

Welcome to the 1st IMPACT Webinar 2024!

«A Pragmatic Approach to Costing Implementation Strategies: Time-Driven Activity-Based Costing»



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Costing Implementation Strategies Using Time-Driven Activity-Based Costing

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(formerly Zuleyha Cidav, PhD)

**“ MOST SIGNIFICANT,
LEAST MODIFIABLE
BARRIER ”**



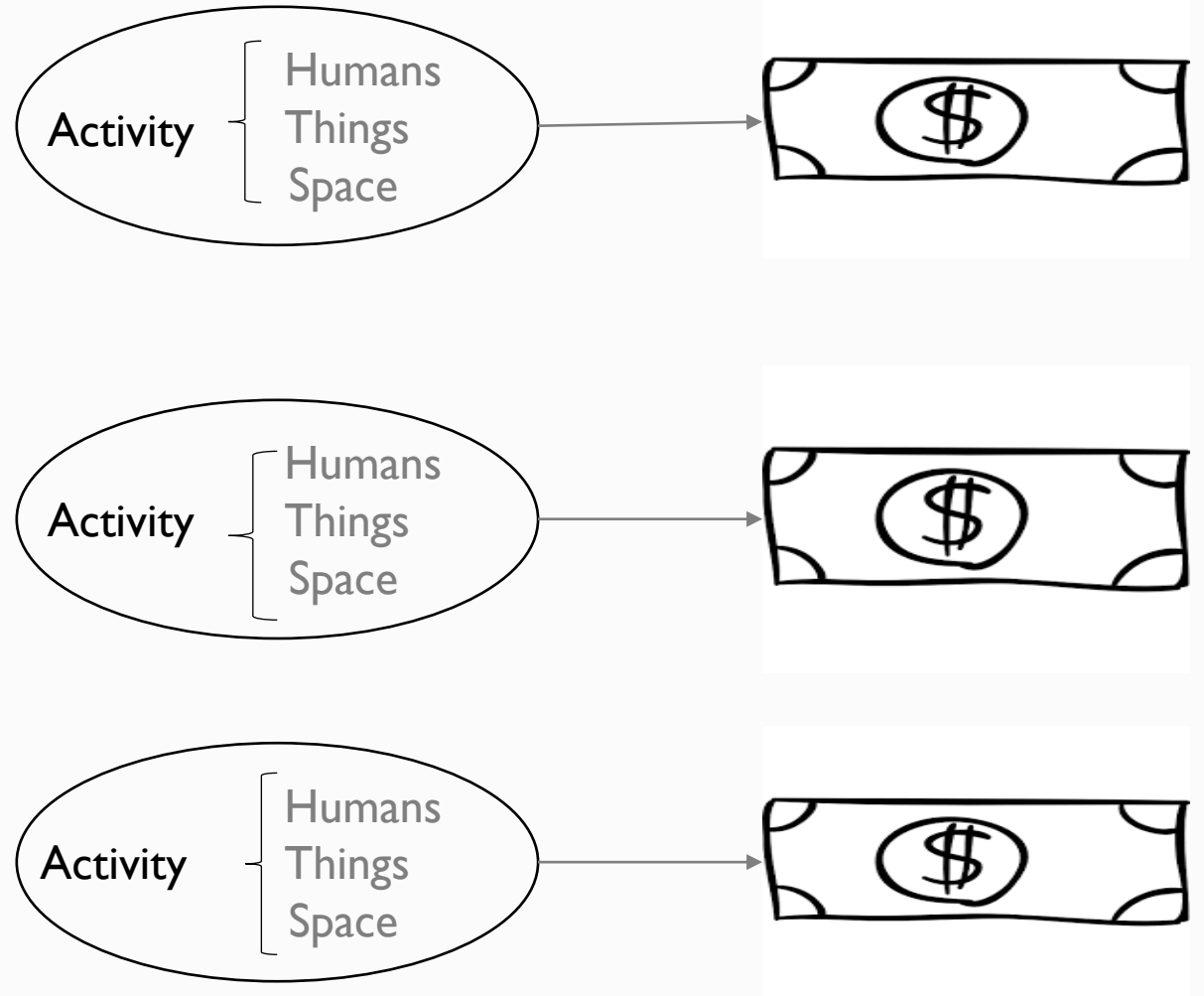
COST

BENEFIT

DECISION



VS



*“Implementation strategies are **activities** that are accomplished to achieve changes in practice.”*



What was consumed?

Resource A

Resource B

Resource C

Where was it consumed?

Activity 1

Activity 2

Activity 3

A close-up photograph of a white puzzle with one red piece missing. The red piece is located in the center of the frame. The puzzle pieces are interlocking and have a slightly textured surface. The lighting is even, highlighting the edges of the pieces.

**WHY DON'T WE
HAVE COST
INFORMATION?**

Resource Use and Cost Estimation

Precise

Practical

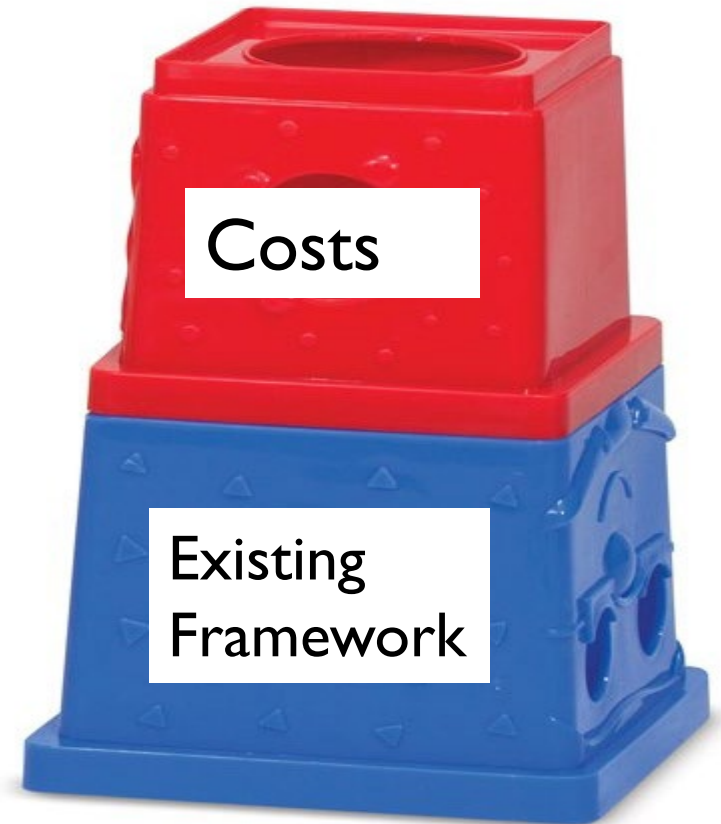
Integrated



How?

Use a costing method shown to yield precise estimates in a more practical way

Piggyback on an existing implementation approach



Harvard Business Review

www.hbr.org



November 2004

Now What?

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Time-Driven Activity-Based Costing



Time-Driven Activity Based Costing

Process identification

Process Mapping: Activities

Resource identification

Time spent per unit activity

Total time spent on activity

Price per unit time

Total cost

Time-Driven Activity Based Costing

Process identification

Process Mapping: Activities

Resource identification

Time spent per unit activity

Total time spent on activity

Price per unit time

Total cost

Proctor, Powell & McMillen, 2014

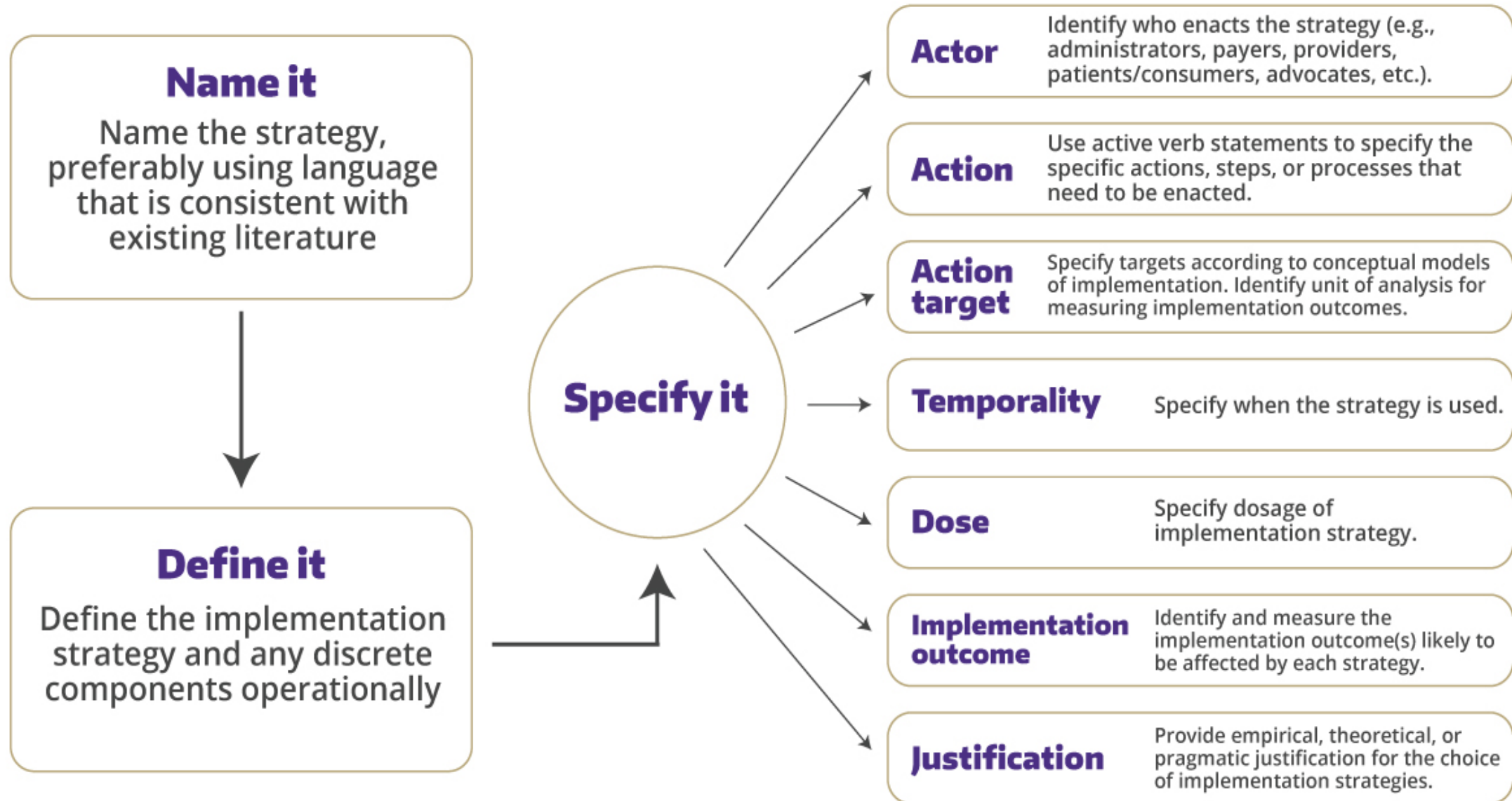


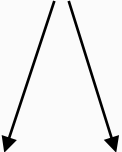
TABLE 4. Application of Proctor et al's Reporting Framework to the Specific Elements Within the Overarching Implementation Strategy Used in the CHCs^a

Individual elements of practice facilitation implementation strategy	Proctor et al reporting framework domains							
	Actor	Action	Target of the action	Temporality	Dose	Outcomes affected	Justification ^b	
Engagement of clinic leadership during preimplementation planning process	Study team	Identify clinic champions—MDs interested in quality improvement, diabetes care; often in leadership role	Build ownership and acceptance of the intervention among clinic leadership; prepare site for implementation	Presubmission of proposal	One time	Improved staff trust, understanding, uptake of intervention	Structural, staff engagement, culture (CFIR)	
	Study team/clinic champions/clinic leadership	Design implementation process		Preimplementation	Ongoing discussions first 9 mo of study			Design quality and packaging, planning, engaging (CFIR)
	Clinic leadership	Hire practice facilitator—current clinic staff with interest in quality improvement, diabetes care (final selection—nurse, panel managers, quality improvement specialist)			One time within first 9 mo of study			Networks and communication (CFIR)
	Study team	Train clinic champions and practice facilitators			Multiple informal trainings, and information provided as requested	Enable peer-to-peer training and coaching	Knowledge and beliefs, self-efficacy (CFIR)	
Communication of organizational support for the intervention	Clinic champion	Communicate expectations of behavior change related to the intervention	Build knowledge and acceptance of the intervention among clinic staff	Explicitly at start of implementation, then as needed	I-h meeting at each clinic, then informally as needed	Improved staff trust, understanding, uptake of intervention	Structural, networks and communication, culture (CFIR)	
		Share evidence underlying intervention with colleagues/other clinic staff		Annually at start of implementation years 1 and 2	I-h meeting at each clinic			Evidence strength and quality, engaging, relative advantage (CFIR)

Time-Driven Activity Based Costing

- 1. Process identification
- 2. Process mapping: Activities
- 3. Resource identification
- 4. Activity Frequency
- 5. Time spent per unit activity
- 6. Total time spent on activity
- 7. Price per unit time
- 8. Total activity cost

Dosage



	Actions	Actors	Action Frequency	Time Spent per Unit Action	Total Time Spent on Action	Wage Rate	Total Activity Cost
I	II	III	IV	V	VI	VII	VIII
Strategy Name	Action 1	Actor A	#	hours	hours	\$/hour	\$
		Actor B		hours	hours	\$/hour	\$
	Action 2	Actor C	#	hours	hours	\$/hour	\$
	Action 3	Actor A	#	hours	hours	\$/hour	\$
		Actor B		hours	hours	\$/hour	\$
					Total Strategy Cost		\$

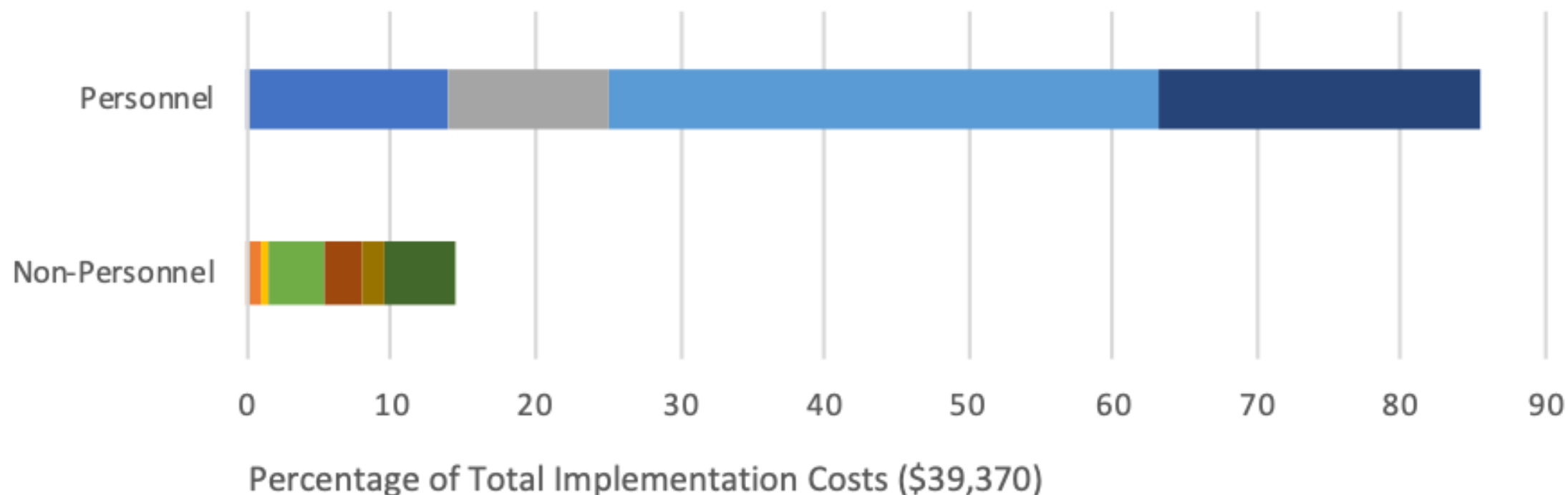
↑
Temporality

Table 1 Costing Practice Facilitation Using the Time Driven Activity Based Costing

Implementation Strategy	Actions	Actors	Action Frequency	Time Spent per Unit Action (hours)	Total Time Spent on Action (hours)	Wage rate (\$)	Total Cost (\$)
I	II	IV	V	VI	VII	VIII	IX
Initial work for site readiness	Meet with partners in-person	1 general practice facilitator	12	2	24	50	1,200
		1 site administrator	12	2	24	45	1,080
		3 clinicians	12	2	72	55	3,960
	Travel to partners for in person meetings	1 general practice facilitator	12	1	12	50	600
		1 site administrator	24	0.5	12	45	540
	Communicate with partners via phone	1 general practice facilitator	24	0.25	15	50	750
		1 site administrator	60	0.25	15	45	675
	Initial training of partners	Meet with partners in person to deliver the training workshop	1 practice facilitator	2	8	16	50
1 site administrator			2	8	16	45	720
3 clinicians			2	8	48	55	2,640
Monitor training workshop via videoconferencing		1 expert consultant	2	8	16	65	1,040
Ongoing administrative support	Meet with partners via videoconferencing for administrative issues	1 practice facilitator	24	1	24	50	1,200
		1 site administrator	24	1	24	45	1,080
	Consult partner as needed by phone	1 practice facilitators	12	0.5	6	50	300
		1 site administrator	12	0.5	6	45	270
Remote consultation	Observe EBP delivery sessions and provide feedback via videoconferencing	1 expert consultant	16	1	16	65	1,040
		3 clinicians	16	1	48	55	2,640
	Give ongoing clinical training via video conferencing	1 expert consultant	10	1	10	65	650
		1 clinician	10	1	10	55	550
	Consult clinicians in scheduled group consultation sessions by phone	1 expert consultant	24	1	24	65	1,560
		3 clinicians	24	1	72	55	3,960
Consult clinicians individually as needed by phone	1 expert consultant	48	0.5	24	65	1,560	
	1 clinician	48	0.5	24	55	1,320	
Fidelity review	Watch recorded EBP delivery sessions and fill out fidelity assessment forms	1 expert consultant	36	1	36	65	2,340

	Personnel Time Costs	33,660
	Non-Personnel Costs	
	Travel	360
	Training materials	250
	Assessment and Evaluation materials	1,500
	Recording Equipment	1000
	Office supplies	600
	Software for case management	2,000
	Total Non-Personnel Costs	5,710
	Total Implementation Costs	39,370

Figure 1 Composition of Implementation Costs



■ General practice facilitator

■ Site administrator

■ Clinician

■ Expert consultant

■ Travel

■ Training materials

■ Assessment and Evaluation materials

■ Recording Equipment

■ Office supplies

■ Software for case management

Figure 2 Cost Composition by Implementation Strategy

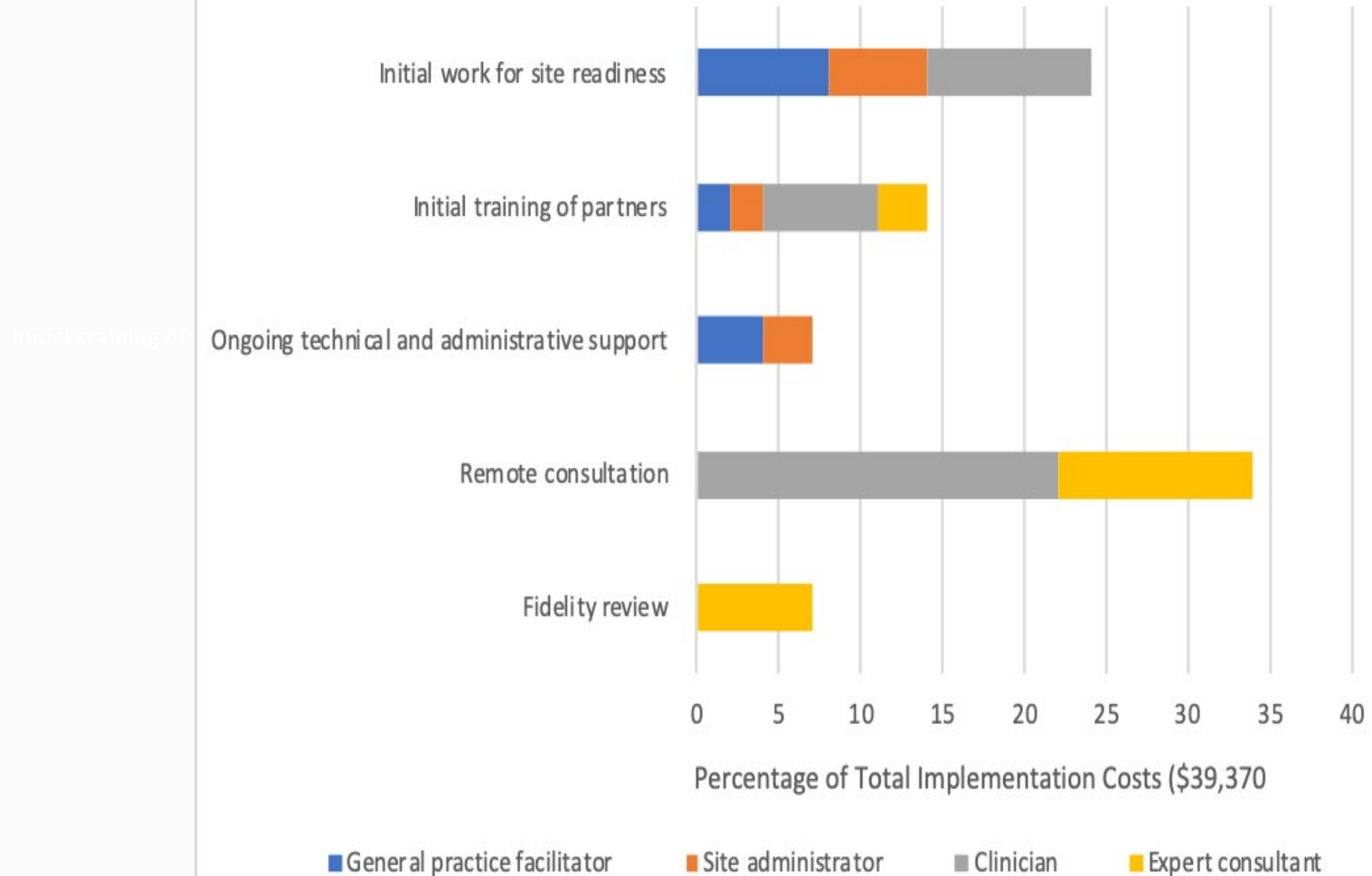
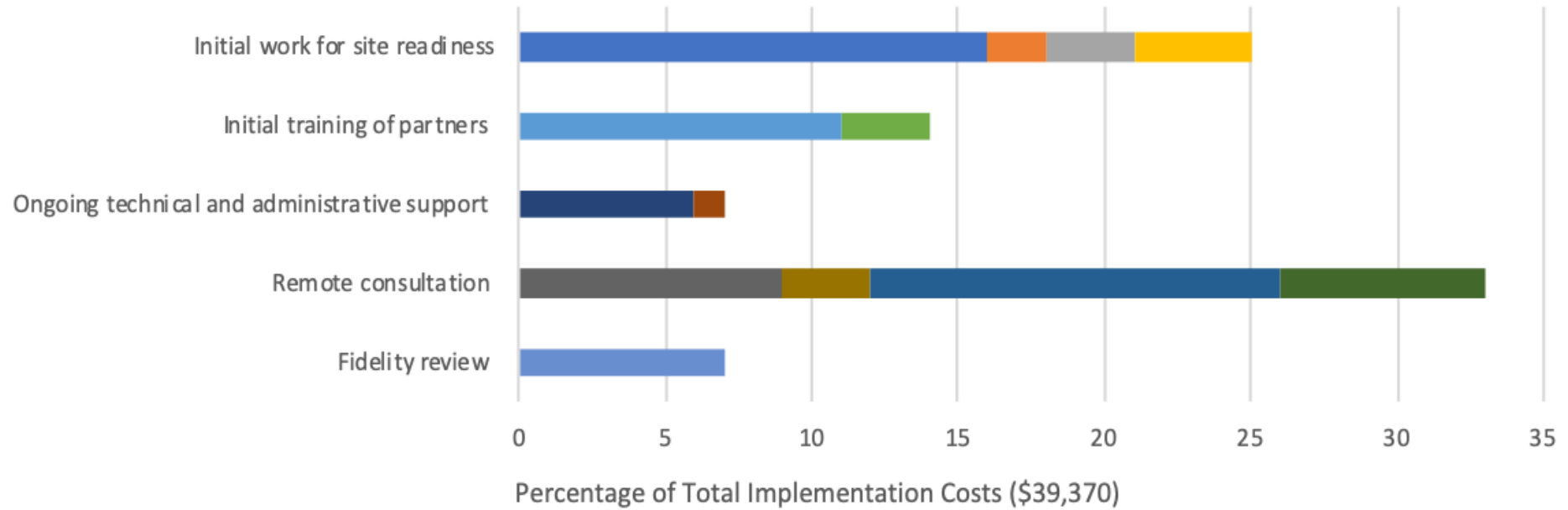


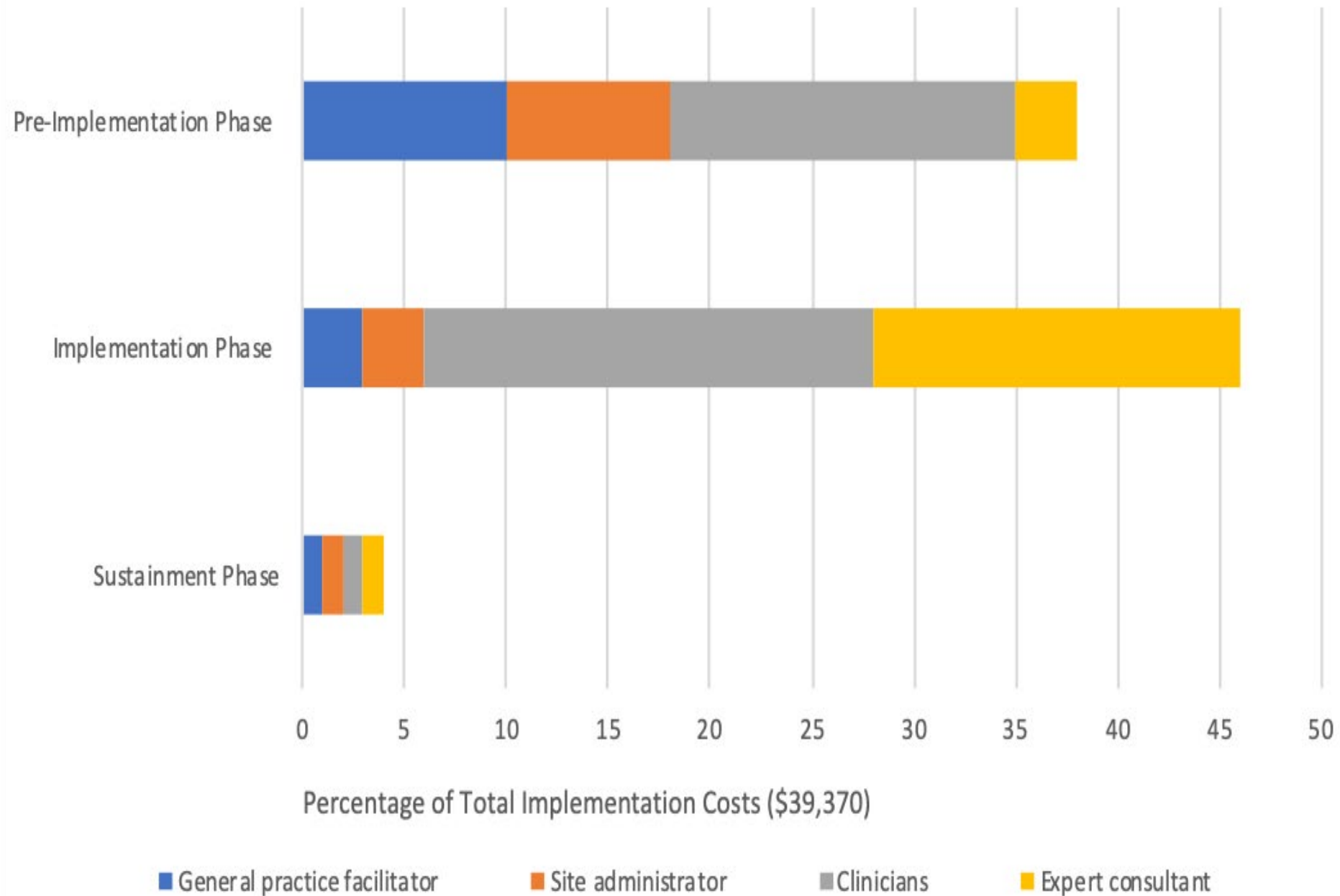
Figure 3. Action Cost by Implementation Strategy



- Meet with partners in-person
- Travel to partners for in person meetings
- Communicate with partners via phone
- Communicate with partners via email
- Meet with partners in person to deliver the training workshop
- Monitor training workshop via video-conferencing
- Meet with partners via video-conferencing for administrative issues
- Consult partner as needed by phone
- Observe treatment? session and provide feedback via video-conferencing
- Give ongoing clinical training via video conferencing
- Consult d inicians in scheduled group consultation sessions by phone
- Consult d inicians individually as needed by phone
- Watch recorded treatment sessions and fill out fidelity assesment forms

Initial training of

Figure 4. Cost Composition by Implementation Phase



Precise, activity-level

Practical

Integrated

Specifying Implementation Strategies

Proctor, Powell & McMillen, 2014

Actor	Who enacts the strategy?
Action	Does what?
Dose	How much?
Temporality	When? In what order?
Action Target	What constructs are targeted?
Implementation Outcome	To achieve what outcome?
Justification	Empirical or theoretical rationale?
Resource Use and Cost	What resources are needed? What does it cost?



PROGRAMMATIC COSTS OF PROJECT IMPACT FOR CHILDREN WITH AUTISM

- Project ImPACT (Improving Parents As Communication Teachers)
teaching social communication skills to young children with ASD
- RCT with Philadelphia Early Intervention System
- Study Aims:
 - estimate implementation and intervention delivery costs
 - showcase an application of Time-Driven Activity-Based Costing (TDABC)
in implementation research

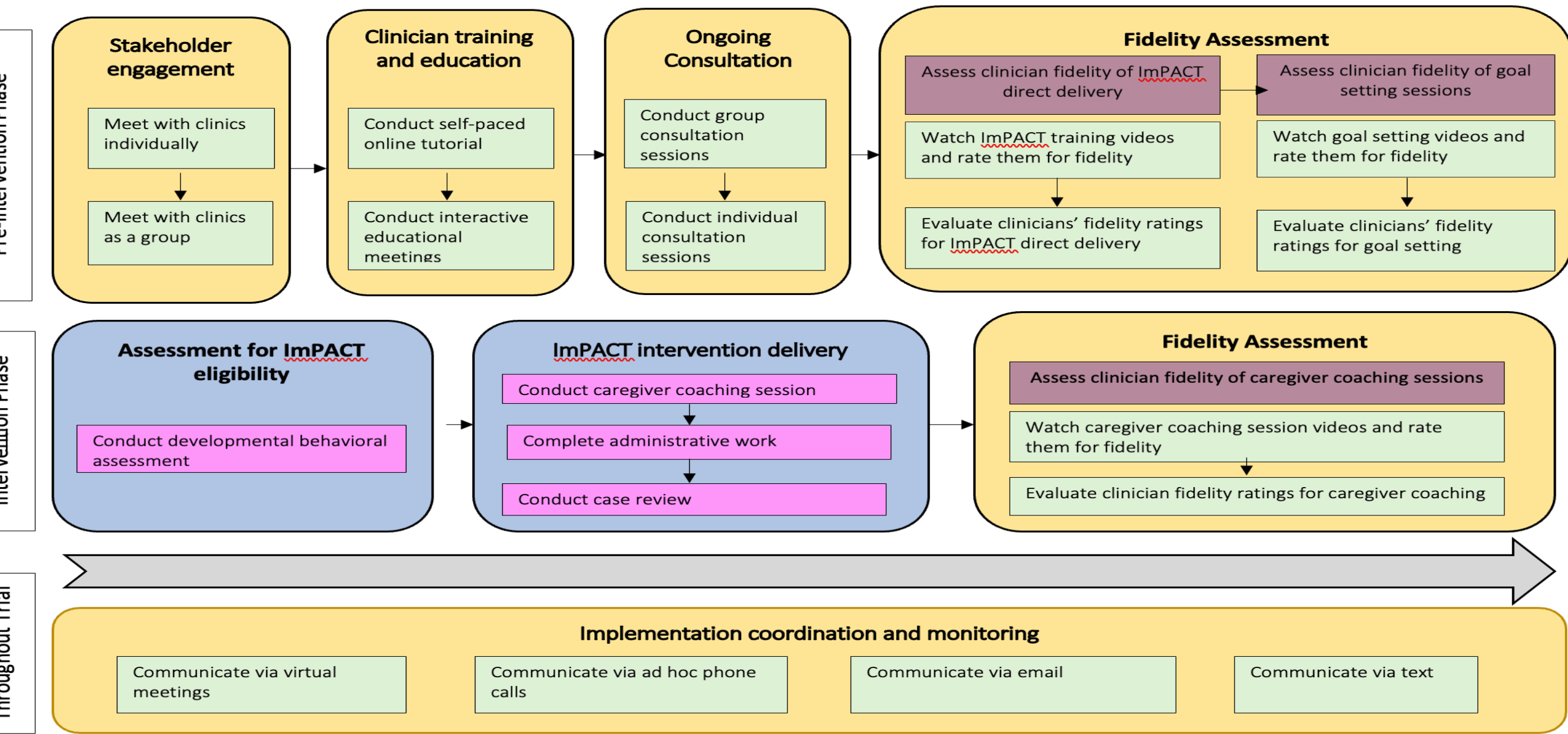
PROJECT IMPACT

- 2-year, implementation-intervention trial (hybrid 2)
6 community agencies, 18 clinicians, 3 from each agency
Per clinician 3 children < 30 months and their caregiver, total of 54 participants
- Three study conditions:
 - Low dose Project ImPACT, 1 hour/week over six months
 - High dose Project ImPACT, 4 hours/week over six months
 - Treatment as usual
- Outcomes
Effectiveness: social communication outcomes in children, responsiveness and self-efficacy of caregivers
Implementation: cost, acceptability, adoption, feasibility, clinician fidelity, parent fidelity

METHODS

- TDABC + Proctor rubric (Cidav et al. 2020, 2021)
process mapping: strategy name, actors, actions, temporality, dosage
- Programmatic costs from payer perspective,
first year of implementation
- Cost measures:
implementation cost per clinician and site,
intervention cost per child and per hour,
total hours spent and associated costs,
costs by actor, action, implementation strategy, and intervention activity

Figure 1. Process Map of Implementation and Delivery of the Project ImPACT



Yellow: Implementation strategies
 Purple: Implementation sub-strategies
 Green: Implementation strategy actions
 Blue: Intervention activities
 Pink: Intervention actions

Table S1. Resource Use and Costs of Project IMPACT Implementation Strategies																			
Implementation Strategies	Actions	Action description	Action temporality	Actors	Number of actors in unit action	Time driver	Time driver frequency	Time driver unit duration (hours)	Total hours	Wage rate (\$)	Total cost (\$)	Action time (hours)	Action cost (\$)	Implementation strategy time (hours)	Implementation strategy cost (\$)				
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P				
Stakeholder engagement	Meet with clinics individually	Project manager and project coordinators have remote individual meetings with leaders at each clinic.	Pre-implementation. April 2020	Clinic leader	2	Number of meetings	4	1	8	82	656	20	1,228	31	2,027				
				Project manager	1		4	1	4	81	324								
				Project coordinator	2		4	1	8	31	248								
	Meet with clinics as a group	Project manager and project coordinators have one remote meeting with all clinic leaders.	Pre-implementation. May 2020	Clinic leader	8	Number of meetings	1	1	8	82	656	11	799						
				Project manager	1		1	1	81	81									
				Project coordinator	2		1	1	2	31	62								
Clinician training and education	Conduct self-paced online training	Each clinician watches a one-time 6h online training.	Pre-implementation. July 2020	Clinician	1	Number of online tutorials completed	12	6	72	125	9,000	72	9,000	296	32,436				
				Conduct interactive educational meetings	External trainer delivers four 3.5h day of virtual workshops for all clinicians. Consultant and project coordinators are present.		Pre-implementation. July 2020	Clinician	12	Number of meetings	4	3.5	168	125	21,000	224	23,436		
								Consultant	1		4	3.5	14	56	784				
								External trainer	1		4	3.5	14	56	784				
				Project coordinator	2	4	3.5	28	31	868									
Ongoing consultation	Conduct group consultation sessions	Consultant, external trainer, project coordinators and clinicians meet for supervision and case discussion.	Implementation. August 2020 - July 2021.	Clinician	12	Number of group consultation sessions	18	1	216	125	27,000	288	30,132	504	45,954				
				Consultant	1		18	1	18	56	1,008								
				External trainer	1		18	1	18	56	1,008								
				Project coordinator	2		18	1	36	31	1,116								
	Conduct individual consultation sessions	Each clinician separately meets with consultant for a live coaching observation and feedback.	Implementation. August 2020 - July 2021.	Clinician	1	Number of individual consultation sessions	108	0.5	54	125	6,750	216	15,822						
				Consultant	1		108	1.5	162	56	9,072								

Table S2. Resource Use and Costs of Low Dose Project IMPACT Per-Child when delivered virtually															
Intervention Activities	Actions	Action description	Action temporality	Actors	Number of actors in unit action	Time driver	Time driver frequency	Time driver unit duration (hours)	Total hours	Wage rate (\$)	Total cost (\$)	Action time (hours)	Action cost (\$)	Activity time (hours)	Activity cost (\$)
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Assessment for IMPACT eligibility	Conduct developmental-behavioral assessment	Clinician meets a family to conduct a developmental behavioral assessment for the child.	Implementation. August 2020 - July 2021.	Clinician	1	Number of developmental-behavioral assessments conducted	2	1	2	125	250	2	250	2	250
IMPACT delivery	Conduct caregiver coaching session	Clinician meets with a family to deliver IMPACT.	Implementation. August 2020 - July 2021.	Clinician	1	Number of IMPACT caregiver sessions	14	1	14	125	1,750	14	1,750	19	2,326
	Complete administrative work	Clinician writes progress notes after each session with families.	Implementation. August 2020 - July 2021.	Clinician	1	Number of IMPACT caregiver sessions	14	0.25	3.5	125	438	4	438		
	Conduct case review	Clinician meets with a supervisor from their clinic, to discuss child's progress during a quarterly review.	Implementation. August 2020 - July 2021.	Clinician	1	Number of meetings	4	0.17	0.67	125	83	1.3	138		
				Clinic leader	1		4	0.17	0.67	82	55				
													Total hours per-child	21	
													Personnel time cost per-child		2,576
													Non-Personnel Costs per-child (IMPACT manual)		43
													Total IMPACT Delivery Cost per-child		2,619
													Total IMPACT Delivery Cost per hour		126

IMPLEMENTATION COSTS

- Total implementation cost: \$174,038
per clinic: \$43,509, per clinician: \$14,503
2,168 personnel hours
- Uncompensated clinician time cost: 60%
- Cost breakdown:

Actor	%	Implementation strategy	%	Implementation action	%
clinician	60	implementation coordination and monitoring	47	email exchanges	21
consultant time	12	ongoing consultation	26	phone/virtual meetings	18
project manager	10	clinician training	19	conducting group consultation	17
project coordinator	9	fidelity assessment represented	7	interactive educational meetings	13
external trainer	6	stakeholder engagement	1	individual consultation	9
clinic leader	3			communication via text	7
				self-paced online training	5
				other (8 actions)	10

INTERVENTION COSTS

- Virtual, **low dose** per child total cost: \$2,576 (21 hrs)
- Virtual, **high dose** per child total cost: \$9,650 (77 hrs)
- In-home, **low dose** per child total cost: \$4,369 (35 hrs)
- In-home, **high dose** per child total cost: \$17,025 (136 hrs)
- Non-personnel costs per child: \$43 (1%)

- Cost breakdown:

Actor	%	Intervention delivery activity	%	Intervention delivery action	%
clinician	98	Project ImPACT delivery to caregivers	89	conducting caregiver coaching sessions	68
clinic leader	1	assessment of the child's ImPACT eligibility	10	conducting case reviews	5
				completing administrative work	17
				conducting developmental assessments	10

DISCUSSION

- Uncompensated clinician time,
largest portion of implementation costs
- Implementation coordination and monitoring costs,
nearly half of the implementation costs
- Ongoing cost of Project ImPACT delivery,
much lower than initial implementation cost
- Significant travel costs for in-home delivery
- Value of process mapping and TDABC in implementation research