



ICTPH Pre – Clinic Launch Enrolment Process:

Deploying a Mobile Phone-based Data Collection Tool in Rural Tamil Nadu

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Introduction

IKP Centre for Technologies in Public Health (ICTPH, 2011) is a not-for-profit research organisation with its mission to design inclusive health-systems for remote rural populations, ensuring accessibility and affordability. With its on-ground partner SughaVazhvu (SughaVazhvu, 2011), ICTPH is piloting a technology-enabled comprehensive primary healthcare delivery model in rural Thanjavur in Tamil Nadu. Each of our pilots, referred to as a Rural Micro Health Centre (RMHC), caters to a catchment population of about 10,000 people in a radius of 3-4 km.

There is the need for an enrolment process preceding the launch of an RMHC, for the identification and tracking of the population served. This paper details the pre-launch enrolment exercise, where local staff, recruited temporarily, distributed a unique household ID card to every household in the identified catchment and collected demographic information such as the name, age and gender of each family member, and the lat-long co-ordinates of the household using a smart phone running Android OS and a data-collection tool called ODK Collect.

The Context

To understand the context of the enrolment process, it is important to understand the ICTPH Health Systems Model (Johar, 2010) where the RMHCs anchor multiple functions, focussed on the *wellness* of the *community*. Crucial to this approach comprising preventive screening, curative, and community and clinic-based intervention components, is the knowledge of the communities it works in. Provisioning customised services to the rural population encompasses multiple complexities, and essential for the work at hand is a clear demographic understanding of the target geography. The problems the mobile enrolment exercise tries to solve are:

- 1. Mapping of population served:** Accurately mapping the households in the catchment and understanding their geographical distribution in relation to the RMHC.
- 2. Accurate identification and trackability:** Identifying the patient (and her household) when she visits the RMHC seeking care so that electronic health records are mapped to the right individual. Previously, creation of the household database was based on some data on the catchment area captured manually as a one-time exercise. This served as the seed data from which our database would organically grow. However we encountered difficulty, not the least in searching for and correctly identifying the individual on the database, given the lack of standardisation of addresses and the existence of multiple individuals by the same name in same hamlet. Local names could be spelt in a variety of ways, which often resulted in incomplete and incorrect search results. The introduction of a phonetic search function though mitigated this problem to a certain extent, was not completely error-free and was still considerably time-consuming. Tracking a patient's episodes through time is essential to our model, and these difficulties pressed the need for a system of unique identification of individuals.
- 3. Community outreach activities:** Enabling our community outreach activities with accurate location information of our target populations. Geo-tagged information will also facilitate distance-optimisation in the allocation of households to the Health Extension Worker, maximising productivity.

4. Landscape epidemiology: Building a strong landscape-epidemiological database by accurately correlating geographies with disease determinants, and studying care-seeking behaviour and disease occurrence patterns in their geographical context. At a population level, this data provides valuable insights into the epidemiological statistics of the population being served, which is crucial for a preventive-promotive approach to healthcare. The geo-tagged information would enable the mapping of disease incidence in the catchment area, identification key drivers and trends, the local aetiology of vector-borne infections and targeting community based interventions based on this. For example, high incidence of diarrhoea in a certain geography might call for the implementation of a water quality intervention.

The Enrolment Process

Launching a new RMHC at Andipatti village, Thanjavur district, the solution consisted of recruiting temporary local staff to perform an enrolment exercise, that included distributing a household ID card, to over 3000 households in the identified catchment and collecting information such as name, age and gender of each of the family members, and the GPS co-ordinates of the household using a smart phone.

The complete Enrolment process is laid out in this paper, beginning with the preparation – (tool selection, mapping of the catchment area, recruitment and training of personnel); roll-out – (execution, monitoring, auditing), and the evaluation of the project.

PREPARATION

1. Technology Platform

In designing the enrolment project it was important to have in mind the alignment of the other processes. The enrolment data was to act as the seed data for other processes such the Population-based Individual Screening Protocol (Johar, 2011), clinic visits, follow-up visits, etc.

A range of technology platforms were evaluated before deciding upon Open Data Kit (ODK). ODK presented us with the following advantages:

1. Allows the setting up of own server
2. Ease and elegance of form building (X-forms) - logic building, grouping, etc.
3. No cap on the number of form submissions
4. Allows to capture a range of features like barcode, GPS coordinates
5. Standardisation with Android touch screen phones
6. OpenSource

The mobile phone selected for this exercise was the Samsung Galaxy Pop running Android v2.1 OS, each costing about Rs 8500. A GPRS connection, costing Rs 99 per month, was enabled on each of the phones. At the backend, we used ODK's in-built integration with Google Fusion Tables to aggregate all the information. This was then linked to the database of ICTPH's home-grown Health Management Information System (HMIS) (Rajanna, 2010). The specifics of ODK and the integration with the HMIS are detailed in a Technical Note presented in **Annexure 1**.

2. Defining Enrolment Parameters

Through the Enrolment exercise, 10 Enrolment Officers, audited daily by 2 Field Supervisors, covered over 3000 households in the catchment area. It was essential to define the enrolment parameters prior to the Enrolment:

Household

The unit of enrolment was the household. Every household would receive a unique bar-coded ID card. For the purpose of enrolment, we defined a household as *distinct from a family*. We used the (Government of India Census, 1971) definition of a household as “a group of persons who commonly live together and would take their meals from a common kitchen unless the exigencies of work prevented any of them from doing so”. There could be 2 or more socially connected groups cooking from different hearths, but staying in the same house or boundaries in which case they are considered as 2 different households. This approach allows the households to use the Household Enrolment ID card more effectively.

Household respondent:

In order that the data collected be accurate, it is important to define clear criteria for a respondent. A household respondent is defined as someone from the household who can represent all the household members. To give it a more objective definition the following criteria were followed:

- He/she should be above the age of 18
- He/she should be integral part of the household
- He/she should not be a guest

Catchment area:

In order to lay out the scope of the Enrolment, the catchment area was defined as population patches within a 4 km radius of the RMHC. This area would normally be expected to have 10000-15000 individuals.

3. Human Resource Design

The surveyors were to be locally hired *Enrolment Officers* (EOs) from the catchment area. They were commissioned for the duration of the enrolment project. They were typically youth with a minimum of Higher Secondary (Plus-Two Level) Education.

The EOs would report to *Field Supervisors* who were responsible for all technical support and field-based troubleshooting. The field supervisors were permanent staff of SughaVazhvu and also each played the role of an Enrolment Officer during the pilot enrolment conducted in the isolated villages.

A *Normaliser* would play the vital role of covering any remaining isolated population patches where EO allocation would not add any value because of the distance. i.e. a normaliser would work in a hamlet of typically 10-150 households whereas an EO would cover an area of 150-250 households. Unlike an EO who would serially enrol households throughout the day, a normaliser would be expected to travel different geographies to cover all small patches.

The Field Supervisors would also play the role of auditors for quality control. It was their responsibility to administer an audit questionnaire to a sample population, which would be compared with the data collected by the Enrolment Officers to audit the quality of the Enrolment exercise.

4. Enrolment kit

A kit was prepared to be sent with each enrolment officer. This Enrolment Kit consisted of:

1. Laminated printout of the Enrolment Protocol
2. Laminated printout of age and date of birth chart
3. Training manual
4. Specially designed jacket and bag
5. Samsung Galaxy pop mobile phone
6. Bar coded ID cards.

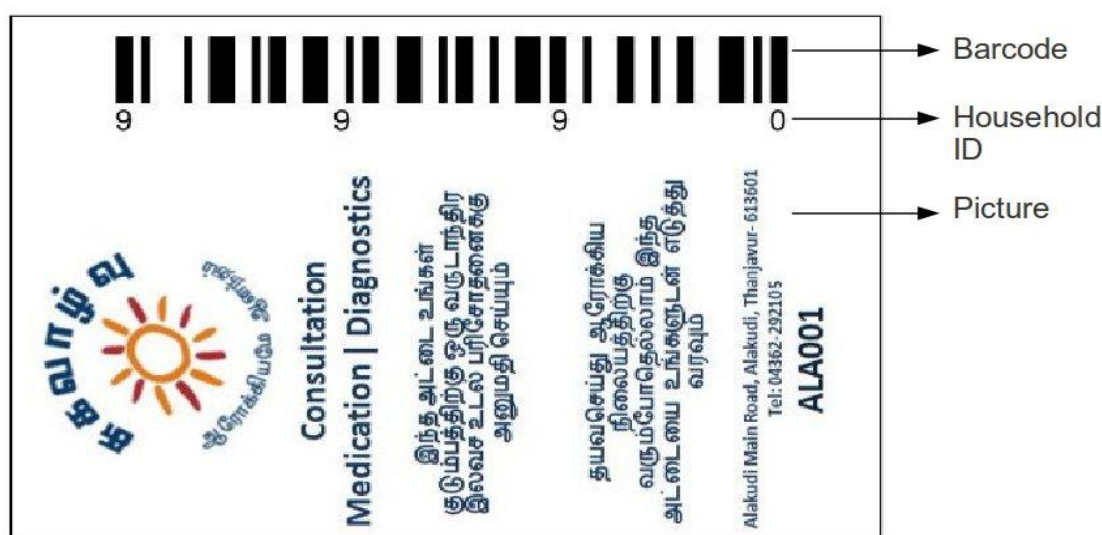


Figure 1: Household ID Card Format

The ID card consists of three parts

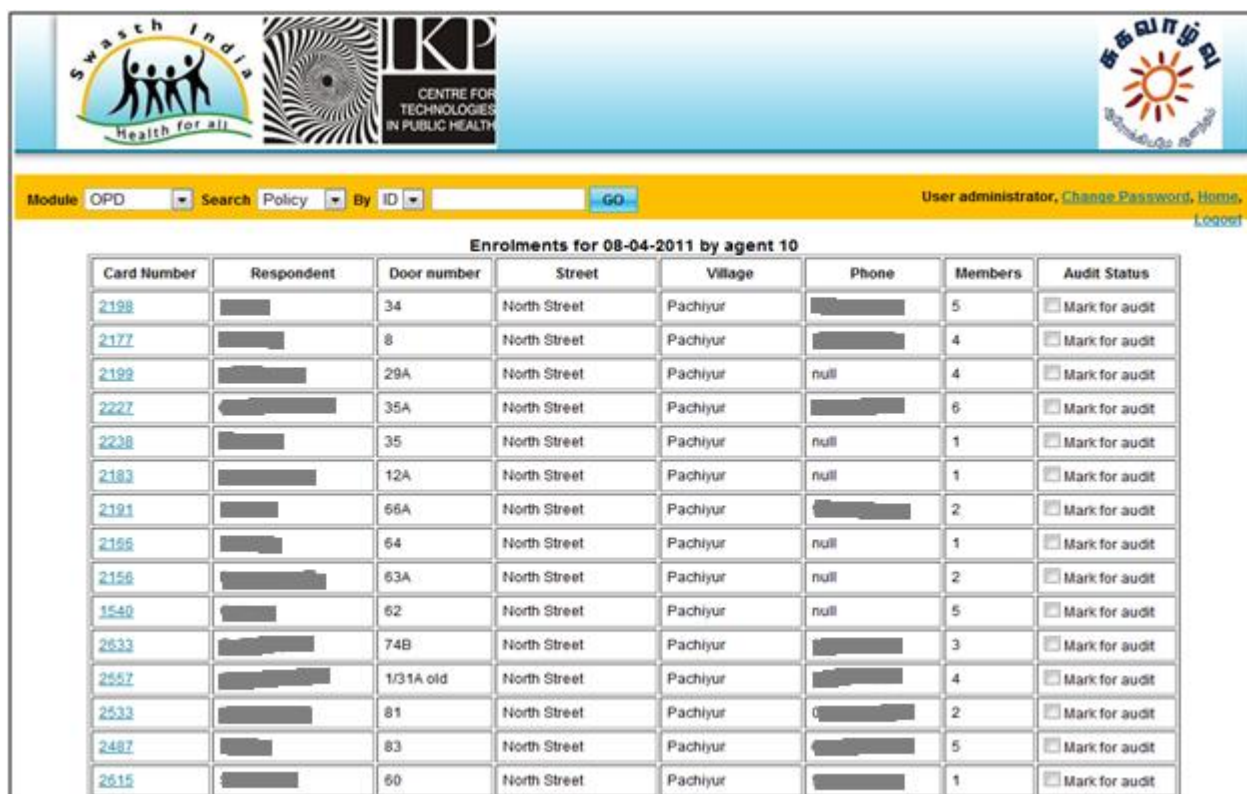
1. Household ID: Is a running 4 digit number randomly allocated to households at the time of the enrolment process. Since an RMHC caters to a population of about 3000 households, a 4-digit number suffices.
2. Barcode: The household number is also encoded as a barcode on the ID card. The symbology used was code 128 A, because it was found to be optimal for use with a low resolution camera that comes installed in mobile devices.
3. Picture: All the textual information contained in the ID card was saved as a picture in order to preserve formatting during the printing process.

The ID card contains the address of the RMHC and also mentions the services offered there.

5. Audit Design

Daily audits would be made to ensure quality of data collected by the enrolment officers. A printed sheet would be given to the field supervisors every day which consisted of audit parameters of data collected the previous day. These households for audit were picked either

randomly with a back-end platform or using the GPS maps in case of any discrepancy in the map.



Card Number	Respondent	Door number	Street	Village	Phone	Members	Audit Status
2198		34	North Street	Pachiyur		5	<input type="checkbox"/> Mark for audit
2177		8	North Street	Pachiyur		4	<input type="checkbox"/> Mark for audit
2199		29A	North Street	Pachiyur	null	4	<input type="checkbox"/> Mark for audit
2227		35A	North Street	Pachiyur		6	<input type="checkbox"/> Mark for audit
2238		35	North Street	Pachiyur	null	1	<input type="checkbox"/> Mark for audit
2183		12A	North Street	Pachiyur	null	1	<input type="checkbox"/> Mark for audit
2191		66A	North Street	Pachiyur		2	<input type="checkbox"/> Mark for audit
2166		64	North Street	Pachiyur	null	1	<input type="checkbox"/> Mark for audit
2156		63A	North Street	Pachiyur	null	2	<input type="checkbox"/> Mark for audit
1540		62	North Street	Pachiyur	null	5	<input type="checkbox"/> Mark for audit
2633		74B	North Street	Pachiyur		3	<input type="checkbox"/> Mark for audit
2657		1/31A old	North Street	Pachiyur		4	<input type="checkbox"/> Mark for audit
2633		81	North Street	Pachiyur		2	<input type="checkbox"/> Mark for audit
2487		83	North Street	Pachiyur		5	<input type="checkbox"/> Mark for audit
2615		60	North Street	Pachiyur		1	<input type="checkbox"/> Mark for audit

Figure 2: Daily Enrolments by Agent with a provision to mark for Audit

The Audit Questionnaire is contained in **Annexure 2**.

6. Monitoring and Evaluation Design

Monitoring and evaluation are integral to ensuring the accuracy and reliability of the data, and were done in the following ways:

GPS maps: Daily check on the GPS map allows monitoring of the entries real-time. Each enrolment officer would be marked separately on the map to monitor any overlaps in allocated area, overcrowding of GPS tags from one location or a household etc.

Audit results: The audit results would allow us to give constructive feedback to the enrolment officers both on the quality of the data and other subjective parameters.

Real-time fetching: Real time fetching of data to our server allows monitoring performance of the EOs against their individual targets.

As part of the data collection exercise we realised the need for tracking the progress real-time and for monitoring the quality of data being sent up to the servers. A dedicated dashboard was built in the HMIS to track the data collection.

Mobile Data Collection Dashboard	
Message:	
Collection Statistics	Agent-wise collection statistics Village-wise completion statistics Agent enrolment count table
Date and Time Analysis	Aggregated date-wise collection statistics Agent code: <input type="text" value="4"/> <input type="button" value="Date-wise stats for agent"/> Time-of-day completion statistics Agent code: <input type="text" value="6"/> <input type="button" value="Time-wise stats for agent"/> Progress against plan
Administration	Agent code: <input type="text" value="1"/> <input type="button" value="Synchronize data for agent"/> Agent code: <input type="text" value="1"/> Date: <input type="text"/> <input type="button" value="Select data for audit"/> Card number: <input type="text"/> <input type="button" value="Edit Enrolment"/> Pending audits
Synchronization	Household data file: <input type="text"/> <input type="button" value="Browse..."/> Individual data file: <input type="text"/> <input type="button" value="Browse..."/> <input type="button" value="Upload"/>

Figure 3: A dedicated dashboard was built into the HMIS to enable the project manager to detect any process flaws and correct them quickly.

Annexure 3 shows the various modes of feedback that the dashboard was designed to provide.

PROCESS FLOW

1. Catchment mapping

We had no satellite map of Andipatti available to us, and this threw the challenge of identifying the villages and population patches in the catchment area from limited resources. Block Development Offices (BDOs) and Taluka Office have basic block level maps of village Panchayats in the block¹. This is a good starting point to broadly decide on the villages that fall under the catchment area.

The next step was to create a detailed catchment area map by physically identifying all population patches within a 4 km radius area of the RMHC. A tracking software <http://mytracks.appspot.com/> on an Android phone was used to draw route trails and locate points in all the population patches. Small isolated patches of as small as 20 households' size were also GPS mapped and named in this exercise.

Street Mapping

Once a detailed population patch map was ready, the next step was to identify all the streets in the various villages. Identification of streets is a very important step in order to pre-populate the list of street names in the ODK form and assign each to the respective village. This eliminates the possibility of spelling errors and also reduces time spent in entering the address.

¹ See <http://www.indiadevelopmentblog.com/2008/04/one-small-step-closer-to-englightenment.html> for details of the system of local self government in India and its administrative boundaries. Retrieved July 2011.

The street information was collected from different resources like village Panchayat offices, village post offices, and local resource persons. These street names were verified by physically visiting the places. A printed sheet was given to the field coordinators to capture basic village information.

Population size and area allocation

Knowing the population of each village or population patch is important to allocate human resources to carry out the enrolment. The size of the population was collected from Census 2001 register provided by the village offices of the Panchayat. This information was used to identify unique clusters of households that would determine the number of enrolment officers. Logical boundaries were drawn so that enrolment officers do not have overlaps in their allocated areas. . A geographical boundary in this context is defined any uninhabited patch like river, road, field etc. which demarcates one allocated group of population with another.

In the case of Andipatti the villages were classified as either 1 EO per village (usually 200 household size) or 2 EOs per village (usually 400 household size). In case of 2 EOs per village size the village is demarcated by a geographical boundary as given below.

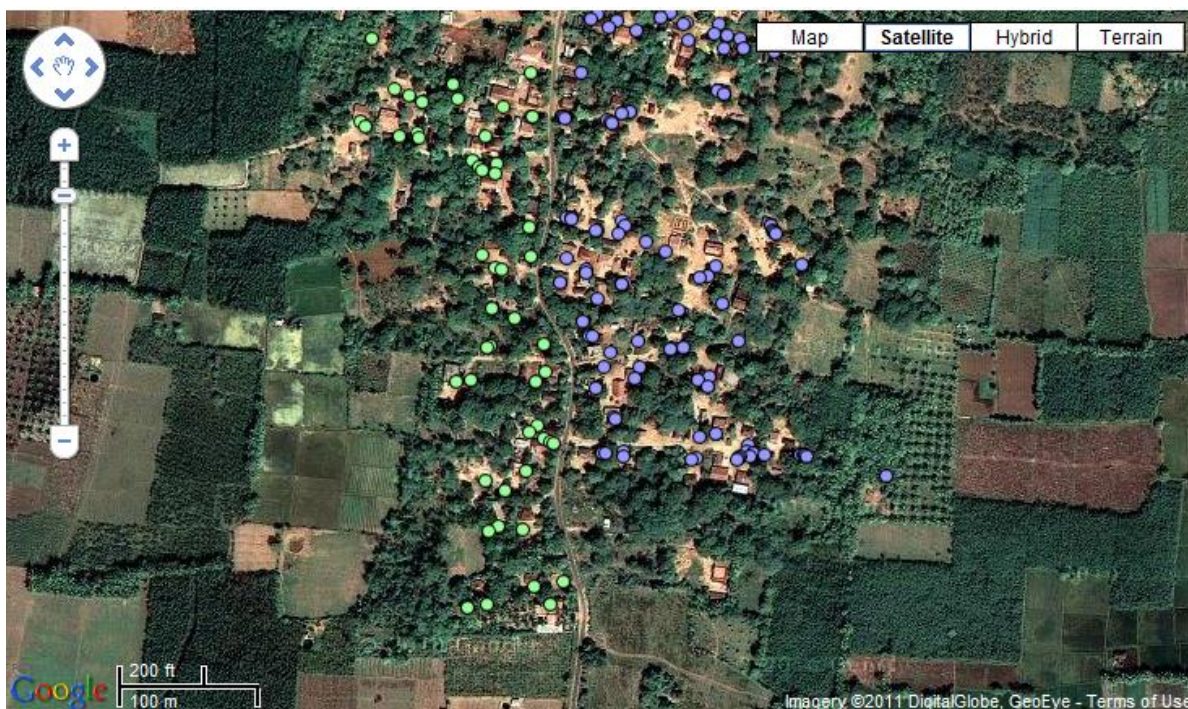


Figure 4: The above given Google map shows a sample village (Pachiyur) from the Andipatti Enrolment project where geographically demarcated areas are marked in different coloured dots. The green dots represent GPS coordinates of households captured by one particular EO whereas blue dots represent another EO. In this case the road dividing the village into two halves acts as an ideal geographical boundary.

2. Recruitment and training:

Using ads in local newspapers and announcements in the village, we recruited 10 enrolment officers. Since many of the enrolment officers were not used to smart-phones we trained them on using the new devices by performing supervised mock-enrolments with each other. The training

also included soft-skills orientation in order to ensure uniformity in the messaging when the officer communicates with the catchment population.

The Recruitment and Training is given in detail in **Annexure 4**.

3. Testing

The entire enrolment comprised of 3 phases- Pilot, Phases I & II. The first was an internal pilot where future Field Supervisors played the role of Enrolment Officers where they got to know the entire process to enable them to supervise the Enrolment Officers better. This pilot covered only small isolated population patches (each of population of about 44 households) were covered. Isolated population patches were chosen to get operational insights without intimidating a larger community. The goal was to successfully complete the entry of at least 120 HHs in 3 days' time.

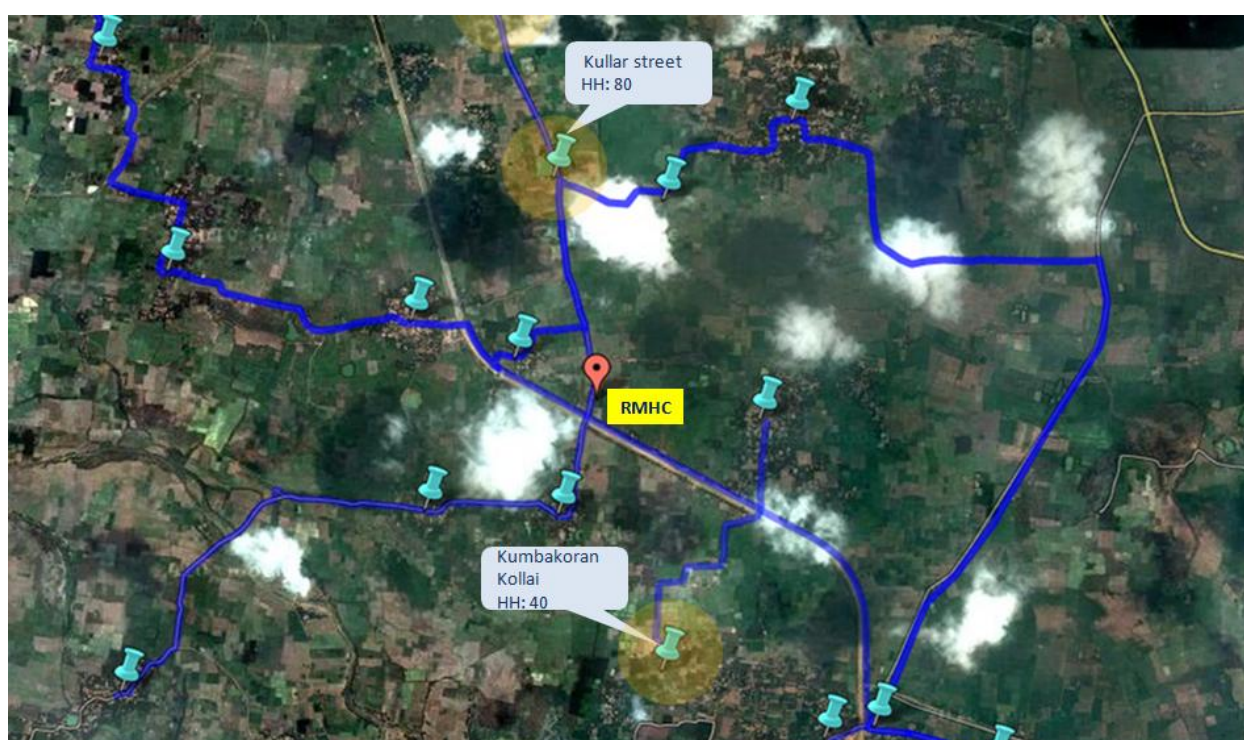


Figure 5: The diagram shows the Satellite map merged with GPS coordinates of different isolated population patches considered during the internal pilot. The yellow circle indicates an area of radius 0.5 km.

4. Roll-Out

We adopted a two-phased approach to the Enrolment process in order to organically induct Field Supervisors on project management and technical trouble shooting. In Phase 1 only a radius of 1.5 km from the RMHC was covered whereas in Phase 2 the remaining radius of 1.5 - 3 km was covered.



Figure 6: The diagram shows the Satellite map merged with GPS coordinates of different population patches covered in the Phase 1 and 2. The yellow region indicates an area of radius 1.5 km. covered in Phase 1 and the red region indicates the area covered during the Phase 2.

Technical support and field supervision

The field supervisors were responsible for providing technical support to the enrolment officers. The EOs reported to them twice a day. The first reporting would be at 9:30 am where the EOs would collect the charged mobile phones and ID cards and communication materials for the day. The second reporting would be at 5:30 pm when the enrolment officers would hand over the phone to the field supervisors for manual Wi-Fi fetching (In case the data is not sent via GPRS. As per our experience 20% of the total data required manual syncing) data fetching and have them charged and ready for the next day.

Targets and compensation

There is no existing benchmark as such for the compensation for this kind of role and varies highly depending on the geographies. We looked at the NREGA (National Rural Employment Guarantee Act)² rates of Rs.150/- per day as a comparable standard, and assumed a minimum of 10 household enrolments a day at the rate of Rs.15/- per enrolment.

We incentivised the enrolment officers using 2 pay buckets:

1. 10-15 households would fetch Rs.15/- per household enrolment
2. 16 and more households would fetch Rs.20/- per household enrolment

² <http://nrega.nic.in/netnrega/home.aspx>

The difference between the two buckets was incentive enough to motivate the enrolment officers to strive to be part of the second bucket. Within a quick span of time the enrolment officers started completing an average of around 30 household enrolments per day which earned them around Rs.450/- per day on average.

Annexure 4 contains the MoU signed with the EOs, containing terms and conditions related to minimum targets, compensation, hardware ownership, reporting and training structure, in order to bring transparency into the process.

Monitoring and evaluation

GPS based feedback

At the backend, ODK was integrated with Google Fusion Tables so that all the data collected was monitored real-time. The dashboard captured the relative performance of each of the officers and also helped review the quality of the captured data. Mapping the GPS coordinates collected by enrolment was a good way visually monitoring the enrolment process on a daily basis. Mapping the enrolment information on to a real-time map also ensured that no officers strayed outside their own allocated boundaries.

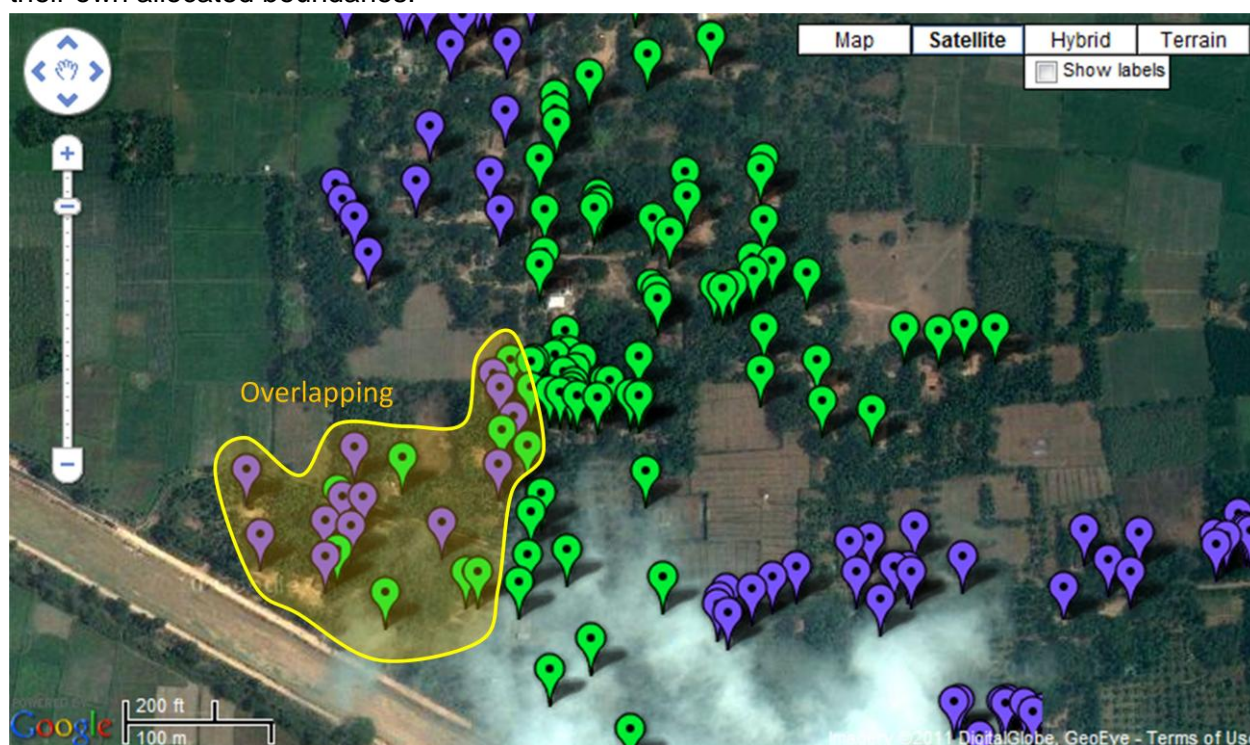


Figure 7: The green and blue markers represent two different enrolment officers who were allocated two sides of the same village (Karrukkadipatti) where the geographical separator is the main street. GPS monitoring enabled identifying and rectifying the overlap immediately.

Risk Audit

A small portion of the previous day's enrolments - about 5% - were selected for a daily audit that was performed by the field supervisors. The audit questionnaire was designed to catch any falsification of data and also to ensure that the officers were courteous.

Weekly feedback and Payouts

The enrolment officers were given weekly feedback, sharing the result of the enrolment done during the week. Sharing of GPS maps of the household enrolled, targets and enrolment progress, weekly consolidation of the audit results etc. would be a part of the feedback session. A graphical representation of the comparison between different enrolment officers in the payout sheet built a culture of healthy competition both in terms of quantity and quality of the data collection. **(Annexure 6)**

OUTCOMES AND PROJECT EVALUATION

Andipatti Summary

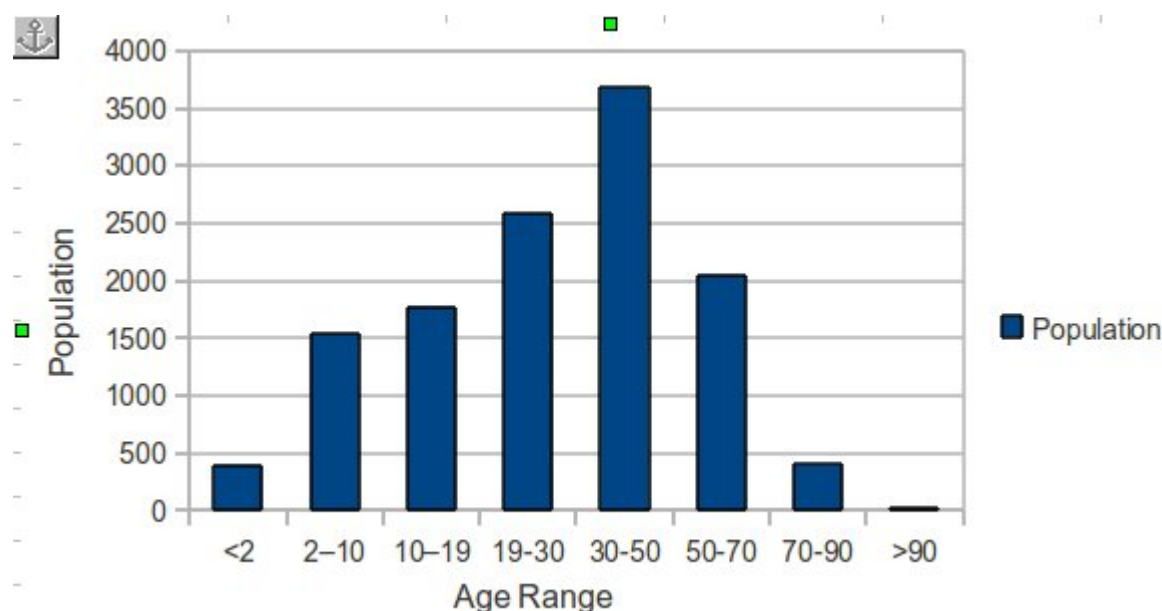


Figure 8: An Age-breakdown of the enrolled Andipatti population

Total number of individuals in the catchment area: 12,435

Males: 6196

Females: 6218

Such demographic information would enable us in targeting our specific interventions at the relevant sub-population:

Cardio Vascular Disease Intervention (age range 35-64): 4,206

Sprinkles Infant Nutritional Supplementation (infants 0-24 months): 403

Cervical Cancer (Females in the age range 30-50 yrs): 1,833

The GPS data collected during enrolment also helps understand the effect of distance on patient traffic:

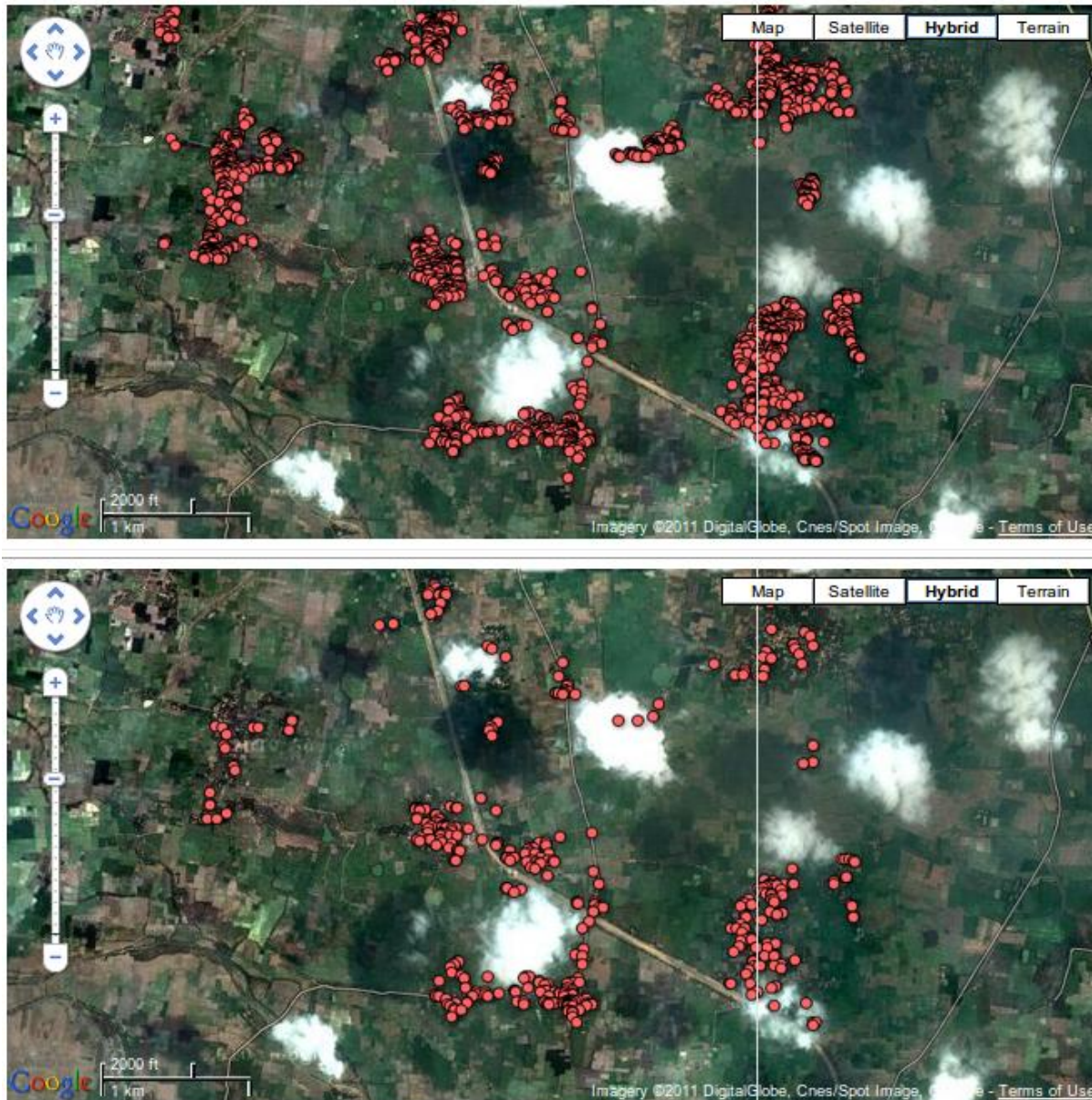


Figure 9: The map on the top shows all the households mapped in the Andipatti enrolment exercise, and the one below shows all of those households that have made at least one visit to the RMHC.

51 of the 102 households we mapped in Andipatti village – which is 50% - had sought our services in the first month of the clinic's operations. As we go further out Mudalipatti and Athanangkottai are at 30% and 20% respectively. On the other end of the spectrum are Chellampatti and Pachiyur, both of which are far out on the north-west corner of the visible map; no one from the 250-odd households we registered had come to our RMHC.

Progress mapping

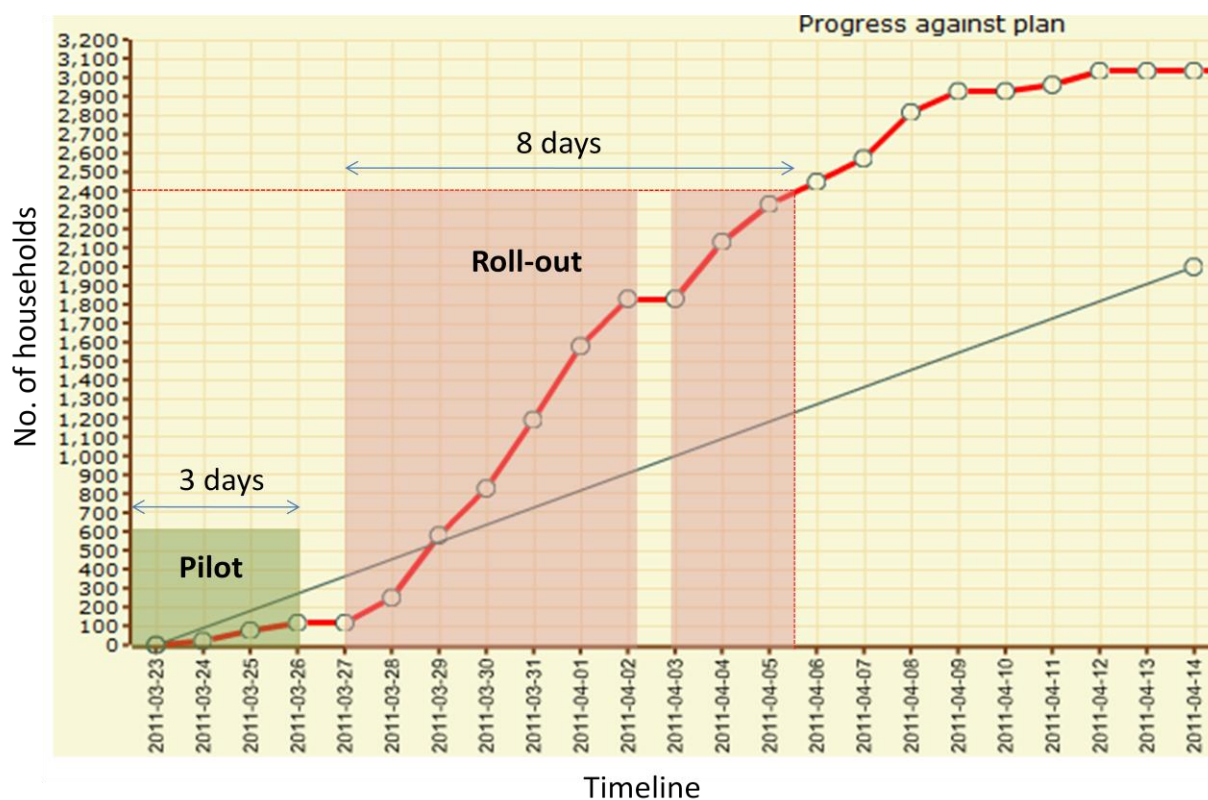


Figure 10: The graph of the actual progress of the Enrolment Project against the expected progress. The Enrolment exercise was completed about half the expected time.

Project Evaluation Parameters

While designing the project the evaluation parameters were defined in order to track progress and evaluate the project in its dynamic states. Some of the important evaluation parameters are discussed below:

1. Timely completion

Since enrolment precedes the clinic launch and thereafter the other health interventions completing it within a rigid timeframe is important. A progress plan chart was prepared against which we could track the timelines.

2. Human resource utilisation

Working in rural India, human resource is a challenge. This project tried to leverage local resource that also brings with it understanding and familiarity of the geography, and also helps cultivate trust amongst the local community.

Local personnel were selected as Field Supervisors from within the organization that went through a one-day project management and training session.

3. Project cost

CAPEX	Unit cost	No.	Total cost
Mobile phones	8500	11	93500
Bags	120	11	1320
Jackets	450	8	3600
Prints	350	11	3850
			102270

OPEX	Unit Cost	No.	Total Cost
Salary for EO	20	3000	60000
Salary of Field Supervisors	3667	3	11000
Bike rent	2000	1	2000
Travel cost and food	1000	3	3000
			76000

4. Data quality

Data quality was maintained by the continuous matching of a sample of the enrolment data with the audit data. The results of the data audit were very reassuring.

Conclusion

In this paper we have set out the entire end-to-end pre-clinic-launch enrolment process, whereby the demographic details and the GPS coordinates of all the households in the catchment area are collected using Android mobile phones. The entire enrolment exercise was completed in less than 15 days with fairly good quality, capturing information on about 3000 households consisting of nearly 13000 individuals. This experience proved to be repeatable when we replicated this activity at another pilot, Alakudi, in less than 10 days, for nearly half the cost (Rs. 10 per household enrolled in Alakudi, as opposed to Rs.20 at Andipatti). The data collected from the exercise was fed into the HMIS before the RMHC operations began and the usage of ID cards immediately proved an improvement over the earlier method of identification (based on name search). The systematic enrolment process also served as a good marketing exercise since it reached every household in the catchment.

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Data Collection - Technical Note

Open Data Kit

Open Data Kit (ODK) is an open source platform for mobile data collection that provides a standard way of defining and rendering forms using the XForms specification. Four separate components from the ODK suite come together to form a data collection solution.

- ODK Build provides a wizard for defining a form for including basic data validation and branching logic.
- ODK Collect is an application that runs on the mobile phone rendering the form and uploading data back to the server.
- ODK Aggregate is the server component that stores the form responses submitted through the mobile phones.
- ODK Validate is an offline tool that allows a user to validate manually generated Xforms.

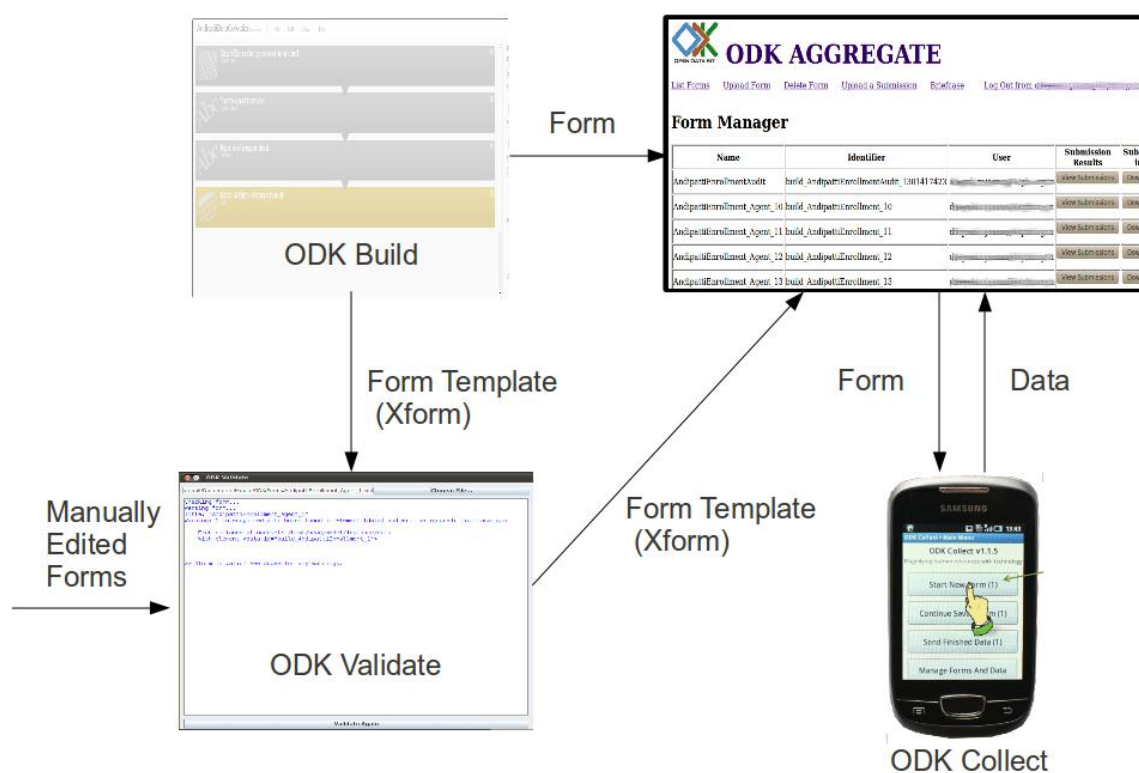


Figure 1.1: ODK consists of components for building forms (Build), rendering them on mobile phones (Collect) and storing the responses (Aggregate).

HMIS Integration

Survey responses from multiple mobile phones are collated in the server component, ODK Aggregate. Aggregate is based on the Google AppEngine framework which includes a basic hosting service for free. Aggregate comes with scripts as well as documentation that make it effortless to deploy. Once deployed, Aggregate allows for external data access through various modes, such as integration with Google Fusion Tables, Rhiza Insights and Google Spreadsheets. We chose Google Fusion Tables for the backend integration because of its support for graphical visualization and well-documented programming APIs. Once the enrollment agents start filling the surveys and sending them to ODK Aggregate, the responses are also automatically pushed into Fusion Tables in a tabular form that allows for instant visualization, filtering and basic error checking. Using the programming interface, the ICTPH Health Management Information System (HMIS) access this data using the programmer interface and populates its own databases.

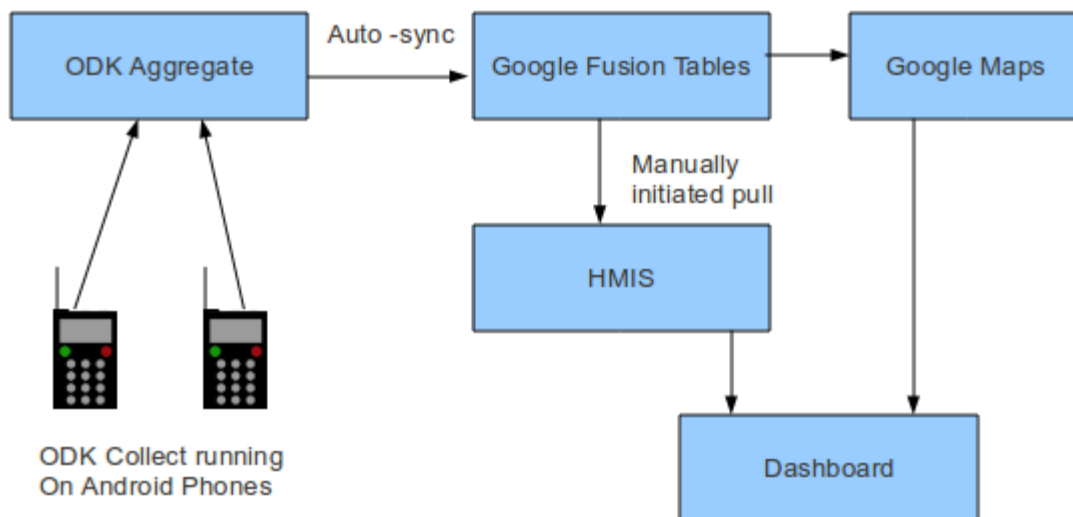


Figure 1.2: Google Fusion Tables was used as an intermediary between ODK Aggregate and HMIS because of its well-documented programming interface.

Final Risk Audit on ODK

Screen display	Type	Options
Auditor no.	Drop down	1,2
Check if anyone visited HH from Sughavazhvu?	Drop down	Yes, No, Don't know
Check if HH recieved a ID card, if yes, could I look at it	Drop down	Yes, No, Don't know
Scan the bar-code	Bar-code scan	
Check if respondent matches the criteria	Drop down	Yes, No, Don't know
Check if the address is correct	Drop down	Yes, No, Don't know
Capture no. of family members	Numeric	
Check if the EO explained about SughaVazhvu	Drop down	Yes, No, Don't know
Check if the EO was friendly	Drop down	Yes, No, Don't know

Mobile Data Collection Dashboard

Figures 3.1 to 3.6 show the various modes of feedback that the dashboard was designed to provide.

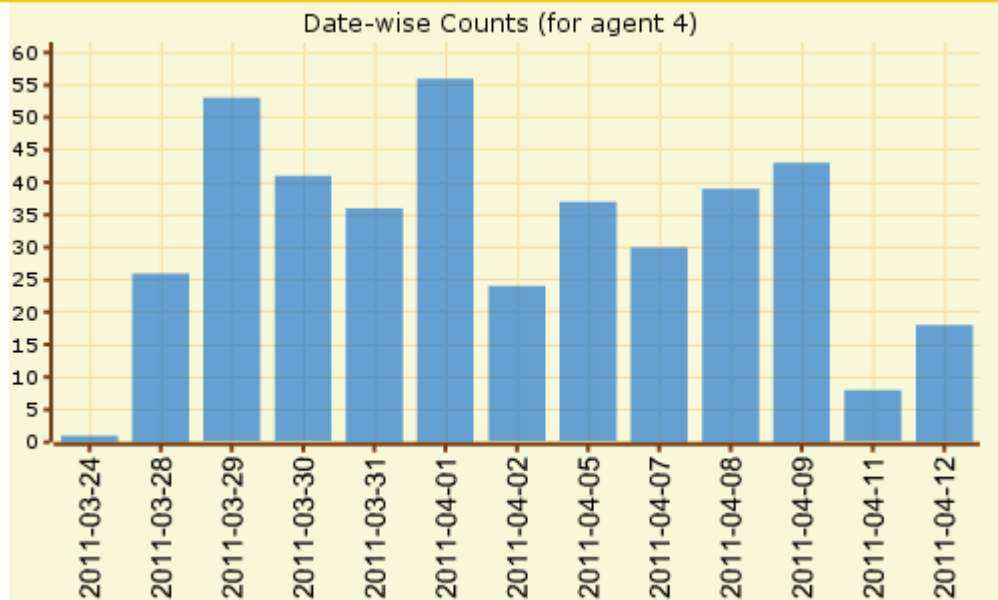


Figure 3.1: A day-wise breakup of enrolments count allows the project manager to track daily output.

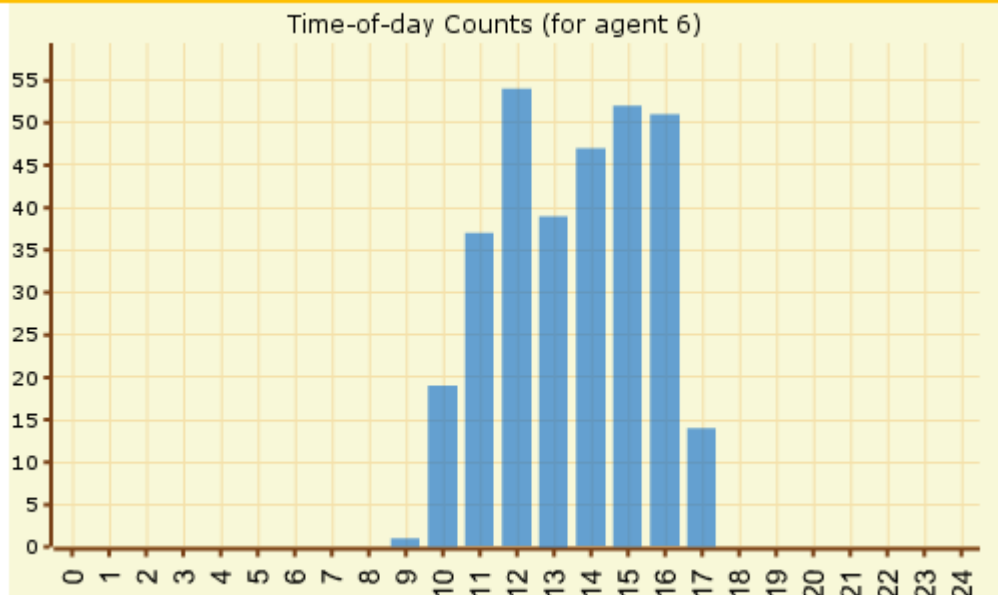


Figure 3.2: A report of enrolments done during various times of the day indicate if there were any stoppages or reduced throughputs at any particular time.

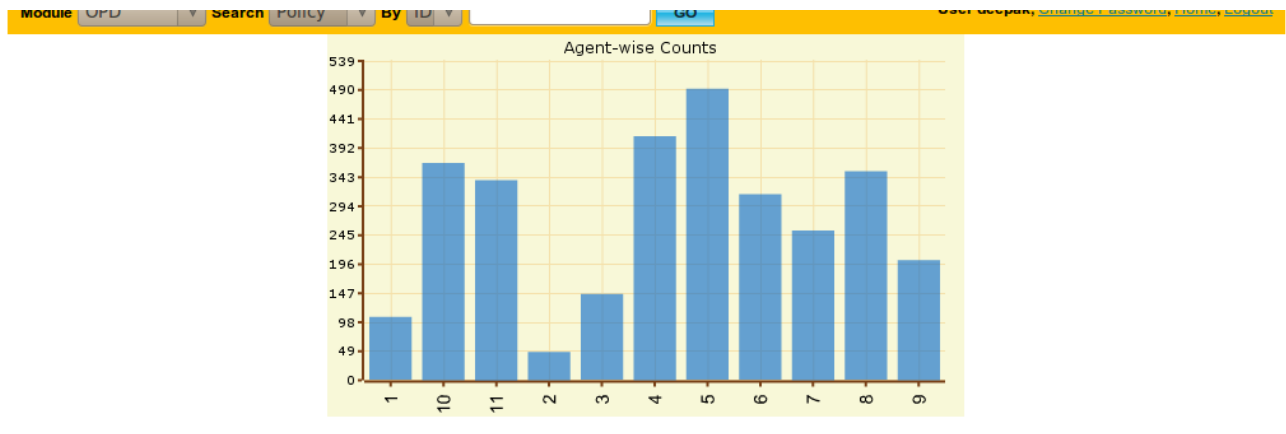


Figure 3.3: Agent-wise counts of enrolments were important to deliver targeted feedback to the surveyors to ensure that expected targets were continuously achieved.

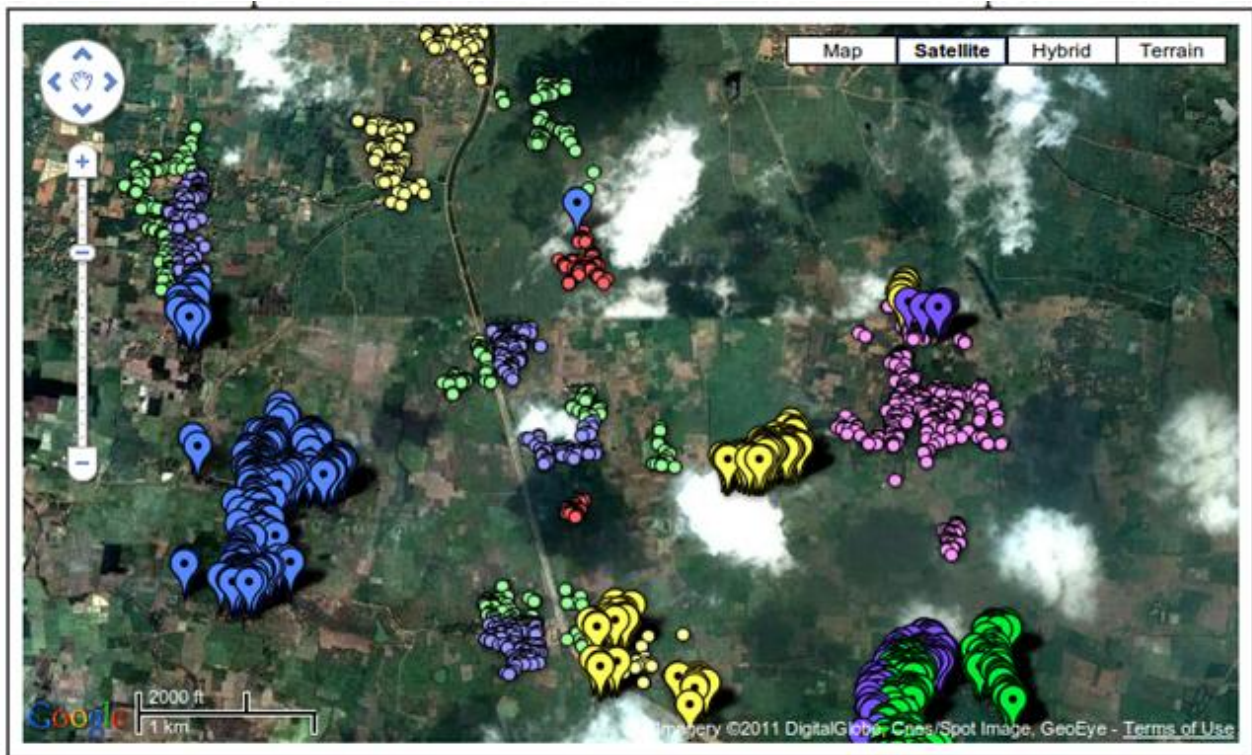


Figure 3.4: Mapping enrolments over a map also indicated whether agents were crossing allocated boundaries and also to ensure comprehensive coverage in the catchment areas.

ANNEXURE 3: HMIS Dashboards for Monitoring



ANNEXURE 3: HMIS Dashboards for Monitoring

Figure 4.4 (On previous page): Tracking the progress of enrolment agents on the map gives feedback on the adherence to plan. This figure tracks the progress of one of the surveyors over three days. This information is useful in optimizing the area allocation and to determine direction of surveys.

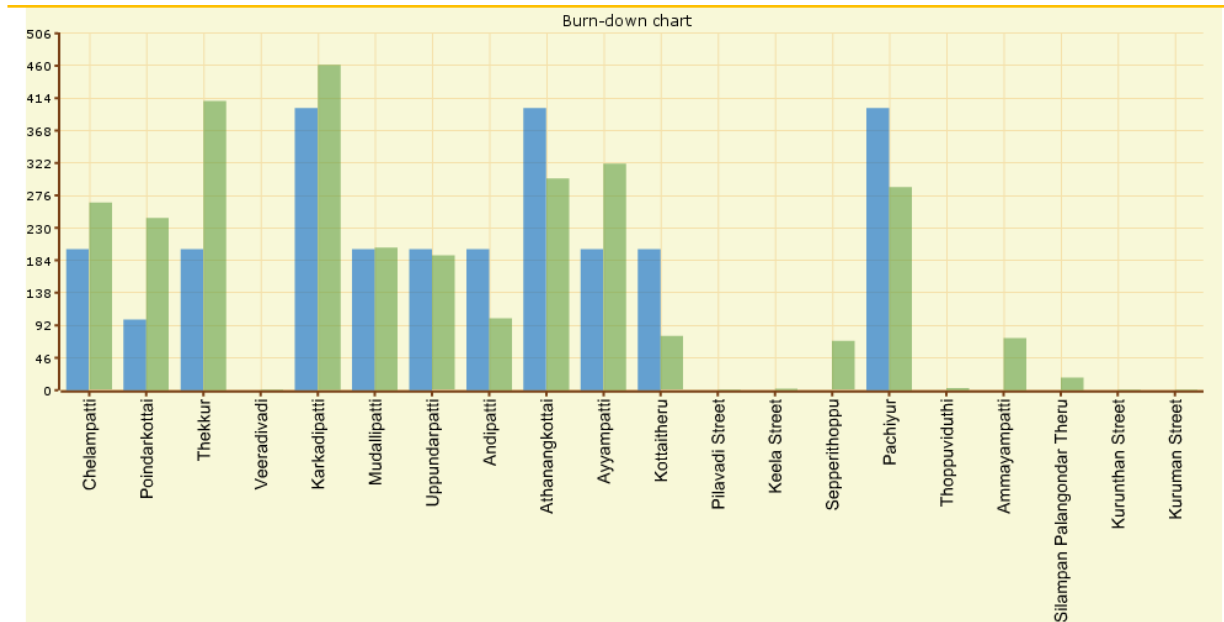
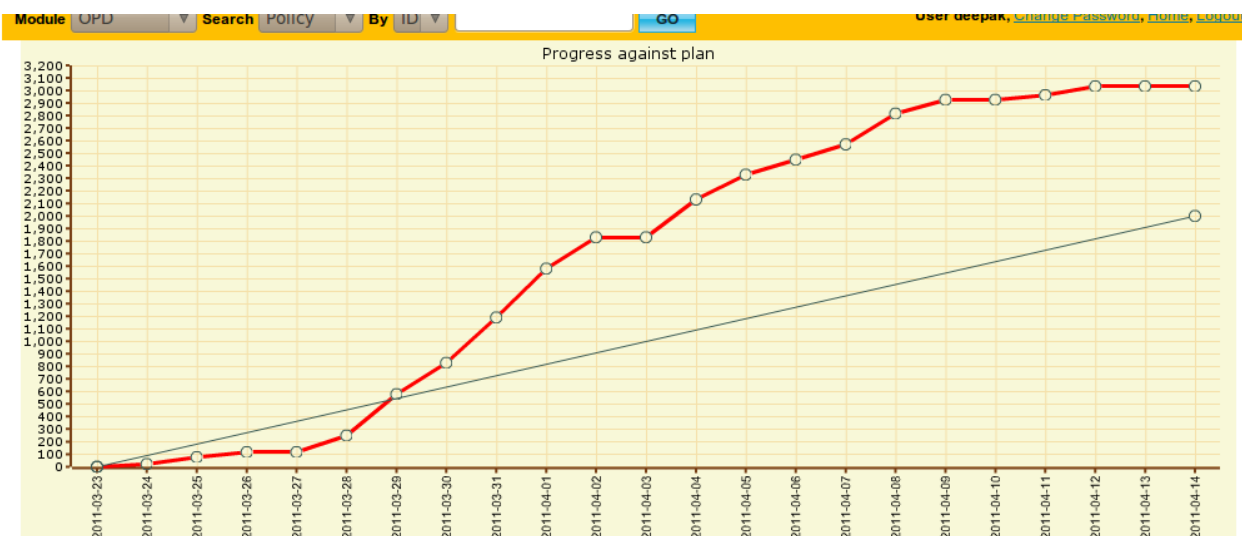


Figure 3.5: It was important for the dashboard to indicate the progress for each of the villages in the catchment to determine optimal allocation of resources over geographies. The blue lines in this chart indicate the approximate number of households as estimated by the state census (2001) and the green indicates the actual number of households enrolled.



ANNEXURE 3: HMIS Dashboards for Monitoring

Figure 3.6 (On previous page): The initial estimate of this enrolment project is indicated by the grey line; an estimated 2000 households were planned to be covered over a span of 22 days. The red-line indicates the actual enrolment numbers; 3033 households were targeted over roughly 18 days, including a pilot phase of 4 days in which only three in-house enrolment agents covered nearly 200 households (as indicated by the initial low-gradient of the red line).

Interview and EO candidate screening

Date: 22nd March, 2011

Time: 10:00 am to 6:00 pm

Venue: SughaVazhvu RMHC, Andipatti

Interviewer: Sabyasachi, Rathinam, Alexander

Expected no. of Applicants: 30-40 candidates

Selection Phases	Responsibility		Duration	Time
Preliminary Interview	Group A	Group B	1 hour	
	Rathinam	Alexander		10:00-11:00
Induction	Rathinam		1 hour	11:00-12:00
Lunch Break (<i>Lunch will be provided to all candidates</i>)				
Training	Group A	Group B		
	Rathinam	Alexander	2 hours	14:00-16:00
Exam and Final Selection	Sabyasachi+Rathinam+Alexander		2 hours	16:00-18:00

The objective of the interview is to identify appropriate candidates for Andipatti Enrolment project. A total of 13 candidates will be selected from a large pool of applicant (*for spot registration candidates application form will be complete*).

The screening process is divided into 4 phase as following:

Preliminary Interview: This is a short face to face interview with the candidate where scoring will be given as follows:

Checks	Question	Marks on		
		10	Weightage	Scores
Confidence level of the candidate	Do you think you can learn to use our mobile application within a day?	10	5	50
Communication skills of the candidates	What kind of work you like to do?	10	8	80
Proficiency in reading and writing English	Ask the candidate to write his and his father's name. What is the meaning of brother in law/daughter in law etc.?	10	8	80
His HH location and distance of our catchment village	Ask him where he stays and match it with our Map	10	6	60
His interest level to do this Enrollment	What do you know about SughaVazhvu so far?	10	8	80
Education level	<10th-4; 10th-5; 10+2-6; Diploma-7; graduation-8; masters-9	10	5	50
				100%

The above table is only a sample scoring sheet.

Induction: The induction will involve:

1. Introduction to SughaVazhvu
2. Objective of the Enrollment
3. What are the expectation from an Enrollment Officer (EO)
4. Duration and minimum daily targets
5. Compensation for correct and complete entry
6. Certification
7. Reporting structure in brief
8. Important dates
9. Selection parameters, MoU and waiting list provision

Training and Mock Practice: Training will be provided on the following subjects:

1. Visit/Enrolment Protocol
2. Communication to the Household about SughaVazhvu
3. Mobile usage, technical support- Mobile usage Practical
4. Reporting protocol to Fields Supervisors
- 5.

Exam and Final Selection: 3 successful entries of HH (dummy) using ODK-Samsung apps are required. The candidates will be divided into 2 groups. One will play a role of an EO and another group as HH Respondent. The entire process and candidates conduct will be observed by the interviewer during this mock practice and scored accordingly.



Agreement between SughaVazhvu Healthcare and Enrollment Officer

This MOU is entered into on **23th March 2011**

BETWEEN

SughaVazhvu Healthcare Private Limited, a company incorporated under the Companies Act, 1956 and having its registered office at A2, L.P. Amsavalli Illam, 7th Cross Street, Arula Nanda Nagar, Thanjavur, Tamil Nadu- 613007 (hereinafter referred to as "SughaVazhvu" which expression shall whenever the context so admits includes its authorized assigns and successors in title of the FIRST PART.

AND

Mr/ Ms.....
Son/Daughter of
Residing at

(Hereinafter referred to as "SughaVazhvu Enrolment Officer" which expression shall whenever the context so admits include its authorized assigns and successors in title of the SECOND PART

Article 1: Background

- A. Whereas SughaVazhvu is in the field of managing a network of Rural Micro Health Centers (RMHCs) in remote rural villages facilitating primary healthcare to rural populations, along with referral services with the mission of improving the health and wellbeing of the populations that it seeks to serve.
- B. Whereas SughaVazhvu Enrolment Officer has expressed his/ her interest and keenness to provide temporary services to enroll households and create a data set of all members residing in his/ her village.

Article 2: Objective

The objective of this MOU is to provide an opportunity to every suitable individual with temporary employment to enroll households in his/ her village in close collaboration with SughaVazhvu.

Article 3: Terms of MoU

- A. The MoU expires after the date of effect as stated in the first paragraph of the MOU.

Article 4: Terms agreed by SughaVazhvu

- A. Provide initial to the SughaVazhvu Enrolment Officer for enrolling household in his/ her village.
- B. Provide Samsung Galaxy Pop S5570 as a data recording tool.
- C. Provide Instruction manual to assist in enrolling households
- D. Provide supervision while enrolling households.
- E. Provide SughaVazhvu Enrolment Officer Uniform required to be used by the SughaVazhvu Enrolment Officer while performing his/ her obligations.

Article 5: Terms agreed by SughaVazhvu Enrolment Officer

- A. Attend all the training organized by SughaVazhvu.
- B. Enroll all households in his/ her village, as specified by SughaVazhvu as his/ her area of field operations.
- C. Attend weekly update/review meetings at the RMHC Andipatti to be conducted by the SughaVazhvu
- D. Shall use the mobile phone strictly for Official purposes and NOT for personal use.
- E. Shall carefully handle the recording tools while enrolling households in his/ her village. Theft or damage of which, shall be borne by the SughaVazhvu Enrolment Officer by paying a fine of Rs.2000/-
- F. Return the Samsung Galaxy Pop S 5570 and instruction manual provided by SughaVazhu within two days on the completion of the project.
- G. Provide community/individual feedback consolidating field visit experience.
- H. Abide strictly by the code of conduct of SughaVazhvu as communicated through policy circulars from time to time.
- I. Abide by the uniform code of SughaVazhvu while performing SughaVazhvu related obligations/duties.

Article 6:

The Enrollment Officers will be paid according to the following two wage brackets:

- 1. Rs.15/- per enrollment for 10-15 enrollments per calendar day.
- 2. Rs.20/- per enrollment for over 16 enrollments per calendar day.

Conditions:

- 1. Enrollment officers are eligible for payment only upon completion of 10 enrollments per day.
- 2. Payment is also subjective to minimum quality requirements which is at the discretion of the Field Supervisors.

Article 7

The data collected via Samsung Galaxy Pop S 5570 would explicitly belong only to Sughavazhu Health Care.

Article 8: Modification and Termination

- A. This MoU may be modified or terminated at any time. Either party may terminate this MoU with two days prior notice in writing to the other party, provided that the party's duty to fulfill its obligations incurred prior to termination shall survive termination of this MoU.
- B. The MoU may be terminated by either party in the event the performance of the obligations under this MOU

Article 9: Effect of Termination

- A. Neither Party will represent the other Party in any of its dealings and neither Party shall intentionally or otherwise commit any act(s) as would lead a third party to believe that the other Party still has a permanent relationship with the former Party.
- B. Each Party shall stop using the other Party's name, trade mark, etc., in any audio or visual form. Neither Party will be eligible to claim any amount of loss or compensation for the termination of this MOU provided that such termination is effected in accordance with the provisions of these presents.

C. Upon termination the SughaVazhvu Enrolment Officer shall return all recording tools as provided to her as per Article 4.

Article 10: Notice

Any notice required or permitted to be given to the Parties hereunder shall be in writing and sent or transmitted by (i) registered or certified mail, (ii) hand-delivery.

Article 11: Dispute Resolution

This MOU shall be subject and accordance with the laws of India. The Parties to this MOU will attempt in good faith to negotiate a settlement to any claim or dispute between them arising out of or in connection with this contract. In the event that such disputes, claims, suits and actions are not resolved to the mutual satisfaction of the Parties, then the same will be finally decided in accordance with the Arbitration and Conciliation Act, 1996. The venue for arbitration proceedings shall be Thanjavur. All proceedings shall be conducted in Tamil. Subject to the foregoing, the Parties shall submit to the exclusive jurisdiction of the courts of Tamilnadu, India in respect of any disputes or differences or claims arising between the parties.

ANNEXURE 4: Recruitment and Training

This Memorandum of Understanding shall come into effect as of _____
IN WITNESS WHEREOF, both FIRST AND SECOND parties have caused this Memorandum of
Understanding to be signed in their respective names as of the day and year mentioned above.

Signature of the Enrolment Officer:

Signature of Employer

Name of Enrolment Officer:

Name of the Employer

Enrollment Kit

Mobile Checklist: This check should be done before handing over the phones to EOs. Following items are the part of this check list:

1. Correct ODK form is downloaded on Samsung phones
2. Each phone should have a Form specific to an EO (though all forms are replication of each other except the form name)
3. Barcode scanner software is downloaded in all phones from the Android Market
4. Make sure that all phones has gone through at least 2 entries without any problem
5. Make sure all the phones carries a GPRS activated Airtel SIM card
6. Field Supervisors name is stored and all the other names are deleted
7. Make sure GPS works
8. Delete all other apps if it is not required like GPS tracker etc.
9. Change the Setting to a Battery Saving mode
10. Make sure WiFi is on when they come to the RMHC for manual data fetching
11. WiFi should be switched off in the field as it exhausts battery
12. GPRS setting should have been configured
13. Gmail account for WiFi

Enrolment Kit: This is a set of products that an Enrolment Officer should carry while going to the HH for Enrolment. Items should fit into a bag specially designed for Enrolment. The Enrolment Kit will also includes a specially designed Jacket for all Enrolment officers and a Cap with SughaVazhvu logo. The following things will be part of the Enrolment Kit:

1. Enrolment Bag
2. 30 ID cards while starting the day will be provided by the Field Supervisors in the morning (9:30 am) and the unused cards will be taken back in the evening (5:30 pm)
3. Samsung Galaxy Pop phone with correct setting and ODK apps. This will be provided by the Field Supervisor every morning after completely recharging them at the RMHC the previous night. The phones will be returned to the Field Supervisors in the evening and the field supervisors will make sure that the phones are in good condition
4. Age to Date of Birth chart (laminated) which will be used in case the HH Respondent does not know HH member's exact DOB but knows his/her age. (Given below)
5. Samsung-ODK User Manual will be provided which will be used as a reference document by the EO. (Given below)
6. Visit Protocol chart will also be a part of the Enrolment Kit which the EOs should be well versed with. (Given below)
7. SughaVazhvu pamphlet will be given to the HH Respondent.


The User Manual and the Enrollment Protocol chart will be given to them 3 days in advance so that they can memorize the steps before starting. The Field Supervisors will do an overall check every day to make sure the EOs carries a complete Enrollment Kit before starting their day.

Age and Date of birth chart

ANNEXURE 5: Enrolment Kit

Age	Birth Year	Age	Birth Year	Age	Birth Year	Age	Birth Year
100	1911	74	1937	48	1963	22	1989
99	1912	73	1938	47	1964	21	1990
98	1913	72	1939	46	1965	20	1991
97	1914	71	1940	45	1966	19	1992
96	1915	70	1941	44	1967	18	1993
95	1916	69	1942	43	1968	17	1994
94	1917	68	1943	42	1969	16	1995
93	1918	67	1944	41	1970	15	1996
92	1919	66	1945	40	1971	14	1997
91	1920	65	1946	39	1972	13	1998
90	1921	64	1947	38	1973	12	1999
89	1922	63	1948	37	1974	11	2000
88	1923	62	1949	36	1975	10	2001
87	1924	61	1950	35	1976	9	2002
86	1925	60	1951	34	1977	8	2003
85	1926	59	1952	33	1978	7	2004
84	1927	58	1953	32	1979	6	2005
83	1928	57	1954	31	1980	5	2006
82	1929	56	1955	30	1981	4	2007
81	1930	55	1956	29	1982	3	2008
80	1931	54	1957	28	1983		
79	1932	53	1958	27	1984		
78	1933	52	1959	26	1985		
77	1934	51	1960	25	1986		
76	1935	50	1961	24	1987		
75	1936	49	1962	23	1988		

SughaVazhvu pamphlet distributed at the end of each Household Enrolment



SughaVazhvu Healthcare is a primary healthcare provider, with a mission to provide affordable and accessible healthcare. Located in Thanjavur district, SughaVazhvu provides services of *consultation, drugs and diagnostics* through its Rural Micro Health Centres (RMHCs) and a network of Doctors and Nurses.

CONSULTATION	DIAGNOSTICS	MEDICINES
<p>Protocolised care based on international guidelines:</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 30%;"> <ul style="list-style-type: none"> ☀️ Respiratory Infections ☀️ Stomach Infections </div> <div style="width: 30%;"> <ul style="list-style-type: none"> ☀️ Diabetes ☀️ Skin Ailments </div> <div style="width: 30%;"> <ul style="list-style-type: none"> ☀️ Hypertension ☀️ Many more ... </div> </div>		
<p>Diagnostics:</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 30%;"> <ul style="list-style-type: none"> ☀️ Complete Blood Count (CBC) ☀️ Creatinine ☀️ Malaria Test ☀️ Vision Testing </div> <div style="width: 30%;"> <ul style="list-style-type: none"> ☀️ Blood Glucose ☀️ Lipid Profile ☀️ Pregnancy Test ☀️ Cataract Management </div> <div style="width: 30%;"> <ul style="list-style-type: none"> ☀️ Urea & Uric Acid ☀️ Liver Function Test ☀️ Urine Test ☀️ Basic Oral Hygiene </div> </div>		

Annual Family Health Checkup establishing age specific health needs by screening for health conditions such as hypertension, diabetes, obesity, presence of acute and chronic conditions, nicotine dependence, hazardous drinking and visual acuity.

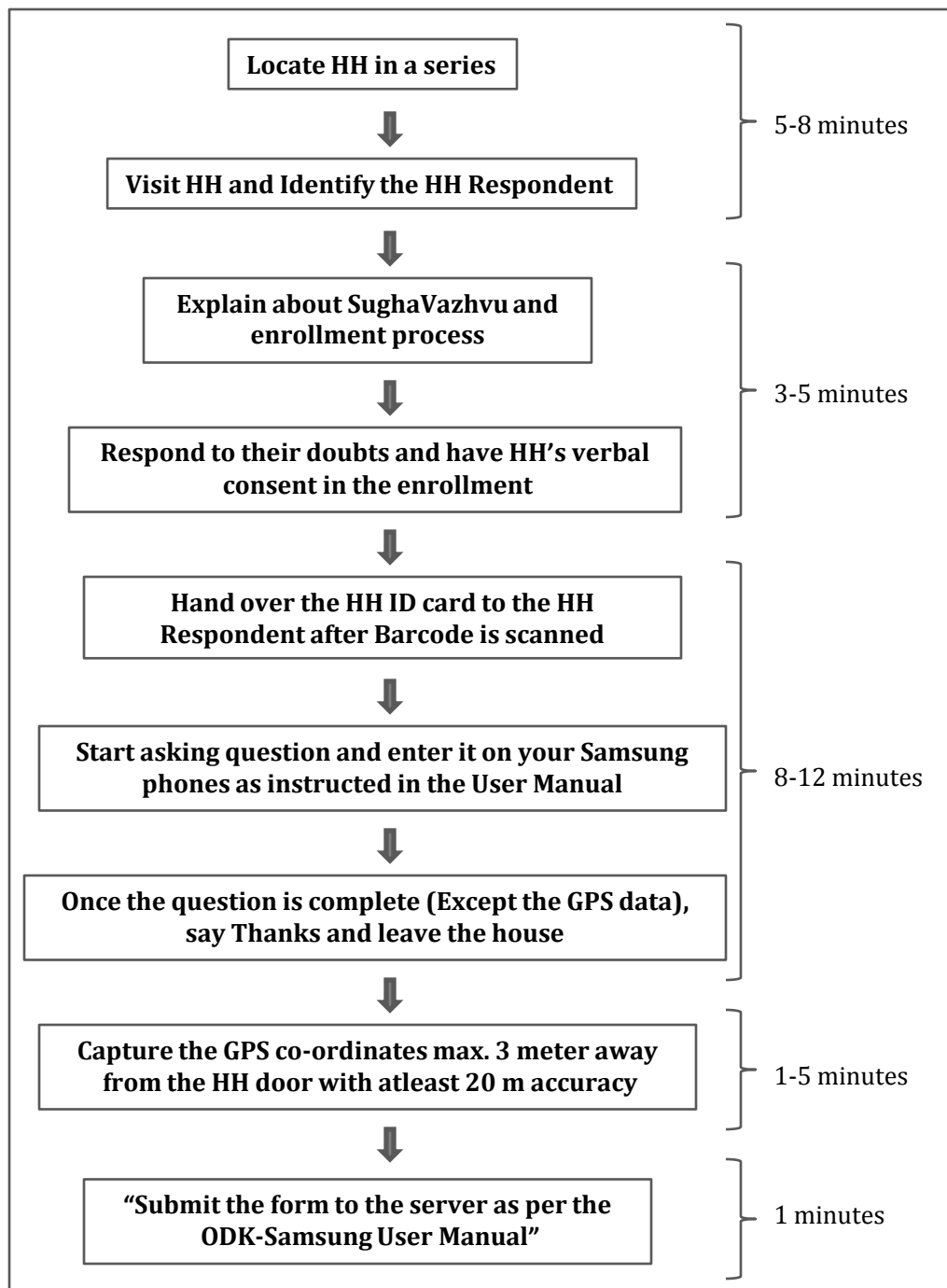
```

graph LR
    A["≥ 18 years  
ADULT"]
    B["10 to 18 years  
ADOLESCENT"]
    C["2 to 10 years  
CHILD"]
    D["0 to 2 years  
INFANT"]
    A --> B
    B --> C
    C --> D
            
```

SughaVazhvu is creating a comprehensive data set for all members residing in the villages in and around Andipatti. Through this we aim to continuously track the wellness of all members helping us deliver quality healthcare.

Please bring the SughaVazhvu ID Card on your visit to the RMHC.

SughaVazhvu Healthcare
 493/1, Main Road, Andipatti, Karkattipatti Post, Thanjavur 614902
 Telephone: 04372-244373



ODK-SAMSUNG ANDROID V2.2 USER MANUAL

**ANDIPATTI ENROLLMENT PROJECT
MARCH-APRIL, 2011**

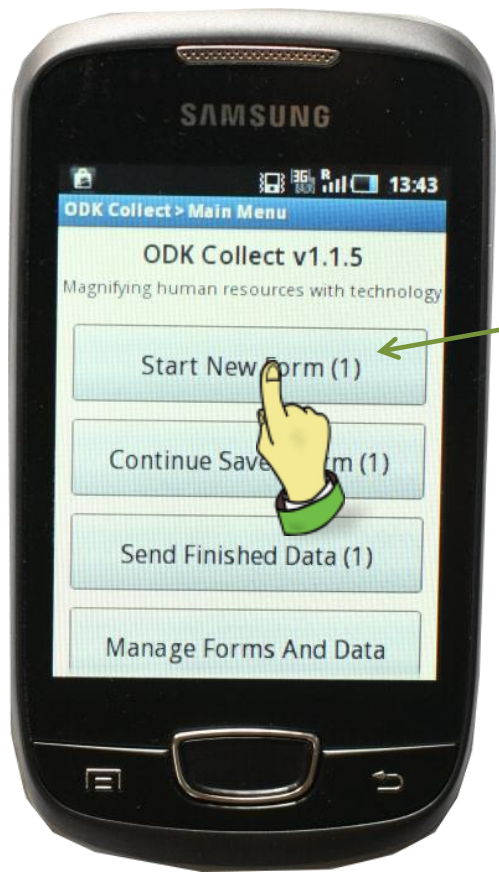
*This User Manual should be carried along everyday during the
Enrollment Process.*

1



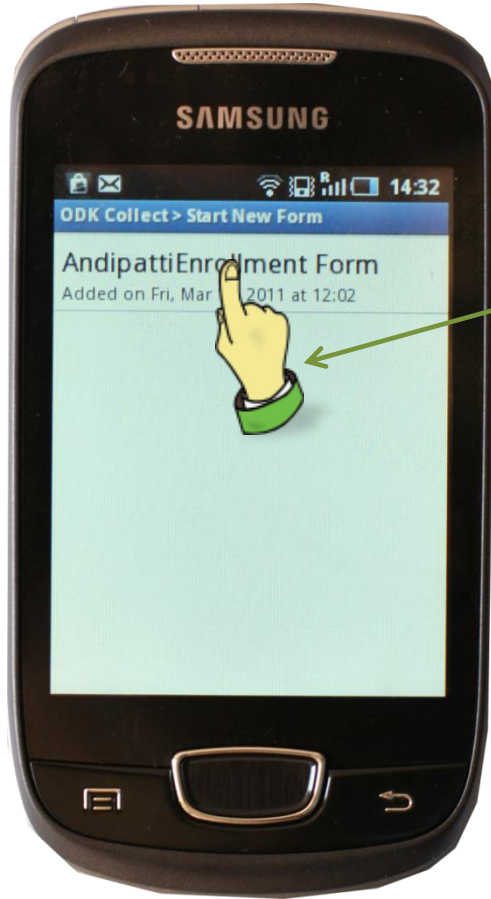
Press the IKON called ODK Collect

2



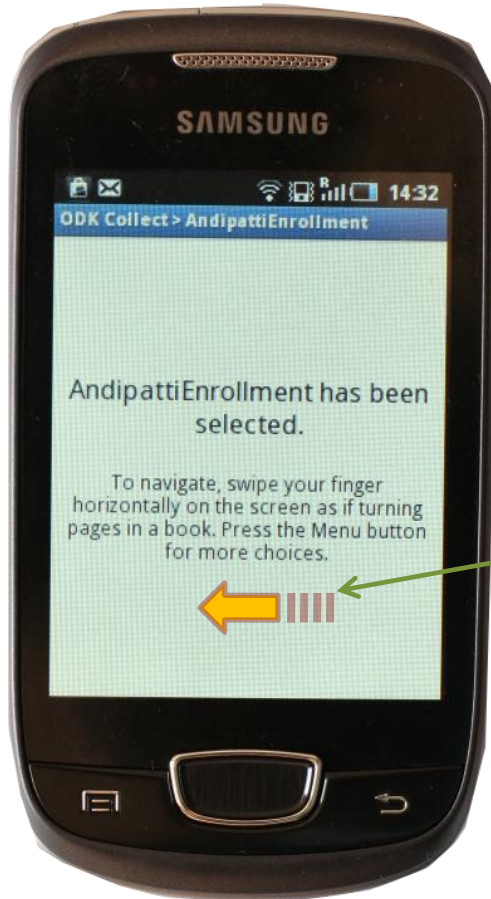
Press this button to get access to the Enrollment form

3



Press the form name to open the form

4



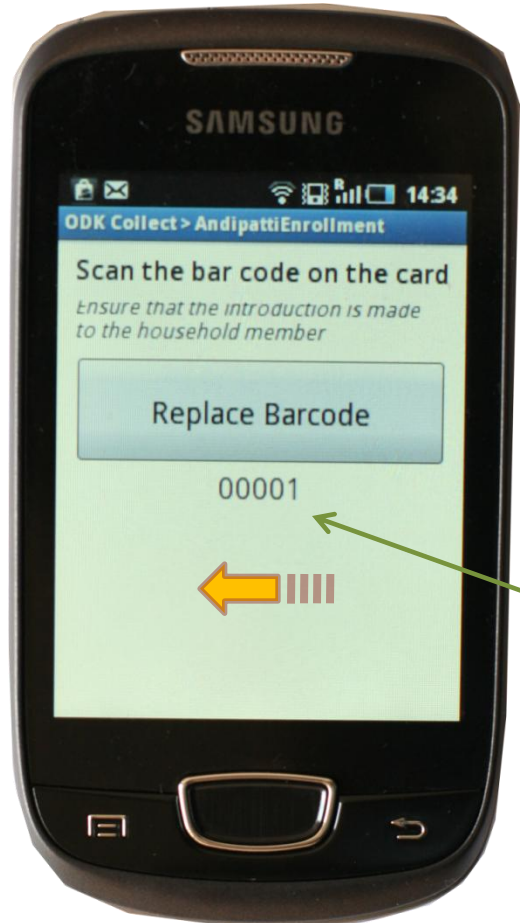
Swipe your fingers as marked by the arrow to go to the next question

5



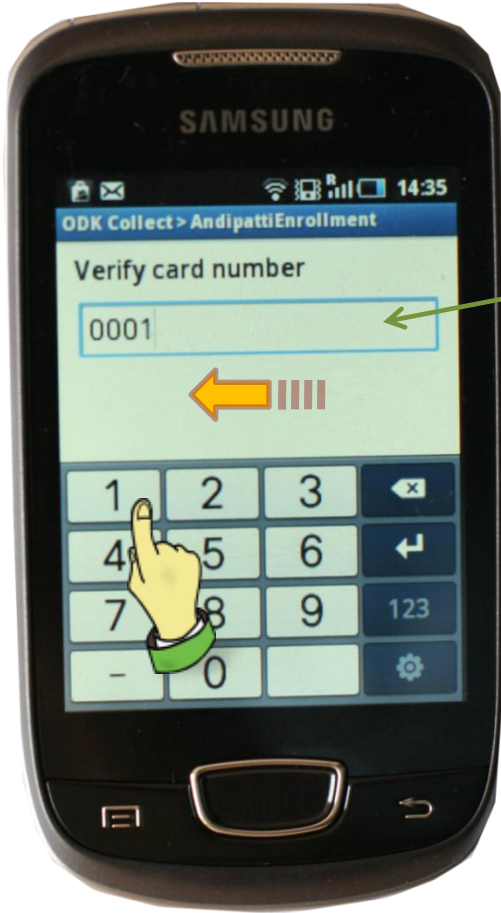
Touch the button "Get Barcode". Scan the Barcode on the Enrollment ID card.

6



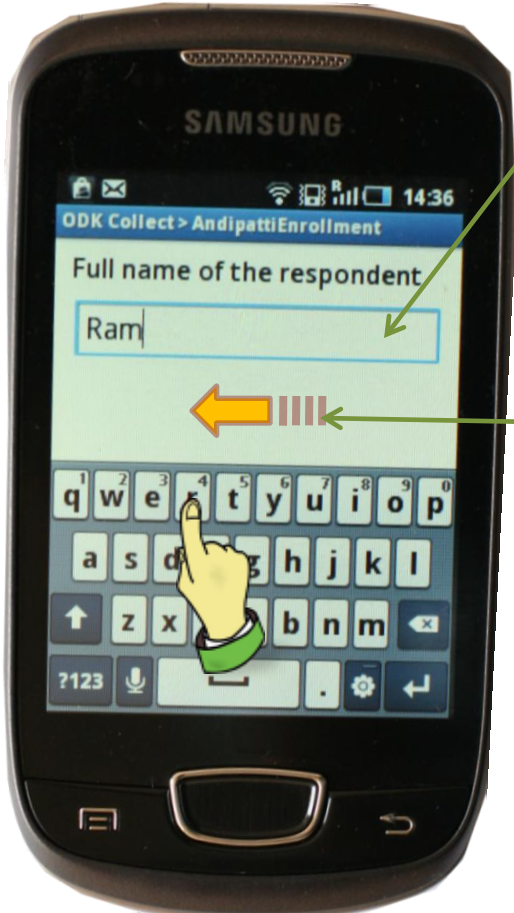
Capture the entire image of the Barcode through your mobile. Keep trying before you see a green line followed the given screen

7



Entire your ID manual from the ID card before handing over the ID card to the HH respondent

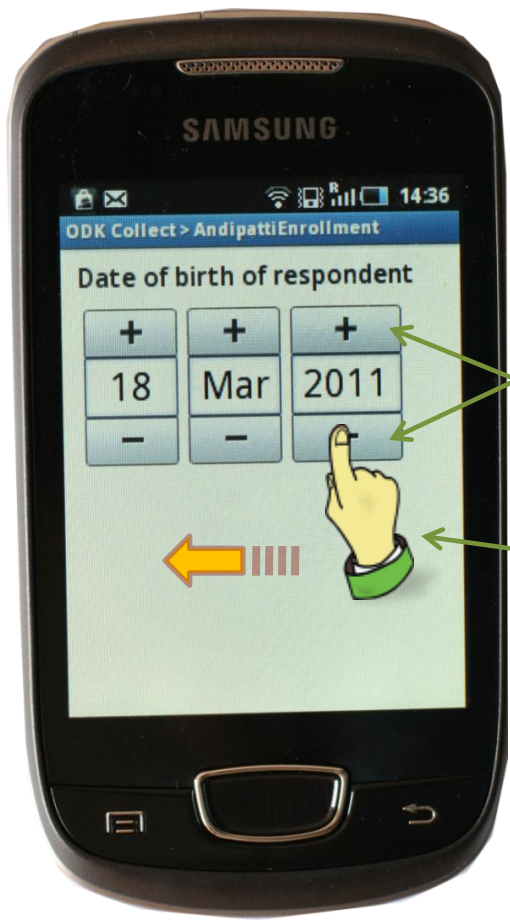
8



Write the name of ONLY hH Respondent. Refer to the definition of HH Respondent in the "Visit Protocol"

Swipe ONLY on the blank space as shown by the arrow.

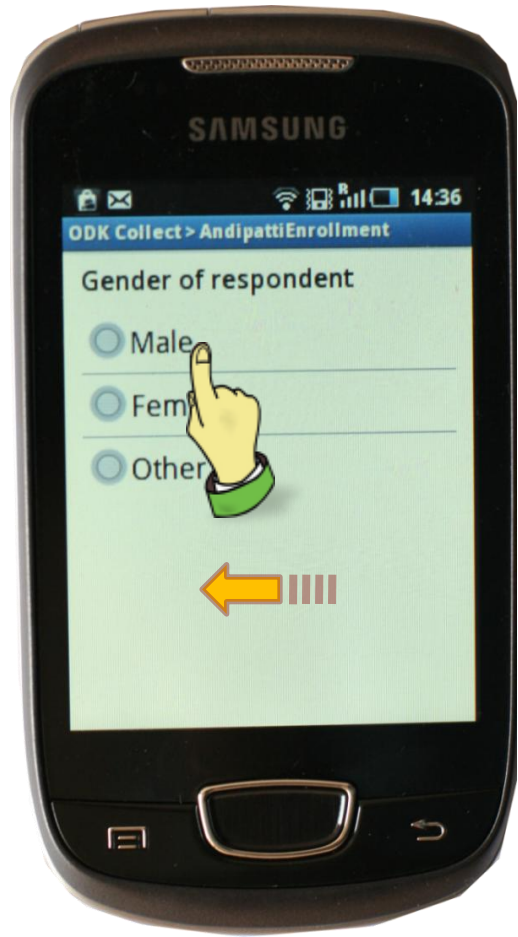
9



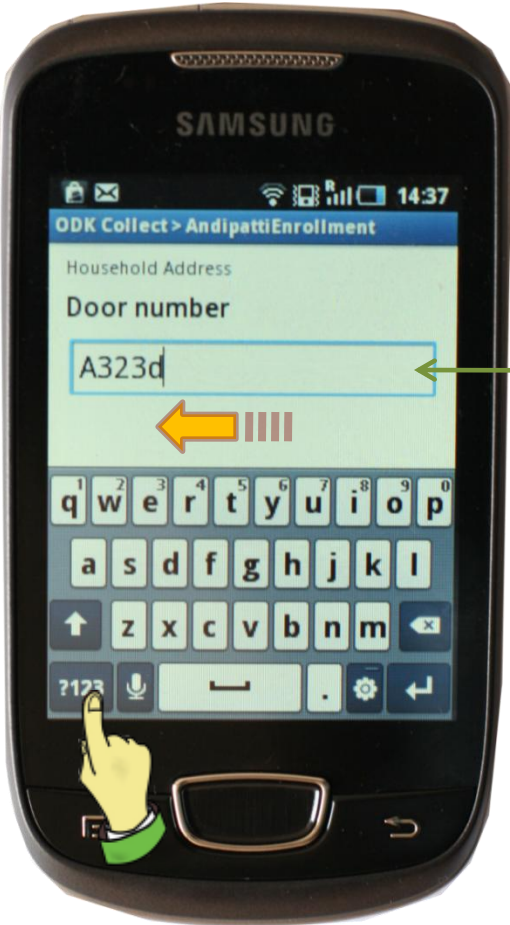
Press "+" or "-" for increasing or decreasing numbers in the calendar.

Keep pressing the "-" in case of entering year for adults

10

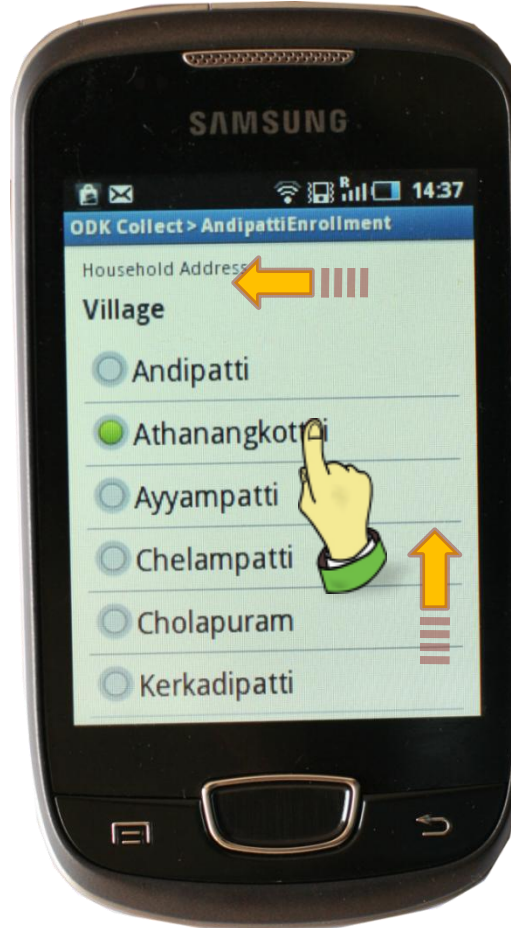


11



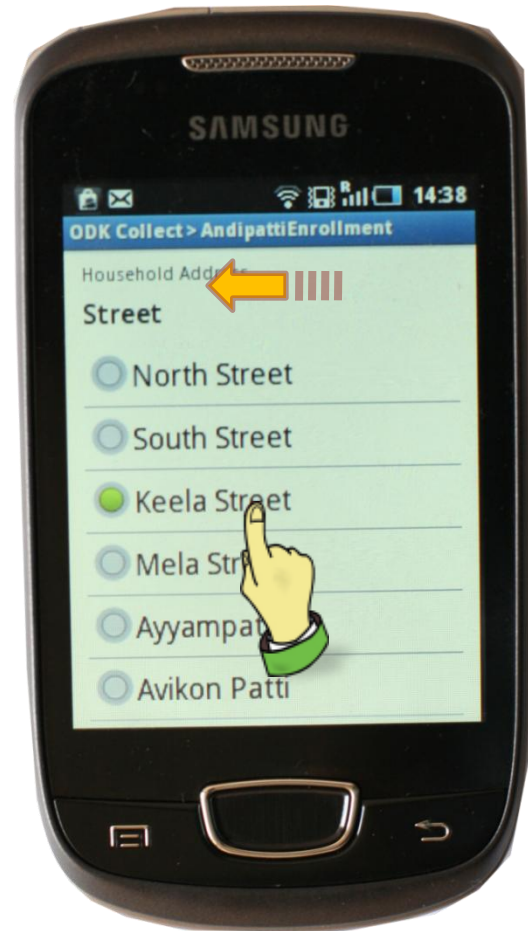
Add the Door no. or house no. It can be both text and numbers

12



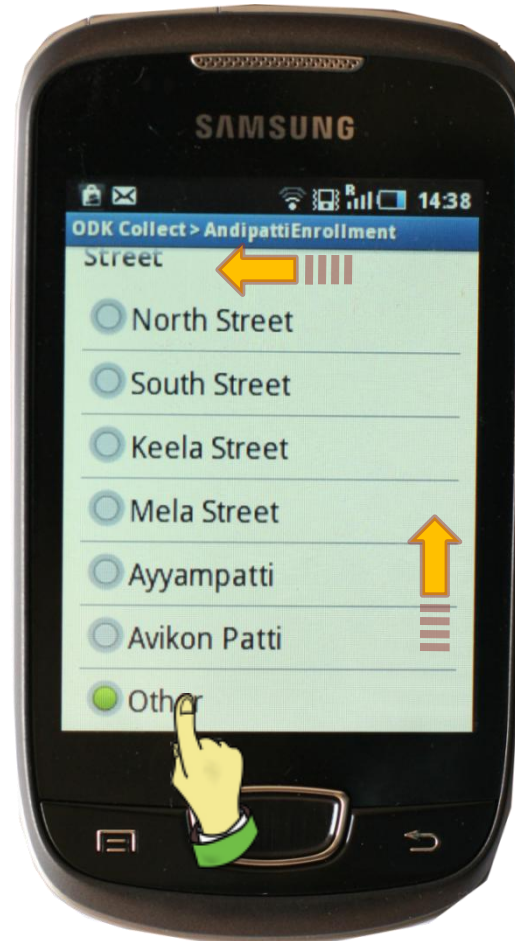
Select the right village the HH located from the list

13



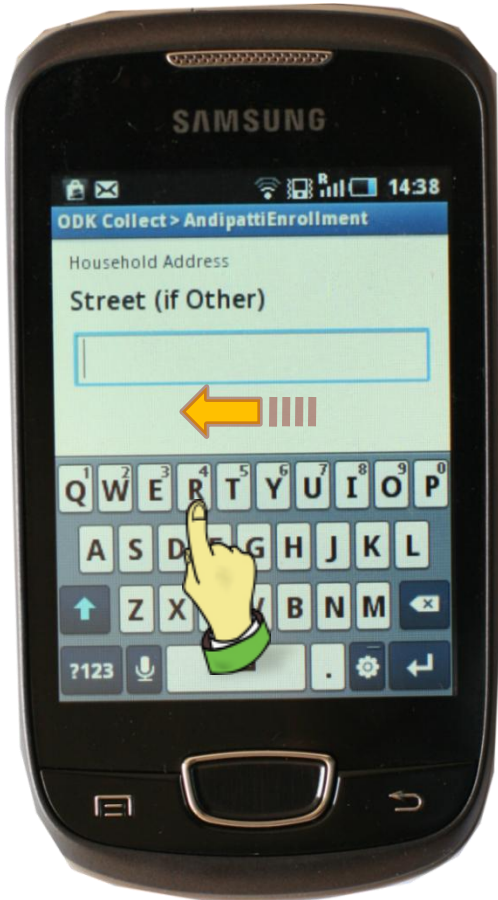
Select the right street name from the list

14



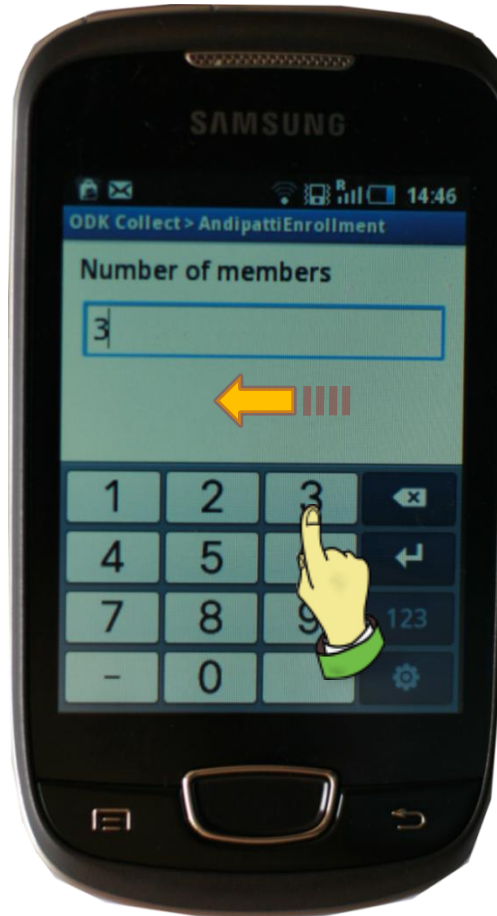
If the street name is not available in the list ONLY then press "Other". This will allow you to enter a new street name. Entire the spelling correctly

15

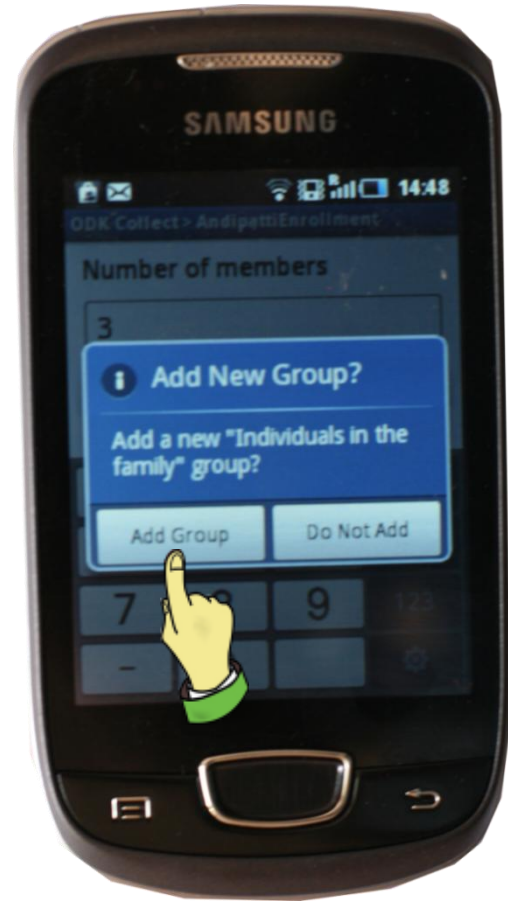


Enter the street name correctly ONLY if the street is not mentioned in the street list

16

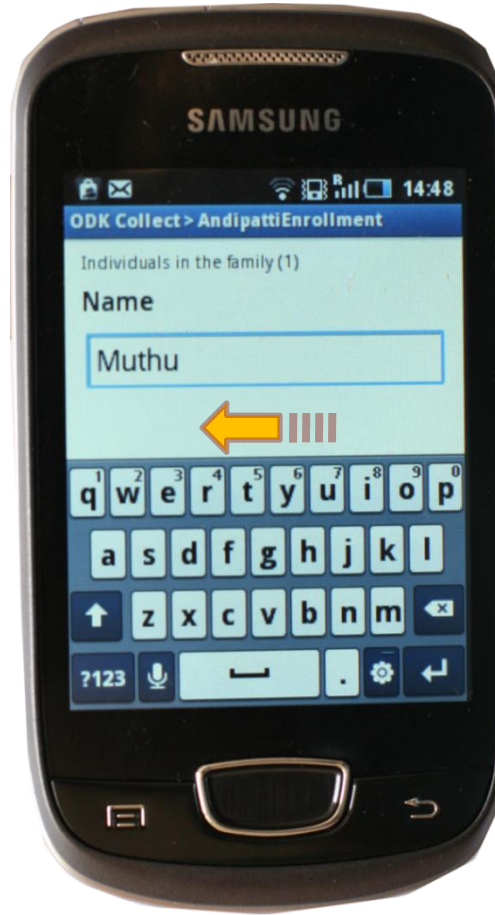


17



After “number of member” you will be asked to add member questions. Press “Add Group” to enter other member’s details.

18



This is the 1st question of the member group

19



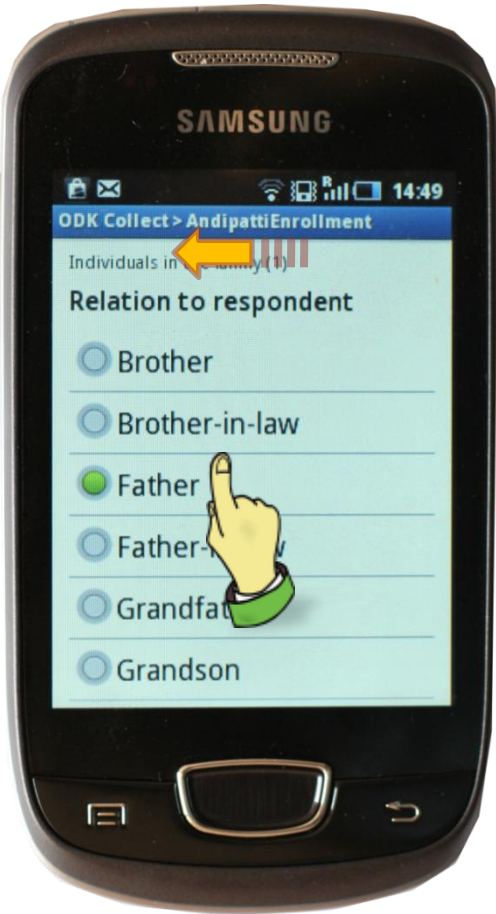
This is the 2nd question of the member group. Enter date as instructed in **step no. 9**

20



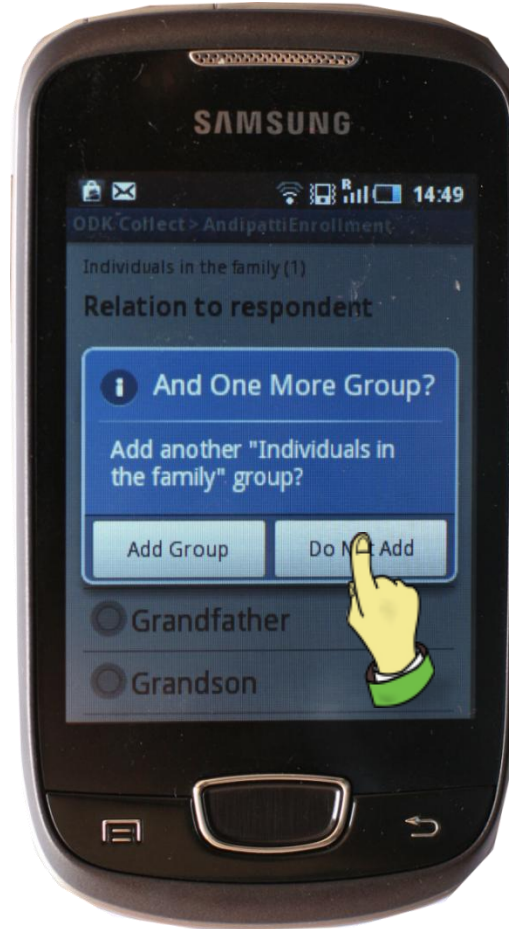
This is the 3rd question of the member group.

21



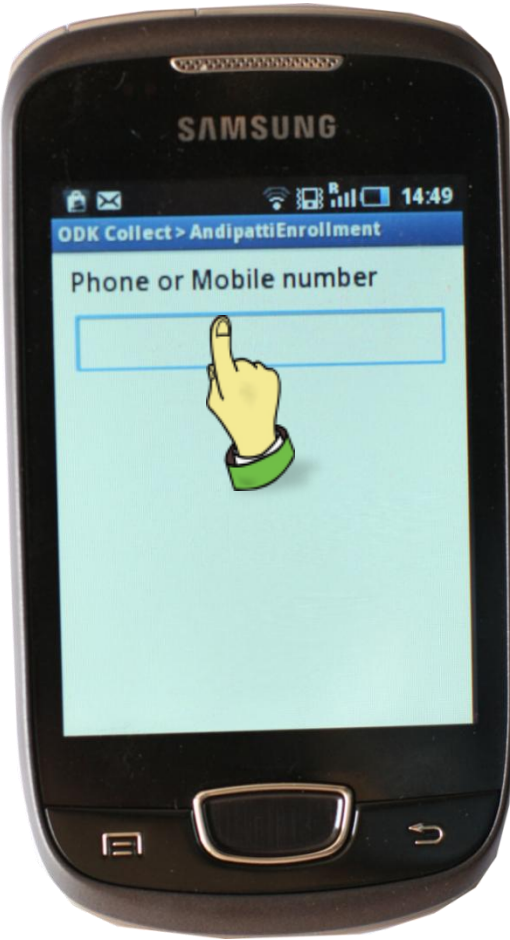
This is the last question of the member group.

22



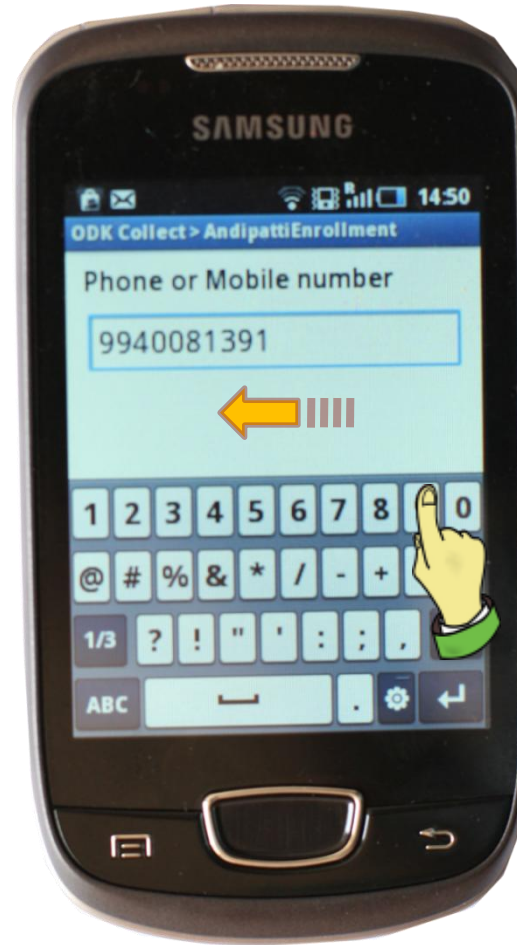
NOTE: if all the family members has been entered then press "Do Not Add".
NOTE: By mistake if you have pressed "Add Group" then type "D", Next, Next, Next and then press "Do Not Add"

23



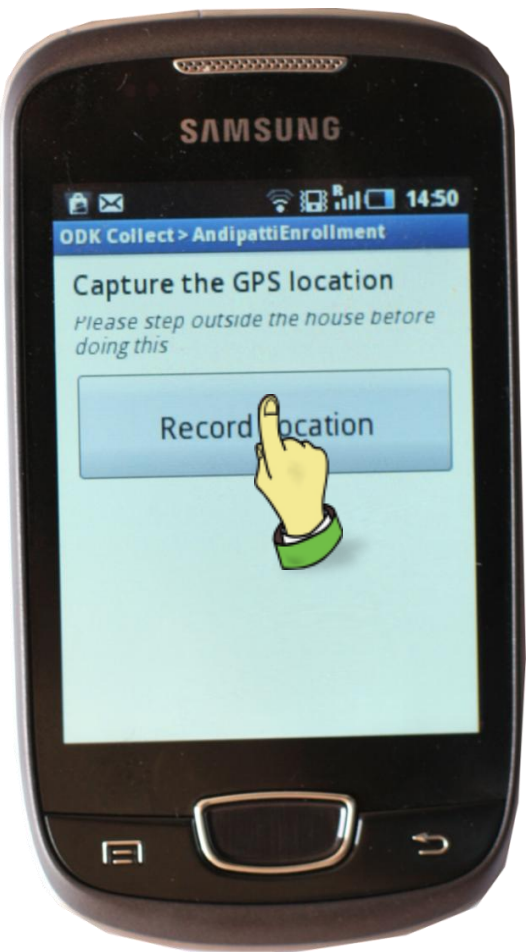
Enter the mobile or land line number.

24



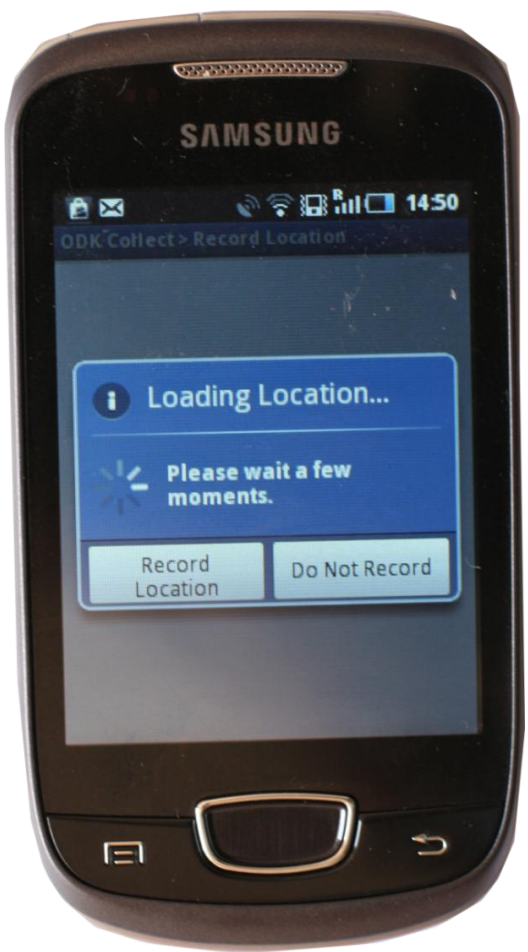
In case the household does not have a phone then ask for any other contact person's phone number and enter it.

25



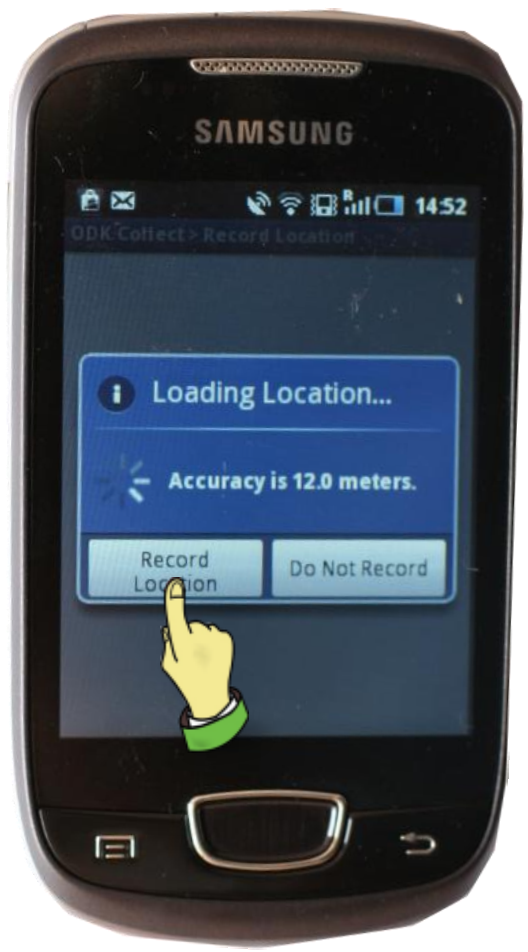
This portion is done soon after you finish the interaction with HH respondent. Say Thanks and come out of the house into a open space (not more than 3 meters away from the HH door). Press this button to record location of the HH.

26



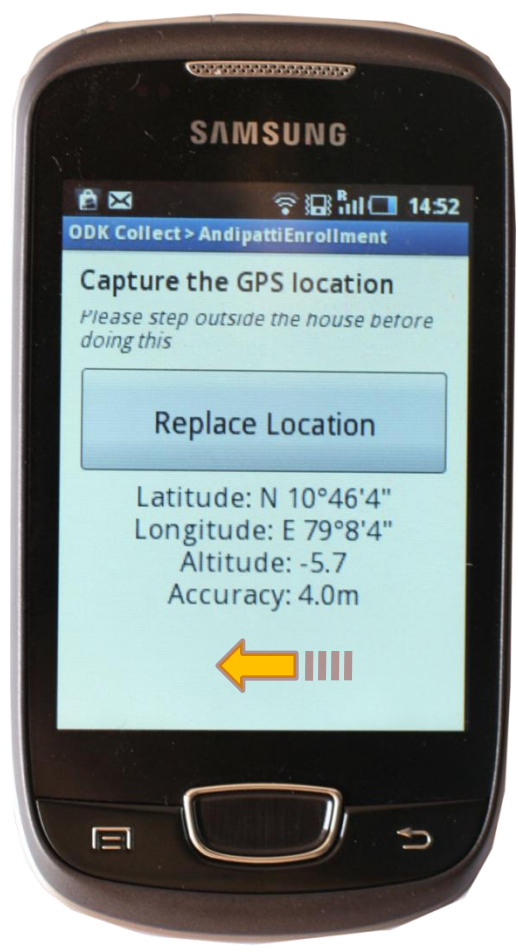
Wait till the phone scans for the location. This might take as long as 5 minutes. DO NOT SKIP THIS STEP

27



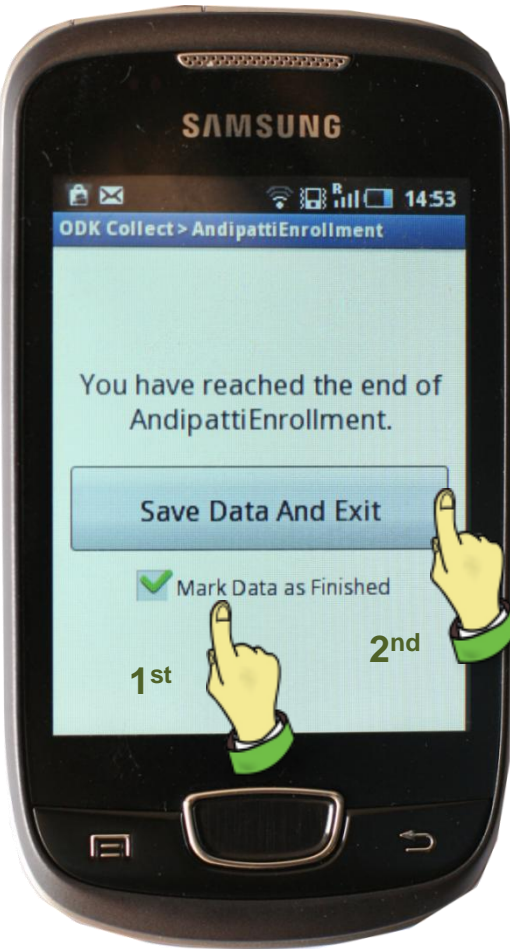
Wait till the phone automatically captures the location.
NOTE: Press "Record Location" only if the Accuracy is < 20 meters after waiting for 5 minutes.

28



The Accuracy should show < 20.0m. If NOT then press the "Replace Location" and follow the same step as 25, 26, 27

29



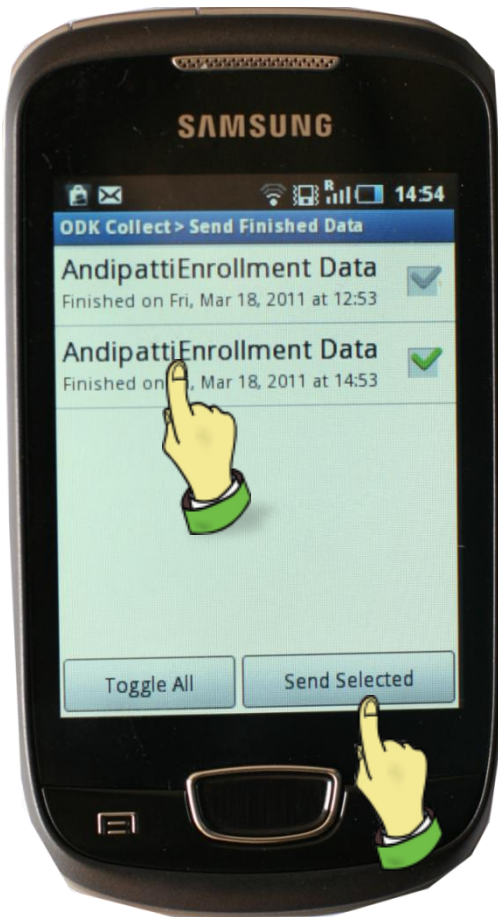
1st press "Mark Data as Finished"
2nd press "Save Data And Exit"

30



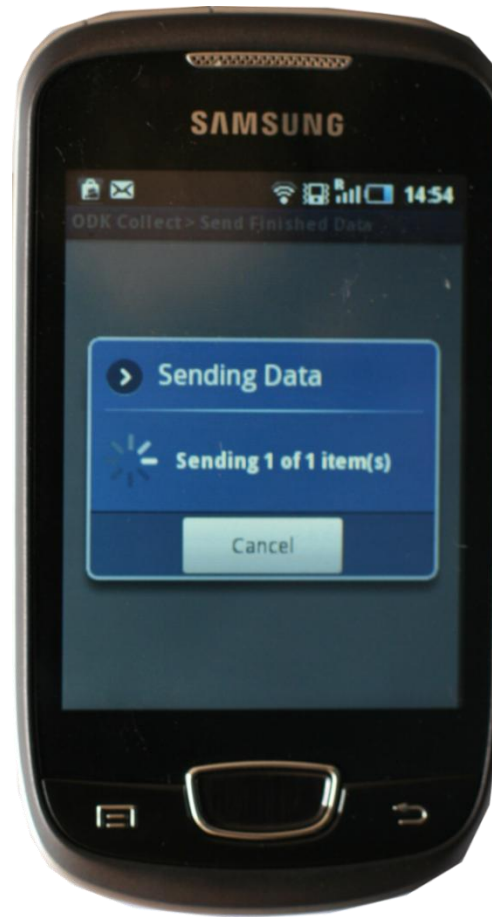
Press "Send Finish Data" to access the record of the last HH entered by you

31



1st click all the completed records in the list
2nd press "Send Selected"

32



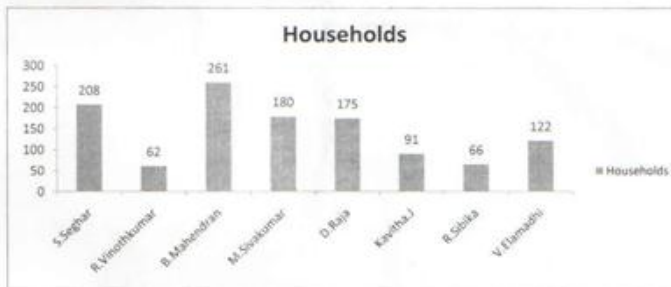
Once the record is successfully sent then start the same process from **Step 1** to **32** for the next HH. Do NOT press "Cancel"

Weekly Payout Sheet for compensating Enrolment Officers



No	Name of EO	Mon	Tue	Wed	Thu	Fri	Sat	Mon	HH	W.Pay	Signature
1		53	37	30	3	31	28	26	208		<i>S. Sagar</i>
		1060	740	600	60	620	560	520	4160	4160	
2		39	0	23	0	0	0	0	62		<i>R. Vinithkumar</i>
		780	0	460	0	0	0	0	1240	1240	
3		50	48	47	49	6	39	22	261		<i>B. Mahendran</i>
		1000	960	940	980	120	780	440	5220	5220	
4		17	0	0	5	158	0	0	180		<i>M. Siva Kumar</i>
		340	0	0	100	3160	0	0	3600	3600	
5		0	37	0	30	39	43	26	175		<i>D. Raja</i>
		0	740	0	600	780	860	520	3500	3500	
6		42	38	11	0	0	0	0	91		<i>T. Janitha</i>
		840	760	220	0	0	0	0	1820	1820	
7		52	0	8	0	0	0	0	66		<i>R. Sibika</i>
		1040	0	160	0	0	0	120	1320	1320	
8		47	39	0	36	0	0	0	122		<i>V. Damodhi</i>
		940	780	0	720	0	0	2440	2440	2440	
Total									1165	23300	

From 16 P.M.



Regd Off: A2, LP Amsavalli Illam | 7th Cross Street | Arulananda Nagar | Thanjavur 613 007