United States Food and Drug Administration

Yale-Mayo Clinic Centers of Excellence in Regulatory Science and Innovation B12 Pediatric Device Survey

OMB Control No. or 0910-NEW

SUPPORTING STATEMENT

Part B. Statistical Methods

1. Respondent Universe and Sampling Methods

This study is designed to assess the perspectives of key actors (defined below) involved in the development of pediatric medical devices. Their assessments are being obtained to (a) identify improvements and continued impediments to the pediatric device development "pipeline" and (b) explore the anticipated impact of alternative requirements or complementary practices that might foster additional investment in pediatric device development and submission for FDA review. These assessments will be collected through two different approaches: Zoom interviews with CEO-level industry executives and on-line surveys, completed as written responses by all other respondents.

Key Actors: For these purposes, two sets of respondents were identified: (1) those involved in the pediatric medical device industry, and (2) clinicians, researchers, and other academics involved in the development of innovative ideas that have the potential to translate into pediatric devices. Our objective is to collect a representative set of assessments from each of these two groups. Each involves a different sampling strategy, with different expected response rates and response-promoting interventions.

Industry Respondents: To assess whether industry perspectives vary by size of the firm, we will stratify the device industry according to the "tiers" identified in Table 1 of Supporting Statement Part A.

Size of Company (Employees)	% of Market by Company Sales	Number of Companies in Each Strata	Target Number of Companies	Expected Sample in Each Strata
1-9	26%	20700	4	7
10-99	9%	5775	2	3
100-499	16%	825	3	5
>500	48%	275	8	11

Table-1: Number of companies =27,554 Source: FDA's Medical Device Industry Profile

Drawing on information from industry associations, we will assemble a list of firms in each strata, then randomly select among those firms for sampling. We conducted a small

pre-test of participation as part of the survey instrument development, see section 4. Based on this experience, we anticipate that participation rates will range from roughly 80% for larger firms down to about 60% for smaller firms and propose samples that vary accordingly (please see right-hand column in Table 1). This yields an average (weighted) participation rate of about 74%. We propose to sample three respondents from each participating firm – the CEO or administrative equivalent (for Zoom interviews), the chief scientist for pediatric devices and the chief regulatory affairs representative (the latter two completing on-line written surveys).

Academic/Clinician Respondents: To provide a sampling frame for the "academic" portion of the sample, we propose to draw upon the last two waves (2013 and 2018) of FDA-funded Pediatric Device Consortia. The combination of the two waves yields a total of a dozen consortia. We would have one designated "leader" from each consortia complete the on-line written survey, along with one randomly selected project leader from each consortia. (In several consortia, the leadership of the 2018 initiatives was the same as that for the 2013 initiatives. In those cases, we will substitute consortia affiliates who are or have worked in the venture capital/or and financial industry for consortia leadership respondents.) Based on our experience during the pretest period we anticipate that consortia leader participation rates will be near 100% with participation rates for project leaders about 80%. This would provide an overall participation rate of 90% from the academic side of the data collection, all completing on-line written surveys.

Role in Consortia	Approximate Number of Potential Respondents	Target Number of Respondents	Expected Sample in Each Strata
Consortia Leader	30	12	12
Project Leader	120	12	15

Table-2: Source FDA: https://www.fda.gov/industry/medical-products-rare-diseases-and-conditions/pediatric-device-consortia-grants-program

Combined Participation Rates: Averaging (and weighting) the participation rates from industry and academic respondents gives the project an overall projected participation rate of about 80 percent.

2. Procedures for the Collection of Information

This study is intended to be an exploratory investigation, designed to compare responses within different strata of the industry respondents [primarily, large firm (n=24) compared to smaller firms (n=27) or between all industry respondents (n=51) compared to academic respondents (n=24). These data will not be used for statistical or hypothesis testing.

As described below (Section 4), in our instrument development we ran question wording past respondents from both industry and academic backgrounds, clarifying any imprecision in the wording of the questions of differences in interpretation across the two groups of respondents. Prototype questions that revealed significant interpretation differences were modified or eliminated from the data collection instruments.

Following these modifications, there was very little missing data (item-nonresponse) in surveys completed by respondents from either of the two target groups. We therefore do not anticipate doing any imputation or other statistical corrections for missing data.

3. Methods to Maximize Response Rates and Deal with Non-response

Our instrument development process (described further below in section 4) leads us to anticipate a high rate of survey participation across all respondent groups, with the exception of industry respondents from smaller firms. These will be sampled with replacement using respondents from within the same strata of firm size.

One of the key lessons for reducing non-participation in the survey or non-response rates for individual survey questions was identifying respondents who have had recent experience with FDA review of a pediatric device submission (albeit not necessarily approval of that device). Respondents who had not had relatively recent (within the past five years) experience were hesitant to respond about current challenges or future prospects, fearing that their prior experience might now be too dated to be relevant. Consequently, we will screen at both the firm and individual level for respondents with experience within this five-year “window of salience”.

4. Test of Procedures or Methods to be Undertaken

The survey instruments deployed in this study were developed under the auspices of the Yale-Mayo Clinic Center for Excellence in Regulatory Science and Innovation (CERSI). a joint effort between Yale University, Mayo Clinic, and the U.S. Food and Drug Administration to create infrastructure for regulatory science knowledge generation, conduct research to address key gaps in knowledge, and develop tools to support regulatory decision-making and the overall mission of the FDA. The survey instruments were developed with Dr. Schlesinger, a CERSI-affiliated faculty member, as lead investigator, with active engagement from scholars knowledgeable about the device industry, from both an academic/clinical perspective and an industry/management perspective. Once a preliminary version of the survey instruments had been developed:

- We piloted the preliminary instruments with four respondents (two from industry, two from academic settings). The pilot testing was completed by a trained set of graduate students, who were trained to probe respondents for matters of clarity after each subsection of survey items. If the language in any of the questions or transitional instructions was deemed unclear, respondents were asked for a preferred wording. All interactions during the pilot phase were recorded and reviewed by Dr. Schlesinger.

- Following this initial round of feedback, the survey instruments were revised and then a second-round of pilot testing/review was conducted with four additional respondents (here again, two from industry, two from academic settings). Once again, respondents were thoroughly debriefed after completing each section of the survey, any remaining issues relating to wording clarity were reviewed and preferred wording identified. Any inconsistencies of interpretation across the two groups of respondents were finalized at this time.

- Final wording for the instruments was conducted by comparing across the two waves of pilot testing to ensure consistency in our assessment of how the questions were being read and how respondents interpreted them.

5. Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data

   Dr. Mark Schlesinger (609-529-4646) will be responsible for the training and supervision of the graduate students (TBN) collecting the data, again under the auspices and overview of the Yale-Mayo Clinic CERSI. Because Dr. Schlesinger has ample experience in survey design, collection and analysis, no outside statisticians were consulted.