

THE ROLE OF STATISTICAL DESIGN IN SAMPLING PLAN AND PILOTING SERVICE IMPROVEMENT INITIATIVE SURVEY - QATAR CASE

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Abstract

As part of Qatar's ongoing Service Improvement Initiative, a major national survey of client satisfaction is to be conducted regarding Qatar's public services.

The national survey is based on a representative sample of the population of Qatar's citizens and residents. This survey is intended to inform the development of client-centric approaches in Qatar's Ministries and Agencies by helping them to gain a greater understanding of the needs and expectations of their clients.

The research is aimed at looking into how this survey can test the survey strategy, data collection tools & field procedures for each population of interest: citizens, residents and tourists.

The research has showed the approaches for Assessing Customer Satisfaction and the main outcome of this experience in judging whether the survey questions flow: logic, order, relevance, easily understood, adequate to be measured.

Sampling plan used in this research suggested that the sample is a national probability sample drawn proportionate to population on the basis of age and gender, and separately by municipality. These groups were used as sampling parameters that have provided the number of sub-groups to be researched.

In this survey, there were two sources of under-coverage and over-coverage in the sample design. First, there were residents that live in labor gatherings. Second, there was the challenge of having to over-sample citizens in certain municipalities. Each of these issues were examined and dealt with accordingly.

1- INTRODUCTION

One of the core functions of any branch of the state of government is to provide public services aimed at improving the quality of life of its citizens. The executive agencies provide services go directly to the public, stakeholders, and support service delivery by other parts of government or act to protect the public. Agencies operate from their departments and have considerable autonomy and freedom of action. This freedom is accompanied by obligations to meet specific financial and operational targets set by their departments. Most agencies for the sake of setting targets, they use historical performance and an assessment of what would be a realistic and achievable improvement. For that, agencies adopt a range of approaches to ensure that their targets are sufficiently focused on their users' needs.

Customer feedback was often used by agencies as a basis for negotiating with their sponsor departments the level of service which they should provide, the resources needed, and the underpinning targets against which their performance should be measured. The extent to which agencies had reliable and comprehensive information on the different characteristics of their key customers and users were, however, variable.

Most agencies have targets directed at achieving specific outcomes or financial management, or focused on speed of delivery, rather than improving access to services or measuring cost and effectiveness. While agencies generally have systems in place for identifying and monitoring costs, these are not often linked to key outputs and outcomes. As a consequence, productivity is not often measured or monitored. Unit costs were frequently hard to measure so agencies were not well informed about comparative performance or the cost of incremental improvements in service delivery.

2- CUSTOMER FEED-BACK INITIATIVE

In order to track and analyze customer feedback over time, organizing our efforts is important. A critical question should be asked is whether we, as the initiator of a customer service project, have the ability to act on the data ourselves, or whether others will be critical to the process. For a unit or branch Customer feedback is valuable for everyone, and everyone can easily ask his or her customers for direct feedback about their needs and how things are going. Among the most common are face to face discussions, telephone calls, meetings and other events, and written correspondence. You can find perspectives containing feedback in newsletters and other information materials, videos, web site messages or electronic mail, newspapers, radio

and television talk shows, and news. Many customer interactions provide an immediate opportunity to hear from customers about how well the government is meeting their needs.

3- APPROACHES FOR ASSESSING CUSTOMER SATISFACTION

There is no one "best" approach for assessing customer satisfaction. What will work best for any particular organization will depend on the kind of product or service provided, the kinds of customers served, how many customers are served, the longevity and frequency of customer/service provider interactions, and what you intend to do with the results. There are two very different approaches produce equally meaningful and useful findings:

First method is to obtaining customer feedback periodically, but it is very important to remember that you can adopt continuous assessment as a standard method for obtaining customer satisfaction information.

The information you obtain from continuous assessment can provide valuable and timely insight into the experiences your customers have had with your organization.

Second method is a Periodic survey approach that obtains feedback from groups of customers at periodic intervals after service or product delivery. They provide an occasional snapshot of customer experiences and expectations.

Understanding customers' expectations and satisfaction requires multiple inputs from customers. Both methods are helpful in obtaining customer feedback for assessing overall accomplishments, degree of success, and areas for improvement.

4- DATA COLLECTION METHODS

Before considering systematic methods for collecting data, we should remember that informal methods for obtaining information from customers clearly produce information that is valuable. Everyone needs to recognize and use these everyday opportunities for customer feedback.

Many formal methods can be used to collect customer feedback data. Methods frequently used to gather customer feedback include focus groups, a mail-back postcard that is included among materials sent to customers, a mail survey, electronic kiosk, a telephone survey, a publication evaluation form included at the back of every copy, and a printed or in-person survey (which might include computer-assisted personal interviews or an intercept survey where you ask every *n*th customer attending a function or visiting a facility to participate). Electronic mail and Web based surveys will become an increasingly important means for collecting customer feedback as more people gain access to the Internet.

5- PILOTING

A pilot survey (pre-testing) is required at this stage to test a small-scale trial of the survey and data collection methods. Conducting a pre-test is extremely important because the results will provide opportunities for refining the questionnaire before the comprehensive data collection activity begins.

One of the best ways to conduct a pre-test is to select individuals randomly from the target group of customers served, invite them to complete the survey according to the method planned for the overall effort, and then participate in a focus group session to review their opinions. A pre-test is helpful for cost projections, and also provides information on the amount of time required to complete the survey.

The main outcome of this experience is to judge whether the survey questions flow: logic, order, relevance, easily understood, adequate to be measured.

6- DETERMINING THE SAMPLE SIZE

If you choose to conduct in-person survey, you will have to decide on the number of people who will be selected to participate. To determine this number, the *sample size*, several factors should be considered, such as the total number of customers served, the intended use of the results, available resources, and time. The larger the percentage sampled, the more certain you can be that the feedback obtained will be representative of the results you would have obtained if you received feedback from every customer.

The sampling error can be estimated through a ***confidence interval***. A confidence interval specifies a range of values within which the true measure is found. Typically, survey results rely on a 95 percent confidence interval, but lower levels are acceptable, depending on how you plan to use the findings. Popular media reports rarely stipulate confidence intervals, but they are implied.

7- SAMPLING DESIGN FOR CITIZENS AND RESIDENTS

There are many ways in which the final sample of individuals can be defined in terms of being representative of the population in the State of Qatar. For example, one might argue that language is suitable given the range of languages used in the country. Unfortunately, the Census does not collect this data. Moreover, the survey will only be conducted in three languages, namely Arabic, English and Urdu. In studies with very large samples, the sample can be defined on many levels. Some previous studies used rural/urban splits nested within regions to determine the sample's representation of the population. Also, in some large survey, gender and age sub-groups by region can be used.

For this first study in the State of Qatar, age and gender groups are workable as sampling parameters, provided the number of sub-groups sought is manageable. If each population of interest has a total sample of 400, it should be feasible to track quotas for six to eight sub-groups defined on the basis of age and gender. In addition, representation can be sought on the basis of region or municipality to improve the confidence in the sampling coverage. This is prudent given the desire for a national probability sample for citizens and residents.

7-1-Sampling citizen for the Survey

Census data allows for calculations of age and gender breakdowns for both citizens and residents in Qatar. This is used to develop individual target sample quotas as shown in **Exhibit 1**. Based on this design, the sample of residents will include a larger proportion of males since there are more of them in the population. Similarly, there are fewer persons aged 50+ in both samples because they also represent a smaller proportion of both populations.

Likewise, **Exhibit 2** shows the initial planned sample distribution by region. Much of the sample for Qataris and non-Qataris will come from Doha and Al Rayyan since they have the largest population base. This table also shows one region, Mesaieed, having no sample for Qataris. This is because there are so few Qataris residing there (0.05%) so applying this proportion to a sample of 400 citizens produces a sample count of less than 1. However, this creates a problem, or bias, related to under-coverage. Consequently, this specific sub-group is assigned a sample of 1 to overcome this problem (see **Exhibit 3**). In turn, one piece of sample is taken away from Al Rayyan to compensate. Recall, data weighting at the analysis stage can smooth out some of these imbalances. It is also likely that the five smallest municipalities will be pooled solely for the purpose of calculating proportional weights, with the goal of minimizing the impact of severe weights on the resulting statistics.

In summary, the sampling plan will be a national probability sample drawn proportionate to population on the basis of age and gender, and separately by municipality for citizens and residents. The goal, then, is to find citizens and residents to participate in the survey in the hopes of filling these sample quotas.

Like other surveys, this means having to secure a consistent rate or response across specific sub-groups of interest. In the absence of knowing those response rates a priori, it is useful to examine where specifically these citizens and residents can be found.

7-2-Sampling Residential Dwelling Units and Households for the Survey

Knowledge of where citizens and residents reside provides insights into specific regions that tend to have a higher incidence of either citizens or residents. This will facilitate some targeting of specific regions in the plan to make it more efficient and productive. This is important since both groups will have equal sample sizes, despite residents outnumbering citizens by a ratio of 3:1.

The sampling strategy for this study can replicate some of the steps taken to conduct the Census. The survey of citizens and residents will rely on two-stage probability sampling methodology. First, residential units and households will be selected in a systematic manner from data that is collected as part of the enumeration process. Second, individuals aged 18 and older will be selected from sampled residential units and households. Each stage is described in greater detail below.

For the enumeration, field teams will visit specific municipalities with maps that define blocks as potential sampling units. In each block, the enumerators will identify the number of buildings, houses and camps that exist. For each one, they will record basic information, including the street address or name of the building (something to identify the building), the number of floors and apartments, and the type of dwelling it appears to be (e.g. residential, commercial, shared accommodations or mixed use).

The complete enumeration will be compiled by the fieldwork manager. Based on the sampling quotas needed for that region and some assumptions about the mix of participants there and the survey response rate, the

fieldwork manager will select sample for each block in the municipality. A systematic procedure will be used to select every *n*th household based on the counts from the enumeration and the desired sample in that block. While not purely random per se, this is a widely accepted approach (near random) for sampling residential units and households.

For this survey, this complexity is less relevant than it is to census-takers. This is because the sampling unit for the National Client Satisfaction Survey is not the household, but rather the individual within that household, one who uses government services. The main goal of this stage in the sampling process is to ensure that certain types of households are not excluded systematically in the design. As such, households and dwelling units are generally considered as one and the same in this study (with a small exception noted below for labor gatherings).

7-3- Labor Gatherings

The 2004 Census reports that 87% of all enumerated households have inhabitants. Most of these (90.2%) are household dwellings or collective households having less than seven persons. Another 7.5% are labor gatherings with seven or more persons and 2.3% are mixed use units.

The data indicate that labor gatherings have an average of 24.0 individuals while other common types of occupancy have 5.3 individuals on average. This means that labor gatherings have 4.5 times as many individuals, on average, as other more common types of occupancy. If the sampling procedure is designed to obtain one respondent from the more common types of occupancy, then it will need to select more respondents to participate from a labor gathering to ensure they are sufficiently covered in the survey (i.e. four-five individuals per labor gathering). As a result, for every 100 sample records, 82 should come from individuals representing common types of occupancy. The other 18 should come from labor gatherings, collected over four labor gatherings (if four to five participants are selected from each gathering). If this is applied to the 800 target sample for citizens and residents combined, 656 will come from regular types of occupancy, and 144 will come from labor gatherings. If four to five persons are selected from each labor gathering, this requires sampling 32 gatherings. Stated another way, the 800 individuals will come from 688 residential units, 656 from more common types of dwellings and 32 from larger labor gatherings.

Labor gatherings generally include only residents, not citizens. If the resident sample includes 400 individuals, this means that a significant proportion of them (144 / 400 or 36%) should be selected from labor gatherings.

Exhibit 4 shows the number of residential units that might be selected based on the type of occupancy and the municipality where they are located if they were selected proportionate to population. According to this Exhibit, most would be selected in Doha and Al Rayyan.

One issue is what to do with those labor gatherings outside Doha and Al Rayyan having a proportionate share so low (counts less than 1.0) that no labor gathering is selected for that region. This is problematic because this represents a bias against labor gatherings outside larger urban centers. To correct for this, the distribution of labor camps selected can be adjusted so that each region is represented while also adjusting the number of interviews to be completed within each gathering so that it represents that gathering's share of the population. This is shown in **Exhibit 5**.

To calculate the number of labor gatherings to be sampled, the following procedure was applied to Exhibit 5:

- Municipalities having an applied labor camp sample count of ten or less were assigned a count of one labor gathering and no more than one labor gathering;
- Municipalities having an applied labor camp sample count of 15 or more were assigned a count of three or more labor gatherings, calculated in increments of five;
- Municipalities having an applied labor camp sample count between 11 and 14 were assigned a count of two labor gatherings.

The results in **Exhibit 5** show that different regions will have slightly different sample targets for labor gatherings and completed interviews.

8- OVER SAMPLING

It will be useful to know which municipalities have a lower or higher incidence of citizens. This helps the field team better plan for targeting specific municipalities of interest. The 2004 Census shows how the incidence of citizens and residents living in residential units other than labor gatherings varies by municipality (see **Exhibit 6**).

In Al Rayyan, the population in common types of occupancy is almost equally split between Qataris and non-Qataris. However, the sampling plan requires that almost two-thirds from that municipality are Qatari citizens. This is because the total sample of citizens is equal in size to the residents, yet not equal in population. For planning fieldwork, this means the field team will need to sample extra common residential units in Al Rayyan because they need to work harder to find Qatari citizens there. A similar pattern exists in Doha. Although there are fewer Qataris there, the field team has to work harder to find them because the sampling plan calls for over-sampling them in this municipality.

Exhibit 7 includes a slight adjustment to Exhibit 6 to remove sample cells having a count of zero. In Mesaieed, the residential unit count among Qataris was increased by one to remove bias due to under-coverage. In turn, one residential unit was taken away in the largest region for Qatari citizens, Al Rayyan. A similar approach was used for residents in Al Ghuwairiya, where one was added in this municipality and one was taken away in Doha. These are shown in italics in **Exhibit 7**.

The plan needs to account for over-sampling in certain municipalities. This is done by selecting more residential units than is defined by the targeted sample. **Exhibit 8** estimates the number of sampled common households needed to reach the target sample quotas for citizens and residents in that region. It also includes different assumptions about the response rate for the survey. As the table shows, even if everyone participated (i.e. 100% response), the field team will need to contact over 1000 of these common types of households to reach the target of 656.

Exhibit 9 summarizes the first-stage sampling plan, including target sample quotas for common types of households and for labor gatherings. This provides the blueprint for finding the types of citizens and residents needed to reach the second stage individual sampling quotas shown in Exhibits 1 and 3. The right hand column of this Exhibit is very close the sum of cells that appear in Exhibit 3. The small differences in the numbers are due to rounding.

9- PROCEDURES WITHIN SELECTED HOUSEHOLDS

The field team needs to implement the following procedures at each household:

- each residential unit or household selected for the sample must be rostered, collecting age and gender details on each person aged 18 and older residing there, including household employees, but excluding any visitors who normally have a residence elsewhere;
- using a random number grid, a single person will be selected from the household to secure a completed survey – the exception is for larger labor gatherings where multiple members of the roster may be selected in accordance with the sampling plan;
- once a household is selected to be sampled or an individual within it has been selected, it must be contacted on at least five occasions before it may be replaced with another household to be sampled – this will minimize the bias associated with having a low completion rate, especially among qualified contacts;
- surveys may be completed in either Arabic, Urdu or English;
- surveys may be self-completed or administered by a trained interviewer;
- only the person selected to complete the survey may do so - they should have no help or interference from anyone else in the household – if they require assistance, they may ask the interviewer; and
- upon completing the survey, it must be returned to the interviewer who will review it for accuracy before leaving – if errors are found, the interviewer will ask the respondent to correct the errors.

10- DETAILED FINDINGS AND IMPLICATIONS OF PILOT SURVEY

After conducting the pilot survey, there are few important issues and findings. These are listed below:

Survey Strategy

- In a word, this is ‘sound’
- Prospects for collecting high quality data with minimal refusals are high
- Field tools work
- Sample plan is feasible
- People will respond, despite the length of the interview
- Trained interviewers make a difference
- Supervision & observation must occur early in field

Interview Length

- The interview is long by most standards

- Between 45 and 60 minutes to complete questionnaires, plus a few minutes for rostering & respondent selection
- Some participants take longer if they take time to weigh their opinion, if their education level is lower or if their language skills are limited
- Once interviewers are comfortable with tools & process steps, an interview can be completed in 40 minutes
- Interviewer fatigue does set in after two completed interviews
- The interview length is of no material consequence
- No one asks about length in advance of the interview
- No one asks how much longer an interview will take
- No evidence of data quality suffering closer to end of interview
- No terminations part-way

Understanding Questions

- Large majority of questions understood
- Interviewers reported that training helped in providing guidelines on what could and could not be said to support respondents' understanding of question
- Frequently, problem areas were overcome by patiently re-reading a question or statement
- All languages worked well
- Urdu was not particularly problematic, just a little too 'wordy' in spots
- Note, the pilot testing did not test comparisons of meaning & interpretation across languages

Ability to Respond

- Response categories are generally functional, complete
- The greatest barrier to an accurate response was memory, but this occurred only rarely
- People follow instructions & interviewers reinforce them when recognizing signs that they are not being followed
- Residents move through services lists faster than citizens because they use a more narrow range of services
- Need to examine research questions separately for residents & citizens

Scales

- Scales are easy to understand & use by respondents
- They also make people think before responding
- With proper training, interviewers can help respondents use them properly & effectively, encouraging people to respond using numbers
- No need to label each point
- Respondents use all points without each one being labeled
- They interpret 4 and 2 to be less strong than 1 and 5
- It is faster when interviewers do not have to read itemized labels

Training

- Mission critical to success of study – needs time & attention
- With compressed pilot schedule, too few hours were devoted to training (15)
- Strong need for guidelines on how to help respondents understand questions & common strategies for promoting accurate (not leading) response
 - varies section to section
- Interviewers learn best during field trials, role-playing
 - Survey questions are ambitious, takes time to cover each topic
 - Too much time in class is boring for interviewers
 - Interviewers do not prepare in advance of training (by reading), even when asked
 - Testing warranted for full field study to ensure interviewers are ready
- Once in field, observation & supervision must be done early & often to prevent bad habits from taking root
- If time permits, re-testing part-way through field may be necessary to ensure interviewers administer survey properly

Citizen & Resident Sample Lists

- Lists very accurate, useful in field
- Finding homes a challenge for field team, even in new areas
 - Street names rarely shown
 - House numbers rarely shown, difficult to follow

- Prospects for interviewer error are high
- Nationality collected during enumeration process, but languages spoken in home more useful for planning interviewer assignments
- Frame to complete ratio workable only if number of contacts allowed is increased from current maximum of three contacts

Citizen & Resident Sample Lists: Labor Gatherings

- Not quite as expected – better not worse
- Statistics Department treats these differently for enumeration, however for this study they seem just like large apartment buildings
- Initially planned to allow for respondent replacement within a gathering
- Suggest these be treated like other apartments, using same rostering & respondent selection without respondent replacement

Securing Interest

- Interviewers very skilled at securing interest
- As instructed, got across key messages without reading script
- Personable, engaging
- Ability to read person who greets them at door, adjust messaging accordingly
- Resourceful in connecting with someone who knows something about home or respondent (e.g. building manager, neighbor) if no person is home

Respondent Selection

- Interviewers took rostering seriously, few errors found
- When found, they were corrected
- Initially, rosters were incomplete, but corrected with coaching
- Kish table easy to use, makes process of selection objective, legitimate to respondent

Confidentiality

- This is not a barrier to participation
- Few respondents mention it or ask questions about it
- Interviewers sometimes forget to communicate confidential nature of data collected
- Corrected with coaching
- Some interviewers note this can be sensitive in Qatar, asked if they may be allowed to volunteer this only if necessary
- Perhaps language can be adjusted to communicate meaning & intent without using the word ‘confidential’

Call Attempts & Call-backs

- Critical to study success
- Ensure fieldwork gets completed on time
- Help reach target response rates (> 60%)
- Average number of contacts in pilot > 4
- Guideline was three contact attempts due to concerns about burden
- If pilot field followed this guideline, available sample would have resulted in low response rate (much less than 50%) & only half of target interviews completed
- Frequent call-backs more important for residents where households are smaller in size
- With Qataris, someone was almost always in the home, which facilitated scheduling of specific call-backs

Field Times, Dates

- Most productive times
- Evenings
- Saturdays
- However, different types of respondents identified on different days, different times in pilot
- Flexible times, dates needed, subject to interviewer availability, or non-response bias may result

Refusal & Response Rates

- Refusal rate low, 3%
- Response rate on target, 66%, but excludes eligible homes screened out at enumeration stage by Statistics Department
- Only possible to achieve response rate by increasing number of call-attempts from 3 to 6 – 8
- Response rate slightly lower among residents

- Not home often, some work long hours
- Higher incidence of language barriers

Supervision & Observation

- Higher level of supervision & observation used
- Tied to nature of testing objectives
- Both important to success of study
- Promote high data quality
- Improve interviewer consistency
- Even new interviewers develop bad habits early (e.g. biased body language), which needs to be identified & corrected

Support Tools

- ID badges effective when worn in a visible location
- Must be shown to people on first contact – makes study more legitimate, helps open doors
- Bags are functional, make interviewers look like they belong to field team
- Helps when call-backs are made by other interviewers
- Show cards & survey packages useful & effective
- Both need to be more user-friendly
- Show cards should all be same size, collated on a single ring for ease of reference (e.g. like paint or material swatches)
- Survey must be in package for interviewer, but allow for introductory script, Kish table, sample information to be removed from questionnaire post interview (to protect confidentiality)

Approach for Tourists

- Fieldwork not conducted at airports
- Encountered hurdles in securing suitable interview location
- Smaller sample size further marginalizes this group relative to other populations of interest
- Raises questions about utility of addressing research questions with this segment & level of effort expended to do so.

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Appendices

Exhibit 1 Desired Sample Distribution by Age, Gender and Citizenship								
Age (18+)	Census				Sample Quotas			
	Qataris		Non-Qataris		Qataris (n=400)		Non-Qataris (n=400)	
	males	females	males	females	males	females	males	Females
18 – 24	12.55%	12.82%	8.05%	3.33%	50	51	32	13
25 – 34	13.73%	14.14%	24.95%	8.50%	55	57	100	34
35 – 49	14.38%	15.65%	33.26%	8.90%	58	63	133	36

50 +	8.44%	8.28%	10.97%	2.05%	34	33	44	8
Total	49.11%	50.89%	77.22%	22.78%	196	204	309	91

Source: Population Census, State of Qatar, March 2004.

Exhibit 2 Initial Sample Distribution by Municipality and Citizenship				
Municipality	Qataris		Non-Qataris	
	Population% from Census	Sample Size	Population% from Census	Sample Size
Doha	32.10%	128	50.19%	201
Al Rayyan	47.43%	190	33.10%	132
Al Wakra	5.63%	23	3.76%	15
Umm Salal	9.02%	36	2.66%	11
Al Khor	2.69%	11	4.75%	19
Al Shamal	0.98%	4	0.56%	2
Al Ghuwairiya	0.18%	1	0.33%	1
Al Jemailya	1.07%	4	1.49%	6
Jeryan Al Betna	0.85%	3	0.91%	4
Mesaieed	0.05%	0	2.25%	9
Total	100%	400	100%	400

Source: Population Census, State of Qatar, March 2004.

Exhibit 3 Desired Sample Distribution by Municipality and Citizenship				
Municipality	Qataris		Non-Qataris	
	Population% from Census	Sample Size	Population% from Census	Sample Size
Doha	32.10%	128	50.19%	201
Al Rayyan	47.43%	189	33.10%	132
Al Wakra	5.63%	23	3.76%	15
Umm Salal	9.02%	36	2.66%	11
Al Khor	2.69%	11	4.75%	19
Al Shamal	0.98%	4	0.56%	2
Al Ghuwairiya	0.18%	1	0.33%	1
Al Jemailya	1.07%	4	1.49%	6
Jeryan Al Betna	0.85%	3	0.91%	4
Mesaieed	0.05%	1	2.25%	9
Total	100%	400	100%	400

Source: Population Census, State of Qatar, March 2004.

Exhibit 4 Residential Units by Type of Occupancy and Municipality					
Municipality	Residential Units with Inhabitants			Counts Applied to Sample	
	Total Number	Labor Gathering (Column %)	More Common Types of Occupancy (Column %)	Labour Gathering	More Common Types of Occupancy
Doha	63371	52.23%	57.59%	16.71	377.82
Al Rayyan	30325	35.12%	26.74%	11.24	175.41
Al Wakra	4409	2.76%	4.08%	0.88	26.75
Umm Salal	3895	1.55%	3.67%	0.50	24.10
Al Khor	3566	3.85%	3.17%	1.23	20.77
Al Shamal	935	0.65%	0.86%	0.21	5.64
Al Ghuwairiya	240	0.57%	0.19%	0.18	1.24
Al Jemailya	2597	2.42%	2.34%	0.77	15.33
Jeryan Al Betna	695	0.55%	0.63%	0.18	4.15
Mesaieed	771	0.30%	0.73%	0.10	4.77

Total	110804			32	656
Residential Units	688				

Source: Population Census, State of Qatar, March 2004

Exhibit 5 Labor Gatherings by Municipality					
Municipality	Counts from Census		Counts Applied to Sample		
	Number of Gatherings	Population Counts in Gatherings	Sample Counts Applied from Population Counts	Gathering Counts	Target Completes Per Labor Gathering
Doha	52.23%	33.46%	48	10	4-5
Al Rayyan	35.12%	44.90%	65	13	5
Al Wakra	2.76%	2.28%	3	1	3
Umm Salal	1.55%	1.90%	3	1	3
Al Khor	3.85%	8.48%	12	2	6
Al Shamal	0.65%	0.47%	1	1	1
Al Ghuwairiya	0.57%	0.61%	1	1	1
Al Jemailya	2.42%	1.12%	2	1	2
Jeryan Al Betna	0.55%	1.97%	3	1	3
Mesaieed	0.30%	4.79%	7	1	7
Total	100%	100%	144	32	

Source: Population Census, State of Qatar, March 2004.

Exhibit 6 Population Incidence in Common Types of Occupancy by Municipality							
Municipality	Percent from Census			Counts Applied to Sample			
	% of Population in Municipality	Incidence of Qataris %	Incidence of Non-Qataris %	Qataris		Non-Qatari	
				Sample	Row %	Sample	Row %
Doha	50.14	21.80	78.20	128	45.76	152	54.24
Al Rayyan	33.67	47.98	52.02	190	73.62	68	26.38
Al Wakra	4.93	38.87	61.13	23	65.79	12	34.21
Umm Salal	5.10	60.18	39.82	36	82.05	8	17.95
Al Khor	2.69	34.11	65.89	11	61.03	7	38.97
Al Shamal	0.73	45.59	54.41	4	71.71	2	28.29
Al Ghuwairiya	0.17	35.51	64.49	1	62.49	0	37.51
Al Jemailya	1.48	24.60	75.40	4	49.67	4	50.33
Jeryan Al Betna	0.51	57.17	42.83	3	80.15	1	19.85
Mesaieed	0.58	2.87	97.13	0	8.21	2	91.79
Total	100%			400		256	

Source: Population Census, State of Qatar, March 2004.

Exhibit 7 Adjusted Units Counts in Common Types of Occupancy by Municipality							
Municipality	Percent from Census			Counts Applied to Sample			
	% of Population in Municipality	Incidence of Qataris %	Incidence of Non-Qataris %	Qataris		Non-Qatari	
				Sample	Row %	Sample	Row %
Doha	50.14	21.80	78.20	128	45.76	151	54.24
Al Rayyan	33.67	47.98	52.02	189	73.62	68	26.38
Al Wakra	4.93	38.87	61.13	23	65.79	12	34.21
Umm Salal	5.10	60.18	39.82	36	82.05	8	17.95
Al Khor	2.69	34.11	65.89	11	61.03	7	38.97
Al Shamal	0.73	45.59	54.41	4	71.71	2	28.29

Al Ghuwairiya	0.17	35.51	64.49	1	62.49	1	37.51
Al Jemailya	1.48	24.60	75.40	4	49.67	4	50.33
Jeryan Al Betna	0.51	57.17	42.83	3	80.15	1	19.85
Mesaieed	0.58	2.87	97.13	1	8.21	2	91.79
Total				400		256	

Source: Population Census, State of Qatar, March 2004.

Exhibit 8 Targets for Common Types of Occupancy by Municipality for Different Response Rates							
Municipality	Residential Units			Households Needed			
	Qataris	Non-Qataris	Total	100%	75%	50%	25%
Doha	128	151	279	610	814	1220	2441
Al Rayyan	189	68	257	273	364	546	1092
Al Wakra	23	12	35	48	64	96	193
Umm Salal	36	8	44	48	64	96	192
Al Khor	11	7	18	28	38	56	113
Al Shamal	4	2	6	7	9	14	27
Al Ghuwairiya	1	1	2	3	4	6	11
Al Jemailya	4	4	8	16	22	33	65
Jeryan Al Betna	3	1	4	4	6	9	17
Mesaieed	1	2	3	36	48	72	143
Total	400	256	656	1074	1431	2147	4294

Exhibit 9 Residential Targets and Sample Sizes by Type of Occupancy and Municipality						
Municipality	Types of Residential Units			Target Samples of Individuals		
	Common	Labor Gatherings	Total	Common	Labor Gatherings	Total
Doha	279	10	289	279	48	327
Al Rayyan	257	13	270	257	65	322
Al Wakra	35	1	36	35	3	38
Umm Salal	44	1	45	44	3	47
Al Khor	18	2	20	18	12	30
Al Shamal	6	1	7	6	1	7
Al Ghuwairiya	2	1	3	2	1	3
Al Jemailya	8	1	9	8	2	10
Jeryan Al Betna	4	1	5	4	3	7
Mesaieed	3	1	4	3	7	10
Total	656	32	688	656	144	800