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Chapter 4 – Estimates of the Number of Clients Served
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4.   ESTIMATES OF THE NUMBER OF FEEDING AMERICA CLIENTS SERVED

A key factor in assessing the size and contribution of the FA network is to form an estimate of the number of people the network's emergency food providers serve.[13] Estimates of the numbers of different types of providers in the network are also of great interest. Both sets of numbers are derived in this chapter.

In presenting weekly and annual estimates of the number of different people served, our objective is to gauge the number of people served food at any time in the period covered. That is, we wish to form an estimate of the number of people *ever served* at least once in a typical week and the number served at least once in the past year. Our weekly estimates are based on the analysis weights calculated using the survey sampling design and accounting for nonresponse or non-cooperation at each survey stage (agencies, programs, and clients). For the annual results, additional extrapolation across the year is needed, as described below.

4.1   BACKGROUND AND LIMITATIONS

The estimation process draws on several data sources to derive estimates of the size of the FA system:

- Information from the survey sample frame of providers, which was compiled from food bank records.

- Information from the sampling and data collection operations on the observed numbers of clients served by providers, the providers' days of operation, and similar factors.

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[13] Because the client counts are not based solely on survey data (for example, as in the Hunger in America 2006 study, they employ model-based assumptions about how newcomers are districted across months of the year), the term "projection" may be more appropriate than "estimate." However, so as to not alternate between referring to client counts as projections and agency counts as estimates, we refer to each set of counts as estimates.

- Information from the client survey on respondents' length and frequency of use of the emergency food system.

- Information from FA administrative files on the sizes of the food banks that participated in the study compared with those that did not participate.

Given these rich data sources, several approaches can be taken in the estimation work. In much of the work below, we draw primarily on an approach, rooted in standard statistical estimation theory, where we (1) compute the probabilities of various providers and clients being in our survey sample, (2) compute analysis weights based on these probabilities, and (3) make estimates of the underlying population totals by summing the relevant analysis weights. In some instances, however, we use alternative approaches to develop certain estimates, compensate for limited information availability, make adjustments based on hypotheses, and test the robustness of our conclusions. We describe these approaches later in this chapter.

Our estimates unavoidably contain some uncertainty, which comes from several factors:

- ***Statistical Sampling Error.*** Sampling error results from the fact that many of the estimation parameters are based on *statistical samples,* rather than on surveys of all the relevant providers and clients.

- ***Reporting Error.*** Some of the interview questions on which our estimates are based were unavoidably complex. As a result, some error undoubtedly exists because respondents did not always understand the questions and did not always report accurately.

- ***Nonresponse Bias.*** As with any survey, it must be assumed that there is at least some error *due to nonresponse.* In this survey, it would be caused by the agencies and clients who did not respond to our surveys being systematically different from those that did.

- ***Coverage Bias.*** About 88% of the FA food banks participated in the study, which may lead to coverage bias. While we have adjusted for this, we cannot determine for sure exactly how accurate our adjustments are.

- ***Alternative Estimation Methods.*** As the subsequent discussion makes clear, several methods could be used in deriving the results presented below. Our discussion explains the reasons for the choices we make, but some judgment is involved in this and may influence the final results.

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- ***Seasonality.*** Because of logistical requirements, most of the data were collected during winter and spring 2009. Therefore, it is not possible with this data set to fully examine and correct for fluctuations in the FA system and clients over the entire year.

Despite these possible sources of error, the Mathematica research team for the study believes that the estimates derived below are based on the best survey methods and estimation procedures available, given the resources.

The next section provides an overview of our findings. After that we describe additional details of our calculations. We begin with pantries, since they are the largest component of the FA network.

4.2   OVERVIEW OF FINDINGS

Our basic approach to deriving annual estimates of clients served annually is to start with survey-based estimates of clients served per week, then apply several extrapolation factors to get an annual figure.[14] However, because considerable margins of error are unavoidable in extrapolating from weekly estimates to annual estimates of clients served, we present measures of error in the form of confidence intervals for these counts.

Overall, FA pantries, kitchens, and shelters serve an estimated 37.0 million different people annually and 5.7 million different people in a typical week (Table 4.2.1).[15] The 95-percent confidence intervals associated with these estimates extend from 33.8 to 40.2 million annual clients and from 5.7 to 5.8 million weekly clients. Both ranges take into account the multistage survey design. In addition, the annual range accounts for sampling error associated

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[14] The weekly estimates of clients served by pantries, kitchens, or shelters are estimated using a model-based method which is very similar to that used to produce the 2005 estimates in Hunger in America 2006 study. This is described in the Technical Appendix.

[15] All participation counts for clients are based on an analysis file that excludes all clients interviewed at programs served by 3 food banks due to data collection problems. Thus, all client estimates are based on 181 food banks that participated in the client survey.

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with the factors used in obtaining an annual estimate from a weekly estimate and is computed

using the Taylor series linearization method. These factors are described in detail in Section 4.4

and the estimation of the standard error used to compute the confidence interval is discussed in

detail in the Technical Appendix.

TABLE 4.2.1

ESTIMATES OF NUMBERS OF DIFFERENT CLIENTS SERVED BY THE FA NETWORK
(WEEKLY AND ANNUAL ESTIMATES)

	Each Agency Type Considered Separately	After Correcting for Overlap of Clients Across Agencies[a]
Weekly Estimates		
Pantries (Persons)	5.2 million	5.1 million
(Households)	1.8 million	1.8 million
Kitchens (Persons)	0.6 million	0.5 million
Shelters (Persons)	0.2 million	0.2 million
Total (Persons)		**5.7 million**
95-Percent Confidence Interval		5.7 to 5.8 million
Annual Estimates		
Pantries (Persons)	35.0 million	33.9 million
(Households)	12.3 million	11.9 million
Kitchens (Persons)	2.1 million	1.8 million
Shelters (Persons)	1.6 million	1.3 million
Total (Persons)	n.a.	**37.0 million**
95-Percent Confidence Interval	n.a.	33.8 to 40.2 million

[a]Any client using a pantry is counted under pantries. Clients using just kitchens and shelters are counted under kitchens.

By far, the largest client group is that served by pantries, which account for more than

90% of the annual total. Kitchens are the next most commonly used provider.

4.3   ESTIMATES OF NUMBER OF PANTRIES IN THE NETWORK

To estimate the number of pantries in the FA network, we begin by estimating the

number of pantries served by the *food banks participating in the data collection.* We then

extrapolate to the nonparticipating food banks.

As described in Chapter 3, we began the data collection by asking the participating food banks for lists of all the agencies they served, classified by types of programs the agencies run. A total of 49,386 agencies were listed by the 181 food banks participating in the client survey (Table 4.3.1).[16] However, the food banks listed some of these agencies as running food programs other than pantries, kitchens, or shelters, such as those for day care centers and halfway houses, which were not included in the detailed survey work. As Line 3 of the table shows, after subtracting the agencies without pantries, kitchens, or shelters, 29,802 agencies remained.

To plan the sampling and field operations for the client survey, we obtained detailed operating information for a random sample of these 29,802 agencies. In conducting this work, we found that 14.4% of the agencies that had originally appeared eligible for the survey either were not still operating or were operating types of programs not directly germane to the survey. This left an estimated 27,909 agencies operating types of providers that were to be included in the survey. As Line 6 shows, 91.6% of these 27,909 agencies operated pantries (the others operated kitchens or shelters). An additional step in the derivation accounts for the fact that some agencies operated more than one pantry (Line 8).

Based on these calculations, the estimated final number of pantries served by food banks participating in the client survey is 29,640. The final step in the derivation is to extrapolate from the participating food banks to the entire FA system. The 181 food banks that participated in the client survey represent about 86% of all FA food banks. However, the participating food banks are larger, on average, than the typical food bank. In particular, based on food bank reports to FA, they account for about 88% of all the total food distributed by food banks in the FA system.

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[16] Much of the estimation work focuses on the subset of food banks that participated in the client survey, because we have more complete information on the sample frames for them.

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Based on this information, we use an extrapolation factor of 1.13 to extend the estimates based just on participating food banks to the system as a whole. With this adjustment, the estimate of total pantries in Table 4.3.1 becomes 33,493.

TABLE 4.3.1

ESTIMATED NUMBER OF PANTRIES IN THE FA NETWORK

1.	Total operating agencies listed in the files of the participating food banks	49,386
2.	Percentage of agencies listed as operating at least one pantry, kitchen, or shelter[a]	60.3
3.	Subtotal	29,802
4.	Percentage of agencies in Line 3 that were found prior to survey operations (during detailed sampling work) no longer to be operating or to be operating only types of agencies other than pantries, kitchens, or shelters	14.4
5.	Revised subtotal	27,909
6.	Percentage of agencies in Line 5 that operate pantries[b]	91.6
7.	Agencies operating pantries	25,552
8.	Average pantry providers per agency operating pantries	1.16
9.	Final estimate of pantries in participating food banks	29,640
10.	Adjustment factor for nonparticipating food banks[c]	1.13
11.	Final estimate of pantries	33,493

Source: Lines 1-7 are based on client survey records; Line 8 is based on tabulations of agency survey data.

[a]Remaining agencies were listed in an "other" category, as operating some other type of provider with food service operations, such as a day care center or a halfway house program.

[b]Some additional ineligible agencies were found during the survey work.

[c]On this table, nonparticipating food banks also include those that participated in the agency survey only.

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4.4   ESTIMATES OF THE NUMBER OF PANTRY CLIENTS

Here we present estimates of the number of clients served by FA pantries, based on microlevel information about the design-based analysis weights assigned to individual observations in the sampling work.

For interviewing at pantries, the sampling unit was the household. As discussed in Chapter 3 and detailed in the Technical Appendix volume, we have computed weights for each of the observations in the client survey sample, based on their probabilities of being selected into the sample in a typical week. These weights are based on several factors, including:

- The probability of selecting the client's agency into the subset of agencies used for the client survey and the probability of selecting the client's program. (This reflects the probabilities of the agency being selected at several different stages of the sampling process, the number of days per week the programs are open, and program-level participation rates, in terms of the agencies agreeing to allow the on-site data collection work.)

- The probability of selecting the client into the sample during the on-site work at the agency during the day of client interviewing. (This reflects the number of clients at the agency that day and the number actually selected for interviewing.)

- Client responses to interview questions concerning how many times they had been at any pantry during the week the interviewing took place.

These factors have allowed us to compute probabilities of each of the selected clients (1) being at a pantry *in a typical week,* (2) being selected into the data collection sample, and (3) responding to the survey. The initial set of weekly client weights is calculated based on the inverses of these probabilities. These weights make the sample representative of the universe of households receiving food at least once from a pantry served by a participating food bank *in a typical week.* The sum of these weights, 1.6 million, presented in Line 1 of Table 4.4.1, can be interpreted as an estimate of the number of *different* households obtaining food from pantries served by the participating food banks in a typical week. This estimate is still in terms of

households, not *persons.* The conversion to persons will be done later in the estimation process below. In addition, the estimate applies only to clients in pantries that the participating food banks cover.

The weekly estimate in Line 1 of the table provides the basis of the annual estimates that we are about to derive. However, weekly estimates are also of considerable interest in themselves as a measure of the size of the system. This is true especially because this weekly estimate is probably somewhat more accurate than the annual estimates derived below. In particular, as our methodological discussion in Chapter 3 indicates, computing *annual* estimates unavoidably required asking survey respondents to report on their use of the emergency food system over a significant amount of time—a year in some instances. This long reporting span undoubtedly increases reporting error. In contrast, the weekly estimate requires only that respondents be able to report on their use of the system *during the week of the survey*—a considerably less exacting requirement.

The estimation process continues by drawing on various survey findings to obtain, ultimately, an *annual* estimate of different clients. The next step is to convert the weekly estimate in Line 1 to pantry visits in a month by multiplying by a factor of four weeks per month.[17] We then divide by a survey-based estimate that shows that, on average, households that use pantries visit them 2.0 times per month. Based on these factors, Line 5 indicates that the number of different client household visits in a month at all FA pantries that the participating food banks cover is estimated to be 3.3 million.

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[17] We considered using a factor of 4.3 weeks per month but elected to use the 4.0 factor because 4.0 may reflect more accurately how survey respondents converted between weeks and months in answering the survey questions. The appropriate choice is not fully clear, but it makes a significant difference. Using 4.3 would increase the pantry estimates by about 7%. The 7% is calculated as: [4.3 ÷ 4]).

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TABLE 4.4.1

DERIVATION OF ESTIMATE OF DIFFERENT PEOPLE
USING PANTRIES ANNUALLY

1.	Estimated number of pantry household visits in a week by different households in areas covered by participating food banks	1.6 million
2.	Weeks in a month	4.0
3.	Pantry household visits in a month	6.5 million
4.	Average household visits per month (per household)	2.0
5.	Different household visits in a month	3.3 million
6.	Average monthly percentage of all client households that start using pantries each month	20.8
7.	Total entrants in months 2 through 12 (Line 6 × Line 5 × 11 months)	7.6 million
8.	Total different households in months 1 through 12 (Line 5 + Line 7)	10.9 million
9.	Average household size (persons per household)	2.8
10.	Different people served in months 1 through 12 in areas covered by participating food banks (Line 8 × Line 9)	30.9 million
11.	Adjustment for nonparticipating food banks	1.13
12.	Different people served annually by pantries in the network (Line 11 × Line 10)	35.0 million
13.	Different people served annually by pantries in the network (95-percent confidence interval)	32.1 to 37.8 million

Note: The technique used in the table of adjusting totals by average should be viewed as an approximation of the exact relevant numbers, if the relevant variables, including sample weights, are correlated with one another. For instance, if two variables are correlated, the product of the averages for two variables might not be exactly the same as the average of their products.

The next step in the derivation is to go from the estimated monthly number of unique pantry clients to develop an *annual* estimate. As noted above, in all likelihood, this step is subject to more error than the earlier ones because many of the pantry clients might have had difficulty responding accurately to questions that cover a period as long as a full year.

During the interview, respondents were asked how many months in a row in the past year they had received food from pantries (Question P61b). The response categories to this question,

which interviewers read to respondents, were denominated in months, with the key category being "just this month." We used information from this question to estimate the number of clients who are new to the system, in that they reported not having used a pantry in the 12 months before the current month. About 20.8% of clients fell into this category, resulting in about 7.6 million new-entrant households in the past year.[18]

The next step in deriving an estimate of different users annually is to draw on the survey data to estimate the number of people per household. Based on the survey data, there are about 2.8 people per household in the population using pantries. A subsequent adjustment extrapolates the estimate from the areas covered by participating food banks to the entire set of FA food banks. After making these adjustments, the final estimate of people the FA network pantries served in a year is 35.0 million. The corresponding 95-percent confidence interval, computed using the standard error of the weekly estimate and variation in the factors used to extrapolate to the annual count, extends from 32.1 to 37.8 million clients.

4.5   ESTIMATES OF NUMBER OF KITCHENS IN THE NETWORK

Our analysis of the number of emergency kitchens served by FA food banks uses the same analytical steps as the analysis of pantries. There were 3,550 agencies that, based on the information developed in compiling the sample frame, appeared to be operating kitchens (Table 4.5.1, Line 7). After taking into account that some agencies were operating more than one kitchen program, we estimate that 3,941 kitchens are being served by FA food banks participating in the study. An adjustment for nonparticipating food banks raises the total estimate of kitchens to 4,453.

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[18] This estimate has been adjusted using national employment data (see Section 3.6.2).

TABLE 4.5.1

ESTIMATED NUMBER OF KITCHENS IN THE FA NETWORK

1.	Total operating agencies listed in the files of the participating food banks	49,386
2.	Percentage of agencies listed as operating at least one pantry, kitchen, or shelter[a]	60.3
3.	Subtotal	29,802
4.	Percentage of agencies in Line 3 that were found no longer to be operating or to be operating only types of agencies other than pantries, kitchens, or shelters	14.4
5.	Subtotal	27,909
6.	Percentage of agencies in Line 5 that operate kitchens[b]	12.7
7.	Agencies operating kitchens	3,550
8.	Average kitchen providers per agency operating kitchens	1.11
9.	Final estimate of kitchens in participating food banks	3,941
10.	Adjustment factor for nonparticipating food banks	1.13
11.	Final estimate of kitchens	4,453

Source: Lines 1-7 are based on client survey records; Line 8 is based on tabulations of agency survey data.

[a]Remaining agencies were listed in an "other" category as operating some other type of provider with food service operations, such as a day care center or a halfway house program.

[b]Some additional ineligible agencies were found during the survey work.

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4.6   ESTIMATES OF THE NUMBER OF KITCHEN CLIENTS

Our approach to estimating the number of kitchen clients served in a year also closely parallels that used for pantries. It begins with an estimate of the number of different clients served in a week. We then use data on clients' patterns of use to extrapolate up to an annual estimate. One different factor taken into account is that the sampling unit at the kitchens was adults age 18 and older, rather than households. Therefore, to get a complete measure of clients served, we must use survey data on minors accompanying the adults. As Table 4.6.1 shows, based on the survey weights, an estimated 0.4 million adults used kitchens in a week. Furthermore, there were about 0.2 children per adult. These estimates imply an estimated 0.5 million people using kitchens in a given week.

The next step is to extend this weekly estimate to the month and the year levels. The technique used with pantries—of multiplying the weekly estimates by four weeks per month and then dividing by the average number of times clients use the facility in a month—cannot reasonably be applied to kitchens. This is because kitchen clients tend to use these facilities much more often per week and per month.

An alternative version of the pantry approach is possible, however. Unlike with pantries, the number of people present at kitchens in a given week can be viewed as a reasonable approximation of the clients who are *currently using* the facility at a given point in time. This allows us to use the week as the unit of observation in parts of the accounting. (More formally, most people who can be viewed as "ongoing," or current, clients of a kitchen are likely to use the kitchen at least once during a weekly sampling period and thus have a non-zero probability of selection into the survey on a given week. This is not true of ongoing pantry users, most of whom use pantries only once or twice a month.)

TABLE 4.6.1

DERIVATION OF ESTIMATE OF DIFFERENT PEOPLE
USING KITCHENS ANNUALLY

1.	Estimated number of different adults visiting kitchens in a week in areas covered by participating food banks	0.4 million
2.	Average number of children accompanying adults	0.2 children per adult
3.	Different adults and children visiting kitchens in a week	0.5 million
4.	Average monthly percentage of clients who start using kitchens each month[a]	23.4
5.	New entrants in a year[b]	1.4 million
6.	Different adults and children using kitchens in a year	1.9 million
7.	Adjustment for nonparticipating food banks	1.13
8.	Different people served annually by kitchens in the FA network (Line 6 × Line 7)	2.1 million
9.	Different people served annually by kitchens in the FA network (95-percent confidence interval)	1.9 to 2.3 million

Source: See the Technical Appendix volume for details on the derivation of the table entries.

[a]Estimated percentage is percentage entering in a month. The base of the estimates is the estimated clients at a given point in time, as approximated by a week.

[b]Calculated as follows: (11.75months) × (percentage entering per month from Line 4) × (base estimate of clients at a point in time from Line 3).

  The survey question used to identify "newcomer" kitchen clients is essentially the same as that used for the same purpose for pantry clients (Question K70, "Now thinking about the past year, did you use a soup kitchen . . .). As with pantries, the answer categories are denominated in months of use. Our approach to estimating the percentage of kitchen clients newly receiving services in a given month is based on the percentage of clients responding to the above turnover question by saying that the current month is the only month in the past year that they have been

to a kitchen.[19] About 23.4% of clients fell into this category, resulting in about 1.4 million new

kitchen clients during the year.[20] This leads to an annual estimated number of people using

kitchens in the areas covered by participating food banks of 1.9 million. Finally, as shown at the

bottom of the table, extrapolating this to the entire FA network leads to an estimate of 2.1 million

different kitchen clients per year. The corresponding 95-percent confidence interval, computed

using the standard error of the weekly estimate and variation in the factors used to extrapolate to

the annual count, extends from 1.9 to 2.3 million clients.

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[19] Even though the weighted survey *base* is, analytically, "clients in a week," the question effectively covers a period extending for the entire previous month, because the answer categories read to the respondents are denominated in months.

[20] This estimate has been adjusted using national employment data (see Section 3.6.2).

4.7   ESTIMATES OF EMERGENCY SHELTERS IN THE NETWORK AND ESTIMATES OF THE NUMBER OF EMERGENCY SHELTER CLIENTS IN A YEAR

We have derived estimates of the number of emergency shelters and estimates of the number of clients attending them using methods exactly the same as those used for kitchens (Table 4.7.1 and Table 4.7.2). Overall, we estimate that the number of emergency shelters served by all FA food banks is 3,576 and that the estimate of the number of different clients served meals annually by the shelters is 1.6 million. The corresponding 95-percent confidence interval for the shelter client count, computed using the standard error of the weekly estimate and variation in the factors used to extrapolate to the annual count, extends from 1.3 to 1.8 million clients.

TABLE 4.7.1

ESTIMATED NUMBER OF SHELTERS IN THE FA NETWORK

1.	Total operating agencies listed in the files of the participating food banks	49,386
2.	Percentage of agencies listed as operating at least one pantry, kitchen, or shelter[a]	60.3
3.	Subtotal	29,802
4.	Percentage of agencies in Line 3 that were found no longer to be operating or to be operating only types of agencies other than pantries, kitchens, or shelters	14.4
5.	Subtotal	27,909
6.	Percentage of agencies in Line 5 that operate shelters[b]	10.0
7.	Agencies operating shelters	2,801
8.	Average shelter providers per agency operating shelters	1.13
9.	Final estimate of shelters in participating food banks	3,165
10.	Adjustment factor for nonparticipating food banks	1.13
11.	Final estimate of shelters	3,576

Source: Lines 1-7 are based on client survey records; Line 8 is based on tabulations of agency survey data.

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TABLE 4.7.1 (continued)

[a]Remaining agencies were listed in an "other" category, as operating some other type of provider with food service operations, such as a day care center or a halfway house program.

[b]Some additional ineligible agencies were found during the survey work.

TABLE 4.7.2

DERIVATION OF ESTIMATE OF DIFFERENT PEOPLE USING SHELTERS ANNUALLY

1.	Estimated number of adults visiting shelters in a week	0.19 million
2.	Average number of children accompanying adults	0.2
3.	Different adults and children visiting shelters in a week	0.22 million
4.	Average monthly percentage of all clients who start using shelters each month[a]	46.1
5.	New entrants in a year[b]	1.2 million
6.	Different adults and children using shelters in a year[c]	1.4 million
7.	Adjustment for nonparticipating food banks	1.13
8.	Different people served annually by shelters in the FA network (Line 6 × 7)	1.6 million
9.	Different people served annually by shelters in the FA network (95-percent confidence interval)	1.3 to 1.8 million

Source: See the Technical Appendix volume for details of the derivation of the table entries.

[a]Estimated percentage is percentage entering in a month. The base of the estimates is the estimated clients at a given point in time, as approximated by a week.

[b]Calculated as follows: (11.75 months) × (percentage entering per month from Line 4) × (base estimate of clients at a point in time from Line 3).

4.8 ESTIMATES OF DIFFERENT CLIENTS ACROSS THE WHOLE FEEDING AMERICA SYSTEM

The estimates derived so far, along with additional data collected in the survey, make it possible to derive an estimate of the total number of different clients served by all three types of FA emergency food providers, taken together. Survey questions asked respondents whether they had used other types of providers (besides the one at which they were interviewed) during the week of the survey. Approximately 8% of pantry users said they had also used a kitchen or a shelter; approximately 51% of kitchen users said they had also used either a pantry or a shelter; and approximately 33% of shelter users said they had also used a pantry or a kitchen.[21] Using these data, together with the estimates of provider use derived earlier, the estimated number of annual system-level clients is 37.0 million in 2009 (Table 4.8.1). The corresponding 95-percent confidence interval extends from 33.8 million to 40.2 million clients.

TABLE 4.8.1

ESTIMATED ANNUAL CLIENTS, UNDUPLICATED ACROSS AGENCIES
(PERSONS)

		Each Agency Type Considered Separately	After Correcting for Overlap of Clients Across Agencies[a]
1.	Estimated number of different pantry clients in a year	35.0 million	33.9 million
2.	Estimated number of different kitchen clients in a year	2.1 million	1.8 million
3.	Estimated number of different shelter clients in a year	1.6 million	1.3 million

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[21] Because we have data on cross-agency use only in a single week (the period before the survey), the figures on multiple-agency use reported in the text may somewhat underestimate the full degree of this type of use when used to estimate different clients in the *annual* estimates. This is true because clients could have used other types of agencies in weeks other than the one asked about. However, because most of the annual counts are based on a single agency type—pantries—we do not believe that the underestimation is substantial. For instance, to establish a probable upper bound on the possible error, suppose the multiple-use factors reported in the text were doubled. The resulting change in the overall annual estimate of different clients would then be less than 7%.

TABLE 4.8.1 (continued)

		Each Agency Type Considered Separately	After Correcting for Overlap of Clients Across Agencies[a]
4.	Total different clients in system	n.a.	37.0 million
5.	Total different clients in system (95-Percent Confidence Interval)	n.a.	33.8 to 40.2 million

[a]Any client using a pantry is counted under pantries. Clients using only kitchens and shelters are counted under kitchens.

n.a. = not applicable.

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4.9   DISCUSSION OF CHANGES IN AGENCY AND CLIENT ESTIMATES FROM 2005 TO 2009

As noted in Chapter 3, the survey methodology and the procedures with which annual and weekly client counts are estimated for the 2010 study are nearly identical to those used in the 2006 study. Thus, there is a high degree of comparability between the estimates from both surveys. In addition, neither the 2006 nor the 2010 study is directly comparable in a formal statistical sense to the 2001 study. This is due to a number of significant refinements and improvements that were made to the study procedures for the 2006 study and that were maintained in 2010. These refinements are described in detail in the Hunger in America 2006 report (see Section 3.8 on page 31).

In this section we describe changes between 2005 and 2009 in the number of FA clients as well as in several factors that are central to producing the estimates in each year. Due to the fact that the differences between the 2001 study and the 2006 and 2010 studies have been documented in the Hunger in America 2006 report, we focus on changes that occurred between 2005 and 2009.

4.9.1   The Size of the Feeding America Network in 2005 and 2009

The findings in Tables 4.3.1, 4.5.1, and 4.7.1 suggest that the system provides comprehensive services that are widely available and that, overall, this network has increased in size between 2005 and 2009. In 2009, the FA network included 33,493 food pantries, 4,453 emergency kitchens, and 3,576 shelters, with each participating food bank providing supplies to all these types of programs. This compares to 2005 in which FA facilities included 29,674 food pantries, 5,601 emergency kitchens, and 4,143 shelters. Thus, the number of pantries in the network has increased by 13% and the numbers of emergency kitchens and shelters have decreased by 20% and 14%, respectively, between 2005 and 2009.

The 2009 findings suggest that the FA network serves very large numbers of clients in a year and that the number of clients has increased from 2005 to 2009. The estimates suggest that 37.0 million different clients were served by the three types of FA emergency food programs in 2009, compared to 25.4 million clients in 2005.[22] The annual number across all three types of programs has increased by 46% since 2005.[23]

The estimate of the number of different clients served by the participating food banks in a typical week is also an important measure of the size of system. In 2009, 5.7 million different clients were served in a typical week, compared to 4.5 million in 2005—a 27% increase. In the next section we discuss how the estimates of the factors that convert the weekly counts to annual counts have changed over this period, which helps explain why the percentage changes for the weekly and annual counts differ.

4.9.2   Interpreting Changes in Client Estimates from 2005 to 2009

There have been sizable increases in the number of unduplicated clients served annually and weekly from 2005 to 2009. In this section we examine these increases in light of the

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[22] A range of estimates from 23.7 to 27.0 million clients was presented in the 2005 report, rather than a single estimate, due to variation in one of the factors (the newcomer rate) used to estimate the annual count from the weekly count. We have used the midpoint of this range to estimate the percent change from 2005 to 2009.

[23] The estimates of emergency food use in the Current Population Survey (CPS) indicate that 4.8 million households receive food from pantries at least once in the last twelve months, an increase of 20% from 2005 (data from 2009 is currently not available) (Nord et al. 2009). Also 0.6 million households receive food from emergency kitchens at least once in the last twelve months, a decrease of 2 percent from 2005. However, as discussed in the Hunger in America 2006 report and noted elsewhere in the relevant research literature, the absolute number of emergency food clients estimated in the CPS has consistently been substantially lower than the number estimated in the FA surveys. Possible reasons for the undercount include the known tendency of the CPS and similar national surveys to undercount use of assistance programs and, relatedly, the role of stigma in how a respondent answers. In particular, in the CPS it is easy for a respondent to decide not to report participation in emergency food if it is embarrassing to do so, while in the Hunger in America survey, this is not possible, since the interview takes place at the emergency food provider. Additional reasons for the discrepancy between the CPS and Hunger in America study estimates include (1) the CPS undercounts those who are most in need of assistance including those in housing Units, (2) the CPS asks respondents about food pantry and emergency kitchen use in the last 12 months, and visits to an agency that took place farther in the past may be more difficult to remember (recall bias); and (3) the CPS sampling frame does not include those not living in housing units. However, these factors notwithstanding, the size of the difference in the estimates should be noted, if not fully understood.

sampling and measurement error present in both years. We also compare the changes in client counts to changes in national indicators of federal food assistance program participation rates, food insecurity, and unemployment based on external data as a "plausibility" check.

The 2009 estimated annual count of 37.0 million is a midpoint of the 95-percent confidence interval that extends from 33.8 to 40.2 million clients. This interval is based on sampling error of both the weekly client count estimate and the set of factors (estimated using the same survey data set) such as the number of pantry visits per month, household size, and the newcomer rate used to convert the weekly count to an annual count (see rows 3, 6, and 9 of Table 4.4.1). It means that, while the specific point estimate of clients is 37.0 million, there is a reasonable probability that the true number of clients could be as low as 33.8 million or as high as 40.2 million.

In 2005, a range was also presented, extending from 23.7 to 27.0 million; however, this range was constructed solely using measurement error in one factor—the newcomer rate. The 2005 range was not, strictly speaking, based on a formal estimate of sampling error and thus did not represent true statistical sampling variation. While one cannot determine whether there is a true statistical difference between the 2005 and 2009 estimate, it is useful to note that the upper end of the 2005 range and the lower end of the 2009 range are separated by almost 7 million clients, making it almost certain that the annual client counts are statistically different in each year.[24]

Accepting the specific annual estimate in 2009 of 37.0 million clients, together with a similar estimate in 2005 of 25.4 million clients, implies an increase of 46% from 2005 to 2009.

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[24] Given the high degree of comparability in survey methodologies, one can also apply the relative standard error from the 2009 client count to the 2005 count to obtain an approximate standard error for the 2005 count. Doing so also demonstrates that there is a statistical difference between the two years in the number of clients served annually.

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This percentage increase is calculated using the midpoints of the ranges in both years. However, given the ranges in 2009 and 2005 that are based on sampling and measurement error, it is possible that the "true" percentage increase is smaller than 46%. For example, if the "true" 2005 annual estimate was 27.0 million (the upper bound of the range) and the "true" 2009 estimate was 33.8 million (the lower bound of the range), then the percentage increase would be approximately 25%. For similar reasons it is also possible that the "true" percent increase could be larger than 46%.

A related question is whether the magnitudes of the increases in the annual and weekly client counts are plausible. External national indicators of federal food assistance participation, food security, and unemployment all support a sizable increase from 2005 to 2009 in the number of clients receiving emergency food from agencies and programs in the FA network. First, participation in the Supplemental Nutrition Assistance Program (SNAP) climbed from 25.3 million participants to 33.5 million participants from the survey period in 2005 to the survey period in 2009—a 32% increase.[25] Second, government estimates based on annual Census Bureau, Current Population Survey (CPS) data indicate that between 2005 and 2008 (data is not currently available for 2009) the number of people in the United States experiencing food insecurity rose from 12.6 million people to an unprecedented 17.1 million people—a 36% increase.[26] Third, employment data from the Bureau of Labor Statistics indicates that the unemployment rate increased from a monthly average of 5.2% in the survey period in 2005 to a monthly average of 8.7% in the survey period in 2009—a 66% increase.

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[25] See http://www.fns.usda.gov/pd/snapmain.htm
[26] Mark Nord, Margaret Andrews, and Steven Carlson. "Household Food Security in the United States, 2008." U.S. Department of Agriculture, Food and Nutrition Service. Economic Research Report No. 83 (ERS-83) November 2009.

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The changes in SNAP participation rates and food security provide support the "true" increase in emergency food clients falling between 33% (corresponding to the difference between the midpoint of the 2005 range and the lower bound of the 2009 range) and 46% (corresponding to the difference between the midpoints of the 2005 and 2009 ranges). However, there is also evidence based on changes in unemployment that provides support that the 46% increase could be a reasonable estimate of the "true" increase in emergency food clients.

4.9.3   Changes Between 2005 and 2009 in Key Factors That Influence the Participation Estimates

Changes in the annual client counts from 2005 to 2009 for pantry, kitchens, and shelters are partly determined by several factors shown in Tables 4.4.1, 4.6.1, and 4.7.2. For example, Table 4.4.1 shows that the annual number of clients served by pantries is built up from the weekly household count using several factors that include the average number of household visits per month, the newcomer rate (labeled in the table as the "average monthly percentage of all client households that start using pantries each month"), and the average household size. Between 2005 and 2009, the estimates of these factors changed in the following ways:

- The average number of household visits per month (per household) increased from 1.8 to 2.0, suggesting an increase in frequency of use among households. For a given number of (distinct) pantry household visits in a given month (line 3 in Table 4.4.1), a larger estimate for this frequency decreases the number of *different* client households (line 5 in Table 4.4.1).

- The average monthly percentage of all client households that start using pantries each month—the newcomer rate—increased from 14.0% to 20.8%. For a given number of different client household visits in a given month (line 5 of Table 4.4.1), an increase in the estimate of the newcomer rate increases the total annual number of different households (line 8 in Table 4.4.1).

- The average household size, measured as number of persons per households, increased from 2.7 to 2.8. For a given total annual number of different households (line 8 of Table 4.4.1), a larger estimate of average household size increases the number of different *people* served annually (line 10 in Table 4.4.1).

Considering changes in these factors collectively suggests that the while there is a greater number of new households seeking network pantry services each month, the effect of this on the number of *different* clients is partially counterbalanced by the increase in the frequency with which households visit pantries.

Unlike for pantries, the factors that convert weekly client counts to annual client counts for kitchens and shelters consist only of an adjustment for the number of children accompanying adults to the kitchen or shelter (because only adults at least 18 years old are sampled at these programs) and an adjustment for the newcomer rate. In general, for a given weekly count, increases in each of these factors lead to increases in the annual client counts for kitchens and shelters. Between 2005 and 2009, the estimates of these factors changed in the following ways:

- The average number of children accompanying adults decreased from 0.3 to 0.2 children for kitchens and remained about the same for shelters (0.2).

- The average monthly percentage of clients who start using kitchens each month increased from 15.0% to 23.4%. For shelters, the newcomer rate increased from 36.0% to 46.1%.

For kitchen and shelter clients, the changes in these factors have opposing effects on the number of *different* clients served annually. While there are fewer children accompanying adults served at kitchens and shelters, there were greater numbers of new clients seeking services in 2009 than in 2005 at these programs. The result was a net increase in kitchen and shelter clients from 2005 to 2009.

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