COVERING THE POPULATION OF UNLICENSED BOARD & CARE HOMES:
PROBLEMS AND SOLUTIONS

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1. Introduction

"Board and care" is a broad term that is used to describe non-medical, community-based facilities that provide shelter, food, 24 hour protective oversight and personal care to some of America's frailest citizens. Board and Care homes, also known as domiciliary care, personal care, assisted living, and residential care homes, play a significant role in providing care and supportive housing for the elderly, chronically mentally ill, and developmentally disabled persons in the U.S.

Although board and care homes have been an integral part of long term residential care for the elderly for many years, little is known about the number of homes in operation or the quality of care that residents receive. The National Health Provider Inventory (NHPI) estimates that in 1991 there were 34,090 licensed board and care homes serving more than 600,000 persons across the country (Clarke 1994). However, licensure requirements vary from state to state spanning a spectrum of regulations that require homes that shelter more than one person to be licensed in some states to less stringent regulatory environments that allow homes serving fewer than 6 persons to remain legally unlicensed. In addition, consumer advocates and providers widely believe that there are substantial numbers of illegally unlicensed homes - that is, facilities that meet the criteria for licensure but avoid being licensed. This results in an ill-defined universe of board and care facilities that was estimated by a 1989 House Report to have over one million elderly and disabled adults residing in 68,000 licensed and unlicensed facilities (U.S. House 1989).

Congressional concerns about the quality and effectiveness of State and federal regulations governing board and care homes, led the Office of the Assistant Secretary for Planning and Evaluation (ASPE), US DHHS to commission a study of these homes in ten states with varying types of regulatory systems. The 1993 survey collected data in 386 licensed and 126 unlicensed board and care homes, including interviews with owners and/or operators, more than 1,100 staff and over 3,200 residents or their proxies.

The primary objective of the study was to determine whether more extensive regulation is associated with better quality of care, and, if such an association exists, to determine whether regulation affects licensed and unlicensed homes differently. For example, a strong regulatory environment may improve the quality of care in licensed homes but have no effect on unlicensed homes.

If regulation does affect quality of care, the association will be most noticeable in the extremes of the regulatory environment. That is, for a fixed sample size, the best chance of detecting regulatory effects on quality is attained by restricting the sample to homes located in five states with the most extensive and five with the most limited regulatory environment. Given the resources available to the study, ASPE decided that this "polarized" approach to assessing the effects of regulation was a cost-effective alternative to a broad-based design that would include homes in states from the entire range of regulatory environments.

This paper focuses on our efforts to construct a sampling frame of unlicensed board and care homes for the ten-state study. The coverage of the sampling frame of unlicensed homes was particularly problematic because, unlike their licensed counterparts, centralized listings of unlicensed homes do not exist. As a result, we constructed a sampling frame using a variety of related sources to generate lists of potentially eligible unlicensed homes. We describe the problems we encountered with this "network" approach (Sudman et al. 1988) to sampling frame construction and the solutions that we implemented including the use of snowball sampling (Kalton & Anderson 1986) to evaluate the completeness of the sampling frame.

2. Survey Population

The survey population for the study consisted of the operators, residents, and staff members of licensed and unlicensed board and care homes in ten states that reflected the extremes of the regulatory environment in 1991. We classified a state regulatory system as extensive or limited based on characteristics of its licensing standards, inspection process, and enforcement or compliance mechanisms. The "defining" charcteristics were specified during interviews with members of the study's technical advisory panel, which included researchers, providers, consumer advocates, and state regulators. Then, we analyzed key components of the regulatory systems of all 50 states to determine whether they included these features.

We identified 21 states that consistently fell into the extensive or limited extremes of the distribution,

regardless of how we weighted the various features of their regulatory systems. We purposively selected the ten study states shown in Table 1 from this group on the basis of additional factors such as the number of licensed board and care homes, region, and amount of State Supplemental Payments (SSP) for beneficiaries of the federal Supplemental Security Income (SSI) program who live in board and care homes.

Table 1. Regulatory Environment of the Study States

Extensive Regulation	Limited Regulation
California	Georgia
Florida	Kentucky
Oregon	Texas
New Jersey	Illinois
Oklahoma	Arkansas

Although this study population facilitates the primary objective of the study, it precludes any inference to the national population of licensed and/or unlicensed board and care homes, their staff, or their residents.

3. Definition of an Unlicensed Home

Because we were faced with ten different definitions/criteria for licensure, we developed an operational definition for an eligible unlicensed board and care home that could be used across states. Also, to deal with assisted living apartments that do not provide three meals a day or 24-hour staffing but appear to provide personal care services, we defined two sets of criteria for inclusion as an unlicensed home - one for traditional board and care "homes" and another for places in which the residents live in their own apartments:

> *Traditional Homes*: were required to provide room, meals, 24-hour oversight/supervision and one or more personal care services (such as transportation, recreational activities, medication supervision, or personal care services) to 2 or more adults who are not related to the owner/operator.

> *Assisted Living Apartments*: were required to provide a more significant level of supportive services (e.g., assistance with medications or personal care services) if they did not meet one of the "core" criteria (i.e., three meals a day, 24-hour protective oversight or supervision)

We developed screening procedures to identify each type of unlicensed home.

4. Sampling Strategy

The lack of a centralized list of unlicensed homes was a major consideration in our development of a sample selection strategy for the ten-state survey. Traditional sampling techniques such as random digit dialing would require screening of the general population (e.g., households) before data collection. However, because the survey population is rare (perhaps less than one unlicensed home for every ten thousand households), screening costs would be prohibitive. Instead, we used cluster sampling to screen (probabilistically) geographic areas for concentrations of unlicensed homes. In addition, cluster sampling offered distinct cost savings over random sampling for the planned on-site data collection activities.

We defined clusters or First-Stage Sampling Units (FSUs) in terms of counties because counties are well-defined geographic units for which much public health and demographic data are available. In addition, counties were convenient geographic areas for constructing the second-stage sampling frame of unlicensed homes using the network sampling technique.

We selected FSUs in two phases. At the first phase, we used state board and care licensure files to select a sample of 80 FSUs spanning 128 counties with probabilities proportional to the number of licensed board and care homes in each FSU. We stratified the FSUs by state to increase the sample representation of small states (in number of licensed homes) like Arkansas at the expense of large states like California. We concentrated our search for unlicensed homes to these selected counties.

At the second phase, our sampling strategy was to reduce the first-phase sample to a manageable number of counties for frame development and data collection but still account for most of the unlicensed homes in the 128 counties. To do this efficiently, we needed knowledgeable local sources who could estimate the number of unlicensed homes in each county.

After discussions with the long-term-care ombudsmen about their involvement with board and care facilities and a review of sources used in past studies, we decided that ombudsmen would be aware of unlicensed homes at the local level. For example, Schiman and Lordeman (1989) reported that a major activity of long-term-care ombudsmen was to identify and refer unlawfully unlicensed homes to the appropriate licensing agency.

We surveyed the long-term-care ombudsmen in all 128 counties selected at the first phase and asked them to give us an estimate of the total number of unlicensed homes operating in their county. In cases where the ombudsmen either did not know or provided questionable estimates, we made further inquiries of other local sources to get an estimate.

In all, the respondents to the survey of ombudsmen estimated that approximately 1,580 unlicensed homes were operating in the 128 counties. We used these counts to categorize the counties into low-yield and high-yield strata. To avoid possible selection bias, all 128 counties were assigned positive selection probabilities, even those with zero estimates.

We selected a second-phase subsample of 40 FSUs that spanned 50 counties and accounted for 1,309 or 83% of the estimated 1,580 unlicensed homes in the first-phase sample. We confined all further sampling activities for unlicensed homes to these counties.

5. Constructing a Sampling Frame

Within the 50-county subsample, we used Network Sampling (Sudman et al,1988) to construct the sampling frame of unlicensed homes. Network Sampling is a statistical technique often used for locating and measuring the size of rare populations. Its objective is simple: to increase the amount of information obtained during a screening by interviewing a related group or network that is knowledgeable about members of the rare population.

For the population of unlicensed homes, the network consisted of local health and social service organizations such as county social services and welfare case workers, case managers for home and community mental health care services, ombudsmen, and hospital discharge planners. Because a significant proportion of residents of board and care homes are referrals from local health and social service organizations, we believed that the combined knowledge of these organizations would account for the overwhelming majority of homes in a county.

We assumed that the few homes overlooked by the referral organization network would be small, unlicensed homes that primarily rely on word-of-mouth referrals. To account for these homes, we obtained a list of all addresses with two or more unrelated SSI recipients in the county and added it to the lists provided by the network of organizations. In addition, we added listings from the telephone book yellow pages for retirement housing, retirement apartments, personal care homes, etc.. Finally, we concatenated the lists, purged duplicate entries (to the extent possible) and eliminated licensed homes. As Table 1 shows, we compiled 3,190 candidate places using the network sampling approach.

6. Screening the Frame for Unlicensed Homes

After compiling the list of candidate places, we used telephone screening to determine whether the candidate place was, in fact, an eligibile unlicensed home. Because we relied on the operators of candidate places to self-report their licensure status, we took the following measures to guard against possible misrepresentation (both intentional and unintentional) of their licensure status. First, we tried to determine whether the candidate place met the core criteria, ie., at least two beds and one resident, provides three meals a day, 24-hour oversight/protection, and one or more personal care services. For assisted living apartments, we made further inquires about the level of their supportive services.

If a candidate place met the core criteria, we then asked about its licensure status. Although we explicitly referred to board and care licensure status as opposed to other forms of licensure, about 18 percent of the unlicensed facilities eventually identified during screening claimed to be licensed. Some were unlicensed board and care home sections of licensed nursing homes. Others were licensed under another agency (e.g., VA or Adult Foster Care). To avoid excluding these eligible homes, we probed for the name of their licensing agency, what they were licensed for, and for how long.

Another 18 percent of the unlicensed homes identified during screening met the core criteria, but claimed to be licensed with the appropriate board and care agency. However, because we were either unable to verify the claim or found that their license had expired, we classified all of these homes as eligible.

When our sources were unable to provide a telephone number for a candidate place, we sent the address to a telephone matching service. If a match could not be found, we tried local criss-cross directories, and, in some cases, non-traditional sources like credit agencies. In all, we secured telephone numbers for approximately 2,000 of the 3,190 candidate places and were subsequently able to complete screening for 1,744 (55%) of them.

We were unable to determine whether unlicensed homes occured more or less frequently on the unscreened portion of the frame (i.e., candidate places without telephones or listed numbers) than on the screened portion. Therefore, to reduce the potential selection bias between the unscreened places and the screened places, we calculated weighting class adjustment factors based on the eligibility or "hit" rate of each of the list sources shown in Table 2.

Within each weighting class (i.e., type of source), we assumed that the eligiblity rate among unscreened places was the same as the screened places. Because we tended to screen sources with high eligiblity rates more completely than other sources, we estimated an overall eligibility rate of 21.6% for the screened portion compared with 16.5% for the unscreened portion.

We examined the sensitivity of our population estimates to these assumptions and found that if the true eligibility rate is 25 percent higher/lower than what we assumed, the estimated total number of unlicensed homes increases/decreases by only 9.1 percent.

Table 2. Distribution of Network Source Listings

Source of Candidate Place	Places Listed[1]	Places Screened[2]	Eligibles Found[3]	Eligibility Rate (%)[4]
State Data Exchange	1,214	486	85	17.5
Retirement Directory	673	485	81	16.7
State Licensing Agency	282	257	64	24.9
VA Community Programs	83	74	44	59.5
Hosp.Discharge Planners/Social Workers	81	58	24	41.4
Adult Foster Care (TX)	108	33	20	60.6
State Attornies General Offices	18	15	15	100.0
Ombudsmen Programs	24	16	15	93.8
Life Styles Directory (TX)	17	17	7	41.2
Yellow Pages	35	34	7	20.6
Boarding & Rooming Home List (NJ)	584	200	2	1.0
Residential Hotel Inspectors (TX)	36	35	3	8.6
Mental Health Case Workers	14	13	0	0.0
Other	21	21	9	42.9
Total	**3,190**	**1,744**	**376**	**21.6**

[1] Non-unique places.
[2] Places with known telphone numbers.
[3] 329 unique eligible facilities were found.
[4] Eligibility rate among places screened.

7. Evaluating the Coverage of the Frame

We identified a total of 329 unlicensed homes in the 50-county subsample using the telephone screening procedures described above. Most (286) of these came from a single network source, while 39 came from two sources, and only 4 from three sources. This lack of overlap among the network sources indicated that the network was not as close knit as we had hoped. However, our subsequent evaluation of the completeness of the network lists provided some evidence that they did account for the vast majority of unlicensed homes in the subsample.

To provide some evidence of the completeness of the network lists, we used another technique for sampling rare populations known as snowball sampling (Kalton and Anderson, 1986). The object of snowball sampling is to create (or, in our case, enlarge) a sampling frame by asking known members of a rare population to identify other members of the population. If the members know each other, then repeating the process among newly identified members should produce a "snowball" effect as more and more population members are identified.

In our case, we assumed that board and care operators, like most business people, would be aware of "competition" from other nearby facilities. Our plan was to take advantage of this awareness by having operators identify one or more nearby unlicensed homes. Then, if we found that we had already identified these homes through network sampling, we would obtain some evidence of the completeness of the frame.

We began the snowball process during our in-person interviews with participating operators by asking them to list any other board and care homes (licensed or unlicensed) that they were aware of in their county. Later, we purged the lists of known ineligibles and then compared the remaining candidate facilities with the network lists used to construct the frame. If the candidate was not on the network lists, we attempted to contact it by telephone to determine if it was a "new" unlicensed home, i.e., one not previously identified either on the screened or unscreened portions of the network lists.

As Table 3 shows, 76 operators provided a total of 316 candidate facilities. However, only 79 of the candidates required further screening to determine their eligibility. The rest were either known ineligibles (i.e., licensed homes or nursing homes) or were already accounted for by the network lists. We were able to contact 58 (73%) of the 79 candidates and found 17 eligible unlicensed facilities not previously identified by the network lists.

Only one of the 17 "new" facilities was reported by more than one operator. We attribute this apparent "isolation" among operators to the preponderance of large urban areas in the subsample.

Table 3. Snowball Sampling Results

Survey Questionnaire Results:

Licensed homes, nursing homes:	192
Ineligible places already identified:	11
Unlicensed homes already identified:	34
Candidates for telephone screening:	79
	316

Telephone Screening Results:

Unable to contact:	21
Ineligible places not previously identified:	41
Unlicensed homes not previously identified:	17
	79

We adjusted the snowball survey findings to account for nonresponse and then weighted the counts to estimate the number of unlicensed facilities in the 50-county subsample not accounted for by the network lists. Table 4 shows that the weighted estimate of 45 "new" homes implies a 92 percent coverage rate for the network lists.

Our estimate of 585 unlicensed homes in the 50-county subsample is less than half of the 1,309 estimated by the ombudsmen. Most of this difference occured in large urban areas where the ombudsmen estimated far more unlicensed homes than we were able to identify. We speculate that this may have been caused by the way they projected their counts in the urban areas (e.g., one unlicensed for every licensed) versus a first-hand knowledge of homes in the rural areas. In any event, the difference between the ombudsmen estimate and the final study estimate was not statistically significant when weighted to reflect the ten-state population.

Table 4. Estimated Coverage of the Network Lists in the 50-County Subsample

Estimated Number of Unlicensed Homes Found:

Screened portion of list	329	
Unscreened portion of list:	213	
	542	(92.6%)

Estimated Number of Unlicensed Homes Missed:

Identified via snowballing:	17	
Among the UTC, refusals, and		
not selected for the study:	26	
	43	(7.4%)

Estimated 50-County Total:	585	(100%)

8. Estimating the Size of the Survey Population

As previously stated, we limited the study's survey population to licensed and unlicensed board and care homes operating within the ten study states. To estimate the characteristics of this population, we assigned design-consistent estimation weights to the sample of participating homes. We based the weights on the probability structure used to select the sample (Iannacchione 1992) and then made adjustments to compensate for survey nonresponse and noncoverage.

To estimate the number of licensed board and care homes eligible for the survey, we estimated the eligibility rates among licensed homes by state and size of home and then applied the rates to counts of homes supplied by the ten state licensing agencies. Because the only ineligible licensed homes were those with only one bed or with no residents at the time of data collection, almost all (97%) of the licensed homes we selected were eligible for the survey.

To estimate the number of unlicensed board and care homes, we multiplied the FSU-level sampling weights by the corresponding estimated total number of unlicensed homes in each of the 50 counties selected for the subsample. Overall, we estimated a total of 1,555 unlicensed homes operating in the ten study states in the Fall of 1993. By applying the design-consistent estimate of the standard error to this estimate, we calculated a one-sided 95% confidence interval with an upper bound of 2,052 unlicensed homes.

Table 5 shows the estimated total number of licensed and unlicensed board and care homes by regulatory system and type of home. We estimated the overall size of the survey population to be 13,189 licensed and unlicensed homes with over 300,000 beds. Unlicensed homes accounted for less than 12 percent of total homes and about 27 percent of the total beds. On average, unlicensed homes were larger than licensed homes (52 beds per unlicensed home compared with 19 beds per licensed home). This is because most assisted living apartments are unlicensed. In fact, assisted living apartments account for a third of all unlicensed homes and well over 80 percent of all unlicensed beds.

Finally, the population estimates indicate that the regulatory environment may influence the frequency of unlicensed homes. For example, over 25 percent of the homes in the five states with limited regulation are unlicensed compared to less than 7 percent in the five states with extensive regulation. Our research team speculates that the relative scarcity of unlicensed homes in the extensively regulated states is caused by regulatory pressures not found in the states with limited regulation.

Table 5. Estimated Number of Eligible Board and Care Homes in the Ten-State Study Population
(Standard Errors of Estimates Shown in Parentheses)

Regulatory Environment and Type of Home	Licensed		Unlicensed	
	Number of Homes	Mean Beds Per Home	Number of Homes	Mean Beds Per Home
Five States with Extensive Regulation				
Traditional Homes:	8,807 (366)	15.9 (1.9)	313 (110)	22.2 (8.4)
Assisted Living Apartments:	109 (61)	120.2 (26.0)	312 (118)	90.4 (14.3)
	8,916 (377)	17.2 (2.1)	625 (136)	56.3 (8.9)
Five States with Limited Regulation				
Traditional Homes:	2,671 (142)	22.8 (3.3)	727 (179)	17.9 (4.7)
Assisted Living Apartments:	47 (13)	112.7 (37.6)	202 (45)	171.6 (17.2)
	2,718 (143)	24.3 (3.4)	929 (270)	51.3 (10.7)
Ten State Total				
Traditional Homes:	11,478 (393)	17.5 (1.7)	1,040 (222)	18.6 (4.2)
Assisted Living Apartments:	156 (63)	117.9 (21.5)	515 (105)	137.6 (17.2)
	11,634 (403)	18.8 (1.8)	1,555 (303)	52.5 (8.4)

9. Further Study

Our exclusive reliance on telephone screening to identify unlicensed homes is perhaps the foremost proviso associated with the study's coverage of unlicensed board and care homes. This reliance required us to make assumptions not only about the veracity of responses to potentially incriminating questions about licensure status, but also about the eligibility rates among candidate places for which we were unable to find telephone numbers.

We made a concerted effort to minimize the misrepresentation of licensure status (intentional or otherwise) by including all facilties that met our core criteria except those verified as currently licensed. However, further study is needed to determine the true eligiblity of facilities that either evaded other aspects of the screening or refused to give us any information at all.

We also attempted to reduce the potential selection bias between homes with known telephone numbers and those with unknown (or no) numbers by calculating weight adjustment factors based on the observed eligiblity rates of the source listings. Our sensitivity analysis of these factors indicates that the survey estimates presented in Table 5 are not unduly affected by minor deviations above or below our assumed rates. However, further study is needed to demonstrate that most unlicensed homes do, in fact, have telephones with traceable telephone numbers.

10. References

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