lease payments	232,278
Less imputed interest	(33,664)
Total	$ 198,614

As of December 31, 2020, the Company had no material additional non-cancelable operating leases that have not yet commenced.

(8) Goodwill and Intangible Assets

Goodwill

The changes in the carrying amount of goodwill are as follows (in thousands):

	Clinical Research	Data Solutions	Consolidated
Balance at December 31, 2018	$ 1,017,903	$ 476,859	$ 1,494,762
Currency translation	7,994	—	7,994
Balance at December 31, 2019	1,025,897	476,859	1,502,756
Acquisition of Care Innovations, Inc.	175,328	—	175,328
Currency translation	12,923	—	12,923
Balance at December 31, 2020	$ 1,214,148	$ 476,859	$ 1,691,007

There are no accumulated impairment charges as of December 31, 2020 and 2019.

Intangible Assets

Intangible assets consist of the following (in thousands):

	December 31, 2020			December 31, 2019		
	Gross Amount	Accumulated Amortization	Net Amount	Gross Amount	Accumulated Amortization	Net Amount
Customer relationships	$ 568,081	$ (173,902)	$ 394,179	$ 559,768	$ (137,728)	$ 422,040
Trade names (finite-lived)	27,889	(17,639)	10,250	28,536	(16,582)	11,954
Patient list and other intangibles	50,774	(22,617)	28,157	44,474	(35,654)	8,820
Database	137,100	(87,811)	49,289	137,100	(59,347)	77,753
Total finite-lived intangible assets	783,844	(301,969)	481,875	769,878	(249,311)	520,567
Trade names (indefinite-lived)	118,010	—	118,010	118,010	—	118,010
Total intangible assets	$ 901,854	$ (301,969)	$ 599,885	$ 887,888	$ (249,311)	$ 638,577

The Company conducts its annual impairment test of indefinite-lived intangibles during the fourth quarter of the fiscal year. For the periods ended December 31, 2020, 2019, and 2018, the Company concluded that the fair value of indefinite-lived intangibles exceeded the carrying value and, therefore, no impairment exists. Amortization expense was $76.3 million, $68.6 million, and $71.6 million for the years ended December 31, 2020, 2019, and 2018, respectively.

Estimated amortization expense related to finite-lived intangible assets for the next five years and thereafter is as follows (in thousands):

2021	$ 71,171
2022	56,532
2023	44,304
2024	35,094
2025	26,502
2026 and thereafter	248,272
Total	$ 481,875

(9) Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consisted of the following (in thousands):

	December 31, 2020	December 31, 2019
Compensation, including bonuses, fringe benefits and payroll taxes	$ 150,390	$ 118,762
Accrued reimbursable expenses	99,578	107,145
Accrued data costs	22,311	27,150
Interest	1,516	4,783
Other	43,388	44,865
Total accrued expenses and other current liabilities	$ 317,183	$ 302,705

(10) Debt

The Company had the following debt outstanding as of December 31, 2020 and 2019 (in thousands):

	Interest rate as of December 31, 2020	Principal amount December 31, 2020	Principal amount December 31, 2019	Maturity Date
Senior Secured Credit Facility:				
First Lien Term Loan	1.4 %	$ 975,000	$ 1,000,000	October 2024
Revolver	1.4 %	91,300	88,800	October 2024
Accounts receivable financing agreement	1.4 %	212,500	170,000	December 2022
Total debt		1,278,800	1,258,800	
Less current portion of Revolver[(1)]		(91,300)	(88,800)	
Less current portion of long-term debt		(25,000)	(25,000)	
Total long-term debt		1,162,500	1,145,000	
Less debt issuance costs		(3,832)	(4,822)	
Total long-term debt, net		$ 1,158,668	$ 1,140,178	

(1) The Company assesses its ability and intent to repay the outstanding borrowings on the Revolver at the end of each reporting period in order to determine the proper balance sheet classification. Outstanding borrowings on the Revolver that the Company intends to repay in less than 12 months from the balance sheet date are classified as current.

As of December 31, 2020, the contractual maturities of the Company's debt obligations were as follows (in thousands):

2021	$ 25,000
2022	237,500
2023	25,000
2024	991,300
2025 and thereafter	—
Total	$ 1,278,800

The Company’s primary financing arrangements are its senior secured credit facility (the “Senior Secured Credit Facility”), which consists of a first lien term loan (“First Lien Term Loan”) and a revolving credit facility (the “Revolver”), and its Accounts Receivable Financing Agreement.

Senior Secured Credit Facility

The Senior Secured Credit Facility has an overall capacity of $1.75 billion (consisting of a $1.0 billion First Lien Term Loan and a $750.0 million Revolver) and a maturity date of October 2024. The Senior Secured Credit Facility also contains customary representations, warranties, affirmative covenants, and events of default. The variable interest rate is a rate equal to the London Interbank Offered Rate (“LIBOR”) or the adjusted base rate (“ABR”) at the election of the Company, plus a margin based on the ratio of total indebtedness to EBITDA. The margin, which is based upon the Company's debt-to-EBITDA ratio,

ranges from 1.0% to 2.0% in the case of LIBOR loans, and 0.0% to 1.0% in the case of ABR loans. The Company has the option of one-, two-, three,- or six-month base interest rates. The credit agreement governing the Senior Secured Credit Facility includes provisions that allow the agreement to be amended to replace the LIBOR rate with a comparable or successor floating rate.

The First Lien Term Loan requires the Company to repay 2.5% of the original aggregate principal amount per annum in equal quarterly installments through September 30, 2024, with the remaining balance due at maturity. There are no voluntary prepayment penalties and prepayment is required upon the issuance of certain debt or asset sales or other events.

The Revolver requires the Company to pay to lenders a commitment fee for unused commitments of 0.15% to 0.35% based on the Company's debt-to-EBITDA ratio. Principal amounts outstanding are due and payable in full at maturity. The Revolver includes borrowing capacity available for letters of credit up to $25.0 million. As of December 31, 2020, the Company had $6.1 million in letters of credit outstanding, which are secured by the Revolver.

As collateral for borrowings under the Senior Secured Credit Facility, the Company granted a pledge on primarily all of its assets, and the stock of wholly-owned U.S. restricted subsidiaries. The Company is also subject to certain financial covenants, which require the Company to maintain certain debt-to-EBITDA and interest expense-to-EBITDA ratios. The Senior Secured Credit Facility also contain covenants that, among other things, restrict the Company's ability to create liens, make investments and acquisitions, incur or guarantee additional indebtedness, enter into mergers or consolidations and other fundamental changes, conduct sales and other dispositions of property or assets, enter into sale-leaseback transactions or hedge agreements, prepay subordinated debt, pay dividends or make other payments in respect of capital stock, change the line of business, enter into transactions with affiliates, enter into burdensome agreements with negative pledge clauses, and make subsidiary distributions. After giving effect to the applicable restrictions on the payment of dividends under the Senior Secured Credit Facility, subject to compliance with applicable law, as of December 31, 2020, all amounts in retained earnings were free of restriction and were available for the payment of dividends. The Senior Secured Credit Facility also contains customary representations, warranties, affirmative covenants, and events of default.

Accounts Receivable Financing Agreement

On December 18, 2020, the Company amended its Accounts Receivable Financing Agreement. The amendment increased the agreement's borrowing capacity to $250.0 million, held the applicable margin at 1.25%, and extended the maturity date to December 18, 2022, unless terminated earlier pursuant to its terms. The Company incurred $0.5 million of fees as a result of the amendment, which were recorded within loss on modification or extinguishment of debt in the consolidated statements of operations. As of December 31, 2020 and 2019, there was $37.5 million and $30.0 million, respectively, of remaining capacity available under the accounts receivable financing agreement. The amount of billed and unbilled receivables included as collateral for this facility were $657.6 million and $600.4 million as of December 31, 2020 and 2019, respectively.

Loans under the Accounts Receivable Financing Agreement accrue interest at either a reserve-adjusted LIBOR or a base rate, plus 1.25%. The Company may prepay loans upon one business day prior notice and may terminate the Accounts Receivable Financing Agreement with 15 days' prior notice.

The Accounts Receivable Financing Agreement contains various customary representations and warranties and covenants, and default provisions which provide for the termination and acceleration of the commitments and loans under the agreement in circumstances including, but not limited to, failure to make payments when due, breach of representations, warranties or covenants, certain insolvency events or failure to maintain the security interest in the trade receivables, and defaults under other material indebtedness.

Fair Value of Debt

The estimated fair value of the Company's debt was $1,275.6 million and $1,255.8 million at December 31, 2020 and 2019, respectively, and was determined based on Level 2 inputs, which are primarily based on rates at which the debt is traded among financial institutions, adjusted for the Company's credit standing. The Revolver is based on current borrowing rates.

(11) Stockholders' Equity

Authorized Shares

The Company is authorized to issue up to one billion shares of common stock, with a par value of $0.01. The Company is authorized to issue up to one hundred million shares of preferred stock, with a par value of $0.01.

Share Repurchase Program

On August 30, 2019, the Company's Board of Directors, or the Board, approved a share repurchase program, or the Repurchase Program, authorizing the repurchase of up to $500.0 million of the Company's common stock in open market purchase, privately-negotiated transactions, secondary offerings, block trades, or otherwise in accordance with all applicable securities laws and regulations, including through Rule 10b5-1 trading plans and pursuant to Rule 10b-18 under the Securities Exchange Act of 1934, as amended, or the Exchange Act. The Repurchase Program does not obligate the Company to repurchase any particular amount of its common stock, and it may be modified, suspended, or terminated at any time at the Board's discretion. The Repurchase Program expires on December 31, 2021.

On September 6, 2019, the Company repurchased, and subsequently retired, 3,079,765 shares at a price of $97.41 per share, for an aggregate purchase price of approximately $300.0 million.

No repurchases were made during the year ended December 31, 2020. As of December 31, 2020, the Company has remaining authorization to repurchase up to $200.0 million of its common stock under the Repurchase Program.

(12) Stock-Based Compensation

Stock Option and RSA/RSU Activity

On September 23, 2013, the Board of Directors approved the formation of the 2013 Stock Incentive Plan for Key Employees of Pinnacle Holdco Parent, Inc. and its subsidiaries, or the 2013 Plan. The 2013 Plan allowed for the issuance of stock options and other stock-based awards as permitted by applicable laws. The number of shares available for grant under the 2013 Plan was 12.5% of the outstanding shares at closing on a fully diluted basis. The Company rolled over 2,052,909 stock options under the 2013 Plan. The fair value of the options that were rolled over equaled the fair value of the options in the predecessor company; therefore, no additional stock-based compensation expense was recorded.

All stock options granted under the 2013 Plan were subject to transfer restrictions of the stock option's underlying shares once vested and exercised. This lack of marketability was included as a discount, calculated using the Finnerty Model, when determining the grant date value of these options. In conjunction with secondary offerings, the transfer restrictions on such shares issuable upon exercise of vested options granted under the 2013 Plan were released. The release of the transfer restrictions was considered a modification under ASC 718, "Stock Compensation." As a result of these modifications, the Company incurred approximately $0.8 million of incremental compensation expense during the year ended December 31, 2018, which is included in transaction-related costs in the accompanying consolidated statements of operations.

On November 23, 2014, the Board of Directors approved the formation of the 2014 Omnibus Plan for Key Employees, or the 2014 Plan. The 2014 Plan allowed for the issuance of stock options, stock appreciation rights, restricted shares and restricted stock units, other stock-based awards, and performance compensation awards as permitted by applicable laws.

The 2018 Stock Incentive Plan, or the 2018 Plan, was approved by stockholders at the annual meeting on May 31, 2018. The 2018 Plan allows for the issuance of stock options, stock appreciation rights, restricted shares and restricted stock units, other stock-based awards, and performance compensation awards as permitted by applicable laws. The 2018 Plan authorized the issuance of 2,000,000 shares of common stock plus all shares that remained available under the 2014 Plan on May 31, 2018 (which included shares carried over from the 2013 Plan).

The 2020 Stock Incentive Plan, or the 2020 Plan, was approved by stockholders at the annual meeting on May 18, 2020. The 2020 Plan allows for the issuance of stock options, stock appreciation rights, restricted shares and restricted stock units, other stock-based awards, and performance compensation awards as permitted by applicable laws. The 2020 Plan authorized the issuance of 2,500,000 shares of common stock plus all shares that remained available under the prior plan on May 18, 2020.

Generally, the Company grants stock options with exercise prices equal to the fair market value of the Company's common stock on the date of grant. The stock option compensation cost calculated under the fair value approach is recognized on a pro-rata basis over the vesting period of the stock options, which is between three years and five years. Most stock option grants are subject to graded vesting as services are rendered and have a contractual life of ten years. The Board and the Compensation Committee have the discretion to determine different vesting schedules.

Aggregated information regarding the Company's option plans is summarized below:

	Number of Options	Wtd. Average Exercise Price	Wtd. Average Remaining Contractual Life (in Years)	Intrinsic Value (in millions)
Outstanding at December 31, 2019	4,861,606	$ 72.45	7.5	$ 188.3
Granted	528,740	103.15		
Exercised	(698,721)	60.15		
Expired/forfeited	(303,189)	95.43		
Outstanding at December 31, 2020	4,388,436	$ 76.52	6.9	$ 214.7
Exercisable at December 31, 2020	2,255,337	$ 58.81	5.7	$ 150.3

The weighted average fair value of options granted during the years ended December 31, 2020, 2019, and 2018 was $36.29, $32.89, and $34.08, respectively. The total fair value of options vested during the years ended December 31, 2020, 2019, and 2018 was $33.2 million, $22.8 million, and $14.6 million, respectively.

Selected information regarding the Company's stock options as of December 31, 2020 is as follows:

	Options Outstanding			Options Exercisable		
Exercise Price	Number of Options	Wtd. Average Remaining Life (in Years)	Wtd. Average Exercise Price	Number of Options	Wtd. Average Remaining Life (in Years)	Wtd. Average Exercise Price
$ 2.94 - 35.50	859,029	3.1	$ 13.80	859,029	3.1	$ 13.80
$ 37.83 - 75.81	1,001,635	6.5	$ 72.83	635,310	6.5	$ 71.64
$ 75.89 - 95.94	986,522	8.3	$ 92.77	301,065	8.2	$ 91.99
$ 96.21 - 116.11	1,541,250	8.3	$ 103.47	459,933	7.7	$ 103.45

The Company's RSAs/RSUs will settle in shares of the Company's common stock on the applicable vesting date. Most RSAs/RSUs granted to employees vest over two or three years. RSAs/RSUs granted to the Company's non-employee directors vest over one or two years.

Activity related to the Company's RSAs/RSUs in 2020 is as follows:

	Awards	Wtd. Average Grant-Date Fair Value	Intrinsic Value (millions)
Unvested at December 31, 2019	632,436	$ 91.07	$ 70.3
Granted	405,915	96.47	
Forfeited	(46,330)	91.44	
Vested	(266,787)	81.50	
Unvested at December 31, 2020	725,234	$ 97.59	$ 91.0

As of December 31, 2020, there was $93.0 million of unrecognized compensation cost related to unvested stock-based awards, which is expected to be recognized over a weighted average period of one and a half years.

Employee Stock Purchase Plan

In April 2017, the Board of Directors approved the PRA Health Sciences, Inc. 2017 Employee Stock Purchase Plan, or ESPP, which was approved by the Company's shareholders on June 1, 2017. The ESPP allows eligible employees to authorize payroll deductions of up to 15% of their base salary or wages to be applied toward the purchase of shares of the Company's common stock on the last trading day of the offering period. Participating employees will purchase shares of the Company's common stock at a discount of up to 15% on the lesser of the closing price of the Company's common stock on the Nasdaq Global Select Market (i) on the first trading day of the offering period or (ii) the last day of any offering period. The aggregate number of shares of the Company's common stock that may be issued under the ESPP may not exceed 3,000,000 shares and no one employee may purchase any shares under the ESPP having a collective fair market value greater than $25,000 in any one calendar year. Offering periods under the ESPP will generally be in six month increments with the administrator of the ESPP having the right to establish different offering periods. The Company's first offering period commenced on January 1, 2018, and the Company recognized stock-based compensation expense of $5.9 million, $4.0 million, and $3.3 million associated with the ESPP during the years ended December 31, 2020, 2019, and 2018, respectively. As of December 31, 2020, there have been 514,888 shares issued and 2,485,112 shares reserved for future issuance under the ESPP.

Stock-based Compensation Expense

Stock-based compensation expense related to employee stock plans is summarized below (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Direct costs	$ 16,122	$ 14,177	$ 9,508
Selling, general and administrative	53,291	31,657	19,635
Transaction-related costs	—	—	773
Total stock-based compensation expense	$ 69,413	$ 45,834	$ 29,916

(13) Income Taxes

The components of income before income taxes and equity in income of unconsolidated joint ventures are as follows (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Domestic	$ 102,085	$ 145,863	$ 45,672
Foreign	156,924	160,064	175,875
	$ 259,009	$ 305,927	$ 221,547

The components of the provision for income taxes were as follows (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Current:			
Federal	$ 26,394	$ 38,333	$ 14,793
State	11,583	13,216	776
Foreign	44,283	35,166	39,998
Total current income tax expense	82,260	86,715	55,567
Deferred:			
Federal	(11,055)	(15,999)	14,224
State	(4,233)	(5,073)	1,403
Foreign	(5,006)	(2,835)	(3,962)
Total deferred income tax (benefit) expense	(20,294)	(23,907)	11,665
Total income tax expense	$ 61,966	$ 62,808	$ 67,232

Income taxes computed at the statutory U.S. federal income tax rate are reconciled to the provision for income taxes as follows:

	Years Ended December 31,		
	2020	2019	2018
Statutory federal income tax rate	21.0 %	21.0 %	21.0 %
State income taxes, net of federal benefit	1.8 %	1.6 %	0.8 %
Impact of the U.S. Tax Cuts and Jobs Act of 2017:			
Rate change	— %	— %	(5.2)%
U.S. minimum tax on foreign entities	(0.9)%	1.6 %	3.3 %
Base erosion anti-abuse tax	— %	— %	8.4 %
Tax on foreign earnings:			
Foreign rate differential	0.1 %	1.8 %	0.8 %
Foreign earnings taxed in the U.S.	— %	(1.1)%	7.9 %
Research and development credits	(1.3)%	(1.5)%	(2.6)%
Stock-based compensation	0.4 %	(1.2)%	(9.6)%
Nondeductible contingent consideration	(3.6)%	— %	3.1 %
Valuation allowance	0.1 %	(0.1)%	0.4 %
Change in liability for uncertain tax positions	1.3 %	(1.3)%	0.4 %
Nondeductible expenses	0.8 %	0.3 %	1.0 %
Interest rate swaps	2.0 %	— %	— %
Other	2.2 %	(0.6)%	0.6 %
Effective income tax rate	23.9 %	20.5 %	30.3 %

The income tax effects from accumulated other comprehensive income are released on a portfolio approach basis. In the year ended December 31, 2020, the Company recognized income tax expense of $5.2 million related to the elimination of stranded tax effects related to the derivative gains and losses previously included within accumulated other comprehensive income.

Components of the deferred tax assets and liabilities were as follows (in thousands):

	December 31,	
	2020	2019
Net operating loss carryforwards	$ 9,475	$ 9,544
Accruals and reserves	15,741	10,043
Equity based compensation	19,364	15,004
Operating lease liabilities	26,934	35,683
Prepaid expenses and other	14,672	9,429
Deferred and unbilled revenue	64,533	64,033
Tax credits	3,341	2,231
	154,060	145,967
Valuation allowance	(8,527)	(8,072)
Total deferred tax assets (net of valuation allowance)	145,533	137,895
Identified intangibles	(151,591)	(156,321)
Operating lease right-of-use assets	(21,660)	(29,440)
Depreciable, amortizable, and other property	(21,008)	(20,363)
Deferred tax liabilities	(194,259)	(206,124)
Net deferred tax liability	$ (48,726)	$ (68,229)
Long-term deferred tax asset	$ 14,725	$ 10,282
Long-term deferred tax liability	$ (63,451)	$ (78,511)

The Company's foreign subsidiaries are taxed separately in their respective jurisdictions. As of December 31, 2020, the Company has cumulative foreign net operating loss carryforwards of approximately $8.0 million. In addition, the Company has federal net operating loss carryforwards of approximately $6.8 million and state net operating loss carryforwards of approximately $238.7 million.

The carryforward periods for the Company's net operating losses vary from four years to an indefinite number of years depending on the jurisdiction. The Company's ability to offset future taxable income with net operating loss carryforwards may be limited in certain instances, including changes in ownership.

In determining the extent to which a valuation allowance for deferred tax assets is required, the Company evaluates all available evidence including projections of future taxable income, carry-back opportunities, reversals of certain deferred tax liabilities, and other tax-planning strategies.

A rollforward of the deferred tax asset valuation allowance accounts is as follows (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Beginning balance	$ 8,072	$ 9,824	$ 25,226
Additions - charged to expense	1,011	153	1,428
Deductions - charged to expense (including translation adjustments)	(556)	(1,905)	(16,830)
Ending balance	$ 8,527	$ 8,072	$ 9,824

The valuation allowance at December 31, 2020 is primarily related to state loss carryforwards, state credit carryforwards, certain foreign deferred tax assets, and loss carryforwards in various foreign jurisdictions.

The Company also has state income tax credit carryforwards available to potentially offset future state income tax of $3.0 million. The state credits begin expiring in 2022. The Company has a $2.5 million valuation allowance against the benefits of these credits.

A reconciliation of the beginning and ending amount of gross unrecognized income tax benefits is presented below (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Beginning balance	$ 30,358	$ 12,891	$ 7,911
Additions based on tax positions related to current year	1,523	1,609	764
Additions for income tax positions of prior years	253	16,704	1,065
Impact of changes in exchange rates	9	(9)	(58)
Impact of change in federal tax rate	—	—	4,236
Settlements with tax authorities	—	(118)	(180)
Reductions for income tax positions for prior years	(894)	(356)	(456)
Reductions due to lapse of applicable statute of limitations	(269)	(363)	(391)
Ending balance	$ 30,980	$ 30,358	$ 12,891

As of December 31, 2020, 2019, and 2018, the total gross unrecognized tax benefits were $31.0 million, $30.4 million, and $12.9 million, respectively. During the year ended December 31, 2020, the liability for uncertain tax positions increased by $0.7 million. As of December 31, 2020, the total amount of gross unrecognized tax benefits which, if recognized, would impact the Company's effective tax rate is $31.0 million. The Company anticipates changes in total unrecognized tax benefits due to the expiration of the statute of limitations within the next 12 months. Specifically, adjustments related to certain foreign tax exposures are expected to be resolved in various jurisdictions. A reasonable estimate of the change in the total gross unrecognized tax benefit expected to be recognized as a result is $1.0 million as of the balance sheet date.

The Company's policy for recording interest and penalties associated with uncertain tax positions is to record such items as a component of income tax expense. The Company recorded increases of $2.8 million, $2.2 million, and $0.6 million during the years ended December 31, 2020, 2019, and 2018, respectively. As of December 31, 2020, the Company has a total of $7.2 million recognized on uncertain tax positions. To the extent interest and penalties are not incurred with respect to uncertain tax positions, amounts accrued will be reduced and reflected as a reduction in income tax expense.

The Company has analyzed filing positions in all of the significant federal, state, and foreign jurisdictions where the Company is required to file income tax returns. The only periods subject to examination by the major tax jurisdictions where the Company does business are the 2011 through 2019 tax years.

As of December 31, 2020, the Company has accumulated undistributed earnings generated by our foreign subsidiaries of approximately $733.9 million. Because $363.4 million of such earnings have previously been subject to the one-time transition tax on foreign earnings required by the 2017 Tax Act, and 2018 and 2019 earnings were subject to Global Intangible Low-taxed Income inclusion, any additional taxes due with respect to such earnings or the excess of the amount for financial reporting over the tax basis of the Company's foreign investments would generally be limited to foreign withholding taxes and state taxes and it is not practicable to calculate the deferred tax liability. The Company intends to indefinitely reinvest these earnings.

(14) Commitments and Contingencies

Employment Agreements

The Company has entered into employment and non-compete agreements with certain management employees. In the event of termination of employment for certain instances, employees will receive severance payments for base salary and benefits for a specified period (six months for vice presidents, nine months for senior vice presidents, and 12 months for executive vice presidents, the president and chief executive officer). Each employment agreement also contains provisions that

restrict the employee's ability to compete directly with the Company for a comparable period after employment terminates. In addition, stock option grant agreements for these employees provide the Company with the right to repurchase from the employee, or the employee with the right to sell to the Company, stock owned by the employee in certain limited instances of termination.

Legal Proceedings

The Company is involved in legal proceedings from time to time in the ordinary course of its business, including employment claims and claims related to other business transactions. Although the outcome of such claims is uncertain, management believes that these legal proceedings will not have a material adverse effect on the financial condition or results of future operations of the Company.

The Company is currently a party to litigation with the City of Sao Paulo, Brazil. The dispute relates to whether the export of services provided by the Company is subject to a local tax on services. The Company has not recorded a liability associated with the claim, which totaled $4.4 million at December 31, 2020, given that it is not deemed probable the Company will incur a loss related to this case. However, a deposit totaling $4.4 million has been made to the Brazilian court in order to annul the potential tax obligation and to avoid the accrual of additional interest and penalties. This balance is recorded in other assets on the consolidated balance sheets. In June 2015, the Judiciary Court of Justice of the State of Sao Paulo ruled in the favor of the Company; however, the judgment was appealed by the City of Sao Paulo. The Company expects to recover the full amount of the deposit when the case is settled. In September 2017, a judge from the Superior Court of Justice of Brazil denied relief to the City of Sao Paulo's appeal and upheld the lower court's ruling in the favor of the Company for the years 2005 to 2012, and in the period from January to October 2013. The judge from the Superior Court of Justice of Brazil also ruled that the Company must appeal the lower court's verdict for October 2013 and the subsequent periods as the Judiciary Court of Justice of the State of Sao Paulo only reviewed the facts that pertained to the period before October 2013.

Insurance

The Company currently maintains insurance for risks associated with the operation of its business, provision of professional services, and ownership of property. These policies provide coverage for a variety of potential losses, including, without limitation, loss or damage to property, bodily injury, general commercial liability, professional errors and omissions, and medical malpractice.

Employee Health Insurance

The Company is self-insured for health insurance for employees within the United States. The Company maintains stop-loss insurance on a "claims made" basis for expenses in excess of $0.3 million per member per year. As of December 31, 2020 and 2019, the Company maintained a reserve of approximately $5.5 million, included in accrued expense and other current liabilities on the consolidated balance sheets, to cover open claims and estimated claims incurred but not reported.

(15) Employee Benefit Plans

Defined contribution or profit sharing style plans are offered in Australia, Belgium, Germany, Hong Kong, India, Israel, Japan, the Netherlands, New Zealand, the Philippines, South Africa, Spain, Sweden, Thailand, and the United Kingdom. In some cases, these plans are required by local laws or regulations.

The Company maintains 401(k) plans in the United States, which cover substantially all employees of its U.S. subsidiaries. The Company matches participant's contributions at varying amounts, subject to a maximum contribution of 6% of the participant's compensation. The employer contributions to the 401(k) plans were approximately $16.0 million, $14.3 million, and $13.6 million for the years ended December 31, 2020, 2019, and 2018, respectively.

The Company maintains a defined benefit pension plan sponsored by a subsidiary in Germany. The unfunded status of the plan in Germany, which covers eight employees, totaled $1.3 million and $1.0 million at December 31, 2020 and 2019, respectively, and was recorded in other long-term liabilities on the consolidated balance sheets.

Additional disclosures regarding these defined benefit pension plans have been excluded due to their immateriality.

(16) Derivatives

The Company is exposed to certain risks relating to its ongoing business operations. The primary risk that the Company seeks to manage by using derivative instruments is interest rate risk arising from movement in market interest rates. Accordingly, the Company has instituted an interest rate hedging program that is accounted for in accordance with ASC 815, "Derivatives and Hedging." The interest rate hedging program uses interest rate swaps designated as cash flow hedges to mitigate interest rate volatility. The Company swaps the difference between fixed and variable interest amounts calculated by reference to an agreed-upon notional principal amount at specified intervals. The Company's interest rate contracts are designated as hedging instruments.

As of December 31, 2020, the Company has no interest rate swaps outstanding. Interest rate swaps with notional amounts of $250.0 million and $375.0 million matured on September 6, 2020 and December 6, 2020, respectively.

The following table presents the notional amounts and fair values (determined using level 2 inputs) of the Company's derivatives as of December 31, 2020 and 2019 (in thousands):

	Balance Sheet Classification	December 31, 2020		December 31, 2019	
		Notional amount	Liability	Notional amount	Liability
Derivatives in a liability position:	Accrued expenses and other current liabilities	$ —	$ —	$ 625,000	$ (2,976)

The Company records the change in the fair value of derivatives designated as hedging instruments under ASC 815 to accumulated other comprehensive loss in the Company's consolidated balance sheets, net of deferred taxes, and will later reclassify into earnings, including the associated tax impact, when the hedged item affects earnings or is no longer expected to occur. For other derivative contracts that do not qualify or no longer qualify for hedge accounting, changes in the fair value of the derivatives are recognized in earnings each period.

In the third quarter of 2015, the Company paid $32.9 million to terminate the interest rate swap agreements it entered into during October 2013. Amounts previously recorded in accumulated other comprehensive loss related to these interest rate swaps, totaling $29.6 million on the termination date, are being reclassified into earnings over the term of the previously hedged borrowing using the swaplet method. For the terminated swaps, the Company reclassified $4.6 million, $6.5 million, and $6.8 million previously recorded in accumulated other comprehensive loss into interest expense during the years ended December 31, 2020, 2019, and 2018, respectively.

The table below presents the effect of the Company's derivatives on the consolidated statements of operations and comprehensive income (in thousands):

	Years Ended December 31,		
Derivatives in Cash Flow Hedging Relationships (Interest Rate Contracts)	2020	2019	2018
Amount of pre-tax (loss) gain recognized in other comprehensive income on derivatives	$ (5,105)	$ (5,928)	$ 3,159
Amount of loss reclassified from accumulated other comprehensive loss into interest expense, net on derivatives	(12,639)	(6,173)	(6,477)

The following table presents the effect of cash flow hedge accounting on the consolidated statements of operations (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Interest expense, net	$ (43,130)	$ (51,987)	(57,399)
Loss on cash flow hedging relationships in Subtopic 815-20 (interest contracts):			
Loss reclassified from accumulated other comprehensive loss into interest expense, net	(12,639)	(6,173)	(6,477)

(17) Accumulated Other Comprehensive Loss

The following table presents a summary of the components of accumulated other comprehensive loss (in thousands):

	Foreign Currency Translation	Derivative Instruments	Total
Balance at December 31, 2017	$ (117,180)	$ (19,290)	$ (136,470)
Other comprehensive (loss) income before reclassifications, net of tax	(41,169)	2,152	(39,017)
Reclassification adjustments, net of tax	—	4,828	4,828
Balance at December 31, 2018	(158,349)	(12,310)	(170,659)
Impact from adoption of ASU 2018-02, Reclassification of certain tax effects from accumulated other comprehensive income	—	1,419	1,419
Balance at January 1, 2019	(158,349)	(10,891)	(169,240)
Other comprehensive income (loss) before reclassifications, net of tax	9,007	(3,031)	5,976
Reclassification adjustments, net of tax	—	3,156	3,156
Balance at December 31, 2019	(149,342)	(10,766)	(160,108)
Other comprehensive income (loss) before reclassifications, net of tax	50,529	(3,719)	46,810
Reclassification adjustments, net of tax	—	14,485	14,485
Balance at December 31, 2020	$ (98,813)	$ —	$ (98,813)

Foreign Currency Translation

The change in the foreign currency translation adjustment during the year ended December 31, 2020 was primarily due to the movements in the British pound, or GBP, Euro, or EUR, Canadian dollar, or CAD, and Russian ruble, or RUB, exchange rates against the U.S. dollar, or USD. The USD depreciated by 3.5%, 9.4%, and 2.2% versus the GBP, EUR, and CAD, respectively, during the year ended December 31, 2020, and the USD strengthened by 16.6% versus the RUB during the same period. The movement in the GBP, EUR, and CAD represented $16.3 million, $36.6 million and $1.3 million, respectively, of the $50.5 million income recorded to accumulated other comprehensive loss during the year ended December 31, 2020. The overall change was partially offset by gains in the RUB, representing $5.5 million of the adjustment.

The change in the foreign currency translation adjustment during the year ended December 31, 2019 was primarily due to the movements in the GBP, EUR, CAD, and RUB exchange rates against the USD. The movement in the GBP, CAD, and RUB represented $11.8 million, $1.9 million, and $3.0 million, respectively, of the $9.0 million income recorded to accumulated other comprehensive loss during the year ended December 31, 2019. The overall change was partially offset by losses in the EUR, representing $6.1 million of the adjustment.

The change in the foreign currency translation adjustment during the year ended December 31, 2018 was primarily due to the movements in the GBP, EUR, CAD, and RUB exchange rates against the USD. The movement in the GBP, EUR, CAD, and RUB represented $12.4 million, $15.2 million, $3.2 million, and $4.6 million respectively, of the $41.2 million loss recorded to accumulated other comprehensive loss during the year ended December 31, 2018.

Accumulated earnings of the Company's U.K. subsidiary totaling $375.4 million have been previously taxed in the U.S. or were deemed to have been repatriated as part of the one-time transition tax under the Act enacted December 22, 2017. The Company has deemed a corresponding amount of intercompany accounts between its U.S. and U.K. subsidiaries to be of a long-term investment nature; these balances have been remeasured to foreign currency translation adjustment during the years ended December 31, 2020 and 2019.

Derivative Instruments

See Note 16 for further information on changes to accumulated other comprehensive loss related to the derivative instruments.

(18) Net Income Per Share

Basic net income per share is calculated by dividing net income by the weighted average number of common shares outstanding for the applicable period. Diluted net income per share is calculated after adjusting the denominator of the basic net income per share calculation for the effect of all potentially dilutive common shares, which in the Company's case, includes shares issuable under the stock option and incentive award plan.

The following table reconciles the basic to diluted weighted average shares outstanding (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Basic weighted average common shares outstanding	63,352	64,506	64,123
Effect of dilutive stock options and RSAs/RSUs	1,406	1,498	2,218
Diluted weighted average common shares outstanding	64,758	66,004	66,341
Anti-dilutive shares	2,413	1,998	1,620

The anti-dilutive shares disclosed above were calculated using the treasury stock method. The treasury stock method calculates dilution assuming the exercise of all in-the-money options and vesting of RSAs/RSUs, reduced by the repurchase of shares with the proceeds from the assumed exercises, and unrecognized compensation expense for outstanding awards.

(19) Supplemental Cash Flow Information

The following table presents the Company's supplemental cash flow information (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Cash paid during the period for:			
Income taxes, net of refunds	$ 77,505	$ 111,283	$ 43,127
Interest	40,337	42,198	48,911
Non-cash investing and financing activities:			
Accrued fixed assets purchases	9,897	9,767	10,312
Cashless exercises of stock options	—	—	12,390

The acquisition date fair value of contingent consideration liabilities recorded during the year ended December 31, 2020 totaled $44.5 million. Refer to Note 3 - Significant Accounting Polices and Note 4 - Business Combinations.

Supplemental cash flow disclosures related to ASC 842 are included in Note 7 - Leases.

(20) Operations by Geographic Area

The table below presents certain enterprise-wide information about the Company's operations by geographic area for the years ended December 31, 2020, 2019, and 2018. The Company attributes revenues to geographical locations based upon where the services are performed.

The Company's operations within each geographical region are further broken down to show each country which accounts for 10% or more of the totals (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Revenue:			
Americas:			
United States [1]	$ 2,153,271	$ 2,082,204	$ 1,962,509
Other	26,579	48,670	47,116
Americas	2,179,850	2,130,874	2,009,625
Europe, Africa, and Asia-Pacific			
United Kingdom	837,202	758,432	689,345
Netherlands	96,438	113,029	115,778
Other	69,875	63,927	57,174
Europe, Africa, and Asia-Pacific	1,003,515	935,388	862,297
Total revenue	$ 3,183,365	$ 3,066,262	$ 2,871,922

[1] All revenue earned by the Data Solutions segment is recorded in the United States.

	December 31,	
	2020	2019
Long-lived assets:		
Americas:		
United States	$ 223,218	$ 220,167
Other	5,787	6,944
Americas	229,005	227,111
Europe, Africa, and Asia-Pacific		
United Kingdom	21,203	21,872
Netherlands	55,627	41,527
Other	66,929	76,549
Europe, Africa, and Asia-Pacific	143,759	139,948
Total long-lived assets	$ 372,764	$ 367,059

(21) Segments

The Company is managed through two reportable segments, (i) Clinical Research and (ii) Data Solutions. In accordance with the provisions of ASC 280, "Segment Reporting", the Company's chief operating decision-maker has been identified as the Chief Executive Officer, who reviews operating results to make decisions about allocating resources and assessing performance for the entire company.

- *Clinical Research Segment*: The Clinical Research segment, which primarily serves biopharmaceutical clients, provides outsourced clinical research and clinical trial related services.

- *Data Solutions Segment*: The Data Solutions segment provides data and analytics, technology solutions, and real-world insights and services primarily to the Company’s life science clients.

The Company's chief operating decision maker uses segment profit as the primary measure of each segment's operating results in order to allocate resources and in assessing the Company's performance. Asset information by segment is not presented, as this measure is not used by the chief operating decision maker to assess the Company's performance. The Company’s reportable segment information is presented below (in thousands):

	Years Ended December 31,		
	2020	2019	2018
Revenue:			
Clinical Research	$ 2,923,045	$ 2,812,969	$ 2,622,409
Data Solutions	260,320	253,293	249,513
Total revenue	3,183,365	3,066,262	2,871,922
Direct costs (exclusive of depreciation and amortization)**:**			
Clinical Research	1,456,055	1,366,066	1,334,803
Data Solutions	192,946	173,475	165,423
Total direct costs (exclusive of depreciation and amortization)	1,649,001	1,539,541	1,500,226
Reimbursable expenses:			
Clinical Research	665,633	650,080	570,405
Data Solutions	128	—	—
Total reimbursable expenses	665,761	650,080	570,405
Segment profit:			
Clinical Research	801,357	796,823	717,201
Data Solutions	67,246	79,818	84,090
Total segment profit	$ 868,603	$ 876,641	$ 801,291
Less expenses not allocated to segments:			
Selling, general and administrative expenses	453,032	394,925	371,795
Transaction-related costs	(44,465)	1,835	35,817
Depreciation and amortization expense	131,630	114,898	112,247
Loss on disposal of fixed assets, net	317	1,058	120
Consolidated income from operations	328,089	363,925	281,312
Interest expense, net	(43,130)	(51,987)	(57,399)
Loss on modification or extinguishment of debt	(450)	(3,928)	(952)
Foreign currency losses, net	(25,499)	(2,257)	(1,043)
Other (expense) income, net	(1)	174	(371)
Consolidated income before income taxes and equity in income of unconsolidated joint ventures	$ 259,009	$ 305,927	$ 221,547

(22) Quarterly Financial Data (unaudited)

The following table summarizes the Company's unaudited quarterly results of operations (in thousands, except per share data:

	2020			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Revenue	$ 783,708	$ 729,891	$ 796,307	$ 873,458
Income from operations [2]	63,180	43,626	124,160	97,123
Provision for income taxes	16,871	7,112	13,058	24,925
Net income	40,660	13,874	91,252	51,257
Comprehensive (loss) income	(3,492)	28,349	127,479	106,002
Basic earnings per share [1]	$ 0.65	$ 0.22	$ 1.44	$ 0.80
Diluted earnings per share [1]	$ 0.63	$ 0.22	$ 1.41	$ 0.78

PRA HEALTH SCIENCES, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

	2019			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Revenue	$ 722,022	$ 763,309	$ 780,691	$ 800,240
Income from operations	78,723	88,013	95,788	101,401
Provision for income taxes	28,138	24,804	3,375	6,491
Net income	44,256	41,055	83,007	74,801
Net (income) loss attributable to non-controlling interests	(172)	73	—	—
Net income attributable to PRA Health Sciences, Inc.	44,084	41,128	83,007	74,801
Comprehensive income	43,827	39,820	56,384	112,296
Comprehensive income attributable to noncontrolling interest	(127)	(48)	—	—
Comprehensive income attributable to PRA Health Sciences, Inc.	$ 43,700	$ 39,772	$ 56,384	$ 112,296
Basic earnings per share [1]	$ 0.68	$ 0.63	$ 1.28	$ 1.19
Diluted earnings per share [1]	$ 0.66	$ 0.62	$ 1.25	$ 1.16

(1) The sum of the quarterly per share amounts may not equal per share amounts reported for year-to-date periods. This is due to changes in the number of weighted average shares outstanding and the effects of rounding for each period.

(2) During the three months ended March 31, 2020, the Company recorded $0.6 million of transaction-related costs associated with the change in fair value of contingent consideration. During the three months ended September 30, 2020, the Company recorded a $45.1 million reduction to transaction-related costs associated with the change in fair value of contingent consideration.

(23) Subsequent Events

On February 24, 2021, the Company entered into a definitive merger agreement to be acquired by ICON plc (ICON). Under the terms of the merger agreement, the Company's stockholders will receive $80 per share in cash and 0.4125 shares of ICON common stock for each share of PRA common stock upon the closing of the transaction. The obligation of the parties to complete the merger is subject to customary closing conditions, including, among others, approval by the Company's stockholders and regulatory approvals.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As of December 31, 2020, we carried out an evaluation under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, of the effectiveness of the design and operation of our disclosure controls and procedures. Regulations under the Exchange Act require public companies, including us, to maintain "disclosure controls and procedures," which are defined in Rule 13a-15(e) and Rule 15d-15(e) of the Exchange Act to mean a company's controls and other procedures that provide reasonable assurance that information required to be disclosed in reports that it files or submits under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in the SEC's rules and forms and that such information is accumulated and communicated to management, including our principal executive officer and principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosures. There are inherent limitations to the effectiveness of any system of disclosure controls and procedures, including the possibility of human error and the circumvention or overriding of the controls and procedures. Accordingly, even effective disclosure controls and procedures can only provide reasonable assurance of achieving their control objectives. Based upon our evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective as of the end of the period covered by this report to accomplish their objectives at a reasonable assurance level.

Management's Report on Internal Control Over Financial Reporting

Our management's report on internal control over financial reporting is set forth in Part II, Item 8 of this Annual Report on Form 10-K and is incorporated herein by reference.

Changes in Internal Control over Financial Reporting

There has been no change in our internal control over financial reporting during the quarter ended December 31, 2020 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Pursuant to General Instructions G(3), information on our directors and corporate governance matters will be filed in a Form 10-K/A within 120 days after the registrant's fiscal year ended December 31, 2020.

We maintain a Code of Conduct that is applicable to all of our directors, officers and employees, including our Chairman, Chief Executive Officer, Chief Financial Officer and other senior financial officers. The Code of Conduct sets forth our standards of ethical business conduct, including conflicts of interest, compliance with applicable laws, accurate books and records, full and fair disclosure, use of our assets and reporting mechanisms for illegal or unethical behavior. This Code of Conduct also satisfies the requirements for a code of ethics, as defined by Item 406 of Regulation S-K promulgated by the SEC. We will disclose within four business days any substantive amendments to the Code of Conduct or waivers of the Code of Conduct granted to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, by posting such information on our website as set forth above rather than by filing a Form 8-K.

The Code of Conduct may be found on the Corporate Governance page of our Investor Relations website at investor.prahs.com.

Item 11. Executive Compensation

Pursuant to General Instructions G(3), information on executive compensation will be filed in a Form 10-K/A within 120 days after the registrant's fiscal year ended December 31, 2020.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Pursuant to General Instructions G(3), information on security ownership of certain beneficial owners and management and related shareholder matters will be filed in a Form 10-K/A within 120 days after the registrant's fiscal year ended December 31, 2020.

Item 13. Certain Relationships and Related Transactions, and Director Independence

Pursuant to General Instruction G(3), information on certain relationships and related transactions and director independence will be filed in a Form 10-K/A within 120 days after the registrant's fiscal year ended December 31, 2020.

Item 14. Principal Accountant Fees and Services

Pursuant to General Instruction G(3), information on principal accounting fees and services will be filed in a Form 10-K/A within 120 days after the registrant's fiscal year ended December 31, 2020.

PART IV

Item 15. Exhibits, Financial Statement Schedules

(1) Financial Statements

The following financial statements and supplementary data are included in Item 8 of this annual report:

(2) Financial Statement Schedules

The information required to be submitted in the Financial Statement Schedules for PRA Health Sciences, Inc. and subsidiaries has either been shown in the financial statements or notes, or is not applicable or required under Regulation S-X; therefore, those schedules have been omitted.

(3) Exhibits

The exhibits listed in the accompanying Exhibit Index following the signature page are filed or furnished as a part of this report and are incorporated herein by reference.

Item 16. Form 10-K Summary

None.

EXHIBIT INDEX

Exhibit Number	Description of Exhibit
3.1	Amended and Restated Certificate of Incorporation of PRA Health Sciences, Inc. (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K filed on November 18, 2014 (No. 001-36732))
3.2	Amended and Restated Bylaws of PRA Health Sciences, Inc. (incorporated by reference to Exhibit 3.2 to the Registrant's Current Report on Form 8-K filed on November 18, 2014 (No. 001-36732))
4.1*	Description of Securities Registered Pursuant to Section 12(b) of the Exchange Act
10.1 **	PRA Health Sciences, Inc., Amended and Restated 2017 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018)
10.2**	PRA Health Sciences, Inc. 2020 Stock Incentive Plan (incorporated by reference as Exhibit 10.1 to the Current Report on Form 8-K filed on May 22, 2020).
10.3**	PRA Health Sciences, Inc. 2018 Stock Incentive Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on May 31, 2018 (No. 001-36732))
10.4**	2014 Omnibus Incentive Plan (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed on November 18, 2014 (No. 001-36732))
10.5**	PRA Global Holdings, Inc. 2013 Equity Incentive Plan (incorporated by reference to Exhibit 10.2 to the Registrant's Registration Statement on Form S-1 (No. 333-198644))
10.6**	PRA Holdings, Inc. 2007 Equity Incentive Plan (incorporated by reference to Exhibit 10.3 to the Registrant's Registration Statement on Form S-1 (No. 333-198644))
10.7**	Form of Stock Option Agreement (incorporated by reference to Exhibit 10.6 to the Registrant's Registration Statement on Form S-1 (No. 333-198644))
10.8**	Form of Rollover Option Agreement (incorporated by reference to Exhibit 10.7 to the Registrant's Registration Statement on Form S-1 (No. 333-198644))
10.9**	Employment Agreement, effective August 16, 2018, between PRA Health Sciences, Inc. and Colin Shannon (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on August 20, 2018 (No. 001-36732))
10.10**	Employment Agreement, effective April 27, 2018, between PRA Health Sciences, Inc. and Michael J. Bonello (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on May 1, 2018 (No. 001-36732))
10.11**	Restricted Stock Grant Notice and Restricted Stock Agreement under the PRA Health Sciences, Inc. 2014 Omnibus Incentive Plan between PRA Health Sciences, Inc. and Michael J. Bonello, dated April 27, 2018 (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed on May 1, 2018 (No. 001-36732)).
10.12**	Amendment to Employment Agreement, effective October 31, 2018, between PRA Health Sciences, Inc. and Michael J. Bonello (incorporated by reference to Exhibit 10.13 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2018)
10.13	Credit Agreement, dated as of October 28, 2019, by and among Pharmaceutical Research Associates, Inc., PRA Health Sciences, Inc., PNC Bank, National Association, as administrative agent and other agents and lenders party thereto. (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K dated October 30, 2019)
10.14	Security Agreement, dated as of October 28, 2019, by and among Pharmaceutical Research Associates, Inc., PRA Health Sciences, Inc., each of the subsidiaries from time to time party thereto and PNC Bank, National Association (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K dated October 30, 2019)
10.15	Guarantee Agreement, dated as of October 28, 2019, by and among the guarantors from time to time party thereto in favor of PNC Bank, National Association, as collateral agent (incorporated by reference to Exhibit 10.3 to the Registrant's Current Report on Form 8-K dated October 30, 2019)
10.16**	Form of Non-Qualified Stock Option Agreement under the PRA Holdings, Inc. 2007 Equity Incentive Plan (incorporated by reference to Exhibit 10.22 to the Registrant's Registration Statement on Form S-1 (No. 333-198644))
10.17**	Form of Non-Qualified Stock Option Agreement (Time-Based Vesting) under the PRA Holdings, Inc. 2007 Equity Incentive Plan (incorporated by reference to Exhibit 10.23 to the Registrant's Registration Statement on Form S-1 (No. 333-198644))
10.18**	Form of Non-Qualified Stock Option Agreement (Performance-Based Vesting) under the PRA Holdings, Inc. 2007 Equity Incentive Plan (incorporated by reference to Exhibit 10.24 to the Registrant's Registration Statement on Form S-1 (No. 333-198644))

10.19**	Form of Option Agreement of PRA International (incorporated by reference to Exhibit 10.25 to the Registrant's Registration Statement on Form S-1 (No. 333-198644))
10.20**	Form of Restricted Stock Grant Notice under the PRA Health Sciences, Inc. 2014 Omnibus Incentive Plan (incorporated by reference to Exhibit 10.27 to the Registrant's Registration Statement on Form S-1 (No. 333-198644))
10.21**	Form of Option Grant Notice under the PRA Health Sciences, Inc. 2014 Omnibus Incentive Plan (Incorporated by reference to Exhibit 10.1 to the Registrant's Current Report the Form 8-K filed on September 5, 2017).
10.22**	Form of Option Grant Notice and Option Agreement under the PRA Health Sciences, Inc. 2018 Stock Incentive Plan. (incorporated by reference to Exhibit 10.21 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2019)
10.23**	Form of Restricted Stock Grant Notice and Restricted Stock Agreement under the PRA Health Sciences, Inc. 2018 Stock Incentive Plan. (incorporated by reference to Exhibit 10.22 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2019)
10.24**	Form of Option Grant Notice and Agreement under the PRA Health Sciences, Inc. 2020 Stock Incentive Plan (incorporated by reference as Exhibit 10.2 to the Current Report on Form 8-K filed on May 22, 2020).
10.25**	Form of Restricted Stock Unit Grant Notice and Agreement under the PRA Health Sciences, Inc. 2020 Stock Incentive Plan (incorporated by reference as Exhibit 10.3 to the Current Report on Form 8-K filed on May 22, 2020).
10.26**	Form of Restricted Stock Grant Notice and Agreement under the PRA Health Sciences, Inc. 2020 Stock Incentive Plan (incorporated by reference as Exhibit 10.1 to the Current Report on Form 8-K filed on September 16, 2020).
10.27	Receivables Financing Agreement, dated as of March 22, 2016, by and among PRA Holdings, Inc., PNC Bank, National Association, as administrative agent, and other agents and lenders party thereto (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on March 25, 2016 (No. 001-36732))
10.28	Purchase and Sale Agreement, dated as of March 22, 2016, by and among PRA Holdings, Inc., PNC Bank, National Association, as administrative agent, and other agents and lenders party thereto (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed on March 25, 2016 (No. 001-36732))
10.29	Joinder and First Amendment to the Receivables Financing Agreement between PRA Receivables LLC, PRA Holdings, Inc. the Toronto-Dominion Bank and PNC Bank, National Association, dated as of May 31, 2018. (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on June 5, 2018 (No. 001-36732))
10.30	Second Amendment to the Receivables Financing Agreement dated December 18, 2020 among PRA Holdings, Inc., as servicer, PRA Receivables LLC, as borrower, PNC Bank, National Association, as administrative agent and as a lender, and The Toronto-Dominion Bank, as a lender (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on December 22, 2020).
10.31* **	Employment Agreement, effective August 10, 2018, between PRA Health Sciences, Inc. and Christopher L. Gaenzle
21.1*	Subsidiaries of the Registrant
23.1*	Consent of Deloitte & Touche LLP
24.1*	Power of Attorney (included on the signature page to this Annual Report on Form 10-K for the year ended December 31, 2020)
31.1*	Certification of the Chief Executive Officer pursuant to Rule 13a-14(a) or 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Certification of the Chief Financial Officer pursuant to Rule 13a-14(a) or 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1*	Certification of the Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2*	Certification of the Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101*	The following financial information from PRA Health Sciences, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2020 formatted in inline XBRL: (i) Consolidated Balance Sheets as of December 31, 2020 and December 31, 2019, (ii) Consolidated Statements of Operations for the years ended December 31, 2020, 2019 and 2018, (iii) Consolidated Statements of Comprehensive Income for the years ended December 31, 2020, 2019 and 2018, (iv) Consolidated Statements of Cash Flows for the years ended December 31, 2020, 2019 and 2018, and (v) Notes to Consolidated Financial Statements
104*	Cover page from PRA Health Sciences, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2020, formatted in inline XBRL and contained in Exhibit 101.

* Filed herewith.

** This document has been identified as a management contract or compensatory plan or arrangement.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf on February 24, 2021 by the undersigned, thereunto duly authorized.

PRA Health Sciences, Inc.

By: /s/ Michael J. Bonello

Name: Michael J. Bonello

Title: Executive Vice President and Chief Financial Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENT that the undersigned officers and directors of PRA Health Sciences, Inc. do hereby constitute and appoint Colin Shannon and Michael J. Bonello, and each of them, as his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place, and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming that all said attorneys-in-fact and agents, or any of them or their or his or her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed by the following persons on behalf of the registrant and in the capacities on the dates indicated.

Signature	Capacity	Date
/s/ Colin Shannon Colin Shannon	President, Chief Executive Officer and Chairman of the Board of Directors (Principal Executive Officer)	February 24, 2021
/s/ Michael J. Bonello Michael J. Bonello	Executive Vice President and Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	February 24, 2021
/s/ Jeffrey T. Barber Jeffrey T. Barber	Director	February 24, 2021
/s/ James C. Momtazee James C. Momtazee	Director	February 24, 2021
/s/ Matthew P. Young Matthew P. Young	Director	February 24, 2021
/s/ Linda S. Grais Linda S. Grais	Director	February 24, 2021
/s/ Alexander G. Dickinson Alexander G. Dickinson	Director	February 24, 2021
/s/ Glen D. Stettin Glen D. Stettin	Director	February 24, 2021

DESCRIPTION OF SECURITIES
REGISTERED PURSUANT TO SECTION 12 OF
THE SECURITIES EXCHANGE ACT OF 1934

The following summary describes our common stock, par value $0.01 per share, of PRA Health Sciences, Inc. (“us,” “we,” “our,” and the “Company”), which are the only securities of the Company registered pursuant to Section 12 of the Securities Exchange Act of 1934, as amended.

DESCRIPTION OF COMMON STOCK

The following summary describes the material terms of our common stock and is not complete. This summary is qualified in its entirety by reference to the General Corporation Law of the State of Delaware (the “DGCL”), our amended and restated certificate of incorporation, and our amended and restated bylaws. For a complete description of our common stock, we refer you to our amended and restated certificate of incorporation and amended and restated bylaws, which have been filed with the SEC and are incorporated by reference as exhibits to this Annual Report on Form 10-K.

Voting Rights— Holders of our common stock are entitled to one vote for each share held of record on all matters to which stockholders are entitled to vote generally, including the election or removal of directors. The holders of our common stock do not have cumulative voting rights in the election of directors.

Dividends— The DGCL permits a corporation to declare and pay dividends out of "surplus" or, if there is no "surplus," out of its net profits for the fiscal year in which the dividend is declared and/or the preceding fiscal year. "Surplus" is defined as the excess of the net assets of the corporation over the amount determined to be the capital of the corporation by the board of directors. The capital of the corporation is typically calculated to be (and cannot be less than) the aggregate par value of all issued shares of capital stock. Net assets equals the fair value of the total assets minus total liabilities. The DGCL also provides that dividends may not be paid out of net profits if, after the payment of the dividend, capital is less than the capital represented by the outstanding stock of all classes having a preference upon the distribution of assets.

Declaration and payment of any dividend will be subject to the discretion of our board of directors. The time and amount of dividends will be dependent upon our financial condition, operations, cash requirements and availability, debt repayment obligations, capital expenditure needs and restrictions in our debt instruments, industry trends, the provisions of Delaware law affecting the payment of dividends to stockholders and any other factors our board of directors may consider relevant.

Liquidation— Upon our liquidation, dissolution or winding up and after payment in full of all amounts required to be paid to creditors and to the holders of preferred stock having liquidation preferences, if any, the holders of our common stock will be entitled to receive pro rata our remaining assets available for distribution.

Rights and Preferences— Holders of our common stock do not have preemptive, subscription, redemption or conversion rights. The common stock will not be subject to further calls or assessment by us. There will be no redemption or sinking fund provisions applicable to the common stock. All shares of our common stock that will be outstanding at the time of the completion of the offering will be fully paid and non-assessable. The rights, powers, preferences and privileges of holders of our common stock will be subject to those of the holders of any shares of preferred stock we may authorize and issue in the future.

EMPLOYMENT AGREEMENT

EMPLOYMENT AGREEMENT (this "Agreement"), entered into effective August 10, 2018 (the "Effective Date"), between PRA Health Sciences, Inc., a Delaware corporation (the "Company") and Christopher L. Gaenzle (the "Executive").

WITNESSETH:

WHEREAS, the Company desires to assure itself of the future services of the Executive and wishes the Executive to be employed by the Company, and the Executive is willing to enter into an agreement to that end, upon the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereby covenant and agree as follows:

1. Employment

The Company hereby agrees to employ the Executive, and the Executive hereby agrees to be in the employ of the Company, on and subject to the terms and conditions of this Agreement.

2. Term

The period of this Agreement (the "Agreement Term") shall commence on the Effective Date and shall continue until terminated in accordance with Section 6 hereof. Although Executive's term of employment hereunder shall commence as of the Effective Date, the parties agree that Executive shall begin the performance of services for the Company on a future mutually agreed date based on Executive's ability to work for the Company on an unrestricted basis (the "Commencement Date").

3. Position, Duties and Responsibilities

Beginning on the Commencement Date:

(a) The Executive shall serve as, and with the title, office and authority of, Executive Vice President, Chief Administrative Officer, and General Counsel of the Company. The Executive shall also, from time to time as requested by the Company, hold similar titles, offices and authority with the Company's subsidiaries and its successors.

(b) The Executive shall have all powers, authority, duties and responsibilities usually incident to the positions and offices of Executive Vice President, Chief Administrative Officer and General Counsel of the Company. The Executive shall report directly to the Company's Chief Executive Officer.

(c) The Executive agrees to devote substantially all of his business time, efforts and skills to the performance of his duties and responsibilities under this Agreement; provided, however, that nothing in this Agreement shall preclude the Executive from devoting reasonable periods required for (i) participating in professional, educational, philanthropic, public interest, charitable, social or community activities, (ii) serving as a director or member of an advisory committee of any corporation or other entity that the Executive is serving on as of the Effective Date or, subject to prior approval of the Board of Directors of the Company (the "Board"), any other corporation or entity that is not in competition with the Company, or (iii) managing his personal investments; provided, further, that any such activities set forth in clauses (i) through (iii) above do not materially interfere with the Executive's regular performance of his duties and responsibilities hereunder.

(d) The Executive shall perform his duties at the offices of the Company located in Raleigh, North Carolina, but from time to time the Executive may be required to travel to other locations in the proper conduct of his responsibilities under this Agreement.

4. Compensation and Benefits

In consideration of the services rendered by the Executive, during the Agreement Term the Company shall pay or provide the Executive the compensation and benefits set forth below.

(a) Salary. The Company shall pay the Executive a base salary (the "Base Salary") equal to $525,000.00 per annum. The Base Salary will be reviewed by the Compensation Committee of the Board (the "Compensation Committee") no less frequently than annually for possible merit increases as the Compensation Committee deems appropriate. The Base Salary may not be reduced following the Effective Date. The Base Salary shall be paid in arrears in substantially equal installments at monthly or more frequent intervals, in accordance with the normal payroll practices of the Company.

(b) Annual Incentive Bonuses. The Company shall provide the Executive with the opportunity to earn an annual target bonus of $225,000.00 for each calendar year of the Company, beginning in the year of the Executive's Commencement Date, as determined by the Compensation Committee in its discretion (the "Annual Bonus"). The amount, if any, of such Annual Bonus shall be determined based upon the Company's and/or the Executive's attainment of reasonable performance goals approved by the Compensation Committee in its sole discretion. Each such Annual Bonus shall be payable on such date or dates as is determined by the Compensation Committee. Notwithstanding any other provision of this Section 4(b), no bonus shall be payable pursuant to this Section 4(b) unless the Executive remains continuously employed with the Company through the applicable bonus payment date. Any Annual Bonus hereunder shall otherwise be payable under the terms of the Company's annual bonus program for its senior officers.

(c) Benefits and Perquisites. The Executive will participate in all executive compensation plans, including cash-based long-term incentive plans, and in the same benefits

and perquisites maintained by the Company for senior executives, on terms that are no less favorable than for other senior executives of the Company.

5. Equity Incentives

During the Agreement Term, the Executive will be eligible for such equity incentive awards under the PRA Health Sciences, Inc. 2018 Stock Incentive Plan (the "Plan") (or any successor plan), as the Compensation Committee shall determine in its discretion. The Compensation Committee has approved the grant of non-qualified stock options and shares of restricted stock as of the Effective Date. The amount and terms of such grants have been separately communicated to Executive.

6. Termination of Employment

The Agreement Term will be terminated upon the occurrence of any of the following events:

(a) Resignation for Good Reason. The Executive may voluntarily terminate his employment hereunder for Good Reason. For purposes of this Agreement, "Good Reason" shall mean any of the following:

(i) Any material breach of this Agreement by the Company (where the Company fails to cure such breach within ten (10) business days after being notified in writing by the Executive of such breach);

(ii) The material diminution, without the Executive's written consent, of the Executive's position, title, authority, duties or responsibilities as indicated in the Employment Agreement, or the appointment of any other person, without the Executive's written consent, to perform any material part of such duties, including without limitation, the failure of the Executive to have such duties and responsibilities with respect to the acquiring entity following a Change in Control (as defined below); or

(iii) Any required relocation of the Executive's principal place of employment by more than 50 miles;

(iv) The failure by the Company to obtain the assumption in writing of its obligation to perform under this Agreement by any successor to all or substantially all of the assets of the Company.

The Executive may terminate his employment for Good Reason by providing the Company thirty (30) days' written notice, or ten (10) days' written notice in the case of a breach set forth in clause (i) above, setting forth in reasonable specificity the event that constitutes Good Reason, within ninety (90) days of the occurrence of such event.

During such applicable advance notice period, the Company shall have the opportunity to cure (if curable) the event that constitutes Good Reason, and if not cured within such period, the

Executive's termination will be effective upon the expiration of such cure period. For purposes of this Agreement, "Change in Control" shall be as defined under the Plan on the date of the Change in Control or as defined under the Plan on the date hereof, whichever is more favorable to the Executive.

(b) Resignation without Good Reason. The Executive may voluntarily terminate his employment hereunder for any reason at any time upon 90 days' written notice to the Company, including for any reason that does not constitute Good Reason.

(c) Termination for Cause. The Company may terminate the Executive's employment hereunder for Cause. For purposes of this Agreement, the Executive shall be considered to be terminated for "Cause" only upon the occurrence of any of the following:

(i) A material breach of this Agreement by the Executive (where the Executive fails to cure such breach within ten (10) business days after being notified in writing by the Company of such breach);

(ii) The Executive's willful refusal (except where due to a physical or mental incapacity) to substantially perform his material duties with respect to the Company which continues beyond ten (10) days after a written demand for substantial performance is delivered to the Executive by the Company;

(iii) The Executive engaging in or causing an act of willful misconduct that has a material adverse impact on the reputation, business, business relationships or financial condition of the Company;

(iv) The Executive's conviction of, or plea of guilty or nolo contendere to, a felony, or any crime involving moral turpitude not involving a traffic offense; or

(v) The Executive's willful refusal to perform the specific lawful directives of the Board which are consistent with the scope of the Executive's duties and responsibilities hereunder;

provided, however, that no action taken by the Executive in the reasonable, good faith belief that it was in the best interest of the Company shall be treated as a basis for termination of the Executive's employment for Cause under clause (i) above, and no failure of the Executive or the Company to achieve performance goals, alone, shall be treated as a basis for termination of the Executive's employment for Cause under clause (ii) or (v) above.

(d) Termination without Cause. The Board shall have the right to terminate the Executive's employment hereunder other than for Cause at any time, subject to the consequences of such termination as set forth in this Agreement.

(e) Disability. The Executive's employment hereunder shall terminate upon his Disability. For purposes of this Agreement, "Disability" shall mean the Executive is eligible for

disability payments under the Company's long-term disability plan as in effect on the date hereof.

(f) Death. The Executive's employment hereunder shall terminate upon his death.

7. Compensation Upon Termination of Employment

In the event the Executive's employment by the Company is terminated during the Agreement Term, the Executive shall be entitled to the severance payments and benefits specified below:

(a) Resignation for Good Reason; Termination without Cause. In the event the Executive voluntarily terminates his employment hereunder for Good Reason or is terminated by the Company other than for Cause, the Company shall pay the Executive and provide him with the following:

(i) Accrued Obligations. The Company shall pay and provide the Executive with his Accrued Obligations. For purposes of this Agreement, "Accrued Obligations" shall consist of the following: (A) accrued and unpaid Base Salary and accrued and unused paid time off through the date of termination; (B) any accrued but unpaid annual bonus with respect to any completed fiscal year of the Company which has ended prior to the date of termination (except upon an involuntary termination for Cause or the existence of Cause is found following a voluntary termination); (C) all accrued and vested benefits under employee pension (including 401(k)) and welfare plans in which the Executive participates, in accordance with applicable plan terms; and (D) unreimbursed business expenses incurred through the termination date, in accordance with Company business expense reimbursement policy.

(ii) Severance Payment. The Company shall pay the Executive an amount equal to the sum of the Executive's annual Base Salary and an amount equal to the Target Bonus Amount for the calendar year immediately preceding the date of the termination of employment (such sum hereinafter defined as the "Severance Amount"). The Severance Amount shall be paid over twelve (12) calendar months, in arrears in substantially equal installments at monthly or more frequent intervals and in accordance with the normal payroll practices of the Company, commencing on the Payment Date (defined below in Section 22(c)).

(iii) Equity Rights. The vesting and exercisability of any outstanding stock options or other equity awards held by the Executive at the time of termination of employment will be governed by the terms of such awards.

(iv) Company-Paid Continuation Coverage. Following the date of the Executive's termination of employment, the Executive and his eligible dependents shall be entitled to continue participating in the Company's group medical, dental, and other health benefit coverages as required under the health care continuation requirements of

the Consolidated Omnibus Reconciliation Act of 1985 ("COBRA"). Such coverages shall be provided to the Executive and his eligible dependents for the 12-month period following the date of the Executive's termination of employment (the COBRA Period") with the same employee cost-sharing as is provided to employees of the Company generally during this 12-month period; provided, however, that if (i) the Company providing any payment or benefit pursuant to this Section 7(a)(iv) would violate the nondiscrimination rules applicable to non-grandfathered plans, or result in the imposition of penalties under, the Patient Protection and Affordable Care Act of 2010 ("PPACA") and related regulations and guidance promulgated thereunder, the parties agree to reform this Section 7(a)(iv) in such manner as is necessary to comply with PPACA, or (ii) the Company is otherwise unable to continue to cover the Executive under its group medical, dental, and other health benefit coverages, or is unable to do so on a pre-tax basis, then, in either case, an amount equal to each remaining Company reimbursement shall thereafter be paid to the Executive as currently taxable compensation in substantially equal monthly installments over the COBRA Period (or the remaining portion thereof) (the "Company-Paid Continuation Coverage").

(b) Resignation without Good Reason; Termination for Cause; Death; Disability. In the event the Executive voluntarily terminates his employment hereunder other than for Good Reason, is terminated by the Company for Cause, or is terminated on account of death or Disability, the Company shall have no obligations to the Executive under this Agreement other than to pay the Executive and provide him with any Accrued Obligations. The vesting and exercisability of any outstanding stock options or other equity awards held by the Executive at the time of any such termination of employment will be governed by the terms of such awards.

8. Change in Control

In the event that the employment of the Executive is terminated on or prior to the expiration of the one-year period immediately following a Change in Control either (a) by the Executive for Good Reason or (b) by the Company other than for Cause: (i) in lieu of the Severance Amount payable pursuant to Section 7(a)(ii) hereof, the Executive will be entitled to a lump-sum payment on the Payment Date equal to two times the Severance Amount (as calculated under Section 7(a)(ii) hereof); and (ii) in lieu of the Company-Paid Continuation Coverage being provided for twelve (12) months pursuant to Section 7(a)(iv) hereof, the Executive will be entitled to Company-Paid Continuation Coverage for twenty-four (24) months following termination of employment.

9. Effect of Excise Tax and Limit on Golden Parachute Payments.

(a) Contingent Reduction of Parachute Payments. If there is a change in ownership or control of the Company that would cause any payment or distribution by the Company or any of its subsidiaries or any other person or entity to the Executive or for the Executive's benefit (whether paid or payable or distributed or distributable pursuant to the terms of this Agreement or otherwise) (each, a "Payment", and collectively, the "Payments") to be subject to the excise tax imposed by Section 4999 of the Internal Revenue Code of 1986, as amended (the "Code")

(such excise tax, together with any interest or penalties incurred by the Executive with respect to such excise tax, the "Excise Tax"), then the Executive will receive the greatest of the following, whichever gives the Executive the highest net after-tax amount (after taking into account federal, state, local and social security taxes): (1) the Payments or (2) one dollar less than the amount of the Payments that would subject the Executive to the Excise Tax (the "Safe Harbor Amount"). If a reduction in the Payments is necessary so that the Payments equal the Safe Harbor Amount, then the reduction will be determined in a manner which has the least economic cost to the Executive and, to the extent the economic cost is equivalent, will be reduced in the inverse order of when payment would have been made to the Executive, until the reduction is achieved. Any reductions pursuant to this Section shall be made in a manner intended to be consistent with the requirements of Section 409A of the Code and the Department of Treasury Regulations and other interpretive guidance issued thereunder, including without limitation any such regulations or other guidelines that may be issued after the Effective Date ("Section 409A").

(b) Determination of the Payments. All determinations required to be made under this Section, including whether and when the Safe Harbor Amount is required and the amount of the reduction of the Payments and the assumptions to be utilized in arriving at such determination, shall be made by a certified public accounting firm designated by the Company (the "Accounting Firm") which shall provide detailed supporting calculations both to the Company and the Executive within fifteen (15) business days of the receipt of notice from the Executive that there has been a Payment, or such earlier time as is requested by the Company. All fees and expenses of the Accounting Firm shall be borne solely by the Company. Any determination by the Accounting Firm shall be binding upon the Company and the Executive. The Executive shall cooperate with any reasonable requests by the Company in connection with any contests or disputes with the Internal Revenue Service in connection with the Excise Tax.

(c) Adjustments. As a result of the uncertainty in the application of Section 4999 of the Code at the time of a determination hereunder, it is possible that Payments will be made which should not have been made under clause (a) of this Section ("Overpayment") or that additional Payments which are not made pursuant to clause (a) of this Section should have been made ("Underpayment"). In the event that there is a final determination by the Internal Revenue Service, or a final determination by a court of competent jurisdiction, that an Overpayment has been made, any such Overpayment shall be treated for all purposes as a loan to the Executive which the Executive shall repay to the Company together with interest at the applicable Federal rate provided for in Section 7872(f) (2) of the Code. In the event that there is a final determination by the Internal Revenue Service, a final determination by a court of competent jurisdiction or a change in the provisions of the Code or regulations pursuant to which an Underpayment arises under this Agreement, any such Underpayment shall be promptly paid by the Company to or for the benefit of the Executive, together with interest at the applicable Federal rate provided for in Section 7872(f) (2) of the Code.

(d) Consultation. The Company shall consult with the Executive in good faith regarding the implementation of the provisions of this Section and the application of Sections 4999 and 409A of the Code; provided, that neither the Company nor any of its subsidiaries, employees or representatives shall have any liability to the Executive with respect thereto.

10. No Mitigation

The Executive shall not be required to seek other employment or to reduce any severance payment or benefit payable to him under Section 7 or 8 hereof, and no such severance benefit shall be reduced on account of any compensation received by the Executive from other employment.

11. Release

Notwithstanding any other provision of this Agreement, all payments and benefits provided under Section 7(a)(ii) and (iv) or Section 8 hereof, as applicable, shall be conditioned upon the Executive executing and honoring a release of claims in favor of the Company in the Company's standard form for Company officers in accordance with Section 22(c) hereof (the "Release").

12. Tax Withholding

All compensation payable pursuant to this Agreement shall be subject to reduction by all applicable withholding, social security and other federal, state and local taxes and deductions.

13. Restrictive Covenants

(a) Covenant Not to Disclose Confidential Information. The Executive acknowledges that during the course of his affiliation with the Company he will have access to and knowledge of certain information and data which the Company considers confidential and the release of such information or data to unauthorized persons would be extremely detrimental to the Company. As a consequence, the Executive hereby agrees and acknowledges that he owes a duty to the Company not to disclose, and agrees that without the prior written consent of the Company, at any time, either during or after his employment with the Company, he will not communicate, publish or disclose, to any person anywhere or use, any Confidential Information (as hereinafter defined), except as may be necessary or appropriate to conduct his duties hereunder, provided the Executive is acting in good faith and in the best interests of the Company, or as may be required by law or judicial process or as provided below in Section 13(f). The Executive will use his best efforts at all times to hold in confidence and to safeguard any Confidential Information from falling into the hands of any unauthorized person and, in particular, will not permit any Confidential Information to be read, duplicated or copied. The Executive will promptly return to the Company all Confidential Information in the Executive's possession or under the Executive's control whenever the Company shall so request, and in any event will promptly return all such Confidential Information if the Executive's relationship with the Company is terminated for any or no reason and will not retain any copies thereof. For purposes hereof the term "Confidential Information" shall mean any information or data used by or belonging or relating to the Company or any of its subsidiaries or affiliates that is not known generally to the industry and which the Company maintains on a confidential basis, including, without limitation, any and all trade secrets, proprietary data and information relating to the

Company's business and products, price lists, customer lists, processes, procedures or standards, know-how, manuals, business strategies, records, drawings, specifications, designs, financial information, whether or not reduced to writing, or information or data which the Company advises the Executive should be treated as confidential information.

(b) Covenant Not to Compete. The Executive acknowledges that he will establish favorable relations with the customers, clients and accounts of the Company and will have access to Confidential Information and trade secrets of the Company. Therefore, in consideration of such relations and to further protect Confidential Information and trade secrets, directly or indirectly, of the Company, the Executive agrees that, at all times during his employment by the Company and for a period of twelve (12) months from the date of termination of the Executive, the Executive will not, directly or indirectly, without the express written consent of the Company:

(i) within (A) the country, region of the country, state, and/or surrounding states in which the Executive's office with the Company was located at the time of the Executive's termination, or (B) fifty (50) miles of the location of the Executive's office with the Company at the time of Executive's termination, be engaged as or employed by or provide services or advice to a Competing CRO (as defined below), whether as owner, manager, officer, director, employee, consultant or otherwise (1) provide products or services that are the same or substantially similar to the products and services provided by the Company and its affiliates or (2) perform duties and responsibilities that are the same or substantially related to the duties and responsibilities that the Executive performed for the Company at any time during the twenty-four (24) months prior to the Executive's termination. "Competing CRO" means any entity (and its respective affiliates and successors) that competes with the Company and its affiliates in the provision of Customer Services (as defined below). "Customer Services" means any product or service provided by the Company and/or its affiliates to a third party for remuneration, including, but not limited to on a contract or outsourced basis, assisting pharmaceutical or biotechnology companies in developing and taking drug compounds, biologics, and drug delivery devices through appropriate regulatory approval processes, and/or recruiting, staffing and placement of personnel in the areas of clinical research, medical writing, biostatistics and programming, in each case (A) during the period of the Executive's employment with the Company, or (B) about which the Executive has knowledge and that which the Executive had knowledge that the Company and/or its affiliates will provide or has contracted to provide to third parties during the twelve (12) months following the Agreement Term;

(ii) Whether as owner, manager, officer, director, employee, consultant or otherwise, solicit the business of, or accept business from any Customer (as defined below) of the Company and/or its affiliates, unless the business being solicited or accepted is not in competition with or substantially similar to the business of the Company and/or its affiliates. For the purposes of this Section 13(b), "Customer" means any person or legal entity (and its subsidiaries, agents, employees and representatives) about whom the Executive has acquired information during the period of the Executive's

employment with the Company through the end of the Agreement Term and as to whom the Executive has knowledge that the Company and/or its affiliates has provided or does provide services at any time upon, or during the twenty-four (24) months prior to, the Executive's termination, or will during the twelve (12) months following the Agreement Term provide services; or

(iii) (A) solicit or induce (or attempt to solicit or induce) to leave the employ of the Company or any of its affiliates for any reason whatsoever any person employed by the Company or any of its affiliates at the time of the act of solicitation or inducement, including by (1) identifying for any third party employees of the Company or any of its affiliates who have special knowledge concerning the processes, methods or confidential affairs of the Company and/or its affiliates or (2) commenting about the quality of work, special knowledge, compensation, skills or personal characteristics of any employee of the Company or any of its affiliates to any third party or (B) hire any person who was employed by the Company or any of its affiliates at the time of the Executive's termination or at any time during the six months prior to the Executive's termination.

(c) Non-Disparagement. At all times during the Agreement Term and thereafter, neither the Executive nor the Company's directors or executive officers shall express any opinions or views or knowingly take any other actions that are intended to adversely affect the business reputation or goodwill of the other party.

(d) Specific Performance. Recognizing that irreparable damage will result to the Company in the event of the breach or threatened breach of any of the foregoing covenants and assurances by the Executive contained in paragraphs (a), (b) or (c) hereof, and that the Company's remedies at law for any such breach or threatened breach will be inadequate, the Company and each of its successors and assigns, in addition to such other remedies which may be available to them, shall be entitled to an injunction, including a mandatory injunction, to be issued by any court of competent jurisdiction ordering compliance with this Agreement or enjoining and restraining the Executive, and each and every person, firm or company acting in concert or participation with him, from the continuation of such breach and, in addition thereto, the Executive shall pay to the Company all ascertainable damages, including costs and reasonable attorneys' fees sustained by the Company by reason of the breach or threatened breach of said covenants and assurances. The obligations of the Executive and the rights of the Company, its successors and assigns under this Section 13 shall survive the termination of this Agreement for the periods set forth above. The covenants and obligations of the Executive set forth in this Section 13 are in addition to and not in lieu of or exclusive of any other obligations and duties of the Executive to the Company, whether express or implied in fact or in law. In addition, the Executive further acknowledges that if he breaches any provision of this Section 13 following his termination of employment with the Company, the Executive will forfeit the right to any unpaid severance or other payments under this Agreement. For purposes of this Section 13, "Company" shall include all subsidiaries of the Company.

(e) Potential Unenforceability of Any Provision. If a final judicial determination is made that all or any portion of any provision of this Agreement is an unenforceable restriction

against the Executive in any jurisdiction, such provision, or portion thereof, shall be rendered void, but only to the extent that such judicial determination finds such provision, or portion thereof, unenforceable and only in such jurisdiction and such unenforceable provision, or portion thereof, shall automatically be reconstituted in such jurisdiction, whether as to duration, scope or otherwise, in a manner that is, to the maximum degree or level permitted, enforceable under the laws of such jurisdiction and as so reconstituted, shall become a part of this Agreement, effective as of the Effective Date.

(f) Certain Permissible Disclosures and Communications. Nothing in this Agreement, including this Section 13, shall prohibit or impede the Executive from communicating, cooperating or filing a complaint with any U.S. federal, state or local governmental or law enforcement branch, agency or entity (collectively, a "Governmental Entity") with respect to possible violations of any U.S. federal, state or local law or regulation, or otherwise making disclosures to any Governmental Entity, in each case, that are protected under the whistleblower provisions of any such law or regulation, provided that in each case such communications and disclosures are consistent with applicable law. The Executive does not need the prior authorization of (or to give notice to) the Company regarding any such communication or disclosure. The Executive hereby confirms that the Executive understands and acknowledges that an individual shall not be held criminally or civilly liable under any federal or state trade secret law for the disclosure of a trade secret that is made (i) in confidence to a federal, state, or local government official or to an attorney solely for the purpose of reporting or investigating a suspected violation of law, or (ii) in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal. The Executive understands and acknowledges further that an individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual files any document containing the trade secret under seal; and does not disclose the trade secret, except pursuant to court order. Notwithstanding the foregoing, under no circumstance will the Executive be authorized to disclose any information covered by the Company's attorney-client privilege or the Company's attorney work product (i) without prior written consent of the Company's General Counsel or other officer designated by the Company, or (ii) unless such disclosure of that information would otherwise be permitted pursuant to 17 CFR 205.3(d)(2), applicable state attorney conduct rules, or otherwise under applicable law or court order.

10. Indemnification

To the fullest extent permitted by the indemnification provisions of the Certificate of Incorporation and Bylaws of the Company in effect as of the date of this Agreement, and the indemnification provision of the laws of the jurisdiction of the Company's incorporation in effect from time to time, the Company shall indemnify the Executive as a director, senior officer or employee of the Company against all liabilities and reasonable expenses that may be incurred in any threatened, pending or completed action, suit or proceeding, and shall pay for the reasonable expenses incurred by the Executive in the defense of or participation in any such action, suit or proceeding to which the Executive is a party because of his service to the Company. The rights of the Executive under this indemnification provision shall survive the termination of

employment with respect to events occurring prior to termination of employment on a basis not less favorable than is provided for any other officer of the Company (other than the Chief Executive Officer). In addition, during the Agreement Term and thereafter, the Executive will be covered by Director and Officer insurance maintained by the Company for present and past executives on a basis that is no less favorable than for any other officer the Company (other than the Chief Executive Officer).

11. Successors

(a) This Agreement shall be binding upon and shall inure to the benefit of the Company and each of its successors and any person, firm, corporation or other entity which succeeds to all or substantially all of the business, assets or property of the Company. As used in this Agreement, the "Company" shall mean the Company as hereinbefore defined and any successor to its business, assets or property as aforesaid which executes and delivers an agreement provided for in this Section 15 or which otherwise becomes bound by all the terms and provisions of this Agreement by operation of law.

(b) This Agreement and all rights of the Executive hereunder shall inure to the benefit of and be enforceable by the Executive's personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees. If the Executive should die while any amounts are due and payable to him hereunder, all such amounts, unless otherwise provided herein, shall be paid to the Executive's designated beneficiary or, if there be no such designated beneficiary, to the legal representatives of the Executive's estate.

10. No Assignment

Except as to withholding of any tax under the laws of the United States or any other country, state or locality, neither this Agreement nor any right or interest hereunder nor any amount payable at any time hereunder shall be subject in any manner to alienation, sale, transfer, assignment, pledge, attachment, or other legal process, or encumbrance of any kind by the Executive or the beneficiaries of the Executive or by his legal representatives without the Company's prior written consent, nor shall there be any right of set-off or counterclaim in respect of any debts or liabilities of the Executive, his beneficiaries or legal representatives, except in the case of termination of employment for Cause (other than with respect to any set-off on nonqualified deferred compensation that is subject to Section 409A); provided, however, that nothing in this Section 16 shall preclude the Executive from designating a beneficiary to receive any benefit payable on his death, or the legal representatives of the Executive from assigning any rights hereunder to the person or persons entitled thereto under his will or, in case of intestacy, to the person or persons entitled thereto under the laws of intestacy applicable to his estate.

11. Entire Agreement

This Agreement contains the entire understanding of the parties with respect to the subject matter hereof and, except as specifically provided herein, cancels and supersedes any and all other agreements between the parties with respect to the subject matter hereof, including but

not limited to the Prior Agreement. Any amendment or modification of this Agreement shall not be binding unless in writing and signed by the Company and the Executive.

12. Severability

In the event that all or any portion of any provision of this Agreement is determined to be invalid or unenforceable, the remaining terms and conditions of this Agreement shall be unaffected and shall remain in full force and effect, and any such determination of invalidity or unenforceability shall not affect the validity or enforceability of any other provision of this Agreement.

13. Notices

All notices which may be necessary or proper for the Company or the Executive to give to the other shall be in writing and shall be delivered by hand or sent by registered or certified mail, return receipt requested, or by air courier, to the Executive at the address of the Executive on file with the Company (or such other address as the Executive may designate by written notice to the Company) and shall be sent in the manner described above to the Chief Executive Officer of the Company at the Company's principal executives offices at 4130 ParkLake Avenue, Suite 400, Raleigh, North Carolina 27612 or delivered by hand to the Chief Executive Officer of the Company, and shall be deemed given when sent, provided that any notice required under Section 6 hereof shall be deemed given only when received. Any party may, by like notice to the other party, change the address at which she or they are to receive notices hereunder.

14. Governing Law

This Agreement shall be governed by and enforceable in accordance with the laws of the State of North Carolina, without giving effect to the principles of conflict of laws thereof.

15. Arbitration

Except to the extent that injunctive relief is sought for any breach of restrictive covenants, any controversy or claim arising out of, or related to, this Agreement, or the breach thereof, shall be settled by binding arbitration in Raleigh, North Carolina, in accordance with the rules of the American Arbitration Association then in effect, and the arbitrator's decision shall be binding and final, and judgment upon the award rendered may be entered in any court having jurisdiction thereof. Each party will pay one-half of the arbitration expenses and his or its own legal fees and costs; provided, in any dispute after a Change in Control, the Company (or successor) will pay all arbitration fees, and all of the Executive's reasonable legal expenses if the Executive prevails on at least one material issue in dispute, as determined by the arbitrator. Notwithstanding any other provision of this Agreement, obligations of the parties under this Section 21 shall survive any termination of employment.

16. Section 409A

(a) General. The parties hereto acknowledge and agree that, to the extent applicable, this Agreement shall be interpreted in accordance with, and incorporate the terms and conditions required by, Section 409A. Notwithstanding any provision of this Agreement to the contrary, in the event that the Company determines that any amounts payable hereunder will be immediately taxable to the Executive under Section 409A, the Company reserves the right (without any obligation to do so or to indemnify the Executive for failure to do so) to (a) adopt such amendments to this Agreement and appropriate policies and procedures, including amendments and policies with retroactive effect, that the Company determines to be necessary or appropriate to preserve the intended tax treatment of the benefits provided by this Agreement, to preserve the economic benefits of this Agreement and to avoid less favorable accounting or tax consequences for the Company and/or (b) take such other actions as the Company determines to be necessary or appropriate to exempt the amounts payable hereunder from Section 409A or to comply with the requirements of Section 409A and thereby avoid the application of penalty taxes thereunder. Notwithstanding anything herein to the contrary, no provision of this Agreement shall be interpreted or construed to transfer any liability for failure to comply with the requirements of Section 409A from the Executive or any other individual to the Company or any of its affiliates, employees or agents and neither the Company nor any of its affiliates shall be liable for any additional tax, interest, or penalties that may be imposed on the Executive as a result of Section 409A or any damages for failing to comply with Section 409A (other than for withholding obligations or other obligations applicable to employers, if any, under Section 409A).

(b) Separation from Service under Section 409A. Notwithstanding any provision to the contrary in this Agreement: (i) no amount shall be payable pursuant to Section 7 or 8 unless the termination of the Executive's employment constitutes a "separation from service" within the meaning of Section 1.409A-1(h) of the Department of Treasury Regulations; (ii) for purposes of Section 409A, the Executive's right to receive any installment payments or benefits pursuant to Section 7(a) shall be treated as a right to receive a series of separate and distinct payments within the meaning of Section 409A; and (iii) to the extent that any reimbursement of expenses or in-kind benefits constitutes "deferred compensation" under Section 409A, such reimbursement or benefit shall be provided no later than December 31 of the year following the year in which the expense was incurred. The amount of expenses reimbursed in one year shall not affect the amount eligible for reimbursement in any subsequent year. The amount of any in-kind benefits provided in one year shall not affect the amount of in-kind benefits provided in any other year. Notwithstanding anything in this Agreement to the contrary, if the Executive is deemed by the Company at the time of the Executive's separation from service to be a "specified employee" for purposes of Section 409A and to the extent delayed commencement of any portion of the payments to which the Executive is entitled under this Agreement is required in order to avoid subjecting the Executive to additional tax or interest (or both) under Section 409A, then any such payment shall not be provided to the Executive prior to the earlier of (A) the expiration of the six (6) month period measured from the date of the separation from service or (B) the date of the Executive's death. Upon the first business day following the expiration of the applicable period, all payments deferred pursuant to the preceding sentence shall be paid in a lump sum to the Executive (or, if applicable, the Executive's estate, heirs or legal representatives), and any remaining payments due to the Executive under this Agreement shall be paid as otherwise provided herein.

(c) Release. Notwithstanding anything to the contrary in this Agreement, to the extent that any payments of "nonqualified deferred compensation" (within the meaning of Section 409A) due under this Agreement as a result of the Executive's termination of employment are subject to the Executive's execution and delivery of a Release as provided under this Agreement: (i) the Company shall deliver the Release to the Executive within ten (10) business days following the date of Executive's termination of employment, and the Company's failure to deliver a Release prior to the expiration of such ten (10) business day period shall constitute a waiver of any requirement to execute a Release; (ii) if the Executive fails to execute the Release on or prior to the Release Expiration Date (as defined below) or timely revokes his acceptance of the Release thereafter, the Executive shall not be entitled to any payments or benefits otherwise conditioned on the Release; and (iii) in any case where the date of Executive's termination of employment and the Release Expiration Date fall in two separate taxable years, any payments required to be made to the Executive that are conditioned on the Release and are treated as nonqualified deferred compensation for purposes of Section 409A shall be made in the later taxable year. For purposes of this Section 22(c), "Release Expiration Date" shall mean the date that is twenty-one (21) days following the date upon which the Company timely delivers the Release to the Executive, or, in the event that the Executive's termination of employment is "in connection with an exit incentive or other employment termination program" (as such phrase is defined in the Age Discrimination in Employment Act of 1967), the date that is forty-five (45) days following such delivery date. The "Payment Date" for any payments due under this Agreement as a result of the Executive's termination of employment shall be the first payroll date following the date that the Executive executes and does not revoke the Release (and the applicable revocation period has expired) or, in the case of any payments that are delayed pursuant to Section 22(c)(iii), the first payroll date to occur in the subsequent taxable year, if later.

10. Counterparts

This Agreement may be executed in counterparts, and by different parties on separate counterparts, each of which shall be deemed an original, but all such counterparts shall together constitute one and the same instrument.

[*Rest of page intentionally omitted*]

IN WITNESS WHEREOF, the Company and the Executive have executed this Agreement as of the date first above written.

EXECUTIVE

/s/ Christopher L. Gaenzle
Christopher L. Gaenzle

PRA Health Sciences, Inc.

/s/ Colin Shannon
By: Colin Shannon
Title: Chairman, President and CEO

EXHIBIT 21.1

Jurisdiction of Organization	Entity Name
Argentina	Pharmaceutical Research Associates Ltda Suc. Argentina
Argentina	RPS Research S.A.
Australia	Pharmaceutical Research Associates Pty Limited
Austria	RPS Research Austria GmbH
Belarus	IOOO IMP-Logistics Bel
Belarus	Pharmaceutical Research Associates CIS, LLC, Minsk Rep Office
Belgium	Pharmaceutical Research Associates Belgium BVBA
Bermuda	RPS Bermuda, Ltd.
Brazil	Pharmaceutical Research Associates Ltda.
Brazil	RPS do Brasil Serviços de Pesquisas LTDA.
British Virgin Islands	RPS China Inc.
Bulgaria	Pharmaceutical Research Associates Bulgaria EOOD
Canada	3065613 Nova Scotia Company
Canada	Pharmaceutical Research Associates ULC
Canada	Services de Recherche Pharmaceutique Srl
Chile	PRA Health Sciences Chile SpA
China	PRA Health Sciences China, Inc.
China	PRA Health Sciences China, Inc., Shanghai Branch
China	PRA Health Sciences, Inc., Dalian Branch
Colombia	PRA Health Sciences Colombia SAS
Costa Rica	Research Pharmaceutical Services Costa Rica, LTDA.
Croatia	Pharm Research Associates d.o.o. Ltd. for clinical trials
Czech Republic	Pharmaceutical Research Associates CZ, s.r.o.
Denmark	Pharmaceutical Research Associates Denmark ApS
Egypt	RPS Egypt (Limited Liability Company)
Estonia	RPS Estonia OÜ
Finland	Pharmaceutical Research Associates Finland Oy
France	Pharmaceutical Research Associates Sarl
France	ReSearch Pharmaceutical Services France S.A.S.
Georgia	Pharmaceutical Research Associates Georgia LLC
Germany	Pharmaceutical Research Associates GmbH
Ghana	Pharm Research Associates (UK) Limited, Ghana Branch
Greece	Pharmaceutical Research Associates Greece A.E.
Guatemala	RPS Guatemala, S.A.
Hong Kong	PRA Health Sciences (Hong Kong) Limited
Hungary	Pharmaceutical Research Associates, Hungary Research and Development Ltd.
Iceland	RPS Iceland ehf.
India	Pharmaceutical Research Associates India Private Limited
Ireland	Research Pharmaceutical Services (Outsourcing Ireland) Limited
Israel	Pharmaceutical Research Associates Israel Ltd.
Italy	Pharmaceutical Research Associates Italy S.r.l.
Italy (branch of PRA Germany)	Pharmaceutical Research Associates GmbH sede secondaria
Japan	PRA Health Sciences KK
Japan	PRA Development Center KK
Kenya	PRA Health Sciences Kenya Ltd.
Latvia	RPS Latvia SIA

Jurisdiction of Organization	Entity Name
Lithuania	UAB RPS Lithuania
Malaysia	RPS Malaysia Sdn. Bhd.
Mexico	Pharmaceutical Research Associates Mexico S. de R.L. de C. V.
México	RPS Research México, S. de R.L. de C.V.
México	RPS Research Servicios, S. de R.L. de C.V.
The Netherlands	Pharmaceutical Research Associates Group B.V.
The Netherlands	Pharmaceutical Research Associates Holdings B.V.
The Netherlands	Pharmaceutical Research Associates Metaholdings B.V.
The Netherlands	PRA International B.V.
The Netherlands	PRA International Operations B.V.
The Netherlands	ReSearch Pharmaceutical Services Netherlands B.V.
New Zealand	Pharmaceutical Research Associates New Zealand Limited
Norway	RPS Research Norway AS
Panama	RPS Panama Inc.
Perú	RPS Perú S.A.C.
Philippines	RPS Research Philippines, Inc.
Poland	Pharmaceutical Research Associates Sp. z o.o.
Portugal	PRA International Portugal, Unipessoal Lda.
Puerto Rico	Research Pharmaceutical Services Puerto Rico, Inc.
Romania	Pharmaceutical Research Associates Romania Srl
Russia	Pharmaceutical Research Associates CIS, LLC, Moscow Branch
Russia	Pharmaceutical Research Associates CIS, LLC, St. Petersburg Branch
Russia	IMP Logistics Joint Stock Company
Russia	LLC RPS Research
Serbia	Pharmaceutical Research Associates doo Belgrade, Dragise Basovana 10/1
Serbia	Research Pharmaceutical Services d.o.o. Beograd-Stari grad u likvidaciji
Singapore	Pharmaceutical Research Associates Singapore Pte. Ltd.
Slovakia	Pharmaceutical Research Associates SK s.r.o.
South Africa	PRA Pharmaceutical SA (Proprietary) Limited
South Africa	RPS Research South Africa (Proprietary) Limited
South Korea	Pharmaceutical Research Associates Korea Limited
Spain	Pharmaceutical Research Associates Espana, S.A.U.
Spain	RPS ReSearch Ibérica, S.L.
Spain	RPS Spain S.L.
Sweden	PRA International Sweden AB
Switzerland	PRA Switzerland AG
Switzerland	RPS ReSearch Switzerland GmbH in liquidation
Taiwan	Pharmaceutical Research Associates Taiwan, Inc.
Taiwan	RPS Taiwan Ltd.
Thailand	RPS Research (Thailand) Co., Ltd.
Turkey	PRA Clinical Research & Development Turkey AE
Ukraine	Pharmaceutical Research Associates Ukraine, LLC
Ukraine	OOO IMP-Logistics Ukraine
Ukraine	RPS Ukraine, LLC
United Kingdom	Care Innovations (UK) Limited
United Kingdom	IMP Logistics UK Limited
United Kingdom	Pharm Research Associates (UK) Limited
United Kingdom	Pharm Research Associates Russia Limited

Jurisdiction of Organization	Entity Name
United Kingdom	Sterling Synergy Systems Limited
United States (California)	ClinStar LLC
United States (California)	Nextrials, Inc.
United States (California)	Pharmaceutical Research Associates CIS, LLC
United States (California)	Pharmaceutical Research Associates Eastern Europe, LLC
United States (Delaware)	CRI NewCo, Inc.
United States (Delaware)	CRI Worldwide, LLC
United States (Delaware)	International Medical Technical Consultants, LLC
United States (Delaware)	Parallel 6, Inc.
United States (Delaware)	PRA Early Development Research, Inc.
United States (Delaware)	PRA Holdings, Inc.
United States (Delaware)	PRA Receivables, LLC
United States (Delaware)	PRA International, LLC
United States (Delaware)	Sunset Hills, LLC
United States (Delaware)	ReSearch Pharmaceutical Services, Inc.
United States (Delaware)	ReSearch Pharmaceutical Services, LLC
United States (Delaware)	Roy RPS Holdings LLC
United States (Delaware)	RPS Parent Holding LLC
United States (Delaware)	RPS Global Holdings, LLC
United States (Delaware)	Source Healthcare Analytics, LLC
United States (Delaware)	Symphony Health Solutions Corporation
United States (Delaware)	Care Innovations, Inc.
United States (Delaware)	Care Innovations, LLC
United States (New Jersey)	CRI International, LLC
United States (Utah)	Lifetree Clinical Research, LC
United States (Virginia)	Pharmaceutical Research Associates, Inc.
Uruguay	RPS Global S.A.
Uruguay	RPS Latin America S.A

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in Registration Statement Nos. 333-221259 and 333-238694 on Form S-8 and Registration Statement No. 333-230102 on Form S-3 of our reports dated February 24, 2021, relating to the financial statements of PRA Health Sciences, Inc. and the effectiveness of PRA Health Sciences, Inc.'s internal control over financial reporting, appearing in this Annual Report on Form 10-K of PRA Health Sciences, Inc. for the year ended December 31, 2020.

/s/ Deloitte & Touche LLP

Raleigh, North Carolina
February 24, 2021

Exhibit 31.1

CERTIFICATION

I, Colin Shannon, certify that:

1. I have reviewed this Annual Report on Form 10-K for the year ended December 31, 2020 of PRA Health Sciences, Inc. (the "registrant");
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
    a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
    b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
    c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
    d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
    a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
    b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 24, 2021

/s/ Colin Shannon

Colin Shannon

President, Chief Executive Officer and Chairman of the Board of Directors (Principal Executive Officer)

Exhibit 31.2

CERTIFICATION

I, Michael J. Bonello, certify that:

1. I have reviewed this Annual Report on Form 10-K for the year ended December 31, 2020 of PRA Health Sciences, Inc. (the "registrant");
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
    a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
    b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
    c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
    d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
    a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
    b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 24, 2021

/s/ Michael J. Bonello

Michael J. Bonello

Executive Vice President and Chief Financial Officer
(Principal Financial Officer)

EXHIBIT 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of PRA Health Sciences, Inc. (the "Company") on Form 10-K for the year ended December 31, 2020 filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Colin Shannon, President, Chief Executive Officer and Chairman of the Board of Directors of the Company, do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company for the periods presented therein.

Date: February 24, 2021

By: /s/ Colin Shannon
Colin Shannon

President, Chief Executive Officer and Chairman of the Board of Directors
(Principal Executive Officer)

EXHIBIT 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of PRA Health Sciences, Inc. (the "Company") on Form 10-K for the year ended December 31, 2020 filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Michael J. Bonello, Executive Vice President and Chief Financial Officer of the Company, do hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company for the periods presented therein.

Date: February 24, 2021

By: /s/ Michael J. Bonello
Michael J. Bonello
Executive Vice President and Chief Financial Officer
(Principal Financial Officer)