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Developing A Cost-Effectiveness Analysis Plan For A Virtual Diabetes Prevention Program

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Abstract

Background: Diabetes is one of the major health concerns in the US. According to the National Diabetes Statistics Report, about 13% adults in the U.S. had diabetes, and 34.5% of the U.S. adults were categorized as prediabetic. An estimated cost of $327 billion were reported as relevant to diagnosed diabetes in 2017 in the United States by the American Diabetes Association. The virtual Diabetes Prevention Program (vDPP) was designed to address barriers that low social-economic status participants faced when they were enrolled in a diabetes prevention program. It used a digital platform to deliver courses, organize meetings and monitor health outcomes, on the purpose of saving participants' time and money. It also had community health workers (CHW) to assist the implementation. This review aimed at identify approaches to analyze the value of the vDPP economically.

Method: We explored two approaches to comparing vDPP costs with costs of previous similar programs: cost effectiveness, which specifically interested in program costs per specified behavior change, and cost benefit, which investigated both program costs and program benefits. The health outcome we were interested in were body weight, HbA1c level and physical activity level.

Results: The program costs were divided into two categories: fixed and recurrent, for easier understanding and collecting. The program benefits were represented by medical cost savings, which could be estimated based on health outcome changes, or compared with other similar interventions.

Discussion: Comparing program costs existed studies with matched results was easier to accomplished than collecting patient cost savings, on the aspect of showing program benefits. However, the final decision is still pending due to the complexity of the analysis.

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Background

Diabetes is associated with numerous negative health consequences, and thus causes increased health care expenditures and elevated burden on health systems. Based on the findings from the American Diabetes Association's *Economic Costs of Diabetes in the U.S.*, the total estimated cost of diagnosed diabetes in 2017 in the United States reached to $327 billion.[1] And according to the National Diabetes Statistics Report, an estimated 34.1 million adults aged 18 years or older in the U.S. had diabetes in 2018, which formed 13% of all US adults.[2] Moreover, a total of 88 million adults were estimated to have prediabetes, and no significant change has been observed in the age-adjusted prevalence of prediabetes since 2005.[2] Prediabetes is when blood glucose levels are higher than normal but not high enough for a diagnosis of diabetes. This means about 34.5% of all US adults were at high risk of diabetes based on their fasting glucose or A1c level. Progress from prediabetes to type 2 diabetes mellitus (T2DM) is preventable by pharmaceutical (Metformin) and lifestyle approaches. In this paper we will be identifying an approach for assessing cost effectiveness of an adapted lifestyle intervention.

The Diabetes Prevention Program (DPP) Research Group performed one of the most cited lifestyle interventions for diabetes prevention, which has also been adopted and translated by many later studies due to its effectiveness in preventing diabetes. Although it was a large study with a sample size of 3,234, there were limitations regarding participant selection. Specifically, the trial recruited participants at high risk for T2DM over 25 years old, who came from different age groups and religions, but socioeconomic status of participants was not taken into considerations.[3] Socioeconomic status is an important factor of subjects' ability to participant, as low income individuals face barriers such as limited access to transportation, financial pressures that may affect ability to fully respond to dietary and physical activity recommendations that are not tailored to low income participants. Participants with low socioeconomic status often have the main part of their life on making a living. They are also more willing to spend time on their work and family, instead of considerations about improving health condition. In the virtual Diabetes Prevention Program (vDPP), we are addressing the barriers by delivering the intervention virtually. On top of that, a community-based study design allows us to address other social barriers and unmet needs faced by low-income participants, such as healthy food access and ability to meet physical activity guidelines.

As part of assessing the adapted vDPP, cost and cost-effectiveness are essential aspects of the program evaluation, due to increasing constraints on health systems.[4] Many cost-effectiveness analyses of existed diabetes interventions, including the DPP, collected medical costs directly, from self-reports or patients' medical records, to estimate program effectiveness.[5-7] The most basic and significant components for medical cost collecting include, but are not limited to, primary and secondary care utilization, prescribed medication costs and out-of-pocket payments, if applicable. For the vDPP, two years of prospective collection of medical costs would allow the strongest assessment of cost effectiveness, although other approaches are available. we identified alternative methods to analyze the costs and effectiveness. In order to allow economic analysis of the vDPP in comparison with other lifestyle interventions, we identified data collection needs for the vDPP. Secondly, we also performed a literature review to develop a method to compare the economic benefit of the vDPP with other studies. The review identified different approaches to analyze the value of the vDPP, and guided development of an efficient data collection tool to assist implementation.

Our decisions were made based on Table 1, which included the major types of economic analyses for scientific interventions. The development of a cost-benefit analysis, as well as a cost-effectiveness analysis that will allow comparisons of costs of existing programs to the cost of the vDPP in terms of the health outcomes they each produce, was the purpose of this review. Specifically, we were interested in three different health outcomes, which allowed us to make a fair evaluation on the economic benefit of the vDPP. These outcomes were body weight, HbA1c level and physical activity of the participants. They were particularly important for this literature review, because the primary outcome of the vDPP is change in body weight, and the HbA1c level is also one of the justified diabetes classification standards that plays a significant role in most diabetes related researches. However, researchers have found that emphasizing body weight too much as a weight discrimination in diabetes prevention might lead to unintended consequences, such as undermined mental health, a higher risk of diabetes and greater chances to gain weight.[8-10] Thus, it is reasonable and beneficial to also pay attention to weight control methods, such as increasing physical activities, by the public in diabetes prevention.

Research Design and Methods

Intervention

The vDPP plans to enroll a total of 120 participants from New Haven and Ansonia/Derby, forming 3 cohorts of 40 participants, each with 20 from both regions. Participants' inclusion criteria for the program are 1) Medicaid-eligible, 2) at least 18 years old at the time of enrollment, 3) English speaking and 4) scored 9 points or more in the CDC prediabetes screening test. In the first 16 weeks, curriculum from the DPP lifestyle intervention will be delivered weekly to participants using Incenta Health, a digital platform accessible via mobile devices. After the end of curriculum delivery, participants will be contacted monthly by CHWs or nurses to check their maintenance status until the one-year program ends.

As mentioned, we explored two approaches to comparing vDPP costs with costs of previous similar programs: cost effectiveness, which specifically interested in program costs per specified behavior change, and cost benefit, which investigated both program costs and program benefits.

Cost Effectiveness Analysis

Comparing program costs occurring during implementation with existed studies to see if the vDPP cost less in achieving similar goals was one of the approaches we suggested. To develop this method, we included program costs from vDPP and identified similar interventions for comparison. The DPP focused on weight loss and physical activity goals for its lifestyle intervention, which were 7% weight loss and $\geqslant 150$ min/wk of activity that was similar in intensity to brisk walking.[11] We suggested the vDPP to use the same goals, in order to make a fairer comparison. To compare the cost estimates from the DPP we adjusted the costs from 2000 USD to 2020 USD using the US Inflation Calculator based on the CPI data published by the U.S. Labor Department's Bureau of Labor Statistics on April 13, 2021 to adjust for inflation and calculate the cumulative inflation rate through March 2021.[12]

In order to define categories included for program costs, we looked at the literature in the topic of cost and cost-effectiveness analysis of diabetes prevention programs that involved community health workers to determine the specified cost list of program costs. Each category in the cost list was then identified as fixed or recurrent to make data collection easier for investigators, and thus capture all of the necessary cost associated with the program. Most of the publications were results of broad searching through PubMed, Google Scholar and Centers of Disease Control and

Prevention (CDC) database. To obtain the most up-to-date information and to keep the data valid within the current social and research environment, the search period was mainly set from January 2014 to January 2021, unless an older publication had higher academic significance. The searching term included *cost-effectiveness analysis*, *cost analysis*, *diabetes prevention* and *community health workers*. In addition to the publication database, we also reviewed materials received from Health Equity Solutions, Inc. (HESCT) based on their professionalism in community health workers.

Cost Benefit Analysis

Based on the fact that a negative change in patient costs represented a saving of health care expenses, we wanted to perform the cost benefit analysis by collecting patient costs.[13] Figure 1 represented an overall description of how each cost should be categorized and collected. In this approach, we had to know not only the program costs, but also the estimated changes in participant medical costs due to participation in the vDPP. However, because medical cost estimation was so complicated, we developed two possible collection plans on top of direct medical costs collection, which included change of costs approximation based on change of outcomes, and interventions comparison. Database searching utilizing PubMed and citation chaining from relevant articles. Searching terms for the second phase of review included *diabetes medical expenditure*, *physical activity, dietary* and *health outcome*. To find cost-effectiveness studies that used the same approach as ours, and to expand the searching scale, we applied *cost-effectiveness*, *community-based*, and *diabetes prevention,* as well. The term searching was followed by abstract review of listed publications to identify population, time frame, program type and relevance of comparison. While strict inclusion criteria were not pre-specified, we focused on diabetes prevention programs similar to the vDPP.

Results

Program Costs

A systematic review suggested that most diabetes interventions involving community health workers identified four basic kinds of program costs, which were training costs, capital costs, recurrent costs and overhead costs.[14] According to the study design, we decided to divide the program costs into two categories: fixed and recurrent. This is because we did not expect there would be any overhead costs happening for our study, and we combined training costs and capital costs in the fixed category to simplify the data collection process. The word "fixed" was used to define costs that should only be recorded once during the whole study time, and would never change afterwards. And the word "recurrent" represented any varied cost that would need to be tracking all the way till the end of the vDPP. The expected costs before the actual initiation of the study are summarized in Table 2, including costs happened in digital platform using, electronic devices purchasing, training, supervisor salary, CHW & nurse salary, CHW & nurse incurred costs, as well as costs for other supplies. It should be noted during program cost collection that estimation of CHWs/nurses' salaries was differentiated according to real scenarios. In the vDPP research, the community health workers and nursers would spend all of their paid time on the research, so we could simply collect their monthly salaries to capture the cost. However, the assumption might not be held for the whole program, or many other studies. We suggested that a more general way to estimate CHWs costs is to calculate their salaries by tracking their work time.

Cost Comparison

Comparing with the DPP cost study, the program costs categories determined for the vDPP were closest to direct medical costs of the DPP lifestyle intervention, in which they included costs for core curriculum, materials, phone calls, supervised activity sessions, etc.[5] Body weight, physical activity and diet were the outcomes selected from the DPP for cost comparisons.[15,16] The comparison is shown in Table 3. Table 4 showcases the number of participants achieving the target goals of the DPP, and corresponding program costs.

Medical Costs – Change of Costs Approximation via Outcomes

Medical costs can be approximated by multiplying costs related to unit health outcome change from the actual data obtained from the vDPP about health outcome changes. Numerous interventions were identified that estimated study effectiveness based on the changes of health outcomes, such as HbA1c level and body weight.[17-20, 21-28] Physical activity was also used as an outcome, and medical cost savings were estimated using physical activity level as an indicator. The possible physical activity capture approach would be walking steps per day and working-out hours per week in the vDPP.[29-35] Table 5 describes the comparison studies that evaluated costs by the changes of those study outcomes.

Three relevant studies were identified that presented the relationship between type 2 diabetes related health care costs change and percentage body weight change of participants, which were comparable to the vDPP. Bell et al. specified in their observational study that a weight loss of over 3% was associated with a diabetes-specific costs decrease of $440 per year, mainly driven by lower outpatient visit and hospital visit rates.[18] In Karkare et al's study, 3%, 5% and 7% weight loss were associated with approximately $189.16, $307.08 and $418.86 saving of annual diabetes-related costs, relatively.[20] Consistently, Mukherjee et al. also found that among obese individuals, weight loss significantly led to decreased total diabetes-related health care costs over the subsequent year, where cost ratio was 0.96 ($p<0.001$).[17] The sustained result supported the hypothesis that we are capable to record participants' body weight change and estimate the medical cost savings in vDPP.

A research conducted in Netherlands by Rodríguez-Sánchez et al. demonstrated that a 1%-point increase in HbA1c is associated with a 2.2% higher total care costs among patients with diabetes, covering their 4-year study period from 2008 to 2011.[22] To showcase the exact costs of HbA1c control, Bansal et al. divided diabetic patients into two groups. Specifically, patients whose HbA1c decrease less than 1% and who had a decrease larger or equal to 1% during the study period were compared to each other on the aspect of total direct medical costs. During the two-year period, a savings of $2503 was observed in the first year and $1690 was saved by patients who had a HbA1c decrease $\geqslant$ 1% in the second year of follow up.[27] It should be noted that most studies investigating the costs of health care in relation to average glucose control focused on treating the patients instead of preventing the disease. In other words, HbA1c level control was a treatment, but not a prevention intervention that we will be conducting in vDPP.

No appropriate cost data indicating association between physical activity and diabetes medical costs was found during the review, but there was a model that might be helpful in explaining the change of medical costs accompanied with varied PA levels. In their study, Shah et al. used the population attributable risk (PAR) percentage, calculated with the Levin's formula, $PAR\% = (p_e(RR-1)/p_e(RR-1) + 1)*100$, and existing statistics datasets to estimate the range of cost of type 2 diabetes attributable to not meeting the physical activity Guidelines and physical inactivity in the US in 2012.[32] Here, p_e represented the prevalence of exposure, which were not meeting the physical activity guidelines and physical inactivity, and RR represented relative risk of diabetes incidence and the exposures. The cost estimation was achieved by multiplying together diabetes-related costs per person and the number of T2D prevented, which should be the product of calculated PAR% and total cases of Type 2 Diabetes in 2012.

Medical Costs – Citing from Comparable Interventions

Performing review on interventions with similar study designs, we selected best matched studies, based on each of the health outcomes. They were displayed parallel to the vDPP according to timelines (see Figures 2A-C). Figure 2A demonstrates how two lifestyle interventions, which had body weight as their primary outcomes, were compared to the vDPP. [36, 37] Both interventions adopted the curriculum from the DPP, just like the vDPP does. At the same time, they also had a program implementation period of one year, which is the same as the vDPP's study time frame. The similarity made it possible for us to borrow their cost analysis on body weight changes to the vDPP. Unfortunately, limited diabetes prevention interventions with HbA1c or physical activity as the primary outcome were found to have similar study designs as the vDPP. Instead, we compared diabetes treatment interventions for HbA1c costs, and physical activities interventions, which had interests in diabetes and other related chronic diseases, to the vDPP's timeline.[38-42] All of these studies delivered their own methods to improve participants' health outcome, which differed from the lifestyle curriculum we used in the vDPP. Lack of similarities in timelines was another barrier for us to utilize their cost estimates in our analysis.

Discussion

To summarize, both cost comparison and cost saving estimations can perform well in providing information on how the vDPP works on the aspect of costs and cost savings. Despite the complexity of the review, the investigators will be able to collect program costs accurately, and choose the best way to estimate either cost effectiveness (program costs for particular change outcomes) or cost benefit (program costs and medical cost savings). Obviously, comparing program costs to the DPP with matched results is much easier to accomplished than collecting patient cost savings, on the aspect of showing program benefits. Lack of publications supporting medical costs estimation also added complexity to cost-effectiveness analysis design. Overall, the innovation and complication of the vDPP attach great significance to this review. As stated at the beginning, this review not only proposed different approaches to cost-effectiveness analysis of the vDPP, but also generated an efficient data collection tool to assist implementation. On top of those, it was capable of helping investigators understand the progress of cost collection and analysis more easily, as well. Another advantage of the review was that it drew people's attention to additional relevant behavior changes, over and above the original study primary outcome, body weight. Like body weight, physical activity and calories restriction are also influential factors of diabetes, but it is not emphasized as much as body weight is.[43] As we mentioned, the United States does not have many studies, linking physical activity or diet with diabetes expenditures tightly. Even though epidemiologists have noticed the importance of physical activity in reducing the risk of diabetes, limited efforts are made to propagandize it.

However, there were also several unavoidable limitations. One of the biggest ones was the matching of study designs between the vDPP and the reviewed literatures, which were used for cost saving estimation. The research team has proposed that the vDPP would only be conducted for one year, during which we could monitor and access to participants' data via the digital platform freely. After that, no follow-up period has been designed. This impeded an accurate approximation of program benefits, because most of the publications we found studied and concluded following-up data of lifestyle interventions. The following-up data is significant in cost-effectiveness analysis, because it tells us if program effects would be sustained, and how costs would be changed after interventions as time goes by. It is common that lifestyle interventions were only be capable of achieving positive cost saving many years after implementations. If we could not understand how cost change patterns look like without the forces of interventions, accuracy of our cost-effectiveness analysis would be limited.

Literature reviews normally suffer from massive loss of information during the searching stage due to the publication bias that happened when we used publication databases as the only evidence resource. The availability of evidence through published literature was confined, due to publication restrictions, like study scale and completeness. It was very possible that studies that had not reviewed or published yet held the information we needed. Researchers usually use funnel plots to assess the publication bias in meta-analysis.[44] Whereas, no tool was suggested as an assessment method of the bias in our literature review. A greater scale of literature searching is expected to mitigate such kind of selection bias.

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Appendix A.

Table 1 Economic Evaluation Types

Type of Analysis	**Question Addressed**	**Measurement of Benefits**
Cost Minimization Analysis	Can we do it for less?	None
Cost Effectiveness Analysis	Is the (natural) outcome worth the cost?	Natural units
Cost Utility Analysis	Are the quality adjusted life years (QALYs) worth the cost?	QALYs
Cost Benefit Analysis	Is there a reasonable return on investment?	Dollars

Figure 1 Mind Map

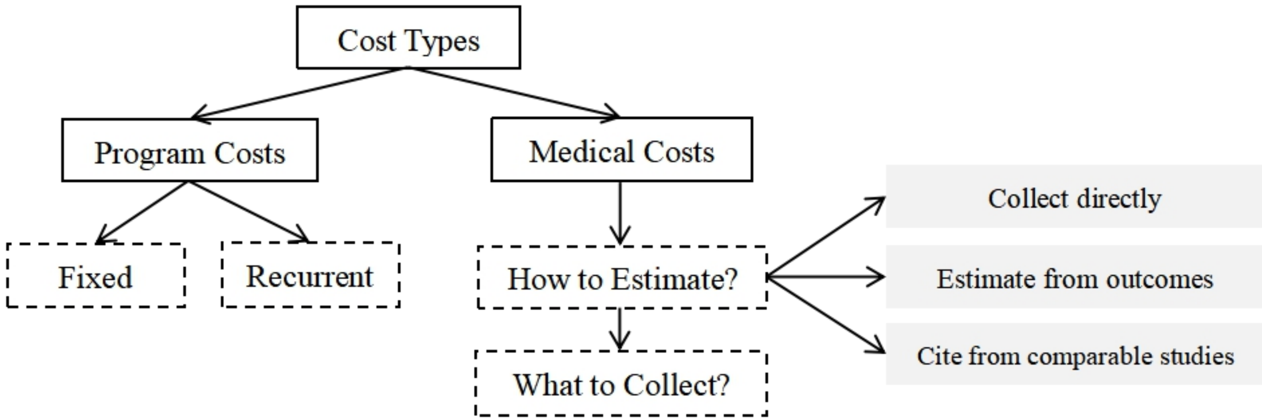


Table 2 Program costs

	Cost
Fixed	Digital platform use
	Electronic devices purchase
	Training fees
Recurrent	Supervisor salary
	CHW & nurse salary
	CHW & nurse incurred costs
	Other Supplies

Table 3 Summary of DPP outcomes and costs

Outcomes	**DPP Lifestyle (Knowler et al.)**			**DPP Metformin (Knowler et al.)**	
	24 week/16 session	**1 yr (Mayer-Davis et al.)**	**3 yr**	**1 yr (Mayer-Davis et al.)**	**3 yr**
Body Weight	-6.5 ± 4.7 kg or -6.9 ± 4.5%	/	-4.5 ± 7.6 kg or -4.9 ± 7.4%	/	-2.1 kg
PA	224 ± 141 min/wk	/	227 ± 212 min/wk	/	/
Diet	/	energy intake -1897 kJ/d (-452 kcal/d) and fat intake -6.6%	/	energy intake -1235 kJ/d (-294 kcal/d) and fat intake -0.8%	/
HbA1c	/	/	no change of HbA1c	/	+0.1%
Cost per capita ($)[1]	/	1399/2103	2780/4178	1019/1532	2542/3821

1. Costs reported in 2000 USD/adjusted to 2020 USD

Table 4 Summary of DPP adherent results and costs

Outcome Goals	DPP Lifestyle (N=1079)[1]			
	24 week/16 session (Wing et al.)		end of intervention (3 yr) (Wing et al.)	
	participant achieved the goal n (%)[1]	Cost per participant achieved the goal 2020 USD	participant achieved the goal n (%)[1]	Cost per participant achieved the goal 2020 USD
7% Weight Loss	528 (49%)	$4,297.61	399 (37%)	$11,298.40
≥150 min/wk of activity[2]	798 (74%)	$2,843.53	722 (67%)[3]	$6,243.85
Total cost[4]	$2,269,137.00		$4,508,062.00	

1. N=Total participant number in the intervention group; n=participant number achieved the goal

2. Using activities similar in intensity to brisk walking

3. 75% of participants who met PA goals at the end of the core curriculum achieved goals at the end of intervention; 50% of participants who did not meet PA goals at the end of the core curriculum achieved goals at the end of intervention

4. Dollars were adjusted by the US Inflation Calculator, which uses the latest US government CPI data published on April 13, 2021 to adjust for inflation and calculate the cumulative inflation rate through March 2021. The U.S. Labor Department's Bureau of Labor Statistics will release the Consumer Price Index (CPI) with inflation data for April on May 12, 2021. https://www.usinflationcalculator.com/

Table 5 Lists of publications on association between costs and health outcomes

Study	Year	Duration	Health Outcome Measures	Study Design	Study Population	Costs Included in Estimation
Body Weight						
Mukherjee et al.	2016	12 months	percentage weight change	cohort study	≥ 18 years old subgroup: obese individuals with no previous cardiovascular disease	The gross covered payments for all health care service or products, including the patients' and the payers' portions of payment
Bell et al.	2014	2000-2010	percentage weight change	cohort study	≥ 18 years at least 1 non-insulin anti diabetic (NIAD) therapy prescription during the patient identification period required to be diagnosed with T2D.	The estimated costs to treat the patient based on charges billed for pharmacy and medical services
Fridman et al.	2020	/	percentage weight change	literature review	/	Outpatient and inpatient medical costs, labs costs and pharmacy costs (both all-cause and diabetes-related)
Karkare et al.	2019	2010-2014	percentage weight change	cohort study	patients with diabetes	All-cause and T2DM-related costs, including mutually exclusive pharmacy services, outpatient visits, emergency department (ED) visits and inpatient visits
HbA1c						
Elgart et al.	2019	2015-2016	percentage HbA1c	cohort study	≥ 18 years old diagnosed with type 2 diabetes	Costs of hyperglycemia drug treatment

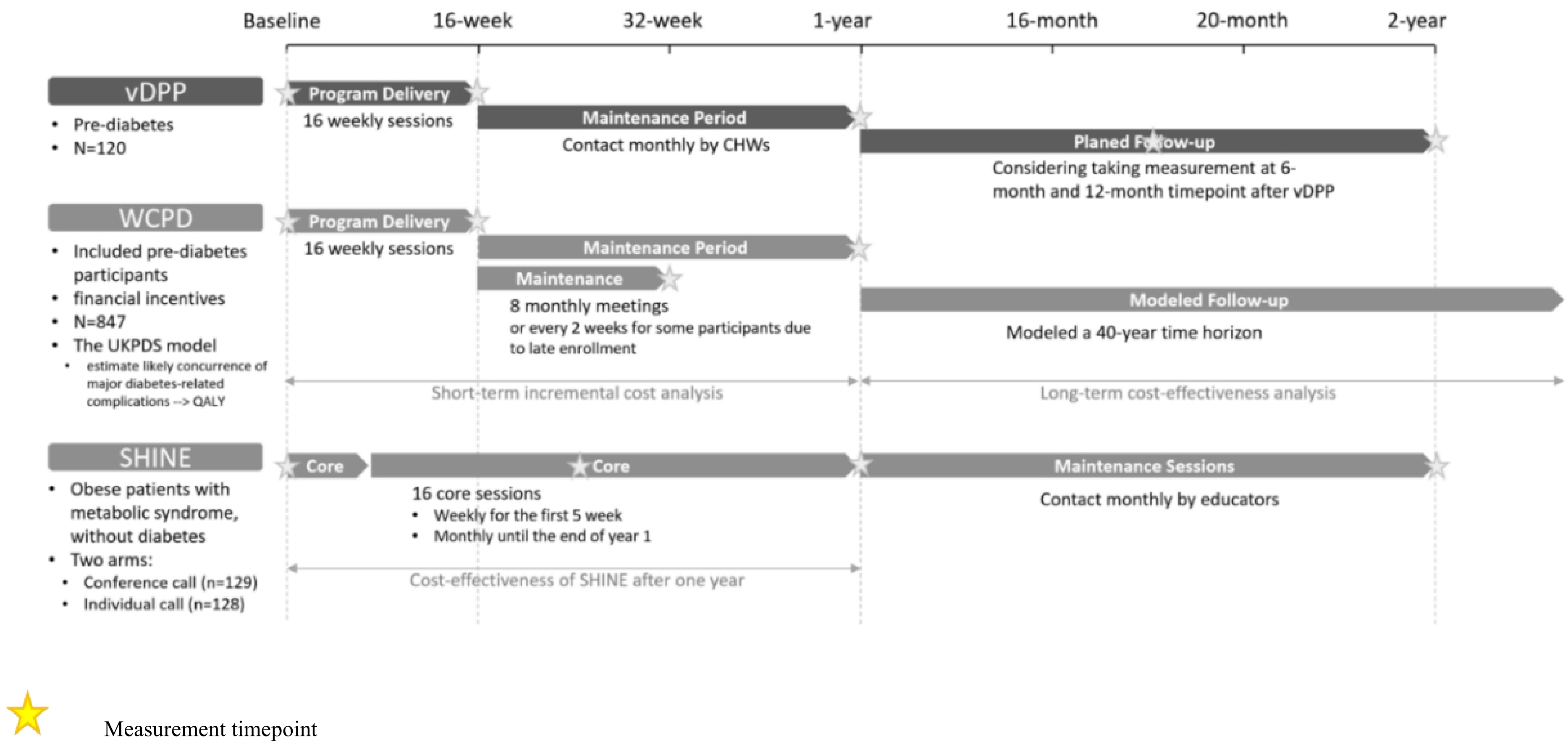
					have filled out a QUALIDIAB form with HbA1c data	
Rodríguez- Sánchez et al. / the Netherlands	2018	2008-2011	percentage HbA1c	cohort study	diagnosed with type 2 diabetes	Total costs not necessarily related to diabetes including GP treatment, hospitalization, drugs and devices cost
Oglesby et al.	2006	1998-2003	percentage HbA1c	cohort study	individuals with continuous insurance coverage diagnosed with type 2 diabetes	Diabetic Prescription Drugs and Total Diabetes Attributable Costs, Such payments include both payments by insurance companies as well as payments by patients.
Aagren et al.	2011	April to September 2007	percentage HbA1c	cohort study	≥ 18 years old diagnosed with type 1 or type 2 diabetes patients' average HbA1c value had to be ≥6%	Overall medical and diabetes-related costs were defined as the sum of office, inpatient, outpatient, ER and other costs, such as costs associated with laboratory tests, rehabilitation facilities and nursing homes. Diabetes-related costs included prescription refills and medical claims coded with ICD-9-CM 250.xx.
Juarez et al.	2013	2006-2009	percentage HbA1c	cross sectional and cohort study	diagnosed with type 2 diabetes be at least 18 but under 75 years old be enrolled with medical and drug coverage have at least 1 HbA1c value at >9% in 2006	Costs included direct medical expenses paid by the health plan: facility, physician services, and pharmaceutical

Mata-Cases et al.	2020	/	HbA1c level (mmol/mol)	Modelling simulations	diagnosed with type 2 diabetes cared for by the Catalonian Health Institut in 2011 in Catalonia baseline level of HbA1c	Management costs and Direct costs
Bansal et al.	2018	2009-2014	percentage HbA1c	cohort study	≥ 18 years old had at least two A1C measurements within 180–240 days of each other with an initial A1C ≥ 9% continuously enrolled with medical and pharmacy benefits through a commercial health insurance plan or Medicare Advantage health plan	Total direct healthcare costs were computed by summing the costs associated with all medical and pharmacy claims. Total direct costs included inpatient, outpatient (e.g., office visits, outpatient surgery), emergency room (ER) services, pharmacy (drugs and medical supplies), insulin pump costs (not shown) and blood glucose meter costs (not shown)
Menzin et al.	2010	2002-2006	percentage HbA1c	cohort study	≥ 30 years old diagnosed with type 2 diabetes 2 or more A1c values within 1 year of each other during the study period	Costs per Study Patient for Diabetes Related Hospitalizations
Physical Activity						
Kato et al. /Japan	2013	10 years	steps/day	Simulation	middle-aged Japanese people	Categorized medical costs (total, diabetes, stroke, etc.)
Bueno et al.	2017	/	min/week; frequency of	cross sectional study	hypertensive and/or diabetic seniors	Annual expenditures of medicine use

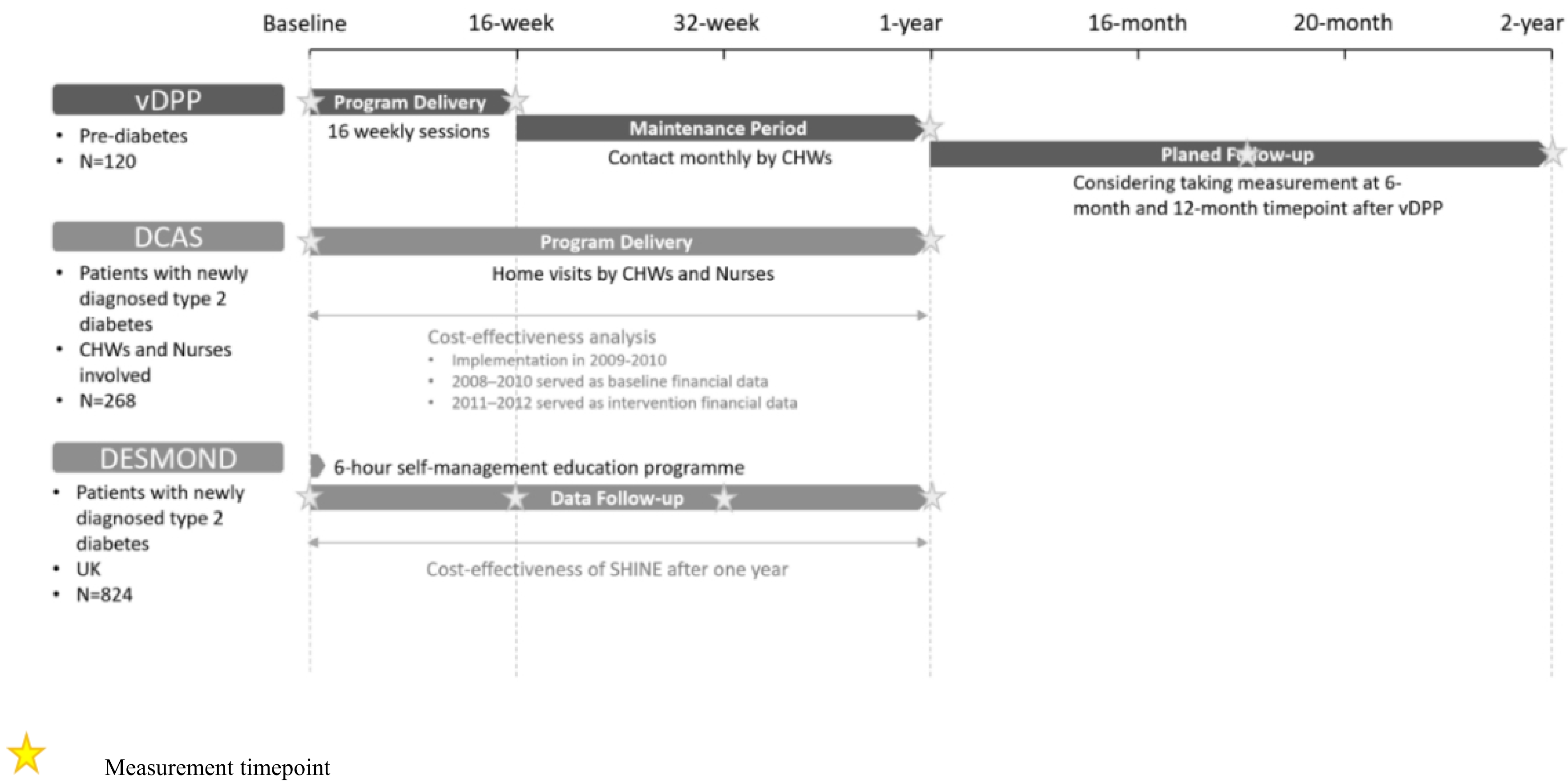
			walking (weekly)			
Aoyagi et al. /Japan	2011	2000-2007	steps/day	cohort study	>=65 years old	Mainly as the outpatient
Shah et al.	2016	/	min/week	cross sectional study	the US adults	The annual medical cost
Fernandes et al. /Brazil	2019	2014-2015	steps	cohort study	40-65 years old no diagnosis of previous cardiovascular complications, no diabetes complications, no regular medication use, and no physical disability	The costs of medicine use
Codogno et al. /Brazil	2011	/	scoring of questionnaires based on occupational, sports and leisure and mobility	cross sectional study	diagnosed with type 2 diabetes ≤ 75 years old individuals would have to present at least one-year complete medical records previous to the interview	Laboratory tests; Medication (T2D, other); consultation (Medical, Nursing)
Xu et al.	2018	2002-2013	minutes/week	cohort study	the US adults	The sum of total health care expenditure

Figure 2 Timelines

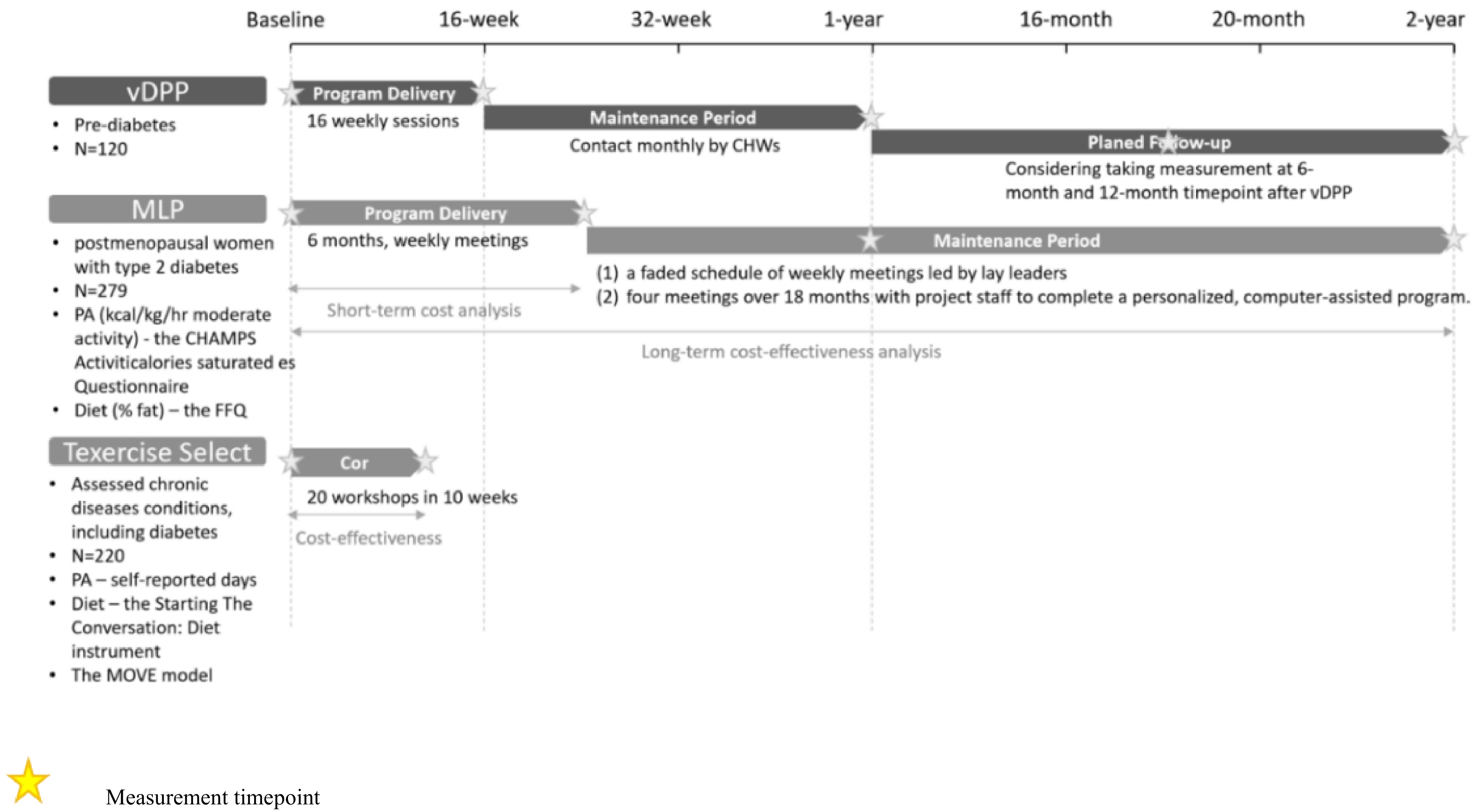
A. Cost-effectiveness analysis of diabetes prevention interventions with body weight as the primary outcome



B. Cost-effectiveness analysis of diabetes treatment interventions with HbA1c as the primary outcome



C. Cost-effectiveness analysis of physical activity interventions



Appendix B

Table 6 Actual Costs as for April. 2020

Category	**Amount (USD)**
Digital Platform	$504/person-year
Electronic Devices Purchase for CHWs	N/A
Electronic Devices Purchase for participants	$80/device
Training Fees	N/A
Office Supplies	N/A
Supervisor Salary	N/A
CHW Salary	$70,720/year
Nurse Salary	N/A
CHW Incurred Cost	N/A
Nurse Incurred Cost	N/A
Total	$140,800