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A prospective programmatic cost analysis of Fuel Your Life: A worksite translation of DPP

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Abstract

Objective—An accounting of the resources necessary for implementation of efficacious programs is important for economic evaluations and dissemination.

Methods—A programmatic costs analysis was conducted prospectively in conjunction with an efficacy trial of Fuel Your Life (FYL), a worksite translation of the Diabetes Prevention Program. FYL was implemented through three different modalities, Group, Phone, and Self-study, using a micro-costing approach from both the employer and societal perspectives.

Results—The Phone modality was the most costly at \$354.6 per participant, compared to \$154.6 and \$75.5 for the Group and Self-study modalities, respectively. With the inclusion of participant-related costs, the Phone modality was still more expensive than the Group modality but with a smaller incremental difference (\$461.4 vs. \$368.1).

Conclusions—This level of cost-related detail for a preventive intervention is rare, and our analysis can aid in the transparency of future economic evaluations.

Introduction

Diabetes is the seventh leading cause of adult morbidity in the United States, affecting nearly 29 million people annually.^{1,2} Complications associated with diabetes include amputations, renal disease, myocardial infarction, stroke, and death.³ At an annual cost of \$245 billion (in 2012 US\$), diabetes is a costly condition in terms of medical utilization and lost productivity.¹ In response to this costly epidemic, the US federal government has supported numerous research activities to identify effective primary and secondary prevention interventions for diabetes. Thus, the evidence-base for effective diabetes prevention interventions has expanded over the last few decades. One such evidence-based program is the Diabetes Prevention Program (DPP), a behavioral lifestyle intervention designed to reduce obesity and the risk of diabetes among participants.⁴ These participants received training from a lifestyle coach toward modifications in important facets of their lifestyle such as a healthy diet, increased physical activity, and stress reduction.^{5,6} Efficacy studies found that DPP was successful in helping participants meet long-term weight loss and physical activity goals⁷ and reducing the incidence of diabetes by 58% in a pre-diabetic population.⁸ Further, DPP was more cost-effective than a pharmacological intervention in terms of cost per quality-adjusted life-years gained.⁹⁻¹¹ Additionally, significant outcomes related to the DPP lifestyle intervention have included improvements in cardiovascular disease risk factor status, dietary intake, incontinence, and health-related quality of life.¹²⁻¹⁵

Reviews of both clinical trials and translational lifestyle-based programs have found that these interventions are both efficacious and effective in achieving weight loss and slowing the progression of diabetes.¹⁶⁻¹⁸ However, uncertainty regarding the costs and cost effectiveness of such programs can serve as a deterrent to their implementation.¹⁸ A comprehensive analysis of programmatic costs can mitigate this barrier and provide valuable information for dissemination efforts by presenting the total economic value of the resources required for implementation.^{19,20} For example, several economic evaluations of diabetes prevention interventions exist,²¹⁻²⁴ including the cost-effectiveness of the original DPP trial.⁹⁻¹¹ The DPP cost analysis at three years found that the lifestyle intervention cost \$1445 (2000 US dollars) per person more compared to the placebo group in terms of direct nonmedical costs such as participant time, purchases, and transportation related to participation.²⁵ The lifestyle intervention was more costly by \$2780 per person compared to the placebo group in medical costs but less costly in terms of indirect costs related to productivity by \$174 per person. Cost-effectiveness analyses of DPP found that the lifestyle intervention was cost-effective from both the healthcare system and societal perspectives at 3 years⁹ and 10 years^{10,11} relative to the placebo arm in terms of both cases of diabetes delayed or prevented and quality-adjusted life years gained.

With demonstrated effectiveness and cost-effectiveness, the next step in the public health model for prevention is widespread dissemination and implementation. Success in clinic-based interventions has led to the translation of DPP to a variety of settings, including community settings,²⁶⁻³⁴ healthcare settings,^{35,36} telehealth,³⁷ and in the workplace.³⁸⁻⁴⁰ The workplace serves as an ideal setting for the delivery of DPP, as the population is stable, workers interact with each other, both employers and employees share the burden of illness, and both agree that the workplace is an appropriate setting for weight management

programs.⁴¹⁻⁴³ In the Guide to Community Preventive Services, the US Task Force for Community Preventive Services specifically recommends worksite programs that improve diet and physical activity behaviors.⁴⁴

In this issue, the results of a rigorous evaluation of a worksite translation of DPP are presented (referred to herein as *Fuel Your Life*).⁴⁵ This analysis shows that the phone group lost an average of 4.9 lbs., the small group lost 2.7 lbs., and self-study group lost 2.7 lbs. over the 12-month intervention period. The purpose of this article is to present the results of a rigorous prospective cost analysis conducted alongside this DPP translation to the workplace. For employers, in particular, understanding programmatic costs is critical for program uptake and sustainability. We describe our approach for collecting and analyzing the programmatic costs and provide a detailed analysis of cost components that can inform future implementation efforts. Results from this study also provide a foundation for future economic evaluations of FUEL Your Life (FYL). This research is an important step towards the dissemination of an evidence-based public health intervention aimed at reducing risk of chronic disease in a worksite setting.

Methods

Description of the DPP Translation

An important modification of DPP for FYL is a reduction in the intensity of the participant-coach interaction. This modification was designed to ease implementation of the original DPP model to minimize disruptions of normal worksite operations, resulting in an intervention more amenable to a workplace setting. The original DPP intervention involved a 6-month core intervention period, followed by a 6-month maintenance period. The frequency of participant-coach interactions was reduced from 16 to eight one-hour sessions over a six-month core period, and to three total sessions rather than once monthly sessions occurring during the six-month maintenance period.

A further modification was added by offering the program in two different formats: small group meetings led by a coach (Group) and one-on-one telephone meetings with a coach (Phone). For the evaluation of this modification, these two implementation scenarios were compared to a Self-study (or control) group. In all three modalities at baseline, participants attended a brief in-person orientation session, weight check with a coach, and received a program manual containing the educational and behavior change content of FYL. Additional contact with the health coach was limited to email reminders to review each lesson for the Self-study modality while in the Group and Phonemodalities, participants were provided regular contact with a health coach. For the Group modality, small groups of 8 to 10 participants met for approximately one hour with the health coach for each intervention session, while Phone intervention sessions were conducted one-on-one between the health coach and each participant, lasting for approximately 30 minutes. The intervention sessions for both the Group and Phone modalities followed the same schedule; however, the Group sessions were designed to promote encouragement and support among participants, while the Phone sessions were customized to the individual participant. Following both the core and maintenance intervention periods, participants attended a brief in-person coach meeting

and received a weight check. All intervention sessions were conducted during normal work hours unless otherwise requested by the participants.

Study Sample

Programmatic costs were assessed for the N=660 (n=242 Self-study; n=236 Group; n=182 Phone) participants in the FYL evaluation from January 2013 to April 2015. We adopted an intent-to-treat approach that considered the costs to provide the intervention to all employees enrolled in the intervention, as opposed to limiting our analysis to those who received the full intervention, as this method provides an estimate of the true costs to provide the intervention in a non-research employer-based setting. Participants were withdrawn at their request or after missing four consecutive sessions. Additionally, participants were only included in the outcome analysis if they participated in either follow-up data collection. In total, 242 participants were excluded from final data analysis. Complete descriptions of the intervention design and primary outcomes of the evaluation are reported elsewhere in this issue.⁴⁵

Study Design for the Cost Analysis

Programmatic costs were assessed from both the employer and societal perspectives, and every effort was made to adhere to best practice guidelines for the costing of prevention interventions.^{46,47} The employer perspective included all costs that would accrue to an employer to implement and run the FYL program, while the societal perspective included additional costs not incurred directly by the group implementing the program, such as participant intervention and study time, participant purchases related to participation in the intervention, and program space used in the Group modality. All costs were categorized as personnel or non-personnel, and non-personnel costs were further broken down into intervention materials, travel, overhead, space, and participant costs. Costs classified as research were excluded from all cost analyses. Prospective collection of the programmatic costs required to implement and administer FYL the program took place from January 2013 to April 2015. While intervention planning began before these dates, most of those early resource expenditures were not intervention-related but rather directed to building research capacity. However, it is possible that some pre-implementation costs were not included. While the time horizon for the evaluation was 28 months, each participant was part of the intervention for a one-year period, and therefore, discounting of costs was not necessary. All final cost estimates are provided in 2013 US dollars (US\$).

For the collection and analysis of costs, we utilized a micro-costing approach, a method where all resources used to administer or deliver an intervention and those consumed by participants are explicitly identified, measured, and valued.⁴⁸⁻⁵¹ Micro-costing is preferred over other costing methods as it leads to greater precision and the estimates are less likely to be biased. This added precision is an especially important feature when attempting to estimate participant level costs in prevention interventions without making post-hoc assumptions of the homogeneity of service delivery and resource utilization.⁵² For this evaluation, we met with the intervention team before implementation began and identified all relevant resource inputs for the cost analysis and then created a plan for capturing and valuing those resources.

Given that, like most prevention interventions, personnel time was the largest contributor to required programmatic resources for FYL, care was taken to develop a personnel time reporting system that most accurately captured this resource. Intervention personnel reported time using Appointment-plus, an online scheduling system. All Phone sessions were scheduled and valued as requiring 30 minutes to complete and coaches would make two attempts to reach the participant during this block of time. Additional attempts to reach the participant were made at a time when other calls were not scheduled and these attempts were valued at five minutes per missed call. Supervisor time was estimated at 10% of total coach time, based on the supervisor's estimate of how her time was spent on this intervention. Finally, all personnel time was valued based on an hourly rate calculated from the wages and benefits paid to intervention personnel, \$30.52 per hour for coaches and \$31.64 per hour for supervisors.

The intervention team collected material costs, categorized each as fixed or variable, and allocated them to the appropriate intervention modality. Costs that were not tied to a specific modality were allocated evenly across all three modalities. Variable costs were reported as unit costs and multiplied by the number of participants in each modality. These costs included manuals/resource books, appointment cards, agreements, and information packets. Fixed costs included recruitment materials, the Appointment-plus software subscription, intervention team uniforms, and telephone and reminder services. A detailed listing of the intervention materials and individual costs are provided in Appendix Table 1. Other non-personnel costs include coach travel costs for group sessions, which were estimated at \$7.50 per session, and intervention team overhead costs which were calculated at 47% of total personnel costs, based on University indirect rates for the evaluation team.

Program participants recorded time for participating in FYL sessions and for completing program assignments. These time diaries were used to calculate total participant time costs by multiplying participant time by the average wages and benefits for a Georgia state employee (\$20.37 per hour). For two of the modalities (Group and Phone), participant time spent on program assignments was recorded prospectively on a weekly basis by the coach as well as retrospectively during data collection, while Self-study participant time was collected retrospectively only. Collecting participant time with two instruments allowed us to compare participation time collected both prospectively and retrospectively and from two different sources, participants themselves and coaches. While a thorough analysis of the difference in participants' recall prospectively versus retrospectively is outside the scope of this paper, pronounced differences were observed with regard to recall period, and this discovery merits further examination. Participants were also asked to report on program-specific purchases they may have made voluntarily during the course of the intervention, including a scale, home gym equipment, clothing or shoes for exercise, and food scales or measuring cups. Purchases were valued based on unit prices for these items published elsewhere²⁵ and from retail store prices. Appendix Table 2 includes details on all unit prices used in this analysis.

Finally, to estimate the potential savings generated by FYL in terms of reduced medical care utilization and increased productivity, participants were surveyed about this information before starting the program (baseline) and after both the core and maintenance intervention

periods (follow-up). Assessing differences in healthcare utilization is important for ascertaining cost savings, and an estimation of the effects on productivity is particularly relevant for a workplace intervention. Information on healthcare utilization and expenditures was obtained through a series of questions pertaining to hospital stays, emergency room visits, outpatient procedures, medical doctor consultations, therapy sessions, and prescription usage. Information on productivity in terms of absenteeism and presenteeism were measured with questions from the World Health Organization's Health and Work Performance Questionnaire (HPQ).^{53,54}

Sensitivity Analysis

In one-way sensitivity analyses, we tested the robustness of the programmatic cost results to various methodological assumptions. For personnel costs, we tested different approaches for valuing time required for missed phone calls and appointments, particularly for the Phone modality. We also varied the hourly wage and fringe rate for intervention personnel by 20%, the percentage of coach time used to estimate total supervision time from 5% to 20%, and the time lost per missed call from two to six minutes. For non-personnel costs, we varied the percentage of personnel costs used to estimate overhead costs down to 25% and the space cost, the unit cost for coach travel to group meetings, participant hourly rate, and the value of participant purchases each by 20%. Finally, we varied the maximum number of missed call attempts allowed down to two. The Phone modality coach would attempt to contact the participant at the beginning of the scheduled time and once more during the next 30 minutes if the initial call was not completed. After that, additional attempts would occur when the coach did not have any other scheduled calls with participants. For each scenario, we determined the number of missed calls saved and the number of completed calls that would not have occurred if the coach had stopped attempting to contact the participant, along with the personnel time and the associated cost savings from fewer attempted and completed calls.

Results

Employer Perspective

Table 1 reports the total personnel time in hours for each modality, categorized by time spent in intervention sessions, coach meetings/weight checks, missed one-on-one appointments or phone calls (missed time), and supervision. Self-study did not include time for intervention sessions and missed calls were only possible in the Phone modality. Personnel time for intervention sessions was greatest in the Phone modality due to the one-on-one nature of the coach-participant interaction; coaches spent an average of about two hours and ten minutes with each participant during the core period and 35 minutes per participant during the maintenance period. In contrast, Group modality coaches spent an average of about 1 hour and 25 minutes total per participant in intervention sessions during the two periods. The total time in coach meetings/weight checks for the Self-study and Group modalities was driven by the larger sample sizes; at the participant-level, these time costs were similar across modalities. On average, coaches across all three modalities spent about 33 minutes with each participant in coach meetings and weight checks during the core period and 17 minutes during the maintenance period. Missed time was relatively small for the Self-study and

Group modalities. Missed time was not small in the Phone modality, as coaches spent a significant amount of time trying to contact participants for either scheduled appointments or to reschedule missed appointments. During the core and maintenance periods, the coaches experienced 2784 and 762 missed calls, respectively, an average of almost 20 total missed calls per participant. During the core and maintenance periods, missed time for the Phone modality averaged over three hours per participant and less than 15 minutes per participant for the Group and Self-study modalities.

Total programmatic costs from the employer perspective are reported in Table 2. Personnel costs, in accordance with the personnel time reported in Table 1, were highest during both the core and maintenance periods for the Phone modality (\$31,220 and \$9510), followed by the Group (\$13,244 and \$5625) and Self-study (\$4711 and \$3941) modalities. The comparatively high personnel costs of the Phone modality were largely driven by the costs from missed time during both the core and maintenance periods. Total non-personnel costs were also highest in the Phone modality during both the core and maintenance periods (\$18,686 and \$5049), followed by the Group (\$13,470 and \$4137) and Self-study (\$7047 and \$2632) modalities. This difference was primarily driven by the overhead costs, which are directly tied to total personnel costs. The total programmatic costs, summed across categories for the core and maintenance periods, were \$64,465 for the Phone modality; \$36,477 for the Group modality; and \$18,331 for the Self-study modality. The aggregate programmatic costs are converted to programmatic costs per participant by dividing by the number of participants in each modality. As a result, the average cost per participant for the Phone modality was \$200 more than the average cost per participant for the Group modality (\$354.2 vs. \$154.6) and about \$280 more than the Self-study participant (\$354.2 vs. \$75.7) from the employer perspective.

Societal Perspective

For this cost analysis, the societal perspective includes both the costs included in the employer perspective along with several additional categories. These categories include the space used to conduct group sessions; the time participants spent participating in intervention sessions, coach meetings, and weight checks during work time; the time participants spent reviewing lessons outside of work time; purchases made by participants due to participation in the intervention; healthcare utilization costs reported by participants; and productivity related to days of work missed. However, healthcare utilization and productivity have been excluded from this cost analysis because rates did not significantly differ among intervention arms at baseline or follow-up and did not change significantly for any of the study arms from baseline to follow-up.

Table 3 reports the total costs from the employer perspective, costs across the aforementioned additional categories, and total societal perspective costs. Participant costs for time spent in intervention sessions were about 3 times as large during the core period (\$32,769 vs. \$11,691) and the maintenance period (\$5971 vs. \$1871) in the Group modality compared to the Phone modality. The 60-minute session length for group meetings drives this difference compared to the 30-minute session length for phone meetings. Differences among the modalities for coach meetings/weight checks were comparable to those observed

for personnel costs (Table 2). The costs for participant-reported purchases were higher in the Group modality (\$8271) compared to the Phone (\$5948) or Self-study (\$4812) modalities. While the aggregate costs were similar for the Group and Phone modalities during both core and maintenance sessions, the average costs per participant were higher in the Phone modality (\$461.4 vs. \$368.1). The difference in average costs per participant between the Phone and Group modalities decreased from \$200 from the employer perspective to \$97 from the societal perspective. This difference is due to higher costs for the Group modality across all cost categories specific to the societal perspective, both participant-related and space costs.

Sensitivity Analysis

In the one-way sensitivity analyses of parameters used in the cost analysis, only two parameters consistently changed total costs at the employer or societal perspectives by at least 10%: coach and supervisor salaries and the percentage of personnel costs used to estimate overhead costs. Table 4 reports the results for these specific analyses, while results for all sensitivity analyses are reported in Appendix Table 3. For the 20% decrease and increase in coach and supervisor salaries, per participant costs at the employer perspective varied between \$65 and \$86, \$131 and \$178, and \$288 and \$420 for the Self-study, Group, and Phone modalities, respectively. For the reduction of the overhead percentage of personnel time to 25%, per participant costs at the employer perspective were \$68, \$137, and \$305, respectively.

Personnel time could be reduced in the Phone modality if coaches ceased attempts to contact a participant to make up a missed appointment after a specified number of missed calls. The impact of reducing the number of attempts on the total number of missed calls and the number of completed calls (successful intervention session for the Phone modality) are shown in Figure 1. Little reduction in the total number of missed calls during the core and maintenance periods (<2%) is achieved until the number of attempts is limited to five. For example, in a scenario where only one additional attempt is made beyond the first two attempts during the originally scheduled appointment time (maximum of three attempts), 1195 (34%) fewer attempts are made with 137 (13%) fewer completed calls. The savings in personnel time from this reduction in attempted and completed calls is \$5130 (\$28 per participant) or a reduction of 30% in personnel missed time and 8% in total employer-perspective costs for the Phone modality. Participants were scheduled in 30 minute blocks of time and once two failed attempts had been made for a participant during their scheduled time and coaches waited five minutes for participants to call back, there was not enough time remaining before the next scheduled call to contact another participant and conduct an intervention session. Therefore, the largest possible reduction in personnel missed time costs is around 50%.

Discussion

The importance of a careful accounting of programmatic costs cannot be overstated when considering the successful dissemination of effective programs. A prospective micro-costing approach, as demonstrated in this evaluation, is the most accurate way to provide detailed

information to potential providers on the resources required for implementation. In this evaluation, we compared the costs of two possible modalities for implementation of a worksite tailored translation of DPP. Based on our analyses, an employer might expect to spend between \$100 and \$400 per participant in personnel, material, travel, and overhead costs depending upon choice of implementation.

The Phone modality was found to be more expensive from the perspective of an employer providing the program, costing around \$354 per participant, primarily due to the increased burden on personnel delivering the intervention. Meeting with participants individually was more time consuming than meeting in a group, and participants often did not respond to scheduled appointment times, causing health coaches to spend large amounts of time attempting to reschedule. Indeed, the sheer amount of personnel costs attributable to missed phone calls was a novel finding of this analysis; however, these large costs are due in part to the fact that this analysis took place alongside a research study and therefore health coaches made greater than average efforts to follow up with missed appointments. A potential way to mitigate these costs would be to limit the number of times a health coach attempts to contact a participant to three missed calls. This limit on attempted calls would result in a reduction in missed call time for personnel of around 30% but less than a 10% reduction in total costs for the Phone modality. This reduction does little to close the gap in total costs between the Phone and Group modalities.

To compare our results to the costs for other DPP translations, we found two studies where the direct medical cost calculations are the closest comparator to our estimates from the employer-perspective.^{25,33} In the first study by Hernan et al.,²⁵ the original DPP randomized multi-center trial, per participant costs were on average \$1254 (adjusted from 2000 to 2013 US dollars), compared to our per person estimates of \$155 for the Group modality and \$354 for the Phone modality. One explanation for the higher per person costs in Hernan et al.²⁵ was that the authors used a higher percentage of personnel time to calculate overhead in the analysis (69% vs. 47%). However, when we apply the same overhead allocation, the costs per participant increase less than 15%. Rather, the higher costs may be related to the increased time spent with participants either through group settings, one-on-one, or on the phone with a trainer or lifestyle case manager. In fact, personnel time per participant averaged 28 hours in the first year of the original DPP study, compared to just 7.3 and 2.6 hours in the Phone and Group modalities, respectively, for this worksite translation.

The second study was a translation of DPP for the Health Living Partnerships to Prevent Diabetes study, where community health workers delivered the intervention in a group setting.³³ The authors reported total costs of \$607 per participant (adjusted from 2010 to 2013 US dollars) during the first 6 months or “intensive phase” with an additional \$301 during the next 18 months or “maintenance phase.” The higher costs per participant were driven again by the increased interaction of participants with study personnel and the higher materials costs. Personnel time per participant in the Healthy Living Partnerships translation averaged 21.4 hours during the intensive phase and materials were over \$100 per participant compared to around \$20 per participant in this worksite translation.

Dissemination is an important next step in the public health model for prevention and an understanding of the resources required for implementation are essential. In a review of factors that either promote or interfere with the translation of public health research into practice, Glasgow and Emmons⁵⁵ suggested that cost data are essential for decision making but often not reported or difficult to interpret. In this study, we report in detail the expected personnel time and non-personnel resources needed to conduct the intervention in a worksite setting. A number of assumptions were made in the cost analysis we have presented, especially for non-personnel costs, which might not be relevant for all potential providers. However, sufficient information should be available to address most of these limitations. For example, if a provider expects to pay a different salary to coaches and supervisors, an updated hourly rate would need to be multiplied by the time provided in Table 1 to determine an estimated total personnel cost. Overhead costs may be known or expected to be a different percentage of personnel costs and replacing the overhead estimates in Table 2 and recalculating the total costs could address either of these situations. Finally, an employer might be interested in a cost estimate of reimbursing employees for purchases related to participation or in the cost of renting space needed for providing group sessions and could add the relevant costs from Table 3 to those in Table 2.

The primary strength of this study is the detail in which the average resource use and unit costs for each component of the intervention are reported. A recent review of the cost-effectiveness of behavioral interventions, including studies focused on both exercise and diet modification, found that this level of detail was often missing, making it difficult to compare the results of the studies and evaluate the quality of the cost collection and valuation.⁵⁶ However, there are limitations to this cost analysis as well. The majority of the costs were collected using study databases while some costs were estimated, such as overhead or the value of space used for the group sessions. Sensitivity analyses have been used to show the impact of model assumptions but cannot eliminate the uncertainty in these estimates. Further, we relied on self-report for participant study time, purchases, healthcare utilization, and productivity rather than on administrative data or some other more reliable source. Several studies have shown that self-report serves as a reasonable proxy for both of these measures when the recall period is relatively short, ideally four months or less.^{57,58} Finally, the recall period in this study was six months and, therefore, may not have been accurate for all participants.

Conclusions

We have presented a prospective analysis of the programmatic costs of a worksite translation, Fuel Your Life, of DPP. Two different delivery modalities, in a Group setting and on the Phone, have been compared along with a Self-study modality. These costs should give potential future adopters of the intervention reasonable estimates of the resources required to implement such a program. Further, we have carefully described and reported the collection and valuation of the resources across all cost categories used to administer and provide the intervention. This level of cost-related detail is rare, and our analysis can aid in the transparency of future economic evaluations that arise from this study.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.
Percent reduction in number of attempted/completed calls and reduction in costs from placing a limit on the number of phone attempts for a participant in the Phone modality.

Table 1

Total personnel time (in hours) by modality during the core and maintenance session periods.

Time Category	Self-study N=242	Group N=236	Phone N=182
<i>Core Sessions</i>			
Intervention Sessions	n/a	263.0	396.0
Coach Meetings/Weight Checks	130.9	127.6	100.2
Missed Calls (#)	n/a	n/a	2784
Missed Time	9.0	2.6	430.7
Supervision	14.0	39.3	92.7
<i>Total Core Session Time</i>	<i>154</i>	<i>433</i>	<i>1020</i>
<i>Maintenance Sessions</i>			
Intervention Sessions	n/a	75.0	108.0
Coach Meetings/Weight Checks	64.5	81.0	41.5
Missed Calls (#)	n/a	n/a	762
Missed Time	52.5	11.0	132.8
Supervision	11.7	16.7	28.2
<i>Total Maintenance Session Time</i>	<i>129</i>	<i>184</i>	<i>311</i>
Core + Maintenance Total Time	283	616	1330
per participant	1.17	2.61	7.31

Note: Rows may not add exactly due to rounding.

Table 2

Total programmatic costs for the employer perspective, by category, for each modality during the core and maintenance session periods. All costs are in 2013 US\$.

Cost Category	Self-study N=242	Group N=236	Phone N=182
Personnel Cost			
<i>Core Sessions</i>			
Intervention Sessions	n/a	\$8027	\$12,086
Coach Meetings/Weight Checks	\$3994	\$3894	\$3058
Missed Time	\$275	\$79	\$13,144
Supervision	\$443	\$1244	\$2933
Total Core Personnel Cost	\$4711	\$13,244	\$31,220
<i>Maintenance Sessions</i>			
Intervention Sessions	n/a	\$2289	\$3296
Coach Meetings/Weight Checks	\$1969	\$2472	\$1267
Missed Time Cost	\$1602	\$336	\$4054
Supervision Cost	\$370	\$528	\$893
Total Maintenance Personnel Cost	\$3941	\$5625	\$9510
Non-personnel Cost			
<i>Core Sessions</i>			
Intervention Materials	\$4833	\$5273	\$4012
Travel	n/a	\$1973	n/a
Overhead	\$2214	\$6225	\$14,673
Total Core Non-Personnel Cost	\$7047	\$13,470	\$18,686
<i>Maintenance Sessions</i>			
Intervention Materials	\$780	\$931	\$579
Travel	n/a	\$563	n/a
Overhead	\$1852	\$2644	\$4469
Total Maintenance Non-Personnel Cost	\$2632	\$4137	\$5049
Total Cost			
Total Core Employer-Perspective Costs	\$11,758	\$26,714	\$49,906
<i>per participant</i>	<i>\$48.6</i>	<i>\$113.2</i>	<i>\$274.2</i>
Total Maintenance Employer-Perspective Costs	\$6573	\$9762	\$14,559
<i>per participant</i>	<i>\$27.1</i>	<i>\$41.4</i>	<i>\$80.0</i>
Total Employer-Perspective Costs	\$18,331	\$36,477	\$64,465
<i>per participant</i>	<i>\$75.7</i>	<i>\$154.6</i>	<i>\$354.2</i>

Table 3

Total programmatic costs for the societal perspective, by category, for each modality during the core and maintenance session periods. All costs are in 2013 US\$.

Cost Category	Self-study N=242	Group N=236	Phone N=182
Total Core Employer Perspective Costs	\$11,758	\$26,714	\$49,906
<i>Core Participant Time Costs</i>			
Lessons	\$2477	\$7470	\$3717
Intervention Sessions	n/a	\$22,616	\$5867
Coach Meetings/Weight Checks	\$2752	\$2683	\$2107
Total Core Participant Time Costs	\$5229	\$32,769	\$11,691
Participant Purchases	\$4812	\$8271	\$5948
Space Cost	n/a	\$2630	n/a
Total Core Societal Perspective Costs	\$21,799	\$70,385	\$67,544
Total Maintenance Employer Perspective Costs	\$6573	\$9762	\$14,559
<i>Maintenance Participant Time Costs</i>			
Intervention Sessions	n/a	\$4268	\$1004
Coach Meetings/Weight Checks	\$1356	\$1703	\$873
Total Maintenance Participant Time Costs	\$1356	\$5971	\$1877
Space Cost	n/a	\$750	n/a
Total Maintenance Societal Perspective Costs	\$7929	\$16,484	\$16,436
Total Societal Perspective Costs	\$29,729	\$86,869	\$83,980
<i>per participant</i>	<i>\$122.9</i>	<i>\$368.1</i>	<i>\$461.4</i>

Table 4

Sensitivity analysis results for most influential cost analysis parameters.

Cost Analysis Parameter	Self-study N=242	Group N=236	Phone N=182
<i>Base employer perspective costs</i>	<i>\$18,331</i>	<i>\$36,477</i>	<i>\$64,465</i>
Coach/supervisor salaries - 20%	\$15,788 (-14%)	\$30,929 (-15%)	\$52,490 (-19%)
Coach/supervisor salaries + 20%	\$20,875 (+14%)	\$42,024 (+15%)	\$76,439 (+19%)
Overhead percentage = 25%	\$16,428 (-10%)	\$32,326 (-11%)	\$55,504 (-14%)