2019 ANNUAL REPORT

MEDPACE

EXECUTIVE OFFICERS

- **August J. Troendle**
  President, Chief Executive Officer
  and Chairman of the Board of Directors
- **Jesse J. Geiger**
  Chief Financial Officer and
  Chief Operating Officer,
  Laboratory Operations
- **Susan E. Burwig**
  Executive Vice President,
  Operations
- **Stephen P. Ewald**
  General Counsel and
  Corporate Secretary

BOARD MEMBERS

- **August J. Troendle**
  Chairman of the Board of Directors
- **Brian T. Carley**
  Audit Committee, Chair
- **Fred B. Davenport Jr.**
  Lead Director
  Compensation Committee, Chair
  and Audit Committee
- **Ashley M. Keating**
- **Thomas C. King**
- **Robert O. Kraft**
  Audit and Compensation Committee
- **Cornelius P. "Neal" McCarthy III**
  Compensation Committee

CORPORATE OFFICE

Medpace Holdings, Inc.
5375 Medpace Way
Cincinnati, Ohio 45227
513-579-9911
www.medpace.com

TRANSFER AGENT

American Stock Transfer &
Trust Company, LLC
718-921-8124
Email: info@amstock.com
www.astfinancial.com

INVESTOR INQUIRIES

investor@medpace.com

MEDIA INQUIRIES

Julie Hopkins
513-579-9911, ext. 12627
j.hopkins@medpace.com

COMMON STOCK LISTING

NASDAQ under ticker symbol
MEDP

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Deloitte & Touche LLP
250 E 5th St.
Suite 1900
Cincinnati, Ohio 45202

The information included in this Annual Report on Form 10-K as filed with the U.S. Securities and Exchange Commission on February 25, 2020 presents information as of and for the fiscal year ended December 31, 2019 and, accordingly, does not include information for updates or developments that are not required to be otherwise reported in the Annual Report on Form 10-K for the fiscal year ended December 31, 2019.

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

FORM 10-K

(Mark One)

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

For the fiscal year ended December 31, 2019

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: 001-37856

Medpace Holdings, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**32-0434904**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

5375 Medpace Way, Cincinnati, OH 45227
(Address of principal executive offices) (Zip Code)

(513) 579-9911
(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock $0.01 par value	**MEDP**	**Nasdaq Global Select Market**

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, a 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 is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant, based upon the closing sale price as reported on the Nasdaq Global Select Market on June 30, 2019, the last business day of the registrant's most recently completed second fiscal quarter, was approximately $1.8 billion. For purposes of this computation, shares of the registrant's common stock held by each executive officer, director, and each person known to the registrant to own 10% or more of the outstanding voting power have been excluded in that such persons are affiliates.

Indicate the number of shares outstanding of each of the issuer's classes of Common Stock, as of the latest practicable date.

Class	**Number of Shares Outstanding**
Common Stock $0.01 par value	**36,092,497 shares outstanding as of February 21, 2020**

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement to be filed with the Securities and Exchange Commission relating to the 2020 Annual Meeting of Stockholders are incorporated herein by reference into Part III of this Annual Report on Form 10-K to the extent stated herein.

MEDPACE HOLDINGS, INC. AND SUBSIDIARIES
ANNUAL REPORT ON FORM 10-K
FOR FISCAL YEAR ENDED DECEMBER 31, 2019

TABLE OF CONTENTS

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements. We intend such forward-looking statements to be covered by the safe harbor provisions for forward-looking statements contained in Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. All statements other than statements of historical facts contained herein, including statements regarding our results of operations; financial position and performance; liquidity and our ability to fund our business operations and initiatives; capital expenditure and debt service obligations; business strategies, plans and goals, including those related to marketing, acquisitions and expansion of our business; product approvals and plans; industry trends; expectations regarding consumer behaviors and trends; our culture and operating philosophy; human resource management; arrangements with and delivery of our services to the customers; conversion of backlog; dividend policy; legal proceedings; and our objectives for future operations, are forward-looking statements. The words "expect," "anticipate," "intend," "plan," "believe," "seek," "see," "will," "would," "target," and similar expressions are intended to identify forward-looking statements. Forward-looking statements are based largely on our current expectations and projections about future events and financial trends that we believe may affect our financial condition, results of operations, business strategy, short-term and long-term business operations and objectives, and financial needs. These forward-looking statements are subject to inherent uncertainties, risks, changes in circumstances and other important factors that are difficult to predict. Moreover, we operate in a very competitive and rapidly changing environment in which new risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all important factors on our business or the extent to which any factor, or combination of such factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the forward-looking events and circumstances discussed may not occur and our financial condition and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements. We caution you therefore against relying on these forward-looking statements. Some of the important factors that could cause actual results to differ from our expectations include regional, national, or global political, economic, business, competitive, market and regulatory conditions and the other important factors included in this Annual Report on Form 10-K in "Item 1A Risk Factors," "Item 7 Management's Discussion and Analysis of Financial Condition and Results of Operations," and "Item 7A Quantitative and Qualitative Disclosures About Market Risk." We qualify all of our forward-looking statements by these cautionary statements. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise. For a further discussion of the risks relating to our business, see "Item 1A Risk Factors" of Part I of this Annual Report on Form 10-K.

WEBSITE AND SOCIAL MEDIA DISCLOSURE

We use our website (www.medpace.com) and our corporate Facebook, YouTube, LinkedIn, Vimeo, Instagram and Twitter accounts as channels of distribution of company information. The information we post through these channels may be deemed material. Accordingly, investors should monitor these channels, 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 and social media channels are not, however, a part of this report.

TRADEMARKS

We own or have the rights to use various trademarks referred to in this Annual Report on Form 10-K, including, among others, Medpace and ClinTrak and their respective logos. Solely for convenience, we may refer to trademarks in this Annual Report on Form 10-K without the TM and ® symbols. Such references are not intended to indicate, in any way, that we will not assert, to the fullest extent permitted by law, our rights to our trademarks. Other trademarks appearing in this Annual Report on Form 10-K are the property of their respective owners.

MARKET AND INDUSTRY INFORMATION

Market data used throughout this Annual Report on Form 10-K is based on management's knowledge of the industry and the good faith estimates of management. All of management's estimates presented herein are based on industry sources, including analyst reports and management's knowledge. We also relied, to the extent available, upon management's review of independent industry surveys and publications prepared by a number of sources and other publicly available information. We are responsible for all of the disclosure in this Annual Report on Form 10-K and while we believe that each of the publications, studies and surveys used throughout this Annual Report on Form 10-K are prepared by reputable sources, we have not independently verified market and industry data from third-party sources.

All of the market data used in this Annual Report on Form 10-K involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates. While we believe the estimated market position, market opportunity and market size information included in this Annual Report on Form 10-K is generally reliable, such information, which in part is derived from management's estimates and beliefs, is inherently uncertain and imprecise and has not been verified by any independent source. Projections, assumptions and estimates of our future performance and the future performance of the industry in which we operate are necessarily subject to a high degree of uncertainty and risk due to a variety of factors, including those described in "Item 1A Risk Factors" of Part I of this Annual Report on Form 10-K and elsewhere in this Annual Report on Form 10-K. These and other factors could cause results to differ materially from those expressed in our estimates and beliefs and in the estimates prepared by independent parties. See "Forward-Looking Statements" above.

GLOSSARY

We define the terms below that appear throughout this report as follows:

"Large pharmaceutical companies." Large pharmaceutical companies represent the top 20 pharmaceutical companies by worldwide prescription drug sales in the year ended December 31, 2018 as classified by Evaluate Ltd via EvaluatePharma©.

"Mid-sized biopharmaceutical companies." Mid-sized biopharmaceutical companies represent biopharmaceutical companies with at least $250 million in sales in the year ended December 31, 2018, based on publicly available data and management's knowledge, that are not classified as a top 20 pharmaceutical company by Evaluate Ltd via EvaluatePharma©.

"Phase I." Phase I trials are typically conducted in healthy individuals or, on occasion, in patients, and typically involve 20 to 80 subjects and range from a few months to several years. These trials are designed to establish the basic safety, dose tolerance, absorption, metabolism, distribution and excretion of the clinical product candidate, the side effects associated with increasing doses, and if possible, early evidence of effectiveness. If the trial establishes the basic safety and metabolism of the clinical product candidate, Phase II trials are generally initiated.

"Phase II." Phase II trials are conducted in a limited population of patients with the disease or condition that the clinical product candidate is intended to treat. These trials typically test a few hundred patients and last on average 12 to 18 months. Phase II trials are typically designed to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the clinical product candidate for specific targeted diseases or conditions, and to determine dose tolerance, optimal dosage and dosing schedule. Phase II trials are sometimes divided into two phases: Phase IIa trials typically evaluate the dose response of the clinical product candidate and Phase IIb trials typically evaluate the efficacy of the clinical product candidate at the prescribed doses. If the Phase II trials indicate that the clinical product candidate may be safe and effective, Phase III trials are generally initiated.

"Phase III." Phase III trials evaluate the clinical product candidate in significantly larger and more diverse patient populations than Phase I and II trials and are conducted at multiple, geographically dispersed sites. On average, this phase lasts from one to three years. Depending on the size and complexity, Phase III CRO contracts may include multiple sequential trials. During this phase, the clinical product candidate's overall benefit/risk ratio and the basis for product approval are established. If the clinical product candidate successfully completes Phase III, then the sponsor may submit a New Drug Application, or NDA, or Biologics License Application for approval by the United States Food and Drug Administration, or FDA, or a similar marketing authorization application for approval by non-U.S. regulatory agencies.

"Phase IV." Phase IV or "post-approval" trials are intended to monitor the drug's long-term risks and benefits, to analyze different dosage levels, to evaluate different safety and efficacy parameters in target populations or to substantiate marketing claims. Phase IV trials typically enroll thousands of patients and last from six months to several years. The FDA may require Phase IV testing and surveillance programs to monitor the effect of approved drugs which have been commercialized, and the FDA has the power to prevent or limit further marketing of a product based on the results of post-marketing programs.

"Small biopharmaceutical companies." Small biopharmaceutical companies represent biopharmaceutical companies that have less than $250 million in sales in the year ended December 31, 2018, based on publicly available data and management's knowledge.

Part I

Item 1. Business

Overview

We are one of the world's leading clinical contract research organizations, or CROs, by revenue, solely focused on providing scientifically-driven outsourced clinical development services to the biotechnology, pharmaceutical and medical device industries. Our mission is to accelerate the global development of safe and effective medical therapeutics. We differentiate ourselves from our competitors by our disciplined operating model centered on providing full-service Phase I-IV clinical development services and our therapeutic expertise. We believe this combination results in timely and cost-effective delivery of clinical development services for our customers. We believe that we are a partner of choice for small and mid-sized biopharmaceutical companies based on our ability to consistently utilize our full-service, disciplined operating model to deliver timely and high-quality results for our customers. Accordingly, we believe we are well positioned to continue to expand our market share in the growing Phase I-IV CRO market.

We were founded in 1992 by August J. Troendle, an industry pioneer, as a Phase II-IV focused CRO with a strong, scientifically-driven and disciplined operating model. Throughout our 27-year history, we have grown almost exclusively organically, with our core founding members having been integrally involved in developing and instilling our differentiated culture and operating philosophy across our company. We are led by a dedicated and experienced senior management team with significant industry experience and knowledge focused on clinical development. Our senior management team has an average tenure with Medpace of 15 years, including four senior managers with over 20 years with us, and brings a healthy balance of significant experience with Medpace, regulators and other companies in the industry.

We focus on conducting clinical trials across all major therapeutic areas, with particular strength in Cardiology, Metabolic Disease, Oncology, Central Nervous System, or CNS, and Antiviral and Anti-infective or AVAI.

Our Market

Clinical Development Process

Before a new drug can be commercialized, it often must undergo extensive pre-clinical and clinical testing and regulatory review to verify safety and efficacy. CROs provide a comprehensive range of product development services for Phase I-IV clinical trials. These clinical trials are separated into distinct phases in order to thoroughly evaluate the product. Pharmaceutical Research and Manufacturers of America, 2019 Biopharmaceutical Research Industry Profile, a trade group publication, indicates that from drug discovery through approval by the United States Food and Drug Administration, or FDA, developing a new medicine takes approximately 10 to 15 years.

Our Services

We provide a full suite of services supporting the entire clinical development process from Phase I to Phase IV. We offer these services across a wide range of therapeutic areas.

Our comprehensive suite of clinical development services includes, but is not limited to, the following:

Medical Department

The medical department consists of therapeutic leads who provide strategic direction for study design and planning, train operational staff, work with primary investigators, provide medical monitoring and meet with regulatory agencies. Our customers rely on our expertise throughout the entire clinical trial process with therapeutically-focused physicians fully engaged throughout the study. We believe this depth of therapeutic leadership and engagement on each project results in a close working relationship with customers built on a level of trust that results in us being granted greater control over the clinical trial process.

Clinical Trial Management

Our team of clinical trial managers are responsible for leading all aspects of study execution. The clinical trial manager, or CTM, drives accountability across the functional team members and is responsible for successful operational execution. The CTM serves as the primary contact for the customer. Experience and therapeutic expertise are main factors when assigning CTMs to projects.

ClinTrak is integrated with our standard operating procedures ("SOPs"), allowing the CTMs to access real-time study metrics. ClinTrak is constantly evaluated and enhanced with our processes.

Data-Driven Feasibility

We have a dedicated feasibility team consisting of clinical experts who are an integrated part of the project team. Our feasibility team is able to analyze a specific protocol, using many data sources to determine countries and sites that are most appropriate for the study.

Study Start-Up

Our global Study Start-Up staff is well-versed in all aspects of clinical trial start up activities, including study documentation submission processes to independent Institutional Review Boards, or IRBs, ethics committees and to ex-US competent authorities. Our study start-up team includes fully dedicated budget and legal associates to ensure focused negotiations and execution of site contracts.

Patient Recruitment and Retention

We navigate the complex world of patient recruitment and retention by providing strategic solutions that address clinical program needs. Our dedicated internal patient recruitment and retention department supports the study team in providing an overall strategy that identifies patient motivators and any potential barriers to join the clinical research study, and includes recommended strategies to effectively engage and recruit patients, as well as how to retain the patients once they enroll.

Clinical Monitoring

Our clinical monitoring group consists of highly experienced clinical research associates, or CRAs. With their experience and training, our CRAs are able to provide unparalleled site management services that includes both in-house and onsite monitoring. Their knowledge of local regulations and laws, in addition to Good Clinical Practice, or GCP, and International Council on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use, or ICH, guidelines ensure compliance and data quality. Our CRAs report into a global matrix structure to ensure consistent training, oversight and management. Each CRA receives comprehensive, hands-on training in an individualized curriculum consisting of in-house and field-based training, supplemented with clinical research department core rotations and ongoing study-specific training.

Risk-Based Monitoring

We support a comprehensive approach to monitoring to ensure adequate protection of the rights, welfare, and safety of human subjects and the quality and integrity of the study. This approach focuses on prevention and mitigation of important and likely risks to the study, and is part of the overarching surveillance that Medpace utilizes to manage studies. Medpace utilizes this approach for all studies, regardless of whether a centralized monitoring approach is employed.

Regulatory Affairs

Our Regulatory Affairs and Scientific and Strategic Development departments have a strong track record of providing expert strategic, operational, and tactical regulatory guidance, as well as creating thorough, scientifically-grounded regulatory compliant documentation to regulatory agencies around the globe. Members of these teams bring a long tenure of regulatory experience and scientific knowledge to each project. We bring former government officials and experienced drug development subject matter experts to provide comprehensive international support at each stage of the drug and biologics development processes. They have particular expertise within the areas of advanced therapeutics, accelerated development pathways, pediatrics, and rare diseases. We also have a dedicated publishing function that has full electronic and paper publishing capabilities to support all types of international regulatory submissions.

Medical Writing

Medical writers work closely with Medpace's medical experts, biostatisticians, and other members of the study team to develop study protocols, clinical and statistical study reports, and integrated submission documents according to regulatory guidelines. Members of Medpace's medical writing group possess substantial scientific knowledge and experience as well as strong communication skills. This skill set and collaborative approach coupled with a thorough quality control document review process, allow Medpace to produce high-quality, submission-ready documents for each contracted project.

Biometrics and Data Sciences

We provide customers with high-quality data collected during clinical trials that is the foundation of a successful clinical trial and forms the backbone of regulatory submissions, including New Drug Applications. We use global GCP-compliant SOPs, combined with continuous quality control, to ensure that data is consistent, efficient, and comprehensive.

Data Management: Our data management team develops detailed specifications for the collection, organization, validation, analysis and quality control of clinical trial data ensuring the most cost-effective, secure and regulatory compliant process.

Biostatistics: Our experienced team of biostatisticians provides trial design consulting, statistical methodology recommendations, programming expertise and reporting accuracy necessary to deliver clinical trials efficiently and on time. We offer comprehensive data analysis plans, thoroughly tested and validated customized programs, interpretation of study results, integrated efficacy and safety analysis for regulatory submissions, adaptive design and statistical support throughout the clinical trial.

Pharmacovigilance

Our safety and pharmacovigilance group collects, evaluates, analyzes and reports safety information. We provide global adverse event management, physician reviewed safety narrative writing and custom safety surveillance. Monitored by licensed physicians who are trained to provide oversight and to analyze and evaluate the emerging safety profile of the compound, we have designed our process to ensure safety and expedite approvals.

Core Laboratory

Our core laboratory services include both imaging services and cardiovascular core laboratory services. We partner with imaging experts from major academic and clinical institutions involved in research to provide image reading in a secure environment utilizing identical software and workstations integrated into ClinTrak allowing for prompt turnaround and oversight. Our imaging experts have clinical trial experience utilizing imaging modalities such as CT, MRI, PET/CT, 3D volumetric analysis, ultrasound, DEXA, angiography, endoscopy and photography. Our cardiovascular core laboratory provides state-of-the-art standardized electrocardiogram services and data analysis to support clinical trials.

Laboratories

Central Laboratory. Through our Central Laboratory, we provide comprehensive, full-service capabilities globally in four locations, including Cincinnati, Ohio; Leuven, Belgium; Beijing, China; and Singapore. The Central Laboratory has longstanding core competency in specialized esoteric testing, including biomarkers for efficacy in addition to standard assay offerings. Data consistency and harmonization are maintained utilizing global SOPs and reference ranges, identical analytic platforms, methodologies, reagent systems, calibrator and quality control programs, within a strict framework compliant with GCP requirements and regulatory guidelines to ensure laboratory data reflect the impact of the investigational compound and not differences in testing practices.

Bioanalytical Laboratory. Through our Bioanalytical Laboratory we provide highly scientific and value-added testing of biological samples using proprietary methods. Working in a Good Laboratory Practice compliant setting following FDA and European Medicines Agency, or EMA, guidelines, the Bioanalytical Laboratory delivers method transfer, development, validation, sample analysis and metabolite screening and identification of pre-clinical and clinical biological samples with expertise in developing proprietary, highly scientific, esoteric and sensitive tests. Areas of specific bioanalytical expertise include advanced mass spectrometry and immunoassay technologies for bioanalytical analysis and all bioanalytical aspects for small and large molecules. Our Bioanalytical Laboratory is located on our clinical research campus in Cincinnati, Ohio.

Biorepository. Medpace Biorepository Services offers solutions for comprehensive specimen life cycle management, which can begin with providing sample collection kits to sites through to receipt, processing, storage, retrieval and destruction. Our biorepository also provides opportunities to prospectively acquire specific specimens to answer early program decisions or gain insight into clinical trial subject stratification.

Molecular and genetic testing. Medpace supports sponsors with advanced testing to detect pathogenic events at the genome level including viral load and viral shedding, Microsatellite instability (MSI) testing, Sanger sequencing and fragment analysis and targeted gene sequencing panels.

The majority of our laboratory services are performed as a component of a full-service clinical development arrangement with our customers. We also offer our laboratory services on a stand-alone basis, although this has historically represented an immaterial amount of our net revenue. Regardless of the nature of the arrangement, our laboratory services are delivered consistently to our customers as a component of their clinical development activities.

Clinics

Our Clinics offering conducts studies in normal healthy volunteers, special populations, and patient populations over a spectrum of diseases and is located on our clinical research campus in Cincinnati, Ohio. Experience includes, but is not limited to: first-in-human, bioavailability/bioequivalence, single and multiple ascending dose, drug to drug interaction, food effect and device studies.

Quality Assurance

Our quality assurance team works closely with study teams to ensure compliance with protocols, SOPs and regulatory guidelines to ultimately protect research subject safety as well as the integrity and validity of study data. Our quality assurance team also provides services including regulatory training, internal system audits, SOP oversight, hosting of audits and regulatory inspections, as well as performs third party audits of critical vendors and investigative sites on behalf of our customers.

Customers

We have a well-diversified, attractively-positioned customer base that includes small biopharmaceutical companies, mid-sized biopharmaceutical companies and large pharmaceutical companies. We have conducted trials for many of the world's leading pharmaceutical, biotechnology and medical device companies.

We have in the past and may in the future enter into arrangements with our customers or other drug, biologic or medical device companies in which we take on payment risk by making strategic investments in our customers or other drug companies, providing flexible payment terms or fee financing to customers or other companies, or entering into other risk sharing arrangements on trial execution.

Net New Business Awards and Backlog

New business awards represent the value of anticipated future net revenue that has been recognized in backlog during the period. This value is recognized upon the signing of a contract or receipt of a written pre-contract confirmation from a customer that confirms an agreement in principle on budget and scope. New business awards also include contract amendments, or changes in scope, where the customer has provided written authorization for changes in budget and scope or has approved us to perform additional work as of the measurement date. Awards may not be recognized as backlog after consideration of a number of factors, including whether (i) the relevant net revenue is expected only after a pending regulatory hurdle, which might result in cancellation of the study, (ii) the customer funding needed for commencement of the study is not believed to have been secured or (iii) study timelines are uncertain or not well defined. In addition, study amounts that extend beyond three years from measurement date are not included in backlog. The number and amount of new business awards can vary significantly from period to period, and an award's contractual duration can range from several months to several years based on customer and project specifications.

Cancellations arise in the normal course of business and are reflected when we receive written confirmation from the customer to cease work on a contractual agreement or when we believe the future revenue is unlikely to be realized. The majority of our customers can terminate our contracts without cause upon 30 days' notice. Similar to new business awards, the number and amount of cancellations can vary significantly period over period due to timing of customer correspondence and study-specific circumstances.

Net new business awards represent gross new business awards received in a period offset by total cancellations in that period. On an Accounting Standards Codification Topic 606, Revenue from Contracts with Customers ("ASC 606") basis, net new business awards were $1,094.4 million and $899.4 million for the years ended December 31, 2019 and 2018. On an Accounting Standards Codification Topic 605, Revenue Recognition ("ASC 605") basis, net new business awards were $581.0 million and $426.1 million for the years ended December 31, 2018 and 2017, respectively.

Backlog represents anticipated future net revenue from net new business awards that have commenced, but have not been completed. Reported backlog will fluctuate based on new business awards, changes in scope to existing contracts, cancellations, net revenue recognition on existing contracts and foreign exchange adjustments from non-U.S. dollar denominated backlog. As of December 31, 2019, our backlog increased by $225.3 million, or 21.3%, to $1,283.2 million compared to $1,057.9 million as of December 31, 2018. Included within backlog as of December 31, 2019 is approximately $695 million to $715 million that we expect to convert to net revenue in 2020, with the remainder expected to convert to net revenue in years after 2020. Backlog and net new business award metrics may not be reliable indicators of our future period net revenue as they are subject to a variety of factors that may cause material fluctuations from period to period. These factors include, but are not limited to, changes in the scope of projects, cancellations and duration and timing of services provided. No assurance can be given that we will be able to realize the net revenue that is included in backlog. See "Item 1A. Risk Factors—Risks Relating to Our Business—Our backlog may not convert to net revenue at our historical conversion rates," and "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations—New Business Awards, Cancellations and Backlog" of Parts I and II, respectively, of this Annual Report on Form 10-K for more information.

Sales and Marketing

We employ an integrated sales and marketing team to sell our services to biotechnology, pharmaceutical and medical device companies.

We have an experienced and highly trained global team of professional business development representatives and business development support staff focused on securing business from both new and existing customers, through a consultative and strategic sales approach. We embed our medical and scientific experts from the beginning of the sales process when we first engage potential customers, and they remain embedded across the lifecycle of the sale and throughout the life of the project, program or partnership.

As part of its sales strategy, our business development team focuses on a customer segmentation model. Our team targets and engages customers in our addressable market, matches customer characteristics with therapeutic fit and maintains a mindset of full-service outsourcing. Our structured and disciplined approach facilitates strong account evaluation, which results in increased focus by the sales team, the development of effective and productive territories, the management of sales force effectiveness and the creation of a process whereby both marketing and sales operate under the same guiding principles.

We are able to consult collaboratively with our customers and help optimize timely completion of their clinical trials and programs, in part, because we engage our therapeutic experts from the beginning of the sales process and involve our regulatory affairs experts and highly trained operations team throughout the clinical trial process. Our sales team is then able to take the study design, regulatory plan and execution plan discussed up front and carry that through to the proposal and provide a final concept during one-on-one customer discussions and final CRO evaluations.

Our marketing team supports the business development function in three key areas, generating brand awareness through customized campaigns and web-site development, conference planning and lead generation through market research and business intelligence analysis. The marketing team is set up in two mirrored teams, one team to address our therapeutic strategy and tactics, and the second team to monitor and address market environment across our lines of business. All of our sales and marketing data are housed within a third party customer relationship management tool that provides us the analytics we need to make sales planning and sales management decisions.

Competition

We compete primarily against other full-service CROs as well as services provided by in-house research and development, or R&D, departments of biopharmaceutical companies. Our major CRO competitors include Laboratory Corporation of America Holdings, ICON plc, Syneos Health, Inc., PAREXEL International Corporation, PPD, Inc., PRA Health Sciences, Inc., IQVIA Holdings Inc. and numerous specialty and regional CROs.

We generally compete on the basis of a number of factors, including experience within specific therapeutic areas, quality of staff and services, reliability, range of provided services, ability to recruit principal investigators and patients into studies expeditiously, ability to organize and manage large-scale, global clinical trials, global presence with strategically located facilities, speed to completion, price and overall value. We believe we compete effectively with our competitors across these factors, particularly due to our full-service operating model, our deep therapeutic expertise in areas that are among the largest, most complex and fastest growing in pharmaceutical development, our global platform and our experienced and committed management team. However, some of our competitors have greater financial resources and a wider range of service offerings over a greater geographic area than we do, which could put us at a competitive disadvantage with respect to these competitors.

The CRO industry remains fragmented, with several hundred smaller, narrowly focused service providers and a small number of full-service companies with global capabilities. We believe there are significant barriers to others becoming a global provider offering a broad range of services and products including the cost and experience necessary to develop strong therapeutic areas, expertise to manage complex clinical programs, infrastructure to support large global programs, ability to deliver high-quality services and expertise required to prepare regulatory submissions in numerous jurisdictions.

Government Regulation

Development of Drugs, Biologics and Medical Devices

The development of drugs, biologics and medical devices is highly regulated in the United States and other countries. Our services are subject to varying regulatory requirements designed to ensure the quality and integrity of the pre-clinical and clinical trial process. In the United States, the FDA has primary authority to regulate these activities, in addition to the approval process, and the subsequent manufacturing, safety, labeling, storage, record keeping and marketing for these products, which are the responsibility of our customers. Before a marketing application for a drug is ready for submission to regulatory authorities, the candidate drug must often undergo rigorous testing in clinical trials. In the United States, these trials must be conducted in accordance with the Federal Food, Drug, and Cosmetic Act, its implementing regulations, and other federal and state requirements that require

the drug to be tested and studied in certain ways prior to approval. The FDA has similar authority and requirements with respect to the clinical testing of biological products and medical devices. Before a human clinical trial may begin in the United States, the manufacturer or sponsor of the clinical product candidate must file an Investigational New Drug Application, or IND, with the FDA, which contains, among other things, the results of pre-clinical 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 pursuant to, and in accordance with, an effective IND. Each human clinical trial we conduct is subject to the oversight of an IRB, which is an independent committee that has the regulatory authority to review, approve and monitor a clinical trial for which the IRB has responsibility. The FDA and IRB receive reports on the progress of each phase of clinical testing and may require the modification, suspension, or termination of clinical trials if, among other things, an unreasonable risk is presented to patients or if the design of the trial is insufficient to meet its stated objective. In addition, information about certain clinical trials must be made publicly available on the federal government website, www.clinicaltrials.gov.

In the United States, GCP regulations govern the design, conduct, performance, monitoring, auditing, recording, analysis, and reporting of clinical trials. In order to comply with GCP and other requirements, we must, among other things:

- comply with specific requirements governing the selection of qualified principal investigators and clinical research sites;
- obtain specific written commitments from principal investigators;
- obtain IRB review and approval and supervision of the clinical trials by an independent review board or ethics committee;
- obtain a favorable opinion from regulatory agencies to commence a clinical trial;
- verify that appropriate patient informed consents are obtained before the patient participates in a clinical trial;
- ensure that 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;
- monitor drug or biologic accountability at clinical research sites; and
- verify that principal investigators and clinical trial staff maintain records and reports and permit appropriate governmental authorities access to data for review.

Clinical trials conducted outside the United States are subject to the laws and regulations of the country where the trials are conducted. These laws and regulations may or may not be similar to the laws and regulations administered by the FDA and other laws and regulations regarding the protection of patient safety and privacy and the control of clinical trial pharmaceuticals, medical devices or other clinical trial materials. Within the EU, these requirements are enforced by the EMA and requirements may vary slightly from one member state to another. In Canada, clinical trials are regulated by the Health Products and Food Branch of Health Canada as well as provincial regulations. Similar requirements also apply in other jurisdictions, including countries outside the EU and countries in Asia and Latin America where we operate or where our customers may intend to apply for marketing authorization. Clinical trials conducted outside the United States also may be subject to FDA regulation if the clinical trials are conducted pursuant to an IND or an Investigational Device Exemption for a product candidate that will seek FDA approval or clearance. In addition, clinical trial sponsors follow ICH E6 guidelines as a principle for GCP.

The clinical trial customer and the parties conducting the clinical trials share in responsibilities to ensure that all applicable legal and regulatory requirements are fulfilled. Many of the functions we regularly perform in the conduct of clinical trials subject us directly to regulations (e.g., compliance with GCP), and in some circumstances, we will take on legal and regulatory responsibility either through a transfer of obligations to us from our clinical trial customers or our acting as local legal representative for certain of our clinical trial customers. We may be subject to regulatory action if we fail to comply with these requirements. Failure to comply with certain regulations may also result in the termination of ongoing research and disqualification of data collected during the clinical trials. 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 trial, refusal of the FDA to approve

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. See "Item 1A. Risk Factors—Risks Relating to Our Business—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" of Part I of this Annual Report on Form 10-K.

We monitor our clinical trials to test for compliance with applicable laws and regulations in the United States and the foreign jurisdictions in which we operate. We have adopted SOPs 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 requirements.

Health Information Privacy

The confidentiality of personal health information, including patient-specific information collected during clinical trials, is heavily regulated in the United States and other countries. The U.S. Department of Health and Human Services has promulgated rules under the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 and their implementing regulations, including the Privacy and Security Rules, or collectively, HIPAA, that govern the use, handling and disclosure of personally identifiable medical information. These regulations also establish procedures for the exercise of an individual's rights and the methods permissible for de-identification of health information. HIPAA applies to "covered entities," which include certain types of healthcare providers, as well as service providers to covered entities which access protected health information, known as "business associates." Two of our subsidiaries, Medpace Clinical Pharmacology, LLC and C-MARC, LLC, are covered entities under HIPAA. Further, many investigators with whom we are involved in clinical trials are also directly subject to HIPAA as covered entities. There are instances where we may be considered a business associate of a covered entity investigator, and we have signed business associate agreements with some investigators. If we are determined to be a business associate, we would be directly liable for any breaches of protected health information and other HIPAA violations. We are also liable contractually under any business associate agreements we have signed with covered entities. In addition, we are also subject to privacy legislation in Canada under the federal Personal Information Protection and Electronic Documents Act, the Act Respecting the Protection of Personal Information in the Private Sector and the Personal Health Information Protection Act and privacy legislation in the EU under the 95/46/EC Privacy Directive on the protection and free movement of personal data, as replaced by the General Data Protection Regulation from early 2018 onwards. See "Item 1A. Risk Factors—Risks Relating to Our Industry—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" of Part I of this Annual Report on Form 10-K.

Health Industry Arrangements

The conduct of pre-clinical and clinical trials may be subject to laws and regulations that are intended to prevent the misuse of government healthcare program funding. In the United States, these laws include, among others, the False Claims Act, which prohibits submitting or causing the submission of false statements or improper claims for government healthcare program payments; and the Anti-Kickback statute, which prohibits paying, offering to pay or receiving payment with the intent to induce the referral of services or items that are covered under a federal healthcare program. Violations of these laws and regulations may incur administrative, civil, and criminal penalties.

Employee Safety and Workplace Conditions

Most of our employees are office based and subject to health and safety regulations covering offices, with which we comply. In addition to its comprehensive regulation of safety in the workplace, the U.S. Occupational Safety and Health Administration has established extensive requirements relating to workplace safety for healthcare employers whose workers might be exposed to blood-borne pathogens such as HIV and the hepatitis B virus, which apply to our clinic and laboratories. Furthermore, certain employees might have to receive initial and periodic training to ensure compliance with applicable hazardous materials regulations and health and safety guidelines. We are subject to similar regulations with respect to our laboratories in Belgium, Singapore and China.

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.

Intellectual Property

We develop and use a number of proprietary methodologies, analytics, systems, technologies and other intellectual property in the conduct of our business. We rely upon a combination of confidentiality policies, nondisclosure agreements and other contractual arrangements to protect our trade secrets, and copyright and trademark laws to protect other intellectual property rights. We have obtained or applied for trademarks and copyright protection in the United States and in a number of foreign countries. Our material trademarks include Medpace and ClinTrak. Although the duration of trademark registrations varies from country to country, trademarks 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. Although we believe the ownership of trademarks is an important factor in our business and that our success does depend in part on the ownership thereof, we rely primarily on the innovative skills, technical competence and marketing abilities of our employees. We do not have any material licenses, franchises or concessions.

Employees

As of December 31, 2019 we had approximately 3,500 employees worldwide. None of our employees are currently covered by a collective bargaining agreement specific to our company. We believe our overall relations with our employees are good. As of December 31, 2018 and 2017, we had approximately 2,900 and 2,500 employees, respectively.

The success of our business depends upon our ability to attract and retain qualified professional, scientific and technical staff. The level of competition among employers in the United States and overseas for skilled personnel, particularly for those with Ph.D., M.D. or equivalent degrees or training, is high. We believe that our brand recognition and our multinational presence are advantages in attracting qualified candidates. We also believe that the wide range of clinical trials in which we participate allows us to offer broad experience to clinical researchers. In addition, our disciplined and centralized approach to hiring and training has fostered, and we believe will continue to foster, strong employee loyalty and a low turnover rate.

Liability and Insurance

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

At our Phase I clinic, we study the effects of drugs on healthy volunteers. In addition, in our clinical business we, on behalf of our customers, 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 customers 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 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 customers 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.

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 Securities and Exchange Commission, or 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 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.medpace.com, and our investor relations website is located at investor.medpace.com. Information on our website is not incorporated by reference herein. 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

Investing in our common stock involves a high degree of risk. You should consider carefully the risks and uncertainties described below, together with the other information included in this Annual Report on Form 10-K. The occurrence of any of the following risks may materially and adversely affect our business, financial condition, results of operations and future prospects. In these circumstances, the market price of our common stock could decline. Other events that we do not currently anticipate or that we currently deem immaterial may also affect our business, prospects, financial condition and results of operations.

Risks Relating to Our Business

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

We experience termination, cancellation and non-renewals of contracts by our customers in the ordinary course of business, and the number and dollar value of cancellations can vary significantly from year to year.

The time between when a clinical trial is awarded and when it goes to contract is typically several months, and prior to a new business award going to contract, our customers can cancel the award without notice. Moreover, once an award goes to contract, most of our customers for clinical trial services can terminate our contracts without cause upon 30 days' notice. Our customers 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 forego or terminate a particular clinical trial;
- lack of available financing, budgetary limits or changing priorities;
- actions by regulatory authorities;
- changes in law;
- 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 investigator recruitment or patient enrollment in a trial;
- decisions to downsize product development portfolios due to general economic conditions, Market conditions or otherwise;
- 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 customers' manufacturing facilities.

As a result, contract terminations, delays and modifications are a regular part of our business. In the event of termination, our contracts often provide for payment to us of fees for services provided up to the point of termination and for close-out activities for winding down the clinical trial, and reimbursement of all non-cancellable expenses. These payments may not be sufficient for us to maintain our profit margins or recover our costs, 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 customer engagement. Historically, cancellations and delays have negatively impacted our operating results.

Clinical trials can be costly and for the year ended December 31, 2019, 71% and 19% of our net revenue was derived from small biopharmaceutical companies and mid-sized biopharmaceutical companies, respectively, which may have limited access to capital. In addition, we provide services to our customers before they pay us for some of our services. There is a risk that we may initiate a clinical trial for a customer, and the customer subsequently becomes unwilling or unable to fund the completion of the trial. In such a situation, notwithstanding the customer'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 are generally terminable 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 customers cancel, delay or reduce their commitments under our contracts with them. Thus, the loss or delay of a large contract or the loss or delay of multiple contracts could adversely affect our net revenue and profitability. In addition, the terminability of our contracts puts increased pressure on our quality control efforts, since not only can our contracts be terminated by customers as a result of poor performance, but any such termination may also affect our ability to obtain future contracts from the customer involved and others.

Our backlog may not convert to net revenue at our historical conversion rates.

Backlog represents anticipated future net revenue from net new business awards that have commenced, but have not been completed. Reported backlog will fluctuate based on new business awards, changes in scope to existing contracts, cancellations, revenue recognition on existing contracts and foreign exchange adjustments from non-U.S. dollar denominated backlog. Once work begins on a project, net revenue is recognized over the duration of the project. Projects may be terminated or delayed by the customer or delayed by regulatory authorities for reasons beyond our control. To the extent projects are delayed, the timing of our net revenue could be adversely affected. Moreover, in the event that a customer cancels a contract, we often would be entitled to receive payment for services provided up to the point of cancellation and for close-out activities for winding down the clinical trial, and reimbursement of all non-cancellable expenses. Typically, however, we have no contractual right to the full amount of the future net revenue reflected in our backlog in the event of a contract cancellation or subsequent changes in scope that reduce the value of the contract. The duration of the projects included in our backlog, and the related net revenue recognition, generally range from a few months to several years. Our backlog may not be indicative of our future net revenue, and we may not realize all of the anticipated future net revenue reflected in our backlog. A number of factors may affect the realization of our net revenue from backlog, including:

- the size, complexity and duration of the projects;
- the cancellation or delay of projects; and
- 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 projects in any given reporting period that may be included in our backlog. Because of these large projects, our backlog in that reporting period may reach levels that may not be sustained in subsequent reporting periods. Additionally, although an increase in backlog will generally result in an increase in net revenue over time, an increase in backlog at a particular point in time does not necessarily correspond directly to an increase in net revenue during any particular period, or at all. The extent to which contracts in backlog will result in net revenue depends on many factors, including, but not limited to, delivery against project schedules, scope changes, contract terminations and the nature, duration and complexity of the contracts, and can vary significantly 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 net revenue. A decrease in this conversion rate would mean that the rate of net revenue recognized on contracts may be slower than what we have experienced in the past, which could impact our net revenue and results of operations on a quarterly and annual basis. The 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 timeframe for obtaining the necessary regulatory approvals. Additionally, delayed projects will remain in backlog and will not generate revenue at the rate originally expected. Thus, the relationship of backlog to realized revenues is indirect and may vary significantly over time.

Additionally, if small and mid-sized biopharmaceutical companies become less able to access capital in the future, we may see a decrease in backlog conversion to net revenue and net new business awards due to project delays or cancellations. These companies have contributed materially to our historical net revenue. If they cannot commit the same or a greater level of capital to our services going forward, our results of operations may suffer.

Our operating results have historically fluctuated between fiscal quarters and years and may continue to fluctuate in the future, which may adversely affect the market price of our stock.

Our operating results have fluctuated in previous quarters and years and may continue to vary significantly from quarter to quarter and year to year and are influenced by a variety of factors, such as:

- timing of contract amendments for changes in scope that could affect the value of a contract and potentially impact the amount of net new business awards and net revenue from quarter to quarter;
- commencement, completion, execution, postponement or termination of large contracts;
- contract terms for the billing and recognition of revenue milestones;
- progress of ongoing contracts and retention of customers;
- timing of and charges associated with completion of acquisitions and other events;
- changes in the mix of services delivered, both in terms of geography and type of services;
- customer disputes or other issues that may impact the revenue we are able to recognize or the collectability of our related accounts receivable
- exchange rate fluctuations; and
- adoption of Accounting Standards Updates released by the Financial Accounting Standards Board

Our operating results for any particular quarter or year are not necessarily a meaningful indicator of future results and fluctuations in our quarterly or yearly operating results could negatively affect the market price and liquidity of shares of our common stock.

Our operating margins could decrease due to increased pricing pressure or other pressures.

Historically, we have been able to generate the operating margins that we do because of our disciplined, full-service operating model. However, we operate in a highly competitive environment, and, if we experience increased levels of competitive pricing pressure, our operating margins may decrease. In addition, we may adapt our operating model to achieve greater levels of growth or in response to investor demands. Such changes could result in lower operating margins.

Our operating margins and profitability will be adversely affected if we are unable to either achieve efficiencies in our operating expenses or grow revenues at a rate faster than expenses.

We operate in a highly competitive environment and experience competitive pricing pressure. To achieve our operating margins over the last three years, we have implemented initiatives to control the rate of growth of our operating expenses. We will continue to utilize these initiatives in the future with a view to offsetting these pricing pressures; however, we cannot be certain that we will be able to achieve the efficiency gains necessary to maintain or grow our operating margins or that the magnitude of our growth in service revenue will be faster than the growth in our operating costs. If we are unable to grow our service revenue at a faster rate than our operating costs, our operating margins will be adversely affected. Our initiatives and any future cost initiatives may also adversely affect us, as they may decrease employee morale or make it more difficult for us to meet operational requirements.

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 biopharmaceutical companies to perform a wide range of services to assist them in bringing new drugs to market. Our services include monitoring clinical trials, data and laboratory analysis, electronic data capture, patient recruitment 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 foreign regulatory authorities relating to our activities in conducting pre-clinical studies and clinical trials. Before clinical trials begin in the United States, a drug is tested in pre-clinical trials that must comply with Good Laboratory Practice and other requirements. An applicant must file an IND, which must become effective before human clinical testing may begin. Further, an independent IRB, for each medical center proposing to participate in the clinical trial must review and approve the protocol for the clinical trial. Once initiated, clinical trials must be conducted pursuant to and in accordance with the applicable IND conditions, the requirements of the relevant IRBs, the Federal Food, Drug, and Cosmetic Act and its implementing regulations, including GCP, and other requirements. We are also subject to regulation by the Drug Enforcement Administration, or 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 or our customers. Such actions may include injunctions or failure of such regulatory authority to grant marketing approval of our customers' products, imposition of clinical holds or delays, suspension or withdrawal of approvals, rejection of data collected in our clinical trials, license revocation, product seizures or recalls, operational restrictions, civil or criminal penalties or prosecutions, damages or fines. Customers 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 business, financial condition, results of operations, cash flows or 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 results 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. As examples:

- non-compliance generally could result in the termination of ongoing clinical trials or the disqualification of data for submission to regulatory authorities;
- non-compliance could compromise data from a particular trial, such as failure to verify that adequate informed consent was obtained from patients, which could require us to repeat the trial under the terms of our contract at no further cost to our customer, but at a potentially substantial cost to us; and
- breach of a contractual term could result in liability for damages or termination of the contract.

The services we provide in connection with 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 customer or other current customers or failure to obtain future contracts from the affected customer or other current or potential customers.

Investigation of customers. From time to time, one or more of our customers 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 customers 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 customers or regulatory authorities could claim that we performed our services improperly or that we are responsible for clinical trial or program compliance. If our customers or regulatory authorities make such claims against us, we could be subject to significant costs in defending our activities and potential damages, fines or penalties. In addition, negative publicity regarding regulatory compliance of our customers' clinical trials, programs or products could have an adverse effect on our business and reputation.

Insufficient customer funding to complete a clinical trial. As noted above, clinical trials can cost tens of millions of dollars. There is a risk that we may initiate a clinical trial for a customer, and then the customer becomes unwilling or unable to fund the completion of the trial. In such a situation, notwithstanding the customer's ability or willingness to pay for or otherwise facilitate the completion of the trial, we may be ethically bound to complete or wind down the trial at our own expense.

Interactive voice/web response service malfunction. We develop and maintain our own, and also use third-parties to run, interactive voice/web response systems. These systems automatically manage the randomization of patients in a given clinical trial to different treatment arms and regulate the supply of investigational drugs. An error in the design, programming or validation of these systems could lead to inappropriate assignment or dosing of patients which could give rise to patient safety issues, invalidation of the trial or liability claims against us. Furthermore, negative publicity associated with such a malfunction could have an adverse effect on our business and reputation. Additionally, errors in randomization may require us to repeat the trial at no further cost to our customer, but at a substantial cost to us.

In addition to the above U.S. laws and regulations, we must comply with the laws of all countries where we do business, including laws governing clinical trials in the jurisdiction where the trials are performed. Failure to comply with applicable requirements could subject us to regulatory risk, liability and potential costs associated with redoing the trials, which could damage our reputation and adversely affect our operating results.

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.

The majority of our Phase I–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 customers 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 customer. 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, we may be unable to successfully negotiate changes in scope or change orders on a timely basis or at all, which could require us to incur cost outlays ahead of the receipt of any additional revenue. In addition, under US GAAP, we cannot recognize additional revenue anticipated from change orders until appropriate documentation is received by us from the customer authorizing the change. However, if we incur additional expense in anticipation of receipt of that documentation, we must recognize the expense as incurred. 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.

If we are unable to successfully execute our growth strategies, our results of operations or financial condition could be adversely affected.

Our key growth strategies include: continued organic growth, continued maintenance of margins, increasing capture of the high-growth clinical development market, deepening existing and developing new relationships with our core customer segment and pursuing selective and complementary bolt-on acquisitions. Though we will strive to meet these goals, we may not have or adequately build the competencies necessary to achieve our objectives. In addition, we may not receive market acceptance for our services and we may face increased competition. If we are unable to successfully continue our organic growth, continue to maintain our margins, increase our capture of the clinical development market, deepen existing and develop new relationships with our core customer segment, pursue complementary and non-transformative acquisitions or attract additional large pharmaceutical company customers, our future business, reputation, results of operations and financial condition could be adversely affected.

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

Our success substantially depends on the collective performance, contributions and expertise of our senior management team, including August J. Troendle, our Chief Executive Officer and founder, and other key personnel including qualified management, professional, scientific and technical operating staff. There is significant competition for qualified personnel in the biopharmaceutical services industry, particularly for those with higher educational degrees, such as a medical or nursing degree, a Ph.D., or an equivalent degree, and our industry generally tends to experience relatively high levels of employee turnover. If any of our key employees were to join a competitor or to form a competing company, some of our customers might choose to use the services of that competitor or new company instead of our own. Furthermore, customers or other companies seeking to develop in-house capabilities may hire some of our senior management or other key employees. The departure of any key contributor, 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 business, financial condition, results of operations, cash flows or reputation.

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 customers, such as ClinTrak, 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 intend to increase our use of web-enabled and other integrated information systems in delivering our services. We already provide access to such an information system, ClinTrak, to certain of our customers in connection with the services we provide to 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 facilities or at those of our third party provider that backs up our data centers could result in interruptions in the flow of data to our servers and from our servers to our customers. Corruption or loss of data may result in the need to repeat a trial at no cost to the customer, but at significant cost to us, or result in the termination of a contract or damage to our reputation. Moreover, regulatory authorities may impose requirements on the use of electronic

records and signatures for regulatory purposes. For example, FDA's regulations at 21 CFR Part 11 establish the criteria pursuant to which the FDA will consider electronic records and signatures to be trustworthy, reliable, and generally equivalent to paper records and handwritten signatures. Any failures to comply with those regulatory requirements could impact our customers' ability to rely on the data contained in those electronic records in our systems or result in the FDA's rejection of the data. Additionally, in order for our information systems to continue to be effective going forward, we periodically need to upgrade our technology systems and increase our capacity to keep pace with technological developments and our growth as a company. Significant delays in system enhancements or inadequate performance of new or upgraded systems once completed could damage our reputation and harm our business. Our operations also may suffer if we are unable to effectively manage the implementation of and adapt to new technology systems. We have entered into agreements with certain vendors to provide systems development and integration services that develop or license to us the IT platform for programs to optimize our business processes. If such vendors fail to perform as required or if there are substantial delays in developing, implementing and updating the IT platform, our customer delivery may be impaired, and we may have to make substantial further investments, internally or with third parties, to achieve our objectives. Additionally, our progress may be limited by parties with existing or claimed patents who seek to prevent us from using preferred technology or seek license payments from us. Any such shortcoming may require us to make substantial further investments in our IT platform, which could adversely affect our financial results. 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. As our business continues to expand globally, these types of risks may be further increased by instability in the geopolitical climate of certain regions, underdeveloped and less stable utilities and communications infrastructure and other local and regional factors. Although we carry property and business interruption insurance, our coverage might not be adequate to compensate us for all losses that may occur.

Unauthorized disclosure of sensitive or confidential data, whether through system failure or breaches or employee negligence, fraud or misappropriation, could damage our reputation and cause us to lose customers. Similarly, unauthorized access to or through our information systems or those we develop for our customers, 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 result in negative publicity, significant remediation costs, legal liability and damage to our reputation and 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.

If the security of confidential information used in connection with our services is breached or otherwise subject to unauthorized access, our reputation and business may be materially harmed.

Our services require us to collect, store, use, and transmit significant amounts of confidential information, including personally identifiable information, and other critical data. We employ a range of information technology solutions, controls, procedures, and processes designed to protect the confidentiality, integrity, and availability of our critical assets, including our data and information technology systems. While we engage in a number of measures aimed to protect against security breaches and to minimize problems if a data breach were to occur, our information technology systems and infrastructure may be vulnerable to damage, compromise, disruption, and shutdown due to attacks or breaches by hackers or due to other circumstances, such as error or malfeasance by employees or third party service providers or technology malfunction. The occurrence of any of these events, as well as a failure to promptly remedy these events should they occur, could compromise our systems, and the information stored in our systems could be accessed, publicly disclosed, lost, stolen, or damaged. Any such circumstance could adversely affect our ability to attract and maintain customers, cause us to suffer negative publicity, and subject us to legal claims and liabilities or regulatory penalties. In addition, unauthorized parties might alter information in our databases, which would adversely affect both the reliability of that information and our ability to market and perform our services. Techniques used to obtain unauthorized access or to sabotage systems change frequently, are constantly evolving and generally are difficult to recognize and react to effectively. We may be unable to anticipate these techniques or to implement adequate preventive or reactive measures. Several recent, highly publicized data security breaches at other companies have heightened consumer awareness of this issue and may embolden individuals or groups to target our systems or those of our strategic partners or enterprise customers.

Our business could be harmed if we are unable to manage our growth effectively.

We believe that sustained growth places a strain on human, operational and financial resources. To manage our growth, we must continue to attract and retain qualified management, professional, scientific and technical operating personnel and to improve our operating and administrative systems. We believe that maintaining and enhancing both personnel and our systems at reasonable cost are instrumental to our success. We cannot assure you that we will be able to attract and retain qualified operating personnel due to competitiveness in the industry around hiring. Additionally, we cannot assure you that we will be able to enhance our current technology or obtain new technology that will enable our systems to keep pace with developments and the needs of our customers. The nature and pace of our growth introduces risks associated with quality control and customer dissatisfaction due to delays in performance or other problems. In addition, foreign operations involve the additional risks of assimilating differences in foreign business practices, hiring and retaining qualified personnel and overcoming language barriers. Failure to manage growth effectively could have a material adverse effect on our business.

Our customer or therapeutic area concentration may have a material adverse effect on our business, financial condition, results of operations or cash flows.

Although we did not have any customer that represented 10% or more of our net revenue during the year ended December 31, 2019, we derive a significant portion of our revenues from a limited number of large customers. For the year ended December 31, 2019, we derived 28.8% and 7.0% of our net revenue from our top 10 customers and our largest customer, respectively. In addition, approximately 31.3% and 8.5% of our backlog, as of December 31, 2019, was concentrated among our top 10 customers and our largest customer by backlog concentration, respectively. Moreover, 8.5% of our backlog, as of December 31, 2019, was concentrated with our largest customer by net revenue. If any large customer decreases or terminates its relationship with us, our business, financial condition, results of operations or cash flows could be materially adversely affected. Also, consolidation in our actual or potential customer base results in increased competition for important market segments and fewer available customer accounts.

Additionally, conducting multiple clinical trials for different sponsors in a single therapeutic class, involving similar drugs, biologics or medical devices, may adversely affect our business if some or all of the trials are terminated because of new scientific information or regulatory decisions that affect the products as a class. Moreover, even if these trials are not terminated, they may compete with each other, thereby limiting our potential revenue going forward.

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 foreign countries, including, but not limited to, countries in Europe, Latin America, Asia, the Middle East and Africa, that may require complex arrangements to deliver services on global contracts for our customers. 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, for example, by limiting the amount of data necessary for a trial to proceed, resulting in delays or potential cancellation of contracts, which in turn may result in loss of revenue;
- the United States or other 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 foreign countries may exceed those in the United States and foreign earnings may be subject to withholding requirements or the imposition of tariffs, exchange controls or other restrictions, including restrictions on repatriation;
- certain foreign countries are expanding or may expand their regulatory framework with respect to patient informed consent, protection and compensation in clinical trials, and privacy, 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;

- certain foreign countries are expanding or may expand their banking regulations that govern international currency transactions, particularly cross-border transfers, which may inhibit our ability to transfer funds into or within a jurisdiction, impeding our ability to pay our principal investigators, vendors and employees, thereby impacting our ability to conduct trials in such jurisdictions;
- the regulatory or judicial authorities of foreign 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 foreign countries, some of which may conflict with laws in the United States;
- potential violations of existing or newly adopted local laws or anti-bribery laws, such as the United States Foreign Corrupt Practices Act, or FCPA, and the UK Bribery Act of 2010, may cause a material adverse effect on our business, financial condition, results of operations, cash flows or reputation;
- changes in political and economic conditions, including inflation, may lead to changes in the business environment in which we operate, as well as changes in foreign currency exchange rates;
- foreign governments may enact currency exchange controls that may limit the ability to fund our operations or significantly increase the cost of maintaining operations;
- customers in foreign jurisdictions may have longer payment cycles, and it may be more difficult to collect receivables in foreign 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 customers. 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 Asia, 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, results of operations, cash flows or reputation.

Due to the global nature of our business, we may be exposed to liabilities under the Foreign Corrupt Practices Act and various other 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 FCPA, UK Bribery Act of 2010 and other U.S. and foreign 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 foreign 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 (including mandatory training) 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 foreign 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 FCPA violations or violations of other anti-corruption laws committed by companies in which we invest or that we acquired or will acquire.

In the past, we have had net losses and we may report net losses in the future, which could negatively impact our ability to achieve or sustain profitability.

In the past, we have had net losses and we cannot assure you that we will achieve or sustain profitability on a quarterly or annual basis in the future. If we cannot maintain profitability, the value of our stock price may be impacted.

Our effective income tax rate may fluctuate, 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, for various reasons, 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.

Factors that may affect our effective income tax rate include, but are not limited to:

- the requirement to exclude from our quarterly worldwide effective income tax calculations losses in jurisdictions where no income tax benefit can be recognized;
- actual and projected full year pre-tax income, including differences between actual and anticipated income before taxes in various jurisdictions;
- changes in tax laws, or in the interpretation or application of tax laws, in various taxing jurisdictions;
- audits or other challenges by taxing authorities;
- the establishment of valuation allowances against a portion or all of certain deferred income tax assets if we determined that it is more likely than not that future income tax benefits will not be realized; and
- changes in the relative mix and size of clinical trials and staffing levels in various tax jurisdictions.

These changes may cause fluctuations in our effective income tax rate that could adversely affect our results of operations and cause fluctuations in our earnings and earnings per share.

Governmental authorities may question our intercompany transfer pricing policies or change their laws in a manner that could increase our effective tax rate or otherwise harm our business.

As a U.S. company doing business in international markets through subsidiaries, we are subject to foreign tax and intercompany pricing laws, including those relating to the flow of funds between the parent and subsidiaries. Tax authorities in the United States and in foreign markets closely monitor our corporate structure and how we account for intercompany fund transfers. If tax authorities challenge our corporate structure, transfer pricing mechanisms or intercompany transfers, our operations may be negatively impacted and our effective tax rate may increase. Tax rates vary from country to country and if regulators determine that our profits in one jurisdiction should be increased, we might not be able to fully utilize all foreign tax credits that are generated, which would increase our effective tax rate. Additionally, the Organization for Economic Cooperation and Development, or OECD, has issued certain proposed guidelines regarding base erosion and profit sharing. Once these guidelines are formally adopted by the OECD, it is possible that separate taxing jurisdictions may also adopt some form of these guidelines. In such case, we may need to change our approach to intercompany transfer pricing in order to maintain compliance under the new rules. Our effective tax rate may increase or decrease depending on the current location of global operations at the time of the change. Finally, we might not always be in compliance with all applicable customs, exchange control, Value Added Tax and transfer pricing laws despite our efforts to be aware of and to comply with such laws. In such case, we may need to adjust our operating procedures and our business could be adversely affected.

If we are unable to recruit suitable investigators and enroll patients for our customers' clinical trials, our clinical development business may suffer.

The recruitment of investigators and patients for clinical trials is essential to our business. Investigators are typically located at hospitals, clinics or other sites and supervise the administration of the investigational drug, biologic or device to patients during the course of a clinical trial. 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 to the termination of ongoing clinical trials or development of a product.

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

Our business involves the testing of new drugs, biologics and medical devices 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 for those with life-threatening illnesses, resulting from adverse reactions to the products 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 customers, 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 business, financial condition, results of operations, cash flows or 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 institutions and 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 products to patients during the course of a clinical trial. If the investigators or study staff commit errors or make omissions during a clinical trial that result in harm to trial patients, or patients suffer harm with a delayed onset after a clinical trial is completed and the product has obtained regulatory approval, 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 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 and the institutions at which clinical trials may be conducted.

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

We operate a facility where Phase I clinical trials are conducted, which ordinarily involve testing an investigational drug, biologic or medical device 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 and clinical trials in accordance with FDA, DEA and other applicable regulations could result in disruptions to our operations. Additionally, we face risks associated with adverse events resulting from the administration of such drugs, biologics and medical devices 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. This liability, particularly if it 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.

Our insurance may not cover all of our indemnification obligations and other liabilities associated with our operations.

We maintain insurance designed to provide coverage for ordinary risks associated with our operations and our ordinary indemnification obligations, which we believe to be customary for our industry. The coverage provided by such insurance may not be adequate for all claims we may make or may be contested by our insurance carriers. If our insurance is not adequate or available to pay liabilities associated with our operations, or if we are unable to purchase adequate insurance at reasonable rates in the future, our business, financial condition, results of operations or cash flows may be materially adversely impacted.

Exchange rate fluctuations may have a material adverse effect on our business, financial condition, results of operations or cash flows.

As a large portion of our net 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 foreign currency exchange rates could significantly affect our financial condition, results of operations and cash flows.

The revenue and expenses of our foreign 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 foreign results into U.S. dollars for purposes of reporting our consolidated results.

We are subject to foreign 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 such periods may affect our profitability with respect to such contracts.

Additionally, the majority of our global contracts are denominated in U.S. dollars or Euros, while the currency used to fund our operating costs in foreign countries is denominated in various different currencies. Fluctuations in the exchange rates of the currencies we use to contract with our customers and the currencies in which we incur cost to complete those contracts can have a significant impact on our results of operations.

We may limit these risks through exchange rate fluctuation provisions stated in our service contracts. We have not, however, mitigated all of our foreign currency transaction risk, and we may experience fluctuations in financial results from our operations outside the United States and foreign currency transaction risk associated with our service contracts.

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

The biopharmaceutical industry is fragmented and 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 being 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, coverage 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 who compete with each other, and we sometimes provide services to such customers regarding competing drugs in development. Our existing or future relationships with our biopharmaceutical customers may deter other biopharmaceutical customers from using our services or, in certain instances, may result in our customers 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 customers, and such customers 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 customers in the broader healthcare market with interests that are adverse to theirs. Any loss of customers or reductions in the level of revenues from a customer could have a material adverse effect on our business, financial condition, results of operations or cash flows.

If we are unable to successfully integrate potential future acquisitions, our business, financial condition, results of operations and cash flows could be adversely affected.

We anticipate that a portion of our future growth may come from targeted acquisitions to expand our current capabilities and service offerings. The success of any acquisition will depend upon, among other things, our ability to effectively integrate acquired personnel, operations, products and technologies into our business and to retain the key personnel and customers 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 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 expenses, diversion of management's attention from other business concerns and, with respect to the acquisition of international companies, the inability to overcome differences in international business practices, language and customs. Our failure to successfully integrate potential future acquisitions could have an adverse effect on our business, financial condition, results of operations and cash flows.

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 goodwill was recorded in connection with Cinven's acquisition of us in 2014. In accordance with US 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 discounted cash flows. Our ability to realize the value of the goodwill and intangible assets will depend on the future cash flows of our businesses. 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.

Our operations involve the use and disposal of hazardous substances and waste which can give rise to liability that could adversely impact our financial condition.

We conduct activities that have involved, and may continue to involve, the controlled use of hazardous materials and the creation of hazardous substances, including medical waste and other highly regulated substances. As a result, our operations pose the risk of accidental contamination or injury caused by the release of these materials and/or the creation of hazardous substances, including medical waste and other highly regulated substances. In the event of such an accident, we could be held liable for damages and cleanup costs which, to the extent not covered by existing insurance or indemnification, could harm our business. In addition, other adverse effects could result from such liability, including reputational damage resulting in the loss of additional business from certain customers.

The failure of third parties to provide us critical support services could materially adversely affect our business, financial condition, results of operations, cash flows or reputation.

We depend on third parties for support services vital to our business. Such support services include, but are not limited to, laboratory services, third-party transportation and travel providers, technology providers, freight forwarders and customs brokers, drug depots and distribution centers, suppliers or contract manufacturers of drugs for patients participating in clinical trials and providers of licensing agreements, maintenance contracts or other services. In addition, we also rely on third-party CROs and other contract clinical personnel for clinical services either in regions where we have limited resources, or in cases where demand cannot be met by our internal staff. The failure of any of these third parties to adequately provide us critical support services could have a material adverse effect on our business, financial condition, results of operations, cash flows or reputation.

We have only a limited ability to protect our intellectual property rights, 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. 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. We rely upon a combination of trade secrets, confidentiality policies, nondisclosure, invention assignment and other contractual arrangements, and copyright, trademark and trade secret laws, to protect our intellectual property rights. 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. 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.

The United Kingdom's withdrawal from the European Union may have a negative effect on global economic conditions, financial markets and our business.

In June 2016, a majority of voters in the United Kingdom (UK) elected to withdraw from the European Union, or the EU, in a national referendum (commonly referred to as Brexit). The UK left the EU on January 31, 2020, which has initiated an 11-month transition period by which the UK is to leave the single market and customs union. The withdrawal has created significant uncertainty about the future relationship between the UK and the EU. The withdrawal by the UK has also given rise to calls for the governments of other EU member states to consider withdrawal. These developments, or the perception that any of them could occur, have had and may continue to have a material adverse effect on global economic conditions and the stability of global financial markets, and may significantly reduce global market liquidity and restrict the ability of key market participants to operate in certain financial markets. The withdrawal has also created uncertainty with regard to the regulation of data protection in the UK. In particular, it is unclear how the UK's withdrawal will affect the UK's enactment of the European General Data Protection Regulation, and how data transfers to and from the UK will be regulated following any transition period. The UK's withdrawal may have adverse practical or operational implications on our business. Any of these factors could depress economic activity and restrict our access to capital, which could have a material adverse effect on our business, financial condition and results of operations and reduce the price of our common stock.

Due to the fact that we have operations located within the UK, Brexit could negatively impact our operations resulting primarily from (a) operational disruptions due to changes in the manner in which people and products are moved between the UK and EU following Brexit; (b) changes in the regulatory regime governing in clinical trials in the UK once the UK is no longer under umbrella EU scheme; and (c) potential price increases for supplies purchased by our UK businesses from companies located in the EU or elsewhere.

Further, due to Brexit, the value of the British Pound Sterling incurred significant fluctuations. Additionally, further actions related to Brexit may occur in the future. If the value of the British Pound Sterling continues to incur similar fluctuations, unfavorable exchange rate changes may negatively affect the value of our operations and businesses located in the UK, as translated to our reporting currency, the United States Dollar, in accordance with US GAAP, which may impact the revenue and earnings we report. For more information with respect to Exchange Rate risk applicable to us, please see Part 2 Item 7A. "Market Risk Disclosures" elsewhere in this Annual Report on Form 10-K. Continued fluctuations in the British Pound Sterling may also result in the imposition of price adjustments by EU-based suppliers to our UK businesses, as those suppliers seek to compensate for the changes in value of the British Pound Sterling as compared to the European Euro. Any of these results could have a material adverse effect on the business, revenues and financial condition of our UK and European operations.

Potential future investments in our customers' businesses or products could have a negative impact on our financial results.

We have in the past and may in the future enter into arrangements with our customers or other drug, biologic or medical device companies in which we take on payment risk by making strategic investments in our customers or other drug companies, providing flexible payment terms or fee financing to customers or other companies, or entering into other risk sharing arrangements on trial execution. Our financial results would be adversely affected if the amount realized from any such risk sharing arrangement was less than the value of our services under the contract related to such arrangement.

We act as legal representative and/or data representative for some clients.

We act as the legal representative and/or the data representative for certain clients in certain jurisdictions. As we believe that acting as legal representative and/or data representative of clients exposes us to a higher risk of liability, this service is provided subject to our policy and requires certain preconditions to be met. The preconditions relate to obtaining specific insurance commitments and indemnities from the client to cover the nature of the exposure. However, there is no guarantee that the specific insurance will be available and provide cover or that a client will fulfil its obligations in relation to their indemnity.

Our operations might be affected by the occurrence of a natural disaster or other catastrophic event.

We depend on our customers, investigators, laboratories and other facilities for the continued operation of our business. Although we have contingency plans in place for natural disasters or other catastrophic events, these events, including terrorist attacks, pandemic flu, hurricanes, floods and ice and snow storms, could nevertheless disrupt our operations or those of our customers, investigators and collaboration partners, which could also affect us. Even though we carry business interruption insurance policies and typically have provisions in our contracts that protect us in certain events, we might suffer losses as a result of business interruptions that exceed the coverage available under our insurance policies or for which we do not have coverage. Any natural disaster or catastrophic event affecting us or our customers, investigators or collaboration partners could have a significant negative impact on our operations and financial performance.

Changes in accounting standards may adversely affect our financial statements.

From time to time the Financial Accounting Standards Board, or FASB, and SEC issue new or revised guidance that we are required to adopt. It is possible that future accounting standards may require changes to our current accounting treatment and may require us to make changes to our accounting systems and processes. These changes could have a material impact on our business, results of operations and financial condition. See Note 2 to our audited consolidated financial statements included elsewhere in this Annual Report on Form 10-K for details regarding recently implemented accounting standards and recently issued accounting pronouncements and the potential impact they may have on the Company.

Risks Relating to Our Industry

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

Our revenues depend on the level of R&D expenditures, size of the drug development pipelines and outsourcing trends of the biopharmaceutical industry, including the amount of such R&D expenditures that is outsourced and subject to competitive bidding among CROs. Accordingly, economic factors and industry trends that affect biopharmaceutical companies affect our business. For example, if biopharmaceutical companies become less able to access capital in the future, they may commit less capital to our services going forward. Also, biopharmaceutical companies continue to seek long-term strategic collaborations with global CROs with favorable pricing terms. Many of our competitors seek out these collaborations, while we generally do not. If our competitors can successfully enter into these collaborations, it may reduce the share of the biopharmaceutical outsourcing business that we might otherwise be positioned to capture.

In addition, if the biopharmaceutical industry reduces its outsourcing of clinical trials or such outsourcing fails to grow at projected or expected rates, or at all, our business, financial condition, results of operations and cash flows could be materially and adversely affected. We may also be negatively impacted by consolidation and other factors in the biopharmaceutical industry, which may slow decision making by our customers, result in the delay or cancellation of existing projects, cause reductions in overall R&D expenditures or lead to increased pricing pressures. Further, in the event that one of our customers combines with a company that is using the services of one of our competitors, the combined company could decide to use the services of that competitor or another provider. All of these events could adversely affect our business, financial condition, cash flows or results of operations.

We face intense competition in many areas of our business and, if we do not compete effectively, our business may be harmed.

The CRO industry is highly competitive. We often compete for business with other CROs as well as internal development departments at some of our customers, some of which could be considered large CROs in their own right. We also compete with universities and teaching hospitals. Some of these competitors have greater financial resources and a wider range of service offerings over a greater geographic area than we do. If we do not compete successfully, our business will suffer. The industry is 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, such as acceptance of less favorable contract terms, which could adversely affect our operating results. In recent years, our industry has experienced consolidation. This trend is likely to produce more competition from the resulting larger companies. Further, certain of our key competitors are private and, therefore, they do not contend with the cost pressures of being a public company. We compete with both large CROs and mid-sized CROs, and have increasingly faced more competition from larger CROs. Our ability to continue to grow and perform effectively will directly impact our success against our competitors. In addition, there are few barriers to entry for smaller specialized companies considering entering the industry. Because of their size and focus, small CROs might compete effectively against larger companies such as us, especially in lower cost geographic areas, which could have a material adverse effect on our business.

We may be affected by healthcare reform and potential additional regulatory reforms, which may adversely impact the biopharmaceutical industry or otherwise reduce the need for our services or negatively impact our profitability.

Numerous government bodies are considering or have adopted various healthcare reforms and may undertake, or are in the process of undertaking, efforts to control growing healthcare costs through legislation, regulation and voluntary agreements with healthcare providers and biopharmaceutical companies, including many of our customers. By way of example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the Affordable Care Act, was signed into law, which, among other things, expanded, over time, health insurance coverage, imposed health industry cost containment measures, enhanced remedies against healthcare fraud and abuse, added new transparency requirements for healthcare and health insurance industries, imposed new taxes and fees on pharmaceutical and medical device manufacturers, added new requirements for certain applicable drug and device manufacturers to disclose payments to physicians, including principal investigators, and imposed additional health policy reforms, any of which may significantly impact the biopharmaceutical industry. We are uncertain as to the full effects of these reforms on our business and are unable to predict what legislative proposals, if any, will be adopted in the future. If regulatory cost containment efforts limit the profitability of new drugs, our customers may reduce their R&D expenditures, which could reduce the business they outsource to us. Similarly, if regulatory requirements for product testing are relaxed or harmonized across jurisdictions, or simplified drug approval procedures are adopted, the demand for our services could decrease.

Government bodies may also adopt healthcare legislation or regulations that are more burdensome than existing regulations. For example, product safety concerns and recommendations by the Drug Safety Oversight Board could change the regulatory environment for drug products, and new or heightened regulatory requirements may 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 industry sponsored clinical trials, which could reduce the need for our services. These developments and the lack of clarity regarding future healthcare policies and regulations have created significant uncertainty that could adversely affect our business, financial condition, cash flows or results of operations.

Consolidation in the biopharmaceutical industry could lead to a reduction in our revenues.

The biopharmaceutical and CRO industries are currently undergoing a period of increased merger activity. Several large biopharmaceutical companies have recently completed mergers and acquisitions that will consolidate the outsourcing trends and R&D expenditures into fewer companies, and many larger and medium sized biopharmaceutical companies have been acquiring smaller biopharmaceutical companies. As a result of this and future consolidations, our customer diversity may decrease and our business may be adversely affected.

If we fail to comply with federal, state and foreign 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 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.

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 the Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009 and their implementing regulations, including the Privacy and Security Rules, or collectively, HIPAA, generally require individuals' written authorization, in addition to any required informed consent, before protected health information 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. Two of our subsidiaries, Medpace Clinical Pharmacology, LLC and C-MARC, LLC, are covered entities under HIPAA. Further, because of amendments to the HIPAA Privacy and Security Rules that were promulgated on January 25, 2013, known as the Omnibus Final Rule, service providers to covered entities under HIPAA, known as business associates, are now directly subject to HIPAA. 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 of protected health information and other HIPAA violations. We are also liable contractually under any business associate agreements we have signed with covered entities. If we are determined to be a business associate, we would be subject to HIPAA's enforcement scheme, which, as amended, can result in up to $1.5 million in annual civil penalties for each HIPAA violation. A single breach incident can result in multiple violations of the HIPAA standards, meaning that penalties could be in excess of $1.5 million. In addition, the Federal Civil Penalties Inflation Adjustment Improvement Act of 2015 required all federal agencies to adjust their civil monetary penalties to inflation, no later than August 1, 2016. As a result, the minimum annual penalties for each HIPPA violation which occurs later than February 17, 2009 is now $1.7 million.

HIPAA also authorizes state attorneys general to file suit on behalf of their residents for violations. Courts are able to award damages, costs and attorneys' fees related to violations of HIPAA in such cases. While HIPAA does not create a private right of action allowing individuals to file suit against us in civil court for violations of HIPAA, its standards have been used as the basis for duty of care cases in state civil suits such as those for negligence or recklessness in the misuse or breach of protected health information. In addition, HIPAA mandates that the Secretary of the U.S. Department of Health and Human Services conduct periodic compliance audits of HIPAA covered entities and their business associates for compliance with the HIPAA privacy and security standards, and Phase two of these audits, focusing on business associates has begun.

In the EU, personal data includes any information that relates to an identified or identifiable natural person with health information carrying additional obligations, which may include obtaining the explicit consent from the individual for collection, use or disclosure of the information. In addition, we are subject to EU rules with respect to export of such data out of the EU. Such data export rules are constantly changing, for example, following a decision of the European Court of Justice in October 2015, transferring personal data to U.S. companies like us that had certified as a member of the EU-U.S. Safe Harbor Scheme was declared invalid and the other methods to permit transfer are now under review. In July 2016, the European Commission approved the EU-U.S. Privacy Shield, which replaces the U.S. Safe Harbor Scheme. The United States, the EU and its member states, and other countries where we have operations, such as China, Russia and Singapore, continue to issue new privacy and data protection rules and regulations that relate to personal data and health information. Failure to comply with certain certification/registration and annual re-certification/registration provisions associated 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. Federal, state and foreign governments may propose 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 or theft of or unauthorized access to such data. 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. We also are subject to the requirements of the EU's General Data Protection Regulation, or GDPR, because we are processing data in the EU and data of EU residents outside of the EU. The GDPR shortens the deadline for data breach notifications, imposes additional obligations when we process personal data on behalf of our customers, including in relation to security measures, and increases administrative burdens on companies processing personal data, including employee and business partner data. If we do not comply with our obligations under the GDPR we could be exposed to significant fines of up to 20 million EUR or up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher.

Our business could be harmed from the loss or suspension of a license or imposition of a fine or penalties under, or future changes in, or interpretations of, the law or regulations of the Clinical Laboratory Improvement Act of 1967, and the Clinical Laboratory Improvement Amendments of 1988 (CLIA), or those of other national, state or local agencies in the U.S. and other countries where we operate laboratories.

The commercial laboratory testing industry is subject to extensive U.S. regulation, and many of these statutes and regulations have not been interpreted by the courts. CLIA extends federal oversight to virtually all clinical laboratories operating in the U.S. by requiring that they be certified by the federal government or by a federally approved accreditation agency. The sanction for failure to comply with CLIA requirements may be suspension, revocation or limitation of a laboratory's CLIA certificate, which is necessary to conduct business, as well as significant fines and/or criminal penalties. In addition, we are subject to regulation under state law. State laws may require that laboratories and/or laboratory personnel meet certain qualifications, specify certain quality controls or require maintenance of certain records. We also operate laboratories outside of the U.S. and are subject to laws governing our laboratory operations in the other countries where we operate.

Applicable statutes and regulations could be interpreted or applied by a prosecutorial, regulatory or judicial authority in a manner that would adversely affect our business. Potential sanctions for violation of these statutes and regulations include significant fines and the suspension or loss of various licenses, certificates and authorizations, which could have a material adverse effect on our business. In addition, compliance with future legislation could impose additional requirements on us, which may be costly.

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, even without wrongdoing on our part, 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. Further, our customers could be similarly exposed to intellectual property suits and the resulting economic and operational strain defending such claims could negatively impact such customers' ability to fund or continue ongoing clinical trials on which we are working.

Actions by regulatory authorities or customers to limit the scope of or withdraw an approved drug, biologic or medical device from the market could result in a loss of revenue.

Government regulators have the authority, after approving a drug, biologic or medical device, to limit its indication for use by requiring additional labeled warnings or to withdraw the product's approval for its approved indication based on safety or other concerns. Similarly, customers may act to voluntarily limit the availability of approved products or withdraw them from the market after we begin our work. If we are providing services to customers for products that are limited in availability or withdrawn, we may be required to narrow the scope of or terminate our services with respect to such products, which would prevent us from earning the full amount of net revenue anticipated under the related service contracts.

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 customers or be unable to attract new customers, which could lead to a decrease in our revenue and have a material adverse effect on our financial condition.

Circumstances beyond our control could cause the CRO industry to suffer reputational or other harm that could result in an industry-wide reduction in demand for CRO services, which could harm our business.

Demand for our services may be affected by perceptions of our customers regarding the CRO industry as a whole. For example, other CROs could engage in conduct that could render our customers less willing to do business with us or any CRO. Likewise, a widely reported injury to clinical trial participants could result in negative perceptions of clinical trial activity, thereby adversely impacting our industry. One or more CROs could engage in or fail to detect malfeasance, such as inadequately monitoring sites, producing inaccurate databases or analysis, falsifying patient records, and performing incomplete lab work, or take other actions that would reduce the confidence of our customers in the CRO industry. As a result, the willingness of biopharmaceutical companies to outsource R&D services to CROs could diminish and our business could thus be harmed materially by events outside our control.

Risks Relating to Indebtedness

We may utilize our debt capacity and undertake additional obligations. Incurring such debt or undertaking such additional obligations could further exacerbate the risks to our financial condition.

Although we currently have no debt outstanding, we have in the past used borrowings under our credit facility to fund operations and to repurchase Medpace common shares. We may utilize our debt capacity under our Credit Facility to continue to do so in the future. Furthermore, if we fail to comply with the credit facility requirements, we may be in default. Upon an event of default, if the credit agreement is not amended or the event of default is not waived, the lender could declare all amounts outstanding, together with accrued interest, to be immediately due and payable. If this happens, we may not be able to make those payments or borrow sufficient funds from alternative sources to make those payments. Even if we were to obtain additional financing, that financing may be on unfavorable terms.

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

Because our Line of Credit in our existing Credit Facility is subject to variable-rate interest, fluctuations in interest rates could have a material effect on our business should we utilize the Line of Credit. As a result, we may incur higher interest costs if interest rates increase. These higher interest costs could have a material adverse impact on our financial condition and the levels of cash we maintain for working capital.

We may become dependent upon our lenders for financing to execute our business strategy and meet our liquidity needs. If our lenders are unable to fund borrowings under their credit commitments or we are unable to borrow, it could negatively impact our business.

During periods of volatile credit markets, there is risk that any lenders, even those with strong balance sheets and sound lending practices, could fail or refuse to honor their legal commitments and obligations under existing credit commitments, including but not limited to, extending credit up to the maximum permitted by a credit facility. If our lenders are unable to fund borrowings under their revolving credit commitments or we are unable to borrow (such as having insufficient capacity under our borrowing base), it could be difficult in such environments to obtain sufficient liquidity to meet our operational needs.

Changes in the method of determining London Interbank Offered Rate ("LIBOR"), or the replacement of LIBOR with an alternative reference rate, may adversely affect interest expense related to outstanding debt.

Amounts drawn under our Credit Facility may bear interest rates in relation to LIBOR, depending on our selection of repayment options. On July 27, 2017, the Financial Conduct Authority ("FCA") in the UK announced that it would phase out LIBOR as a benchmark by the end of 2021. It is unclear whether new methods of calculating LIBOR will be established such that it continues to exist after 2021. The U.S. Federal Reserve is considering replacing U.S. dollar LIBOR with a newly created index called the Broad Treasury Financing Rate, calculated with a broad set of short-term repurchase agreements backed by treasury securities. If LIBOR ceases to exist, we may need to renegotiate the Credit Facility and may not able to do so with terms that are favorable to us. The overall financial market may be disrupted as a result of the phase-out or replacement of LIBOR. Disruption in the financial market or the inability to renegotiate the Credit Facility with favorable terms could have a material adverse effect on our business, financial position, and operating results.

Downgrades of our credit ratings could adversely affect us.

We can be adversely affected by downgrades of our credit ratings because ratings are a factor influencing our ability to access capital and the terms of any new indebtedness, including covenants and interest rates. Our customers and vendors may also consider our credit profile when negotiating contract terms, and if they were to change the terms on which they deal with us, it could have a material adverse effect on our business, results of operations, cash flows, and financial condition.

Risks Relating to Ownership of Our Common Stock

Our Chief Executive Officer and founder controls a substantial amount of our outstanding common stock and his interests may be different from or conflict with those of our other shareholders.

As of December 31, 2019, August J. Troendle, our Chief Executive Officer and founder, through his direct ownership of 603,702 shares of our common stock and his beneficial ownership of 7,760,584 shares of our common stock held by Medpace Investors LLC ("Medpace Investors"), controls approximately 23.2% of the outstanding shares of our common stock. Upon a distribution of our common stock held by Medpace Investors, our Chief Executive Officer would receive approximately 84.3% of such distributed shares. Accordingly, Troendle is able to exert a significant degree of influence or actual control over our management and affairs and control all corporate actions requiring shareholder approval, irrespective of how our other shareholders may vote, including:

- the election and removal of directors and the size of our board of directors, or the Board;
- any amendment of our articles of incorporation or bylaws; or

- the approval of mergers and other significant corporate transactions, including a sale of substantially all of our assets.

Moreover, Troendle's share ownership may also adversely affect the trading price for our common stock to the extent investors perceive disadvantages in owning shares of a company with a significant shareholder.

Our anti-takeover provisions could prevent or delay a change in control of our company, even if such change in control would be beneficial to our shareholders.

Provisions of our amended and restated certificate of incorporation and amended and restated bylaws, as well as provisions of Delaware law could discourage, delay or prevent a merger, acquisition or other change in control of our company, even if such change in control would be beneficial to our shareholders. These provisions include:

- authorizing the issuance of "blank check" preferred stock that could be issued by our Board to increase the number of outstanding shares and thwart a takeover attempt;
- establishing a classified Board so that not all members of our Board are elected at one time;
- the removal of directors only for cause;
- prohibiting the use of cumulative voting for the election of directors;
- limiting the ability of shareholders to call special meetings or amend our bylaws;
- requiring all shareholder actions to be taken at a meeting of our shareholders and not by written consent; and
- establishing advance notice and duration of ownership requirements for nominations for election to the Board or for proposing matters that can be acted upon by shareholders at shareholder meetings.

These provisions could also discourage proxy contests and make it more difficult for our shareholders to elect directors of their choosing and cause us to take other corporate actions our shareholders desire. In addition, because our Board is responsible for appointing the members of our management team, these provisions could in turn affect any attempt by our shareholders to replace current members of our management team.

In addition, the Delaware General Corporation Law, or the DGCL, to which we are subject, prohibits us, except under specified circumstances, from engaging in any mergers, significant sales of stock or assets or business combinations with any shareholder or group of shareholders who owns at least 15% of our common stock for three years following their becoming the owner of 15% of our common stock.

Our non-employee directors may acquire interests and positions that could present potential conflicts with our and our shareholders' interests.

Our non-employee directors make investments in companies and may, from time to time, acquire and hold interests in businesses that compete directly or indirectly with us. Our non-employee directors may also pursue, for their own accounts, acquisition opportunities that may be complementary to our business, and as a result, those acquisition opportunities might not be available to us. Our organizational documents contain provisions renouncing any interest or expectancy held by our non-employee directors in corporate opportunities. Accordingly, the interests of our non-employee directors may supersede ours, causing our non-employee directors and their affiliates to compete against us or to pursue opportunities instead of us, for which we have no recourse. Such actions on the part of our non-employee directors and inaction on our part could have a material adverse effect on our business, financial condition, results of operations and cash flows.

We are party to transactions with related persons that may increase the risk of allegations of conflicts of interest, and such allegations may impair our ability to realize the benefits we expect from these transactions.

Due to the relationships among us and certain related persons, the agreements or other transactions we have entered into with them are considered related person transactions. Our agreements or transactions with related persons may not be on terms as favorable to us as they would have been if they had been negotiated among unrelated persons. For additional information on related person transactions involving us, see the "Certain Relationships" section in our Proxy Statement for our 2019 Annual Meeting of Stockholders. While our Related Person Transaction Policy and Procedures requires our Audit Committee's consideration of all relevant facts and circumstances, including a determination of whether the transaction has terms comparable to those that could be obtained in an arm's length transaction, the potential for a conflict of interest exists and such related persons may have conflicts of interest, or the appearance of conflicts of interest, with respect to matters involving or affecting us and the related person. Moreover, we are subject to the risk that our stockholders may challenge any such related person transactions and the agreements entered into as part of them. If such a challenge were to be successful, we might not realize the benefits expected from the transactions being challenged. Moreover, any such challenge could result in substantial costs and a diversion of our management's attention, could have a material adverse effect on our reputation, business and growth and could adversely affect our ability to realize the benefits expected from the transactions, whether or not the allegations have merit or are substantiated.

We may issue shares of preferred stock in the future, which could make it difficult for another company to acquire us or could otherwise adversely affect holders of our common stock, which could depress the price of our common stock.

Our amended and restated certificate of incorporation authorizes us to issue one or more series of preferred stock. Our Board has the authority to determine the preferences, limitations and relative rights of the shares of preferred stock and to fix the number of shares constituting any series and the designation of such series, without any further vote or action by our shareholders. Our preferred stock could be issued with voting, liquidation, dividend and other rights superior to the rights of our common stock. The potential issuance of preferred stock may delay or prevent a change in control of us, discourage bids for our common stock at a premium to the market price, and materially and adversely affect the market price and the voting and other rights of the holders of our common stock.

The provision of our amended and restated certificate of incorporation requiring exclusive venue in the Court of Chancery in the State of Delaware for certain types of lawsuits may have the effect of discouraging lawsuits against our directors and officers.

Our amended and restated certificate of incorporation requires, to the fullest extent permitted by law, that (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our shareholders, (iii) any action asserting a claim against us arising pursuant to any provision of the DGCL or our amended and restated certificate of incorporation or the bylaws or (iv) any action asserting a claim against us governed by the internal affairs doctrine will have to be brought only in the Court of Chancery in the State of Delaware. Although we believe this provision benefits us by providing increased consistency in the application of Delaware law in the types of lawsuits to which it applies, the provision may have the effect of discouraging lawsuits against our directors and officers.

The requirements associated with being a public company require significant company resources and management attention.

We are subject to the reporting requirements of the Exchange Act, the Sarbanes-Oxley Act of 2002, as amended (the "Sarbanes-Oxley Act"), the listing requirements of the securities exchange on which our common stock is traded, and other applicable securities rules and regulations. The Exchange Act requires that we file annual, quarterly and current reports with respect to our business and financial condition and maintain effective disclosure controls and procedures and internal control over financial reporting. In addition, subsequent rules implemented by the SEC and NASDAQ may also impose various additional requirements on public companies. We have incurred, and we will continue to incur, additional legal, accounting and other expenses that we did not previously incur, particularly as we are no longer an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act"). We have made, and will continue to make, changes to our corporate governance standards, disclosure controls and financial reporting and accounting systems to continue to meet our reporting obligations. However, the measures we take may not be sufficient to satisfy our obligations as a public company, which could subject us to delisting of our common stock, fines, sanctions and other regulatory action and potentially civil litigation.

We ceased to be an "emerging growth company" as of the end of the year ended December 31, 2019. We are now subject to Section 404(b) of the Sarbanes-Oxley Act, which requires that our independent registered public accounting firm provide an attestation report on the effectiveness of our internal control over financial reporting, among other additional requirements. Compliance with Section 404 will be expensive and time consuming for management and could result in the detection of internal control deficiencies of which we are currently unaware. Moreover, if we have a material weakness in our internal controls over financial reporting, we may not detect errors on a timely basis, and our financial statements may be materially misstated. We or our independent registered public accounting firm may not be able to conclude on an ongoing basis that we have effective internal controls over financial reporting, which could harm our operating results, cause investors to lose confidence in our reported financial information and cause the trading price of our common stock to fall. Any failure to file accurate and timely quarterly and annual reports that we are required to file with the SEC under the Exchange Act could result in sanctions, lawsuits, delisting of our shares from the NASDAQ Global Select Market or other adverse consequences that would materially harm our business.

Our operating results and share price may be volatile, and the market price of our common stock may drop.

Our quarterly operating results have fluctuated, and are likely to fluctuate in the future. In addition, securities markets worldwide have experienced, and are likely to continue to experience, significant price and volume fluctuations. This market volatility, as well as general economic, market or political conditions, could subject the market price of shares of our common stock to wide price fluctuations regardless of our operating performance. The public market for our common stock is new and the trading price of shares of our common stock may fluctuate in response to various factors, including:

- market conditions in the broader stock market or in the healthcare sector;
- developments affecting biopharmaceutical companies generally or biopharmaceutical research and development outsourcing;
- actual or anticipated fluctuations in our quarterly financial and operating results;
- introduction of new products or services by us or our competitors;
- the public's reaction to our press releases, our other public announcements and our filings with the SEC;
- changes in, or failure to meet, earnings estimates or recommendations by research analysts who track our common stock or the stock of other companies in our industries;
- strategic actions by us, our customers or our competitors, such as acquisitions or restructurings;
- changes in accounting standards, policies, guidance, interpretations or principles;
- issuance of new or changed securities analysts' reports or recommendations or termination of coverage of our common stock by securities analysts;
- sales, or anticipated sales, of large blocks of our stock;
- the granting or exercise of employee stock options;
- volume of trading in our common stock;
- additions or departures of key personnel;
- regulatory or political developments;
- litigation and governmental investigations;
- changing economic conditions;
- defaults on our indebtedness;
- exchange rate fluctuations; and
- the other factors listed in this "Risk Factors" section.

These and other factors, many of which are beyond our control, may cause our operating results and the market price and demand for shares of our common stock to fluctuate substantially. While we believe that operating results for any particular quarter are not necessarily a meaningful indication of future results, fluctuations in our quarterly operating results could limit or prevent investors from readily selling their shares and may otherwise negatively affect the market price and liquidity of shares of our common stock. In addition, in the past, when the market price of a stock has been volatile, holders of that stock have sometimes instituted securities class action litigation against the company that issued the stock. If any of our shareholders brought a lawsuit against us, we could incur substantial costs defending the lawsuit. Such a lawsuit could also divert the time and attention of our management from our business, which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Because we have no current plans to pay regular cash dividends on our common stock, our shareholders may not receive any return on investment unless they sell their common stock for a price greater than that which they paid for it.

We do not anticipate paying any regular cash dividends on our common stock for the foreseeable future. Any decision to declare and pay dividends in the future will be made at the discretion of our Board and will depend on, among other things, our results of operations, financial condition, cash requirements, contractual restrictions and other factors that our Board may deem relevant. Therefore, any return on investment in our common stock is solely dependent upon the appreciation of the price of our common stock on the open market, which may not occur.

We are a holding company and rely on dividends and other payments, advances and transfers of funds from our subsidiaries to meet our obligations and pay any dividends.

We have no direct operations and no significant assets other than ownership of 100% of the capital stock of our subsidiaries. Because we conduct our operations through our subsidiaries, we depend on those entities for dividends and other payments to generate the funds necessary to meet our financial obligations, and to pay any dividends with respect to our common stock. Legal and contractual restrictions and the financial condition and operating requirements of our subsidiaries, may limit our ability to obtain cash from our subsidiaries. The earnings from, or other available assets of, our subsidiaries might not be sufficient to pay dividends or make distributions or loans to enable us to pay any dividends on our common stock or other obligations. Any of the foregoing could materially and adversely affect our business, financial condition, results of operations and cash flows.

If securities or industry analysts do not publish research or reports about our business, if they adversely change their recommendations regarding our common stock or if our results of operations do not meet their expectations, our share price and trading volume could decline.

The trading market for shares of our common stock is influenced by the research and reports that industry or securities analysts publish about us or our business. We do not have any control over these analysts. If one or more of these analysts cease coverage of our company or fail to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our share price or trading volume to decline. Moreover, if one or more of the analysts who cover us downgrade our stock, or if our results of operations do not meet their expectations, our share price could decline.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

As of December 31, 2019, we had leased commercial locations in various countries across North America, Europe, Asia/Pacific, South America and Africa. We also own lab and office space in Leuven, Belgium. Most of these facilities consist solely of office space; however, we have five laboratories located across four facilities and a logistics warehouse. Our principal executive offices are located on a corporate campus in Cincinnati, Ohio consisting of four buildings totaling approximately 350,000 square feet. The leases for three buildings in our Cincinnati site expire in 2022, 2027 and 2027, respectively. We own the other building. Additionally, we entered into a lease for an additional corporate office, which is currently under construction, on the corporate campus in Cincinnati, Ohio. This lease consists of approximately 249,000 square feet and expires in 2040. None of our leases are individually material to our business model and all have either options to renew or are located in major markets with what we believe are adequate opportunities to continue business operations on terms satisfactory to us.

Item 3. Legal Proceedings.

We are party to legal proceedings incidental to our business and may become subject to additional legal proceedings in the future. While the outcome of these matters could differ from management's expectations, we do not believe that the resolution of these matters, individually and in the aggregate, is reasonably likely to have a material adverse effect to our consolidated financial statements. Litigation is subject to inherent uncertainties. See Note 12 "Commitments, Contingencies and Guarantees—Legal Proceedings" to our consolidated financial statements included in Item 8 of Part II in this Annual Report on Form 10-K.

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 Global Select Market under the symbol "MEDP".

Holders of Record

On February 21, 2020, there were approximately 23 shareholders of record of our common stock. Because many of the shares of our common stock are registered in "nominee" or "street" names, we believe that the total number of beneficial owners is considerably higher.

Dividend Policy

We have not paid any dividends to date, nor do we have current plans to pay any cash dividends on our common stock for the foreseeable future and instead intend to retain earnings, if any, for future operations, expansion and debt repayment. However, in the future, subject to the factors described below and our future liquidity and capitalization, we may change this policy and choose to pay dividends.

We are a holding company which does not conduct any business operations of our own. As a result, our ability to pay cash dividends on our common stock is dependent upon cash dividends and distributions and other transfers from our subsidiaries.

In addition, under Delaware law, our Board may declare dividends only to the extent of our surplus (which is defined as total assets at fair market value minus total liabilities, minus statutory capital) or, if there is no surplus, out of our net profits for the then current and/or immediately preceding fiscal year.

Any future determination to declare dividends will be at the discretion of our Board and will take into account:

- general economic business conditions;
- our net income, financial condition and results of operations;
- our capital requirements;
- our prospects;
- the ability of our operating subsidiaries to pay dividends and make distributions to us;
- legal restrictions; and
- such other factors as our Board may deem relevant.

Recent Sales of Unregistered Securities

Date	Equity Plan	Number of Stock Options Exercised	Exercise Price	Approximate Aggregate Purchase Price
October 1, 2019	2014 Equity Incentive Plan	3,703	$ 16.20	$ 60,000
October 2, 2019	2014 Equity Incentive Plan	900	16.20	14,600
October 2, 2019	2014 Equity Incentive Plan	2,778	18.23	50,600
October 4, 2019	2014 Equity Incentive Plan	1,255	14.41	18,100
October 17, 2019	2014 Equity Incentive Plan	6,334	14.41	91,300
October 17, 2019	2014 Equity Incentive Plan	3,703	16.20	60,000
October 24, 2019	2014 Equity Incentive Plan	389	14.41	5,600
October 24, 2019	2014 Equity Incentive Plan	1,111	16.20	18,000
October 28, 2019	2014 Equity Incentive Plan	1,401	14.41	20,200
October 31, 2019	2014 Equity Incentive Plan	3,703	14.41	53,400
November 1, 2019	2014 Equity Incentive Plan	40	14.41	600
November 4, 2019	2014 Equity Incentive Plan	1,481	16.20	24,000
November 5, 2019	2014 Equity Incentive Plan	6,136	16.20	99,400
November 6, 2019	2014 Equity Incentive Plan	4,455	16.20	72,200
November 7, 2019	2014 Equity Incentive Plan	926	14.41	13,300
November 8, 2019	2014 Equity Incentive Plan	500	14.41	7,200
November 11, 2019	2014 Equity Incentive Plan	260	14.41	3,700
November 11, 2019	2014 Equity Incentive Plan	1,111	16.20	18,000
November 15, 2019	2014 Equity Incentive Plan	518	14.41	7,500
November 15, 2019	2014 Equity Incentive Plan	555	16.20	9,000
November 25, 2019	2014 Equity Incentive Plan	450	14.41	6,500
December 2, 2019	2014 Equity Incentive Plan	2,470	16.20	40,000
December 5, 2019	2014 Equity Incentive Plan	1,450	16.20	23,500
December 9, 2019	2014 Equity Incentive Plan	3,111	14.41	44,800
December 19, 2019	2014 Equity Incentive Plan	2,888	14.41	41,600
December 19, 2019	2014 Equity Incentive Plan	1,925	16.20	31,200
Total		53,553		$ 834,300

All of the forgoing transactions involved issuances of securities to employees of the Company and are exempt from registration pursuant to Rule 701 promulgated under the Securities Act of 1933, as amended, as transactions pursuant to benefit plans and contracts relating to compensation.

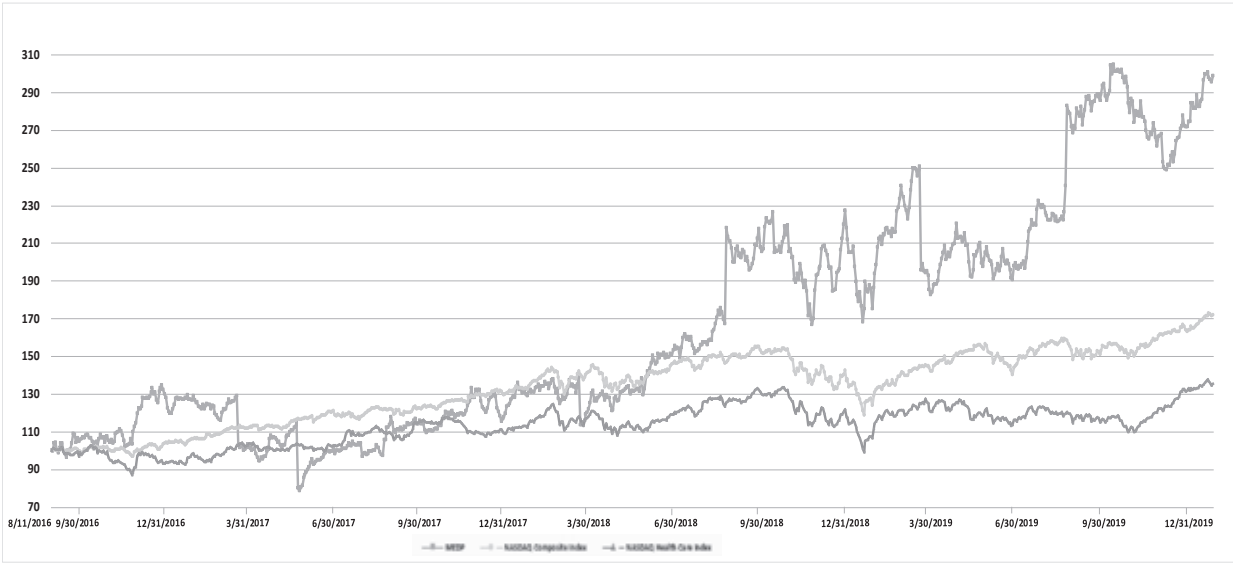
Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None.

Stock Performance Graph

The information included under the heading “Stock Performance Graph” is “furnished” and not “filed” for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities of that section, nor shall it be deemed to be “soliciting material” subject to Regulation 14A or incorporated by reference in any filing under the Securities Act of 1933, as amended, or the Exchange Act of 1934, as amended.

Our common stock is listed for trading on the NASDAQ under the symbol "MEDP." The Stock Price Performance Graph set forth below compares the cumulative total shareholder return on our common stock for the period from August 11, 2016 through December 31, 2019, with the cumulative total return of the Nasdaq Composite Index and the Nasdaq Health Care Index over the same period. The comparison assumes $100 was invested on August 11, 2016 in the common stock of Medpace Holdings, Inc., in the Nasdaq Composite Index, and in the Nasdaq Health Care Index and assumes reinvestment of dividends, if any. The stock price performance of the following graph is not necessarily indicative of future stock price performance. Information used in the graph was obtained from the Nasdaq Stock Market, a source believed to be reliable, but we are not responsible for any errors or omissions in such information.



Equity Compensation Plan Information

The information required by Part II, Item 5 of the Annual Report on Form 10-K regarding equity compensation plans is incorporated herein by reference to "Part III, Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters."

Item 6. Selected Financial Data

The following tables set forth, for the periods and at the dates indicated, our selected historical consolidated financial data. We have derived the selected consolidated financial data as of December 31, 2019 and 2018, and for the years ended December 31, 2019, 2018 and 2017 from our audited consolidated financial statements appearing elsewhere in this Annual Report on Form 10-K. We have derived the selected consolidated financial data as of December 31, 2017, 2016 and 2015 and for the years ended December 31, 2016 and 2015 from our audited consolidated financial statements not appearing elsewhere in this Annual Report on Form 10-K. Our historical results are not necessarily indicative of the results we may achieve in any future period.

On July 25, 2016, the Board approved, and made legally effective, a 1-for-1.35 reverse stock split of the Company's common stock. All share, stock option and per share information presented in the consolidated financial statements have been adjusted to reflect the reverse stock split on a retroactive basis for all periods presented. There was no change in the par value of the Company's common stock.

You should read the following information together with the more detailed information contained in "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and the accompanying notes appearing elsewhere in this Annual Report on Form 10-K.

(in thousands except per share data)	YEAR ENDED DECEMBER 31,				
	2019 (3)	**2018** (3)	**2017**	**2016**	**2015**
Consolidated Statements of Operations					
Revenue:					
Revenue, net	$ 860,969	$ 704,589	$ -	$ -	$ -
Service revenue, net	-	-	386,462	370,621	320,101
Reimbursed out-of-pocket revenue	-	-	49,690	50,961	38,958
Total revenue	860,969	704,589	436,152	421,582	359,059
Operating expenses:					
Direct service costs, excluding depreciation and amortization	321,006	252,284	211,773	198,510	163,707
Reimbursed out-of-pocket expenses	294,266	236,775	49,690	50,961	38,958
Total direct costs	615,272	489,059	261,463	249,471	202,665
Selling, general and administrative	95,245	75,681	63,357	61,507	56,998
Impairment of goodwill	-	-	-	-	9,313
Depreciation	8,360	9,240	8,574	7,442	6,379
Amortization	14,829	29,561	37,900	50,672	63,142
Total operating expenses	733,706	603,541	371,294	369,092	338,497
Income from operations	127,263	101,048	64,858	52,490	20,562
Other (expense) income, net:					
Loss on extinguishment of debt	-	-	-	(10,726)	-
Miscellaneous (expense) income, net	(863)	1,060	(354)	(423)	(1,133)
Interest expense, net	(1,568)	(8,157)	(7,559)	(19,384)	(27,259)
Total other expense, net	(2,431)	(7,097)	(7,913)	(30,533)	(28,392)
Income (loss) before income taxes	124,832	93,951	56,945	21,957	(7,830)
Income tax provision	24,389	20,766	17,823	8,532	843
Net income (loss)	$ 100,443	$ 73,185	$ 39,122	$ 13,425	$ (8,673)
Net income (loss) per share attributable to common shareholders:					
Basic	$ 2.79	$ 2.05	$ 1.00	$ 0.38	$ (0.28)
Diluted	$ 2.67	$ 1.97	$ 0.98	$ 0.37	$ (0.28)
Weighted average common shares outstanding:					
Basic	35,881	35,547	39,056	35,690	31,346
Diluted	37,576	36,912	39,839	36,329	31,346
Cash Flow Data:					
Net cash provided by operating activities	$ 201,867	$ 156,584	$ 97,385	$ 91,732	$ 85,870
Net cash used in investing activities	(19,144)	(16,973)	(12,237)	(13,422)	(6,432)
Net cash used in financing activities	(73,918)	(141,580)	(97,828)	(58,008)	(116,489)
Other Financial Data:					
Backlog (at period end) (1)	$ 1,283,218	$ 1,057,898	$ 524,402	$ 483,918	$ 429,659
Net new business awards (2)	1,094,388	899,445	426,082	426,960	359,538

(Amounts in thousands)	AS OF DECEMBER 31, 2019 (3)	2018 (3)	2017	2016	2015
Consolidated Balance Sheet Data					
Cash and cash equivalents	$ 131,920	$ 23,275	$ 26,485	$ 37,099	$ 14,880
Restricted cash	-	7	7	308	2,857
Accounts receivable billed and unbilled, net:	155,662	133,449	83,079	79,767	65,088
Working capital	(25,974)	(78,912)	(62,735)	(35,355)	(39,296)
Total assets	1,143,071	967,933	950,717	979,105	984,041
Total long-term debt, net (including current portion)	-	79,721	221,611	163,642	377,941
Total liabilities	416,788	378,230	447,187	368,395	570,567
Total shareholders' equity	726,283	589,703	503,530	610,710	413,474
Total liabilities and shareholders' equity	1,143,071	967,933	950,717	979,105	984,041

(1) Backlog represents anticipated future net revenue from net new business awards that have commenced, but have not been completed. However, because the contracts included in our backlog are generally terminable without cause, we do not believe that our backlog as of any date is necessarily a meaningful predictor of future results.

(2) Net new business awards are new business awards net of award modifications and cancellations that had been recognized in backlog during the period. New business awards represent the value of anticipated future net revenue that has been awarded during the period that is recognized in backlog. This value is recognized upon the signing of a contract or receipt of a written pre-contract confirmation from a customer that confirms an agreement in principle on budget and scope. New business awards also include contract amendments, or changes in scope, where the customer has provided written authorization for changes in budget and scope or has approved us to perform additional work as of the measurement date. Awards may not be recognized as backlog after consideration of a number of factors, including whether (i) the relevant net revenue is expected only after a pending regulatory hurdle, which might result in cancellation of the study, (ii) the customer funding needed for commencement of the study is not believed to have been secured or (iii) study timelines are uncertain or not well defined. In addition, study amounts that extend beyond three years from measurement date are not included in backlog. The number and amount of new business awards can vary significantly from period to period, and an award’s contractual duration can range from several months to several years based on customer and project specifications.

(3) The years ended December 31, 2019 and 2018 are presented on an ASC 606 basis. All other periods are presented on an ASC 605 basis.

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 in conjunction with our consolidated financial statements and the notes thereto included elsewhere in this Annual Report on Form 10-K. This item and the related discussion contain forward-looking statements reflecting current expectations that involve risks and uncertainties. Actual results and the timing of events may differ materially from those indicated in such forward-looking statements. Important factors that may cause such differences include, but are not limited to, those discussed under the "Forward-Looking Statements" above and "Item IA. Risk Factors" in Part I of this Annual Report on Form 10-K.

Business Overview

We are one of the world's leading clinical contract research organizations, or CROs, by revenue, solely focused on providing scientifically-driven outsourced clinical development services to the biotechnology, pharmaceutical and medical device industries. Our mission is to accelerate the global development of safe and effective medical therapeutics. We differentiate ourselves from our competitors by our disciplined operating model centered on providing full-service Phase I-IV clinical development services and our therapeutic expertise. We believe this combination results in timely and cost-effective delivery of clinical development services for our customers. We believe that we are a partner of choice for small- and mid-sized biopharmaceutical companies based on our ability to consistently utilize our full-service, disciplined operating model to deliver timely and high-quality results for our customers.

We focus on conducting clinical trials across all major therapeutic areas, with particular strength in Cardiology, Metabolic Disease, Oncology, Central Nervous System, or CNS and Antiviral and Anti-infective, or AVAI. Our global platform includes approximately 3,500 employees across 37 countries, providing our customers with broad access to diverse markets and patient populations as well as local regulatory expertise and market knowledge.

How We Generate Revenue

We earn fees through the performance of services detailed in our customer contracts. Contract scope and pricing is typically based on either a fixed-fee or unit-of-service model, with consideration of activities performed by third parties, as well as ancillary costs necessary to deliver on the contract scope that are reimbursable by our customers. Our contracts can range in duration from a few months to several years. These contracts are individually priced and negotiated based on the anticipated project scope, including the complexity of the project and the performance risks inherent in the project. The majority of our contracts are structured with an upfront fee that is collected at the time of contract signing, and the balance of the fee is collected over the duration of the contract either through an arranged billing schedule or upon completion of certain performance targets or defined milestones.

Revenue, which is distinct from billing and cash receipt, is recognized based on the satisfaction of the individual performance obligations identified in each contract. Substantially all of our customer contracts consist of a single performance obligation, as the promise to transfer the individual services defined in the contracts are not separately identifiable from other promises in the contract, and therefore not distinct. Our performance obligations are generally satisfied over time and recognized as services are performed. The progression of our contract performance obligations are measured primarily utilizing the input method of cost to cost. Cancellation provisions in our contracts allow our customers to terminate a contract either immediately or according to advance notice terms specified within the applicable contract, which is typically 30 days. Contract cancellation may occur for various reasons, including, but not limited to, adverse patient reactions, lack of efficacy, or inadequate patient enrollment. Upon cancellation, we are entitled to fees for services rendered and reimbursable costs incurred through the date of termination, including payment for subsequent services necessary to conclude the study or close out the contract. These fees are typically discussed and agreed upon with the customer and are realized as revenue when we believe the amount can be estimated reliably and its realization is probable. Changes in revenue from period to period are driven primarily by new business volume and task order execution activity, project cancellations, changes in estimated costs to complete performance obligations, and the mix of active studies during a given period that can vary based on therapeutic area and or study life cycle stage.

Costs and Expenses

Our costs and expenses are comprised primarily of our total direct costs, selling, general and administrative costs, depreciation and amortization and income taxes.

Total Direct Costs

Total direct costs are primarily driven by labor and related employee benefits, but also include contracted third party service related expenses, fees paid to site investigators, reimbursed out of pocket expenses, laboratory supplies and other expenses contributing to service delivery. The other costs of service delivery can include office rent, utilities, supplies and software licenses which are allocated between Total direct costs and selling, general and administrative expenses based on the estimated contribution among service delivery and support function efforts on a percentage basis. Total direct costs are expensed as incurred and are not deferred in anticipation of contracts being awarded or finalization of changes in scope. Total direct costs, as a percentage of net revenue, can vary from period to period due to project labor efficiencies, changes in workforce, compensation/bonus programs and service mix.

Selling, General and Administrative

Selling, general and administrative expenses are primarily driven by compensation and related employee benefits, as well as rent, utilities, supplies, software licenses, professional fees (e.g., legal and accounting expenses), travel, marketing and other operating expenses.

Depreciation

Depreciation is provided on our property and equipment on the straight-line method at rates adequate to allocate the cost of the applicable assets over their estimated useful lives, which is three to five years for computer hardware, software, phone, and medical imaging equipment, five to seven years for furniture and fixtures and other equipment, and thirty to forty years for buildings. Leasehold improvements and deemed assets from landlord building construction are amortized on a straight-line basis over the shorter of the estimated useful life of the improvement or the associated remaining lease term.

Amortization

Amortization relates to finite-lived intangible assets recognized as expense using the straight-line method or using an accelerated method over their estimated useful lives, which range in term from 5 to 15 years.

Income Tax Provision

Income tax provision consists of federal, state and local taxes on income in multiple jurisdictions. Our income tax is impacted by the pre-tax earnings in jurisdictions with varying tax rates and any related tax credits that may be available to us. Our current and future provision for income taxes will vary from statutory rates due to the impact of valuation allowances in certain countries, income tax incentives, certain non-deductible expenses, and other discrete items.

Key Performance Metrics

To evaluate the performance of our business, we utilize a variety of financial and performance metrics. These key measures include net new business awards and backlog.

Net New Business Awards and Backlog

New business awards represent the value of anticipated future net revenue that has been recognized in backlog during the period. This value is recognized upon the signing of a contract or receipt of a written pre-contract confirmation from a customer that confirms an agreement in principle on budget and scope. New business awards also include contract amendments, or changes in scope, where the customer has provided written authorization for changes in budget and scope or has approved us to perform additional work as of the measurement date. Awards may not be recognized as backlog after consideration of a number of factors, including whether (i) the relevant net

revenue is expected only after a pending regulatory hurdle, which might result in cancellation of the study, (ii) the customer funding needed for commencement of the study is not believed to have been secured or (iii) study timelines are uncertain or not well defined. In addition, study amounts that extend beyond three years from measurement date are not included in backlog. The number and amount of new business awards can vary significantly from period to period, and an award's contractual duration can range from several months to several years based on customer and project specifications.

Cancellations arise in the normal course of business and are reflected when we receive written confirmation from the customer to cease work on a contractual agreement or when we believe the future revenue is unlikely to be realized. The majority of our customers can terminate our contracts without cause upon 30 days' notice. Similar to new business awards, the number and amount of cancellations can vary significantly period over period due to timing of customer correspondence and study-specific circumstances.

Net new business awards represent gross new business awards received in a period offset by total cancellations in that period. On an Accounting Standards Codification Topic 606, Revenue from Contracts with Customers ("ASC 606") basis, net new business awards were $1,094.4 million and $899.4 million for the years ended December 31, 2019 and 2018. On an Accounting Standards Codification Topic 605, Revenue Recognition ("ASC 605") basis, net new business awards were $581.0 million and $426.1 million for the years ended December 31, 2018 and 2017, respectively.

Backlog represents anticipated future net revenue from net new business awards that have commenced, but have not been completed. Reported backlog will fluctuate based on new business awards, changes in scope to existing contracts, cancellations, net revenue recognition on existing contracts and foreign exchange adjustments from non-U.S. dollar denominated backlog. As of December 31, 2019, our backlog increased by $225.3 million, or 21.3%, to $1,283.2 million compared to $1,057.9 million as of December 31, 2018. Included within backlog as of December 31, 2019 was approximately $695 million to $715 million that we expect to convert to net revenue in 2020, with the remainder expected to convert to net revenue in years after 2020.

On an ASC 606 basis, the effect of foreign currency adjustments on backlog was as follows: unfavorable foreign currency adjustments of $6.6 million for the year ended December 31, 2019 and unfavorable foreign currency adjustments of $2.3 million for the year ended December 31, 2018. On an ASC 605 basis, the effect of foreign currency adjustments on backlog resulted in unfavorable foreign currency adjustments of $1.1 million for the year ended December 31, 2018 and favorable foreign currency adjustments of $3.2 million for the year ended December 31, 2017.

Backlog and net new business award metrics may not be reliable indicators of our future period revenue as they are subject to a variety of factors that may cause material fluctuations from period to period. These factors include, but are not limited to, changes in the scope of projects, cancellations, and duration and timing of services provided.

Exchange Rate Fluctuations

The majority of our contracts and operational transactions are U.S. dollar denominated. The Euro represents the largest foreign currency denomination of our contractual and operational exposure. As a result, a portion of our revenue and expenses is subject to exchange rate fluctuations. We have translated the Euro into U.S. dollars using the following average exchange rates based on data obtained from www.xe.com:

	Year Ended December 31,		
	2019	2018	2017
U.S. Dollars per Euro:	1.12	1.18	1.13

Results of Operations

Year Ended December 31, 2019 compared to Year Ended December 31, 2018

(Amounts in thousands, except percentages)	Year Ended December 31, 2019	2018	Change	% Change
Revenue, net	$ 860,969	$ 704,589	$ 156,380	22.2%
Direct service costs, excluding depreciation and amortization	321,006	252,284	68,722	27.2%
Reimbursed out-of-pocket expenses	294,266	236,775	57,491	24.3%
Total direct costs	615,272	489,059	126,213	25.8%
Selling, general and administrative	95,245	75,681	19,564	25.9%
Depreciation	8,360	9,240	(880)	(9.5)%
Amortization	14,829	29,561	(14,732)	(49.8)%
Total operating expenses	733,706	603,541	130,165	21.6%
Income from operations	127,263	101,048	26,215	
Miscellaneous (expense) income, net	(863)	1,060	(1,923)	
Interest expense, net	(1,568)	(8,157)	6,589	
Income before income taxes	124,832	93,951	30,881	
Income tax provision	24,389	20,766	3,623	
Net income	$ 100,443	$ 73,185	$ 27,258	

Total revenue

Total revenue increased by $156.4 million to $861.0 million for the year ended December 31, 2019, from $704.6 million for the year ended December 31, 2018. The increase was primarily driven by strong activity within the Oncology and other uncategorized therapeutic areas.

Total direct costs

Total direct costs increased by $126.2 million, to $615.3 million for the year ended December 31, 2019 from $489.1 million for the year ended December 31, 2018. The increase was primarily attributed to higher reimbursed out-of-pocket expenses and higher personnel costs, outsourced services, and service-related supply costs to support the growth in service activities. Reimbursed out-of-pocket expenses, which can fluctuate significantly from period to period based on the timing of the program initiation or closeout, increased $57.5 million for the year ended December 31, 2019, compared to the same period in the prior year. The remaining increase was primarily attributed to higher personnel costs of $45.1 million, outsourced service costs of $7.1 million, and service-related supply costs of $5.7 million in the year ended December 31, 2019, compared to the same period in the prior year.

Selling, general and administrative

Selling, general and administrative expenses increased by $19.6 million, to $95.2 million for the year ended December 31, 2019 from $75.7 million for the year ended December 31, 2018. The increase was primarily driven by higher personnel costs of $16.7 million in the year ended December 31, 2019, compared to the same period in the prior year, to support growth in project activities.

Depreciation and Amortization

Depreciation and amortization expense decreased by $15.6 million, to $23.2 million for the year ended December 31, 2019 from $38.8 million for the year ended December 31, 2018. The decrease in depreciation and amortization was primarily related to the amortization of our definite lived intangible assets, which are amortized on an accelerated basis.

Miscellaneous (expense) income, net

Miscellaneous (expense) income, net decreased by $1.9 million to $0.9 million of expense for the year ended December 31, 2019 from $1.1 million of income for the year ended December 31, 2018. These changes were mainly attributable to foreign exchange gains or losses that arise in connection with the revaluation of short-term inter-company balances between our domestic and international subsidiaries, 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.

Interest expense, net

Interest expense, net decreased by $6.6 million to $1.6 million for the year ended December 31, 2019 from $8.2 million for the year ended December 31, 2018. The decrease in interest expense, net was related to a lower average outstanding balance in the year ended December 31, 2019 under our Prior Senior Secured Revolving Credit Facility (as defined below).

Income tax provision

Income tax provision increased by $3.6 million, to $24.4 million for the year ended December 31, 2019 from $20.8 million for the year ended December 31, 2018. The overall effective tax rates for the years ended December 31, 2019 and 2018 were 19.5% and 22.1%, respectively. The decrease in the effective tax rate for year ended December 31, 2019 was primarily attributable to a notable amount of excess tax benefits recognized from share-based compensation and tax benefits related to Foreign Derived Intangible Income (FDII). The increase in the income tax provision for the year ended December 31, 2019 was primarily due to an increase in pre-tax book income compared to the same period in the prior year, which was partially offset by excess tax benefits recognized from share-based compensation and tax benefits related to the FDII.

Year ended December 31, 2018 compared to Year ended December 31, 2017

See “Item 7 Management’s Discussion and Analysis of Financial Condition and Results of Operations” in the Annual Report on Form 10-K for the year ended December 31, 2018.

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 sources of liquidity are operating cash flows and funds available for borrowing under our new unsecured credit facility (the “Credit Facility”). As of December 31, 2019, we had cash and cash equivalents of $131.9 million. Approximately $21.6 million of our cash and cash equivalents, none of which was restricted, was held by our foreign subsidiaries as of December 31, 2019.

On September 30, 2019, the Company entered into the Credit Facility consisting of up to a $50.0 million revolving line of credit (the “Line of Credit”). The Credit Facility replaced a Senior Secured Term Loan Facility of $165.0 million (the “Prior Senior Secured Term Loan Facility”) and a Senior Secured Revolving Credit Facility of $150.0 million (the “Prior Senior Secured Revolving Credit Facility” and, together with the Prior Senior Secured Term Loan Facility, the “Prior Senior Secured Credit Facilities”) which were set to expire in December 2021. In relation to the termination of the Prior Senior Secured Credit Facilities, we repaid all outstanding obligations. As a result, no amounts remain outstanding under the Prior Senior Secured Credit Facilities.

As of December 31, 2019, we had $49.8 million available for borrowing under the Credit Facility. Our expected primary cash needs on both a short and long-term basis are for investment in operational growth, capital expenditures, share repurchases, selective strategic bolt-on acquisitions, other investments, and other general corporate needs. We have historically funded our operations and growth with cash flow from operations and borrowings under our credit facilities. We expect to continue expanding our operations through organic growth and potentially highly selective bolt-on acquisitions and investments. We expect these activities will be funded from existing cash, cash flow from operations and, if necessary, borrowings under our existing or future credit facilities or other debt. We have deemed that foreign earnings will be indefinitely reinvested and therefore we have not

provided taxes on these earnings. While we do not anticipate the need to repatriate these foreign earnings for liquidity purposes given our cash flows from operations and available borrowings under existing and future credit facilities, we would incur taxes on these earnings if the need for repatriation due to liquidity purposes arises. We believe that our sources of liquidity and capital will be sufficient to finance our cash needs for the next 12 months and on a longer-term basis. However, we cannot assure you that our business will generate sufficient cash flow from operations, or that future borrowings will be available to us under our Credit Facility or otherwise, in an amount sufficient to fund our liquidity needs.

	Year Ended December 31,		
Cash Flows (Amounts in thousands)	**2019**	**2018**	**2017**
Net cash provided by operating activities	$ 201,867	$ 156,584	$ 97,385
Net cash used in investing activities	(19,144)	(16,973)	(12,237)
Net cash used in financing activities	(73,918)	(141,580)	(97,828)
Effect of exchange rates on cash, cash equivalents, and restricted cash	(167)	(1,241)	1,765
Increase (decrease) in cash, cash equivalents, and restricted cash	$ 108,638	$ (3,210)	$ (10,915)

Cash Flows from Operating Activities

Cash flows from operations are driven mainly by net income, stock based compensation expense, amortization of intangibles and net movement in advanced billings, accrued expenses, prepaid and other current assets, and accounts receivable and unbilled, net. Accounts receivable and unbilled, net, and advanced billings fluctuate on a regular basis as we perform our services, bill our customers and ultimately collect on those receivables. We attempt to negotiate payment terms in order to provide for payments prior to or soon after the provision of services, but this timing of collection can vary significantly on a period by period comparative basis.

Net cash flows provided by operating activities were $201.9 million for the year ended December 31, 2019 consisting of net income of $100.4 million. Adjustments to reconcile net income to net cash provided by operating activities were $65.9 million, primarily related to amortization of intangibles of $14.8 million, depreciation of $8.4 million, stock based compensation expense of $20.7 million, deferred income tax provision of $10.1 million, and noncash lease expense of $9.9 million. Changes in operating assets and liabilities provided $35.6 million in operating cash flows and were primarily driven by increased accrued expenses of $21.8 million and increased advanced billings of $44.6 million, offset by increased accounts receivable and unbilled, net of $21.3 million.

Net cash flows provided by operating activities were $156.6 million for the year ended December 31, 2018 consisting of net income of $73.2 million. Adjustments to reconcile net income to net cash provided by operating activities were $43.8 million, primarily related to amortization of intangibles of $29.6 million, depreciation of $9.2 million, stock based compensation expense of $6.5 million, and deferred income tax provision of $3.9 million, offset by $7.7 million of amortization and adjustment of deferred credit. Changes in operating assets and liabilities provided $39.6 million in operating cash flows and were primarily driven by increased accrued expenses of $29.0 million and increased advanced billings of $35.6 million, offset by increased accounts receivable and unbilled, net of $27.0 million.

Net cash flows provided by operating activities were $97.4 million for the year ended December 31, 2017 consisting of net income of $39.1 million. Adjustments to reconcile net income to net cash provided by operating activities were $45.4 million, primarily related to amortization of intangibles of $37.9 million, depreciation of $8.6 million, stock based compensation expense of $4.5 million, and deferred income tax provision of $3.2 million, offset by $8.8 million of amortization and adjustment of deferred credit. Changes in operating assets and liabilities provided $12.9 million in operating cash flows and were primarily driven by increased accounts payable of $4.8 million, increased advanced billings of $7.7 million, and increased pre-funded study costs of $5.3 million, offset by increased prepaid expenses and other current assets of $3.5 million.

Cash Flow from Investing Activities

Net cash used in investing activities was $19.1 million for the year ended December 31, 2019 primarily consisting of property and equipment expenditures.

Net cash used in investing activities was $17.0 million for the year ended December 31, 2018 primarily consisting of property and equipment expenditures.

Net cash used in investing activities was $12.2 million for the year ended December 31, 2017 primarily consisting of property and equipment expenditures.

Cash Flow from Financing Activities

Net cash used in financing activities was $73.9 million in the year ended December 31, 2019, primarily related to $80.4 million in principal payments on our Prior Senior Secured Term Loan Facility, offset by $6.5 million in proceeds from stock option exercises.

Net cash used in financing activities was $141.6 million in the year ended December 31, 2018, primarily related to $72.2 million in principal payments on our Prior Senior Secured Term Loan Facility and $70.0 million in principal payments on our Prior Senior Secured Revolving Credit Facility.

Net cash used in financing activities was $97.8 million in the year ended December 31, 2017, primarily related to $155.6 million in repurchases of common stock and $42.4 million in payments on our Prior Senior Secured Credit Facilities, offset by $100.0 million in proceeds from the Prior Senior Secured Revolving Credit Facility.

Share Repurchases

In November 2017, the Board members who are not affiliated with Cinven (the "Disinterested Directors") approved an agreement to repurchase 2,000,000 shares of the Company's common stock from Cinven in connection with a Secondary Offering (as described in Note 1 of the Notes to the Consolidated Financial Statements) for aggregate consideration of approximately $60.3 million, representing a purchase price of $30.16 per share. The Company funded the repurchase with approximately $60.0 million in borrowings under the Prior Senior Secured Revolving Credit Facility and cash on hand.

In August 2017, the Disinterested Directors of the Company approved a stock repurchase agreement with Medpace Limited Partnership, a Guernsey limited partnership (the "Limited Partnership" acting through its general partner, Medpace GP Limited, a Guernsey company, the "General Partner" and, the Limited Partnership acting through the General Partner, "Cinven"), pursuant to which the Company repurchased 2,000,000 shares of the Company's common stock from Cinven for aggregate consideration of approximately $60.5 million, representing a purchase price of $30.27 per share. The Company funded the repurchase with cash on hand and $40.0 million in borrowings under our Prior Senior Secured Revolving Credit Facility.

In April 2017, the Board of the Company authorized a share repurchase program with an authorized repurchase level of $50.0 million. The share repurchase program was cancelled in the fourth quarter of 2017. Repurchases under the repurchase program took place in the open market or negotiated transactions, at the discretion of the Company's management. During the year ended December 31, 2017, the Company repurchased 1,342,786 shares of its outstanding common stock for $34.7 million under this share repurchase program.

The Company has elected to constructively retire all repurchased shares with all amounts paid in excess of Common stock par value reflected within Accumulated deficit in the Company's consolidated balance sheets, except for 200,000 shares, which are reflected within treasury stock in the Company's consolidated balance sheets.

In the first quarter of 2018, the Board of the Company authorized a share repurchase program with an authorized repurchase level of $50.0 million. There have been no share repurchases under this program.

Indebtedness

On September 30, 2019 (the "Closing Date"), Medpace Inc., as borrower (the "Borrower"), and Medpace IntermediateCo, Inc., a wholly-owned subsidiary of the Company, as guarantor (the "Guarantor"), entered into the new loan agreement (the "Loan Agreement"), which provides for a new unsecured credit facility (the "Credit Facility") in an aggregate principal amount up to $50.0 million. The Loan Agreement also provides that the Credit Facility will expire in 364 days from the Closing Date. The Credit Facility replaced the Prior Senior Secured Term Loan Facility of $165.0 million and the Prior Senior Secured Revolving Credit Facility of $150.0 million, which were set to expire in December 2021. In relation to the termination of the Prior Senior Secured Credit Facilities, we repaid all outstanding obligations. As a result, no amounts remain outstanding under the Prior Senior Secured Credit Facilities.

The Credit Facility is guaranteed by the Guarantor and its material, direct or indirect wholly owned domestic subsidiaries, with certain exceptions, including where providing such guarantees is not permitted by law, regulation or contract or would result in adverse tax consequences. All of the obligations under the Credit Facility are unsecured.

As of December 31, 2019, there were no borrowings outstanding under the Credit Facility. The Credit Facility provides that outstanding balances will bear interest at a rate of LIBOR plus 100 basis points (1.00%).

The Credit Facility is subject to customary negative covenants. The Company was in compliance with all financial covenants as of December 31, 2019.

The Credit Facility contains certain events of default, including, among others, non-payment of principal or interest, breach of the covenants, cross default and cross acceleration to certain other indebtedness, defaults on monetary judgment orders, certain ERISA events, certain bankruptcy and insolvency events, actual or asserted invalidity of any guarantee or security document and change in control.

As of December 31, 2019, we had no indebtedness under the Credit Facility. As of December 31, 2019, we had $0.2 million in letters of credit outstanding related to certain operating lease obligations, which are secured by the Credit Facility.

Contractual Obligations and Commercial Commitments

We have various contractual obligations, which are recorded as liabilities in our consolidated financial statements. Other items, such as operating lease obligations, are not recognized as liabilities in our consolidated financial statements but are required to be disclosed. The following table summarizes our future payments for all contractual obligations and commercial commitments for the years subsequent to the year ended December 31, 2019:

	Payments Due by Period				
Contractual Obligations (In thousands)	**Total**	**Less than 1 year**	**1-3 years**	**3-5 years**	**More than 5 years**
Operating lease obligations	201,496	17,474	35,952	26,931	121,139
Total	$ 201,496	$ 17,474	$ 35,952	$ 26,931	$ 121,139

We have recorded a tax liability for unrecognized benefits for uncertain tax positions of $8.2 million, which has not been included in the above table due to the uncertainties in the timing of settlement of the income tax positions.

We are a party to certain vendor contracts related to clinical services that if cancelled may require payments for services performed and potentially additional services required to protect safety of subjects. The value of these potential wind-down provisions is generally borne by our customers and is not practical to estimate.

Off-Balance Sheet Arrangements

Off-balance sheet arrangements refer to any transaction, agreement or other contractual arrangement to which an entity not consolidated under our entity structure exists, where we have an obligation arising under a guarantee contract, derivative instrument or variable interest or a retained or contingent interest in assets transferred to such an entity or similar arrangement that serves as credit, liquidity or market risk support for such assets. We have no off-balance sheet arrangements.

Jumpstart our Business Startups Act of 2012

As of the year ended December 31, 2019, we ceased to be an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012, since the market value of our common stock held by non-affiliates exceeded $700 million as of June 30, 2019. As a result, beginning with this Annual Report on Form 10-K for the year ended December 31, 2019, we are subject to Section 404(b) of the Sarbanes-Oxley Act, which requires that our independent registered public accounting firm provide an attestation report on the effectiveness of our internal control over financial reporting, included herein.

Critical Accounting Policies and Estimates

The preparation of financial statements in accordance with generally accepted accounting principles in the United States of America, or US GAAP, requires us to make a variety of decisions which affect reported amounts and related disclosures, including the selection of appropriate accounting principles and the assumptions on which to base accounting estimates. In reaching such decisions, we apply judgment based on our understanding and analysis of the relevant circumstances, including our historical experience and other assumptions. Actual results could differ from our estimates. We are committed to incorporating accounting principles, assumptions and estimates that promote the representational faithfulness, verifiability, neutrality and transparency of the accounting information included in the financial statements.

Revenue Recognition

We generally enter into contracts with customers to provide services ranging in duration from a few months to several years. The contract terms generally provide for payments based on a fixed-fee or unit-of-service arrangement. We account for revenue in accordance with ASC 606, Revenue from Contracts with Customers, which we adopted on January 1, 2018. Revenue on contracts is recognized, when or as we satisfy the contract performance obligations by transferring control of the services provided to the customer, at the amount that reflects the consideration to which we expect to be entitled in exchange for transferring those services. Our performance obligations are generally satisfied over time and recognized as work progresses.

Contract Assumptions

Accounting for contracts performed over a period of time involves the use of various assumptions to estimate total contract revenue and costs. We estimate expected costs to complete a contract and recognize contracted revenue over the life of the contract as those costs are incurred while performing our contracted obligations.

Cost estimates are based on a detailed project budget and are developed based on many variables, including, but not limited to, the scope of the work, labor productivity, the complexity of the study, the participating geographic locations and the Company's historical experience. To assist with the estimation of costs expected at completion over the life of a project, regular contract reviews are performed in which performance to date is compared to the most current estimate to complete assumptions. The reviews include an assessment of costs incurred to date compared to expectations based on budget assumptions and other circumstances specific to the project. The total estimated costs necessary to complete is updated and any revisions to the existing cost estimate results in cumulative adjustments to the amount of revenue recognized in the period in which the revisions are identified. Because of the uncertainties inherent in estimating the costs necessary to fulfill contractual obligations, it is possible that estimates may change in the near term, resulting in a material change in revenue reported.

Contracts generally provide for pricing modifications upon scope of work changes. We recognize revenue, at an amount to which we expect to be entitled, related to work performed in connection with scope changes when the underlying services are performed and a binding contractual commitment has been established with the customer. If our customers do not agree to pricing changes upon changes in our scope of work, we could be exposed to cost overruns and reduced contract profitability. Costs are not deferred in anticipation of contracts being awarded or amendments being finalized, but are expensed as incurred.

Most contracts are terminable by the customer, either immediately or according to advance notice terms specified within the contracts. These contracts require payment of fees for services rendered through the date of termination and may require payment for subsequent services necessary to conclude the study or close out the contract. Final settlement amounts are agreed to with the customer based on remaining work to be performed. These amounts are included in revenue when we believe the amount can be estimated reliably and its realization is probable. In evaluating the probability of recognition, we consider the contractual basis for the settlement amount and the objective evidence available to support the amount.

Certain contracts contain volume rebate arrangements with our customers that provide for rebates if certain specified spending thresholds are met. These obligations are considered as a reduction in revenue when it appears probable that the arrangement thresholds will be met.

We occasionally enter into incentive fee arrangements with customers that provide for additional compensation if certain defined contractual milestones or performance thresholds are met. These additional fees are included in the estimated transaction price when there is a basis to reasonably estimate the amount of the fee and when achievement of the incentive milestone is deemed probable. These estimates are based on anticipated performance, our best judgment at the time or ultimately, upon achievement of the threshold or milestone.

We record revenue net of any tax assessments by governmental authorities that are imposed and concurrent with specific revenue generating transactions.

Performance Obligations

Substantially all of our contracts consist of a single performance obligation, as the promise to transfer the individual services described in the contracts are not separately identifiable from other promises in the contracts, and therefore not distinct. Revenue recognition is determined by assessing the progress of performance completed or delivered to date compared to total services to be delivered under the terms of the arrangement. The measures utilized to assess progress on the satisfaction of performance are specific to the performance obligation identified in the contract.

For the majority of our contract performance obligations, we utilize the input method of cost to cost to measure progress. Under this method, the Company determines cost incurred to date for the services it provides compared to the total estimated costs at completion.

For certain other contractual performance obligations, the Company has determined that an output method is the best measure of progress. These relate to certain unitized contracts, and the Company recognizes revenue in the period in which the unit is delivered compared to total contracted units.

Lease Recognition

The Company enters into contracts to lease facilities and equipment to be used in its operations. At contract inception, the Company determines whether a contract contains a lease within the scope of Accounting Standard Codification Topic 842, Leases (“ASC 842”), and determines the appropriate classification of the lease as either operating or finance.

Contracts containing operating leases are recorded on the consolidated balance sheets within Operating lease right-of-use ("ROU") assets, Other current liabilities, and Operating lease liabilities. Operating lease ROU assets and operating lease liabilities are recognized based on the present value of the future lease payments over the lease term as of the lease commencement date. In addition, operating ROU assets also include lease payments made and exclude lease incentives and initial direct costs incurred. Operating lease expense for lease payments is recognized on a straight-line basis over the lease term within Total direct costs and Selling, general, and administrative expenses. Variable lease costs are primarily related to adjustments for inflation, common area maintenance and property tax and are recognized within Total direct costs and Selling, general and administrative expenses.

Contracts containing finance leases are recognized initially in the same manner as Operating lease ROU assets and liabilities; however, they are recorded on the consolidated balance sheets within Property and equipment, net, Other current liabilities, and Other long-term liabilities. Finance lease assets are subsequently amortized on a straight line basis over the lease term within Depreciation expense, while the lease liability is accreted within Interest expense, net utilizing the discount rate determined at lease commencement and reduced by periodic lease payments over the lease term. Currently, the Company does not have any finance leases.

The discount rate utilized in determining the present value of future payments for both operating and finance leases, unless implicit in the lease contract, is determined based on the Company's collateralized incremental borrowing rate based on the information available at lease commencement.

Lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option as determined at lease commencement.

Many of our lease agreements have both lease and non-lease components, which the Company has elected to treat as a single lease component for recognition purposes.

The Company may enter into short-term leases (leases with a lease term of less than one year), which it has elected not to capitalize as assets and liabilities on the consolidated balance sheets, but instead recognizes lease payments within Total direct costs and Selling, general, and administrative expenses on a straight line basis over the lease term.

Goodwill and Intangible Assets

Goodwill

Goodwill represents the excess of purchase price over the fair value of net assets acquired in business combinations. Our reporting units are Phase I-IV clinical research services, or Phase I-IV and Laboratories.

The carrying value of goodwill is reviewed at least annually for impairment, or as indicators of potential impairment are identified, at the reporting unit level. We perform our annual goodwill impairment test during the fourth quarter each year, comparing the fair value of each of our reporting units with its carrying amount, inclusive of goodwill. A goodwill impairment charge would be recognized for the amount by which the carrying amount exceeds the reporting unit's fair value. Reporting unit fair value is estimated using a combination of the income approach, a discounted cash flow analysis, and the market approach, utilizing the guideline company method. The reporting unit's discounted cash flow analysis requires significant management judgment with respect to net revenue, total direct costs and amortization, selling, general and administrative expenses, capital expenditures and the selection and use of an appropriate discount rate. The projected revenue and expense assumptions and capital expenditures are based on our annual and long-term business plans. Discount rates reflect market-based estimates of the risks associated with the projected cash flows directly resulting from the use of those assets in operations.

There was no indication of impairment related to goodwill based on the fourth quarter 2019 assessment as the fair value of the reporting units was substantially in excess of carrying value.

This process is inherently subjective and dependent upon estimates and assumptions we make. In determining our expected future cash flows, we assume that we will continue to acquire and convert new business to contract, execute on these contracts with reasonable profit, collect customer receivables and thus generate positive cash flows. However, future declines in the operating results of these reporting units could indicate a need to reevaluate the fair value of these components under accounting guidance governing goodwill and may ultimately result in future impairment. We continue to monitor for any potential indicators of impairment.

Intangible Assets

The Company has an indefinite lived intangible asset related to its trade name valued at $31.6 million. The carrying value of the trade name asset is reviewed at least annually for impairment, or as indicators of potential impairment are identified. The Company performs its annual impairment test in the fourth quarter each year in conjunction with its annual assessment of goodwill. The assessment consists of comparing the carrying value of the indefinite lived intangible asset to its estimated fair value, utilizing the relief from royalty method, an income approach valuation. The relief from royalty method requires management judgment with respect to projected net revenue, profitability and growth and the selection and use of an appropriate discount rate. There was no indication of impairment related to the trade name asset based on the fourth quarter 2019 assessment.

Our assessment of impairment charges on any assets classified currently as having indefinite lives could change in future periods if certain events were to occur, including, but not limited to, the following: a significant change in business results, an increase in our discount rates due to a change in our weighted average cost of capital, a decrease in growth rates, economic deterioration that is more severe or longer in duration than anticipated or another significant economic event.

Finite-lived intangible assets consist mainly of the value assigned to customer relationships and developed technologies. Finite-lived intangible assets are amortized straight-line or using an accelerated method over their estimated useful lives, which range in term from 5 to 15 years. Amortization expense recognized related to finite lived intangible assets was $14.8 million, $29.6 million and $37.9 million, respectively, for the years ended December 31, 2019, 2018 and 2017.

Income Taxes

We are subject to income taxes in the United States and numerous foreign jurisdictions. Significant judgment is required in the forecasting of taxable income using historical and projected future operating results in determining our provision for income taxes and the related assets and liabilities. The provision for income taxes includes income taxes paid, currently payable and receivable, and deferred taxes.

We record deferred tax assets and liabilities based on temporary differences between the financial statement bases and tax bases of assets and liabilities. Deferred tax assets are recorded for tax benefit carryforwards using tax rates anticipated to be in effect in the year in which temporary differences are expected to reverse. If it does not appear more likely than not that the full value of a deferred tax asset will be realized, the Company records a valuation allowance against the deferred tax asset, with an offsetting charge to the Company’s income tax provision or benefit.

The recoverability of our deferred tax assets is estimated based on consideration of all available positive and negative evidence, including, but not limited to, our ability to generate a sufficient level of future taxable income, reversals of deferred tax liabilities (other than those with an indefinite reversal period), tax planning strategies and recent financial performance. The assessment of recoverability is performed on a jurisdiction by jurisdiction basis. Based on the analysis of the above factors, we determined that as of December 31, 2019 and 2018 a valuation allowance in the amount of $0.8 million and $0.2 million, respectively, was required relating to certain foreign operating loss carryforwards, and other deferred tax assets that are currently not expected to be realized. Differences in actual results compared to our estimates and changes in our assumptions could result in an adjustment to the valuation allowance in the future and would generally impact earnings or other comprehensive income depending on the nature of the respective deferred asset for which the valuation allowance exists.

We have recognized certain liabilities, including penalties and interest in the amount of $1.4 million as of December 31, 2019, within other long-term liabilities on the consolidated balance sheets. These relate to uncertain tax positions that are subject to various assumptions and judgment. Liabilities for these uncertain tax positions are assessed on a position by position basis. The calculation of these liabilities involves dealing with uncertainties in the application of complex tax regulations in both domestic and foreign jurisdictions. These positions may be subject to audit and review by tax authorities, and may result in future taxes, interest and penalties if we are unsuccessful in defending our positions. If the 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.

As of December 31, 2019 and 2018, as a result of an updated analysis of future cash needs in the United States and opportunities for investment outside the United States, we assert that all foreign earnings will be indefinitely reinvested and therefore we have not provided taxes on these earnings. These undistributed earnings of foreign subsidiaries will support future growth in foreign markets and maintain current operating needs of foreign locations. We will continue to monitor our assertion related to investment of foreign earnings. See Note 11 of the Notes to Consolidated Financial Statements for further information regarding this assertion.

Stock Based Compensation

We have stock based compensation plans in which we issue stock based awards to employees and directors in the form of vested common shares, stock options, stock appreciation rights (SARs), restricted stock awards (RSAs), restricted stock units (RSUs), or other cash based or stock dividend equivalent awards. All of our currently outstanding awards are subject to equity classification pursuant to the terms of the award grants and based on accounting guidance which governs such transactions. Accounting guidance applicable to equity classified awards require all stock based compensation, including vested shares, grants of employee stock options and restricted stock to be recognized in the consolidated statements of operations based on their grant date fair values.

We estimate the fair value of our stock options utilizing the Black-Scholes-Merton option pricing model, which requires the input of highly subjective assumptions including: the expected stock price volatility, the calculation of the expected holding period of the award, the risk free interest rate and expected dividends on the underlying common stock. Due to the lack of Company specific historical and implied volatility data, we have based our estimate of expected volatility on the historical volatility of a group of peer companies that are most representative of our company. The historical volatility is calculated based on a period of time commensurate with the expected holding period assumption. The holding period represents the period that our option awards are expected to be outstanding. We use the simplified method as prescribed by accounting guidance governing such awards, to calculate the expected term for options granted to employees as we do not have sufficient historical evidence data to provide a reasonable basis upon which to estimate the expected holding period. This simplified method utilizes the mid-point between the vesting date and the date of the contractual term. The risk free rate is based on extrapolated rates of U.S. Treasury bonds whose terms are consistent with the expected holding period of the stock options. We have assumed a dividend yield of zero as we have not historically paid any dividends on our common stock.

All our stock based option awards are subject to service based vesting conditions. Compensation expense related to stock option awards to employees is recognized on a straight line basis based on the grant date fair value over the associated service period of the award, which is equal to the vesting term.

The following table summarizes the key weighted average assumptions used in the Black-Scholes-Merton option pricing model to calculate the fair value of options during the periods:

	Year Ended December 31,		
	2019	**2018**	**2017**
Expected holding period - years	2.6	5.4	5.4
Expected volatility	26.3%	27.0%	28.0%
Risk-free interest rate	2.0%	2.8%	2.0%
Expected dividend yield	0.0%	0.0%	0.0%

The assumptions used in the table above reflect both grant date inputs to arrive at the grant date fair values for stock options subject to equity-classified stock compensation accounting and reflect a fair value calculation for stock options outstanding in the period subject to liability-classified stock compensation accounting. As of December 31, 2019 all outstanding stock based awards were subject to equity classification.

The weighted average grant date fair value of employee stock options granted was $14.06, $11.51 and $8.54 for the years ended December 31, 2019, 2018 and 2017.

Effect of Recent Accounting Pronouncements

Refer to Note 2 of the Notes to Consolidated Financial Statements for management's discussion of the effect of recent accounting pronouncements.

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, inflation, interest rates, and other relevant market rates or prices changes. We are exposed to market risk from changes in foreign currency exchange rates, inflation rate and credit risk and we regularly evaluate our exposure to such changes.

Foreign Currency Risk

We have business operations globally, and accordingly, we are exposed to foreign currency fluctuations that can affect our financial results. For the years ended December 31, 2019 and 2018, approximately 11.1% and 8.7% of our revenue was derived from contracts denominated in currencies other than the U.S. dollar, whereas approximately 22.3% and 29.8% of our operational costs, including, but not limited to, salaries, wages and other employee benefits, were derived in foreign currencies. Of these exposures, approximately 81.9% and 87.5% of revenue denominated in foreign currencies and approximately 52.8% and 48.3% of operational costs denominated in foreign currencies were Euro denominated for the years ended December 31, 2019 and 2018, respectively. Our financial statements are reported in U.S. dollars and, accordingly, fluctuations in exchange rates will affect the translation of our revenues and expenses denominated in foreign currencies into U.S. dollars for purposes of reporting our consolidated financial results. We recalculated our reported pre-tax income for the years ended December 31, 2019 and 2018 using foreign exchange rates that were 10% higher and 10% lower than actual exchange rates utilized during the year. When utilizing foreign exchange rates 10% higher than actual exchange rates, our pre-tax income for the years ended December 31, 2019 and 2018 is positively impacted by approximately $6.7 million and $5.1 million, respectively. When utilizing foreign exchange rates 10% lower than actual exchange rates, our pre-tax income for the years ended December 31, 2019 and 2018 is negatively impacted by approximately $6.7 million and $5.1 million, respectively.

We are also subject to foreign currency transaction risk for fluctuations in exchange rates during the period of time between contract commencement and cash settlement for services that we provide in relation to the contract. This exposure may affect our contract and operational profitability. To mitigate our foreign currency risk exposure we provide for exchange rate fluctuation adjustments subject to certain thresholds within our contracts where contract currency varies from currencies where costs will be incurred to support delivery of the contract.

Credit Risk

Financial instruments that subject the Company to credit risk primarily consist of cash and cash equivalents, and accounts receivable and unbilled, net. The cash and cash equivalent balances are held and maintained with high-quality financial institutions with reputable credit ratings and, consequently, we believe that such funds are subject to minimal credit risk.

We generally do not require collateral or other securities to support customer receivables. In the years ended December 31, 2019 and 2018, credit losses have been immaterial and within our expectations. Moreover, in many cases we require advance payment from our customers for a portion of the study contract price upon the signing of a service contract which helps to mitigate credit risk. As of the years ended December 31, 2019 and 2018, there were no major customers accounting for more than 10% of our accounts receivable and unbilled, net.

Inflation

Our contracts that provide for services to be performed in excess of a year generally are based on inflation assumptions for the portion of the services to be performed beyond one year. We do not have significant operations in countries where the economy is considered highly inflationary, and do not believe in the near term that inflation will have a material adverse impact on us. However, if actual rates are greater than our inflation assumptions, inflation could have a material adverse effect on our operations or financial condition.

Interest Rates

We have no outstanding long-term debt as of December 31, 2019. We therefore no longer have meaningful interest rate risk. However, if the need for additional liquidity arises and we utilize our Credit Facility, interest rates could have a material adverse effect on our operations or financial condition.

Item 8. Financial Statements and Supplementary Data.

Management's Report on Internal Control Over Financial Reporting

Management of Medpace Holdings, 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 our 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 our management and directors, 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, 2019. 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, 2019 was effective.

The effectiveness of the Company’s internal control over financial reporting has been audited by Deloitte & Touche LLP, an independent registered public accounting firm, as stated in their report included herein.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of Medpace Holdings, Inc. and subsidiaries

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Medpace Holdings, Inc. and subsidiaries (the "Company") as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive income, shareholders' equity, and cash flows, for each of the three years in the period ended December 31, 2019, and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, 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, 2019, 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 25, 2020, expressed an unqualified opinion on the Company's internal control over financial reporting.

Change in Accounting Principle

As discussed in Note 2 to the financial statements, the Company has changed its method of accounting for leases as of January 1, 2019, due to the adoption of Financial Accounting Standards Board (“FASB”) Accounting Standards Codification (“ASC”) Topic 842, Leases, using the comparatives under FASB ASC Topic 840, Leases approach.

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 2 to the financial statements

Critical Audit Matter Description

The Company recognizes contract revenue over the contract term as the service progresses, because the transfer of control to the customer is continuous. Substantially all of the Company's clinical research contracts consist of a single performance obligation as the promise to transfer individual services described in the contracts are not separately identifiable from other promises in the contracts, and therefore not distinct. The accounting for these contracts involves judgment, particularly as it relates to the process of estimating costs to complete a contract for the performance obligation, which includes direct costs, reimbursable out-of-pocket costs, and reimbursable investigator site payments. Contract costs are recognized as incurred, and revenue recognition is based on cost incurred to date for the services provided compared to the total estimated costs to complete a contract.

Given the judgments necessary to estimate costs to complete a contract for the performance obligation used to recognize revenue for certain clinical research contracts over time, auditing such estimates required extensive audit effort due to the complexity of contracts and a high degree of auditor judgment 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 costs to complete a contract for the performance obligation used to recognize revenue for certain clinical research contracts included the following, among others:

- We selected a sample of contracts and performed the following:
  - Evaluated whether the contracts were properly included in management's calculation of contract revenue based on the terms and conditions of each selected contract, including whether continuous transfer of control to the customer occurred as progress was made toward fulfilling the performance obligation.
  - Compared the transaction prices to the consideration expected to be received based on current rights and obligations under the contracts and any pricing modifications and scope changes that were agreed upon with the customers.
  - Tested management's identification of distinct performance obligations by evaluating whether the progress of performance completed or delivered to date compared to total services to be delivered under the terms of the arrangement.
  - Tested the accuracy and completeness of the total contract costs incurred to date for the performance obligation.
  - Evaluated the estimates of costs to complete a contract for the performance obligation by:
    - Comparing costs incurred to date to the costs management estimated to be incurred to date.
    - Evaluating management's ability to achieve the estimates of total contract 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.
    - Comparing management's estimates for the selected contracts to costs of similar performance obligations, when applicable.
  - Tested the mathematical accuracy of management's calculation of revenue for the performance obligation.
- We selected a sample of contracts and evaluated management's ability to estimate total contract costs accurately by comparing actual costs to management's historical estimates.

/s/ Deloitte & Touche LLP

Cincinnati, Ohio
February 25, 2020

We have served as the Company's auditor since 2002.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the shareholders and the Board of Directors of Medpace Holdings, Inc. and subsidiaries

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Medpace Holdings, Inc. and subsidiaries (the "Company") as of December 31, 2019, 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, 2019, 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, 2019, of the Company and our report dated February 25, 2020, expressed an unqualified opinion on those financial statements, and included an explanatory paragraph related to the Company's change in method of accounting for leases in fiscal year 2019.

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

Cincinnati, Ohio
February 25, 2020

MEDPACE HOLDINGS, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

(Amounts in thousands, except share amounts)

	As Of December 31, 2019	2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 131,920	$ 23,275
Restricted cash	-	7
Accounts receivable and unbilled, net (includes $1.9 million and $3.8 million with related parties at December 31, 2019 and 2018, respectively)	155,662	133,449
Prepaid expenses and other current assets	29,446	21,383
Total current assets	317,028	178,114
Property and equipment, net	47,292	52,255
Operating lease right-of-use assets	52,152	-
Goodwill	662,396	660,981
Intangible assets, net	54,350	69,179
Deferred income taxes	376	713
Other assets	9,477	6,691
Total assets	$ 1,143,071	$ 967,933
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable (includes $0.2 million and $0.3 million with related parties at December 31, 2019 and 2018, respectively)	$ 22,404	$ 16,737
Accrued expenses	109,252	87,493
Advanced billings (includes $3.0 million and $0.4 million with related parties at December 31, 2019 and 2018, respectively)	192,359	147,935
Other current liabilities	18,987	4,861
Total current liabilities	343,002	257,026
Long-term debt, net, less current portion	-	79,721
Operating lease liabilities	45,212	-
Deemed landlord liability, less current portion	-	24,484
Deferred income tax liability	12,849	439
Other long-term liabilities	15,725	16,560
Total liabilities	416,788	378,230
Commitments and contingencies (see Note 12)		
Shareholders' equity:		
Preferred stock - $0.01 par-value; 5,000,000 shares authorized; no shares issued and outstanding at December 31, 2019 and 2018, respectively	-	-
Common stock - $0.01 par-value; 250,000,000 shares authorized at December 31, 2019 and 2018, respectively; 36,065,278 and 35,665,910 shares issued and outstanding at December 31, 2019 and 2018, respectively	360	356
Treasury stock - 200,000 shares at December 31, 2019 and 2018, respectively	(6,030)	(6,030)
Additional paid-in capital	666,585	639,381
Retained earnings (accumulated deficit)	68,109	(41,487)
Accumulated other comprehensive loss	(2,741)	(2,517)
Total shareholders' equity	726,283	589,703
Total liabilities and shareholders' equity	$ 1,143,071	$ 967,933

See notes to consolidated financial statements.

MEDPACE HOLDINGS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS

(Amounts in thousands, except per share amounts)

	Year Ended December 31,		
	2019	**2018**	**2017**
Revenue:			
Revenue, net (includes $18.9 million and $15.1 million with related parties for the years ended December 31, 2019 and 2018)	$ 860,969	$ 704,589	$ -
Service revenue, net (includes $11.1 million with related parties for the year ended December 31, 2017)	-	-	386,462
Reimbursed out-of-pocket revenue (includes $1.5 million with related parties for year ended December 31, 2017)	-	-	49,690
Total revenue	860,969	704,589	436,152
Operating expenses:			
Direct service costs, excluding depreciation and amortization	321,006	252,284	211,773
Reimbursed out-of-pocket expenses	294,266	236,775	49,690
Total direct costs	615,272	489,059	261,463
Selling, general and administrative	95,245	75,681	63,357
Depreciation	8,360	9,240	8,574
Amortization	14,829	29,561	37,900
Total operating expenses	733,706	603,541	371,294
Income from operations	127,263	101,048	64,858
Other expense, net:			
Miscellaneous (expense) income, net	(863)	1,060	(354)
Interest expense, net	(1,568)	(8,157)	(7,559)
Total other expense, net	(2,431)	(7,097)	(7,913)
Income before income taxes	124,832	93,951	56,945
Income tax provision	24,389	20,766	17,823
Net income	$ 100,443	$ 73,185	$ 39,122
Net income per share attributable to common shareholders:			
Basic	$ 2.79	$ 2.05	$ 1.00
Diluted	$ 2.67	$ 1.97	$ 0.98
Weighted average common shares outstanding:			
Basic	35,881	35,547	39,056
Diluted	37,576	36,912	39,839

See notes to consolidated financial statements.

MEDPACE HOLDINGS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(Amounts in thousands)

	Year Ended December 31,		
	2019	**2018**	**2017**
Net income	$ 100,443	$ 73,185	$ 39,122
Other comprehensive (loss) income			
Foreign currency translation adjustments, net of taxes	(224)	(1,783)	3,008
Comprehensive income	$ 100,219	$ 71,402	$ 42,130

See notes to consolidated financial statements.

MEDPACE HOLDINGS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY

(Amounts in thousands)

	Common Stock	Treasury Stock	Additional Paid-In Capital	(Accumulated Deficit) Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Total
BALANCE — December 31, 2016	$ 407	$ -	$623,629	$ (9,584)	$ (3,742)	$ 610,710
Impact to Retained Earnings from adoption of ASU 2016-09			440	(440)		
BALANCE — January 1, 2017	407	-	624,069	(10,024)	(3,742)	610,710
Net income				39,122		39,122
Foreign currency translation					3,008	3,008
Stock-based compensation expense			4,463			4,463
Stock options exercised	1		1,811			1,812
Repurchases of common stock	(51)			(149,500)		(149,551)
Treasury stock purchases	(2)	(6,030)				(6,032)
Tax effect of initial public offering related costs			(2)			(2)
BALANCE — December 31, 2017	$ 355	$ (6,030)	$630,341	$ (120,402)	$ (734)	$ 503,530
Impact to Retained Earnings from adoption of ASU 2014-09				5,730		5,730
BALANCE — January 1, 2018	355	(6,030)	630,341	(114,672)	(734)	509,260
Net income				73,185		73,185
Foreign currency translation					(1,783)	(1,783)
Stock-based compensation expense			6,499			6,499
Stock options exercised	1		2,541			2,542
BALANCE — December 31, 2018	$ 356	$ (6,030)	$639,381	$ (41,487)	$ (2,517)	$ 589,703
Impact to Retained Earnings from adoption of ASU 2016-02				9,153		9,153
BALANCE — January 1, 2019	356	(6,030)	639,381	(32,334)	(2,517)	598,856
Net income				100,443		100,443
Foreign currency translation					(224)	(224)
Stock-based compensation expense			20,741			20,741
Stock options exercised	4		6,463			6,467
BALANCE — December 31, 2019	$ 360	$ (6,030)	$666,585	$ 68,109	$ (2,741)	$ 726,283

See notes to consolidated financial statements.

MEDPACE HOLDINGS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

(Amounts in thousands)

	Year Ended December 31,		
	2019	**2018**	**2017**
CASH FLOWS FROM OPERATING ACTIVITIES:			
Net income	$ 100,443	$ 73,185	$ 39,122
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation	8,360	9,240	8,574
Amortization	14,829	29,561	37,900
Stock-based compensation expense	20,741	6,499	4,463
Amortization of debt issuance costs and discount	954	615	662
Noncash lease expense	9,949	-	-
Deferred income tax provision	10,050	3,942	3,237
Amortization and adjustment of deferred credit	(801)	(7,712)	(8,781)
Other	1,754	1,653	(673)
Changes in assets and liabilities:			
Accounts receivable and unbilled, net	(21,256)	(27,047)	(2,898)
Prepaid expenses and other current assets	(7,381)	(1,241)	(3,533)
Accounts payable	4,730	1,342	4,816
Accrued expenses	21,824	29,029	(1,313)
Pre-funded study costs	-	-	5,292
Advanced billings	44,584	35,593	7,735
Lease liabilities	(9,034)	-	-
Other assets and liabilities, net	2,121	1,925	2,782
Net cash provided by operating activities	201,867	156,584	97,385
CASH FLOWS FROM INVESTING ACTIVITIES:			
Property and equipment expenditures	(17,912)	(16,024)	(11,724)
Acquisition of intangibles	-	-	(569)
Other	(1,232)	(949)	56
Net cash used in investing activities	(19,144)	(16,973)	(12,237)
CASH FLOWS FROM FINANCING ACTIVITIES:			
Proceeds from stock option exercises	6,520	2,489	1,812
Repurchases of common stock	-	-	(155,583)
Payment of debt	(80,438)	(72,188)	(12,375)
Proceeds from revolving loan	-	-	100,000
Payments on revolving loan	-	(70,000)	(30,000)
Payment of deemed landlord liability	-	(1,881)	(1,682)
Net cash used in financing activities	(73,918)	(141,580)	(97,828)
EFFECT OF EXCHANGE RATES ON CASH, CASH EQUIVALENTS, AND RESTRICTED CASH	(167)	(1,241)	1,765
INCREASE (DECREASE) IN CASH, CASH EQUIVALENTS, AND RESTRICTED CASH	108,638	(3,210)	(10,915)
CASH, CASH EQUIVALENTS, AND RESTRICTED CASH — Beginning of period	23,282	26,492	37,407
CASH, CASH EQUIVALENTS, AND RESTRICTED CASH — End of period	$ 131,920	$ 23,282	$ 26,492
SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION—			
Cash paid during the period for income taxes	$ 13,235	$ 23,311	$ 17,180
Cash paid during the period for interest	$ 1,489	$ 7,589	$ 6,888
Acquisition of property and equipment—non-cash	$ 2,529	$ 1,551	$ 678

See notes to consolidated financial statements.

As of December 31, 2019 and 2018, and for the Years Ended December 31, 2019, 2018 and 2017

1. BASIS OF PRESENTATION

Description of Business

Medpace Holdings, Inc. together with its subsidiaries, ("Medpace" or the "Company"), a Delaware corporation, is a global provider of clinical research-based drug and medical device development services. The Company partners with pharmaceutical, biotechnology, and medical device companies in the development and execution of clinical trials. The Company's drug development services focus on full service Phase I-IV clinical development services and include development plan design, coordinated central laboratory, project management, regulatory affairs, clinical monitoring, data management and analysis, pharmacovigilance new drug application submissions, and post-marketing clinical support. The Company also provides bio-analytical laboratory services, clinical human pharmacology, imaging services, and electrocardiography reading support for clinical trials.

The Company's operations are principally based in North America, Europe, and Asia.

Share Repurchases

In November 2017, the Board members who are not affiliated with Cinven (the "Disinterested Directors") approved an agreement to repurchase 2,000,000 shares of the Company's common stock from Cinven in connection with the Secondary Offering (as described below) for aggregate consideration of approximately $60.3 million, representing a purchase price of $30.16 per share. The Company funded the repurchase with approximately $60.0 million in borrowings under the Prior Senior Secured Revolving Credit Facility (defined in Note 7 of the Notes to Consolidated Financial Statements) and cash on hand.

In August 2017, the Disinterested Directors of the Company approved a stock repurchase agreement with Medpace Limited Partnership, a Guernsey limited partnership (the "Limited Partnership" acting through its general partner, Medpace GP Limited, a Guernsey company, the "General Partner" and, the Limited Partnership acting through the General Partner, "Cinven"), pursuant to which the Company repurchased 2,000,000 shares of the Company's common stock from Cinven for aggregate consideration of approximately $60.5 million, representing a purchase price of $30.27 per share. The Company funded the repurchase with cash on hand and $40.0 million in borrowings under our Prior Senior Secured Revolving Credit Facility.

In April 2017, the Board of the Company authorized a share repurchase program with an authorized repurchase level of $50.0 million. The share repurchase program was cancelled in the fourth quarter of 2017. Repurchases under the repurchase program took place in the open market or negotiated transactions, at the discretion of the Company's management. During the year ended December 31, 2017, the Company repurchased 1,342,786 shares of its outstanding common stock for $34.7 million under this share repurchase program.

The Company has elected to constructively retire all repurchased shares with all amounts paid in excess of Common stock par value reflected within Accumulated deficit in the Company's consolidated balance sheets, except for 200,000 shares, which are reflected within treasury stock in the Company's consolidated balance sheets.

In the first quarter of 2018, the Board of the Company authorized a share repurchase program with an authorized repurchase level of $50.0 million. There have been no share repurchases under this program.

Secondary Offerings

During the year ended December 31, 2018, Cinven sold a total of 16,399,997 shares of the Company's common stock as part of multiple secondary offerings. The Company incurred professional fees in connection with the secondary offerings of $0.7 million during the year ended December 31, 2018. The fees are included within operating expenses in the accompanying consolidated statement of operations. As of August 27, 2018, Cinven does not beneficially own any shares of the Company's outstanding common stock. The Company did not sell any shares in or receive any proceeds from the secondary offerings.

During the year ended December 31, 2017, Cinven sold a total of 4,600,000 shares of the Company's common stock as part of a secondary offering. The Company incurred professional fees in connection with the secondary offering of $0.4 million during year ended December 31, 2017. The fees are included within operating expenses in the accompanying consolidated statement of operations.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Principles of Consolidation and Presentation

The accompanying consolidated financial statements have been prepared in accordance with generally accepted accounting principles in the United States of America ("US GAAP") and include the accounts and operations of the Company and its subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with US GAAP requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Actual results could differ from these estimates.

Significant items that are subject to management estimates and assumptions include revenue, net, allowances for doubtful accounts, acquisition purchase price allocations, long-lived asset impairment and useful lives, exit liabilities, stock-based compensation, uncertain income tax positions and contingencies.

Reportable Segments

The Company emphasizes its full service outsourcing model, providing services focused on the development, management and execution of clinical trials. As part of this full service approach, the Company utilizes centralized systems, customer interface technology, support functions and processes that cross service offerings and align resources to deliver efficient clinical trial services. Given the full service approach, the chief executive officer, who is the chief operating decision maker ("CODM") assesses the allocation of resources based on key metrics including revenue, backlog, and net awards by service offering and consolidated profitability and consolidated cash flows. Based on the Company's full service model, internal management and reporting structure, and key metrics used by the CODM to make resource allocation decisions, management has determined that the Company's operations consist of a single operating segment. Therefore, results of operations are presented as a single reportable segment.

Foreign Currencies

Assets and liabilities recorded in foreign currencies on foreign subsidiary financial statements are translated at the exchange rate on the balance sheet date, while equity accounts are translated at historical exchange rates. Revenue and expenses are recorded at average rates of exchange during the year. Translation adjustments are recorded to Accumulated other comprehensive loss in the consolidated statements of shareholders' equity and consolidated statements of comprehensive income.

Separately, net realized gains and losses on foreign currency transactions are included in Miscellaneous (expense) income, net, on the consolidated statements of operations. Foreign currency transactions resulted in a net (loss)/gain of ($0.6) million, $0.4 million, and ($1.0) million during the years ended December 31, 2019, 2018, and 2017, respectively.

Revenue Recognition

The Company generally enters into contracts with customers to provide services ranging in duration from a few months to several years. The contract terms generally provide for payments based on a fixed fee or unit-of-service arrangement. The Company accounts for revenue in accordance with ASC 606, Revenue from Contracts with Customers, which the Company adopted on January 1, 2018 using the modified retrospective implementation method. Revenue on contracts is recognized when or as the Company satisfies the contract performance obligations, at the amount that reflects the Company's cumulative progress toward delivery of the performance obligation. This progress assessment is applied to the amount of consideration to which the Company expects to be paid for delivery of the performance obligation. The Company's performance obligations are generally satisfied over time and related revenue is recognized as services are provided to meet these obligations.

Contract Assumptions

An arrangement is accounted for as a contract within the scope of ASC 606 when the Company and its customers approve the contract, are committed to perform their respective obligations, each party can identify its rights regarding the goods or services to be transferred, commercial substance is present, and it is probable that the Company will collect substantially all of the consideration to which it will be entitled in exchange for the goods or services that will be transferred to the customer.

For the Company's services to meet this criteria, contracts generally need to be written, pending regulatory hurdles required to commence work must be cleared, the study protocol must be completed, the customer must have adequate funding or reasonable path to funding to execute the contracted portion of the study, and the study must be actively moving forward. Once these criteria have been met, it is deemed that the Company and its customers are committed to perform their respective obligations. Depending on the timing of when these criteria are met, revenue recognition may vary significantly on a period over period basis.

Accounting for contracts performed over a period of time involves the use of various assumptions to estimate total contract revenue and costs. The Company estimates expected costs to complete a contract and recognizes contracted revenue over the life of the contract as those costs are incurred.

Cost estimates are based on a detailed project budget and are developed based on many variables, including, but not limited to, the scope of the work, the complexity of the study, the participating geographic locations and the Company's historical experience. To assist with the estimation of costs expected at completion over the life of a project, regular contract reviews are performed in which performance to date is compared to the most current estimate to complete assumptions. The reviews include an assessment of costs incurred to date compared to expectations based on budget assumptions and other circumstances specific to the project. The total estimated costs necessary to complete is updated and any revisions to the existing cost estimate results in cumulative adjustments to the amount of revenue recognized in the period in which the revisions are identified. In the case of cost estimates related to activities legally contracted as reimbursable in nature, including but not limited to investigator fee activity, these estimates also influence the Company's assumed contract value and assumed remaining performance obligations. Because of the uncertainties inherent in estimating the costs necessary to fulfill contractual obligations, it is possible that estimates may change in the near term, resulting in a material change in revenue reported.

Contracts generally provide for pricing modifications upon scope of work changes. The Company recognizes revenue, at an amount to which it expects to be entitled, related to work performed in connection with scope changes when the underlying services are performed and a binding contractual commitment has been established with the customer. If the Company's customers do not agree to contract changes upon changes in the Company's scope of work, the Company could be exposed to cost overruns and reduced contract profitability. Costs are not deferred in anticipation of contracts being awarded or amendments being finalized, but are expensed as incurred.

Most contracts are terminable by the customer, either immediately or according to advance notice terms specified within the contracts. These contracts require payment of fees for services rendered through the date of termination and may require payment for subsequent services necessary to conclude the study or close out the contract. Final settlement amounts are agreed to with the customer based on remaining work to be performed. These amounts are included in revenue when the Company believes the amount can be estimated reliably and its realization is probable. In evaluating the probability of recognition, the Company considers the contractual basis for the settlement amount and the objective evidence available to support the amount.

Certain contracts contain volume rebate arrangements with our customers that provide for rebates if certain specified spending thresholds are met. These obligations are considered as a reduction in revenue when it appears probable that the arrangement thresholds will be met, which can be at contract inception. Total revenue is presented net of rebates of $6.2 million, $1.2 million and $0.2 million in the consolidated statements of operations during the years ended December 31, 2019, 2018 and 2017, respectively.

The Company occasionally enters into incentive fee arrangements with customers that provide for additional compensation if certain defined contractual milestones or performance thresholds are met. These additional fees are included in the estimated transaction price when there is a basis to reasonably estimate the amount of the fee and when achievement of the incentive milestone is deemed probable. These estimates are based on anticipated performance, the Company's best judgment at the time or ultimately, upon achievement of the threshold or milestone.

The Company records revenue net of any tax assessments by governmental authorities that are imposed and concurrent with specific revenue generating transactions.

Performance Obligations

Substantially all of the Company's contracts consist of a single performance obligation, as the promise to transfer the individual services described in the contracts are not separately identifiable from other promises in the contracts, and therefore not distinct. Revenue recognition is determined by assessing the progress of performance completed or delivered to date compared to total services to be delivered under the terms of the arrangement. The measures utilized to assess progress on the satisfaction of performance are specific to the performance obligation identified in the contract.

For the majority of the Company's contract performance obligations, it utilizes the input method of cost to cost to measure progress, as the Company has determined that it is the most consistent measure of progress among contract tasks and represents the most faithful depiction of the transfer of services over the contract life. Under this method, the Company determines cost incurred to date for the services it provides compared to the total estimated costs at completion.

For certain other contractual performance obligations, the Company has determined that an output method is the best measure of progress. These relate to certain unitized contracts, and the Company recognizes revenue in the period in which the unit is delivered compared to total contracted units.

On December 31, 2019 and 2018, the Company had approximately $1.4 billion and $1.1 billion of performance obligations remaining to be performed for active projects.

Concentration of Credit Risk

Financial instruments that subject the Company to credit risk primarily consist of cash and cash equivalents and accounts receivable. The cash and cash equivalent balances are held and maintained with financial institutions with reputable credit ratings and, consequently, the Company believes that such funds are subject to minimal credit risk.

The Company generally does not require collateral or other securities to support customer receivables. In the years ended December 31, 2019, 2018 and 2017, credit losses have been immaterial and within management's expectations. At December 31, 2019 and 2018, there were no customers accounting for more than 10% of the Company's accounts receivable.

Costs and Expenses

The Company incurs costs associated with service delivery including direct labor and related employee benefits, laboratory supplies, and other expenses. These costs are recorded in Direct service costs, excluding depreciation and amortization as a component of Total direct costs in the accompanying consolidated statements of operations. In addition, the Company incurs expenses on behalf of its customers for various project expenditures including, but not limited to, investigator site payments, travel, meetings, printing, and shipping and handling fees that are reimbursed by its customers at cost. These costs are included in Reimbursable out-of-pocket expenses as a component of Total direct costs in the accompanying consolidated statements of operations. Total direct costs are expensed as incurred and are not deferred in anticipation of contracts being awarded or finalization of changes in scope. Selling, general and administrative includes administrative payroll and related employee benefits, sales and marketing expenses, administrative travel, and other expenses not directly related to service delivery. Rent, utilities, supplies, and software license expenses are allocated between Total direct costs, and Selling, general and administrative based on

the estimated contribution among service delivery and support function efforts on a percentage basis. Depreciation and amortization is reported separately in the accompanying consolidated statements of operations. Costs of sales and marketing activities not subject to recovery pursuant to customer contracts, such as feasibility assessments and negotiation of contracts, are expensed as incurred and recorded as a component of Selling, general and administrative in the accompanying consolidated statements of operations.

Advertising expenses are recorded as a component of Selling, general and administrative expenses in the accompanying consolidated statements of operations. Total advertising expenses of $0.7 million, $0.8 million and $0.6 million were incurred during the years ended December 31, 2019, 2018 and 2017, respectively.

Prior to the adoption of Accounting Standard Update No. 2014-09 ‘‘Revenue from Contracts with Customers”, fees paid to investigators and other disbursements in which the Company acts as an agent on behalf of the customer were recorded net in the consolidated statements of operations with no impact on the Company’s revenue or expenses. Funds received in advance of study expenditures were recorded as Pre-funded study cost liabilities on the consolidated balance sheets. Any pre-funded amounts remaining at the conclusion of a study were returned to the client. Pre-funded study cost disbursements of $138.7 million were made during the year ended December 31, 2017.

Income Taxes

The Company’s consolidated U.S. federal income tax return is comprised of its U.S. subsidiaries and one of its foreign branches located in Korea. All foreign subsidiaries of the Company file tax returns in their local jurisdictions.

The Company provides for income taxes on all transactions that have been recognized in the consolidated financial statements in accordance with accounting guidance governing income tax accounting. Accordingly, the impact of changes in income tax laws on deferred tax assets and deferred tax liabilities are recognized in net earnings in the period during which such changes are enacted.

The Company records deferred tax assets and liabilities based on temporary differences between the financial statement bases and tax bases of assets and liabilities. Deferred tax assets are recorded for tax benefit carryforwards using tax rates anticipated to be in effect in the year in which the temporary differences are expected to reverse. If it does not appear more likely than not that the full value of a deferred tax asset will be realized, the Company records a valuation allowance against the deferred tax asset, with an offsetting charge to the Company’s income tax provision or benefit. The value of the Company’s deferred tax assets is estimated based on, among other things, the Company’s ability to generate a sufficient level of future taxable income. In estimating future taxable income, the Company has considered both positive and negative evidence, such as historical and forecasted results of operations, and has considered the implementation of prudent and feasible tax planning strategies.

The Company’s current accounting position is that unremitted foreign earnings are indefinitely reinvested. Therefore, the Company has not recorded deferred foreign withholding taxes on the unremitted foreign earnings. Refer to Note 11 for further information regarding this assertion.

The Company follows accounting guidance related to accounting for uncertainty in income taxes which requires significant judgment in determining what constitutes an individual tax position as well as assessing the possible outcome of each tax position. Changes in judgments as to recognition or measurement of tax positions can materially affect the estimate of the effective tax rate, and, consequently, the Company’s consolidated financial results. The Company considers many factors when evaluating and estimating tax positions and tax benefits, which may require periodic adjustments and which may not accurately anticipate actual outcomes. In addition, the calculation of tax liabilities involves dealing with uncertainties in the application of complex tax regulations in a multitude of jurisdictions. The Company determines its liability for uncertain tax positions globally. If the payment of these amounts ultimately proves to be unnecessary, the reversal of liabilities would result in tax benefits being recognized in the period when it is determined the liabilities are no longer necessary. If the calculation of the liability related to uncertain tax positions proves to be more or less than the ultimate assessment, a tax expense or tax benefit would result. Interest and penalties associated with uncertain tax positions are recognized as components of the Company’s Income tax provision.

Research and Development Credits

Research and development credits are available to the Company under tax laws in certain jurisdictions, based on qualifying research and development spend as defined under those tax laws. Certain tax jurisdictions provide refundable credits that are not wholly dependent on the Company's income tax status or income tax position. In these circumstances the benefit of the credits is recorded as a reduction of operating expense. When they are wholly dependent upon the Company's income tax position, research and development credits are recognized as a reduction of income tax expense.

Stock-Based Compensation

The Company has stock-based employee compensation plans for which it incurs compensation expense.

Equity Awards

In connection with the Company's initial public offering (IPO), the Board approved the formation of the 2016 Incentive Award Plan (the "2016 Plan"), which replaced our 2014 Equity Incentive Plan (the "2014 Plan"). The 2016 Plan provides for long-term equity incentive compensation for key employees, officers and non-employee directors. A variety of discretionary awards (collectively, the "Awards") for employees and non-employee directors are authorized under the 2016 Plan, including vested common shares, stock options, stock appreciation rights ("SARs"), restricted stock awards ("RSAs"), restricted stock units ("RSUs"), or other cash based or stock dividend equivalent awards. The vesting of such awards may be conditioned upon either a specified period of time or the attainment of specific performance goals as determined by the administrator of the 2016 Plan. The option price and term are also subject to determination by the administrator with respect to each grant. Option prices are generally expected to be set at the market price of our common stock at the date of grant and option terms are not expected to exceed ten years. All outstanding Awards under the 2016 Plan are equity classified awards.

The Company created the 2014 Plan, providing for the future issuance of vested shares, stock options, RSAs and RSUs in Medpace Holdings, Inc.'s common stock (the "2014 Plan Awards"). The 2014 Plan Awards were subject to either equity or liability-classification pursuant to the terms of the participant's award agreement and the 2014 Plan based on accounting guidance which governs such transactions. All outstanding Awards under the 2014 Plan are equity classified awards.

Stock-based compensation expense for both the 2016 Plan and 2014 Plan is calculated using the fair value method on the grant date. The Company expenses stock-based compensation using a graded vesting schedule. Stock-based compensation expense is allocated between Total direct costs, and Selling, general and administrative in the consolidated statements of operations based on the underlying classification and scope of work for the employees receiving the Awards.

Net Income Per Share

Basic and diluted earnings or loss per share ("EPS") are computed using the two-class method, which is an earnings allocation that determines EPS for each class of common stock and participating securities according to dividends declared and participation rights in undistributed earnings. The Company's RSAs are considered participating securities because they are legally issued at the date of grant and holders are entitled to receive non-forfeitable dividends during the vesting term.

The computation of diluted EPS includes additional common shares, such as unvested RSUs and stock options with exercise prices less than the average market price of the Company's common stock during the period ("in-the-money options"), which would be considered outstanding under the treasury stock method. The treasury stock method assumes that additional shares would have to be issued in cases where the exercise price of stock options is less than the value of the common stock being acquired because the cash proceeds received from the stock option holder would not be sufficient to acquire that same number of shares. The Company does not compute diluted EPS in cases where the inclusion of such additional shares would be anti-dilutive in effect.

The following table sets forth the computation of basic and diluted earnings per share for the years ended December 31, 2019, 2018 and 2017 (in thousands, except for earnings per share):

	Year Ended December 31,		
	2019	2018	2017
Weighted-average shares:			
Common shares outstanding	35,881	35,547	39,056
RSAs	100	142	90
Total weighted-average shares	35,981	35,689	39,146
Earnings per common share—Basic			
Net income	$ 100,443	$ 73,185	$ 39,122
Less: Undistributed earnings allocated to RSAs	279	291	90
Net income available to common shareholders—Basic	$ 100,164	$ 72,894	$ 39,032
Net income per common share—Basic	$ 2.79	$ 2.05	$ 1.00
Basic weighted-average common shares outstanding	35,881	35,547	39,056
Effect of diluted shares	1,695	1,365	783
Diluted weighted-average shares outstanding	37,576	36,912	39,839
Net income per common share—Diluted	$ 2.67	$ 1.97	$ 0.98

For the years ended December 31, 2019, 2018 and 2017, the computation of diluted EPS excludes the effect of (in thousands) 248, 121 and 63 stock options, respectively, due to each respective period's average fair value of the Company's common stock not exceeding the exercise prices.

Fair Value Measurements

The Company follows accounting guidance related to fair value measurements that defines fair value, establishes a framework for measuring fair value, and establishes a hierarchy for inputs used in measuring fair value. This hierarchy maximizes the use of "observable" inputs and minimizes the use of unobservable inputs by requiring that the most observable inputs be used when available. The hierarchy specifies three levels based on the inputs, as follows:

Level 1: Valuations based on quoted prices in active markets for identical assets or liabilities.

Level 2: Valuations based on directly observable inputs or unobservable inputs corroborated by market data.

Level 3: Valuations based on unobservable inputs supported by little or no market activity representing management's determination of assumptions of how market participants would price the assets or liabilities.

The fair value of financial instruments such as cash and cash equivalents, accounts receivable and unbilled, net, accounts payable, accrued expenses, and advanced billings approximate their carrying amounts due to their short term maturities.

The Company does not have any recurring fair value measurements as of December 31, 2019. There were no transfers between Level 1, Level 2, or Level 3 during the years ended December 31, 2019, 2018 and 2017.

Cash and Cash Equivalents, including Restricted Cash

Cash and cash equivalents, including restricted cash, are invested in demand deposits and money market funds, all of which have an original maturity of three months or less. Restricted cash consists of customer funds received in advance and subject to specific restrictions, as well as amounts placed in escrow for contingent payments resulting from acquisitions or other contractual arrangements.

Accounts Receivable and Unbilled, Net

Accounts receivable represent amounts due from the Company's customers who are concentrated primarily in the pharmaceutical, biotechnology, and medical device industries. Unbilled services represent revenue recognized to date that is currently not billable to the customer pursuant to contractual terms. In general, amounts become billable upon the achievement of negotiated contractual events or in accordance with predetermined payment schedules. Amounts classified to unbilled services are those billable to customers within one year from the respective balance sheet date.

The Company grants credit terms to its customers prior to signing a service contract and monitors the creditworthiness of its customers on an ongoing basis. The Company maintains an allowance for doubtful accounts based on specific identification of accounts receivable that are at risk of not being collected. Uncollectible accounts receivable are written off only after all reasonable collection efforts have been exhausted. Moreover, in some cases the Company requires advance payment from its customers for a portion of the study contract price upon the signing of a service contract. These advance payments are deferred and recognized as revenue as services are performed.

Inventory

Inventory, which consists primarily of laboratory supplies, is valued at the lower of cost or market. Inventory is stated at purchased cost using the first-in, first out (FIFO) cost method. The inventory balance is included in Prepaid expenses and other current assets in the consolidated balance sheets.

Property and Equipment

Property and equipment is recorded at cost. Depreciation is provided on the straight-line method at rates adequate to allocate the cost of the applicable assets over their estimated useful lives, which is three to five years for computer hardware, software, phone, and medical imaging equipment, five to seven years for furniture and fixtures and other equipment, and thirty to forty years for buildings. The Company capitalizes costs of computer software developed for internal use and amortizes these costs on a straight-line basis over the estimated useful life, not to exceed three years. Leasehold improvements and deemed assets from landlord building construction are capitalized and amortized on a straight-line basis over the shorter of the estimated useful life of the improvement or the associated remaining lease term. Repairs and maintenance are expensed as incurred.

Leases

The Company enters into contracts to lease facilities and equipment to be used in its operations. At contract inception, the Company determines whether a contract contains a lease within the scope of Accounting Standard Codification Topic 842, Leases ("ASC 842"), and determines the appropriate classification of the lease as either operating or finance.

Contracts containing operating leases are recorded on the consolidated balance sheets within Operating lease right-of-use ("ROU") assets, Other current liabilities, and Operating lease liabilities. Operating lease ROU assets and operating lease liabilities are recognized based on the present value of the future lease payments over the lease term as of the lease commencement date. In addition, operating ROU assets also include lease payments made and exclude lease incentives and initial direct costs incurred. Operating lease expense for lease payments is recognized on a straight-line basis over the lease term within Total direct costs and Selling, general, and administrative expenses. Variable lease costs are primarily related to adjustments for inflation, common area maintenance and property tax and are recognized within Total direct costs and Selling, general and administrative expenses.

Contracts containing finance leases are recognized initially in the same manner as Operating lease ROU assets and liabilities; however, they are recorded on the consolidated balance sheets within Property and equipment, net, Other current liabilities, and Other long-term liabilities. Finance lease assets are subsequently amortized on a straight line basis over the lease term within Depreciation expense, while the lease liability is accreted within Interest expense, net utilizing the discount rate determined at lease commencement and reduced by periodic lease payments over the lease term. Currently, the Company does not have any finance leases.

The discount rate utilized in determining the present value of future payments for both operating and finance leases, unless implicit in the lease contract, is determined based on the Company's collateralized incremental borrowing rate based on the information available at lease commencement.

Lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option as determined at lease commencement.

Many of our lease agreements have both lease and non-lease components, which the Company has elected to treat as a single lease component for recognition purposes.

The Company may enter into short-term leases (leases with a lease term of less than one year), which it has elected not to capitalize as assets and liabilities on the consolidated balance sheets, but instead recognizes lease payments within Total direct costs and Selling, general, and administrative expenses on a straight line basis over the lease term.

Goodwill and Intangible Assets

Goodwill

Goodwill represents the excess of purchase price over the fair value of net assets acquired in business combinations. The carrying value of goodwill is reviewed at least annually for impairment, or as indicators of potential impairment are identified, at the reporting unit level. The reporting units are Phase I-IV clinical research services and Laboratories as of December 31, 2019.

The Company performs its annual impairment tests during the fourth quarter each year, comparing the fair value of each of our reporting units with its carrying amount, inclusive of goodwill. A goodwill impairment charge would be recognized for the amount by which the carrying amount exceeds the reporting unit's fair value. Fair value is estimated using a combination of the income approach, a discounted cash flow analysis, and the market approach, utilizing the guideline company method. There was no indication of impairment related to goodwill based on the fourth quarter 2019 assessment.

Intangible Assets

The Company has an indefinite lived intangible asset related to its trade name. The carrying value of the trade name asset is reviewed at least annually for impairment, or as indicators of potential impairment are identified. The Company performs its annual impairment test in the fourth quarter each year in conjunction with its annual assessment of goodwill. The assessment consists of comparing the carrying value of the indefinite lived intangible asset to its estimated fair value, utilizing the relief from royalty method, an income approach valuation. There was no indication of impairment related to the trade name asset based on the fourth quarter 2019 assessment.

Finite-lived intangible assets consist mainly of the value assigned to customer relationships and developed technologies. Finite-lived intangible assets are amortized straight-line or using an accelerated method over their estimated useful lives, which range in term from five to fifteen years.

Impairment of Long-Lived Assets

Long-lived assets, primarily property and equipment and finite-lived intangible assets, are reviewed for impairment and the reasonableness of the estimated useful lives whenever events or changes in circumstances indicate that the carrying amounts of the assets may not be recoverable or that a change in useful life may be appropriate. Recoverability for long-lived assets is determined by comparing the forecasted undiscounted cash flows of the operation to which the assets relate to the carrying amount of the assets. If the undiscounted cash flows are less than the carrying amount of the assets, then the Company reduces the carrying value of the assets to estimated fair values, which are primarily based upon forecasted discounted cash flows. Fair value of long-lived assets is determined based on a combination of discounted cash flows and market multiples.

Advanced Billings

Advanced billings represents cash received from customers, or billed amounts per an agreed upon payment schedule, in advance of services being performed or revenue being recognized.

Deemed Landlord Liabilities

Deemed landlord liabilities are recorded at their net present value when the Company enters into qualifying leases and are reduced as the Company makes periodic lease payments on the properties.

Other Current Liabilities and Other Long-Term Liabilities

Deferred credit represents tax credits recognized initially in conjunction with the Nephrogenex asset acquisition that will be recognized within Income tax provision in proportion to the realization of the deferred tax assets and federal tax credits prospectively.

Asset retirement obligations, to the extent they exist, are recorded at their net present value and accreted to the Company’s estimate of liability at the time the obligation would be required to be satisfied.

Recently Adopted Accounting Standards

In January 2017, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update (“ASU”) 2017-01, Business Combinations. The standard changes the definition of a business to assist entities with evaluating when a set of transferred assets and activities is a business. Under the new guidance, an entity first determines whether substantially all of the fair value of the gross assets acquired is concentrated in a single identifiable asset or a group of similar identifiable assets. If this threshold is met, the set is not a business. If it’s not met, the entity then evaluates whether the set meets the requirement that a business include, at a minimum, an input and a substantive process that together significantly contribute to the ability to create outputs. ASU 2017-01 is effective for fiscal years beginning after December 15, 2017, and for interim periods within those fiscal years. The Company, as permitted, early adopted ASU 2017-01 using the prospective method in the second quarter of 2017.

In March 2016, the FASB issued ASU No. 2016-09, *Compensation - Stock Compensation: Improvements to Employee Share-Based Payment Accounting*. The new guidance is intended to simplify certain aspects of accounting for share based payments to employees, including the accounting for income taxes, forfeitures, and statutory tax withholding requirements, as well as classification in the statement of cash flows. The Company elected to adopt this ASU in the first quarter of 2017 as required. The following summarizes the effects of the adoption on the Company's consolidated financial statements:

- *Income taxes* - Upon adoption of this standard, all excess tax benefits and tax deficiencies (including tax benefits of dividends, if distributed, on share-based payment awards) are recognized as income tax expense or benefit in the statement of operations. The tax effects of exercised or vested awards are treated as discrete items in the reporting period in which they occur. As a result, the Company recognized discrete adjustments to income tax expense for the year ended December 31, 2017 of less than $0.1 million related to excess tax benefits. The Company also recognizes excess tax benefits regardless of whether the benefit reduces taxes payable in the current period. The Company applied the prospective adoption approach for any unrecognized excess tax benefits beginning in 2017, which did not result in any cumulative-effect adjustment upon adoption. Prior periods have not been adjusted.

- *Forfeitures* - Prior to adoption, share-based compensation expense was recognized on a straight line basis, net of estimated forfeitures, such that expense was recognized only for share-based awards that were expected to vest. A forfeiture rate was estimated annually and revised, if necessary, in subsequent periods if actual forfeitures differed from initial estimates. Upon adoption, the Company no longer applies a forfeiture rate and instead accounts for forfeitures as they occur. The Company applied the modified retrospective adoption approach beginning in 2017 and booked an immaterial cumulative-effect adjustment to additional paid-in-capital and retained earnings within Shareholders' Equity. Prior periods have not been adjusted.

- *Statements of Cash Flows* - The Company historically accounted for excess tax benefits on the consolidated statements of cash flows as a financing activity. Upon adoption of this standard, excess tax benefits are classified along with other income tax cash flows as an operating activity. The Company elected to adopt this portion of the standard on a prospective basis beginning in 2017. Prior periods have not been adjusted.

- *Earnings Per Share* - The Company uses the treasury stock method to compute diluted earnings per share, unless the effect would be anti-dilutive. Under this method, the Company is no longer required to estimate the tax rate and apply it to the dilutive share calculation for determining the dilutive earnings per share. The Company utilized the prospective adoption approach and applied this methodology beginning in 2017. Prior periods have not been adjusted.

Upon adoption, no other aspects of ASU 2016-09 had an effect on the Company's consolidated financial statements or related footnote disclosures.

In May 2014, the FASB issued ASU No. 2014-09 ''Revenue from Contracts with Customers,'' ("ASC 606") to clarify the principles of recognizing revenue and create common revenue recognition guidance between US GAAP and International Financial Reporting Standards. The new standard became effective for the Company in the first quarter of 2018.

Under ASC 606, the majority of the Company's contracts will have a single performance obligation that is satisfied over time, with revenue recognized based on overall project progress measured as of the financial statement date. This represents a change in the Company's previous revenue accounting methodology, Accounting Standards Codification Topic 605, *Revenue Recognition* ("ASC 605"), as a majority of contracts were accounted for under the multiple element arrangement guidance. Under the previous revenue recognition accounting methodology, certain revenue related to reimbursable expenses was presented either as a separate line item within Reimbursable out-of-pocket revenue or net of related expenses within Service revenue, net in the consolidated statements of operations. As a result of having a single performance obligation, the Company accounts for all revenue related to reimbursable expenses on a gross basis within a single revenue line item. Measurement of progress on contracts with customers will generally be based on the input measurement of cost incurred relative to the total expected costs to satisfy the performance obligation.

The Company elected to utilize the modified retrospective implementation method for its transition to ASC 606 as of January 1, 2018 (the "Implementation Date"). Under this implementation method, the Company recognized the cumulative effect of initially applying the ASC 606 revenue recognition guidance to contracts that were not completed at the Implementation Date. At the Implementation Date, the Company elected to reflect the aggregate effect of all contract modifications that occurred before January 1, 2018 in determining the satisfied and unsatisfied performance obligations and determination of the transaction price.

The cumulative effect adjustment was recorded as a reduction to the opening balance of Accumulated deficit in the consolidated balance sheets in the amount of $5.7 million, with offsetting amounts of $23.9 million to Accounts receivable and unbilled, net, $(1.6) million to Deferred income taxes, $35.1 million to Accrued expenses, $(57.4) million to Pre-funded study costs and $38.9 million to Advanced billings, respectively. The amounts recorded to Accounts receivable and unbilled, net, Deferred income taxes, Accrued expenses, Pre-funded study costs, and Advanced billings reflect differences between revenue recognized and billings to customers by project as well as costs incurred but not settled as of the Implementation Date. The above disclosed cumulative effect adjustments have been revised from the amounts previously disclosed in the Company's interim financial statements filed on Form 10-Q for the quarterly periods ended March 31, 2018, June 30, 2018 and September 30, 2018 to correct certain immaterial misstatements to the opening balance sheet adoption impact of the standard. The effects of these misstatements were immaterial to the Company's results of operations.

In connection with the implementation of ASC 606 on the modified retrospective method, the Company is presenting additional information to assist with the comparability of select line items of the current and prior period year to date reporting in its consolidated balance sheets and consolidated statements of operations. Below the Company has presented the amount by which each financial statement line item is affected in the current reporting period by the application of ASC 606 as compared with the guidance that was in effect before the change (ASC 605).

	Year Ended December 31, 2018		
	As Reported	Adjustments	As Revised under ASC 605
Revenue:			
Revenue, net	$ 704,589	$ (704,589)	$ -
Service revenue, net	-	478,063	478,063
Reimbursed out-of-pocket revenue	-	71,305	71,305
Total revenue	704,589	(155,221)	549,368
Operating expenses:			
Direct service costs, excluding depreciation and amortization	252,284	-	252,284
Reimbursed out-of-pocket expenses	236,775	(165,470)	71,305
Total direct costs	489,059	(165,470)	323,589
Total operating expenses	603,541	(165,470)	438,071
Income from operations	101,048	10,249	111,297
Income before income taxes	93,951	10,249	104,200
Income tax provision	20,766	1,882	22,648
Net income	$ 73,185	$ 8,367	$ 81,552
Net income per share attributable to common shareholders:			
Basic	$ 2.05	$ 0.24	$ 2.29
Diluted	$ 1.97	$ 0.23	$ 2.20
Weighted average common shares outstanding:			
Basic	35,547	-	35,547
Diluted	36,912	-	36,912

ASSETS	As of December 31, 2018		
Current assets:	As Reported	Adjustments	As Revised under ASC 605
Accounts receivable and unbilled, net	133,449	(28,729)	104,720
Prepaid expenses and other current assets	21,383	1,147	22,530
Total current assets	178,114	(27,582)	150,532
Deferred income taxes	713	(389)	324
Total assets	$ 967,933	$ (27,971)	$ 939,962
LIABILITIES AND SHAREHOLDERS' EQUITY			
Current liabilities:			
Accrued expenses	87,493	(51,109)	36,384
Pre-funded study costs	-	61,156	61,156
Advanced billings	147,935	(41,732)	106,203
Other current liabilities	4,861	(590)	4,271
Total current liabilities	257,026	(32,275)	224,751
Deferred income tax liability	439	2,049	2,488
Other long-term liabilities	16,560	(382)	16,178
Total liabilities	378,230	(30,608)	347,622
Shareholders' equity:			
Accumulated deficit	(41,487)	2,637	(38,850)
Total shareholders' equity	589,703	2,637	592,340
Total liabilities and shareholders' equity	$ 967,933	$ (27,971)	$ 939,962

CASH FLOWS FROM OPERATING ACTIVITIES:	Year Ended December 31, 2018		
	As Reported	Adjustments	As Revised under ASC 605
Net income	73,185	8,367	81,552
Adjustments to reconcile net income to net cash provided by operating activities:			
Deferred income tax provision	3,942	4,002	7,944
Changes in assets and liabilities:			
Accounts receivable and unbilled, net	(27,047)	4,842	(22,205)
Prepaid expenses and other current assets	(1,241)	(1,147)	(2,388)
Accrued expenses	29,029	(15,967)	13,062
Pre-funded study costs	-	3,782	3,782
Advanced billings	35,593	(2,907)	32,686
Other assets and liabilities, net	1,925	(972)	953
Net cash provided by operating activities	156,584	-	156,584

In February 2016, the FASB issued ASU 2016-02, "Leases (Topic 842)" ("ASC 842"). The guidance in ASC 842 supersedes the lease recognition requirements in ASC Topic 840, Leases (FAS 13) ("ASC 840"). The objective of ASC 842 is to increase transparency and comparability among organizations by requiring the recognition of Right-of-use assets ("ROU assets") and Lease liabilities on the balance sheet. In addition, ASC 842 introduces additional disclosure requirements that are meant to enable users of the financial statements to assess the amount, timing, and uncertainty of cash flows arising from leases. ASC 842 became effective for the Company in the first quarter of 2019.

ASC 842 allows by policy election, an entity to choose its transition approach. Entities must adopt ASC 842 on a either a modified retrospective basis to each prior reporting period presented or through an optional alternative method referred to as the "Comparatives Under ASC 840 Approach" which allows entities to apply the new requirements to only those leases that exist as of January 1, 2019. The Company has elected to adopt ASC 842 utilizing the Comparatives Under ASC 840 Approach. As such, ASC 842 is applied on a prospective basis as of January 1, 2019 and any cumulative catch up adjustment for differences between ASC 842 and ASC 840 were recorded upon adoption.

ASC 842 also allows for the election of certain practical expedients that are meant to ease the burden of transitioning to ASC 842 while still achieving compliance. The Company elected the "package of three" practical expedient allowing the Company to carry forward decisions made and documented under current U.S. GAAP, rather than reassessing all of the Company's contracts to determine whether they are or contain leases and how they would be classified under ASC 842. The Company has decided not to elect the hindsight practical expedient, which had it been elected, would require the Company to reassess the lease term and assessment of impairment for all of the Company's leases using the facts and circumstances known up to the adoption date of the standard.

ASC 842 had a material impact on our consolidated balance sheets, as all leases currently classified as operating were recognized as ROU assets and lease liabilities upon adoption. In addition, it was determined that two contracts entered into with a related party for two of the Company's corporate offices that were classified as deemed assets and deemed liabilities under ASC 840 were determined to be operating leases under ASC 842. These deemed assets and liabilities were reclassified on the consolidated balance sheets to ROU assets and lease liabilities and an adjustment to retained earnings was recorded as a cumulative adjustment for the difference in depreciation expense and operating lease expense as of the date of adoption.

The impact of the adoption of ASC 842 as of January 1, 2019 is as follows:

ASSETS	**As of**		
	January 1, 2019	**Adjustments**	**December 31, 2018**
Current assets:			
Prepaid expenses and other current assets	21,013	(370)	21,383
Total current assets	177,744	(370)	178,114
Property and equipment, net	37,613	(14,642)	52,255
Operating lease right-of-use assets	51,854	51,854	-
Total assets	$ 1,004,775	$ 36,842	$ 967,933
LIABILITIES AND SHAREHOLDERS' EQUITY			
Current liabilities:			
Other current liabilities	10,951	6,090	4,861
Total current liabilities	263,116	6,090	257,026
Operating lease liabilities	45,294	45,294	-
Deemed landlord liability, less current portion	-	(24,484)	24,484
Deferred income tax liability	3,158	2,719	439
Other long-term liabilities	14,630	(1,930)	16,560
Total liabilities	405,919	27,689	378,230
Shareholders' equity:			
Accumulated deficit	(32,334)	9,153	(41,487)
Total shareholders' equity	598,856	9,153	589,703
Total liabilities and shareholders' equity	$ 1,004,775	$ 36,842	$ 967,933

In February 2018, the FASB issued ASU 2018-02, "Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income." ASU 2018-02 allows for an entity to elect to reclassify the income tax effects on items within accumulated other comprehensive income resulting from U.S. tax reform to retained earnings. The guidance is effective for fiscal years beginning after December 15, 2018 with early adoption permitted, including interim periods within those years. The Company adopted this standard in the first quarter of 2019 and it had no impact on the consolidated financial statements.

In January 2017, the FASB issued ASU 2017-04, "Intangibles- Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment." ASU 2017-04 simplifies how an entity assesses goodwill for impairment by eliminating Step 2 from the goodwill impairment test. As amended, the goodwill impairment test will consist of comparing the fair value of a reporting unit with its carrying amount. An entity should recognize a goodwill impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value. The guidance is effective for fiscal years beginning after December 15, 2019 with early adoption permitted. The Company adopted this standard on a prospective basis in the first quarter of 2019 and it had no impact to the consolidated financial statements.

Recently Issued Accounting Pronouncements

In June 2016, the FASB issued ASU 2016-13, "Financial Instruments-Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments" intended to provide financial statement users with more decision-useful information about expected credit losses and other commitments to extend credit held by the reporting entity. The standard replaces the incurred loss impairment methodology in current GAAP with one that reflects expected credit losses and requires consideration of a broader range of reasonable and supportable information to inform credit loss estimates. The update is effective on January 1, 2020, with early adoption permitted. The Company will adopt this standard in the first quarter of 2020 and expects no material impact to the consolidated financial statements.

3. CONTRACT ASSETS AND CONTRACT LIABILITIES

Contract assets and liabilities are reflected in the Company's consolidated balance sheets within the accounts reflected below.

Contract Assets

Accounts receivable represent amounts due from the Company's customers who are concentrated primarily in the pharmaceutical, biotechnology, and medical device industries. Unbilled represents revenue recognized to date that has not been billed or is not yet contractually billable to the customer. In general, amounts become billable upon the achievement of negotiated contractual events, in accordance with predetermined payment schedules or when a reimbursable expense has been incurred. Amounts classified to unbilled are those billable to customers within one year from the respective balance sheet date.

Accounts receivable and unbilled, net consisted of the following (in thousands):

	As of	
	December 31, 2019	December 31, 2018
Accounts receivable	$ 127,877	$ 85,120
Unbilled receivables	28,368	49,361
Less: allowance for doubtful accounts	(583)	(1,032)
Total accounts receivable and unbilled, net	$ 155,662	$ 133,449

Unbilled receivables decreased to $28.4 million at December 31, 2019 from $49.4 million at December 31, 2018.

Contract Liabilities

Advanced billings represents cash received from customers, or billed amounts per an agreed upon payment schedule, in advance of services being performed or revenue being recognized.

Advanced billings consisted of the following (in thousands):

	As of	
	December 31, 2019	December 31, 2018
Advanced billings	$ 192,359	$ 147,935

Advanced billings increased to $192.4 million at December 31, 2019, from $147.9 million at December 31, 2018.

A rollforward of allowance for doubtful account activity is as follows:

	Year Ended December 31,		
	2019	2018	2017
Allowance for doubtful accounts - beginning balance	$ (1,032)	$ (673)	$ (3,222)
Current year provision	(263)	(791)	(250)
Write-offs, recoveries and the effects of foreign currency exchange	712	432	2,799
Allowance for doubtful accounts - ending balance	$ (583)	$ (1,032)	$ (673)

4. PROPERTY AND EQUIPMENT, NET

Property and equipment, net consisted of the following at December 31 (in thousands):

	2019	2018
Land	$ 1,577	$ 1,240
Equipment	20,225	15,437
Furniture, fixtures, and leasehold improvements	24,624	20,892
Computer hardware, software, and phone equipment	15,958	11,566
Buildings	13,272	8,145
Deemed assets from landlord building construction	-	22,752
Construction-in-progress	3,265	5,334
Property and equipment at cost	78,921	85,366
Less: Accumulated depreciation	(31,629)	(33,111)
Property and equipment, net	$ 47,292	$ 52,255

Depreciation expense was $8.4 million, $9.2 million and $8.6 million for the years ended December 31, 2019, 2018 and 2017, respectively.

In 2011, Medpace, Inc. entered into two multi-year lease agreements governing the future occupancy of additional office space in Cincinnati, Ohio. The Company assumed occupancy of both spaces during 2012 and began making lease payments at that time. The leases expire in 2027 and the Company has one 10-year option to extend the term of the leases. As of December 31, 2018, in accordance with the accounting guidance related to leases under ASC 840, the Company was deemed in substance to be the owner of the properties during the construction phase. The accounting guidance required that a lessee be considered the owner of a real estate project during the construction period if a related party of the lessee is an owner of the real estate. Given that a related party of Medpace made an equity investment in the lessor, Medpace was considered the owner of the property for accounting purposes during the buildings' construction. Accordingly, the Company reflected the building and related liabilities as Deemed assets from landlord building construction ("Deemed Assets") and Deemed landlord liabilities, respectively in the consolidated balance sheets. The Deemed Assets were being fully depreciated, on a straight line basis, over the 15-year term of the lease. As of December 31, 2019, in accordance with the accounting guidance related to leases under ASC 842, these leases have been classified as operating leases and the deemed assets have been removed. See Note 2 in the Notes to Consolidated Financial Statements for a description of the ASC 842 adoption entries.

5. GOODWILL AND INTANGIBLE ASSETS

Goodwill

Total assets carried on the balance sheet and not remeasured to fair value on a recurring basis, identified as Level 3 measurements, as of December 31, 2019 are $694.0 million, comprised of $662.4 million of goodwill and $31.6 million of identified indefinite-lived intangible assets. Accumulated goodwill impairment losses to date amounts to $9.3 million, all of which was recognized in 2015.

Intangible Assets, Net

Intangible assets, net consisted of the following at December 31 (in thousands):

	2019	2018
Intangible assets:		
Finite-lived intangible assets:		
Carrying amount:		
Customer relationships	$ 145,051	$ 145,051
Developed technologies	54,475	54,475
Other	3,074	3,074
Total finite-lived intangible assets	202,600	202,600
Accumulated amortization:		
Customer relationships	(122,426)	(110,636)
Developed technologies	(54,475)	(51,751)
Other	(2,995)	(2,680)
Total accumulated amortization	(179,896)	(165,067)
Total finite-lived intangible assets, net	22,704	37,533
Trade name (indefinite-lived)	31,646	31,646
Total intangible assets, net	$ 54,350	$ 69,179

As of December 31, 2019, estimated amortization expense of the Company's intangible assets for each of the next five years and thereafter is as follows (in thousands):

	Amortization
2020	$ 7,876
2021	5,114
2022	3,353
2023	2,199
2024	1,443
Later years	2,719
	$ 22,704

6. ACCRUED EXPENSES

Accrued expenses consisted of the following at December 31 (in thousands):

	2019	2018
Employee compensation and benefits	$ 34,119	$ 31,344
Project related reimbursable expenses	68,696	51,109
Other	6,437	5,040
Total accrued expenses	$ 109,252	$ 87,493

7. DEBT

Debt consisted of the following at December 31 (in thousands):

	2019	2018
Term loan	$ -	$ 80,438
Less unamortized discount	-	(282)
Less unamortized term loan debt issuance costs	-	(435)
Long-term debt, net, less current portion	$ -	$ 79,721

2019 Credit Agreement

On September 30, 2019 (the "Closing Date"), the Company obtained a new unsecured credit facility in an aggregate principal amount up to $50.0 million (the "Credit Facility") through its wholly owned subsidiaries, Medpace, Inc., as borrower (the "Borrower"), and Medpace IntermediateCo, Inc., as guarantor (the "Guarantor").

On the Closing Date, the Borrower and lender entered into a Loan Agreement (the "Loan Agreement") providing for the Credit Facility, and the Guarantor executed a Guaranty Agreement providing for its guarantee of the payment and performance of the obligations under the Loan Agreement. The Loan Agreement provides that outstanding balances under the Credit Facility will bear interest at a rate of LIBOR plus 100 basis points (1.00%). The Loan Agreement also provides that the Credit Facility will expire in 364 days from the Closing Date.

The Loan Agreement contains other customary loan terms, representations and warranties, and affirmative and negative covenants, in each case, subject to customary limitations, exceptions and exclusions. The Loan Agreement contains certain events of default, including, among others, non-payment of principal or interest and breach of the covenants.

As of December 31, 2019, there were no outstanding borrowings under the Credit Facility and $0.2 million in letters of credit outstanding related to certain operating lease obligations, which are secured by the Credit Facility.

The Loan Agreement replaced the Company's senior secured credit agreement dated as of December 8, 2016 (the "Prior Senior Secured Credit Agreement"), which was terminated on September 30, 2019 (the "Termination Date"). As of September 30, 2019, no amounts were drawn under the Prior Senior Secured Credit Agreement and no fees or penalties were incurred as a result of the termination, other than the payment of accrued commitment fees of $0.1 million through the Termination Date. In addition, on the Termination Date, the Company recorded unamortized loan issuance fees of $0.7 million, consisting of $0.5 million in Selling, general and administrative and $0.2 million of interest expense, during the third quarter of 2019, representing unamortized loan origination fees and loan discounts, respectively, associated with the Prior Senior Secured Credit Agreement.

2016 Credit Agreement

On December 8, 2016, Medpace IntermediateCo, Inc., as borrower, and Medpace Acquisition, Inc., a wholly-owned subsidiary of Medpace Holdings, Inc., as parent guarantor (the "Parent Guarantor"), entered into the Prior Senior Secured Credit Agreement consisting of a $165.0 million term loan (the "Prior Senior Secured Term Loan Facility") issued at 99.7% and a $150.0 million senior secured revolving credit facility (the "Prior Senior Secured Revolving Credit Facility" and, together with the Prior Senior Secured Term Loan Facility, the "Prior Senior Secured Credit Facilities"). The Prior Senior Secured Term Loan Facility and Prior Senior Secured Revolving Credit Facility were set to expire in December 2021, but were terminated on September 30, 2019.

The Prior Senior Secured Credit Facilities provided for, at the Company's option, interest at the Eurocurrency rate or Base rate for the Prior Senior Secured Term Loan Facility and the Prior Senior Secured Revolving Credit Facility borrowings. The Company, at its discretion, could choose interest periods of one, two, three or six months, which determines the interest rate to be applied. Interest on Eurocurrency loans was payable at the end of the selected Eurocurrency term and interest on Base rate loans were payable quarterly in conjunction with any required principal payments.

Borrowings under the Prior Senior Secured Credit Facilities bore interest at a rate equal to, at our option, either (i) the adjusted Eurocurrency rate based on LIBOR for U.S. dollar deposits for loans denominated in dollars, EURIBOR for Euro deposits for loans denominated in Euros and the offer rate for any other currencies for loans denominated in such other currencies for the relevant interest period plus an applicable margin from 1.25% to 2.25% based on the total net leverage ratio from less than 1.50:1.00 to greater than 3.75:1:00, or (ii) an alternative base rate (determined by reference to the highest of (a) the prime commercial lending rate of the administrative agent, as established from time to time, (b) the Federal Funds Rate plus 0.50% and (c) the one-month adjusted Eurocurrency rate for loans in U.S. dollars plus 1.00%) plus an applicable margin from 0.25% to 1.25% based on the total net leverage ratio from less than 1.50:1.00 to greater than 3.75:1:00. The applicable margin as of December 31, 2018 was 1.25% for eurocurrency loans and 0.25% for base rate loans. The Company was able to voluntarily prepay outstanding loans under the Prior Senior Secured Credit Facilities without premium or penalty. As of December 31, 2018, the interest rate applicable on the term loan was the Eurocurrency interest rate of 3.77%.

In addition, the Company was required to pay to the lenders a commitment fee on a quarterly basis at an annual rate of 0.375% of the unused borrowings under the Prior Senior Secured Revolving Credit Facility for the first full fiscal quarter after the closing date, and thereafter 0.50% if the total net leverage ratio is greater than or equal to 3.00:1.00, or 0.375% if the total net leverage ratio is less than 3.00:1.00. At December 31, 2018 the Company had no outstanding borrowings under the Prior Senior Secured Revolving Credit Facility, resulting in $149.8 million in undrawn capacity available under the Prior Senior Secured Revolving Credit Facility. As of December 31, 2018, the interest rate applicable on the Prior Senior Secured Revolving Credit Facility was the Eurocurrency interest rate of 3.77%. In addition, the Company had $0.2 million in letters of credit outstanding, which were secured by the Prior Senior Secured Revolving Credit Facility at December 31, 2018.

The original issue discount of $0.5 million related to the issuance of the Prior Senior Secured Term Loan Facility was recorded as a reduction of the underlying debt issuances within Long-term debt, net, less current portion and was being amortized over the life of the debt using the effective-interest method. The unamortized portion of the discount related to the Prior Senior Secured Term Loan Facility was $0.3 million as of December 31, 2018. Per the terms of the Prior Senior Secured Credit Term Loan Facility, principal was scheduled to be paid quarterly on the last business day of March, June, September and December of each year, beginning March 2017.

Origination fees of $0.8 million related to the Prior Senior Secured Term Loan Facility were recorded as a reduction of the underlying debt issuances in Long-term debt, net. These fees were being amortized over the life of the debt using the effective-interest method. The unamortized portion of the origination fees related to the Prior Senior Secured Term Loan Facility was $0.4 million at December 31, 2018.

In the second quarter of 2019, the Company paid off its remaining outstanding obligations against its Prior Senior Secured Term Loan Facility. Upon satisfaction of the outstanding obligations of the Prior Senior Secured Term Loan Facility, the Company recorded unamortized term loan issuance fees of $0.3 million to Selling, general and administrative expenses and the unamortized discount of $0.2 million to Interest expense, net.

Origination fees of $1.6 million related to the Prior Senior Secured Revolving Credit Facility were originally capitalized as a component of Other assets. These fees were being amortized over the life of the debt using the effective-interest method. The unamortized portion of the origination fees related to the Prior Senior Secured Revolving Credit Facility were $0.9 million at December 31, 2018.

The Prior Senior Secured Credit Facilities were guaranteed by the Parent Guarantor and its material, direct or indirect wholly owned domestic subsidiaries, with certain exceptions, including where providing such guarantees is not permitted by law, regulation or contract or would result in adverse tax consequences. The Prior Senior Secured Credit Facilities were subject to customary covenants relating to financial ratios and restrictions on certain types of transactions, including restricting the Company's ability to incur additional indebtedness, acquire and dispose of assets, make investments, pay dividends, or engage in mergers and acquisitions. The Company was required to maintain a ratio of consolidated funded indebtedness minus unrestricted cash and cash equivalents (in the aggregate not to exceed $50 million and to include not more than $25 million of foreign unrestricted cash and cash equivalents) to consolidated EBITDA for the most recent four fiscal quarter period not to exceed 4.00:1.00; provided that the Company shall be permitted to increase the ratio to 4.50:1.00 in connection with any permitted acquisition or any other acquisition consented to by the Administrative Agent and the Required Lenders (as defined in the Prior Senior Secured Credit Agreement) with total cash consideration in excess of $25 million. Such increase shall be applicable for the fiscal quarter in which such acquisition is consummated and the three consecutive test periods thereafter. The Company was also required to maintain a ratio of consolidated EBITDA to consolidated interest expense, in each case for the most recent four fiscal quarter period, of not less than 3.00:1.00. The Company was in compliance with all financial covenants as of December 31, 2018.

8. LEASES

The Company enters into leases for real estate and equipment. Real estate leases are for our corporate office space and laboratories around the world. Real estate leases have remaining lease terms of less than one year to 20 years. Many of the Company’s leases include options to extend the leases on a month to month basis or for set periods for up to 20 years. Many leases also include options to terminate the leases within one year or per other contractual terms.

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

	Year Ended December 31, 2019
Operating lease cost	$ 13,151
Variable lease cost	2,813

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

	Year Ended December 31, 2019
Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash flows from operating leases	$ 9,773
Right-of-use assets obtained in exchange for lease obligations:	
Operating leases	10,294

Supplemental balance sheet information related to the leases was as follows (in thousands):

	As of December 31, 2019
Operating lease right-of-use assets	$ 52,152
Other current liabilities	$ 10,977
Operating lease liabilities	45,212
Total operating lease liabilities	$ 56,189
Weighted Average Remaining Lease Term (years)	
Operating leases	6.3
Weighted Average Discount Rate	
Operating leases	6.0%

Lease payments due related to lease liabilities as of December 31, 2019 were as follows (in thousands):

	Related Party Operating Leases	Non-Related Parties Operating Leases	Total Operating Leases
2020	$ 5,600	$ 7,644	$ 13,244
2021	5,600	7,435	13,035
2022	5,267	4,664	9,931
2023	3,613	3,916	7,529
2024	3,613	2,875	6,488
Later years	9,665	8,644	18,309
Total lease payments	33,358	35,178	68,536
Less: imputed interest	(6,162)	(6,185)	(12,347)
Total	$ 27,196	$ 28,993	$ 56,189

As of December 31, 2019, we have several additional leases with contractual obligations, which have not yet commenced, with future payments of $133.0 million. This includes a lease related to a corporate office under construction in Cincinnati, Ohio, which has not yet commenced, with future payments of $124.0 million. This lease will commence in fiscal year 2020 with an initial lease term of 20 years and a renewal option for two 10-year terms at prevailing market rates.

Comparative period disclosures under ASC 840:

Rental expense under operating leases totaled $9.2 million and $7.9 million for the years ended December 31, 2018 and 2017, respectively, and is allocated between Total direct costs, and Selling, general and administrative in the consolidated statements of operations.

Future minimum rental payments for lease obligations with initial terms in excess of one year as of December 31, 2018 are as follows (in thousands):

	Related Party Operating Leases	Non-Related Parties Operating Leases	Total Operating Leases
2019	$ 1,987	$ 6,186	$ 8,173
2020	6,843	6,617	13,460
2021	6,964	5,873	12,837
2022	6,757	3,694	10,451
2023	5,229	3,257	8,486
Thereafter	103,870	5,752	109,622
Total minimum lease payments	$ 131,650	$ 31,379	$ 163,029

Minimum annual payments required in conjunction with the Deemed landlord liabilities as of December 31, 2018 are as follows (in thousands):

	Related Party Minimum Lease Payments	Less: Interest	Total Principal Amounts Due
2019	$ 3,918	$ 1,818	$ 2,100
2020	3,988	1,662	2,326
2021	4,039	1,490	2,549
2022	4,092	1,301	2,791
2023	4,145	1,095	3,050
Thereafter	15,697	1,929	13,768
Total	$ 35,879	$ 9,295	$ 26,584

9. SHAREHOLDERS' EQUITY

Stock-Based Compensation

2016 Incentive Award Plan

On August 11, 2016 in connection with the Company's IPO, the Board approved the formation of the 2016 Incentive Award Plan (the "2016 Plan"), which replaced our 2014 Equity Incentive Plan (the "2014 Plan"). The 2016 Plan provides for long-term equity incentive compensation for key employees, officers and non-employee directors. A variety of discretionary awards (collectively, the "Awards") for employees and non-employee directors are authorized under the 2016 Plan, including vested shares, stock options, stock appreciation rights ("SARs"), restricted stock awards ("RSAs"), restricted stock units ("RSUs"), or other cash based or stock dividend equivalent awards, which are all equity-classified instruments under the 2016 Plan. The number of shares registered and available for grant under the 2016 Plan is 6,000,000. The vesting of such awards may be conditioned upon either a specified period of time or the attainment of specific performance goals as determined by the administrator of the 2016 Plan. The option price and term are also subject to determination by the administrator with respect to each grant. Option prices are generally expected to be set at the market price of the Company's common stock at the date of grant and option terms are not expected to exceed ten years.

The Company granted 816,286 awards to employees under the 2016 Incentive Award Plan during the year ended December 31, 2019, consisting of 10,000 stock option awards and 227,610 restricted stock units ("RSU") vesting after four years, 5,000 stock option awards vesting after one year, 551,676 fully-vested stock option awards and 22,000 stock option awards with vesting in twelve equal monthly installments beginning on March 31, 2019. The Company granted an additional 41,853 stock option awards to non-employee directors under the 2016 Incentive Award Plan, during the year ended December 31, 2019. These awards will vest on the earlier of (a) the day immediately preceding the date of the first annual meeting following the date of grant and (b) the first anniversary of the date of grant, subject to the non-employee director continuing in service through the applicable vesting date.

The Company granted 850,700 awards to employees under the 2016 Plan during the year ended December 31, 2018, consisting of 550,500 stock option awards and 300,200 restricted stock units ("RSU"), all vesting after four years. The Company granted an additional 33,801 stock option awards to non-employee directors under the 2016 Incentive Award Plan, during the year ended December 31, 2018. These awards will vest on the earlier of (a) the day immediately preceding the date of the first annual meeting following the date of grant and (b) the first anniversary of the date of grant, subject to the non-employee director continuing in service through the applicable vesting date.

The Company granted 968,550 awards to employees under the 2016 Plan during the year ended December 31, 2017, consisting of 797,550 stock option awards, 118,000 restricted stock awards ("RSA") and 38,000 restricted stock units ("RSU"), all vesting after four years. The Company granted 15,000 stock option awards, vesting equally on the second, third and fourth anniversary of the grant date over four years. Additionally, the Company granted 41,346 stock option awards, vesting over one year, to non-employee directors under the 2016 Incentive Award Plan, during the year ended December 31, 2017.

The 2016 Plan expires in 2026, except for awards then outstanding, and is administered by the Board. All Awards granted at the IPO or thereafter were or will be issued under the 2016 Plan.

The company satisfies stock option exercises and vested stock awards with newly issued shares. Shares available for future stock compensation grants totaled 3.2 million and 3.8 million at December 31, 2019 and 2018.

2014 Equity Incentive Plan

The 2014 Plan for employees and directors provided the issuance of vested shares, stock options, RSAs and RSUs in Medpace Holdings, Inc.'s common stock. The awards were granted to key employees as additional compensation for services rendered and as a means of retention over the vesting period, typically three to four years. RSAs awarded under the 2014 Plan were subject to automatic forfeiture upon departure until vested and entitle the shareholder to all rights of common stock ownership except that they may not be sold, transferred, pledged or otherwise disposed of during the restriction period, except as noted in the following paragraph. The 2014 Plan allowed for the issuance of non-qualified stock options to employees, officers, and directors under this plan (collectively, "the Participants"). Under the 2014 Plan, options could be granted with an exercise price equal to or greater than the fair value of common stock at the grant date as determined by the Board of Directors. The stock options, if unexercised, expired seven years from the date of grant. The awards under the 2014 Plan were equity classified instruments for all periods presented.

In the third quarter of 2019, Medpace Investors, LLC ("MPI"), a related party to the Company, filed a Tender Offer Statement ("Tender Offer") offering to purchase, for cash, vested stock options of employee holders of options outstanding from the 2014 Incentive Award Plan. The Tender Offer resulted in the tender and purchase of 229,431 vested options from employee holders of options by MPI. Under generally accepted accounting guidance governing such transactions, because the Tender offer by an economic interest holder in the Company, this transaction is accounted for as a settlement of vested options and a reissuance of options at fair value as of the transaction date. Expense related to the reissuance of options to MPI is included as stock-based compensation expense of $5.1 million within Selling, general and administrative expenses during the year ended December 31, 2019.

Equity Awards

Valuation Assumptions

The Company determines the fair value of stock options using the Black-Scholes-Merten option pricing model (the "BSM Model"). The BSM Model is primarily affected by the fair value of the Company's common stock (see restricted share valuation discussion below), the expected holding period for the option, expected stock price volatility over the term of the awards, the risk-free interest rate, and expected dividends.

The following table sets forth the key weighted-average assumptions used in the BSM Model to calculate the fair value of options:

	Year Ended December 31,		
	2019	2018	2017
Expected holding period - years	2.6	5.4	5.4
Expected volatility	26.3%	27.0%	28.0%
Risk-free interest rate	2.0%	2.8%	2.0%
Expected dividend yield	0.0%	0.0%	0.0%

The assumptions used in the table above reflect grant date inputs to arrive at the grant date fair values for stock options subject to equity-classified stock compensation accounting.

The expected holding period represents the period of time the grants are expected to be outstanding. The Company uses the simplified method, as prescribed by accounting guidance governing such awards, to calculate the expected holding period for options granted to employees as we do not have sufficient historical evidence data to provide a reasonable basis upon which to estimate the expected holding period. For options valued by the Company for the years ended December 31, 2019, 2018 and 2017, the expected holding period is based on an average between the midpoint of the vesting date and the expiration date of the options.

The Company estimates expected volatility primarily by using the historical volatility of a publicly traded peer group that operates in the clinical research and development industry. The Company does not have adequate history to calculate its own historical or implied volatility and believes the Company's expected volatility will approximate the historical experience of the peer group.

The risk-free interest rate is based on the yield on U.S. Treasury obligations with remaining durations equal to the expected holding period of the options. The expected dividend yield is assumed to be zero based on recent and anticipated dividend activity.

Subsequent to the IPO, the fair value of common stock is based upon the market price of the Company's common stock on the date of grant as listed on the NASDAQ. Due to the absence of an active market for the Company's common stock prior to the IPO, the Company determined the fair value of restricted shares by obtaining an independent valuation of the fair value of the Company's equity, applying a discount for lack of marketability, and then calculating the implied share price. The fair value of the Company was estimated primarily using an income approach which is based on assumptions and estimates made by management and, secondarily, using other market-related factors in current industry trends as well as observed transaction values. In determining the estimated future cash flows used in the income approach, the Company developed and applied certain estimates and judgments, including current and projected future levels of income based on management's plans, business trends, prospects and market and economic conditions, including market-participant considerations. Significant assumptions utilized in the income approach were based on company specific information and projections, which were not observable in the market and are thus considered Level 3 measurements by authoritative guidance. The discount for lack of marketability (the "Marketability Discount") was applied to reflect what a market participant would consider in relation to the post-vesting restrictions imposed regarding the inability to sell, transfer, or pledge the shares during the restriction period. The Marketability Discount was estimated by using the BSM Model to calculate the cost of a theoretical put option to hedge the fluctuation in value of the investment between the valuation date and an anticipated liquidity date.

The following table summarizes the grant date fair values of stock options and restricted shares issued during the period as well as the allocation of stock-based compensation expense to Total direct costs, and Selling, general and administrative reported in the consolidated statements of operations:

	Year Ended December 31,		
	2019	2018	2017
Weighted average, grant date fair value			
Stock options	$ 14.06	$ 11.51	$ 8.54
Restricted shares (RSAs and RSUs)	$ 60.53	$ 49.38	$ 31.90
Stock-based compensation expense allocated to:			
Total direct costs	$ 6,999	$ 4,132	$ 2,128
Selling, general, and administrative	13,742	2,367	2,335
Total stock-based compensation expense	$ 20,741	$ 6,499	$ 4,463

Award Activity

The following table sets forth the Company's stock option activity:

	Year Ended December 31,					
	2019		2018		2017	
	Options	Weighted Average Exercise Price	Options	Weighted Average Exercise Price	Options	Weighted Average Exercise Price
Outstanding - beginning of Period	2,945,040	$ 24.18	2,782,868	$ 20.73	2,350,166	$ 17.57
Granted	859,960	$ 54.97	584,301	$ 37.72	853,896	$ 28.67
Exercised	(399,368)	$ 16.19	(169,771)	$ 14.98	(116,787)	$ 15.52
Forfeited/Expired	(375,561)	$ 19.91	(252,358)	$ 23.69	(304,407)	$ 20.55
Outstanding - end of period	3,030,071	$ 34.50	2,945,040	$ 24.18	2,782,868	$ 20.73
Exercisable - end of period	1,435,088	$ 38.62	1,096,116	$ 16.01	917,592	$ 15.40

The following table sets forth the Company's Restricted Share activity:

	Year Ended December 31,		
	2019	2018	2017
	Shares/Units	Shares/Units	Shares/Units
Outstanding and unvested - beginning of period	421,200	183,629	59,258
Granted	227,610	300,200	156,000
Vested	-	(29,629)	(29,629)
Forfeited	(79,040)	(33,000)	(2,000)
Outstanding and unvested - end of period	569,770	421,200	183,629
Cumulative vested shares - end of period	1,913,916	1,913,916	1,884,287

The following table summarizes information about stock options expected to vest, stock options exercisable, and unvested restricted share awards expected to vest at December 31, 2019:

	Weighted Average Exercise Price	Stock Options	Restricted Shares	Weighted Average Remaining Life (Years)
December 31, 2019				
Number of stock options expected to vest	$ 34.50	3,030,071	-	4.0
Number of Restricted Shares expected to vest		-	569,770	
Total expected to vest - December 31, 2019		3,030,071	569,770	
Total stock options exercisable - December 31, 2019	$ 38.62	1,435,088		3.6
Unrecognized compensation cost - December 31, 2019 (in thousands)		$ 5,884	$ 19,697	
Weighted average years over which unrecognized compensation cost will be recognized		1.9	2.9	

The following table sets forth the aggregate intrinsic value of stock options exercised, the fair values of awards vested, and share based liabilities settled during the respective periods (in thousands):

	Year Ended December 31, 2019	2018	2017
Total intrinsic value of stock options exercised	$ 19,807	$ 5,326	$ 1,619
Total grant-date fair value of stock options vested	$ 12,117	$ 1,417	$ 1,317
Total grant-date fair value of restricted shares vested	$ -	$ 447	$ 447
Total settlement date fair value of restricted shares vested	$ -	$ 1,568	$ 1,074

The actual tax benefits recognized related to stock-based compensation totaled $5.5 million, $1.0 million and $0.5 million for the years ended December 31, 2019, 2018 and 2017, respectively.

10. EMPLOYEE BENEFIT PLANS

The Company provides a 401(k) plan that covers substantially all U.S. employees. Participants can elect to contribute up to 50% of their eligible earnings on a pre-tax basis, subject to Internal Revenue Service annual limitations.

The U.S.-based plan offers a year-end employer matching contribution, requiring the participant to be an employee at year-end to qualify for the match. Participants with one year or more of service are eligible for the matching contribution. Participants fully vest in the employer contributions after three years of service. The employer contribution represents a percentage of a participant's eligible compensation. The Company's 401(k) Plan costs were $3.1 million, $2.7 million and $2.3 million during the years ended December 31, 2019, 2018 and 2017, respectively, and were allocated between Total direct costs, and Selling, general and administrative in the consolidated statements of operations.

The Company has various defined contribution arrangements for eligible employees of non-U.S. entities. These defined contribution arrangements provide employees with retirement savings and life insurance benefits. The Company incurred expenses related to these arrangements of $1.2 million, $1.0 million and $0.9 million in the years ended December 31, 2019, 2018 and 2017, respectively, and were allocated between Total direct costs, and Selling, general and administrative in the consolidated statements of operations.

The Company is also required to pay certain minimum statutory post-employment benefits. The Company recognizes a liability and the associated expense for these benefits when it is probable that employees are entitled to the benefit.

11. INCOME TAXES

US Tax Reform

The "Tax Cuts and Jobs Act" (TCJA) was enacted on December 22, 2017 and it significantly reforms the Internal Revenue Code of 1986, as amended. The TCJA, among other things, includes a reduction in the U.S. federal tax rate from 35% to 21%, allows for the expensing of capital expenditures, requires companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred, creates new taxes on certain foreign sourced earnings and puts into effect the migration from a "worldwide" system of taxation to a territorial system.

The Company recognized the income tax effects of the "Tax Cuts and Jobs Act" (TCJA) in its audited consolidated financial statements on our 2017 Annual Report on Form 10-K in accordance with Staff Accounting Bulletin No. 118, which provides Securities and Exchange Commission staff guidance for the application of ASC Topic 740, Income Taxes, in the reporting period in which the TCJA was signed into law. The guidance also provides for a measurement period of up to one year from the enactment date for the Company to complete the accounting for the U.S. tax law changes. As such, the Company's 2017 financial results reflected the provisional estimate of the income tax effects of the TCJA.

The Company completed its analysis of the TCJA in 2018 and adjusted the 2017 provisional estimates to the final amounts. A summary of the provisional and final amounts is included below:

- Transition tax on unrepatriated foreign earnings: The Company originally estimated a transition tax expense of $0.6 million and the final transition tax liability is $0.7 million. The adjustment unfavorably impacted the effective tax rate by approximately 0.1%.
- Reduction of U.S. Federal Corporate Tax Rate: The Company originally estimated a provisional tax benefit of $3.4 million related to the revaluation of deferred tax assets and liabilities. The deferred tax assets/liabilities as of December 31, 2017 were adjusted to match the balances per the 2017 U.S. corporate income tax return. The revised deferred balance was then adjusted from a 35% tax rate to a 21% tax rate. This resulted in a final tax benefit of approximately $3.6 million. The adjustment favorably impacted the effective tax rate by approximately 0.2%.
- Indefinite reinvestment assertion: Prior to the passage of the TCJA, the Company asserted that all of the undistributed foreign earnings of its foreign subsidiaries were considered indefinitely reinvested and accordingly, no deferred taxes were provided. Beginning in 2018, the TCJA provides a 100% deduction for dividends received from 10-percent owned foreign corporations by U.S. corporate shareholders, subject to a one-year holding period. Although dividend income is now exempt from U.S. federal tax in the hands of the U.S. corporate shareholders, companies must still apply the guidance of ASC 740-30-25-18 to account for the tax consequences of outside basis differences and other tax impacts of their investments in non-U.S. subsidiaries. The Company has accrued the Transition Tax on the deemed repatriated earnings that were previously indefinitely reinvested. The Company has not recorded deferred foreign withholding taxes on approximately $21.1 million of pre-2018 earnings which are considered permanently reinvested.
- Global intangible low taxed income (GILTI): The TCJA creates a new requirement that certain income (i.e., GILTI) earned by foreign subsidiaries must be included currently in the gross income of the U.S. shareholder. The Company has made an accounting policy election to treat GILTI taxes as a current period expense.

The Company files income tax returns for U.S. federal and various U.S. states, as well as various foreign jurisdictions. The liabilities for unrecognized tax benefits are carried in Other long-term liabilities on the consolidated balance sheets because the payment of cash is not anticipated within one year of the balance sheet date.

The components of income before income taxes consisted of the following (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Domestic	$ 117,326	$ 88,014	$ 52,986
Foreign jurisdictions	7,506	5,937	3,959
Income before income taxes	$ 124,832	$ 93,951	$ 56,945

Income tax provision consisted of the following (in thousands):

	Current	Deferred	Total
Year ended December 31, 2019			
U.S. Federal	$ 10,577	$ 8,922	$ 19,499
U.S. state and local	1,761	987	2,748
Foreign jurisdictions	2,023	119	2,142
	$ 14,361	$ 10,028	$ 24,389
Year ended December 31, 2018			
U.S. Federal	$ 13,372	$ 4,172	$ 17,544
U.S. state and local	1,912	(116)	1,796
Foreign jurisdictions	1,408	18	1,426
	$ 16,692	$ 4,074	$ 20,766
Year ended December 31, 2017			
U.S. Federal	$ 10,953	$ 3,466	$ 14,419
U.S. state and local	2,032	51	2,083
Foreign jurisdictions	1,576	(255)	1,321
	$ 14,561	$ 3,262	$ 17,823

The difference between the statutory rate for federal income tax and the effective income tax rate was as follows (in thousands):

	Year Ended December 31,					
	2019		2018		2017	
Income tax expense calculated at the federal statutory rate	$ 26,215	21.0%	$ 19,730	21.0%	$ 19,931	35.0%
Effect of:						
State and local taxes, net of federal benefit	2,021	1.6	1,978	2.1	1,606	2.8
Tax on foreign earnings, net of tax credits and deductions	593	0.4	172	0.2	(69)	(0.1)
Tax reform adjustment	-	-	(195)	(0.2)	(3,418)	(6.0)
Write off of Deferred Tax Assets	-	-	509	0.6	-	-
Deferred credit	(802)	(0.6)	(802)	(0.9)	(1,053)	(1.9)
Permanent items:						
Stock-based awards	(3,011)	(2.4)	(651)	(0.7)	(179)	(0.3)
Tax reform	-	-	126	0.1	574	1.0
Deduction for FDII	(2,283)	(1.8)	-	-	-	-
Other	964	0.8	687	0.7	483	0.9
State/Local tax credits	(793)	(0.6)	(1,253)	(1.3)	(1,187)	(2.1)
Foreign tax credits	-	-	(727)	(0.8)	-	-
Change in liability for uncertain tax positions	1,325	1.0	1,102	1.2	1,141	2.0
Other	160	0.1	90	0.1	(6)	(0.0)
	$ 24,389	19.5%	$ 20,766	22.1%	$ 17,823	31.3%

Components of the Company's net deferred tax asset (liability) included in the consolidated balance sheets consisted of the following at December 31 (in thousands):

	2019	2018
Deferred tax assets:		
Accrued liabilities	$ 12,229	$ 18,670
Depreciation and amortization	1,121	872
Foreign operating loss carryforward	447	248
U.S. state and local tax credits and carryforward	184	223
Other	96	41
Valuation allowance	(755)	(169)
Total deferred tax assets	13,322	19,885
Deferred tax liabilities:		
Depreciation and amortization	(21,787)	(18,803)
Prepaid expenses	(808)	(550)
Advanced billings	(3,147)	-
Other	(53)	(258)
Total deferred tax liabilities	(25,795)	(19,611)
Net deferred tax asset	$ (12,473)	$ 274

U.S. state and local tax credits noted above will expire in 2024 if not utilized.

The Company has foreign operating loss carryforwards for which a deferred tax asset of $0.4 million has been established. The Company has a valuation allowance of $0.4 million against this deferred tax asset based upon its assessment that it is more likely than not that this amount will not be realized. The ultimate realization of this tax benefit is dependent upon the generation of sufficient operating income in the respective tax jurisdictions. Approximately 28% of the foreign net operating loss carryforwards can be utilized over an indefinite period whereas the remainder will expire at various times from 2020 to 2029 if not utilized.

In May 2017, the Company acquired Nephrogenex which included deferred tax assets of $22.2 million, consisting of tax effected net operating losses in the amount of $13.5 million, tax effected capitalized research and development expenses of $8.5 million and tax effected federal tax credits of $0.2 million, and deferred tax liabilities of $0.1 million. In 2018, the Company disposed of approximately $7.4 million in deferred tax assets and reduced the deferred credit by approximately $6.9 million (net increase in tax expense of approximately $0.5 million) as a result of an IRC Section 382 ownership shift that occurred as a result of Cinven's sales of the Company's securities. The ownership shift resulted in a limitation in the ability to utilize the acquired tax attributes and resulted in the described asset write-off and reduction of the deferred credit.

Annual activity related to the Company's valuation allowance is as follows (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Beginning Balance	$ 169	$ 2,394	$ 987
Additions charged to expense	375	-	-
Additions due to asset acquisition	265	-	2,033
Reductions from utilization, reassessments and expirations	(54)	(2,225)	3
Remeasurement due to effect of tax reform	-	-	(629)
Ending Balance	$ 755	$ 169	$ 2,394

A reconciliation of the beginning and ending balances of the total amounts of gross unrecognized tax benefits is as follows (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Beginning Balance	$ 8,525	$ 6,890	$ 5,698
Increases in tax positions for prior years	-	-	5
Decreases in tax positions for prior years	(888)	(579)	-
Increases in tax positions for current year	2,081	2,214	1,187
Lapse in statute of limitations	-	-	-
Ending Balance	$ 9,718	$ 8,525	$ 6,890

Interest and penalties associated with uncertain tax positions are recognized as components of Income tax provision in the consolidated statements of operations. There was no material change to tax-related interest and penalties during the years ended December 31, 2019, 2018 and 2017. As of December 31, 2019 and 2018, respectively, the Company has a liability for interest and penalties of $1.4 million and $1.0 million that is associated with related tax liabilities of $8.2 million and $7.2 million for uncertain tax positions.

The Company operates in various foreign, state and local jurisdictions. The number of tax years for which the statute of limitations remains open for foreign, state and local jurisdictions varies by jurisdiction and is approximately four years (2015 through 2019). For federal tax purposes, the Company's open tax years are 2016 through 2019.

12. COMMITMENTS, CONTINGENCIES, AND GUARANTEES

Legal Proceedings

Medpace periodically becomes involved in various claims and lawsuits that are incidental to its business. Management believes, after consultation with counsel, that no matters currently pending would, in the event of an adverse outcome, have a material impact on the Company's consolidated balance sheets, statements of operations, or cash flows for the years ended December 31, 2019, 2018 and 2017.

Purchase Commitments

The Company has several minimum purchase commitments for project related supplies totaling $11.9 million as of December 31, 2019. In return for the commitment, Medpace receives preferential pricing. The commitments expire at various times through 2026.

13. MISCELLANEOUS (EXPENSE) INCOME, NET

Miscellaneous (expense) income, net consisted of the following (in thousands):

	Year Ended December 31,		
	2019	2018	2017
Net (loss) gain on foreign-currency transactions	$ (581)	$ 386	$ (1,004)
Other (expense) income	(282)	674	650
Miscellaneous (expense) income, net	$ (863)	$ 1,060	$ (354)

14. RELATED PARTY TRANSACTIONS

Employee Loans

The Company periodically extends short term loans or advances to employees, typically upon commencement of employment. Total receivables as a result of these employee advances of $0.2 million existed at December 31, 2019 and 2018, respectively, and are included in the Prepaid expenses and other current assets and Other assets line items of the consolidated balance sheets, respectively, depending on the contractual repayment date.

Management Fees

In conjunction with the IPO, the Advisory Services Agreement with Cinven Capital Management (V) General Partner Limited ("Cinven") expired. Subsequent to the IPO, the Company paid fees for director services provided by Cinven employees that were members of the Company's Board of Directors and any related committees. The director fees were paid directly to Cinven in accordance with the Company's non-employee director compensation policy. During the third quarter of 2018, Cinven sold its remaining shares of the Company's common stock and all three members of the Company's Board affiliated with Cinven subsequently resigned. During the years ended December 31, 2018 and 2017, the Company incurred director fees of $0.1 million, respectively. In connection with these fees, Cinven incurred related travel expenses of less than $0.1 million and $0.1 million, respectively, during the years ended December 31, 2018 and 2017.

Service Agreements

Coherus BioSciences, Inc. ("Coherus") and MX II Associates, LLC ("MXII")

The chief executive officer of the Company was a member of Coherus BioSciences, Inc.'s ("Coherus") board of directors until his resignation in the first quarter of 2018. Coherus is no longer considered a related party as of the first quarter of 2018. During 2011 a related party of the Company in which the Company's chief executive officer is the managing member, MXII, made an investment in Coherus. In early 2012 the Company made a $2.5 million investment in Coherus. Concurrent with the initial investment, MXII secured the exclusive rights for Medpace to perform Phase I through Phase III clinical trial work for certain Coherus' "bio-similar" drug compounds executed through a MSA. The agreement provides for a minimum fee commitment for clinical trial services and is cancelable without cause by either party upon 30 days prior notice. During the year ended December 31, 2017, the Company recognized service revenue of $8.0 million from Coherus in the Company's consolidated statements of operations.

In addition, the company recognized Reimbursed out-of-pocket revenue and Reimbursed out-of-pocket expenses with Coherus in the consolidated statements of operations of $1.3 million during the year ended December 31, 2017.

Xenon Pharmaceuticals, Inc. ("Xenon")

Certain executives and employees of the Company, including the chief executive officer, have held equity investments in Xenon, a clinical-stage biopharmaceutical company. In addition, a Medpace employee was a director of Xenon until May 2015. During the second quarter of 2017, the chief executive officer sold his entire equity position held in Xenon. Xenon is no longer considered to be a related party subsequent to this sale. During July 2015 the Company and Xenon entered into an amended MSA agreement for the Company to provide clinical trial related services. The Company recognized service revenue from Xenon of $0.6 million during the six months ended June 30, 2017 in the Company's consolidated statements of operations. In addition, the Company recognized Reimbursed out-of-pocket revenue and Reimbursed out-of-pocket expenses with Xenon in the consolidated statements of operations of $0.1 million during the six months ended June 30, 2017.

Cymabay Therapeutics, Inc. ("Cymabay")

Cymabay is a clinical-stage biopharmaceutical company developing therapies to treat metabolic diseases with high unmet medical need, including serious rare and orphan disorders. A Medpace employee was a member Cymabay's board of directors from the first quarter of 2016 until his resignation in the first quarter of 2020. The Company and Cymabay entered into a MSA dated October 21, 2016. Subsequently, the Company and Cymabay have entered into several task orders for the Company to perform clinical trial related services. The Company recognized total revenue from Cymabay of $13.2 million and $10.8 million during the years ended December 31, 2019 and 2018 in the Company's consolidated statements of operations. The Company recognized service revenue from Cymabay of $0.6 million during the year ended December 31, 2017 in the Company's consolidated statements of operations. As of December 31, 2019 and 2018, respectively, the Company had Advanced billings from Cymabay of $1.6 million and less than $0.1 million recorded in the consolidated balance sheets. In addition, as of December 31, 2019 and 2018, the Company had Accounts receivable and unbilled, net from Cymabay of $1.4 million and $2.5 million recorded in the consolidated balance sheets, respectively.

LIB Therapeutics LLC and subsidiaries ("LIB")

Certain executives and employees of the Company, including the chief executive officer, are members of LIB's board of managers and/or have equity investments in LIB. The Company entered into a MSA dated November 24, 2015 with LIB, a company that engages in research, development, marketing and commercialization of pharmaceutical drugs. Subsequently, the Company and LIB have entered into several task orders for the Company to perform clinical trial related services. The Company recognized total revenue from LIB of $2.0 million and $3.7 million during the years ended December 31, 2019 and 2018 in the Company's consolidated statement of operations. The Company recognized service revenue from LIB of $1.4 million during the year ended December 31, 2017 in the Company's consolidated statements of operations. As of December 31, 2019 and 2018, the Company had, from LIB, Advanced billings of $0.5 million and $0.3 million in the consolidated balance sheets, respectively. In addition, the Company had Accounts receivable and unbilled, net from LIB of $0.3 million and $1.0 million in the consolidated balance sheets at December 31, 2019 and 2018, respectively.

CinRX Pharma and subsidiaries ("CinRx")

Certain executives and employees of the Company, including the chief executive officer, are members of CinRx's board of managers and/or have equity investments in CinRx, a biotech company. The Company and CinRx have entered into several task orders for the Company to perform clinical trial related services. During the years ended December 31, 2019 and 2018, the Company recognized total revenue from CinRx of $3.7 million and $0.5 million in the Company's consolidated statements of operations. During the year ended December 31, 2017, the Company recognized service revenue from CinRx of $0.4 million in the Company's consolidated statements of operations. As of December 31, 2019 and 2018, the Company had Advanced billings from CinRx of $0.9 million and $0.1 million in the consolidated balance sheets, respectively. As of December 31, 2019 and 2018 the Company had Accounts receivable and unbilled, net from CinRx of $0.2 million and $0.4 million in the consolidated balance sheets.

The Summit, a Dolce Hotel ("The Summit")

The Summit Hotel, located on the Medpace campus, is owned by the chief executive officer, and managed by an unrelated hospitality management entity. Medpace incurs travel lodging and meeting expenses at The Summit. During the years ended December 31, 2019 and 2018, Medpace incurred expenses of $0.6 million and $0.4 million at The Summit.

Medpace Investors, LLC ("MPI")

MPI is a noncontrolling shareholder and related party of Medpace Holdings, Inc. MPI is owned and managed by employees of the Company. The chief executive officer of Medpace is also the manager and majority unit holder of MPI. The Company acted as a paying agent for MPI with taxing authorities principally in instances when employee tax payments or remittance of withholdings related to equity compensation are required. Refer to Note 9 of the Notes to Consolidated Financial Statements for details of the Tender Offer transaction.

Purchase of Real Estate Properties

In December 2016, the Company entered into a purchase agreement for four parcels of real estate property that are closely situated to the Medpace campus in Cincinnati, Ohio, from AT Redevelopment Company, LLC, which is wholly-owned by the Company's chief executive officer. The purchase price of the real estate property was $0.4 million as determined by an independent third party broker's opinion of value. The transaction closed on January 11, 2017.

Leased Real Estate

Headquarters Lease

The Company has entered into operating leases for its corporate headquarters and a storage space facility with an entity that is wholly owned by the Company's chief executive officer. The Company has evaluated its relationship with the related party and concluded that the related party is not a variable interest entity because the Company has no direct ownership interest or relationship other than the leases. The lease for headquarters is for an initial term of twelve years through November 2022 with a renewal option for one 10-year term at prevailing market rates. The Company pays rent, taxes, insurance, and maintenance expenses that arise from the use of the properties. Annual base rent for the corporate headquarters allows for adjustments to the rental rate annually for increases in the consumer price index. Under ASC 842, operating lease cost recognized for the year ended December 31, 2019 was $2.0 million and was allocated between Direct service costs, excluding depreciation and amortization, and Selling, general and administrative in the consolidated statements of operations. The Operating lease right-of-use assets at December 31, 2019 were $5.3 million in the consolidated balance sheets. The current and long-term portions of the lease liabilities at December 31, 2019 were $1.8 million and $3.5 million, respectively, and were recognized in Other current liabilities and Operating lease liabilities in the consolidated balance sheets. Under ASC 840, lease expense recognized for the years ended December 31, 2018 and 2017 was $2.2 million and $2.1 million, respectively. The lease expense was allocated between Direct service costs, excluding depreciation and amortization, and Selling, general and administrative in the consolidated statements of operations.

In 2018, Medpace, Inc. entered into a multi-year lease agreement governing future occupancy of additional office space in Cincinnati, Ohio. The lease expires in 2040 and the Company has two 10-year options to extend the term of the lease.

ASC 842 – Operating Leases

The Company entered into two multi-year lease agreements governing the occupancy of space of two buildings in Cincinnati, Ohio with an entity that is wholly owned by the Company's chief executive officer and certain members of his immediate family. The Company assumed occupancy in 2012 and the leases expire in 2027 with the Company having one 10-year option to extend the lease term. The Company pays rent, taxes, insurance, and maintenance expenses that arise from the use of the property. Annual base rent for the corporate headquarters allows for adjustments to the rental rate annually for increases in the consumer price index. Under ASC 842, the Company has

determined that the leases are operating leases. Operating lease cost recognized for the year ended December 31, 2019 is $3.6 million. The lease cost was allocated between Total direct costs and Selling, general and administrative in the consolidated statements of operations. The Operating lease right-of-use assets at December 31, 2019 were $21.9 million in the consolidated balance sheets. The current and long-term portions of the lease liabilities at December 31, 2019 were $2.3 million and $19.7 million, respectively, and were recognized in Other current liabilities and Operating lease liabilities in the consolidated balance sheets.

ASC 840 - Deemed Assets and Deemed Landlord Liabilities

In accordance with the accounting guidance related to leases, the Company was deemed in substance to be the owner of the property during the construction phase and at completion. Accordingly, the Company reflected the buildings and related liabilities as deemed assets from landlord building construction in Property and equipment, net, Other current liabilities, and Deemed landlord liabilities, respectively, on the consolidated balance sheets. The deemed assets were being fully depreciated, on a straight line basis, over the 15-year term of the lease. Deemed landlord liabilities are recorded at their net present value when the Company enters into qualifying leases and are reduced as the Company makes periodic lease payments on the properties. Accretion expense was being recorded over the term of the lease as a component of Interest expense, net in the Company's consolidated statements of operations. The Company paid $3.8 million during the years ended December 31, 2018 and 2017, respectively. The current and long-term portions of the Deemed landlord liability at December 31, 2018 were $2.1 million and $24.5 million, respectively. The Company has recognized $14.6 million of deemed assets, net at December 31, 2018, in the consolidated balance sheets.

Travel Services

The Company incurs expenses for travel services for company executives provided by a private aviation charter company that is owned by the chief executive officer and the executive vice president of operations of the Company ("private aviation charter"). The Company may contract directly with the private aviation charter for the use of its aircraft or indirectly through a third party aircraft management and jet charter company (the "Aircraft Management Company"). The travel services provided are primarily for business purposes, with certain personal travel paid for as part of the executives' compensation arrangements. The Aircraft Management Company also makes the private aviation charter aircraft available to third parties. The Company incurred travel expenses of $1.2 million, $1.3 million and $1.1 million during the years ended December 31, 2019, 2018 and 2017, respectively. These travel expenses are recorded in Selling, general and administrative in the Company's consolidated statements of operations. As of December 31, 2019 and 2018, the Company had Accounts payable due to Aircraft Management Company of less than $0.1 million and $0.2 million in the consolidated balance sheets, respectively.

15. CASH FLOW STATEMENT – SUPPLEMENTAL INFORMATION

During the year ended December 31, 2017, the Company engaged in the following significant non-cash investing and financing activities:

- Acquired net assets totaling $0.7 million consisting of net Deferred tax assets of $21.1 million, offset by net Deferred tax liabilities of $0.1 million and deferred credits within Other long term liabilities of $20.3 million in exchange for Accounts receivable and unbilled, net of $0.6 million and Other assets of $0.1 million.

16. ENTITY WIDE DISCLOSURES

Operations By Geographic Location

The Company conducts operations in North America, Europe, Africa, Asia-Pacific and Latin America through wholly-owned subsidiaries and representative sales offices. The Company attributes revenue to geographical locations based upon the location of the contracting entity. For the years ended December 31, 2019 and 2018, total revenue attributable to the U.S. represented approximately 95% and 97%, respectively, of total consolidated total revenue.

The following table summarizes property and equipment, net by geographic region and is further broken down to show countries which account for 10% or more of total as of December 31, if any (in thousands):

	2019	2018
Property and equipment, net:		
United States	$ 25,603	$ 38,609
Europe		
Belgium	10,045	6,014
Other	5,728	5,500
Total Europe	15,773	11,514
Asia-Pacific	5,671	1,930
Other	245	202
Total property and equipment, net	$ 47,292	$ 52,255

Revenue by Category

The following table disaggregates the Company's revenue by major source (in thousands):

	Years Ended December 31,	
	2019	2018
Therapeutic Area		
Oncology	$ 256,766	$ 189,056
Other	222,514	163,983
Metabolic	138,650	124,837
Cardiology	91,258	95,213
AVAI	86,390	77,271
Central Nervous System	65,391	54,229
Total revenue	$ 860,969	$ 704,589

In the current year and for all periods presented, the revenue associated with medical device projects, previously a separate therapeutic area, has been included in the respective therapeutic area that best aligns with the therapeutic focus of the medical device project and represents how management evaluates disaggregated revenue in its internal reporting.

17. QUARTERLY FINANCIAL DATA (unaudited)

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

	2019			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Revenue, net	$ 200,741	$ 214,104	$ 216,238	$ 229,886
Total direct costs	145,703	150,312	152,070	167,187
Income from operations	25,895	35,259	29,991	36,118
Net income	19,198	27,455	23,977	29,813
Net income per share attributable to common shareholders - Basic	$ 0.54	$ 0.76	$ 0.67	$ 0.82
Net income per share attributable to common shareholders - Diluted	$ 0.51	$ 0.73	$ 0.63	$ 0.78

	2018			
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Revenue, net	$ 163,077	$ 170,144	$ 179,253	$ 192,115
Total direct costs	117,254	116,676	123,996	131,133
Income from operations	20,119	23,345	26,918	30,666
Net income	14,551	16,568	19,305	22,761
Net income per share attributable to common shareholders - Basic	$ 0.41	$ 0.46	$ 0.54	$ 0.64
Net income per share attributable to common shareholders - Diluted	$ 0.40	$ 0.45	$ 0.52	$ 0.61

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

None.

Item 9A. Controls and Procedures

Limitations on Effectiveness of Controls and Procedures

In designing and evaluating our disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints and that management is required to apply judgment in evaluating the benefits of possible controls and procedures relative to their costs.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our chief executive officer and chief financial officer, evaluated, as of the end of the period covered by this Annual Report on Form 10-K, the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")). Based on that evaluation, our chief executive officer and chief financial officer concluded that our disclosure controls and procedures were effective as of the end of the period covered by this report.

Management's Annual 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

During the year ended December 31, 2019, the Company adopted ASU 2016-02 and centralized the Company's lease accounting system and processes effective January 1, 2019. This implementation resulted in a material change to the Company's internal control over financial reporting as of that date. The operating effectiveness of these changes has been evaluated as part of our annual assessment of the effectiveness of internal controls over financial reporting.

As of the year ended December 31, 2019, the Company has remediated a material weakness, identified as of December 31, 2018, in the Company's internal control over financial reporting related to implementation of ASU No. 2014-09 "Revenue from Contracts with Customers (Topic 606)". Remedial actions included improvement and enhancement of the design and operation of control activities and procedures associated with our revenue recognition processes, including both preventive and detective control activities. Additionally, we implemented upgrades to our accounting systems which improved the accuracy and completeness of key financial reports and data generated from our accounting systems that support our revenue recognition calculations. As of December 31, 2019, testing of both the design and operating effectiveness of the new and improved controls was completed, and management concluded that the material weakness in internal control over financial reporting related to implementation of ASU No. 2014-09 has been remediated.

The operating effectiveness of internal control over financial reporting is discussed in Part II, Item 8 of this Annual Report on Form 10-K.

In addition, in the ordinary course of business, we routinely enhance our information systems by either upgrading current systems or implementing new ones. Except as may be otherwise described herein, there have been no changes in our internal control over financial reporting during the quarter ended December 31, 2019 that have materially affected, or are 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.

The information required by this item will be included in our definitive proxy statement (or the "Proxy Statement") for our 2020 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the end of our fiscal year covered by this Annual Report and is incorporated herein by reference.

Item 11. Executive Compensation

The information required by this item will be included in our Proxy Statement for our 2020 Annual Meeting of Stockholders, and is incorporated herein by reference.

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

The information required by this item will be included in our Proxy Statement for our 2020 Annual Meeting of Stockholders, and is incorporated herein by reference.

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

The information required by this item will be included in our Proxy Statement for our 2020 Annual Meeting of Stockholders, and is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services

The information required by this item will be included in our Proxy Statement for our 2020 Annual Meeting of Stockholders, and is incorporated herein by reference.

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 Medpace Holdings, 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	Exhibit Description	Incorporated by Reference				Filed/ Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation of Medpace Holdings, Inc.	8-K	001-37856	3.1	8/16/16	
3.2	Amended and Restated Bylaws of Medpace Holdings, Inc.	8-K	001-37856	3.2	8/16/16	
4.1	Specimen Stock Certificate evidencing shares of common stock	S-1/A	333-212236	4.1	7/26/16	
4.2	Voting Agreement	10-Q	001-37856	4.2	11/3/16	
4.3	Description of Securities					*
#10.1	Medpace Holdings, Inc. 2016 Incentive Award Plan	10-Q	001-37856	10.1	11/3/16	
#10.2	Medpace Holdings, Inc. 2016 Senior Executive Incentive Bonus Plan	10-Q	001-37856	10.2	11/3/16	
10.3	Registration Rights Agreement	10-Q	001-37856	10.3	11/3/16	
#10.4	Form of Medpace Holdings, Inc. 2016 Incentive Award Plan Restricted Stock Award Grant Notice	S-1/A	333-212236	10.13	8/1/16	
#10.5	Form of Medpace Holdings, Inc. 2016 Incentive Award Plan Stock Option Grant Notice and Stock Option Agreement	S-1/A	333-212236	10.14	8/1/16	
#10.6	Form of Medpace Holdings, Inc. 2016 Incentive Award Plan Restricted Stock Unit Award Grant Notice.	S-1/A	333-212236	10.15	8/1/16	
#10.7	Medpace Holdings, Inc. 2016 Incentive Award Plan Sub-Plan for UK Participants	S-1/A	333-212236	10.16	8/1/16	
#10.8	Amended and Restated Employment Agreement, by and between Medpace Holdings, Inc. and August J. Troendle	S-1/A	333-212236	10.18	7/26/16	
#10.9	Medpace Holdings, Inc. 2016 Incentive Award Plan UK Company Share Option Plan (CSOP) Sub-Plan	S-1/A	333-212236	10.19	8/1/16	
#10.10	Medpace Holdings, Inc. Non-Employee Director Compensation Policy revised effective October 25, 2018	10-Q	001-37856	10.1	10/30/18	
10.11	Loan Agreement dated as of September 30, 2019, by and among Medpace, Inc., as borrower, and PNC Bank, National Association.	8-K	001-37856	10.1	10/1/19	
21.1	List of Subsidiaries of Medpace Holdings, Inc.					*

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed/ Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
23.1	Consent of Deloitte & Touche LLP, Independent Registered Public Accounting Firm					*
31.1	Rule 13a-14(a) / 15d-14(a) Certification of Chief Executive Officer					*
31.2	Rule 13a-14(a) / 15d-14(a) Certification of Chief Financial Officer					*
32.1	Section 1350 Certification of Chief Executive Officer					**
32.2	Section 1350 Certification of Chief Financial Officer					**
101.INS	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document					*
101.SCH	Inline XBRL Taxonomy Extension Schema Document					*
101.CAL	Inline XBRL Taxonomy Calculation Linkbase Document					*
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document					*
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document					*
101.PRE	Inline XBRL Taxonomy Extension Presentation					*
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)					

* Filed herewith.
** Furnished herewith.
# Indicates management contract or compensatory plan.

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 by the undersigned, thereunto duly authorized.

MEDPACE HOLDINGS, INC.

By: /s/ JESSE J. GEIGER
Name: Jesse J. Geiger
Title: Chief Financial Officer, and Chief Operating Officer, Laboratory Operations

Date: February 25, 2020

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENT that the undersigned officers and directors of Medpace Holdings, Inc. do hereby constitute and appoint August J. Troendle and Jesse J. Geiger, 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 below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Capacity	Date
/s/ AUGUST J. TROENDLE August J. Troendle	President, Chief Executive Officer and Chairman of the Board of Directors (Principal Executive Officer)	February 25, 2020
/s/ JESSE J. GEIGER Jesse J. Geiger	Chief Financial Officer, and Chief Operating Officer, Laboratory Operations (Principal Financial and Accounting Officer)	February 25, 2020
/s/ BRIAN T. CARLEY Brian T. Carley	Director	February 25, 2020
/s/ ROBERT O. KRAFT Robert O. Kraft	Director	February 25, 2020
/s/ FRED B. DAVENPORT JR. Fred B. Davenport Jr.	Director	February 25, 2020
/s/ CORNELIUS P. MCCARTHY III Cornelius P. McCarthy III	Director	February 25, 2020
/s/ ASHLEY M. KEATING Ashley M. Keating	Director	February 25, 2020
/s/ THOMAS C. KING Thomas C. King	Director	February 25, 2020

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, August J. Troendle, certify that:

1. I have reviewed this Annual Report on Form 10-K of Medpace Holdings, Inc.;

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 25, 2020

By: /s/ August J. Troendle
August J. Troendle
President, Chief Executive Officer and Chairman of the Board of Directors
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Jesse J. Geiger, certify that:

1. I have reviewed this Annual Report on Form 10-K of Medpace Holdings, Inc.;

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 25, 2020

By: /s/ Jesse J. Geiger
Jesse J. Geiger
Chief Financial Officer and Chief Operating Officer, Laboratory Operations
(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 Medpace Holdings, Inc. (the "Company") on Form 10-K for the year ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company for the periods presented therein.

Date: February 25, 2020

By: /s/ August J. Troendle
August J. Troendle
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 Medpace Holdings, Inc. (the "Company") on Form 10-K for the year ended December 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company for the periods presented therein.

Date: February 25, 2020

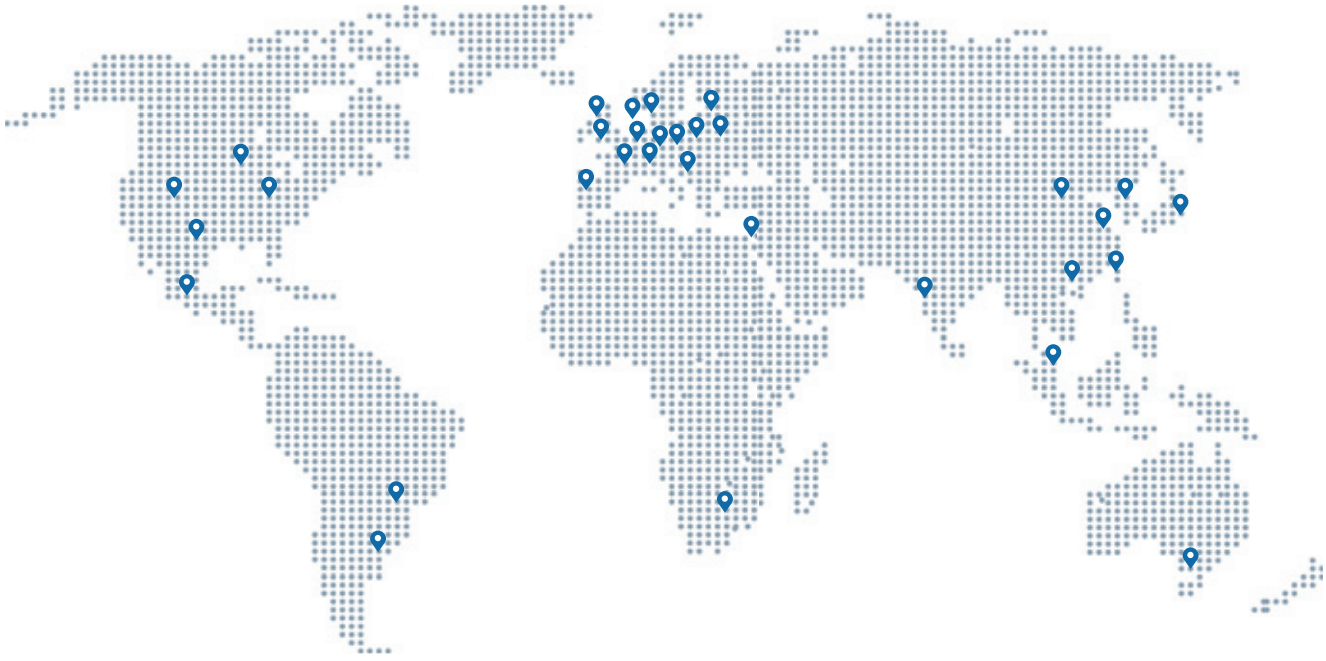
By: /s/ Jesse J. Geiger
Jesse J. Geiger
Chief Financial Officer and Chief Operating Officer, Laboratory Operations
(Principal Financial Officer)

[THIS PAGE INTENTIONALLY LEFT BLANK]

[THIS PAGE INTENTIONALLY LEFT BLANK]

[THIS PAGE INTENTIONALLY LEFT BLANK]

MEDPACE LOCATIONS



NORTH AMERICA

Cincinnati, OH
(HQ, Includes Lab and Clinic)
Dallas, TX
Denver, CO
Mexico City, Mexico
Minneapolis, MN

AFRICA

Johannesburg, South Africa

ASIA-PACIFIC

Beijing, China (Includes Lab)
Hong Kong
Melbourne, Australia
Mumbai, India
Seoul, South Korea
Shanghai, China (Includes Lab)
Singapore (Includes Lab)
Taipei, Taiwan
Tokyo, Japan

EUROPE

Budapest, Hungary
Kyiv, Ukraine
Leuven, Belgium (Includes Lab)
London, UK
Lyon, France
Maastricht, Netherlands
Madrid, Spain
Milano, Italy
München, Germany
Prague, Czech Republic
Rotterdam, Netherlands
Stirling, UK
St. Petersburg, Russia
Warsaw, Poland

LATIN AMERICA

Buenos Aires, Argentina
São Paulo, Brasil

MIDDLE EAST

Lod, Israel

MEDPACE

5375 Medpace Way, Cincinnati, Ohio 45227