

# Activities by suppliers & technicians during the provision of wheeled mobility

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# Project Purpose & Objectives

- This study was designed to collect time and activities associated with the provision of wheeled mobility and seating devices.
- *Primary aim:* to report the type and duration of activities undertaken during the provision of wheeled mobility devices
- *Secondary aim:* to compare the time and activities associated with CRT with those associated with DME.

# Time – motion Methodology

- Identify participants
- Follow participants throughout work day
- Log type and duration of activities
- Typically
  - few subjects
  - great depth of data

Epi...ate	Epi...ID	RT...D	Episo...tion
4/15/10	1	AC	DME Office
4/15/10	2	AC	Client's...
4/15/10	3	AC	DME Office
4/15/10	4	AC	DME Office
4/15/10	5	AC	DME Office
4/15/10	6	AC	DME Office
4/15/10	7	AC	DME Office
4/15/10	8	AC	Client's...

# Selecting participants

- Minimum of \$1.5 million in annual CRT sales
- Employ at least 1 RTS with a min of 3 years experience
- Employ at least 1 technician

	ATL	BUF
# contacted	65	4
# met criteria	7	3
# agreed	5	2
Pool of RTS	14	12
Pool of Techs	11	5

4 RTSs and 2 Technicians randomly selected from each location

# Defining CRT

- Power Wheelchairs with HCPCS Codes:
  - Group 3: K0848-K0864
  - Group 4: K0868-K0886
- Manual Wheelchairs HCPCS Codes:
  - E1161, E1229, E1234, E1235, E1231, E1236, E1237, E1238, K0005, K0009
- Seating System
  - DME { – C1- Prefabricated seat and/or back
  - CRT { – C2- Made to Measure seat and/or back
  - C3- Custom Molded seat and/or back
  - C4- Combination pre-fabricated/made to measure/custom molded seat and back system
  - Support Modifier: If seating included support components (i.e., lateral supports, headrests, etc.)

# Activity categories

<b>Visit Prep</b>	<b>Pre-Delivery</b>	<b>Delivery</b>	<b>Follow-Up</b>	<b>Misc</b>
Intake/ Coordinate Eval	Assessment/ Equipment Trial	Load/Unload Equipment	Adjust/Fit WC	Multiple Clients
Obtain/Prep Trial Equipment	Home Assessment	Configure / Fit / Test WC	Maintenance / Repair	
	Quoting/ Order Parts	Client Education	Quoting/ Order Parts	
	Assemble WC	Travel	Travel	
	Travel	Waiting	Waiting	
	Waiting			

# Dataset

- Observations of
  - 12 people (8 RTS & 4 Technicians)
  - 110 days of activity
  - 2 metro areas
  - 1229 activities

<b>Activity</b>	<b>Count</b>	<b>Complexity</b>	<b>Count</b>	<b>Mobility Equip Code</b>	<b>Count</b>
Visit Prep	37	CRT	612	Manual WC	446
Pre-delivery	541	DME	260	Power WC	360
Delivery	193	N/A	357	Scooter	52
Follow-up	244			No Value	371
Multiple clients	214				
N=	1229	N=	1229	N=	1229

## Number of activities by mobility device classifications & complexity

	CRT	DME	All
Standard wheelchair (K0001)	2	13	15
Lightweight wheelchair (K0003)	7	18	25
High strength, lightweight wheelchair (K0004)	6	30	36
Ultralightweight wheelchair (K0005)	168	0	168
Heavy Duty Wheelchair (K0006)	0	2	2
Extra Heavy Duty Wheelchair (K0007)	0	5	5
Other Manual Wheelchair-base (K0009)	32	0	32
Manual Adult- includes TIS (E1161)	158	0	158
Pediatric Manual TIS (e1232)	8	0	8
Pediatric, Manual folding w seating system (e1236)	4	0	4
Group 1 power wheelchair : K0813 - K0816	0	8	8
Group 2 power wheelchair: K0820 - K0843	16	128	144
Group 3 power wheelchair: K0848 - K0864	194	0	194
Group 4 power wheelchair: K0868 - K0886	10	0	10
Power wheelchair, group 5 pediatric (K0891)	2	0	2
Scooter	0	50	50
No Value	1	2	3
All	608	256	864



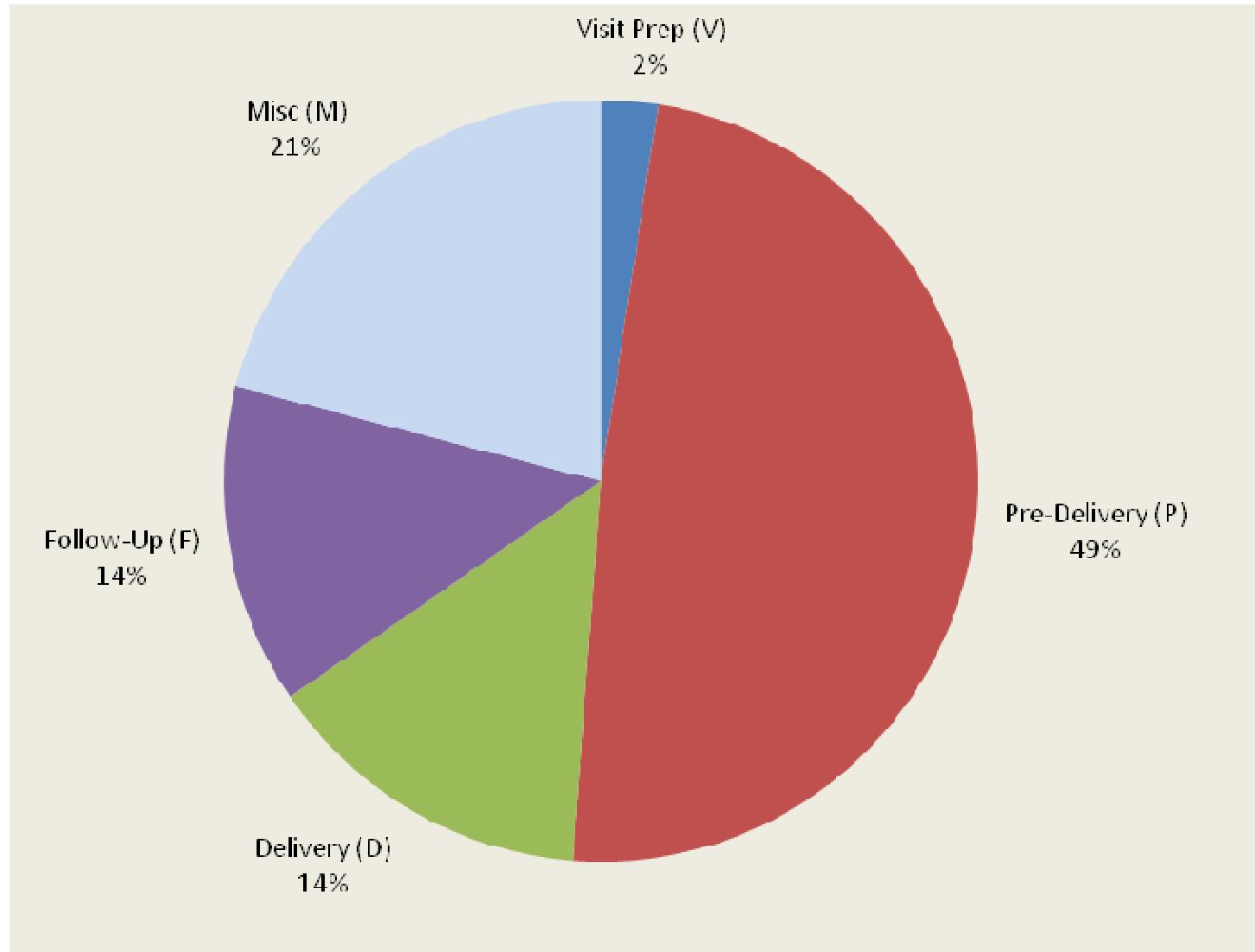
## Clients by Diagnostic category & device complexity

Diagnosis	CRT	DME	Unknown	All
Absence Lower Extremity	4	3	0	7
Arthritis	2	21	0	23
Cardiovascular	1	8	1	10
Cerebral Palsy	106	12	9	127
Cerebrovascular	25	16	5	46
Developmental Disability	23	9	1	33
Diabetes	0	4	0	4
Neuromuscular	78	20	7	105
Obesity	2	7	2	11
Orthopedic Impairment	14	24	0	38
Pulmonary	0	7	0	7
Spinal Cord Injury	80	1	8	89
All	335	132	33	500

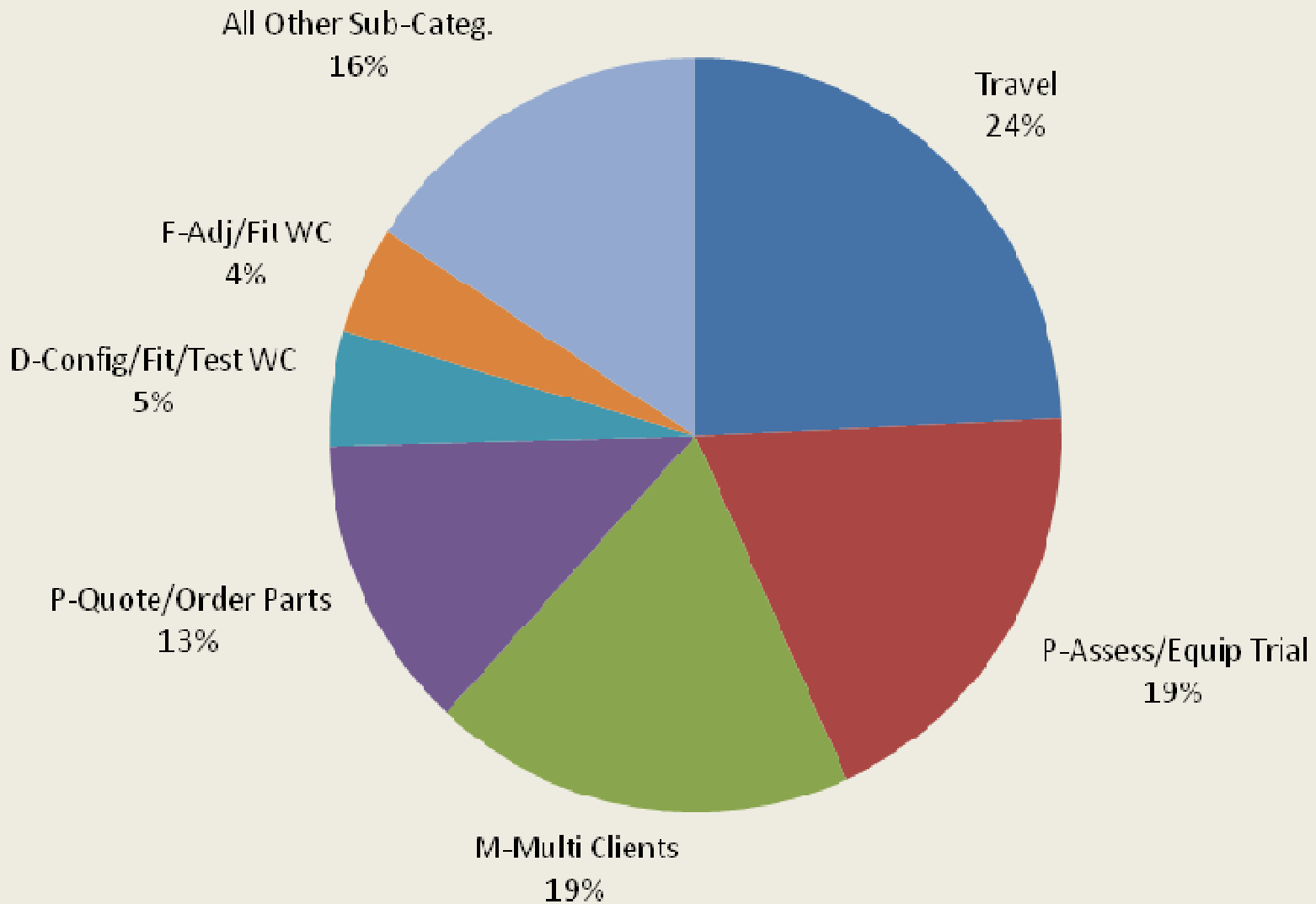
Report of activities:  
by staff type  
by sub-activity

RTS/RTP

# RTS Time Allocation: Major Activity Categories

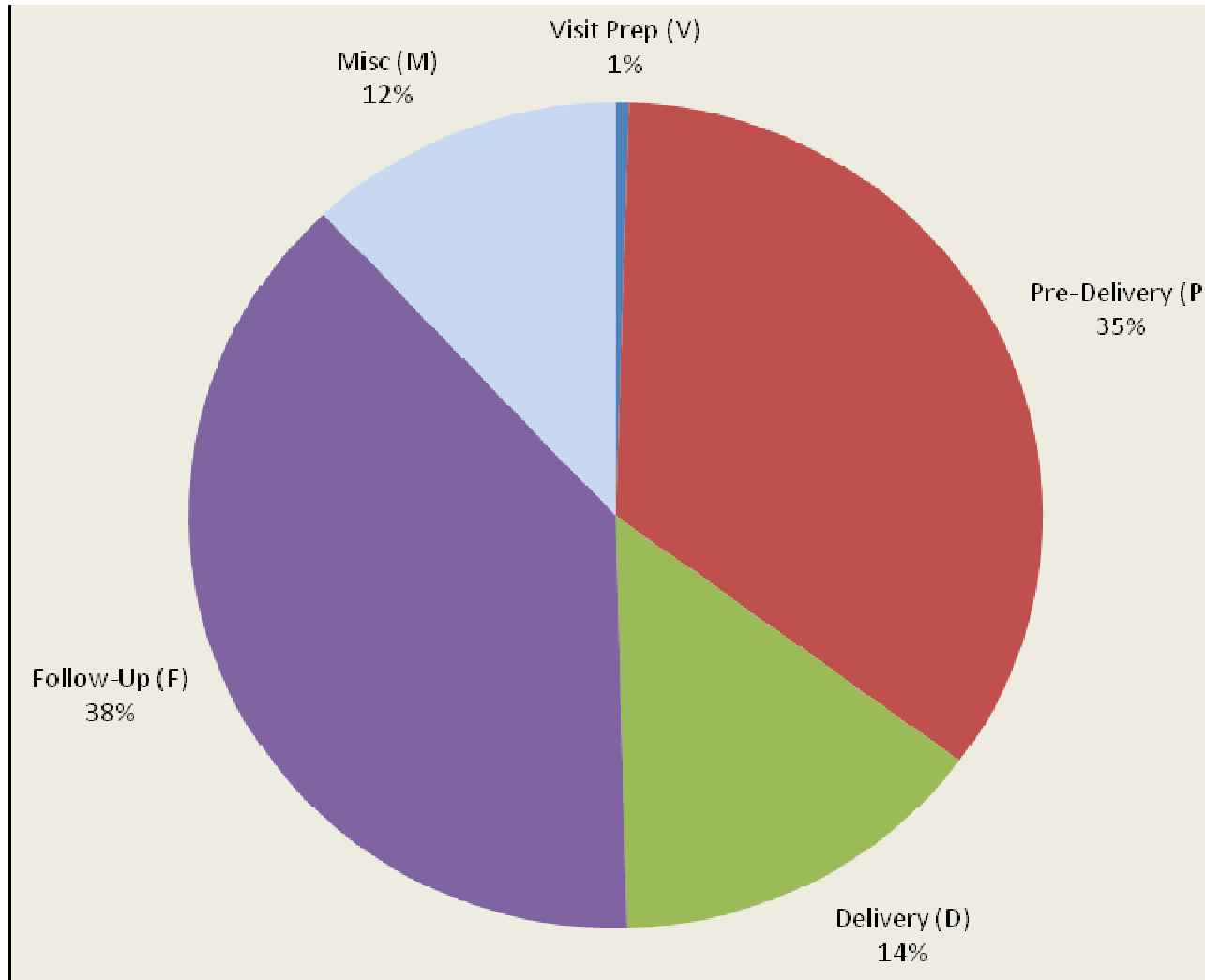


# RTS Time Allocation: Most Common Sub-Categories

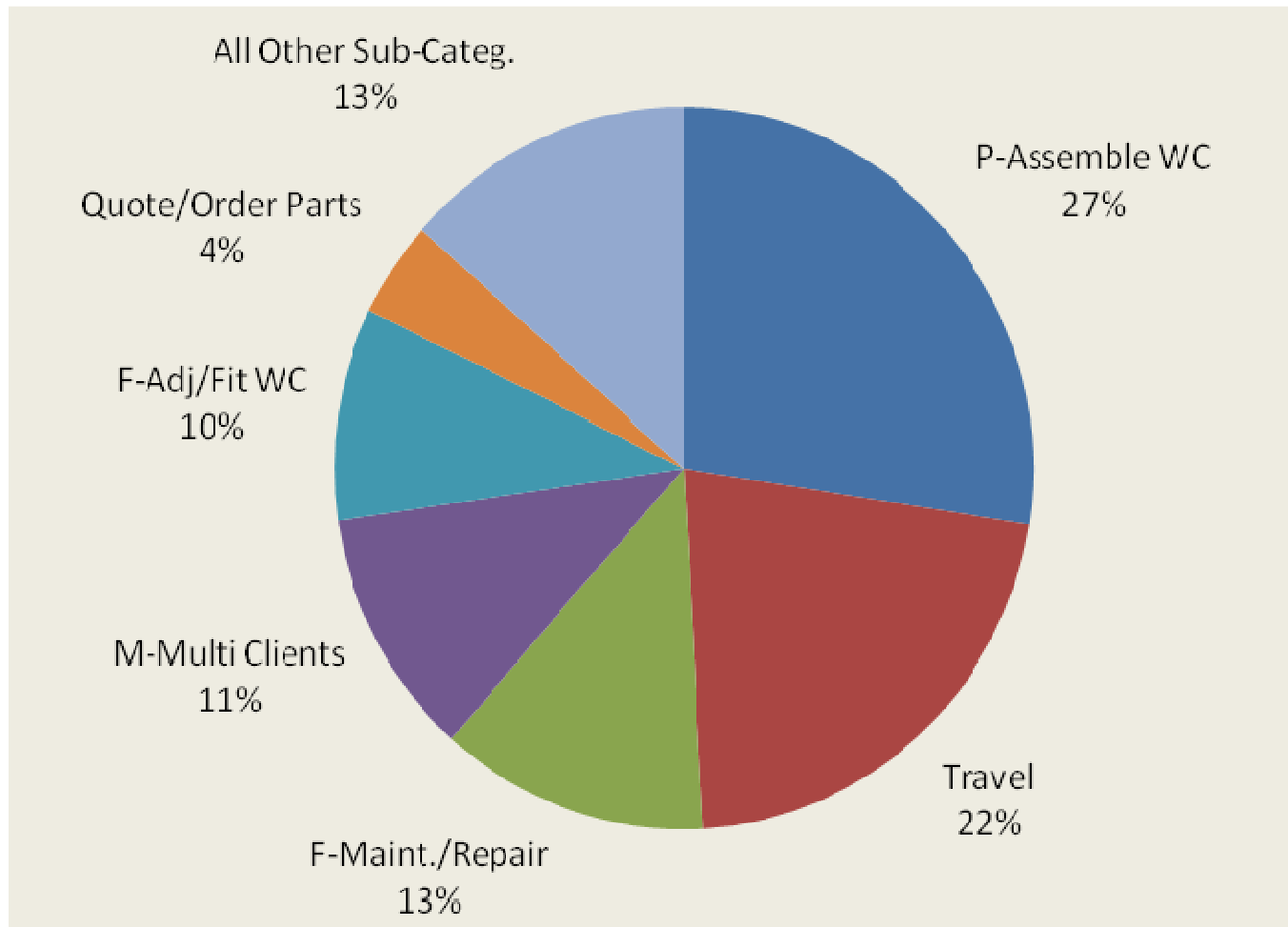


Technicians

# Rehab Tech Time Allocation: Major Activity Categories



# Rehab Tech Time Allocation: Most Common Sub-Categories

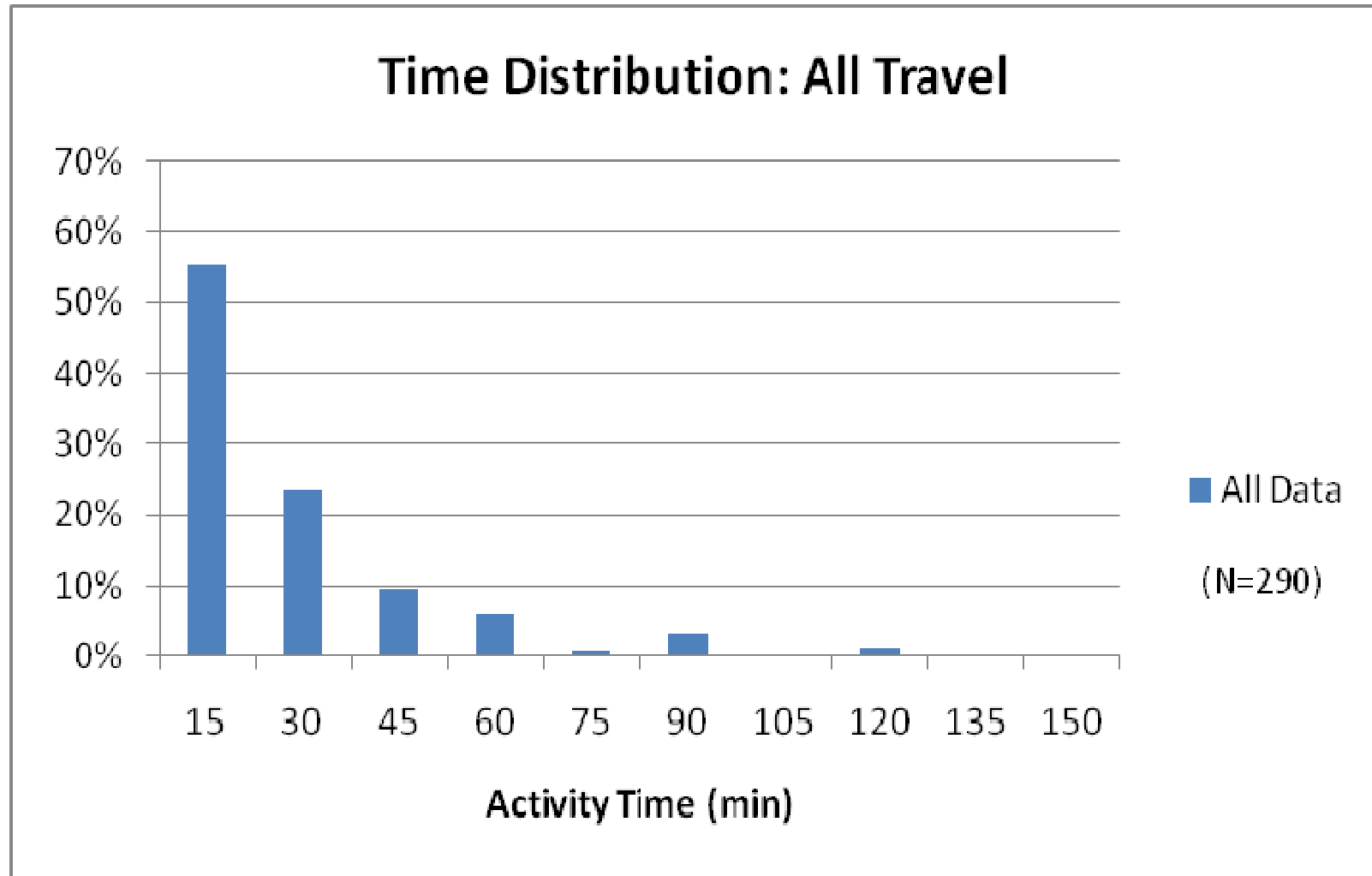




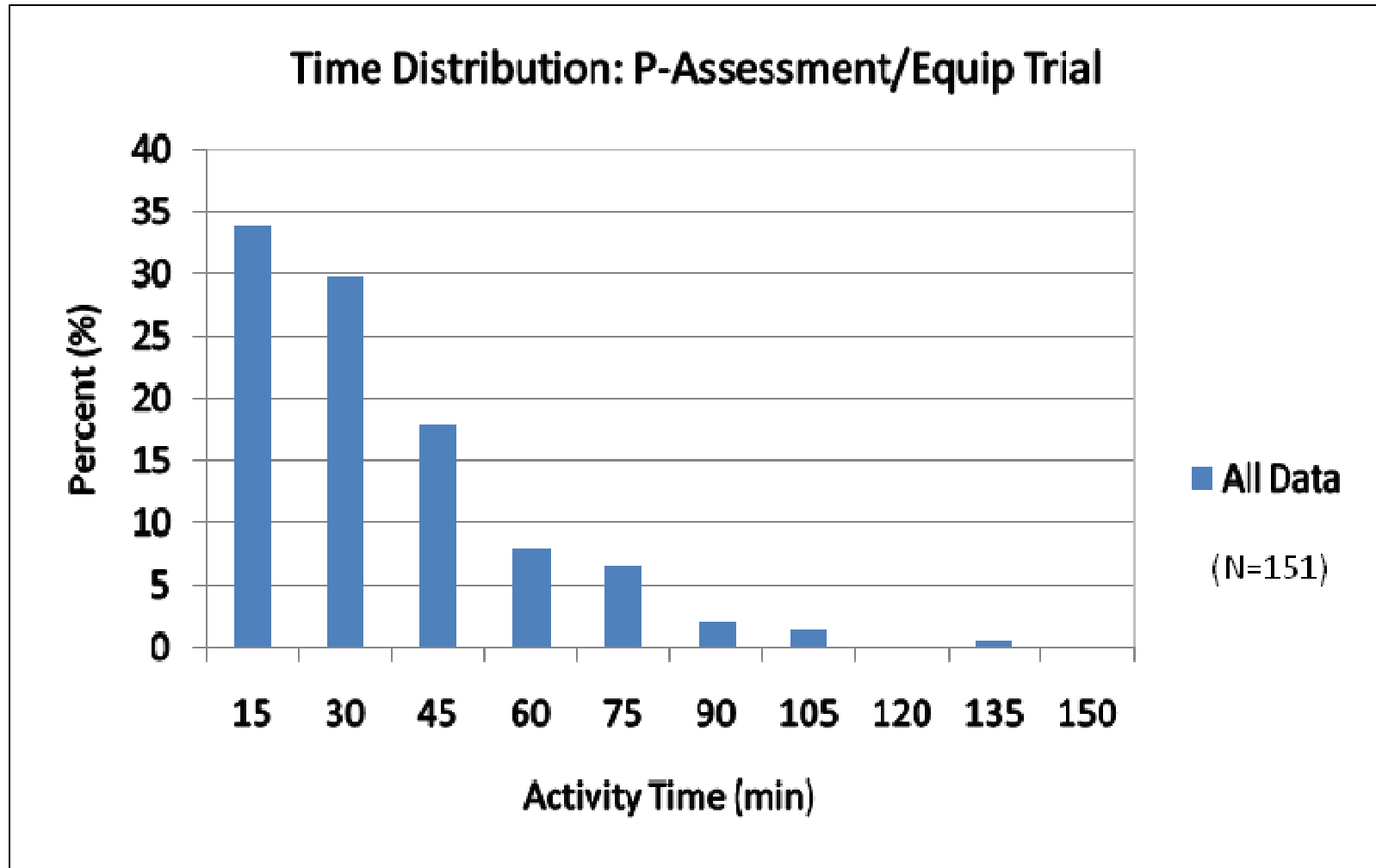
# Time Distributions for Sub-Activity Episodes

RTSs & Technicians

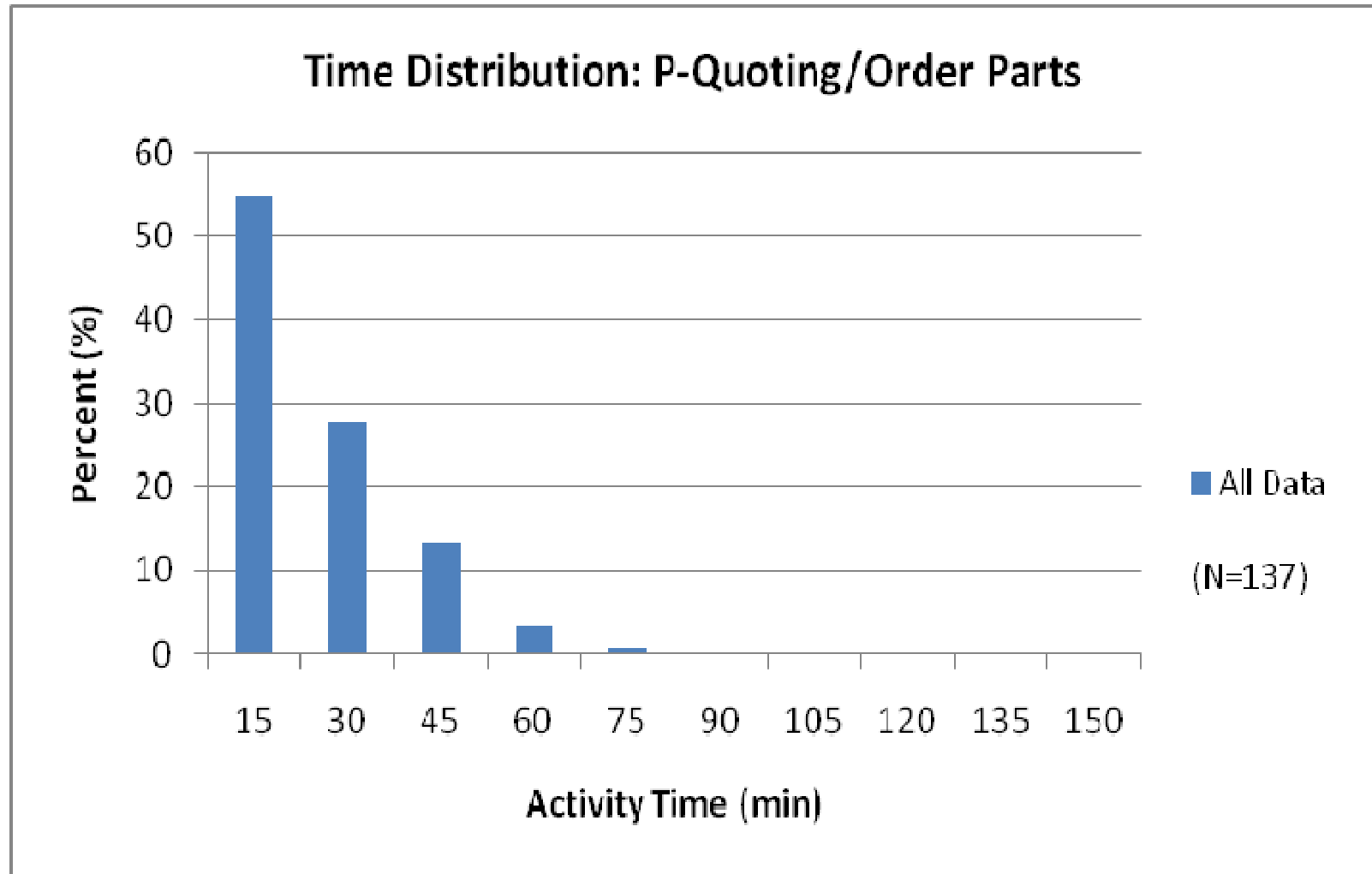
# Travel



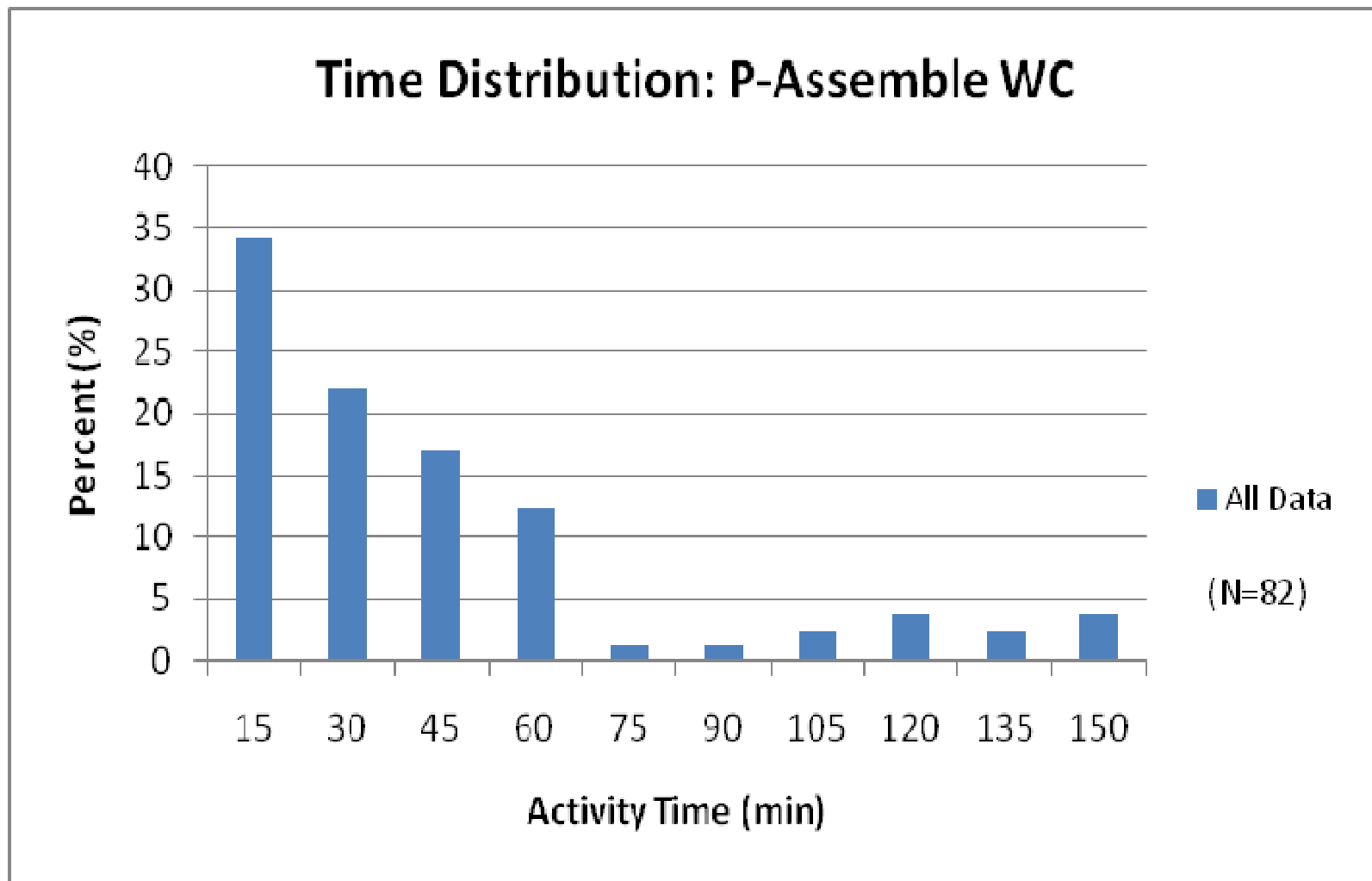
# Pre-Delivery: Assessment / Trial Usage



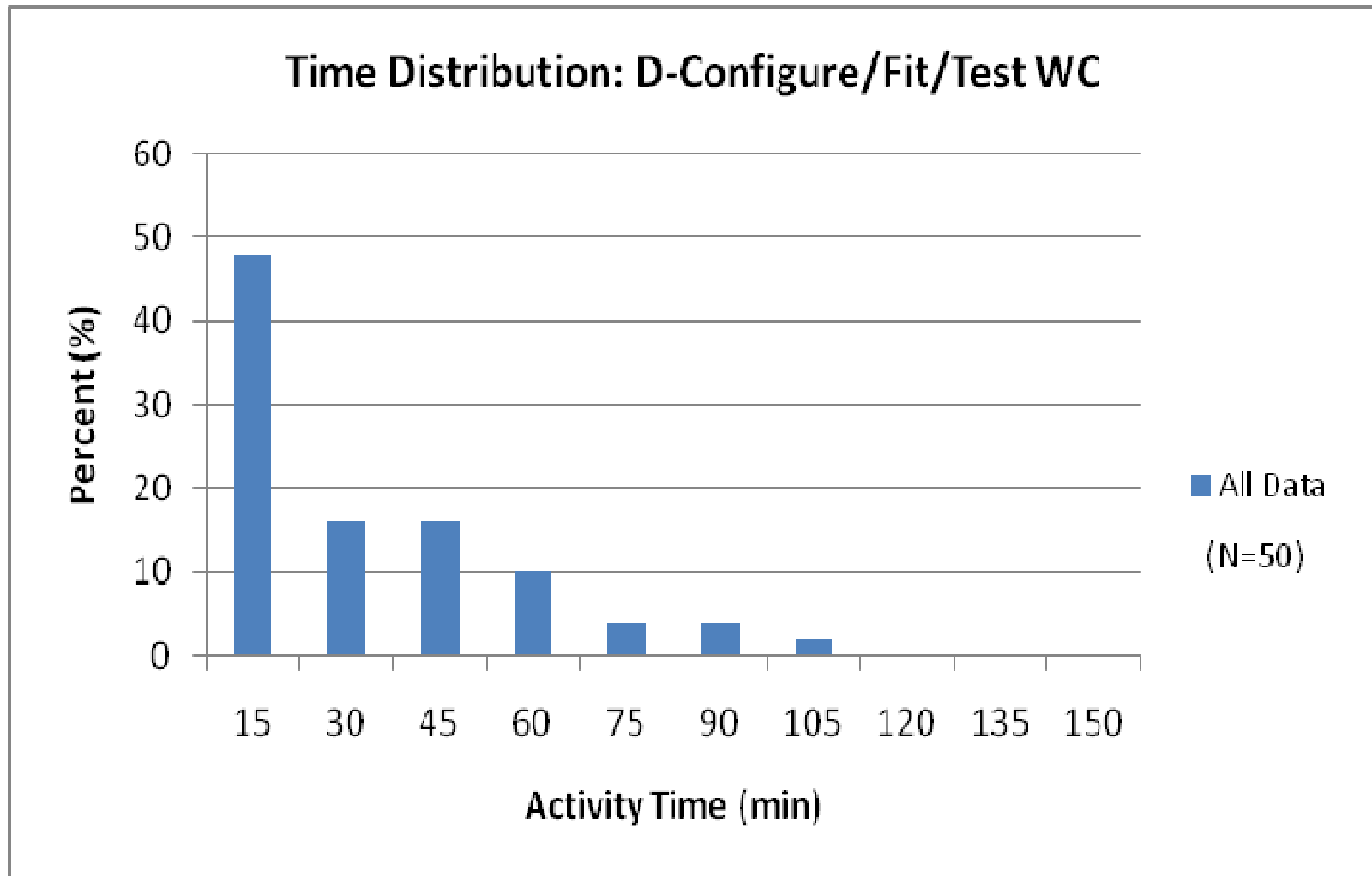
# Pre-Delivery: Quote / Order Parts



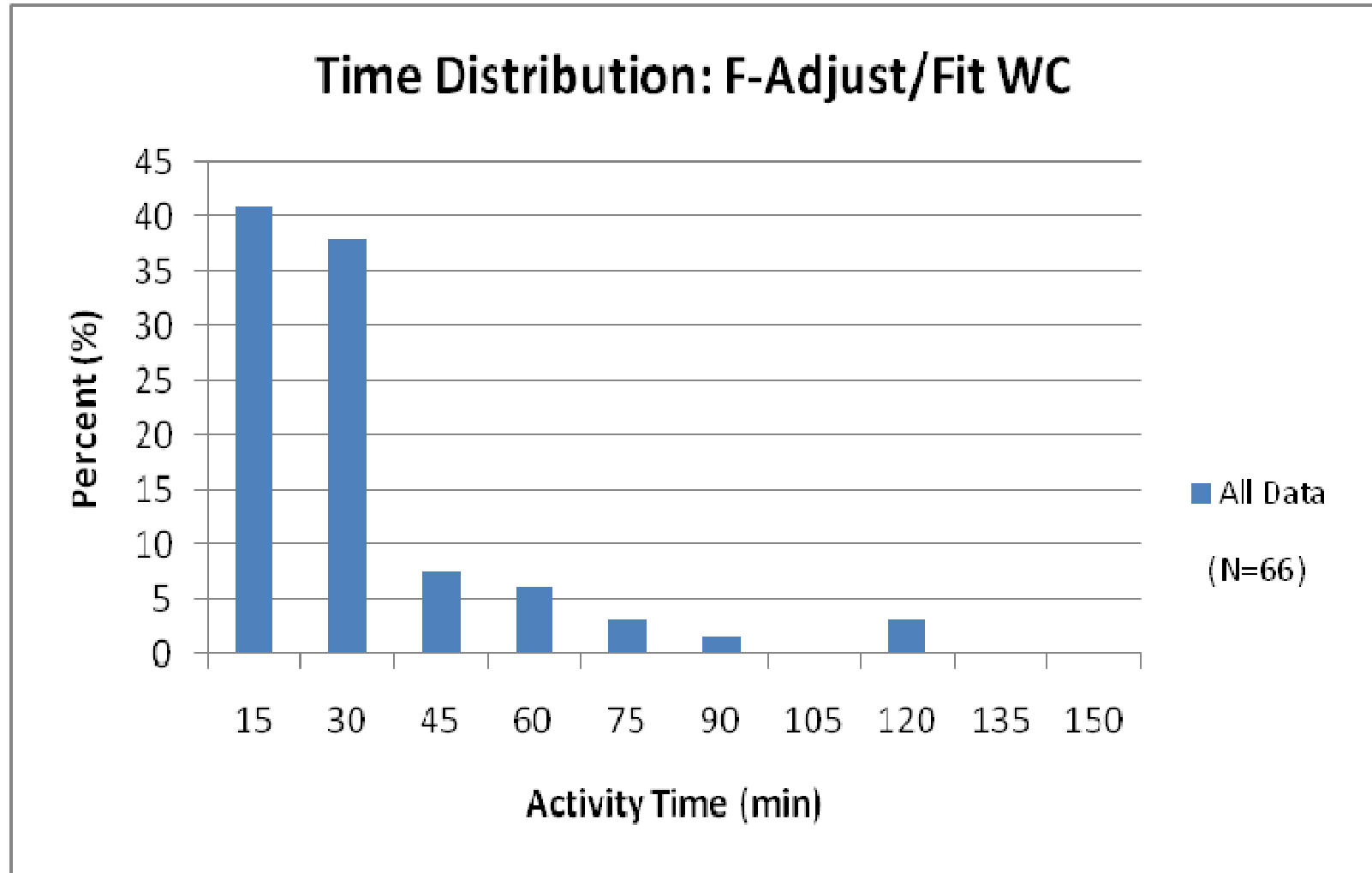
# Pre-Delivery: Assemble WC



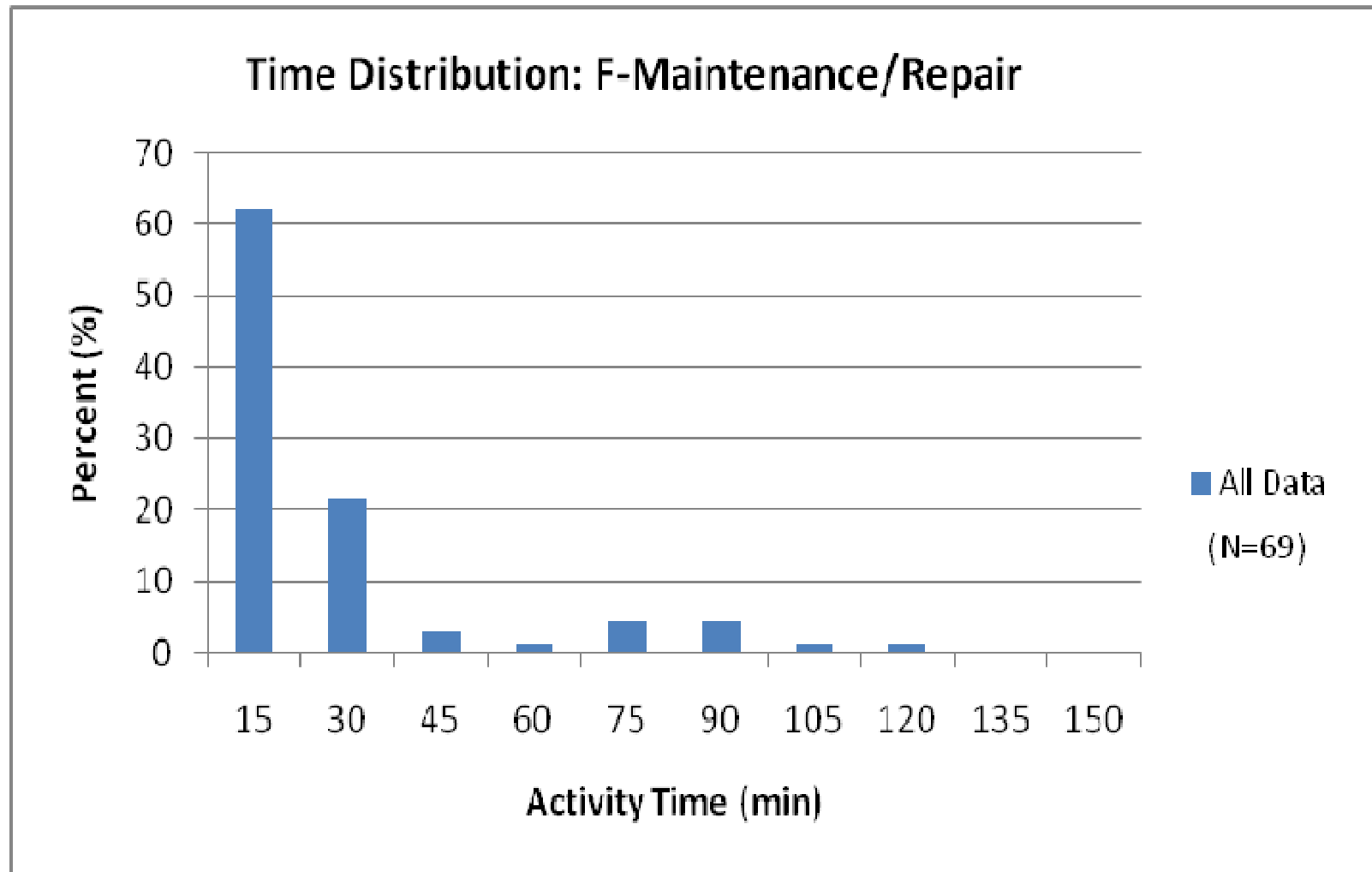
# Delivery: Configure / Fit / Test WC



# Follow-Up : Fit / Adjust WC



# Follow-Up: Maintenance / Repair





# CRT and DME activities

# Multiple ways to look at activity data across device complexity

- Compare number of activities in each category
  - Visit Prep, Pre-delivery, Delivery, Follow-up
- Compare length of activities
  - For each type
  - For different equipment
- Total all daily activities for each client
  - Episodes: time dedicated to a particular client in a day

# # of Activities by type

	CRT	DME	
<b>Visit Prep</b>	16	10	Count
	18	8	Expected count
→ <b>Pre-delivery</b>	303	161	
	326	137	
<b>Delivery</b>	105	55	
	113	47	
→ <b>Follow-up</b>	184	30	
	151	63	

Pearson Chi-Square = 33.43

P-Value = 0.000

# Activity Time

CRT	N	Mean	Median	Max
Visit preparation	16	0.3	0.25	0.75
Pre-delivery	303	0.6*	0.5	2.5
Delivery	105	0.5	0.25	1.75
Follow-up	184	0.5	0.25	2.25

DME	N	Mean	Median	Max
Visit preparation	10	0.2	0.25	0.5
Pre-delivery	161	0.4*	0.25	2.25
Delivery	55	0.4	0.25	2
Follow-up	30	0.4	0.25	1

While the set of CRT activities involved disproportionately fewer Pre-Delivery Activities, the added complexity of sub-activities such as assessment, ordering and configuring CRT wheelchairs required more time than analogous DME activities.

# Activity Time across Device Complexity and Wheelchair Type

Time in hours

	N	Mean	StDev
CRT Manual WC	384	0.5	0.45
DME Manual WC	69	0.4	0.3
CRT Power WC	227	0.5	0.41
DME Power WC	140	0.4	0.34

← p=0.001

← p=0.086

# Daily Episodes

- Time dedicated to a particular client in a day
- Sum all activities for a client over a given day

(remember, this does not equate to the total time dedicated to the provision of a device)

# Daily Episode Times (hrs)

**without  
Travel**

		N	Mean	Median	Max
Manual WC	CRT	256	0.6	0.5	4.5
	DME	41	0.4	0.25	0.75
Power WC	CRT	161	0.6	0.5	2.25
	DME	80	0.5	0.5	1.25
Scooter	DME	26	0.4	0.25	1.5

p=0.003

p=0.532

**with  
Travel**

		N	Mean	Median	Max
Manual WC	CRT	256	0.8	0.5	4.5
	DME	41	0.6	0.5	2.75
Power WC	CRT	161	0.7	0.5	3.25
	DME	80	0.8	0.5	2.5
Scooter	DME	26	0.7	0.5	2

p=0.052

p=0.136

# Summary of Non-travel Activity Times (hrs) (Manual & Power WCs)

DME activities

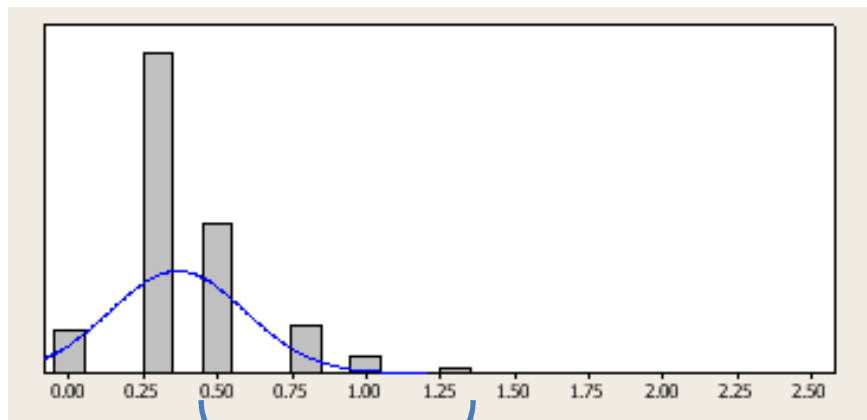
N= 136

Mean= .4 hrs

Median= .25 hrs

Mode = .25 hrs

75<sup>th</sup> percentile= .5



Top 25%

CRT activities

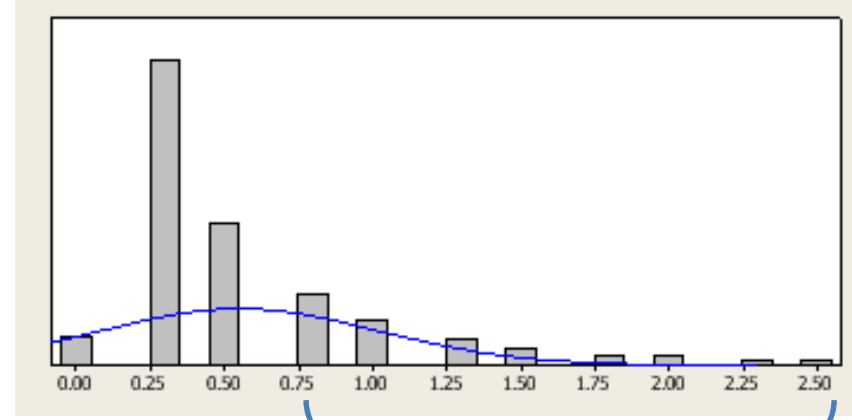
N=390

Mean = .5 hrs

Median= 0.375 hrs

Mode = 0.25 hrs

75<sup>th</sup> Percentile= .75



Top 25%



# Messages

- On average, CRT activities require more time than DME activities
- Most activities are relatively short
- Distribution of activities performed
  - Differ for RTSs and Rehab Techs
- Travel is a significant factor in the provision of wheeled mobility

# Other considerations

- All results are 100% reflective of the definition used for CRT
- One cannot overlook the policy influence of diagnosis
- A need exists to define the factors leading to long duration of engagement
- The best means to learn about provision of mobility devices is to monitor outcomes
  - This requires a completely different methodology

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The opinions contained in this presentation are those of the authors and do not necessarily reflect those of the Department of Education, the Sam Schmidt Paralysis Foundation, or any collaborators.