Learning the Lessons of History:
Getting the Most from a Field Staff-Powered
Contact History Instrument

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Abstract
The Census uses a Contact History Instrument (CHI)—a short survey completed by field representatives about each contact attempt—to aid fieldwork and track response rates during survey production. CHIs are a useful tool for improving efficiency and reducing costs. The New York City Housing and Neighborhood Study (NYCHANS) had adopted a somewhat longer CHI, employing skip and loop patterns for different types of contact attempts to maintain efficiency. Project staff used paradata collected through CHIs to assist with cooperation rate tracking, route cases based on propensity to respond, and to inform field strategies. Case-level data were published in concise and organized dashboards (HANStat) that Interviewers used during recruitment. The HANStat dashboards provided a clear and informative distillation of each case including case notes, current contact information, and detailed attempt history. Using a single, multipurpose CHI provided great value to the NYCHANS team. Our CHI and the HANStat proved to be flexible across different types of interviews. These tools proved to be invaluable given the relatively minimal cost and effort required to fill them out and update the dashboard.

Keywords: contact history instrument, paradata, respondent recruitment, field work

1. Background

Large survey operations often utilize paradata, or data about data collection, to support the allocation of resources and track progress. These data can also support future efforts, such as modeling propensity to respond and developing a framework for adaptive design. While it is easy for large scale survey research teams to make the collection and use of paradata a part of their field efforts, it may seem particularly challenging for small research teams to develop the necessary infrastructure for this additional level of data collection. This paper describes how our relatively small research team collected and used paradata through a simple, low-cost system to guide fieldwork throughout the data collection period of the New York City Housing and Neighborhood Study (NYCHANS).

We discuss the development of our Contact History Instrument (CHI) to generate paradata as well as a project-specific dashboard (HANStat) and secondary reports that were used to track production and inform operational decisions throughout the field period. This paper describes one system, which we found to be efficient in terms of time and cost. This system is flexible and easy to customize for different studies, and may

serve as a model for other small data collection efforts or organizations for how to collect, manage, and use paradata.

1.1 NYCHANS overview

The New York City Housing and Neighborhood Study (NYCHANS) is a randomized control trial that examines the impact of newly constructed affordable housing on the well-being of New York City residents that applied for this housing. It is a collaboration led by researchers at Teachers College Columbia University the New York City Department of Housing Preservation and Development (HPD) and was funded by the National Institutes of Health, the MacArthur Foundation, Doris Duke Charitable Foundation, WT Grant Foundation, and HUD.

The project follows about 2,500 households that applied to HPD's affordable housing lotteries, including about 1,000 that were offered affordable housing (the treatment group) and 1,500 that were eligible but not offered housing due to the overwhelming demand relative to supply (the control group). NYCHANS sites (n=13) include affordable housing developments in six different neighborhoods across three boroughs and include LEED and non-LEED certified developments as well as, mixed-income developments and those that contain only low-income affordable units.

The project's three- to five-year follow-up included face-to-face multi-modal interviews with treatment and control households (Goldstein et al., 2019). An earlier caseload of follow-up interviews focused on adult householders that had not applied to affordable housing with children. An overlapping later caseload of follow-up interviews included caregivers that applied with co-resident children. The goals of the follow-up interview were to assess differences in housing and neighborhood quality, financial stability, neighborhood safety, social context, physical and mental health, and health behaviors between households that were offered affordable housing and those that were not. During the latter caseload focused on caregivers and children, we expanded the scope of our data collection by adding objective health measures, including an actigraphy module where we invited a subset of caregivers and teens to wear an actigraphy device for one week before returning with it to our office so that we could access their step and sleep data.

All our data were collected in-house without the use of enterprise CAPI software. Our team, the Division of Research and Evaluation is part of a New York City government housing agency, the Department of Housing Preservation and Development. The size of our team varied over the course the fieldwork period for three- to five-year follow-up phase, but never comprised more than thirty office and field staff.

1.2 Motivation for the capture and use of paradata

The three- to five-year follow-up phase of NYCHANS necessitated a large and continuous field effort with many cases requiring multiple recruitment attempts, both face-to-face and via phone, before completing an interview. Our sample was difficult to reach for a number of reasons. They were primarily low-income households and many worked long hours, had multiple jobs, or did shift work making it difficult to find a time when they were home and available. There were other barriers particular to doing fieldwork in New York City, for example, buildings that were difficult to enter, units that were difficult to find, and cases that were spread far apart, some of which were accessible by subway, and others requiring a car (Goldstein & Jacobowitz, 2016). Given these challenges, it was especially important to maximize the efficiency and effectiveness of our fieldwork, using paradata.

2. Contact History Instrument (CHI)

2.1 What was the NYCHANS CHI?
The NYCHANS CHI, at its core, was a system of producing consistent field notes across interviewers and attempts. The CHI was a survey instrument built to capture a detailed array of information like the CHI currently used by the Census Bureau in their fieldwork. A typical CHI consisted of about 10-20 questions[1] about the contact attempt and took between two and three minutes to complete, depending on the type of contact attempt and how much new information about the case in question needed to be updated.

Basic information collected included date and time, Interviewers involved, mode, and outcome of each contact attempt. The CHI also asked Interviewers to list reasons for respondents' reluctance as well as strategies that were employed during recruitment. Interviewers also listed what study materials were left behind, and better times and modes to follow up with respondents. CHIs that were filled out after completed interviews included questions about which contacts within the household consented or assented to each module within the study.

The NYCHANS CHI was also used as a means of collecting and updating respondent contact information. In the course of fieldwork, Interviewers recorded updates to respondent contact information identified in the field, including names, phone numbers, addresses, and household composition.

2.2 How were CHI data captured?
The software environment that we used to capture and process CHI data was low-tech and inexpensive. The CHI was programed and completed using the same survey software that our main survey used (SurveyToGo®), meaning that there was no need to purchase an additional program or learn another programming language. Paradata were processed and cleaned using Stata®[2], a statistical package, and reports and dashboards were all created using Excel® and viewed using Adobe Reader®. In sum, no additional programming expertise or software beyond what our project had already made use of were required for capturing, processing, or using CHI paradata.

2.3 Who completed the CHI?
Field staff completed a CHI immediately after each recruitment attempt and for all other interactions with respondents including receiving returned mail, incoming calls, completed interviews, missed appointments, and address locating attempts. Though the CHI was designed and programmed to be as intuitive and user-friendly as possible, field interviewers were trained extensively on proper procedures for completing it.

2.4 Why use a CHI?
Using CHI data, as well data about which respondents were out of scope we were able to track and report on cooperation rates and response rates on an ongoing basis.

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[1] The NYCHANS CHI has a total of 220 questions, but utilized skip and loop patterns so it could be filled out quickly and only present questions that were relevant to the mode of contact and attempt type. For example, many of the questions that were asked in a CHI after a completed interview were skipped when filling out a CHI for a typical attempt at recruitment in the field, and vice-versa.

[2] Although Stata was our statistical package of choice for processing paradata, any statistical could have been used in its place.

Having access to a current set of data about who has and has not completed the survey, as well where these cases were located, allowed us to create logical and efficient routes for fieldwork. Many pieces of information from the CHI were used to optimize caseloads such as respondent reluctance, reported availability (time of day and day of week), days since last contact attempt, what modes of contact had or had not been used, and whether or not an address had yet been confirmed.

CHI data were also used to inform field strategies more generally. For example, we used CHI data to track which recruiters had more or less success scheduling appointments over the phone. We also used CHI data to guide the scheduling of fieldwork based on days and times that we found were most successful with respect to rates of reaching eligible respondents.

Our most novel use of CHI data was for the creation of Case-level fieldwork dashboards (HANStat) that were populated from a combination of sampling frame and CHI data.

3. HANStat

3.1 What was HANStat?
In addition to the more traditional uses of CHI paradata, like tracking progress and informing field strategies, NYCHANS also put CHI data into the hands of field staff HANStat dashboards to informed their strategies and insured that case-level knowledge was shared by all field staff, whether they had worked a particular case before or not.

The HANStat dashboard incorporated data from the sample frame as well as data collected through CHIs at each recruitment attempt (see figure 1). Data from the sample frame included names, birthdates and eligibility of household members, treatment or control group, and which questions would be asked in the survey,[3] paradata from CHIs used in HANStat included updates to contact information and household composition from our sample frame. A history of contact attempts was included in the HANStat as a table and as a graph. Data were presented in two formats to allow both high level understanding of a case's trajectory and a more detailed understanding of each attempt. The graph was a scatter plot of attempts where the X-axis was date and the Y-axis was time of day. The points were colored and shaded to show the contact mode and whether an eligible respondent was reached in the attempt. The graph presentation allowed Interviewers to glean a lot about a case's history from only a brief look at the HANStat. Attempt level data in table form had more details, including a description of the attempt (e.g. if a voicemail was left, or if an interview had been completed), the date and time of the attempt, the initials of the Interviewer(s) that made the attempt, the mode of contact (e.g. phone or face-to-face), whether or not contact was made, and the phone number or address where contact was attempted.

There was also a portion of the HANStat devoted to qualitative results of interactions with a respondent for a given case. This space contained up to five free-form field notes that Interviewers had written about the case. The HANStat contained personally

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[3] The Caregiver Interview took one of two possible paths. Both contained the same group of core questions as well as a set of questions that were unique to that path. This allowed us to ask more questions of our respondents over all, but to maintain a sufficient level of power for the questions that were most important.

identifiable information (PII) as well as case-relevant disposition information, but it did not contain any information from the survey itself.[4]

HANStat was formatted to fit all information for a given case on one page (see Figure 1) and the overall set of cases was published as a PDF 'book' with all or a subset of cases that could be searched by name, numeric identifier, etc. Field staff could access the dashboard on their project tablets in the field or on desktop computers in the office. We published HANStat in PDF format because we did not have the resources to build out a full user interface, though others could modify this approach if a more complicated interface were helpful for their fieldwork.

3.2 How was the dashboard created?
The process for creating HANStat was highly automated, but required human input at certain points. The steps to get from an updated CHI paradata dataset to HANStat were as follows: First, CHIs were filled out by Interviewers on an ongoing basis, as they engaged in fieldwork. Next, CHIs were uploaded to a server hosted by our survey software's website.[5] Once each day, a file containing data from all CHIs that had ever been uploaded was downloaded to our local server. A daily folder was set up for the updated data and a script was run in Stata® which cleaned and restructured those data so that they could be easily accessed for various purposes. One of these outputs was an Excel® worksheet that used formulas and macros to display data as a HANStat dashboard. After CHI data had been downloaded, cleaned, and output, an Interviewer opened the HANStat Excel® file and published the HANStat as a PDF. The PDF was then uploaded securely to project devices where it could be accessed by Interviewers who were in the field where they did not have access to the files on our server. In addition, Interviewers were able to filter and subset the HANStat Excel® output to create customized lists for use in the field. Interviewers found HANStat to be indispensable and felt confident and prepared during fieldwork because they had access to it.

3.3 Who used the dashboard and why?
HANStat could be used in several different ways by Interviewers, depending on the location and mode of contact. For example, when creating a list of cases to recruit in face-to-face fieldwork, Interviewers assembled a custom HANStat document containing a set of dashboards for the cases that they would visit that day. This made the creation and use of the HANStat simple and more efficient than using a full HANStat book, that is, one containing all released cases in the study. On the other hand, when field staff were in the office and received a call from a respondent it was ideal to have a full HANStat containing all cases so that they could quickly look up the caller by name or phone number and get acquainted with the case history without taking up to much of the respondent's time. When in the field or when recruiting by phone Interviewers generally

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[4] Cases were tracked in the CHI and HANStat using a study ID that was different from the ID attached to respondents' answers to the survey when they completed it. To ensure that survey data and CHI/HANStat data were kept separate, each person used a different account to view each type of information. In addition, Interviewers were required to open the CHI/HANStat on a separate tablet from the one they used to open the survey when a respondent agreed to participate and the interview began. As an additional precaution, CHIs (and surveys) were automatically uploaded to separate and secure locations and removed from the devices after they were filled out. This reduced the risk that anyone other than an Interviewer would see a respondent's answers and reduced that chance that the data would be lost.

[5] Once a project tablet was connected to the internet, the upload of all completed CHIs was automatic.

reviewed the HANStat before making an attempt at contact. Interviewers also reviewed HANStats while creating lists of households to reach out to and when planning routes for future fieldwork. The HANStat dashboard allowed Interviewers to share case-level knowledge quickly and consistently and made it possible for any Interviewer to work any case on a given day.

4. Adaptability of the CHI and HANStat

NYCHANS comprised multiple types of interviews, which necessitated collecting different data in the CHI and publishing different data in HANStat for Householder and Caregiver cases. The CHI and HANStat were created as flexible systems that could be adapted in a variety of ways to accommodate a range of survey types.

4.1 Consistent core content of CHI and HANStat
The majority of the content and the processing for CHI paradata and HANStat remained consistent throughout our field period. Most of the CHI data were equally relevant to both the Householder and Caregiver and Child caseloads and no questions were removed from the instrument at any point. Similarly, we did not remove any of the content from HANStat; all changes during our fieldwork period were additive. The sections of the CHI that were present in the Householder and Caregiver cases included basic information about the recruitment attempts, such as date, time, location and mode of contact; information about the result of the attempt such as whether contact was made, strategies used to recruit, reasons for reluctance, suggestions of better times to make contact, and languages spoken in the respondent's home; updates to contact information including addresses, phone numbers, and names. The Householder and Caregiver HANStats included basic information about that case such as treatment/control group, study site, and case disposition; information about each contact such as name, relationship, language spoken, and eligibility for the study. The Householder and Caregiver HANStats included a history of contact attempts in list and graph form and contact information (addresses and phone numbers).

4.2 Changes and adaptations to CHI and HANStat
We made a few substantial changes to the Householder HANStat as we began working the Caregiver and Child caseload of data collection (see Figure 2). As a first step, the CHI was expanded to capture more information about the households in our sample and their eligibility. We interviewed both children and caregivers in this later caseload so we needed to capture eligibility of children as well as adults in the household. Additionally, children might have been eligible for a shorter or longer interview as well as an actigraphy module, depending on their age. This necessitated capturing in CHI and adding to HANStat children's birthdates and current ages.

The CHI and HANStat were modified in several ways to integrate information from and for the actigraphy module that was included in the Caregiver and Child Interview but not for the Householder Interview. CHIs filled out after completed Caregiver and Child Interviews captured wristband size, color, and device number as well as appointment information about when the household would return to close out their actigraphy portion of the interview. Actigraphy closeout appointments also required their own path of questions in the CHI where Interviewers recorded whether a device had been returned, if there were data that we downloaded and what type of incentive the respondent chose for completing this module. Much of this information was also added to the HANStat, which

allowed Interviewers to keep track of device numbers before and during actigraphy closeout as well as what parts of the study each household had completed.

Other functional adjustments to the HANStat included adding a space for qualitative notes about each case, increasing the number of attempts captured and orienting the layout of the HANStat to landscape from portrait. These changes required some reworking for the Excel® part of the HANStat publishing process but did not require any changes to the CHI.

During the course of fieldwork we changed our protocol to publish a separate HANStat for each of our study sites rather than a single HANStat for all cases across all sites. This change was made in response to limits in computing power that made publishing a single HANStat of all cases impossible.
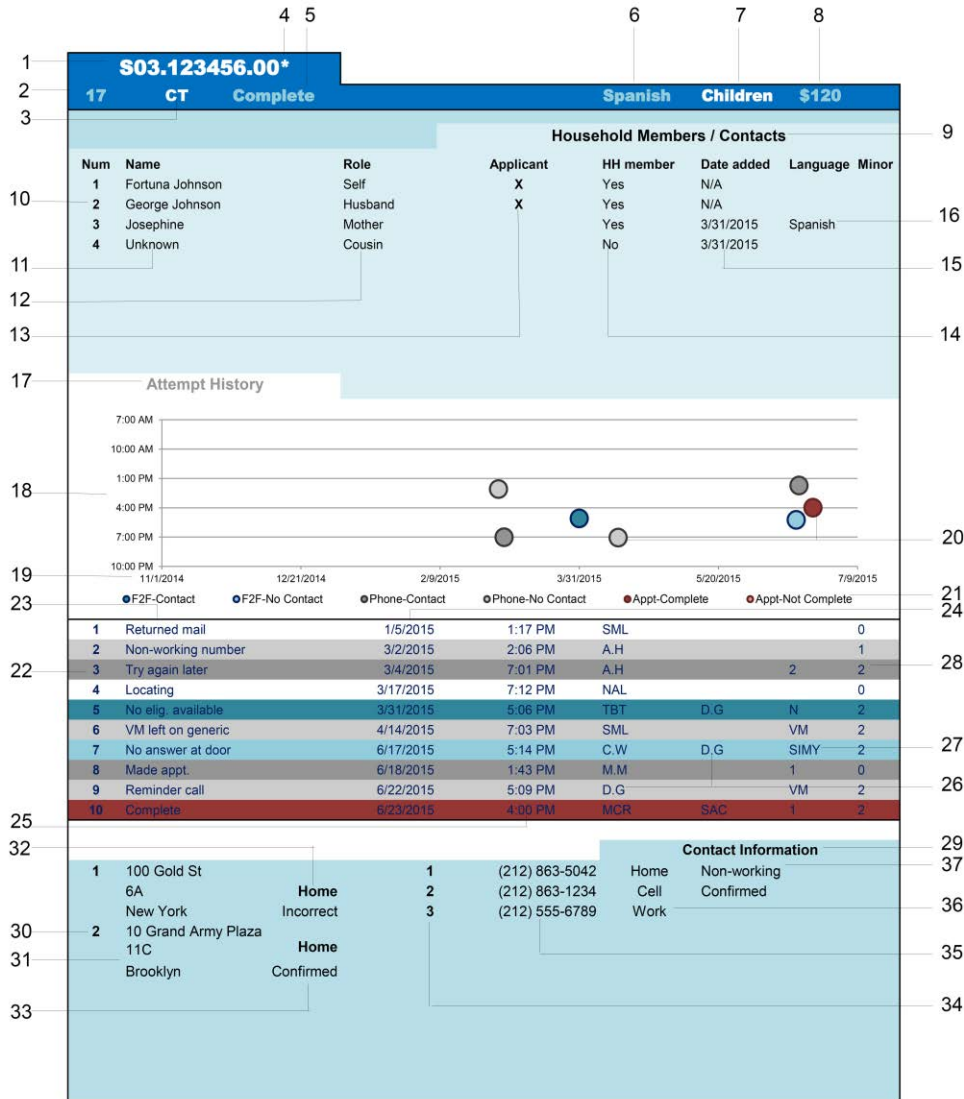
5. Conclusion

Our CHI and the HANStat dashboard proved to be an effective, low-tech solution to many of the barriers and problems associated with the collection and use of paradata. Using the CHI, all Interviewers recorded field notes in a consistent manner and had access to these notes so communication about cases was not a problem when conducting fieldwork. We were able to capture many other data using the CHI so that everything we needed for tracking and reporting purposes was in one place.

The scope of data captured by the NYCHANS CHI was largely similar to what the Census' CHI captures, for example, mode of contact attempted, data and time of contact, whether an interview was conducted and if not, any reasons why, and what strategies were employed during recruitment (Virgile, 2016). With respect to the use of CHI data, our study employed strategies that have proven useful to others, for example, tracking and monitoring of progress (Kreuter, Couper, & Lberg, 2010). We also tracked completed surveys and the success our recruiters had using different field strategies while field work was ongoing. Safir & Tan (2009) analyzed CHI data to determine an ideal number of contact attempts that could use to maximize efficiency in future survey efforts. We also used attempt histories to inform future strategies, for example, by conducting analyses of what days of the week and times of day were best for reaching eligible respondents during fieldwork. CHI data have proven helpful in other ways, for example Dixon (2012) used "reasons for reluctance" data from the CHI of the Current Population Survey (CPS) as part of the creation of non-response weights, which helped reduce non-response bias of that survey after data collection had been completed. The area where our use of CHI data was most innovative was in putting these data in the hands of our field interviewers. This allowed more people to be involved in deciding how to approach cases, importantly including the field staff that made these attempts at recruitment.

The NYCHANS paradata infrastructure proved to be an indispensable piece of our study. The NYCHANS CHI was low-cost, in terms of both time and money. It had a high utility and served a variety of functions: as a way to ensure that all Interviewers recorded field notes in a consistent manner, a way to capture and update respondent contact information, and as a tool to record all necessary data that were used for fieldwork tracking purposes. The HANStat put all current and relevant information about any given case at the disposal of any Interviewer that attempted to recruit that case. In a single page, it conveyed to an Interviewer everything they needed to know about a case before making an attempt. The production of HANStat was highly automated and, like the NYCHANS

CHI, had a high utility that came at a very low cost. Both the HANStat and CHI are flexible and could be accessed on computers in the office or on project tablets when in the field, precluding the need for paper and ameliorating the risk of unintentional disclosure of respondent PII during fieldwork.

The CHI and HANStat were changed to meet the needs of distinct caseloads with different interviews and interview protocols without undue effort on the part of our research team and we believe this system could be easily adapted for use in other studies and surveys. As a small research team doing our own data collection, finding a manageable and inexpensive way to handle paradata was important for our study. The system we created was effective and benefited many aspects of our fieldwork. Other research teams, even small ones, may benefit from using a system like ours to integrate paradata into their field strategy.

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17	CT	Complete			Spanish	Children	$120

Household Members / Contacts

Num	Name	Role	Applicant	HH member	Date added	Language	Minor
1	Fortuna Johnson	Self	X	Yes	N/A		
2	George Johnson	Husband	X	Yes	N/A		
3	Josephine	Mother		Yes	3/31/2015	Spanish	
4	Unknown	Cousin		No	3/31/2015		

Attempt History

(Graph: Time of Attempt vs Date of Attempt)

Y-axis: 7:00 AM, 10:00 AM, 1:00 PM, 4:00 PM, 7:00 PM, 10:00 PM
X-axis: 11/1/2014, 12/21/2014, 2/9/2015, 3/31/2015, 5/20/2015, 7/9/2015

Legend: ● F2F-Contact ○ F2F-No Contact ● Phone-Contact ○ Phone-No Contact ● Appt-Complete ● Appt-Not Complete

1	Returned mail	1/5/2015	1:17 PM	SML			0
2	Non-working number	3/2/2015	2:06 PM	A.H			1
3	Try again later	3/4/2015	7:01 PM	A.H		2	2
4	Locating	3/17/2015	7:12 PM	NAL			0
5	No elig. available	3/31/2015	5:06 PM	TBT	D.G	N	2
6	VM left on generic	4/14/2015	7:03 PM	SML		VM	2
7	No answer at door	6/17/2015	5:14 PM	C.W	D.G	SIMY	2
8	Made appt.	6/18/2015	1:43 PM	M.M		1	0
9	Reminder call	6/22/2015	5:09 PM	D.G		VM	2
10	Complete	6/23/2015	4:00 PM	MCR	SAC	1	2

Contact Information

	Address			Phone		
1	100 Gold St, 6A, New York	**Home** Incorrect	1	(212) 863-5042	Home	Non-working
			2	(212) 863-1234	Cell	Confirmed
2	10 Grand Army Plaza, 11C, Brooklyn	**Home** Confirmed	3	(212) 555-6789	Work	

1 Study ID (SID)	14 Individual lives with applicant	26 Interviewer Initials (1 and 2)
2 Study Site	15 Date contact was added to HANStat	27 Contact / Materials Detail
3 Group Assignment	16 Language spoken by contact	28 Phone / Address Attempted
4 Has a Locating Report	17 Attempt History Tab	29 Contact Information Tab
5 Case Status	18 Time of Attempt (Graph)	30 Address Index Number
6 Household Language	19 Date of Attempt (Graph)	31 Street Address/Unit Number
7 Household has Children	20 Attempt by Status (Graph)	32 Address Type
8 Incentive Offered	21 Legend (Color Coding for Status)	33 Status of Address
9 Household Composition Tab	22 Attempt Number	34 Phone Index Number
10 Contact Number	23 Disposition of Each Attempt	35 Phone Number
11 Contact Name	24 Date of Each Attempt	36 Phone Type
12 Relationship to Primary Applicant	25 Time of Each Attempt	37 Status and Phone Number
13 On Original Application (Eligible)		

Figure 1: Example HANStat Dashboard

Figure 2: Example HANStat Dashboard for the Caregiver and Child Interview
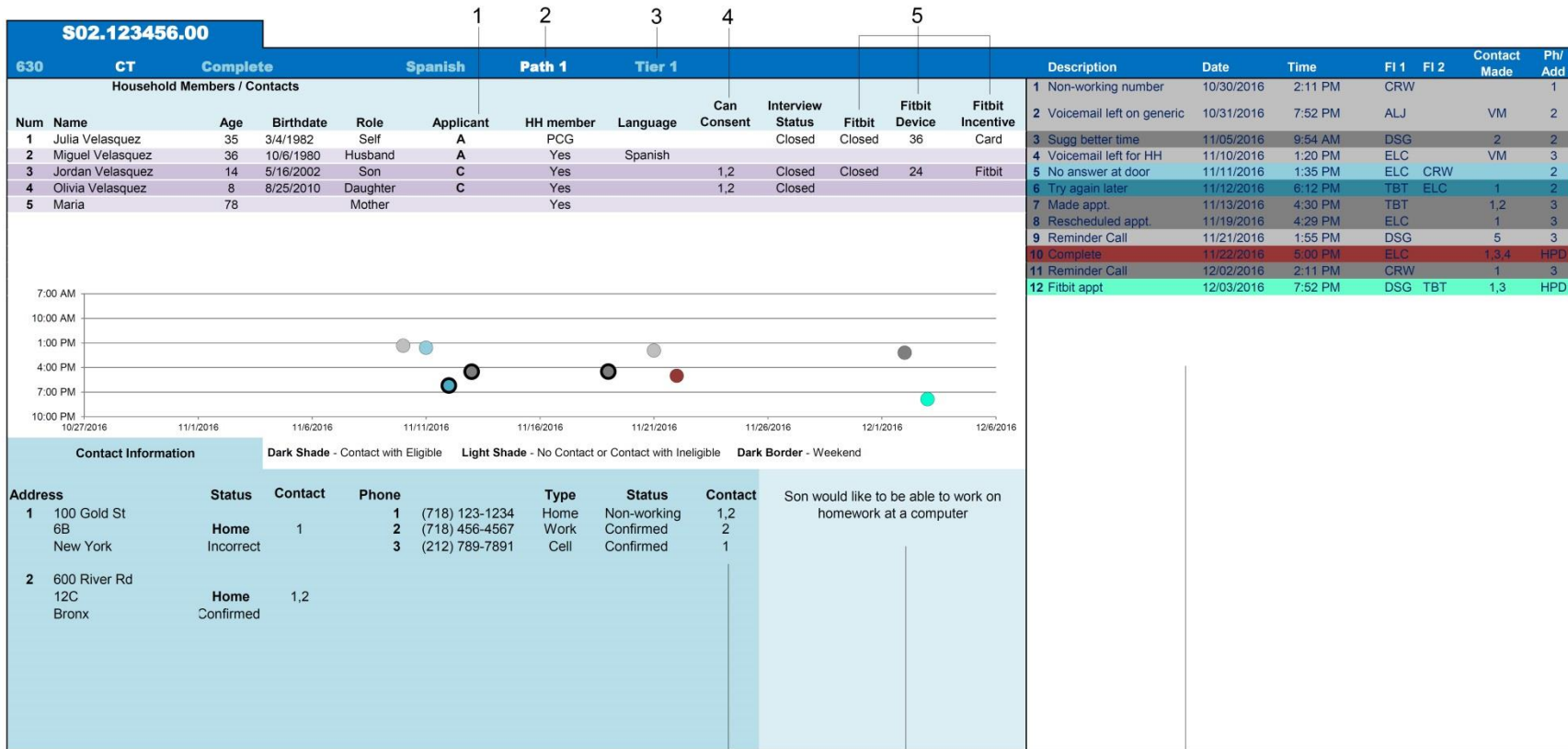
1 Who is Eligible (Adults and Children)   4 Which Adults Can Consent For This Child   7 Qualitative Field Notes

2 Which Set of Questions are Asked   5 Actigraphy Device and Closeout Status   8 Expanded Field Notes Section

3 Incentive Amount (Tier 1 = $120)   6 Which Contact(s) Use Each Phone Number

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