

| *A summary report on refuse storage, collection, and disposal practices in 1,273 cities in 30 States, 1951-54.*

Refuse Handling Practices in the United States

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THE sanitary storage, collection, and disposal of municipal refuse have been a community problem, in varying degrees, since men first banded together for protection. It is only in recent years, however, that the problem has begun to receive concerted attention and action.

Studies have shown that the sanitary handling of refuse is an important factor in controlling such disease vectors as rats, flies, and mosquitoes. The feeding of raw garbage to hogs has been shown to be not only an important factor in the chain of transmission of trichinosis to man, but also a primary mode of transmission of virus diseases of swine, such as vesicular ex-

anthema. In certain metropolitan areas, disposal of refuse by burning in backyard or apartment-house incinerators has been singled out as a significant source of air pollution. The National Fire Protection Association has reported data indicating that in 1953 "rubbish, ignition unknown" ranked third among 26 known causes of fires in buildings. Furthermore, the public is becoming impatient with the nuisances and inconveniences fostered by inadequate and insanitary refuse-handling systems.

So that the extent of the refuse-handling problem might be better understood and the job which yet needs to be done planned accordingly, the Public Health Service has made an inventory of municipal refuse storage, collection, and disposal practices. During the period 1951 through 1954, data outlining practices of 1,273 cities in 30 States were obtained. These data are summarized in this report. Distribution of the cities according to population group is shown in the following tabulation:

Population group	Number of cities
1,000-4,999.....	765
5,000-9,999.....	237
10,000-24,999.....	160
25,000-49,999.....	55
50,000-99,999.....	23
100,000 or more.....	30
Unknown.....	3

Most of the data included in this inventory were collected by or through State health departments. These data were reported on a

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special inventory form, which the Public Health Service made available to State health departments in 1950. The form, prepared with the assistance of the American Public Works Association and various individuals, had been designed to facilitate uniform collection of refuse-handling data. The rest of the data were secured from published reports of other surveys conducted during the inventory period by State health departments or other agencies concerned with refuse handling.

The data presented in this report must be interpreted with cognizance of two limitations. First, although data were received from 30 States, 98 percent of the cities surveyed were in 17 States located east of the Rocky Mountains. Second, certain of the communities reported on early in the inventory period undoubtedly had changed their practices by 1954. Nevertheless, the information presented may provide assistance in evaluating refuse-sanitation practices in the United States.

The data collected during the course of the inventory show encouraging trends, but they also indicate that, despite the long-standing problem of disposing of municipal solid wastes, the preponderance of the job still remains to be accomplished.

Regulations

Three hundred forty-two cities reported that they had regulations governing one or more of the three phases of refuse handling, namely, storage, collection, or disposal. However, because of the nature of the data on the remaining 931 cities, it was not possible to establish what percentage of the latter actually did not have regulations on refuse handling.

Of the 342 cities, 53 percent had regulations which governed all 3 phases. Twenty-two percent had regulations governing storage only, and another 10 percent had regulations covering storage and either collection or disposal. The remaining 15 percent had regulations controlling collection only, disposal only, or both of these.

Data on the enforcement of regulations were received from 260 cities. Fifty-three (20 percent) of these reported that the regulations were enforced by the police department; 34

Definition of Terms

Refuse: All putrescible and nonputrescible solid wastes (except body wastes), including garbage, rubbish, ashes, street cleanings, dead animals, abandoned automobiles, and solid market and industrial wastes.

Garbage: Putrescible animal and vegetable wastes resulting from the handling, preparation, cooking, and consumption of food.

Ashes: The residue from the burning of wood, coal, coke, or other combustible materials.

Rubbish: Nonputrescible solid wastes (except ashes), consisting of both combustible and noncombustible wastes, such as paper, cardboard, cans, grass and shrubbery clippings, wood, glass, bedding, and crockery.

(13 percent), by the public works department or the agency responsible for the collection of refuse; 40 (15 percent), by the health department; and 72 (28 percent) reported that enforcement was the joint responsibility of the health department and some other municipal department, such as the police or public works department. (The remaining 61 cities did not specify the enforcement agency.)

Storage Practice

Separation requirements. Data on separation requirements were received for 1,244 cities. In 488 (39 percent) complete separation of garbage, rubbish, and ashes was required. Combined storage of all refuse was permitted by 642 (52 percent), and 98 (8 percent) required only the separation of garbage from other refuse. Other requirements, such as separation of combustibles from noncombustibles, were reported by 16 cities (1 percent).

Types of containers. Data concerning the use of covered metal containers for storing refuse are given in table 1. It is encouraging to note that for garbage or refuse containing garbage about 85 percent of the reporting cities required the use of this type of container.

Size of containers. Of the 95 cities reporting on the size of containers used for storing resi-

Table 1. Percentage of reporting cities requiring covered metal storage containers

Class of refuse	Residential		Commercial	
	Number cities reporting	Percent requiring covered metal containers	Number of cities reporting	Percent requiring covered metal containers
Garbage-----	138	83	119	84
Rubbish-----	26	58	14	50
Ashes-----	8	25	6	33
Combined refuse-----	171	87	131	86

dential garbage, only 12 (13 percent) permitted storage in containers larger than 30 gallons. Where combined storage of refuse was practiced, however, 43 (36 percent) of the 118 reporting cities permitted containers larger than 30 gallons. Table 2 shows the residential container-size requirements reported for each class of refuse.

Data on the size of containers used for commercial garbage from 69 cities showed that 28 (41 percent) required that containers be of 30 gallons or less. Thirty-two (46 percent) allowed the use of containers up to 40 gallons in size, and 9 (13 percent) permitted storage in containers larger than 40 gallons. Where combined storage of refuse was permitted, 57 of 98 cities required that containers be of 30 gallons or less, the remainder permitting the use of containers larger than 30 gallons in capacity.

Collection Practice

Frequency of collection. Tables 3 and 4 show the variations in the frequency of collection for the various classes of refuse according to season of the year. Of the 698 cities reporting on the summer collection of garbage or combined refuse in residential areas, 397 (57 percent) made collections at least twice a week. With respect to summer collection from commercial establishments, 352 (52 percent) of 626 cities reported that garbage or refuse containing garbage was collected daily. An additional 138 (29 percent) collected this material at least twice a week.

As might be presumed, during the winter

fewer cities provided twice-a-week collection. However, 646 (93 percent) of the 691 cities reporting on winter collection of garbage or combined refuse in residential areas provided at least once-a-week pickup of this material.

Point of collection. Information was obtained from 448 cities on the point at which the collection crew was authorized to pick up refuse. As shown in table 5, 190 (43 percent) specified either the curb or the alley, or both, as the pickup point. Two hundred one (45 percent) reported various combinations of curb, alley, front houseline, and rear houseline as being acceptable pickup points.

Responsibility for collection. In table 6 are the data concerning the agencies responsible for the collection of municipal refuse. It is interesting to note that, when each class of refuse is considered separately, there is a similarity between commercial and residential responsibilities. The responsibility for collection of garbage is fairly evenly distributed on a municipal, contract, and private basis.

Combined collection of refuse in more than 50 percent of the communities was accomplished by private or individual arrangements. Analysis of the data showed that 373 of the 393 cities (95 percent) reporting private residential collection were in the 1,000-9,999 population group. On the other hand, only 20 of 112 cities (18 percent) having a population of 10,000 or more utilized private collection, and 79 (68 percent) utilized municipal collection. A similar relationship between population and responsibility for collection was found upon analysis of the data on combined collection of refuse in commercial areas.

Table 2. Size of containers for residential refuse

Class of refuse	Number of cities reporting	Number reporting maximum size of—			Number allowing more than 30 gallons
		Less than 10 gallons	10-19 gallons	20-30 gallons	
Garbage----	95	6	20	57	12
Rubbish----	22	0	2	10	10
Ashes-----	9	1	2	4	2
Combined refuse----	118	0	13	62	43

Table 3. Frequency of refuse collection in residential areas

Class of refuse	Summer collection					Winter collection				
	Number of cities reporting	Less than 1 per week	1 per week	2 per week	More than 2 per week	Number of cities reporting	Less than 1 per week	1 per week	2 per week	More than 2 per week
Garbage.....	284	2	85	151	46	281	3	137	107	34
Rubbish.....	99	14	35	38	12	98	14	46	30	8
Ashes.....						19	4	8	5	2
Combined refuse.....	414	42	172	157	43	410	42	202	127	39

Table 4. Frequency of refuse collection in commercial areas

Class of refuse	Summer collection					Winter collection				
	Number of cities reporting	Less than 1 per week	1 per week	2 or more per week but less than daily	Daily	Number of cities reporting	Less than 1 per week	1 per week	2 or more per week but less than daily	Daily
Garbage.....	239	2	29	90	118	236	2	53	68	113
Rubbish.....	94	10	9	24	51	93	10	11	24	48
Ashes.....						16	3	4	3	6
Combined refuse.....	387	27	60	93	207	387	26	71	85	201

Types of vehicles. Data on the types of vehicles used in collecting refuse were received from 337 cities having municipal collection. Of these, 157 (46 percent) relied on open vehicles for the collection of refuse. About 10 percent reported the use of covered vehicles, and another 10 percent, mechanical-compactor-type vehicles. The remaining 34 percent reported the use of combinations of these types of vehicles.

Data from 82 cities using contract collection showed that 49 (60 percent) used open vehicles. Only 12 (15 percent) reported the use of the mechanical-compactor type either exclusively or in combination with other types. Data from 147 cities having private collection arrange-

ments revealed that 111 (75 percent) relied on open vehicles. Only 11 (10 percent) reported the use of the mechanical-compactor type either exclusively or in combination with other types.

Method of financing. Table 7 lists the data reported on the method of financing refuse collections. Of the 633 cities that specified their method of financing, 382 (60 percent) indicated that they relied solely on the fee system. An additional 50 (8 percent) reported the use of both special fees and the general tax fund. An analysis of the data by population group revealed that of the communities in the 1,000-4,999 category 75 percent relied wholly or in part on the fee system; of those in the 5,000-9,999 category, 62 percent; of those in the 10,000-24,999 group, 63 percent; of those in the 25,000-49,999 category, 48 percent; of those in the 50,000-99,999 category, 34 percent; and of the cities with 100,000 or more population, 39 percent.

Miscellaneous data. Of 561 cities providing information on the private collection of garbage for hog feed, 464 (83 percent) specified that they permitted this practice. However, during the period of this inventory, many communities

Table 5. Designated point of refuse collection in 448 cities

Point of collection	Number	Percent
Curb or alley, or both.....	190	43
Front houseline.....	10	2
Rear houseline.....	33	7
Combination of above points.....	201	45
Other.....	14	3

Table 6. Responsibility for collection of refuse

Class of refuse	Number of cities reporting	Municipal (percent)	Municipal contract (percent)	Private (percent)
Garbage:				
Residential.....	574	32	38	30
Commercial.....	569	30	38	32
Rubbish or ashes:				
Residential.....	138	64	17	19
Commercial.....	136	58	17	25
Combined refuse:				
Residential.....	740	37	10	53
Commercial.....	740	35	9	56

Table 7. Method of financing refuse collection, according to population group

Population group	Fees	General taxes	Both fees and taxes	Method not specified
1,000-4,999.....	282	103	21	359
5,000-9,999.....	52	40	11	134
10,000-24,999.....	33	25	9	93
25,000-49,999.....	9	13	3	30
50,000-99,999.....	2	8	2	11
100,000 or more.....	4	11	3	12
Total.....	382	201	50	640

undoubtedly experienced considerable change in the methods by which agencies or individuals arranged to handle garbage ordinarily fed to swine. In 1952, the feeding of raw garbage to swine was shown to be a primary cause of the widespread outbreak of the virus disease of swine, vesicular exanthema, which occurred in that year. By 1955, all but two States had regulations requiring the disinfection of garbage fed to swine. The United States Department of Agriculture reported that as of June 30, 1955, 83 percent of almost 1½ million garbage-fed swine on more than 13,000 garbage-feeding establishments were fed cooked garbage.

With regard to the installation of garbage grinders, 28 of 503 reporting cities (6 percent)

prohibited the installation of these devices. Of interest was the fact that 21 of the 28 cities were in the 1,000-9,999 population category.

Of 688 cities reporting on scavenging practice (during the storage or collection period), 139 (20 percent) reported that scavenging was not permitted. Of the cities reporting that scavenging was permitted, almost 90 percent indicated that no license was required.

Disposal Practice

All 1,149 cities reporting on disposal practice indicated the use of one or more of four methods of disposal: incineration, sanitary land fill, open dump, and hog feeding. Ninety-one of the cities (8 percent) reported the use of incineration and 114 (almost 10 percent) reported the use of the sanitary land fill. Table 8 gives the number of cities, according to population category, using each of the four methods.

Table 8. Number of cities reporting use of specified methods of refuse disposal, according to population group

Population group	Number of cities reporting	Incineration	Sanitary land fill	Open dump	Hog feeding
1,000-4,999.....	667	18	32	539	159
5,000-9,999.....	221	26	24	131	80
10,000-24,999.....	156	18	19	76	73
25,000-49,999.....	53	12	16	25	21
50,000-99,999.....	20	6	11	7	8
100,000 and over.....	29	11	11	16	7
Total.....	¹ 1,149	91	² 114	³ 796	348

¹ Population group not specified for 3 cities. ² Population group not specified for 1 city. ³ Population group not specified for 2 cities.

Of significance was the fact that 616 (54 percent) of the 1,149 cities reported the use of the open dump as their only means of disposal. Another 130 (11 percent) reported the use of a combination of the open dump and hog feeding as their only means of refuse disposal.