Construction of Hospitals, Health Centers, and Other Health Facilities, 1951–52

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MORE than a quarter of last year's hospital construction costs were in projects designed to improve existing facilities without addition of any new bed capacity to the Nation's total. This and many of the other facts regarding health facility construction reported in this paper are a byproduct of Public Health Service claimant agency responsibilities under the Controlled Materials Plan (*1*).

In previous years, figures indicating the gross dollar value of hospital and institutional construction put in place have been obtained through reports issued by the Bureau of Labor Statistics and the Department of Commerce. Material published by the American Medical Association and the American Hospital Association contains data on existing hospitals and their bed capacity. More recently the reports issued by the Public Health Service in connection with the Hospital Survey and Construction Program (Hill-Burton Act) have provided comparative statistics with respect to existing hospital beds and requirements, based on State agency classification and analysis.

In addition to these sources, during the past year a wealth of detailed data have become available from applications submitted to the Public Health Service requesting authority to begin construction of hospitals and other health facilities and for allocations of critical materials under the Controlled Materials Plan. From these data, until now not available, it is possible to obtain a much better understanding of the nature and extent of the total construction effort currently being expended in the area of hospitals, health centers, clinics, nursing and convalescent homes, rehabilitation centers, nursing schools, medical research laboratories and related health and medical construction. Broader use of the information will be a valuable byproduct of the claimant agency program.

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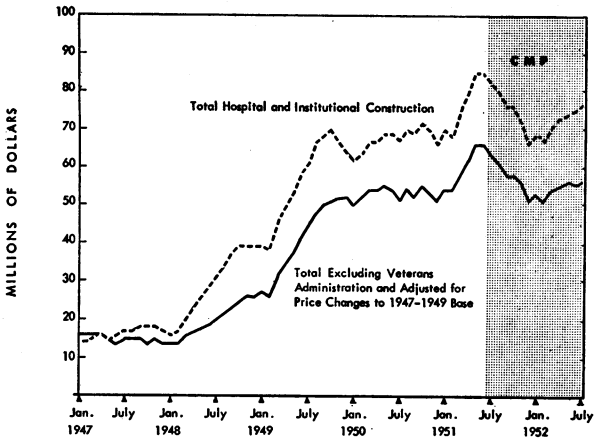
Construction Volume, 1947–52

Since January 1947, hospital and institutional construction has increased rapidly, as shown in figure 1. The exclusion of Veterans Administration hospital construction and the adjustment of all dollar values to a constant base makes it possible to compare the relative physical volume of health construction for the general civilian population over a 5½-year period.

In the civilian field, general health and medical care building more than tripled in volume from January 1947 through June 1952. There was a leveling off in 1950 of the steep upward trend, and the rate has continued since on an approximate plateau, except for a peak in the middle of 1951. Although the shortages of steel, copper, and aluminum have required careful use and allocation of these critical materials, the Nation continued to add to its health facilities at a near record rate through the first year of the Controlled Materials Plan.

Figure 1. Value of all nonmilitary hospital and institutional construction put in place each month, 1947–52.



Source: Bureau of Labor Statistics

Division of Construction Pie

Construction of health and medical care facilities totaled $773 million during the fiscal year July 1, 1951, through June 30, 1952. This represented 2.5 percent of the total national $31 billion annual construction volume. Other segments of special interest to the health profession are: sewer and water—$669 million, or 2.2 percent of the total; educational—$1.9 billion (6.1 percent); residential—$11.2 billion (36.3 percent). Figure 2 shows the proportions assumed by these and other classifications in the building industry and, in turn, the division between the major elements within the area of health and medical care. The "pie" section of this chart distributes the aggregate cost, as cited in the estimates on CMP applications; this covers all the health facility construction projects of the various types for which permits for construction to begin July 1951 through June 1952 were requested from the Division of Civilian Health Requirements, Public Health Service. Small construction projects requiring no more than 5 tons of carbon steel and 250 pounds of copper per quarter could be self-authorized under CMP regulations and are not represented on the chart. The same thing applies to requirements for maintenance, repairs, and operations not exceeding 30 percent per quarter of the rate for the calendar year 1952.

The most striking fact shown by this chart is that seven-tenths, 71 percent, of the total expenditure is for additions and remodeling of in-patient institutions and only slightly more than one-fifth, 22 percent, is going into completely new in-patient medical care facilities. The remainder is for other miscellaneous health facilities. This circumstance is undoubtedly known to persons who are familiar with national hospital building trends, but it may be surprising to others.

The preponderance of activity on general hospitals (new—18 percent; additions and remodeling—47 percent; total—65 percent) as compared with the more specialized institutions is not unexpected. However, it does not indicate the relative needs in each category. Another interesting comparison shows that the proportion of additions and remodeling to new institutions averages about three to one, except for mental facilities, for which it is ten to one.

The number of projects in various categories, the estimated cost, and their materials requirements are listed in table 1.

Materials Estimates and Project Needs

For each calendar quarter, the materials requirements for health facilities, as for all other construction and production, must be estimated and justified to the Defense Production Admin-

Glossary of Terms

Cost of Construction—includes fixed equipment but excludes land cost.

New Start—a construction project for which a permit to begin is required. Not necessarily a new institution.

Project—a unit of construction activity for which a separate permit is requested.

Institutional Construction—Relates to prisons, orphanages, etc. The volume of this type of construction is included with hospital construction in many published statistics. It is believed to be about 5 percent of the "hospital and institutional" total.

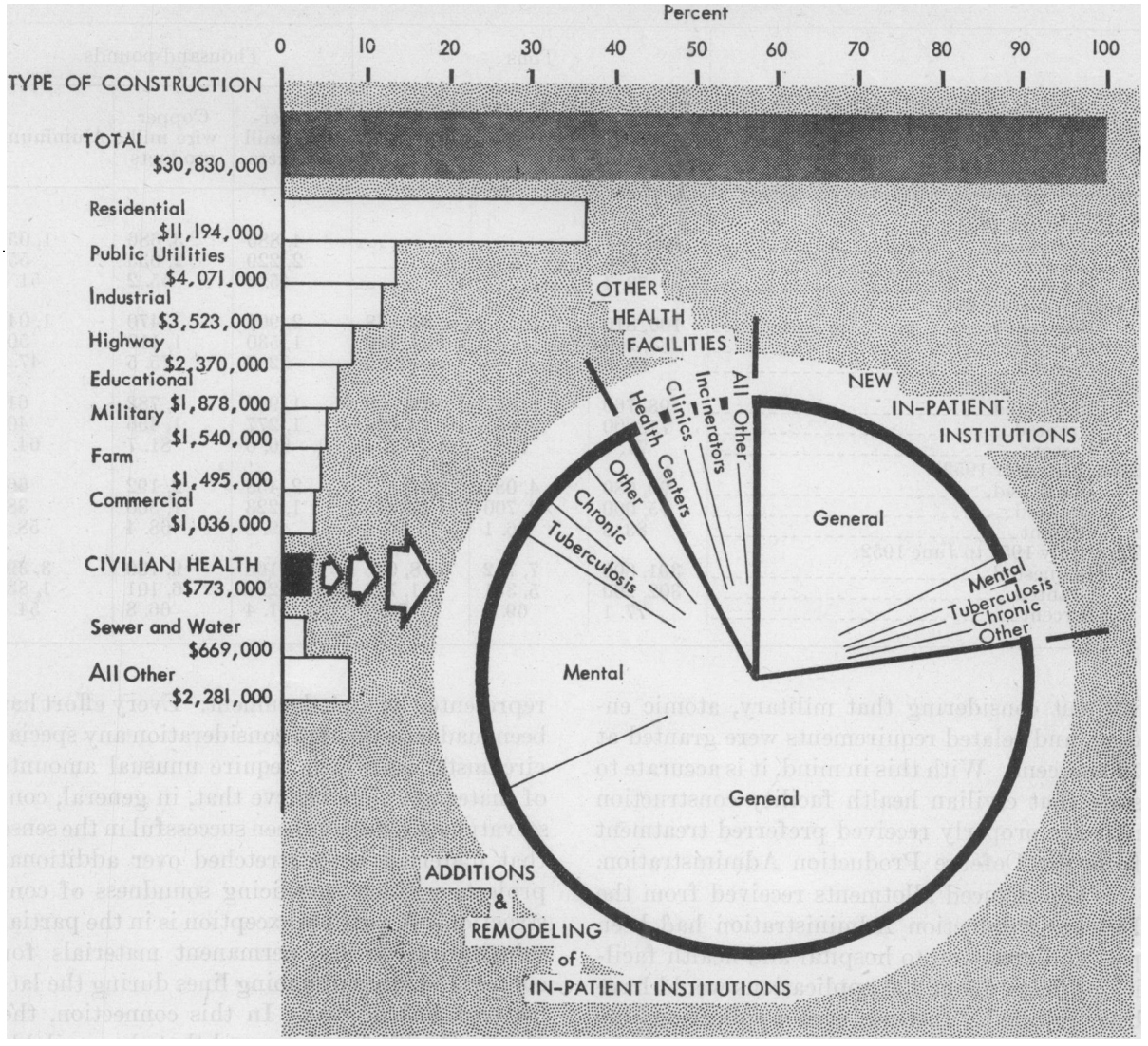
Table 1. Hospital and health facility construction projects, proposed new starts,[1] July 1951 through June 1952

Project	Total number of projects	Total construction cost (in millions of dollars)	Controlled materials requested for total project					
			Total carbon steel (short tons)	Steel plate (short tons)	Structural steel (short tons)	Copper and copper base brass mill products (000 lbs.)	Copper wire mill products (000 lbs.)	Aluminum (000 lbs.)
Grand total	1, 225	$791	254, 758	10, 338	67, 412	8, 641	7, 113	2, 296
Total all hospitals [2]	1, 058	738	230, 807	8, 886	56, 719	8, 208	6, 715	2, 055
New institutions	137	174	53, 666	1, 557	6, 758	1, 979	1, 607	552
Project adding beds	385	366	113, 377	3, 564	30, 088	3, 897	3, 041	798
Other construction	536	198	63, 764	3, 765	19, 873	2, 332	2, 067	705
General hospitals	650	512	157, 192	5, 011	38, 016	6, 215	4, 868	1, 835
New institutions	108	139	43, 039	1, 122	4, 893	1, 626	1, 374	499
Project adding beds	285	256	73, 848	2, 069	17, 470	2, 917	2, 259	741
Other construction	257	117	40, 305	1, 820	15, 653	1, 672	1, 235	595
Mental hospitals	253	136	49, 016	3, 264	15, 779	1, 088	1, 055	157
New institutions	4	12	3, 763	89	1, 088	78	44	18
Project adding beds	50	63	26, 105	1, 419	11, 116	482	429	40
Other construction	199	61	19, 148	1, 756	3, 575	528	582	99
Tuberculosis hospitals	71	26	6, 528	145	946	275	230	14
New institutions	7	8	1, 969	46	385	134	51	9
Project adding beds	23	11	3, 643	25	447	103	128	4
Other construction	41	7	916	74	114	38	51	1
Chronic hospitals	21	34	12, 541	338	777	429	382	11
New institutions	5	9	3, 339	223	162	89	108	3
Project adding beds	9	18	7, 319	28	299	297	130	5
Other construction	7	7	1, 883	87	316	43	144	3
Other hospitals	35	23	3, 489	84	884	138	145	36
New institutions	3	2	590	35	54	17	18	23
Project adding beds	13	16	1, 824	22	690	82	82	7
Other construction	19	5	1, 075	27	140	39	45	6
Nursing homes	28	7	2, 041	44	317	63	35	2
New institutions	10	4	966	42	176	35	12	[3]
Project adding beds	5	2	638	1	66	16	13	1
Other construction	13	1	437	1	75	12	10	1
Total other facilities	167	53	23, 951	1, 452	10, 693	433	398	241
Health centers	67	18	8, 219	110	4, 046	187	173	117
Clinics	43	8	2, 074	29	488	96	82	2
Incinerators [4]	25	18	10, 031	1, 124	5, 411	29	66	114
Other	32	9	3, 627	189	748	121	77	8

[1] Excluding projects later withdrawn by their sponsors. [2] Includes nursing homes. [3] Less than 500 pounds.
[4] The average cost per ton of increased capacity, based on 24-hour operation, was about $3,000.

istration. Since the supplies of steel, copper, and aluminum were only 60, 65, and 64 percent, respectively, of the total amounts claimant agencies requested during the year, the Defense Production Administration had to apportion the available supplies in accordance with its standards of essentiality. Table 2 lists the amounts that were requested and granted by calendar quarter for each of the controlled materials used in hospital and health facility construction. The volume of materials given in this table was required for completion of projects that had started prior to CMP as well as for the needs of the "new starts."

Figure 2. Total United States construction volume (in thousands of dollars) and relative dollar volume of hospital and health facility projects proposed to start July 1951 through June 1952.



New in-patient institutions	*Percent*	*Additions and remodeling of in-patient institutions*	*Percent*	*Other health facilities*	*Percent*
Total	22.0	Total	71.4	Total	6.6
General	17.6	General	47.2	Health Centers	2.3
Mental	1.5	Mental	15.7	Clinics	1.0
Tuberculosis	1.0	Tuberculosis	2.3	Incinerators	2.3
Chronic	1.1	Chronic	3.2	All other	1.0
Other	0.8	Other	3.0		

Source for bar chart data: *Construction,* December 1951 and June 1952, and unpublished data, Bureau of Labor Statistics

The record shows that steel requests were reduced by an average of about one-fourth. Copper-brass mill (plumbing) requirements were cut by nearly one-half and copper wire by a third. The aluminum estimates, which were also reduced almost by one-half, are not considered as vital to construction. This treatment of materials requests for civilian health facility construction should not be compared with the relationship of total supply to total request

Table 2. Controlled materials requested from the Defense Production Administration for construction of civilian health facilities and the amount and percent allocated

Calendar year period	Tons			Thousand pounds		
	Total carbon steel	Steel plate	Structural steel	Copper-brass mill products	Copper wire mill products	Aluminum
Third quarter 1951:						
Requested	102, 144	----------	----------	4, 886	3, 686	1, 059
Granted	75, 000	----------	----------	2, 229	2, 035	550
Percent	73. 4	----------	----------	45. 6	55. 2	51. 9
Fourth quarter 1951:						
Requested	100, 816	----------	24, 258	2, 905	1, 470	1, 049
Granted	81, 200	----------	24, 400	1, 530	1, 110	500
Percent	80. 5	----------	100. 6	52. 7	75. 5	47. 7
First quarter 1952:						
Requested	98, 760	3, 667	26, 366	1, 917	1, 782	619
Granted	71, 000	2, 651	19, 004	1, 277	1, 456	400
Percent	71. 9	72. 3	72. 1	66. 6	81. 7	64. 6
Second quarter 1952:						
Requested	90, 080	4, 085	27, 424	2, 458	2, 192	665
Granted	75, 000	2, 700	18, 315	1, 223	1, 500	388
Percent	83. 3	66. 1	66. 8	49. 8	68. 4	58. 3
Total July 1951 to June 1952:						
Requested	391, 800	7, 752	78, 048	12, 166	9, 130	3, 392
Granted	302, 200	5, 351	61, 719	6, 259	6, 101	1, 838
Percent	77. 1	69. 0	79. 1	51. 4	66. 8	54. 2

without considering that military, atomic energy, and related requirements were granted at 100 percent. With this in mind, it is accurate to state that civilian health facility construction requests properly received preferred treatment from the Defense Production Administration.

If the reduced allotments received from the Defense Production Administration had been passed directly on to hospital and health facility projects, about 400 applications would have been rejected. Instead, each application was screened carefully, with the assistance of the State hospital agencies and the regional offices and the available material was distributed as equitably as possible among all eligible health facility projects. At the same time, an educational campaign was directed toward the conservation of critical materials. As a result, all of the projects falling within our claimant jurisdiction for the first three quarters have been approved and less than 10 projects for second quarter 1952 were pending September 1, 1952 (fig. 3).

The process of analyzing CMP applications is an important and critical responsibility. Months and years of planning and hopes are represented by each document. Every effort has been made to take into consideration any special circumstances which require unusual amounts of materials. We believe that, in general, conservation efforts have been successful in the sense that materials were stretched over additional projects without sacrificing soundness of construction. A possible exception is in the partial substitution of less permanent materials for copper and brass plumbing lines during the latter part of the year. In this connection, the Public Health Service urged that the available copper and brass be used in the more inaccessible locations of structures where any future replacement would be difficult and expensive.

Maintenance of Standards

Equally as important as completely new facilities to students of medical care economics is the expenditure—in dollars and materials—that is required to avoid deterioration. This expenditure is represented by the sum of those repairs and renovations needed to maintain existing beds in operation and in an acceptable status. Included are projects for structural renovation, rewiring, sprinkler systems, fire es-

capes, reroofing, and the like. Some of the projects stem from fire and safety inspections and mandatory orders to correct hazardous conditions. Minor repairs which were self-authorized are excluded from this tabulation. If they were added, they would raise the total number of projects considerably, but, due to their nature, would not proportionately affect the total expenditures or materials requirements.

Of the total number of hospital and nursing home projects approved during the past year, more than one-half (51 percent) did not add beds. Over one-quarter (27 percent) of the cost was for nonbed projects. Table 3 shows the funds and materials required by the three significant "R's"—repair, remodeling, renovation—for various types of facilities during the past year.

Nearly 3 out of every 10 dollars expended for hospital and nursing home construction—about $200 million last year—went into improvements needed to maintain, but not add, beds. And this amount was not all that is really needed for repairs and renovation. Undoubtedly many beds slipped into an unacceptable status because the necessary investment was not made to overcome obsolescence.

Hill-Burton Stimulus

Much of the credit for the increased pace of hospital and other health facility construction during calendar years 1948 and 1949, as well as the current high level shown in figure 1, can be attributed to the stimulating effect of Hill-Burton grants. Thirty-two percent of the cost of all hospital and health facility construction authorized to begin construction from July 1,

Figure 3. Requests for permits to begin health facility construction, by quarters, July 1951 through June 1952.

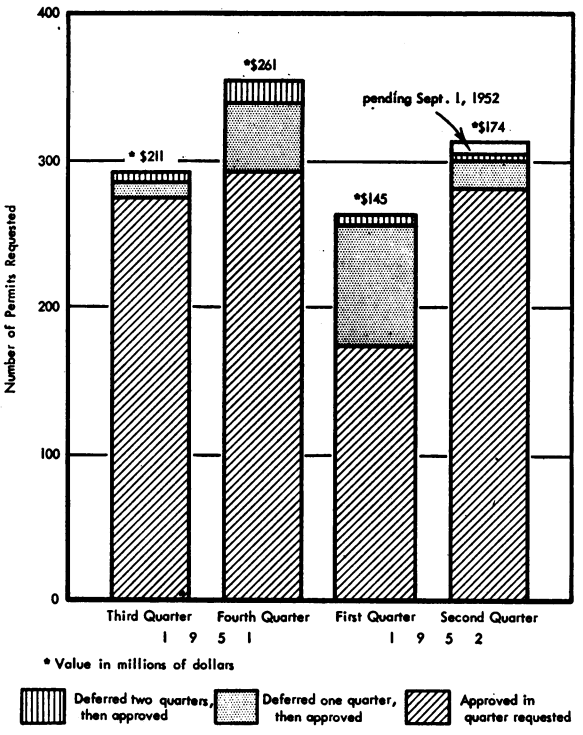


Table 3. Percent of projects, construction cost, and materials required to maintain existing in-patient care facilities without adding beds to Nation's total, July 1951 to June 1952, inclusive

Type of facility	Number of projects		Construction costs (in millions)		Steel requirement (tons)		Copper mill products requirement (000 lbs.)		Copper wire requirement (000 lbs.)	
	Total	Percent not adding beds	Total	Percent not adding beds	Total	Percent used without adding beds	Total	Percent used without adding beds	Total	Percent used without adding beds
Total	1,058	50.7	$738	26.8	230,807	27.6	8,208	28.4	6,715	30.8
General	650	39.5	512	22.9	157,192	25.6	6,215	26.9	4,868	25.4
Mental	253	78.7	136	44.9	49,016	39.1	1,088	48.5	1,055	55.2
Tuberculosis	71	57.7	26	26.9	6,528	14.0	275	13.8	230	22.2
Chronic disease	21	33.3	34	20.6	12,541	15.0	429	10.0	382	37.7
Other hospitals	35	54.3	23	21.7	3,489	30.8	138	28.3	145	31.0
Nursing homes	28	46.4	7	14.3	2,041	21.4	63	19.0	35	28.6

1951, through June 30, 1952, was for projects assisted by the Hill-Burton program. Thirteen percent of the total cost was represented by direct Federal funds. The greater volume of Hill-Burton assistance to general hospitals than other facilities is shown in figure 4.

Analysis of Bed Need

A significant element in the Hill-Burton program is the analysis of bed need by the responsible State agencies. To qualify for Federal grants under the act, a State is required to develop an annual plan approved by the Public Health Service. Each plan includes an inventory of all available non-Federally operated facilities, in terms of "acceptable" and "non-acceptable," and an estimate of the beds and facilities needed to increase the resources of the State to the level authorized by the act. These total bed needs are the number required to meet the minimum standards adopted under the act. They are therefore not necessarily the ultimate goals.

Table 4. In-patient care facilities requested for construction start July 1951 to June 1952, showing beds to be added relative to need, by Federal Security Regions for general hospitals and United States total for other facilities

Type of facility and area	Number of projects	Reported cost of construction (in millions)	Total beds needed [1]	Existing beds Jan. 1, 1952 [1]	Beds to be added by July 1951–June 1952 starts
General hospitals					
Total	650	$511.9	[2] 708,574	[2] 474,334	[2] 28,342
Region 1	44	31.9	44,289	27,012	1,350
Connecticut	9	7.2	9,180	6,628	193
Maine	1	2.5	4,082	1,902	69
Massachusetts	28	20.5	23,217	13,653	1,012
New Hampshire	2	.4	2,564	1,792	27
Rhode Island	3	1.0	3,482	1,938	29
Vermont	1	.3	1,764	1,099	20
Region 2	102	109.5	141,553	103,420	5,214
Delaware	2	.1	1,474	1,253	0
New Jersey	23	20.9	21,496	15,530	1,445
New York	48	53.4	68,267	51,375	1,827
Pennsylvania	29	35.1	50,316	35,267	1,942
Region 3	66	46.4	67,181	42,153	2,681
District of Columbia	1	[3]	3,780	2,491	0
Maryland	12	7.2	10,388	7,280	379
North Carolina	24	21.8	20,001	13,169	1,240
Virginia	13	5.2	13,858	8,614	291
West Virginia	5	2.9	9,104	5,587	212
Puerto Rico	8	8.5	9,914	5,012	555
Virgin Islands	3	.8	136	[4]	4
Region 4	62	36.6	76,458	46,710	2,554
Kentucky	9	7.5	13,430	7,479	484
Michigan	29	13.0	27,953	15,940	884
Ohio	24	16.1	35,075	23,291	1,186
Region 5	77	68.9	87,400	58,605	4,283
Illinois	36	43.0	39,467	28,116	2,457
Indiana	13	13.0	17,874	8,060	772
Minnesota	13	5.3	14,106	10,679	383
Wisconsin	15	7.6	15,953	11,750	671
Region 6	73	44.9	74,269	43,442	2,809
Alabama	14	5.3	13,751	7,251	398
Florida	14	7.8	10,793	7,679	694
Georgia	18	9.3	15,329	8,571	505
Mississippi	6	4.5	9,918	4,793	228
South Carolina	10	11.1	9,714	6,204	660
Tennessee	11	6.9	14,764	8,944	324

Table 4 shows, by State, the available existing and the "total needed" general hospital beds as reported January 1, 1952, by the Division of Hospital Facilities, Public Health Service, as compared with the number of beds which will be added upon completion of the requested construction starts for the period July 1951 through June 1952. Similar data, when available, are also included in this table for other types of health facilities omitting the geographic detail for individual States and regions. The 2-page chart illustrates the need as compared with the current rate of bed construction, neglecting the obsolescence that is not being met through renovation.

The most notable observation to be made from these data is that the current high amount of construction will not close the gap between beds needed and beds existing for general hospitals in less than 7 years; for mental and tuberculosis hospitals in less than 25 years; and for chronic hospitals in less than 170 years! None of these time estimates make provision for an expanding population, for uncorrected

Table 4. In-patient care facilities requested for construction start July 1951 to June 1952, showing beds to be added relative to need, by Federal Security Regions for general hospitals and United States total for other facilities—Continued

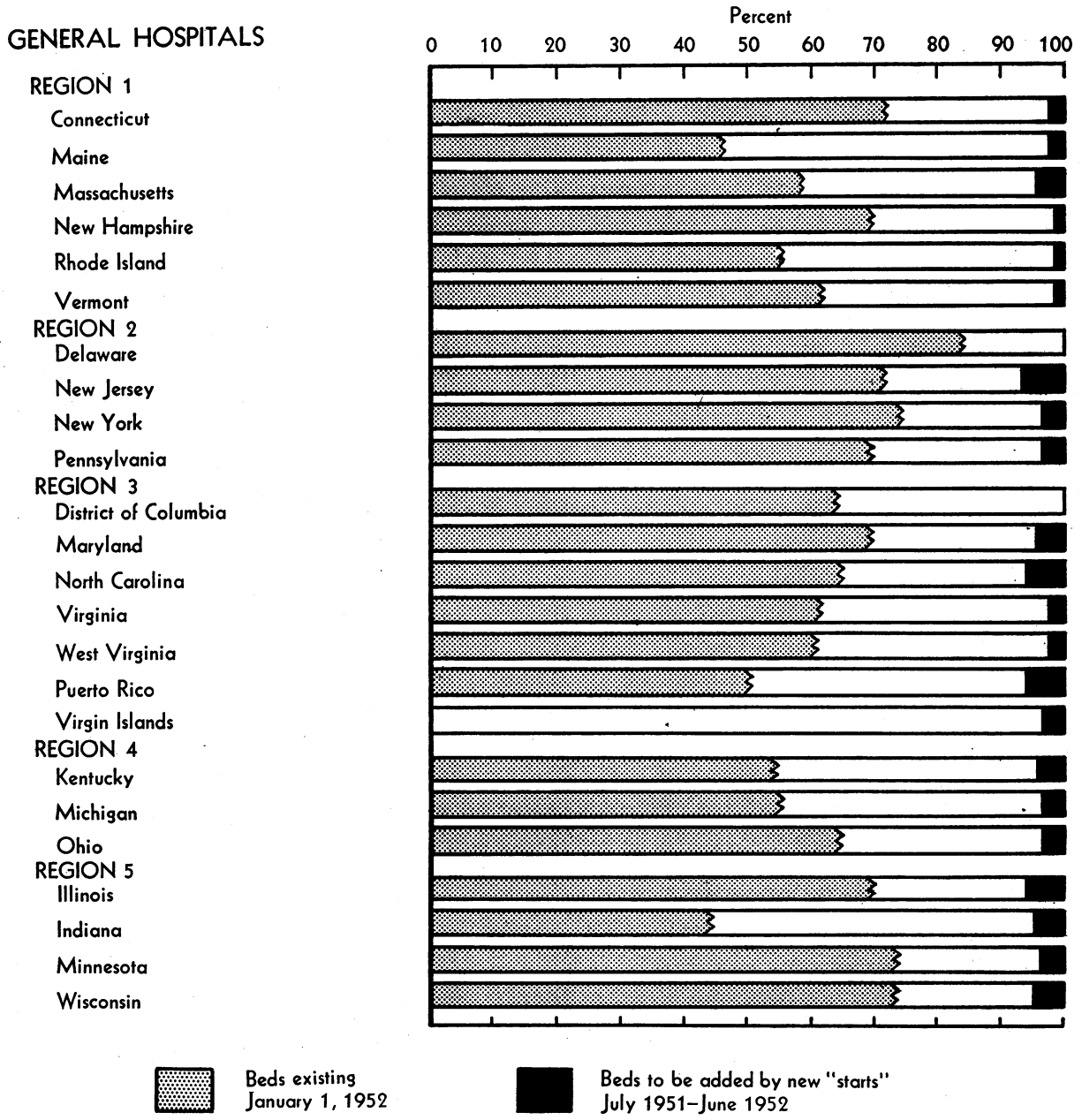
Type of facility and area	Number of projects	Reported cost of construction (in millions)	Total beds needed[1]	Existing beds Jan. 1 1952[1]	Beds to be added by July 1951–June 1952 starts
General hospitals—Continued					
Region 7	49	29.3	53,712	41,414	1,859
Iowa	12	9.2	11,795	9,132	453
Kansas	10	6.3	9,092	6,912	479
Missouri	12	10.2	18,800	14,768	623
Nebraska	8	1.6	6,417	4,891	140
North Dakota	5	1.5	4,079	3,144	153
South Dakota	2	.5	3,529	2,567	11
Region 8	59	52.3	70,292	47,842	3,038
Arkansas	9	9.7	8,722	3,651	569
Louisiana	14	13.9	13,609	9,498	671
New Mexico	4	4.5	3,848	2,428	62
Oklahoma	6	.6	10,442	6,971	41
Texas	26	23.6	33,671	25,294	1,695
Region 9	19	9.0	18,129	14,049	619
Colorado	11	2.6	6,238	5,228	191
Idaho	0	0	3,040	2,047	0
Montana	3	1.2	3,840	3,285	66
Utah	3	3.7	3,435	2,300	252
Wyoming	2	1.5	1,576	1,189	110
Region 10	99	83.1	[2] 75,291	[2] 49,687	[2] 3,935
Arizona	2	4.9	3,921	3,256	387
California	72	59.6	49,287	32,527	2,719
Nevada	0	0	884	645	0
Oregon	9	4.4	6,912	4,572	395
Washington	13	8.0	11,367	7,150	348
Alaska	1	.5	780	329	0
Hawaii	1	.7	2,140	1,208	86
Midway Islands	1	5.0	----------	----------	312
Other facilities (U. S. total)					
Mental hospitals	253	135.6	755,097	412,932	11,733
Tuberculosis hospitals	71	25.9	132,899	87,550	1,750
Chronic hospitals	21	34.0	302,236	43,007	1,509
Other hospitals	35	22.8	----------	----------	826
Nursing homes	28	7.3	----------	----------	1,120

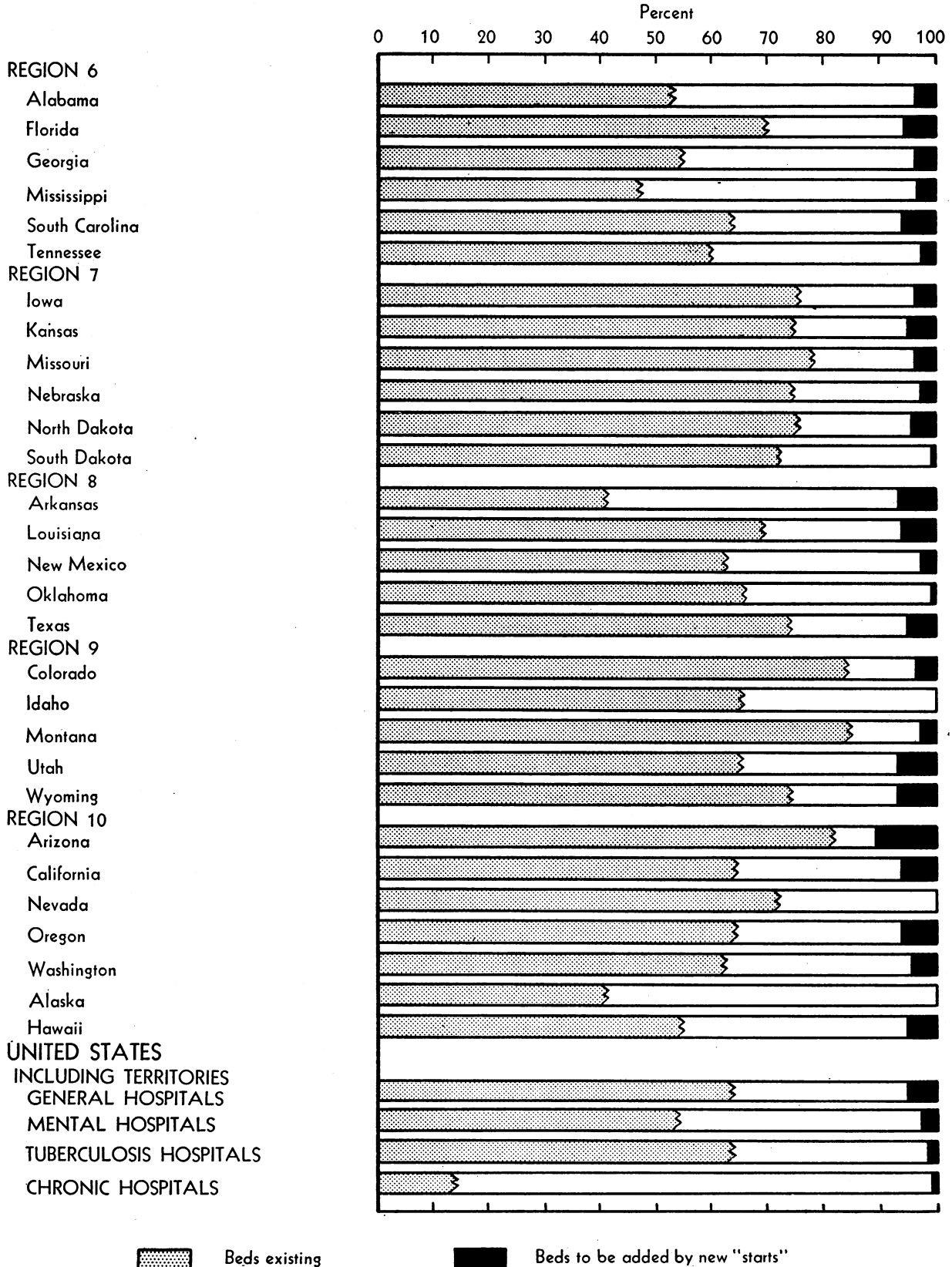
[1] Division of Hospital Facilities, Public Health Service.
[2] Excludes Midway Islands.
[3] Construction cost—$4,000.
[4] No acceptable beds.

Beds Needed and Beds Existing

Compared With One Year's New Construction

The beds existing on January 1, 1952 and the beds to be added by new "starts" July 1951–June 1952 are shown in proportion to total bed needs as of January 1, 1952. Total bed needs are expressed as "100" for each category.




Percent
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Alabama
Florida
Georgia
Mississippi
South Carolina
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REGION 7
Iowa
Kansas
Missouri
Nebraska
North Dakota
South Dakota
REGION 8
Arkansas
Louisiana
New Mexico
Oklahoma
Texas
REGION 9
Colorado
Idaho
Montana
Utah
Wyoming
REGION 10
Arizona
California
Nevada
Oregon
Washington
Alaska
Hawaii
UNITED STATES
INCLUDING TERRITORIES
GENERAL HOSPITALS
MENTAL HOSPITALS
TUBERCULOSIS HOSPITALS
CHRONIC HOSPITALS
Beds existing January 1, 1952
Beds to be added by new "starts" July 1951–June 1952

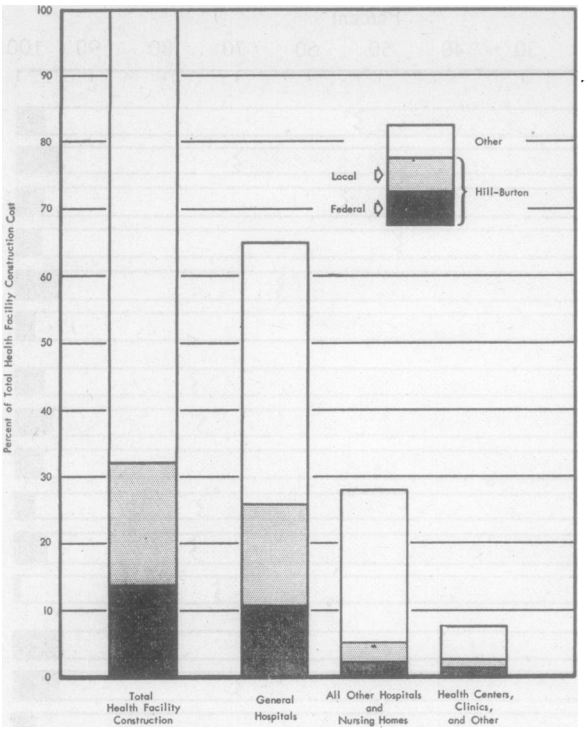

Figure 4. Percent of *total* health facility construction cost supported by Hill-Burton grants, requested starts, July 1951 through June 1952.

obsolescence over future years, or for what may be of primary importance—changes in patterns of hospital usage. Another interesting observation is that no geographic or sectional pattern is evident. There are wide variations between individual States, but the differences are as likely to occur between neighboring States as those separated by half the continent.

Ownership of Projects

Table 5 shows the distribution of construction cost into three categories of ownership: public, private nonprofit, and proprietary for various groups of health facilities. During the year, 44 percent of the construction cost of new starts was on publicly owned facilities, 55 percent on privately owned nonprofit, and 1 percent on proprietary projects.

Summary

1. Civilian health facility construction has not been seriously set back under the controlled materials plan.

Table 5. Percentage distribution of construction cost by type of ownership for requested new starts, July 1951 through June 1952

Type of facility	Percentage of construction cost		
	Public	Private nonprofit	Proprietary
Total	43.6	54.9	1.5
Total hospitals and nursing homes	40.9	58.0	1.1
General hospitals	29.0	69.7	1.3
Mental hospitals	88.1	11.7	.2
Tuberculosis hospitals	87.4	11.1	1.6
Chronic hospitals	21.6	78.4	0
Other hospitals	28.6	70.4	.9
Nursing homes	24.2	72.7	3.0
Health centers	95.1	3.3	1.6
Clinics	8.5	46.5	45.1
Incinerators	100.0	0	0
Other	76.8	23.2	0

2. Construction volume for additions to and remodeling of hospitals far exceeded the volume of new hospital construction.

3. Two-thirds of all construction volume in the civilian health field was for general hospitals.

4. Although given preferred treatment by the Defense Production Administration, civilian health facilities were allocated much smaller quantities of materials than needed. A policy of conservation was adopted to "spread" the available materials and prevent an appreciable number of disapproved applications.

5. More than one-fourth of in-patient construction volume was for nonbed projects.

6. One-third of all health facility construction received Hill-Burton assistance.

7. The number of new beds of all types started during the year was about 45,000.

8. Forty-four percent of health construction was publicly owned; 55 percent was privately owned by nonprofit organizations; and 1 percent was privately owned and operated for profit.

REFERENCE

(*1*) Gilbertson, W. E.: The CMP and the public's health. Pub. Health Rep. 67: 8–13 (1952).