URBAN PLANNING PROCEDURES FOR INPATIENT HEALTH FACILITIES

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ABSTRACT

URBAN PLANNING PROCEDURES
FOR INPATIENT HEALTH FACILITIES

By

Robert James Reichert

The problem established for this paper is to test the validity of the following thesis: Urban planning has not been significantly concerned with health facilities, but should be and can be involved in planning and coordinated development of health care institutions.

As a background for understanding planning problems, research was conducted on the history and characteristics of health facilities from available statistical data, analyses and published histories. Little data or information has been published concerning health facility planning from an urban planning viewpoint. Thus, it was necessary to consult a wide variety of information sources including the vast amount of published information directly related to health facilities, interviews with health and urban planning authorities, the few available urban planning references and personal experience. The method or technique used was to present pertinent findings from the sources consulted in a

logical manner that would establish validity of the thesis and that might serve as a starting point from which urban planning can be involved with health facility planning.

Health facility planning and urban planning are somewhat different but related fields of endeavor. However, they are not as distinctly different as current urban planning practice would indicate. Comprehensive plans typically include a brief study or no study of health facilities and there is an apparent lack of agreement among urban planners as to the proper treatment of health facilities in zoning ordinances. A few special health facility planning studies have been prepared by urban planners, however, that appear to be quite good.

The basic reason for a lack of urban planning involvement in health facility planning is lack of knowledge. Health planning authorities know little or nothing about urban planning and urban planners know little or nothing about health facilities. Much can be done to overcome this problem through communication and education.

Planning procedures, principles, standards and objectives that are presented indicate how urban planning methods of study can be applied to health facility planning. Conclusions from findings of this paper indicate areas where further research is needed and basic policies that should be observed for achieving solutions to common health facility and urban planning problems.

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The topic for this thesis was selected as one means of combining my parents' medical professions as a surgeon and registered nurse and my activities as an urban planner into one paper. My parents helped to make this paper into a family affair by reviewing preliminary drafts and offering helpful suggestions on matters related to the medical profession. Assistance and encouragement they provided is appreciated.

Focusing on a reasonable topic for study of the broad subject covered by this thesis was one of the most difficult tasks and might not have been accomplished with any degree of success without the questions and comments of my thesis advisor, Professor Sanford Farness. His assistance and advice on this thesis is most sincerely appreciated.

Professor Barr and Steve Schor as members of my thesis committee offered constructive advice and comments on the draft submitted for the thesis orals meeting. A number of modifications and improvements were made as a result of their helpful comments.

Each of the several persons interviewed during the course of research for this thesis spent a considerable amount of time with me that was most helpful in gaining a

further insight into health facility planning problems.

I learned the hard way over the past couple of years that a thesis should be completed before leaving the campus. I sincerely thank my parents and Mr. Eldredge Lovelace, principle partner of Harland Bartholomew and Associates, my employer, for their increasing urgings that I complete this thesis.

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INTRODUCTION

This paper is primarily concerned with the need for health facility planning from an urban planning viewpoint. Research on the history and characteristics of health facilities was conducted to provide a background for understanding their relationship to urban planning problems.

Background studies indicate that development of health care facilities evolved around acute general hospitals. These are hospitals that provide care for acutely ill patients who need intensively skilled treatment for a relatively short time. Emphasis is placed throughout this paper on acute general hospitals because of their dominance in the entire system of health care facilities.

However, a wide range of health care facilities is necessary to complement service provided by acute general hospitals and to provide adequate health care services to a community. As a result, this paper presents a broad evaluation of inpatient health care facilities. Institutions without facilities for diagnosis or treatment of patients were not included as a topic of study. Except for some background studies, the scope of this thesis has also been limited to non-federal hospitals.

The thesis of this paper is that urban planning has not been significantly concerned with health facilities, but

should be and can be involved in planning and coordinated development of health care institutions. The first part of the thesis, that urban planning is not involved, is clearly substantiated by studies on the current status of health facility planning. Nearly all health facility planning is conducted on a policy basis by federal and state agencies administering the Hill-Burton program, by local health planning councils and by individual facilities. Some good urban planning studies concerning health facilities have been prepared, but the only general urban planning involvement has been the establishment of specific health facility controls and regulations in zoning ordinances. Lack of adequate background information for writing these ordinances is reflected by various ordinances that seem to be uncertain as to where to permit health facilities.

The basic reason for a lack of urban planning involvement in health facility planning is lack of knowledge. Health planning authorities know little or nothing about urban planning and urban planners know little or nothing about health facilities. Much can be done to overcome this problem through communication and education.

Most health facility planning is relatively short-range similar to capital improvement programming for specific improvements. Urban planning assistance for such studies can be quite beneficial on matters such as site selection, community and demographic characteristics for bed need estimates and financing plans.

An area of urban planning competence is in long-range studies. Urban planning methods of study should be as applicable to health facilities as to other community facilities, such as schools, highways and utilities. Because of the importance of health facilities to the health of a community, they should be a major concern of urban planning. Many characteristics of a community, such as the economy, housing and development patterns are affected, to some degree, by health facilities. Also the cost of constructing, and sometimes maintaining health facilities, often must be borne by public tax resources. Because of the present lack of knowledge, time will be required for research, education and experience before the urban planning profession can become fully competent to conduct health planning studies.

As a partial means of establishing validity of the thesis that urban planning should be and can be involved in planning and coordinating development of health care institutions, research was conducted to establish a beginning for planning procedures, principles, standards and objectives. Conclusions from the findings of this paper indicate areas where further research is needed and basic policies that should be observed, so that health and urban planning agencies produce needed, viable and effective short and long-range health facility plans for solutions to common problems.

CHAPTER I

DEVELOPMENT AND GROWTH OF HEALTH FACILITIES

Today's hospitals and related health facilities provide an essential public service. Health facilities are as necessary to man's physical well-being as churches are to his spiritual welfare and as schools are to his intellectual development. Hospitals generally maintain a high degree of public confidence that excellent service will be provided.

It is only relatively recently, however, that hospitals have become objects of public esteem. They were founded, originally as poor houses; shelter for the aged, orphans, vagrants and the maimed; as community protection from the insane and persons with communicable diseases; and as shelter for persons wounded in wartime. The early hospitals were crowded and unsanitary. Chances of recovery from an illness after entering a hospital were not good. Health hazards were usually greater in a hospital than in the home. Hospitals had such poor reputations that most people would not enter them voluntarily, and in fact, admission to these institutions was frequently regarded as a disgrace.[1]

Numerous factors have accounted for the relatively

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[1]Commission on Hospital Care, Hospital Care in the United States (Cambridge, Mass.: The Commonwealth Fund, Harvard University Press, 1957), pp. 423-424.

recent change and rapid growth of hospitals. All of the factors that have contributed to the growth of the United States have played some role in hospital growth in the nation. Those influences that have hastened or retarded the growth of hospitals may be classified in general terms as: religion, war, medical science, education, social organization, economic conditions and public appreciation.[2]

Early Hospitals

The medical profession arose out of ancient civilizations of Egypt, Babylonia, Persia, India, and Greece.[3] Medical care was most closely associated with religion, but governmental hospitals were also established quite early. The earliest record of governmental hospitals were those established in the 3rd Century B.C. by a Buddhist ruler in India who was socially minded and motivated by religious zeal.[4] The advent of the Christian religion brought a new impetus for health care and hospital facilities. In the early Christian era most hospitals were operated by the church, but charitable organizations and governments also built hospitals.

By the 4th Century A.D. wealthy Christian women organized and supervised charity hospitals in Rome. There

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[2]Ibid., p. 43.

[3]Ibid., p. 425.

[4]Laura G. Jackson, Hospital and Community Studies in External Relationships of the Administrator (New York: The Macmillan Company, 1964), p. 483.

is also some record that at about the same time in Rome, hospitals were established for members of various trades and some convalescent homes were built. During the same time hospitals were being founded for lepers, famine victims and others stricken with various diseases in cities of the Byzantine Empire.[5, 6]

Development of hospitals in western Europe started around the 5th Century. Charitable organizations founded the Hotel Dieu of Lyons in 542, and the Hotel Dieu of Paris in 650. For the church, the first break away from facilities that served as resting places for pilgrims as well as care for the sick, occurred about 1155, when the first purely nursing order was founded by the St. Augustine nuns. The first English hospital worthy of the name was started in 1123.[7] However, at least some form of hospital was in existence in England since the late 8th Century.[8]

During the 13th Century, there were about 19,000 hospitals scattered throughout Europe. Most of these were church institutions with relatively good administration, but healing the soul generally took precedence over healing the body. Church interest in hospitals declined during the 14th and 15th Centuries. Revenues formerly allotted to hospitals

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[5] Ibid., p. 515.

[6] Commission on Hospital Care, op. cit., p. 425.

[7] Commission on Hospital Care, op. cit., pp. 425-426.

[8] Jackson, op. cit., p. 517.

were used for other purposes and the quality of care suffered a considerable setback.[9]

The Renaissance and the Reformation saw the beginning of changes in the hospital system and the advancement of medical science. On the one hand older sciences were being further developed and new sciences were being established. However, on the other hand, in newly Protestant countries, church property was confiscated with the result that church hospitals were discontinued. There were only a few instances in which a hospital was restored as a secular institution or a monastery was converted for hospital use. As a result of the wars of the 16th Century, municipal hospitals were established for those who became sick or wounded in battle, and in general they were run quite badly. In 1524 Cortez established in Mexico City the first hospital on the North American continent with a continuous history of service.[10]

Major advances in medical science were beginning to occur during the 17th Century. However, in the Protestant countries of Europe the quality of hospital care continued to degenerate. Well-managed hospitals had practically disappeared, unsanitary conditions caused frequent outbreaks of epidemics and good nursing care was practically non-existent. In Catholic countries, hospital conditions were somewhat better, and a new nursing organization composed of laywomen

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[9]Commission on Hospital Care, op. cit., pp. 426-427.

[10]Ibid., pp. 427-428.

was started to provide better nursing care in homes of the poor and in some hospitals. Only two enduring hospitals in Quebec and Montreal were founded on the North American continent in the 17th Century. The English had no organization similar to the French or Spanish missionaries, and they developed no hospitals except for an occasional shelter for the sick disembarking from ships.[11]

The 18th Century saw a continuation of major advances in medical science. The quality of care in hospitals, however, was not improving and in fact had become deplorable. To quote from the Commission on Hospital Care:

> European hospitals reached the lowest level of service in history in the Eighteenth Century; the notoriety for their uncleanliness, mismanagement, and slovenly, incompetent nursing care lasted well into the Nineteenth Century. Only a modicum of improvement in the internal management of hospitals resulted from the treatises on sanitary science that appeared at this time.
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> Bad as was the management of hospitals, the treatment of the insane was worse. When kept in confinement, they were either chained or caged and it was not unusual for the public to pay admission fees to view their abnormal behavior. Insanity was regarded as a disgrace, not an illness. Few people realized the extent of the degradation of hospitals and fewer persons devoted efforts to bettering the conditions.[12]

Even a small beginning of a reform movement did not start until the late 18th Century. A fire that destroyed part of the Hotel Dieu of Paris in 1772, prompted an investigation of that hospital. Jackson gives a summary of the findings of the investigation as follows:

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[11] Ibid., pp. 428-431.

[12] Ibid., p. 432.

> The final report, submitted in 1786 and published in 1787, was a revelation of horrors--average mortality, 25 percent; recovery from surgery rare; only 486 beds for single patients; 1220 beds occupied at times by four to six patients each; many patients lying on vile heaps of straw on the floor; no ventilation; almost no segregation of infectious cases; filthy, verminous surroundings; stifling odors.[13]

The report recommended a complete rebuilding of the hospital with segregation of patients based on their type of illness and with ample provision for sunlight and fresh air. One result of the report was that a children's hospital was built at Paris in 1802, but the Hotel Dieu was not rebuilt until 1854.[14, 15]

At about the same time of the hospital investigation in Paris, John Howard was investigating prisons and hospitals in England. The conditions he found were similar to those at Paris. He advocated perfect cleanliness and ventilation in hospitals. The press took up his cause and the public became aroused. A reform movement, even though starting slowly, was finally underway in Europe.[16]

The early hospital system in America was just getting started in the early 18th Century. Pesthouses, isolation hospitals and quarantine stations were organized at seaports to isolate shipboard victims of contagious diseases from inhabitants of the town. These facilities were generally

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[13]Jackson, op. cit., pp. 671-672.

[14]Ibid., pp. 671-672.

[15]Commission on Hospital Care, op. cit., pp. 432-433.

[16]Ibid., pp. 432-433.

built outside the city or on an island in order to obtain the greatest degree of isolation and were not used by inhabitants of the town. In many communities private hospitals were established by a physician so that he would have some place to care for his patients. In several cities almshouses and jails were established as places for keeping the indigent and insane. Nearly every city had a pesthouse to isolate patients during an epidemic, but once the epidemic was over use of the pesthouse was generally discontinued. Most cities also had an almshouse for the poor with possibly an infirmary added if a pesthouse was not available. A not uncommon method of providing for the mentally ill and poor in rural areas was to auction them to the lowest bidder who would care for them for a year at a stipulated fee.[17]

As in Europe, conditions at institutions for care of the poor and insane were deplorable. The Commission on Hospital Care stated:

> Provisions for the care . . . in these city institutions were beyond description. Handcuffs, iron collars, leg irons were commonly used, and confinement in unheated cells under filthy living conditions and with inadequate nourishment was the usual practice.[18]

Many county or municipal hospitals of today were originally a combination almshouse and infirmary. Leading examples included the Philadelphia Almshouse founded in 1713,

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[17]Commission on Hospital Care, op. cit., pp. 432-453.

[18]Ibid., p. 435.

that became Philadelphia General Hospital; the Poor House of the City of New York, established in 1736, that became Bellevue Hospital; and L'Hôspital des Pauvres de la Charité of 1736, that became Charity Hospital in New Orleans. The New Orleans hospital was taken over by the state government in 1840.[19]

Almshouses founded primarily to aid the poor became places of refuge for indigents, criminals, physically handicapped, orphans and insane persons. Since many of these persons were sick, hospital facilities were established that in the evolution of many almshouses became the dominant part of the institution. Finally, all those persons who were not sick were transferred to institutions designed specifically to care for them so that only the hospital remained. These almshouses represent the first public recognition and acceptance of responsibility to provide facilities for care of the sick. Almshouses, coming out of the European tradition of caring for the poor, represent the beginning of an important American tradition that continues today. There are a large number of public hospitals whose primary function is to provide care for the poor.

Almshouses, however, did not provide hospital care for those persons who were sick and could pay for hospital service. To provide care for these persons a new social agency, the voluntary hospital, became established.

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[19]Ibid., pp. 435-447.

Voluntary hospitals served those patients who could afford to pay for the service as well as the indigent. Pennsylvania Hospital in Philadelphia, charted in 1751, became the first voluntary hospital in the United States, thus marking the beginning of the present system of voluntary hospitals. The second voluntary hospital, in New York City, was opened to civilian patients in 1791. Medical instruction was also given at this hospital and it is an early example of a combined hospital and medical school. Records indicate that few other voluntary hospitals were started before the middle of the 19th Century. Very few voluntary hospitals were founded for special types of illness except that four voluntary mental hospitals were started in eastern cities between 1817 and 1836.[20]

The creation of voluntary hospitals introduced entirely new concepts in hospital development. They were the first institutions to devote their services solely to the sick. Voluntary hospitals were charitable institutions not connected with the church or state. They were founded and sustained by donations from persons who were interested in civic affairs and who recognized a community responsibility to provide facilities for care of the sick regardless of economic status, race, color or creed. A further unique factor of voluntary hospitals was that they accepted payment from patients who could afford to do so to help maintain the

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[20]Ibid., pp. 435-447.

hospital. As the Commission on Hospital Care stated:

> The underlying motive in each of these instances and of all future voluntary hospitals was the recognition of community responsibility[21] toward the members of society.
>
> The pattern begun with these first voluntary hospitals has been influential in shaping the functions and administration of all the hospitals that have followed. The fundamental features that set them apart from public and proprietary hospitals are unique in the history of the world's hospitals.[22]

The westward movement of hospitals and the development of church hospitals in the United States started at about the same time. The first two hospitals west of the Allegheny Mountains were started as temporary facilities at Cincinnati in 1815 and Louisville in 1817. The present Cincinnati General Hospital, completed in 1824 as a permanent facility, served as a hospital, insane asylum, orphanage and almshouse. In 1835, the orphans were removed and later the insane and paupers were moved to other institutions. The present Louisville General Hospital was completed as a permanent hospital in 1823, by the state, and management was turned over to the city in 1836. Both are municipal hospitals and currently are affiliated with the only municipal universities having medical schools.[23]

The first hospital west of the Mississippi River, established in St. Louis in 1828, is also the oldest Catholic hospital in the country. The next two Catholic

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[21] Underlining by author.

[22] Commission on Hospital Care, op. cit., pp. 442-443.

[23] Ibid., pp. 444-446.

hospitals founded were in Louisville in 1836, and Baltimore in 1840. Records indicate that these were the only church hospitals established by 1840. However, in the latter half of the 19th Century church hospitals, both Catholic and Protestant, were responsible to a large degree for the tremendous growth of hospitals in that period.[24]

Two other developments of significance, state mental hospitals and federal hospitals, were also started during the period of early hospital formation in the United States. Beginning early in the 19th Century a number of states recognized their responsibility for caring for the mentally ill. This period also saw the development of combination county poor houses and insane asylums. This system was considered to provide more humane treatment for the mentally ill, and it was also found to be cheaper than keeping the insane in jails. The system of county poor farms and state insane asylums became quite popular and spread through every state. Though some improvements have been made, the same basic system continues today.[25]

The development of Federal hospitals might be said to have been started for soldiers during the Revolutionary War. However, the facilities used were tents and private homes, and were so overcrowded that the spread of disease could not be stopped. A little improvement had been made in military

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[24] Ibid., pp. 447-448.

[25] Ibid., pp. 443-444.

hospital facilities by the time of the War of 1812. The turn of the 18th Century also saw the beginning of a Federal hospital system for merchant seamen and for the men in the naval service. Their hospitals were no better or worse than other hospitals of the same time. Their importance is that they established the basis for future military service hospitals and the Public Health Service.[26]

Hospital Development Since 1840

Hospital conditions in the early 19th Century in America were just as deplorable as the conditions in Europe. It took some time before reform movements, started in Europe, began to filter into the United States. The first effort toward reform was started in the early 1840's, when Dorothea Dix became interested in mental hospitals. She was able to bring about changes in thought and practice that form the basis for the present system of governmental hospitals, but unfortunately new hospitals had become so overcrowded by the end of the century that conditions were as bad as when she started her crusade.[27]

The first real hospital reforms in the United States were started by the followers of Florence Nightingale. During the Crimean War, Miss Nightingale, working against opposition of medical officers, proved that improvements in environment and nursing care can save lives. Her results

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[26] Ibid., pp. 448-453.

[27] Ibid., pp. 454-456.

were a reduction in death rates from 42 to 2 percent. Her book on military hospitals revolutionized hospital construction. Her book on nursing care and training is still considered a classic for the principles it established. Miss Nightingale's principles of nurse training were introduced in the United States in 1873, with the opening of the first schools of nursing. From that point on, nursing service started to improve and save lives.[28, 29]

As a result of improvements in nursing care, advancements in medical science, better medical and nursing education, and new theories of hospital construction, the evolution of hospitals saw a change in purpose, function and number in about the period of 1840 to 1900. The former reasons for establishing hospitals were no longer valid. They were now established to care for the sick and they began to provide skilled care to all people. Many hospitals were founded during this period. Catholic hospitals were established at centers of colonization and were soon followed by Protestant and Jewish hospitals in all parts of the country. The major system of Federal hospitals for military service personnel and their dependents was started late in the 19th Century.[30, 31]

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[28] Ibid., pp. 456-471.

[29] Jackson, op. cit., pp. 487, 674, 676.

[30] Commission on Hospital Care, op. cit., pp. 471-472.

[31] Jackson, op. cit., p. 487.

During the period following the Civil War considerable thought was being given to the type of construction that should be used for hospitals. It was generally thought that a hospital should have the greatest amount of light and open air possible. However, it is rather difficult to heat open air so a compromise was developed in the form of pavilion hospitals. These were permanent masonry units of two or more stories not connected with any other unit except by covered walks. With strict sanitation control in hospitals today, this theory of construction is no longer valid. Such a hospital is most difficult to operate from a functional and administrative standpoint, so hospitals are being built today to achieve the most efficient functional arrangement possible.

One other development of significance starting in the late 19th Century was the improvement of medical schools -- the status of many schools had been deplorable until then. The first major improvement was the opening of Johns Hopkins Hospital as a combination hospital and medical school in the 1890's. This hospital was looked to as an outstanding example that should be followed. Education standards were improved throughout the country and many proprietary schools were either improved or went out of business.[32]

All of the previous hospital evolution set the stage for a tremendous improvement in care and growth of hospitals

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[32]Commission on Hospital Care, op. cit., pp. 474-477.

in the 20th Century. Medical knowledge and education have been greatly advanced. Private foundations have contributed extensively to research, medical schools and hospitals. An upswing in the public health movement has resulted in establishment of health departments in every state, numerous local urban and rural public health programs and finally in 1953, a cabinet level post in the Federal government on public health. Numerous voluntary health agencies, hospital associations and medical associations were also founded. At the same time, social and economic trends were influencing a greater use of hospitals and there was a wider dissemination of literature on hospital subjects.[33]

The public had finally gained confidence in hospitals and held them in high esteem. Between 1873 and 1945, the population of the United States more than tripled; there were 36 times as many hospitals; bed capacity had increased 49 times; and, yearly admissions had increased 111 times.[34] Annual admissions had increased over one and one-half times again by 1965.[35]

Early in the 20th Century the tendency was to build hospitals for specific diseases. It was soon realized that this type of organization was too limited and by the end of World War I the emphasis had changed to building hospitals

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[33]Ibid., pp. 478-513.

[34]Ibid., pp. 478-513.

[35]Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1966), p. 428.

for certain age, sex or occupation groups. Since about 1930, the emphasis shifted once again and has stayed primarily on the concept of building general hospitals. For example, the American Hospital Association for 1965 listed 5,800 non-federal short term hospitals of which 5,542 were general hospitals.[36]

As a legacy of the past, a major continuing problem is the condition of mental hospitals. An Ad Hoc committee for the Surgeon General reported in 1961, that, "the inadequacy of present [mental health] facilities is considered . . . one of the nation's major public health problems." There has been some recent notable progress in mental health facilities but the progress is quite slow.[37]

Most general hospitals are designed to care for acutely ill patients who will be in the hospital for a short period of time. However, there are many patients, the chronically ill, the aged, etc., who need to have extended medical care but do not need all of the numerous expensive facilities available at a general hospital. To meet this need there has been a relatively recent development of nursing homes and extended care facilities associated with general hospitals. To illustrate recent growth, skilled nursing homes had a capacity of 180,000 beds in 1954, and this had increased to 340,000 beds in 1963.[38] A study of health

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[36]Ibid., pp. 442-444.

[37]Ibid., p. 687.

[38]Ibid., p. 727.

facility growth and trend characteristics is included in Appendix A.

Developing Concept of Hospital Care and Organization

In order to keep up with the rapid advances in medical knowledge, and provide adequate hospital service for the increasing number of patients requiring hospitalization, changes are occurring in the concepts of general hospital organization and patient care.

Within general hospitals, the new pattern of organization, known as Progressive Patient Care, is intended to provide medical care and services in relation to patients' degree of illness and need for care. Advantages of this concept are an anticipated greater degree of utilization of available beds and a scaling of costs to the hospital and the patient in relation to the degree of care received by the patient. Five elements of Progressive Patient Care are: Intensive Care, Intermediate Care, Self Care, Long Term or Extended Care and Home Care.[39]

Intensive Care, Intermediate Care and Self Care are contained in general hospitals. Intensive Care is for the critically and seriously ill patients and is usually the first special unit to be established under a Progressive Patient Care plan. Intermediate Care is for patients requiring a moderate amount of nursing care and is

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[39]U.S., Department of Health, Education and Welfare, Public Health Service, Elements of Progressive Patient Care (Washington, D.C.: Government Printing Office, 1959), p. 1.

essentially the same degree of care that has been provided by general hospitals in the past. Self care is for patients who are physically self-sufficient but require diagnostic or convalescent care in hospitals. Home care is intended to extend hospital services into the home. This program can reduce the need for hospitalization and still make hospital services available to the patient.

The four elements of Progressive Patient Care discussed above, are not of particular importance to urban planning, except that they should be understood as being part of an over-all medical care facility organizational plan. The fifth element has some ramifications for urban planning. This element is Long Term or Extended Care and would be used for patients needing prolonged skilled medical and nursing care. Extended care facilities would provide only skilled medical and nursing care and would not have the many special facilities and services normally available at hospitals. Currently the most common type of such extended care facilities is the nursing home.

A considerable amount of attention currently is being given to the use of extended care facilities as an extension of hospital care. Since most ailments of the elderly are of a chronic, long-term nature, most patients of extended care facilities are the elderly who can usually be treated just as effectively in these facilities.

CHAPTER II

CURRENT STATUS OF HEALTH FACILITY PLANNING

Hospitals and related health facilities are important public facilities whether they are publicly or privately owned and operated. Their primary function in every instance is to provide a necessary service to the public. Health facility planning authorities recognized that the best and most efficient service can be provided if there is coordinated planning for all health facilities within a given region. It seems logical to assume that urban planning would give the same amount of attention to providing facilities for the public's health as for education. However, the urban planning process quite often has not been concerned with health facilities. Research and experience have established generally recognized procedures, principles and standards for school planning. There has been little research regarding health facilities within the context of urban planning, except for general types of planning principles. Urban planning's primary concern with health facilities has been in zoning ordinances, but there are some instances in the past where hospitals and related health facilities have not been included in zoning ordinances.

There is a vast amount of hospital and related health

facility planning literature but it is concerned almost entirely with internal needs and functional relationships. There is a considerable need for medical care facility planning. Much of this planning need is directly related to the type of activities normally undertaken in the urban planning process.

Need for Planning

The Nation's hospitals and related health facilities face a wide range of problems and deficiencies in maintaining and improving the current high quality of care. Although no two communities have identical characteristics, problems and needs are similar in many communities.

One of the major problems facing hospitals is rapidly rising operating expenses. The consumer price index increased by 29 percent from 1950 to 1964.[1] In the same time period total hospital expenses increased by 166 percent per patient day and 152 percent per patient stay.[2] These costs reflect improved comprehensive service, higher quality of care and an increased availability of specialized services. However, Dr. Rosenfeld, a hospital planning consultant, states that:

> Too often, the increasing costs also reflect uneconomical duplication of local services and facilities

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[1]U.S., Department of Commerce, Bureau of the Census, Statistical Abstract of the United States: 1964 (85th edition; Washington, D.C.: Government Printing Office, 1965), p. 361.

[2]"Hospitals," Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1965), p. 441.

> and/or overexpansion; inefficient use of personnel; wasteful practices; unnecessary hospitalization; prolonged hospitalization in the absence of lower cost, long-term care facilities; continued utilization of small, inefficient or obsolete hospital plants and equipment. . .[3]

The annual cost of operating a hospital bed is a most important factor to consider. In 1961, annual operating costs equaled about 40 percent of the new construction costs for a hospital bed.[4]

A second reason for health facility planning is to achieve a service distribution and balance of facilities. In many communities there are serious recognized imbalances in the availability of health facilities. Among reasons for these imbalances are a random growth of facilities in some areas, increasing need for long-term care facilities, population growth, a shift in geographic distribution of population and a change in population characteristics.[5] The result can be not only a total shortage of facilities in a community, but also a serious under-utilization of some facilities.

A third major problem requiring planning assistance is the obsolescence of health facilities particularly in urban centers with older hospitals. Many older facilities have

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[3]E. D. Rosenfeld, M.D., "Regional Organization of Hospital Services," Hospitals, Journal of the American Hospital Association (May 1, 1966), p. 41.

[4]Joint Committee of the American Hospital Association and Public Health Service, Areawide Planning for Hospitals and Related Health Facilities (Washington, D.C.: U.S. Department of Health, Education and Welfare, Public Health Service, Government Printing Office, 1961), p. 8.

[5]Ibid.

safety hazards, are functionally obsolete, and are excessively expensive to operate. In many instances population has shifted away from the present facilities.[6] Recent estimates by Public Health Service officials indicate that up to $10 billion may be necessary to renovate or replace existing obsolete general hospital beds. This estimated replacement and improvement cost is equal to 90 percent of the total plant assets of all non-federal short-term general and special hospitals and 53 percent of the plant assets of all hospitals in the United States in 1964.[7] These figures present a most grave picture of the seriousness of the problem nationally of obsolescence of hospital facilities. Solutions for the problem of obsolescence are not easy. The very nature of rapid advances in medical science makes many hospital structures become obsolete prematurely because of an inflexible design that does not permit economical expansion of buildings or services.[8] The problem of overcoming built-in obsolescence requires use of architects experienced in hospital design.

Correction of obsolete hospital facilities is a community-wide responsibility recognized by Dr. Rosenfeld:

> The obsolete hospital structure needing fundamental modification or replacement or even abandonment, is rarely an individual hospital problem. Almost all such hospitals must seek local philanthropic gifts and

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[6] Ibid.

[7] Hospitals, op. cit., August 1, 1965, p. 431.

[8] Rosenfeld, op. cit., pp. 42-44.

> federal funds. Priority for these limited federal funds is based on relative state and regional needs, which having been established by state and federal authorities in bed and usage ratios must be followed by establishing a feasible program for the individual hospitals. The establishment of priorities is possible only through regional and local cooperation and planning.[9]

Limitations of financial support for hospitals is a fourth problem that needs planning for guidance to community-wide solutions. Prepayment medical plans such as those of Blue Cross and other insurance agencies have lowered economic barriers to hospitalization and have thus increased effective demand. However, nursing home, mental and ambulatory care is usually excluded from prepayment benefits and there has been a resulting pressure to use insurance covered acute general hospitals in place of less expensive facilities. The Medicare law may help to start overcoming this utilization imbalance if necessary facilities can be provided. Financial aid provided by local, State and Federal governments has produced similar effects of imbalances of services since the aid is not always in relation to the need.[10]

In any given community there is only so much money available to improve or expand health facilities, regardless of need. In the past, individual hospitals would conduct fund raising drives so that they could expand their facilities and services. A growing number of communities are

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[9] Ibid., p. 44.

[10] Joint Committee of the American Hospital Association and Public Health Service, op. cit., p. 9.

beginning to question such an uncoordinated approach. The Joint Committee of the American Hospital Association and Public Health Service noted that, to achieve an adequate community system of medical care facilities, individual hospitals cannot make sound expansion plans without regard for an overall plan and that, once a plan has been agreed to by individual hospitals, the fund raising task is not as formidable as it would be with hospitals working on an individual basis.[11]

A fifth reason for the need for good planning is the magnitude of existing bed shortages. Estimates as of January 1, 1964 for civilian inpatient bed needs in the United States based on Hill-Burton State Plans are as follows:

TABLE 1

ESTIMATED CIVILIAN INPATIENT BED NEEDS 1964

Type of Hospital	Thousands of Beds			
	Existing		Needed	
	Total	Acceptable	Additional	Total
General	742	631	146	777
Long-Term Care	517	324	502	826
Mental	561	468	431	899
Tuberculosis	56	50	4	54
Total	1,876	1,473	1,083	2,556

Source: Health, Education, and Welfare Trends, U.S. Department of Health, Education, and Welfare (1964), pp. S18-S20.

[11] Ibid.

The estimated additional long-term care need includes chronic disease and skilled nursing home beds. Over half of the negligible tuberculosis bed need is represented by one state. The need for fewer tuberculosis beds than currently exist poses something of a problem since some of the existing facilities will have to be converted to other uses or entirely abandoned.

There are other reasons for undertaking health facility planning, but these are of more concern to health facility planning than urban planning. These reasons include a need to not overequip laboratories in individual hospitals where coordination could be developed among several hospitals; a need to improve training and attract additional skilled personnel to the community; and a need to avoid duplication of many special expensive facilities and services.

The Joint Committee of the American Hospital Association and Public Health Service summarized its discussion of the need for area-wide planning with the following list of the value of planning:

- Maintain and improve quality of care as economically as possible.
- Correct deficiencies in existing facilities and services.
- Stimulate the construction of needed facilities, including those for educational purposes.
- Discourage construction not conforming to community needs.
- Assure more effective use of community funds by avoiding unnecessary duplication of highly specialized, infrequently used expensive facilities.
- Improve patient care by developing more effective inter-relationships among facilities.
- Develop an orderly distribution of all facilities in keeping with the projected population characteristics

and the overall community development.
- Encourage individual facilities to define and carry out their objectives and projected roles in relation to other facilities, services and community needs.
- Stimulate facilities to recognize opportunities for better coordination of services.
- Demonstrate the need for philanthropic and public funds through a well-developed information program.[12]

Evaluation of Health Facility Planning in Relation to Urban Planning

Health facility planning in the United States is currently being practiced at four different levels which are: Federal, State, regional and individual facilities. Federal involvement for civilian facilities is as an administrative agency for Hill-Burton funds. The Federal Government allocates funds to the various states and establishes standards for the states to determine the adequacy of existing facilities and the need for new facilities. The Federal Government also provides the states with existing and future population estimates that may not be exceeded when used as the states' basis for estimates of health facilities needed.[13]

States engage in planning as an administrative agency for Hill-Burton funds. Each state annually prepares a plan for hospital and related health facilities construction and improvement. The plan includes a detailed inventory of

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[12] Ibid., p. 10.

[13] U.S., Department of Health, Education and Welfare, Public Health Service, Public Health Service Regulations--Part 53: Pertaining to the Construction and Modernization of Hospital and Medical Facilities (Washington, D.C.: Government Printing Office, December 29, 1964, as amended through August 11, 1965), pp. 2-8.

health facilities in the state. Also included is a listing of facilities that do not conform to Federal and state standards, and a listing of facilities needed by each community in the state. Finally a priority is established for distribution of funds where need is the greatest. For the purpose of the state plan, need is established in terms of total number of general hospital and long-term care beds for each community. No distinction is made as to which facilities need additional beds, whether or not a new hospital should be built, an existing hospital retained or abandoned, or the classification by clinical department of hospital beds needed.[14] To assist and advise Hill-Burton officials, each state has an advisory council that includes representatives of hospitals and other health facilities, the medical profession and the public. The council's major function is to support planning on the local and regional level.

The third level of planning occurs on a regional or area-wide basis. This is the level at which the greatest amount of information may be collected and coordinated plans developed that are in the best interest of the entire community. A Public Health Service publication listed twenty staffed regional hospital planning councils in the United States for 1963 with an additional five councils engaged in regional hospital planning without staff assistance.[15]

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[14] Ibid.

[15] U.S., Department of Health, Education and Welfare, Public Health Service, Procedures for Areawide Health Facility Planning (Washington, D.C.: Government Printing Office, 1963), pp. 113-114.

Recently there has been a substantial increase in the number of hospital planning councils to over 90 such councils currently in existence.[16]

The fourth level of planning occurs with individual facilities. In areas where there are regional hospital planning councils, individual health facility plans can be coordinated for the best interests of the facility and the community. Where there are no regional hospital councils, individual health facility plans may be coordinated by state Hill-Burton officials, but the state is not in a position to provide an adequate service or fully reflect needs of the local community.

Current health facility planning practice is more akin to the urban planning procedure of capital improvement programming than to long-range or comprehensive planning. The Public Health Service (PHS) recommends a target date of 5 to 8 years as a basis for calculating needs and for setting planning goals. Among reasons given for this recommendation are that population projections tend to decrease in accuracy in proportion to the length of the projection period, and that this period provides adequate leadtime for the development of specific construction programs. The PHS also states that a relatively short-range projection period helps reduce errors that would be introduced into longer-range planning

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[16]Hiram Sibley, Executive Director, Hospital Planning Council for Metropolitan Chicago, Inc., Interview, Chicago, Illinois, June 7, 1968.

as a result of such factors as scientific advances, changes in medical practice, and broadening of prepayment coverage. In the PHS view, the ease with which short-range goals can be modified in light of changing circumstances is an additional advantage of a relatively short planning period.[17]

In nearly every instance, health facility planning is aimed toward a specific construction program for new facilities or improvement and modernization of existing facilities. In addition to the Public Health Service reasons for short-range planning, construction programs are geared to meet only needs of the immediate future because of the high cost of maintaining empty beds and only partially used facilities. A long-range planning recommendation is that a site be acquired and facility constructed with expansion possibilities of about 50 to 100 percent.

Hospital administration staff and consultants can assist local communities and health facilities in the complex technical planning that requires some knowledge of medical science. Health facility planning literature, however, contains only brief and general references in relation to overall development of a community. There are references to population characteristics, but the primary concern is in relation to bed needs. There are also occasional references to general criteria that should be used for site selection, but site selection is usually left up to the architect.

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[17] Ibid., p. 11.

The urban planning process should be able to provide services for solutions to common planning problems such as analysis of a community's economy, population characteristics, community growth patterns and hospital site criteria. Unfortunately, urban planning has not been very active in the area of health facility planning. For example, Mr. Keith Rathbon of the Michigan Department of Health stated that city planners have been used little in the past, but he anticipates that they will be used more in the future.[18] As a further example, Mr. Malcolm Drummond of Harland Bartholomew and Associates, a planning consulting firm, stated that the firm does not engage in health facility planning and that the firm does not profess to have the technical knowledge required for such planning.[19]

Urban planning is starting to become involved in health facility planning, however. Some community facility plans contain a brief review of health facilities. In a few instances, planning commissions have published a special study on some aspect of health facilities in the community. Urban planning's major involvement with health facilities is in zoning ordinances. Most zoning ordinances include at least a brief reference to health facilities and some ordinances deal with them in a fair amount of detail.

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[18]Keith Rathbon, Administrative Analyst, Michigan Department of Health, Interview, Lansing, Michigan, August 4, 1966.

[19]Malcolm Drummond, Associate Partner, Harland Bartholomew and Associates, Telephone Interview, St. Louis, Missouri, July 19, 1966.

Comprehensive Plans--A search of the urban planning library at Michigan State University and of the Tri-County Regional Planning Commission library at Lansing, Michigan, indicates the degree of treatment given health facilities in comprehensive and community facility plans. A large number of plans did not have any reference to health facilities. The following are examples of the degree of treatment given health facilities when included in comprehensive or community facility plans.

The Mount Airy, North Carolina, community facilities plan covered the subject of health facilities in two paragraphs. The first paragraph stated that there is a new hospital. The second paragraph stated that immediate expansion is unlikely, based on the occupancy rate, but "if and when additional beds are needed," the existing site would be adequate.[20] A similar plan for Salisbury, North Carolina, noted that there were two hospitals, federal and proprietory, and decided to discuss only the health department.[21]

A public buildings plan for Cape May County, New Jersey, noted that the county had authority to build special, primarily long-term, hospitals but that the probable need

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[20]Department of Conservation and Development, Division of Community Planning, State of North Carolina, Community Facilities Plan, Mount Airy, North Carolina (Raleigh, North Carolina, 1961), p. 34.

[21]Department of Conservation and Development, Division of Community Planning, State of North Carolina, Community Facilities Plan, Salisbury, North Carolina (Raleigh, North Carolina, Undated (early 1960's)).

was for a general hospital or extended-care facility. To allow for "the eventuality that a county hospital may be founded someday," a portion of a large site of the existing county welfare home was planned as a hospital site.[22]

The Lansing, Michigan, Comprehensive Master Plan of 1958 noted the names and sizes of three existing hospitals, and noted that several factors influence bed needs. An unnamed report was referred to that indicated that 500 additional beds would be required by 1980. The Plan stated a hospital should be near the geographic center of population and such a site for a new hospital was suggested.[23]

The most complete health facility study as a part of a community facilities plan was for the Tri-County region around Lansing, Michigan. This study included a reasonably complete inventory of existing acute general hospital facilities and a brief historical sketch of hospital development in the region. Some consideration was given to principles and standards for hospital development including regional distribution, bed needs, site considerations and off-street parking needs. A brief evaluation of existing hospitals was made in relation to the principles established. A similar, though less extensive, study was made of long-term and special hospital facilities and extended-care facilities. A

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[22]County Planning Board, Cape May County, New Jersey, County Government: Structure and Building Space Needs (Cape May County, 1960), p. 34.

[23]City Planning Board, Lansing, Michigan, Comprehensive Master Plan: Lansing and Environs (Lansing, 1958), p. 154.

study of health and welfare agencies was also included in the report. A health facilities plan was not prepared, but it was suggested that a regional hospital planning council should be established.[24]

These examples illustrate that when hospitals and related health facilities are mentioned in a comprehensive plan, they are given brief consideration. The only report that studied health facilities in some detail did not provide an adequate basis to support planning recommendations for a future community-wide system of health facilities.

Special Studies--A few special urban planning studies are noteworthy. The Oakland, California, planning commission prepared an excellent detailed report including recommendations for improvement of a major medical center in the city. The plan was adopted by the city council as a district plan in conformity with the Oakland General Plan. The report included a thorough analysis of factors affecting the medical center and its method of study could serve as a guide for many medical center district studies.[25] In 1963, the Public Health Service prepared a list of metropolitan area hospital surveys that had been made throughout the nation. According to this list there were 30 such surveys. The Oakland,

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[24]Tri-County Regional Planning Commission, Lansing, Michigan, Health and Welfare Facilities: An Inventory, Part III--Community Facilities Study (Lansing, 1964), entire report.

[25]City Planning Commission, Oakland, California, op. cit., entire report.

California, report was the only one on the list prepared by a planning commission.[26]

A second hospital study that is particularly noteworthy was prepared for Prince George's County, Maryland, by the Maryland-National Capital Park and Planning Commission. The report presented hospital problems and needs in the county and established general hospital planning principles. A study was made of population and community characteristics along with an inventory of existing hospital facilities and a study of hospital utilization patterns. Future hospital needs were projected and general locations were suggested for future facilities. It was intended that a follow-up study would recommend precise locations for new hospitals. Projected hospital bed needs were based upon studies by the Health Facilities Planning Council for Metropolitan Washington. Suggestions for new hospital locations were based on location criteria that had been established.[27] Thus, the report represents the type of cooperation that is possible and should be carried out by all health facility planning agencies and urban planning agencies.

A third noteworthy special hospital study was a site location study for a community hospital to serve a relatively

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[26]U.S., Department of Health, Education and Welfare, Public Health Service, Procedures for Areawide Health Facility Planning (Washington, D.C.: Government Printing Office, 1963), pp. 111-112.

[27]The Maryland National Capital Park and Planning Commission, Hospital Study for Prince George's County, Md. (Silver Springs, Maryland, 1965), entire report.

small urban area and adjacent rural area. This study assumed the need for a hospital as determined by hospital planning officials and devoted its entire attention to determining the best location for the hospital. The study established a list of seven criteria that should be used to determine the best hospital site and to be used for evaluating the desirability of alternate sites. The major portion of the report was a study of hospital service area characteristics in terms of population growth trends and distribution, access, patient location, available utilities, nuisances, and land use relationships. Finally a site was recommended as the best location for the hospital.[28] This report also illustrates how the urban planning process can be an important and useful part of a total health facility planning effort. No attempt was made to study elements such as need, size, function or organization of the hospital that should be the concern of health facility planning, but rather generally accepted city planning methods were used to determine the best location for a new hospital in relation to the community's growth and development.

A fourth study that mentioned hospitals was a report on Standards for New Urban Development prepared by the Inter-County Regional Planning Commission at Denver, Colorado. This report presents standards for determining bed needs,

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[28]Myles Boylan, Site Location Study Gratiot Community Hospital: A Description and Appraisal of the Factors that Influence the Selection of a Site for the Proposed Community Hospital (East Lansing, Michigan, 1953), entire report.

hospital size, population served, land requirements, and very general location standards. There is no indication as to how these standards were determined, but the fact that they were presented indicates an awareness on the part of the planning commission that they should become involved in hospital planning.[29]

In addition, special urban planning studies have been prepared that were directly related to creating medical centers in cities such as Chicago, Detroit and Cincinnati. In these cities, a medical center was being created around a core of existing health facilities. The urban planning studies were prepared in cooperation with other medical facility planning studies. They included plans for removing blighted and deteriorated conditions and for creating a new environment. These plans were prepared for specific improvement programs in a manner similar to urban renewal planning for specific improvement programs. The studies illustrate how urban planning and health planning officials can successfully achieve solutions to common planning problems.[30]

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[29]Inter-County Regional Planning Commission, Standards for New Urban Development (Denver, Colorado, 1960), p. 7.

[30]Chicago Plan Commission and the Office of the Housing and Redevelopment Coordinator in Cooperation with the Medical Center Commission and the Chicago Park District, The Medical Center District Planning Analysis and Recommendations (Chicago, 1956); State of Illinois, Medical Center Commission, A Look to the Future Medical Center District--Chicago (Chicago, 1949); The Detroit Medical Center Citizens Committee, The Detroit Medical Center (Detroit, 1958); Jack Cronin, Assistant Director, Greater Cincinnati Hospital Council, Interview, Cincinnati, Ohio, July 20, 1966.

Zoning Ordinances--Urban planning theory states that zoning ordinances should be based upon a comprehensive plan. However, health facilities may be included in zoning ordinances, sometimes in great detail, when there was only brief or no consideration of these facilities in the comprehensive plan. However, a serious problem could occur if health facilities were omitted from zoning ordinances since they are an important land use. Several studies of the zoning ordinance provisions relating to health facilities have been made.

In 1953, the American Society of Planning Officials published a report on Zone Locations for Hospitals and Other Medical Facilities. The report cited early court cases that established the invalidity of an ordinance prohibiting maintenance anywhere in the city of a hospital for treatment of contagious or infectious diseases. Somewhat similar court cases were cited that established that a city could not prohibit tuberculosis hospitals from locating anywhere in the city. It was noted that in 1953, there were few court cases on mental hospitals and that opinion was divided. However, it appeared as if mental hospitals could be included in zoning ordinances. In general, the earlier court cases seemed to be stating a recognition of the fact that hospitals had changed and that "a hospital is not detrimental to public health."[31]

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[31] American Society of Planning Officials, Planning Advisory Service, Zone Locations for Hospitals and Other Medical Facilities, Information Report No. 50 (Chicago, Illinois: American Society of Planning Officials, 1953), pp. 4-8.

The report indicated the trend noted in this thesis toward the development of general hospitals rather than special hospitals. It noted that nearby residential uses may be adversely affected by some elements of hospitals such as public restaurants, laundry operations, hospital power plants and ambulance and delivery drives. The report also observed that hospitals may range from quite small facilities contained in one unit to large medical centers with several thousand beds. The medical center could be on several hundred acres with such diverse land uses that it could take on the characteristics of a university campus. As a result of these and other considerations, there was a conclusion that the matter of zone location and site standards for hospitals is very complex. A suggested solution was the development of performance standards in zoning ordinances that would recognize the necessity to protect adjacent residential areas and that would be in the best interest of the hospital.

Zoning ordinances from the nation's ten largest cities were studied in the ASPO report. In four of these cities (New York, Baltimore, Boston and Philadelphia) hospitals and related health facilities appeared to be permitted in all districts. However, the apparent intent of these ordinances was to permit hospitals only in residential and local commercial districts. The Washington, D.C. ordinance permitted hospitals only in certain residential districts. In Cleveland these facilities were permitted in residential districts and a retail business district. In Detroit and Chicago,

hospitals and related facilities were permitted in multiple dwelling districts and all succeeding districts. St. Louis was the only city that permitted hospitals only as a Use Exception in any district.

A minimum distance was established for the hospital in relation to adjoining residential lots in only four of the cities. A distinction was made between health facilities for the care of contagious, mental, drug or liquor ailments and other types of hospitals in only four cities (Cleveland, Chicago, St. Louis and Los Angeles). In two of the cities where this distinction was made the wording was ambiguous and did not clearly indicate where a general hospital treating the special illnesses would be permitted.

The most complex and most recent (1953) of the ordinances studied was for Los Angeles. This ordinance attempted to regulate the location, hospital size and site standards in relation to the permitted density of the neighborhood where the hospital would be built. Hospitals were permitted in agricultural, residential and local commercial districts. Hospitals were not permitted in major commercial and all subsequent districts, except that hospitals were permitted in all districts as a conditional use with certain conditions established. This was the only ordinance that paid more than brief attention to developing site standards.

Since the 1953 ASPO study of hospital zone locations is rather old, current ordinances from two of the cities (New York and Baltimore) that had the most permissive

regulations have been studied for this thesis to determine if there have been any significant changes.

The New York Zoning Resolution as of 1961, made a distinction between hospitals and nursing homes and for each of these facilities a distinction between philanthropic or non-profit and proprietary facilities. The New York Zoning Resolution established ten major residential districts, eight major commercial districts and three major industrial districts. Hospitals are permitted in every residential and commercial district, and in the light industrial district, except that proprietary hospitals are not permitted in the R-1 or R-2 residential districts. Nursing homes are permitted in the R-1 to R-7 residential districts except that proprietary facilities are not permitted in the R-1 and R-2 residential districts.

Site standards were established that include a Floor Area Ratio (FAR), without additional bonuses, that range from 1.0 to 10.0 in residential districts, 1.0 to 15.0 in commercial districts and 2.4 to 10.0 in the industrial districts. The FAR used depended upon the intended intensity of development permitted in the district. In a similar manner parking requirements varied by district from none through one space per 5, 10 or 20 beds. Parking requirements are the same for hospitals and nursing homes in residential districts, but are lower for nursing homes in commercial districts. Off-street loading requirements are established generally as one space for each 300,000 square feet of floor

area.[32]

A 1962 proposed zoning ordinance for Baltimore, Maryland, established fourteen major residential districts, four major office-residential districts, two shopping center districts, eight major business districts and three industrial districts. A distinction was made between general and special hospitals with special hospitals being for communicable diseases, the insane, etc. Nursing homes were also defined separately. General and special hospitals and nursing homes were permitted as a Special Exception subject to certain conditions in all residential districts. Hospitals, but not nursing homes, were permitted in the office-residential districts in the same manner. Hospitals and nursing homes were permitted as a matter of right in every business district except B-3, a major retail district, and except for nursing homes in B-7, a highway commercial district. Hospitals were permitted in the industrial districts only as an accessory use. A planned development district was written in general terms that would appear to permit development of a medical center. Site standards did not appear to be very fully developed and in residential districts seemed to be left to the reviewing agency for the Special Exception. In the business districts some site standards were established including a floor area ratio. Parking requirements varied by the intensity of development of the various districts in a

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[32]New York, N. Y., Zoning Resolution (1961), entire resolution.

manner similar to New York. In the R-1 to R-8 districts, nursing home parking requirements were less than for hospitals, but were the same in all other districts. Off-street loading requirements were established as approximately one space for each 200,000 square feet of floor area for hospitals.[33]

The comparison of zoning ordinances for these two cities indicates that hospitals and related facilities are currently given considerably greater attention than in the past. However, there still appears to be a need to develop and improve site standards. There also appears to still be some question as to the proper land use relationships for hospitals since they were permitted in nearly every district in both ordinances.

The 1953 American Society of Planning Officials report also included a study of general hospital zone locations in 16 smaller cities. Most of these ordinances permitted hospitals only in residential districts, primarily multiple-family, but one ordinance permitted a general hospital only in a commercial district and one ordinance permitted a general hospital in any district. All but one of these ordinances made at least a small attempt to establish site standards. A similar study of nine zoning ordinances relating to special hospitals such as mental, contagious disease, etc., did not indicate any particular zoning pattern for these

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[33]City Planning Commission, Baltimore, Maryland, Proposed Zoning Ordinance (Baltimore, Maryland, 1962), entire ordinance.

facilities. They were permitted in agricultural, residential, commercial and institutional districts and in any district. Slightly greater attention was given to site standards for special hospitals.[34]

In 1964 the American Society of Planning Officials made a special study of nursing homes that included an examination of selected zoning ordinances. This study noted that a significant trend in zoning for nursing homes is to permit them in single-family residential districts. At least one ordinance related the size of the nursing home permitted to the density of the residential district. Other zoning ordinances would permit nursing homes in single-family districts through special permit or conditional use provisions rather than as a matter of right such as noted previously in the Baltimore ordinance. Some ordinances do not permit nursing homes in low density residential districts, but permit them in medium and high density residential districts both as a matter of right and as special exceptions or conditional uses. Another approach was to permit nursing homes in a special medical center transitional district. Of the ordinances examined the tendency was to not permit nursing homes in a purely commercial or industrial district.

In most ordinances there appears to be a greater attempt to relate the size of nursing homes to the density or intensity of development of districts where they are permitted

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[34]American Society of Planning Officials, Planning Advisory Service, op. cit., pp. 22-24.

than to relate the size of hospitals to the districts where they are permitted. Another interesting comparison is that nursing homes generally have more detailed definitions than hospitals.

Most of the zoning ordinances studied for nursing homes contained site standards with two general characteristics: as the number of beds increases, lot area requirements increase, and as the land use intensity of the zoning district increases, lot size requirements decrease. In general yard requirements are greater than for residential uses in the same district.

The ASPO report concluded its nursing home zoning ordinance provisions study by stating that:

> The typical zoning ordinance deals with the nursing home in very general fashion. As yet there are no generally accepted standards, but a range of them are in use in various combinations. Items of regulation and control include: definitions, size, ownership, minimum sleeping room size, minimum lot area and dimensions, height, site plans, distance from other kinds of zoning districts, exclusion from commercial and industrial areas, access for fire fighting, approval of health officials, screening and landscaping, and off-street parking.[35]

Several studies have been made of parking requirements in zoning ordinances that include a study of hospital parking requirements. The Highway Research Board made two of these studies in 1950 and 1954. In the 1950 study, 155 ordinances were examined and only 20 of these contained specific off-street parking requirements in connection with hospitals. It

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[35]American Society of Planning Officials, Planning Advisory Service, Nursing Homes, Information Report No. 185 (Chicago, Illinois: American Society of Planning Officials, 1964), p. 12.

was found that in these 20 ordinances, eleven different units of measurement were used to prescribe parking requirements. These units of measurement included requiring spaces in relation to hospital beds, patient rooms, square feet of total floor area, square feet of sleeping room area and employees. As a result of this study it was noted that the need for parking facilities consists of at least four elements: (1) the arrival or departure of patients, (2) visitors of patients, during visiting hours, (3) staff and visiting doctors, and (4) employees, including nurses. It was stated that a general hospital requires as many employees as it has patients. (It was noted previously in this thesis that general hospitals currently have an average of 2.4 employees per patient, but this is a figure for total employees and is not related to the peak daytime employee shift.) Based on this study it was suggested that there should be one parking space for each four patient beds (excluding bassinets) in a hospital, plus one space for each staff or visiting doctor (based on the average number), plus one space for each four employees. A need for local variations from this suggestion was anticipated.[36]

The same study found only ten local laws that required off-street parking for sanitariums or convalescent homes. It was believed that these facilities would need fewer parking

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[36]David R. Levin, Requirements for Off-Street Automobile Parking Facilities in Zoning and Other Local Ordinances, Bulletin No. 24 (Washington, D.C.: Highway Research Board, National Research Council, 1950), pp. 37-39.

spaces than hospitals and it was thus suggested that there should be one parking space for each six patient beds, plus one space for each staff or visiting doctor (average), plus one space for each four employees including nurses.[37]

The 1954 report by the Highway Research Board included a study of 311 local ordinances. It was found that 98 of these ordinances had off-street parking requirements relating to hospitals. As in the previous study it was found that there was a wide range of units of measurement for determining the number of parking spaces required. The two most common methods were to relate the number of parking spaces to the number of beds and floor area of the building. The most common requirement was one parking space for each 4 beds (16 ordinances) and the second most common requirement was one parking space for each 1,000 square feet of floor area (11 ordinances). There were also requirements that related lated parking requirements to the number of patients, patient sleeping rooms, doctors, outpatient visits, and employees. In four cases the requirement was for "adequate parking space." In six ordinances there were a combination of units of measurement used somewhat similar to what had been recommended in the 1950 study.[38]

It is interesting to note that the typical hospital

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[37] Ibid., p. 40.

[38] David R. Levin, Parking Requirements in Zoning Ordinances: A Supplement to Bulletin 24, Bulletin 99 (Washington, D.C.: Highway Research Board, National Research Council, 1955), pp. 15-17.

being built today has about 650 square feet of floor area per patient bed. This figure had been increasing and was probably only about 550 to 600 square feet at the time of the 1954 parking study.[39] As a result, the typical ordinance that based parking requirement on floor area instead of number of beds had higher parking standards.

A similar study was made in 1954 for sanitariums, convalescent homes, rest homes and nursing homes. Of the 311 ordinances studied, 65 contained parking requirements relating to these facilities. The units of measurement used were similar to those used for hospitals. In over half of the ordinances, the number of parking spaces required were related to the number of beds with the most common requirement being one parking space for each 2 beds and for each 4 beds (9 ordinances each). Four of the ordinances contained a combination of units of measurement somewhat similar to what had been suggested in the 1950 study.[40]

In order to bring up to date the parking studies that had been made over a decade ago, the American Society of Planning Officials in 1964 made a comparative study of parking requirements in 20 zoning ordinances that had been adopted since 1960. All of these ordinances had parking requirements for hospitals. In all but two of these ordinances, the primary method of requiring parking spaces was in terms of the number of patient beds. Eleven of these ordinances

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[39]George Roth, op. cit.

[40]Levin, op. cit., pp. 18-19.

also added parking requirements in terms of staff doctors and employees. Only two of the ordinances related parking requirements to floor area of the building.[41]

The ASPO report of 1964 also presented parking requirements for convalescent, nursing, and other health homes and institutions. Nineteen of the twenty ordinances contained such requirements. As with hospitals, sixteen of the ordinances required parking in relation to the number of beds and ten of these ordinances added requirements in relation to the number of staff doctors and employees. Three of the ordinances required parking spaces in relation to the floor area of the building.[42] An unpublished study by a planning consultant in 1962, of parking requirements in nine zoning ordinances for hospitals and convalescent homes indicated approximately the same findings as the 1964 ASPO study.[43] These recent findings would seem to indicate that either the 1950 suggestions of the Highway Research Board are being followed in a large number of instances or that there is a wider recognition of health facilities' parking needs.

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[41]American Society of Planning Officials, Planning Advisory Service, Off-Street Parking Requirements, Information Report No. 182 (Chicago, Illinois: American Society of Planning Officials, 1964), p. 5.

[42]Ibid., p. 3.

[43]Harland Bartholomew and Associates, Memorandum on off-street parking requirements in recent zoning ordinances, unpublished (St. Louis, Missouri, 1962).

CHAPTER III

PLANNING PRINCIPLES

As brought out in the preceding chapter, urban planning has been involved in health facility planning to a relatively minor extent. A tendency is evident that urban planning is becoming more involved in health facility planning, but not at a rapid rate. It appears that the major problem retarding involvement of urban planning is failure to understand health facility planning and to develop principles and standards for health facility planning. The intent of this chapter is to make an initial attempt at establishing health facility planning principles that would be applicable to urban planning methods of study.

It is possible to establish several generalized principles that can be of some guidance in planning the future health facility system, but they are not always readily translatable into specific plans. Thus, this chapter also gives consideration to factors such as delineation of regional planning areas, estimating future needs, location criteria, and a brief look at standards.

General Health Facility Planning Principles

The following planning principles represent conclusions based on material presented previously and on a

modification and composite summary of various principles and statements contained in health facility planning literature:[1]

1. Health facility planning should be comprehensive and should:
   a. Include planning for all types of health care facilities and services.
   b. Include planning for the entire geographic area of service.
   c. Provide for each facility to prepare its own plans consistent with the comprehensive

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[1]The following references were consulted:
The Maryland-National Capital Park and Planning Commission, Hospital Study for Prince George's County, Md. (Silver Spring, Maryland, 1965); Michigan Health Facilities Planning Council, Guide and Suggested Procedures for the Development and Operation of Regional and Metropolitan Area Health Facilities Planning Councils (Lansing, Michigan, 1965); Michigan Health Facilities Planning Council, Guide and Suggested Procedures for Use by a Health Facility Longrange Planning Committee, A Working Draft (Lansing, Michigan, 1965); Michigan Health Facilities Planning Council, A Guide to Long-Range Planning for Institutional Long-Range Planning and Development Committees (Lansing, Michigan, 1960); Edgar B. Haire, "Fitting the Hospital into the Regional Plan," Hospitals, Journal of the American Hospital Association (May 1, 1966), pp. 47-52; Joint Committee of the American Hospital Association and Public Health Service, Areawide Planning for Hospitals and Related Health Facilities (Washington, D.C.: U.S., Department of Health, Education and Welfare, Public Health Service, Government Printing Office, 1961); Joint Committee of the American Hospital Association and Public Health Service, Areawide Planning of Facilities for Long-Term Treatment and Care (Washington, D.C.: U.S., Department of Health, Education and Welfare, Public Health Service, Government Printing Office, 1963); U.S., Department of Health, Education and Welfare, Public Health Service, Procedures for Areawide Health Facility Planning: A Guide for Planning Agencies (Washington, D.C.: Government Printing Office, 1963); U.S., Department of Health, Education and Welfare, Public Health Service, Principles for Planning the Future Hospital System: A Report on Proceedings of Four Regional Conferences (Washington, D.C.: Government Printing Office, 1959).

long-range plan.

d. Provide for and encourage a continuing short and long-range planning process.

e. Plan facilities consistent with the direction of population growth and community development.

2. Consolidation and coordination of facilities and services for a high quality of care, savings in capital investment and efficient operation should be encouraged by planning:

a. As few independent facilities as possible consistent with the population base.

b. New hospitals as relocations or branches of existing hospitals.

c. The closing of too-small hospitals.

d. A balance between short and long-term facilities.

e. The best distribution and sharing of facilities and services to achieve an efficient system through:

(1) Elimination of unnecessary duplication.

(2) Developing agreements for exchange of services between facilities.

3. Quality of care should adhere to recognized criteria.

4. Continuity of care from outpatient through

inpatient to home care services should be sought including:

a. Attempts to coordinate acute care and long-term care by locating long-term care facilities in close proximity to general hospitals.

5. Proper utilization of facilities should be sought.

The above items 3, 4 and 5 are primarily of concern to medical studies and are not dealt with in detail in this paper.

6. Economical expenditure of funds should be encouraged by:

a. Proposing facilities, services and beds needed within financial resources of the community.

b. Establishing financially sound priorities for immediate projects.

c. Recommending replacement of hospitals which can be enlarged or modernized only at excessive costs.

d. Suggesting practical alternate uses for buildings whose present use should be terminated.

e. Promoting razing of buildings that are no longer suitable for providing health services or other community needs.

7. Health care should be a community responsibility that requires:
   a. Informed citizens and a community commitment to financially support provision of major facilities.
   b. Costs of new construction included in the community capital improvement program.

Delineation of Planning Area

An early step in any program is to select or determine the planning area. Plans prepared by State Hill-Burton agencies divide the states into major hospital regions and community hospital service areas. However, since more detailed studies can be made on the local level, the state designated service area should be studied to determine if it is appropriate. Any modifications required should be incorporated into the State Plan. The Public Health Service makes similar recommendations for local study and modification of the State determined service area if necessary.[2]

The Public Health Service states that delineation of the planning area for health facility service should be based upon such factors as population distribution, natural geographic boundaries, and transportation and trade patterns,

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[2]U.S., Department of Health, Education and Welfare, Public Health Service, Procedures for Areawide Health Facility Planning: A Guide for Planning Agencies (Washington, D.C.: Government Printing Office, 1963), p. 30.

so that all parts of the service area are reasonably accessible to existing or proposed health facilities. The PHS also states that the planning area should contain a present or projected population sufficient to support a hospital of at least the minimum size adopted by the agency for its region. The defined planning area should include territory for which population estimates and projections are regularly available or for which such data can be readily prepared.[3] The total area, or sub-areas should be defined in such a manner that there will be reasonable possibilities for implementation of the plan. Access to a hospital is considered to be most important in terms of travel time rather than distance. There seems to be general agreement that wherever possible the maximum travel time should not greatly exceed 30 minutes.[4]

The planning area should also be delineated in such a manner that each major existing hospital will serve primarily the area in which it is located. In this regard, data should be obtained on patient origin and this data should be represented on a map. This data together with an analysis of anticipated growth patterns of the community should provide the best indication of service area boundaries to be used for planning purposes. The essence of this discussion on defining planning area boundaries is that at least a loosely

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[3]Ibid., pp. 30-31.

[4]Jack Cronin, Assistant Director, Greater Cincinnati Hospital Council, Interview, Cincinnati, Ohio, July 20, 1966.

formulated gravity model should be used. The most important element is data on existing patient origin with an analysis of projected population concentration locations and travel time as important considerations.

For the purposes of delineating acute care service areas in State Plans, state hospital systems are divided into a hierarchical system with three major types of hospitals: base hospitals, regional hospitals and community hospitals. For example, in Michigan, to be designated as a base hospital area there must be a medical school with a teaching hospital or a total population of at least 300,000 with at least one general hospital of 200 or more beds that has a teaching program. In addition, there must be an existing pattern of referral of patients from community areas and regional centers.

For an area to be designated as a regional center it must have at least one general hospital of more than 100 beds with a teaching program. There must also be an existing pattern of referral of patients from adjacent community areas. A community area must have a general hospital with facilities for obstetrics, surgery, and emergency cases with a laboratory and diagnostic x-ray services.[5]

In Michigan, there are currently three base hospitals in Detroit, Ann Arbor and Grand Rapids. These base hospitals have not been assigned a specific service area, but rather

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[5]Michigan Department of Public Health, Michigan State Plan for Hospital and Medical Facilities Construction, 1965-66 (Lansing, Michigan, 1966), pp. 37-38.

the intention appears to be that each should serve the entire state. There are 14 regions in Michigan. Each region may have one or more regional hospitals. Within its region a base hospital also appears to serve as a regional hospital. Community hospitals are located in the same region as the regional center to which there is a predominant pattern of referrals.[6]

Each region in Michigan is further subdivided so that each community area and regional center has a self-contained service area that does not overlap other service areas. For example, in the Kalamazoo-Battle Creek Region there are two regional centers and seven separate community areas. The primary service area for each regional center does not include any part of the service area of the seven communities.[7]

An objective of designating the hospital system in this manner is to achieve a distribution of hospitals that are easily accessible to all people in the region and to avoid a proliferation of numerous small hospitals that would be unable to provide adequate services. A secondary objective is to achieve a coordinated hospital system with special and expensive services provided in relation to population distribution and density. Designating a hospital system in this manner is a useful planning tool. However, it is nothing more than a tool. For various reasons, especially the fact that most hospitals have an autonomous board of directors or

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[6] Ibid., p. 36.

[7] Ibid., p. 152.

administration, it is highly doubtful if such a system will ever become formally organized.

Federal regulations state that the same service areas shall be used for planning general hospital facilities and facilities for long-term care, except that State agencies may use different areas for planning facilities for long-term care when this is consistent with effective relationships between the location of facilities and the need for services.[8] As an example of the use of this exception, the State of Michigan designates counties or groups of counties as the service area for long-term care facilities.[9]

Estimating Future Needs

A planning program should start with an estimate of future needs before reasonable plans can be prepared to meet those needs. Estimating future hospital and related health facility needs can be a complex process especially when the purpose of the estimate is for a specific construction program. However, estimating future needs does not have to be a complex process when the estimates are intended to be used for long-range comprehensive planning purposes. All that is required is a basic understanding of estimating long-range needs.

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[8]U.S., Department of Health, Education and Welfare, Public Health Service, Supplement to the Public Health Service Regulations--Part 53: Pertaining to the Construction and Modernization of Hospitals and Medical Facilities (Washington, D.C.: Government Printing Office, August 11, 1965).

[9]Michigan Department of Public Health, op. cit., p. 38.

Over the past four decades several methods have been used to estimate future hospital needs. These estimates have included factors such as admission rates, average daily hospital census, bed-death ratios, bed-birth ratios, age group utilization and a bed-population ratio. The first attempt to make quantitative estimates of needs for facilities was undertaken in 1920. By the late 1920's a commonly accepted "ideal" bed need estimate was 5.0 general hospital beds per 1000 persons. Until fairly recently generally accepted estimates of general hospital bed needs have fallen in the range of 4.0 to 5.0 beds per 1000 persons. The validity of estimating needs in terms of beds per 1000 persons has been questioned for the past two to three decades, however, and in the 1960's was dropped from general usage.[10]

All of the methods for estimating needs used in the past have attempted to account at least to some degree, for past utilization experience. As noted in Appendix A there are a vast number of variables that affect health facility utilization rates. However, it is rather simple to state that the number of beds needed will depend on the number of people admitted to them. The problem in estimating future needs is to determine which are the important variables that affect the number of people admitted and the length of time they stay.

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[10]Gerald D. Rosenthal, The Demand for General Hospital Facilities, Hospital Monograph Series No. 14 (Chicago, Illinois: American Hospital Association, 1964), pp. 10-14.

References are available that indicate, in detail, methods for calculating future needs.[11] Rather than reproduce those references here, a summary of major calculation methods is presented in Appendix B. However, a discussion of some highlights and implications of these calculation methods is in order. First, the methods of calculation recommended and required by the Public Health Service take into account the fact that admission rate, average stay and population are the chief determinants of bed needs. However, these methods do not reflect the fact that there is a changing trend in utilization. The calculation methods shown in Appendix B combine current utilization rates with projected population to estimate future needs.

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[11]For the most detailed example of future bed needs calculations, see: U.S., Department of Health, Education and Welfare, Public Health Service, Procedures for Areawide Health Facility Planning: A Guide for Planning Agencies (Washington, D.C.: Government Printing Office, 1963), pp. 22-29; The Federal formula for calculating future bed needs under the Hill-Burton program is contained in: U.S., Department of Health, Education and Welfare, Public Health Service, Public Health Service Regulations--Part 53: Pertaining to the Construction and Modernization of Hospital and Medical Facilities (Washington, D.C.: Government Printing Office, 1964), p. 3; The Federal regulations permit the use of a different formula if prior approval is obtained from the Surgeon General. An example of a modified formula is used by Michigan as explained in: Michigan Department of Health, op. cit., pp. 274-278; An involved, theoretical mathematical model for estimating future general hospital beds was prepared for the American Hospital Association by: Gerald D. Rosenthal, op. cit., entire book; The Public Health Service has also prepared a report on methods for estimating bed needs in Progressive Patient Care units within a general hospital in the following publication: U.S., Department of Health, Education and Welfare, Public Health Service, The Progressive Patient Care Hospital: Estimating Bed Needs (Washington, D.C.: Government Printing Office, 1963), entire report.

At least a portion of the long list of variables that affect length of stay and admissions is accounted for indirectly if only local utilization rates are used in the formulas. It would seem local variables could be more effectively accounted for if hospital utilization rates would be projected. Utilization rates should be projected on the basis of an analysis of past trends tempered with an analysis of anticipated changes in variables such as economic and education level of population, age and sex distribution, supply of physicians, extent of prepayment coverage, percent of population in an urban area, adequacy of bed supply and the concept of Progressive Patient Care as used locally. Further variables that should be considered are existing hospital locations in relation to population distribution and access routes, medical staff organization and staff privileges, and the fact that there is a higher utilization rate in base and regional hospitals since they admit patients from community hospital areas.

Another important element in estimating future bed needs is determining or assuming the future occupancy level at which health facilities will operate. Since health facilities operate at an average annual occupancy level of less than 100 percent, the estimate of bed needs must be increased to account for less than full occupancy. As noted in Appendix A, most short-term facilities are operating at an annual occupancy rate of around 70 to 75 percent and long-term facilities are at about 85 percent. There is general

agreement among medical authorities that short-term facilities should maintain an annual occupancy rate of at least 85 percent and long-term facilities should have an occupancy rate of about 90 percent. Within general hospitals, occupancy rates can be expected to vary by major clinical service. Medical and surgical services should have highest occupancy rates since there is a greater degree of latitude available for scheduling patient admissions.[12] Federal requirements partially take into account the general recommendation of medical authorities that occupancy rates should be higher. Urban planning procedures should include consultations with local health officials before establishing occupancy rates to be used in calculating future bed needs.

It is unlikely that urban planning procedures would require as much detail presented in the second set of formulas in Appendix B, but there may be a need to use more detail than established in the Federal formula for Hill-Burton programs. It might also be desirable for the planning process to include a series of future bed need estimates based upon different assumptions of future population, utilization rates and occupancy levels.

The method presented in Appendix B, for estimating need for extended-care facilities, based on utilization rates and the assumption that a certain percent of patients can be transferred from acute general hospitals, is probably the

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[12]Robert E. Reichert, M.D., member Northern Kentucky Hospital Study Committee, Interview, Covington, Kentucky, July 17, 1966.

best calculation method currently available. However, it is possible that after several years' experience with Medicare a more accurate estimate of need will be based only on utilization rates of extended-care facilities.

The need for mental, tuberculosis and other special facilities cannot be determined with as great a degree of accuracy as can the need for general hospitals. The Public Health Service states that planning agencies may wish to employ projected patient days and desirable occupancy rates in determining need for these facilities. On the other hand, the PHS states that the agency may choose only to promulgate minimum standards regarding facility size, location, comprehensiveness of treatment program, and other factors against which it can evaluate the merits of specific proposals.[13]

Location Criteria

Urban planning should be most effective in planning future site locations for hospitals and related health facilities. Site location criteria must reflect the unique features of health facilities as opposed to other public facilities. However, site location criteria for hospitals and related health facilities is not significantly different from similar criteria for locating public facilities such as schools or even private developments such as shopping centers.

Nearly all social institutions have a distinct

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[13]U.S., Department of Health, Education and Welfare, Public Health Service, Procedures for Areawide Health Facility Planning: A Guide for Planning Agencies (Washington, D.C.: Government Printing Office, 1963), pp. 28-29.

development hierarchy. To continue the comparison started above, schools develop with the large university campus and then move down to high schools that serve large areas of a community, and then to junior high schools that serve smaller areas of a community, and finally to elementary schools that serve only immediately adjacent neighborhoods. In a similar manner, shopping centers develop with a large central business district that may serve a large portion of one or more states, and then move down to regional centers that serve major areas of a community and then to community centers that serve smaller areas, and finally to neighborhood or local shopping centers that serve only immediately adjacent neighborhoods. Hospitals and related facilities start with the large medical center or teaching hospital that may be similar to a university campus, and then move to regional hospitals that serve major segments of a community, and then to community hospitals that usually serve smaller communities. Long-term care facilities provide basically an extension of hospital care. They may be relatively large and serve major segments of a community or they may be fairly small and serve just adjacent neighborhoods.

Site criteria for hospital planning has been developed and has had fairly widespread acceptance.[14] This criteria

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[14]U.S., Department of Health, Education and Welfare, Public Health Service, Design and Construction of General Hospitals (New York: F. W. Dodge Corporation in collaboration with Modern Hospital Publishing Company, Chicago, Illinois, 1953), pp. 43-46.

is the basic source for the following discussion, but it has been modified to more adequately reflect the hierarchy of health facility development and general health facility planning principles established previously, and to cover areas of omission.

1. Accessibility--Hospitals should be located on or near major streets for ease of access by emergency and obstetrical patients and for the significant traffic volumes generated by a large number of delivery trucks, doctors, visitors, and personnel who travel to and from the facility daily. Location on public transit routes, especially for facilities with large outpatient clinics, is also desirable. Furthermore, hospitals generally should not be over 30 minutes travel time from any part of their primary service area. In order to achieve an optimum distribution with the fewest number of facilities, a hospital should be located so as to have the best access from a large tributary area.

In some cities, such as Chicago, hospitals are not located within reasonable convenience or accessibility for many low income persons. The only reasonable method of travel to reach an available hospital or clinic for much of the low income population group is public transit. An excessive travel time and distance, with one or more bus transfers, may be encountered. A result is that many of these people are not able to travel to low cost clinics or to available hospitals as often as desirable and they do not

receive adequate health care services.[15] Thus, health facilities' location and tributary area for reasonable accessibility and travel time for low income population groups may be determined by availability and schedules of public transit.

Long-term care facilities typically are not as large as general hospitals, do not provide emergency care, and generate significantly lower traffic volumes. As a result, good access to extended-care facilities is not of critical importance other than for emergency vehicles. The important element is to relate traffic generating capacity of the facility to the major street plan.

2. Public Utilities--Health facilities should be located near water, sewer, electric, telephone and gas lines that are presently adequate or are planned for future expansion of capacity sufficient to accommodate probable future health facility expansion. The utilities should be adequate to meet all anticipated health facility needs, including fire fighting on the upper floors of the institution without recourse to booster pumps, if possible.

3. Nuisances--Health facility locations should be free from undue noise and vibrations, such as that emanating from railroads, freight yards, fire stations, heavy industrial districts, major commercial centers, main traffic arteries, schools and children's playgrounds. Care should also be

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[15]Hiram Sibley, Executive Director, Hospital Planning Council for Metropolitan Chicago, Inc., Interview, Chicago, Illinois, June 7, 1968.

taken to avoid locating a health facility in the approach zone of an airport. The site should avoid potential explosion or fire hazards and should not be exposed to smoke, foul odors or dust, or be so located that prevailing winds from industrial development will bring smoke or objectionable odors to the facility. The facility should be remote from ground conditions that would encourage breeding of flies, mosquitoes or other insects. Proximity to a cemetery is psychologically undesirable. Probable expansion or intrusion of future developments of an objectionable nature should also be considered.

4. Topography and Natural Ground Features--Sufficiently high ground to provide for natural drainage is desirable, but the elevation should not be so great as to be a handicap to ambulatory patients. A fairly level site is desirable since it permits great freedom in design and general orientation of the building, but it may be desirable to have a sufficient change in elevation to permit a separation of service and patient entrances. While most patients in acute general hospitals are confined to bed, the presence of trees, rivers, lakes or other desirable natural features should have at least some helpful psychological effect and would help provide an attractive setting and environment for the facility. A more important psychological effect is to have each patient's room receive sunlight at least part of the day. Location opposite a public park or other public facility, provided it is not noisy, is advantageous. Subsoil

conditions should also be investigated to determine suitability for foundations.

5. Land Cost--Although ideally the most desirable health facility site would be chosen regardless of price, land prices need to be carefully considered in specific selection of a site. Costs of items such as site improvements and relocation of site occupants to be displaced should be considered in final site selection. The federally-assisted urban renewal program should also be considered as a method of acquiring land at a relatively low cost with the least disruptive effect on the community. The renewal program includes favorable financial provisions for hospital site expansion. Also, the federal government requires that site occupants be offered an opportunity to relocate in decent housing at a cost they can afford. To help meet this requirement the federal government pays the full cost of generous financial relocation assistance.

6. Population Distribution--Most health facilities do not have a well-defined service area, such as a service area for schools. However, the facilities should be located for reasonable convenience, access and travel time for the majority of the people they serve. Hospitals should also be located for the convenience of staff doctors, many of whom are moving their offices to the suburbs for the convenience of their patients. Care should be taken to avoid constructing a hospital in an area until doctors have started establishing offices in that area or the doctors may fail to admit

patients to the new hospital.

Consideration should be given to differences in daytime and nighttime population concentrations. Areas such as central business districts and industrial districts usually have a high daytime population, but have relatively few people at night. Health facilities, particularly for emergency patients, should be located within a reasonable distance and travel time of daytime population concentrations. A full range of health facilities should be available within a reasonable distance and travel time for the nighttime or resident population. Methods of transportation for low income families may be limited; thus, health facilities may need to be located in close proximity to concentrations of such a population group.

The direction of community growth and shifting population concentrations also needs to be considered. For example, a hospital should not be built in an area opposite to the direction of community growth. As another example, a hospital should not be abandoned in an area of declining population just as the area is being renewed and population is beginning to return.

Extended-care facilities have a closer resemblance to elementary schools or neighborhood shopping centers than hospitals, and in a similar manner should be located in closer relation to the people and neighborhoods that they serve. The location criteria for those facilities should not be unlike that of local shopping districts in that they

should be especially convenient to a local tributary area and should not be located on an interior minor street in a low density residential area. Some greater latitude of location in higher density residential areas could be expected if the site meets the other criteria established herein.

7. Land Use Relationships--Little information is available about characteristics of health facilities with respect to their site and adjacent land uses. The most complete studies that have been prepared are for medical centers where there was an existing concentration of hospitals within a small geographic area. Through personal observations, interviews and published information available,[16] the following comments can be made regarding past health facility development as a guide for location criteria.

Many older hospitals built before World War II were in primarily residential areas. At the time of construction, they may or may not have been in a built-up part of the city, but urban growth has long since pushed way beyond the

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[16]References consulted for the following discussion include: Chicago Plan Commission and the Office of the Housing and Redevelopment Coordinator in Cooperation with the Medical Center Commission and the Chicago Park District, The Medical Center District Planning Analysis and Recommendations (Chicago, 1956); State of Illinois, Medical Center Commission, A Look to the Future Medical Center District--Chicago (Chicago, 1949); City Planning Commission, Oakland, California, Medical Center Hill (Oakland, 1959); Tri-County Regional Planning Commission, Lansing, Michigan, Health and Welfare Facilities an Inventory--June, 1964 Part III--Community Facilities Study (Lansing, 1964); The Detroit Medical Center Citizens Committee, The Detroit Medical Center (Detroit, 1958); Isadore Rosenfield, Hospitals-Integrated Design (New York: Progressive Architecture Library, Reinhold Publishing Company, 1947).

hospital location. Some older hospitals are located on or near major transportation routes, but there are others that do not have especially good access. Many older hospitals are on woefully inadequate sites. There are not enough parking spaces, there is insufficient room to expand the hospital and former open green areas are now parking lots. In some instances, hospitals may be crowded against other buildings; buildings around hospitals may be old, and obsolete, and serious deterioration and blight may have settled into the hospital neighborhood.

In cities such as Detroit, Chicago and Cincinnati, several of the older hospitals were developed in close proximity to each other, probably more by accident than by planning. However, the cities are taking advantage of an excellent opportunity to create a major medical center by removing all of the blighted structures through urban renewal and creating an entirely new environment. New hospital facilities may be constructed. In general, there will be supporting uses such as extended-care facilities, doctors' offices, laboratories, and residential units for nurses, interns, residents and employees of the area. Adequate parking facilities are being planned. New open spaces will be created for pedestrian use and for improving aesthetic qualities of the area.[17]

Not all cities have the opportunity to improve a

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[17]Chicago Plan Commission, et al., op. cit. (1956); The Detroit Medical Center Citizens Committee, op. cit. (1958); Jack Cronin, op. cit.

hospital's environment to such a major extent as creating a new medical center district. In some cases, hospitals need to be abandoned entirely because of old and/or obsolete buildings. In other cases, hospitals might be converted to an extended-care facility. Other hospitals need to be retained and expanded, but are on an inadequate site. Site expansion may be difficult, especially if adjacent neighborhoods have been able to avoid deterioration and declining property values.

Certainly not all hospitals have the poor site and environmental characteristics described above. Many hospitals, especially newer ones built since World War II, are on sites that are adequate to allow for expansion and parking needs and provide an aesthetically pleasing setting. Most hospitals have not been built in the heart of major commercial or industrial areas. They are usually located in residential areas, adjacent to outlying commercial areas and/or on major streets that may have become developed with strip commercial uses. There has been a relatively recent tendency for associated health facilities to develop adjacent to hospitals. Some doctors, usually specialists, are retaining offices in central business districts, but other doctors are moving their offices to the suburbs, and adjacent to hospitals. The most recent trend has been for hospitals to build extended-care facilities either on the hospital grounds or near the hospital. Institutions for long-term care of patients with mental illness, mental retardation

or tuberculosis have, for the most part, developed as independent, geographically isolated facilities.

Physical therapy facilities are needed in acute general hospitals, but most patients in such hospitals do not need large hospital grounds as an area for exercise and, thus, most acute general hospitals have not acquired land for this purpose. However, many patients at psychiatric hospitals are ambulatory and need exercise. Large open areas around the buildings of psychiatric hospitals can be of some therapeutic value, whereas there is little or no therapeutic value of large open areas around acute general hospitals.[18] Furthermore, psychiatric hospitals, having an average size of over 1400 beds in 1964, are considerably larger than acute general hospitals.[19] As a result of all of these factors, even the older psychiatric hospitals were developed on considerably larger sites than acute general hospitals. A recent trend in psychiatric hospitals is toward development of low rise buildings on larger sites than have been used in the past.

Nursing homes and related facilities have been located in a wider range of community settings than any other type of health facility. These facilities have been located in various parts of the community ranging from low density single family neighborhoods to high density multi-family

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[18]Robert E. Reichert, M. D., op. cit.

[19]Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1965), p. 449.

areas and commercial districts. Many of the facilities, especially smaller ones, are in converted residences.[20] The more recent larger facilities may be compatible with low density residential areas if extreme care is taken with site development, but usually they are more compatible with higher density residential areas. Since nursing homes are in essence long-term residences for the patients, some conflicts may develop when the facilities are located in commercial areas similar to a mixing of apartments and business uses. Nursing homes have also been located away from the community and out in the country. In general, nursing home residents prefer to be in a home that is close to their family and friends.[21]

Based on the above comments and observations, the following is general location criteria with respect to land use relationships. Large medical centers represent a dominant or an intensive degree of land use somewhat similar to a large shopping center or college campus. Complementary land uses would include offices, medically oriented businesses, small convenience stores, medium to high density residential uses, other health facilities, institutional uses, and parks and open spaces. Depending on numerous design considerations, intensity of land use for medical

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[20] American Society of Planning Officials, Planning Advisory Service, Nursing Homes, Information Report No. 185 (Chicago: American Society of Planning Officials, 1964), pp. 7-9.

[21] Ibid.

centers could range from almost total land coverage with high rise buildings to a campus type setting with large open green areas and low buildings. Generally, new medical centers are created around or adjacent to existing hospitals.

General hospitals are somewhat similar in character to high schools or medium size shopping centers. Hospital buildings are large, they generate significant traffic volumes and they require large parking areas. As with high schools, institutions of this sort are not compatible with low density residential areas, and because of nuisances associated with business and industrial areas, they usually are not located in such areas. Thus, business fringe areas, medium density development areas, and other sites on major streets specially suited for institutional uses would be appropriate hospital locations. Land uses that are specially compatible with hospitals and often locate adjacent to hospitals include doctors' offices, long-term care facilities and staff residences.

Long-term care facilities are basically residential units that are somewhat similar to large apartment buildings. Locations that generally are appropriate for apartments also should be appropriate for long-term care facilities. Long-term hospitals, especially psychiatric hospitals, tend to locate on quite large sites so that an environment is created that is relatively independent of adjacent development.

Development of Standards

The area where urban planning appears to have been

weakest in the field of health facility planning is establishment of generally recognized standards. An impetus for urban planning to enter this field would be establishment of such standards. An initial attempt to establish a basis for determining standards that would be desirable for individual communities is the following:

Facility Size--Because of varying conditions it is difficult to establish a hard and fast rule for the minimum size of acute general hospitals, but most medical authorities recommend that in urban areas the minimum size should be 200 beds. Occasionally this is modified to a minimum size of 400 beds in larger urban areas and 150 beds in small urban areas.[22] Less information is available on the desirable minimum size of community hospitals in rural areas. However, there appears to be general agreement that hospitals in rural areas should be distributed so that no hospital would be smaller than 50 beds.[23] This, of course, means that some small rural communities would receive hospital service from another community. In recognition of the fact that hospitals should exceed a certain minimum size, the Michigan Department of Health will program Hill-Burton funds for only one hospital in any area that has a population of less than 150,000 persons.[24] In order to obtain a maximum efficiency level,

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[22]U.S., Department of Health, Education and Welfare, Public Health Service, op. cit., pp. 30-31.

[23]The Maryland-National Capital Park and Planning Commission, op. cit., p. 6.

[24]Keith Rathbon, Administrative Analyst, Michigan Department of Health, Interview, Lansing, Michigan, August 4, 1966.

the maximum size for acute general hospitals has been cited as 600 beds to 800 beds,[25] but the chief determinant is to not exceed a size consistent with effective management.

Smaller sizes are recommended for extended-care facilities than for hospitals. Nicholson states that the facilities for long-term care can be operated efficiently in units as small as 20 to 25 beds or in larger units of that are roughly multiples of 25 beds. Thus, she recommends that no long-term care facility should be smaller than 20 beds and that units between 30 and 50 beds particularly should be avoided. She also recommended that long-term care facilities should not exceed 400 to 500 beds because of decreased efficiency and flexibility in the use of personnel.[26]

In view of the wide size range possibilities noted above, the Public Health Service recommendation for expansion planning of 50 to 100 percent may not be very realistic. For example, a hospital that is originally constructed for 200 beds may eventually need to expand to 800 beds or an expansion of four times the original size. As another example, one community may need two 750 bed hospitals, but in another community of similar size the minimum number needed may be three 500 bed hospitals in order to satisfy distribution needs. Thus, it would seem that a fixed expansion percentage

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[25]The Maryland-National Capital Park and Planning Commission, op. cit., p. 6.

[26]Edna E. Nicholson, Planning New Institutional Facilities for Long-Term Care (New York: G. P. Putnam's Sons, 1956), pp. 87-88.

should not be established as a planning guide. Instead, individual communities should determine the maximum size hospital that will satisfy the various needs and characteristics of that community. All planning should then be in relation to the maximum size ultimately anticipated. A site adequate for the ultimate size should be acquired and initial facilities should be designed with sufficient flexibility for expansion.

Site Size--One standard that urban planning has made some attempts to establish is a minimum site size. Urban planning is familiar with site size standards for schools. Apparently they attempt to carry this familiarity over to hospitals. For once the comparison between schools and hospitals is not valid because of a wide range of varying hospital conditions. A hospital may consist of low rise-spread out buildings, high rise buildings or some combination. The basic clinical services for any general hospital are medical, surgical and maternity service with at least minimum ancillary facilities. All other services and ancillary facilities are growth services. Some hospitals may be established with only the basic services and others may be established with a wide range of services. The building size, parking needs and land requirements will vary with the type of services provided.[27]

A generalized ideal hospital layout has been prepared,

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[27]George Roth, Potter-Tyler-Martin and Roth, Architects, Interview, Cincinnati, Ohio, July 20, 1966.

as shown in Figure 1, to give an indication of the various hospital requirements that have an affect on site design and minimum site size requirements. As shown in Figure 1, minimum site development requirements include approach drives and parking facilities for emergency patients, admitting, doctors, supplies, personnel, visitors and outpatient clinics. As can be seen, adequate development can require large land areas. Furthermore, Wheeler recommends that no more than one-third of the total site should be used for parking.[28] The result is that an all-encompassing site size standard cannot be presented. However, if sufficient research were conducted, it should be possible to establish minimum site size standards in relation to varying conditions that hospitals present. At least the elements presented here provide a basis for conducting such research and for establishing the site need for individual general hospitals.

With the exception of emergency patients and outpatient clinics, most of the site and parking needs for long-term care facilities are similar to hospitals. One major difference is that long-term care facilities have fewer employees, and they have fewer doctors and visitors at the peak period. However, some long-term patients are ambulatory and it is desirable to have pleasant, well landscaped grounds for the use of these patients.

Parking--Figure 1 also illustrates the type of parking

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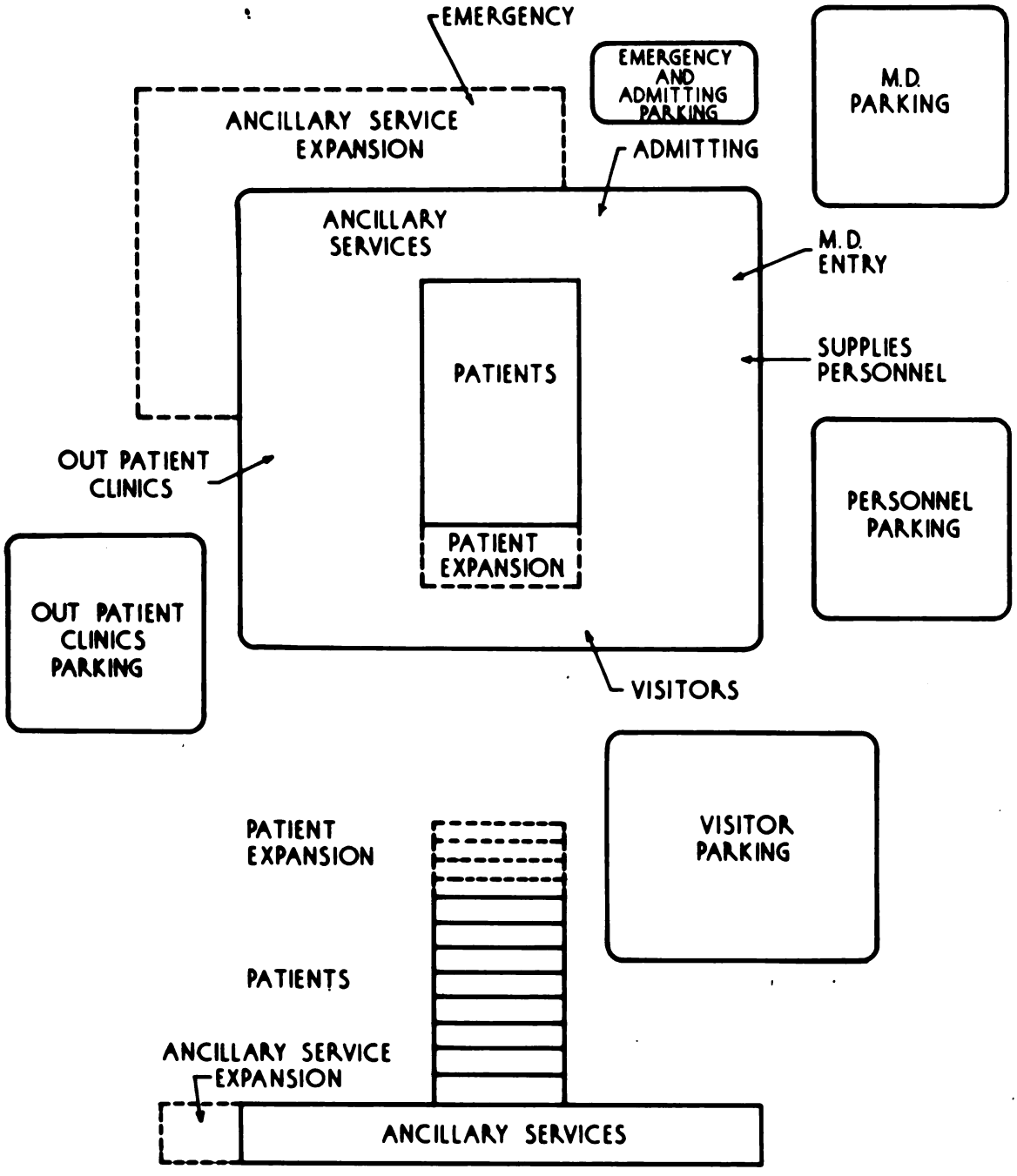
[28]E. Todd Wheeler, Hospital Design and Function (New York: McGraw-Hill Book Company, 1964), p. 247.

FIGURE 1

GENERALIZED IDEAL HOSPITAL LAYOUT



SOURCE: GEORGE ROTH, POTTER-TYLER-MARTIN AND ROTH, ARCHITECTS, INTERVIEW, CINCINNATI, OHIO, JULY 20, 1966.

needs for hospitals. Parking demand could be determined for an individual hospital based on elements presented in Figure 1 and the degree to which automobiles are used by people working in or visiting the hospital. As a few general statements, the peak parking period for doctors at most hospitals occurs in the morning and the peak visitor parking period occurs in the afternoon and evening. It might be possible to have a combined use of some parking facilities. As noted in Appendix A, there are currently an average of 2.42 employees per patient and this figure is increasing. However, not all of these employees work at the same time. A study by Wheeler indicates that about 65 to 75 percent of all employees will work on the peak daytime shift with larger hospitals having the lower percentage on the peak shift.[29]

Service Area Population--It is common in urban planning to relate school sizes and service areas to the number of people served. It is also possible to make a rough attempt to relate hospitals to the number of people in the tributary area. If it is assumed that the current level of non-federal general and special hospital beds of nearly 4.0 per 1000 persons is providing adequate service, then hospitals in urban areas ranging from 200 to 800 beds serve a population range of 50,000 to 200,000 persons. By continuing with the same assumption of bed needs and assuming that rural

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[29] Ibid., p. 14

hospitals will be no smaller than 50 beds, then each rural hospital should have a minimum service area of 12,500 persons. It should be noted that these figures are an attempt to establish general standards or guidelines. In all cases more detailed estimates of bed needs should be made during the planning process.

Maximum Grades--One fairly definite standard for health facilities can be established. The maximum grade for entrance drives should not exceed 8 percent. Where there are grades in excess of 8 percent, there is a most undesirable occurrence--patients in ambulances start to slide. In addition, the maximum grade on parking lots should not exceed 5 percent.[30]

Construction Costs

Since a major portion, if not all, of the construction costs of hospitals often involves public expenditure, it would seem logical that hospital construction programs should be included in a planning commission's capital improvement program. Because of the wide range of facilities and services that may be included in a hospital, regional variations in construction costs and the current rapid rate of inflation of construction costs, it would be foolhardy to attempt to indicate with any degree of certainty the cost of building or modernizing a hospital. However, a brief guide and implication of construction costs can be presented.

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[30]Roth, op. cit.

The typical general hospital being built today has about 650 square feet of total floor area per bed. A hospital with 750 square feet of floor area per bed is considered to be deluxe. However, these figures are increasing. In the Greater Cincinnati area as of July, 1966, the cost of general construction and in-built equipment was running around $33 to $35 per square foot of floor area for the typical hospital. The total program including site development, general construction, all equipment, professional fees and contingencies was running about $38 to $40 per square foot of floor area. In addition to these figures, the site must be acquired.[31]

Not only are the costs of operating extended-care and related facilities considerably less than hospitals, but construction costs are considerably less. Two reasons for this are that the floor area per bed and the construction cost per square foot of floor area are less for extended-care facilities than for hospitals. This difference in construction costs has an important implication on public fiscal policies as illustrated by a hypothetical example prepared by the Public Health Service.

For this example a community of 256,000 persons was assumed. Bed needs for long-term and acute care needs were calculated by the methods presented in Appendix B. It was then assumed that 10 percent of the calculated acute care

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[31] Ibid.

bed needs were attributable to long-term care patients who could be transferred to extended-care facilities. The revised bed need calculation indicated that 60 fewer acute care beds were needed and that there should be an additional 54 long-term care beds. This represents an apparent negligible savings of 6 beds. However, the hypothetical example indicated the following cost differences:[32]

Savings on general beds	$1,218,000
Cost of additional long-term beds	- 594,000
Net saving to the community	$ 624,000

Thus, from the standpoint of construction costs, coordinated planning for long-term and short-term facilities is necessary.

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[32]U.S., Department of Health, Education and Welfare, Public Health Service, Procedures for Areawide Health Facility Planning: A Guide for Planning Agencies (Washington, D.C.: Government Printing Office, 1963), p. 28.

CHAPTER IV

LONG-RANGE HEALTH FACILITY PLANNING PROCEDURES

Planning procedures presented in this chapter are intended to illustrate an approach to using the various health facility planning factors studied previously in this thesis. Urban planning studies should complement rather than duplicate shorter range and more detailed studies prepared by health facility planning officials. Thus, the following procedures are intended to apply to long-range urban planning methods of study.

A rational approach to long-range health facility planning should be similar to any other type of urban planning study. A typical method of preparing urban planning studies is to proceed in a logical order through the following six steps:

1. Determine scope and purpose.
2. Prepare statement of principles and objectives.
3. Analyze existing conditions.
4. Estimate future needs.
5. Prepare plans.
6. Prepare plan implementation program.

The following is a discussion of this six-step procedure as it relates to long-range health facility planning.

Scope and Purpose

The first logical step in any planning program is to determine the scope and purpose of the studies. A determination should be made of the intended relationship of long-range health facility planning to the community's comprehensive plan. Conferences should be held with the local hospital planning council or with other local health facility planning officials, if there is not a planning council. The relationship of the Hill-Burton state plan to the local community should also be determined.

Results of initial determinations on scope and purpose should include delineation of the planning area and the planning period or target date for planning purposes. At the outset there should be a clear indication of the type of health facilities to be included in the study. The study should include at least short-term general and special hospitals, and extended-care facilities. Studies might also include long-term hospitals, nursing homes, and public health and welfare agencies.

The degree of detail that will assist local health facility planning officials and that will complement their programs should be established. For example, in many communities the need for health facilities, including bed need estimates, could be furnished by local health facility planning officials so that such estimates could be an assumed urban planning factor. As a second example, the study may be aimed primarily toward long-range planning, but there may be

some short-range problems that the urban planning studies could materially assist in solving. In each community the scope and purpose probably will vary, and thus, should be established for each planning program before proceeding with further studies.

Principles and Objectives

The primary purpose of planning principles and objectives should be to establish a basis for studies of existing conditions and for planning recommendations. Various planning principles presented in Chapter III may serve as a guide for the planning principles to be established for each study. In addition, principles and objectives contained in the Hill-Burton state hospital and medical facility plan should be reviewed and appropriate elements should be incorporated in the local planning program.

The planning principles and objectives should be sufficiently general to provide a broad basis for the planning program. However, there should also be sufficient detail to provide a sound basis for evaluating existing conditions with respect to the principles, and to provide a guide to detailed planning recommendations. The more detailed guidelines may be similar to location criteria and standards established in Chapter III. The planning principles established in this thesis should be generally applicable to urban planning health facility studies, but planning principles should be established for each study with respect to local conditions.

Existing Conditions

Basic supporting data for planning recommendations is derived from studies of existing conditions. The study of existing conditions should emphasize differences from the established standards, principles and objectives. Based on previous studies made for this thesis, a list of data that should be obtained for urban planning health facility studies is suggested in Appendix C. The following is a brief discussion of analysis that may be made and of the usefulness of the data for preparing long-range health facility plans.

Existing Facilities. Data on number and location of beds provides a complete inventory of existing beds. By combining the existing inventory with planned or programmed changes in the inventory, a comparison with bed need estimates may be made to judge the overall adequacy of present and planned capacity. Historical data on year of construction and year of major additions with number of beds added will provide trend data on bed capacity. Combining bed capacity trends with past population will give a general indication of past bed capacity in relation to total population. All health facilities should be mapped and analyzed with respect to all of the factors affecting the location of health facilities.

Data on age and general condition should be mapped and analyzed to determine the long-range adequacy of each facility. When general condition data is combined with bed need estimates and the present bed inventory, the actual

number of beds required by the end of the planning period can be calculated. Floor area and building height information may be used to study the relationship of the building to its site. Floor area statistics may also be used to develop ratios as a guide to judging adequacy of various site characteristics. These might include a ratio of floor area to land area and the percent of building coverage. The parking space inventory provides data to compare with existing parking usage and demands. The comparison may be used to judge present and future parking adequacy. An analysis of data and ratios developed on existing facilities might be used to develop general rules-of-thumb to guide long-range planning decisions.

Utilization. Data on number of admissions and patient days should be used to calculate the average length of stay in days, the average occupancy percentage and the average percent of utilization of existing beds. Depending on the degree of detail required, calculations may be made by major clinical service or on a total bed basis. Similar calculations for past utilization trends provide a sound basis for preparing estimates of future level of utilization. Data on percent of patients transferable from acute general hospitals to extended-care facilities is important for estimating future bed needs by type of facility.

Patient origin data is important for several purposes. A first logical use is to determine the approximate service area of each facility. A map and analysis of patient origin

data should clearly show where there are overlapping areas of service and where patients by-pass one facility to go to another. If there is a significant amount of overlapping of excessively large service areas, patient origin data should point the way to further investigations to determine reasons for such findings. The data will show travel distances and may be used to estimate travel time to health facilities. Combining patient origin data with an analysis of health facility distribution pattern may indicate current areas that have a deficiency of facilities and should assist in guiding long-range planning decision on location of new facilities. To be most useful, patient origin data should be obtained by relatively small analysis areas such as census tracts within the planning area. The analysis areas used should be related to population estimating areas for which data is available.

In addition, patient origin data by larger analysis areas such as counties outside the planning area will identify facilities that are performing significant services for patients from outside the planning area. Such information in conjunction with other utilization data may affect future bed need estimates.

An analysis of current parking space usage and demand in conjunction with the parking space inventory will indicate current deficiencies. This data may also be used to derive estimates of parking spaces and area required for new health facilities.

Population. The degree of detail required for population data depends primarily upon the degree of detail used in studies of facility utilization and bed need estimates. The number, age and sex breakdown suggested in Appendix C relates to studies based on major clinical services and types of facilities. If studies are to be made only in terms of total beds, then data on total population may be adequate. However, demographic and economic factors usually vary in different parts of a community. To account for these differences, it would seem that the wisest course of action is to study broad age and sex categories by relatively small analysis area. A visual presentation of this study in the form of maps and charts should be used in connection with the distribution of health facilities.

As noted in previous chapters, income levels affect utilization of health facilities. Because of this fact, income levels may affect the location of health facilities and/or travel distance to facilities. For example, in an area with a high concentration of welfare recipients, patients may have to travel an excessive distance, by-passing private facilities, to reach a public facility that may not charge or that may accept welfare payments. As a result, utilization and patient origin data should be analyzed with respect to income levels to determine problems created by differences in income and to guide planning recommendations.

Community Data. In order to properly relate health facilities to the community they are to serve, it is vital

that certain information on the community be used as a part of the study of existing conditions. A basic item for study is the community's comprehensive plan, if there is such a plan, or if not, a study of important elements normally included in a comprehensive plan. Land use maps and statistics should be studied to relate the distribution of health facilities to areas of existing and future development. A study of transportation facilities will indicate current deficiencies from the standpoint of location criteria on accessibility and will play a significant role in decisions for location of new facilities. It can be generally expected that future urban areas will be served with utilities, but the timing of development of utility extensions may affect long-range health facility plans.

Topography and ground features should be studied for consideration of specific sites for new health facilities. There should also be a more detailed study of land uses to assure that a site is not adjacent to nuisances and to locate potential sites for new facilities. Neighborhood conditions in the general vicinity of a health facility may affect decisions such as whether or not to expand and the size of a new site to be acquired. Urban renewal plans should be studied to determine their potential effect on changing numbers and characteristics of the population. Through urban renewal it may be possible to acquire expansion room or new sites at a reduced cost, and at the same time assist the local community's financing plan for urban renewal.

Local laws, especially zoning ordinances, may restrict the location where health facilities can be built and may assist in establishing desirable environments for location of health facilities. There usually will be zoning requirements that should be considered such as minimum site size, minimum parking area, set-backs from streets, maximum building height and a maximum floor area ratio. Results of the studies of existing conditions may also indicate improvements that should be made to local zoning ordinance provisions concerning health facilities.

Financial Data. Financial data can be used for two purposes. First, a study of trends and current use of prepayment plans may affect estimates of future bed needs. Second, financial resources are necessary to implement a plan. There are several sources of funds for health facility construction including gifts, governmental grants, loans, bond issues and tax revenues. Each of the potential sources of funds should be studied to determine the potential funds available.

Other Information. The location of doctors' offices should be analyzed to determine the relationship with existing health facilities, patient origin and potential effect on location of new facilities. A detailed study and plan for nursing homes may not be necessary, but an analysis of nursing home location and site characteristics may assist to improve zoning ordinance provisions on nursing homes. A historical study of health facility development in the

community could provide background for understanding the present situation.

Since the urban planning study could be conducted in cooperation with health facility planning officials, there should be a thorough understanding of local and state health facility planning organizations. Implementing many planning proposals may depend on provisions of state and Federal legislation. In order to understand what may be legally possible under present legislation or where laws should be changed, it is first necessary to study present legislation. For example, financing plans may depend on Federal and state grants. As another example, local plans may call for a hospital district composed of several units of government, to build health facilities; the hospital district can be used only if there is proper state enabling legislation.

Source of Data. Various governmental and non-governmental agencies and organizations collect, analyze and publish data on health facilities. Among these groups are State Hill-Burton agencies, state licensing agencies, state and local health departments, the Guide Issue of "Hospitals" magazine published annually in August, medical societies and directories, hospital and nursing home associations, and the Joint Commission on Accreditation of Hospitals. Generally, it would be wise to check these sources for data that would be applicable to the local study. However, these organizations compile data for their own purposes or in a general manner so that the data may not be applicable or sufficiently

complete for a local study.

The best source of information on local health facilities should be the local hospital planning council. Normally, the planning council could be expected to have information on at least the location of health facilities, bed inventory, planned and programmed changes in bed inventory, facility ownership and basic utilization data. The hospital planning council may have other information including patient origin data, and state and Federal legislation. If there is no hospital planning council, data the council would normally have probably will need to be obtained through surveys of each hospital and other health facility. Survey forms should be carefully designed to achieve the desired results and to avoid imposing an additional workload on health facility staffs wherever possible. If surveys must be conducted, the most time consuming survey will most likely be on patient origin. Patient origin data should include at least a complete one day sample of all health facility patients. It would be best for local health facility officials to conduct the surveys or to have the surveys conducted with their cooperation.

Local planning agencies should also have a considerable amount of information available, including at least community data and population estimates. The planning agency may not have population data in the form required for a health facility study, but should be able to readily prepare the necessary estimates and projections. Once population

projections are available, the hospital planning council should be able to provide future bed need estimates.

Even though local hospital planning councils and planning departments or planning commissions could normally be expected to have much of the data required for a long-range health facility study, it can be expected that obtaining some data will require special surveys. Information on existing facilities requiring special surveys may include data on age, general condition, floor area, building height, site size and parking space inventory. Utilization surveys may be required for data on percent of patients transferable from acute general hospitals to extended-care facilities and on use of parking spaces. Surveys and special studies may also be required for financial data, history and perhaps location of doctors' offices and nursing homes.

Future Needs Estimates

Normal techniques for preparing estimates of future occurrences are based on studies of past trends. Sometimes future estimates are tempered with judgment as to how the future will differ from the past. Such general statements apply to health facility planning as well as to other urban planning studies. Generally the local hospital planning council should provide the estimates of future needs to serve as a basis for long-range health facility plans. However, urban planning should be responsible for providing population projections used to calculate future bed need

estimates. If future estimates are provided by a hospital planning council, much of the previously discussed data on bed inventory and utilization statistics would not be required for an urban planning study.

If there is no hospital planning council, it would probably be necessary for the urban planning study to include an analysis of past trends and prepare future bed need estimates. Methods of preparing these estimates are presented and discussed in Chapter III.

Plan Preparation

As with any urban planning study, preparing long-range health facility planning recommendations is an art as much or more than it is a science. Final recommendations represent a matter of skill, judgment and experience in relating the plan to established standards, principles and objectives, to future needs estimates and to all other factors that are judged to influence the plan.

An accepted urban planning process that is equally valid for long-range health facility planning involves a three-step procedure. First, tentative plans should be prepared. The tentative plans should be reviewed and checked to assure that they meet the established standards, principles and objectives. The plans should be statistically checked to be certain that all future needs are satisfied. Other statistical checks could be made in relation to travel time and distance.

Preparation of the tentative plan should include close attention to various factors that will affect eventual implementation of the plan. One of the major elements affecting implementation is financing. Thus, the tentative plan should include cost estimates and studies of available financing. The tentative plan should be reviewed to assure that financial capabilities and limitations of the community will enable eventual completion of the entire plan.

Second, based on the review of the tentative plan, it should be modified as necessary and a preliminary plan should be prepared and published. The preliminary plan should be reviewed with all governmental and non-governmental agencies concerned with local health facility planning and with community development. Publicity and public feed-back on the preliminary plan should also be encouraged.

As a result of the various reviews and feed-back on the preliminary plan, the third step is to modify the preliminary plan as necessary and publish the final planning recommendations.

Plan Implementation Program

Completion of the long-range health facility plan should be considered as only the beginning step and not the end of the planning program. The plan is merely a "blueprint" for the future health facility system. The task that remains is to actually bring the plan into being. The plan is of little or no value unless it is followed and its recommendations are carried out in ensuing years.

Several main tools that may be used to implement a long-range health facility plan are the following:

Adoption of Plan. The final plan should be adopted by the hospital planning council as its official policy guide. In addition, planning commissions should adopt the plan as a part of the community's comprehensive plan and forward the plan to the governing body for similar adoption.

Financing Improvements. As with other community facilities for public service and use, health facilities depend in large part on public funds for construction and development purposes. As a result, it is only logical that financing plans for health facilities should be included in planning commissions' and communities' long-range capital improvement programs. An equitable means of using limited public funds most efficiently may be arrived at in this manner.

The financing plans for health facilities included in capital improvement programs might include fund drives, revenue or general obligation bonds, Hill-Burton grants, tax revenue, and health facility gifts and funds. In certain instances, substantial savings may accrue to the community by coordinating hospital construction with urban renewal plans.

Legal and Regulatory Measures. Depending on decisions made in the plan, it may be desirable in some cases to create a hospital district to develop new health facilities. In some states it would be necessary to obtain enabling legislation in order to create a hospital district. When

enabling legislation is established, the hospital district should be adequately financed and begin to function. Generally, the main advantage of a hospital district would be that health facilities for community service would be developed by the community with broad tax base support.

Various community regulatory measures may be used to assist in implementing the plan. Based on studies for the long-range health facility plan, various improvements might be made in zoning ordinance provisions relating to health facilities. Such amendments should be reviewed by planning commissions and recommended to their governing body for adoption. The primary purpose of such zoning ordinance provisions should be to guide appropriate development of health facilities in relation to overall community development.

In states having official map enabling legislation, health facilities should be included in the official map and ordinance in a manner similar to other community facilities. Subdivision regulations should also contain provisions that would require subdividers to reserve and not develop for a specified time period, land indicated on the plan for health facilities in order to give the appropriate agency time to acquire the land before it is developed.

Coordination with Other Community Activities. Many facets of community development might be coordinated with health facilities in a major or minor degree. As noted previously, there may be several benefits in coordinating hospital construction with urban renewal activity. Health

facilities contribute to traffic on the major arterial system and a good major street system is necessary for access to health facilities. As a result, each should be planned and built in relation to the other. In a similar manner, utilities and health facilities have an effect on each other.

Detailed Studies. Detailed studies and plans within the framework or policy guide of the long-range plan should lead to actual land acquisition and construction programs. Hospital planning councils should be constantly aware of community growth trends so that new sites may be acquired before they are developed for other purposes.

Hospital planning councils need to continue to prepare detailed capital improvement plans in a range of five to eight years in the future. These plans correspond to planning commissions capital improvement programs and should be an integral part of such programs. Of course, the final planning step is preparation of detailed architectural and engineering plans that lead to construction of individual facilities.

Periodic Review. All communities are continually changing in one manner or another. As with any long-range planning program, health facility plans should be kept current with changing community conditions. Depending on the rate of growth the long-range plans should be reviewed at periodic intervals of five to ten years.

CHAPTER V

SUMMARY AND CONCLUSIONS

Health facility planning and urban planning are somewhat different but related fields of endeavor. They are not as distinctly separate, however, as the current status of planning indicates.

Most health facility planning today is aimed toward a specific construction program. This planning is primarily concerned with internal facilities and functional relationships, specific sites, construction plans and schedules, and financing arrangements. Urban planning concepts of capital improvement programming, on a relatively short-range basis, are comparable to this process.

Few of the early city planning studies considered hospitals and related health facilities since they were not in the public sector. As health facilities have increasingly become public institutions, urban planning has become more concerned and involved with these facilities. However, it is still common for urban planning to give little or no attention to health facilities.

Several factors can be cited as reasons for urban planning's limited involvement with health facilities. During the late Nineteenth Century when city planning was

emerging as a profession in the United States, hospitals still maintained a lingering poor reputation. Planners of that time, and even today, had little knowledge of hospitals or health facilities.

Central values for urban planning in the past have been placed on factors such as beauty, economy and efficiency. Economic or efficient expenditure of public funds did not consider health facilities since few of these facilities were publicly owned. As a result, these institutions were not considered in the same light as schools or parks, for example.

Urban planning as a profession is quite young compared to the medical profession and generally has not been well understood in the past. Health planning agencies have usually failed to ask for urban planning assistance. This failure is quite logical in view of the relative age of the professions and the lack of understanding of assistance that can be provided to achieve solutions to common planning problems.

When all factors for urban planning's limited involvement are considered together, the one single reason that emerges is a basic lack of knowledge. Simply improving communication among urban planning and health planning agencies should help to overcome much of this problem. Adding an emphasis on health planning in urban planning curriculums at universities should also help.

Urban planning is presently changing toward a broader

scope of endeavor. Along with traditional land use studies and planning for an efficient arrangement of public facilities, planning is giving consideration to the total environment including social problems and the ecological system. Within this broader planning framework, health facilities have become an important element.

In strictly economic terms, the magnitude of costs involved in constructing and operating health facilities is high. Most hospitals are voluntary or public and are operated on a not-for-profit basis. Financial support, at least for constructing these facilities, generally must come from the public sector. As a result, hospitals should logically be included in any community's five or six year capital improvement program. However, as a general rule, this is not currently being done.

In many instances the relatively short-range health facility planning must be performed by persons with a good knowledge of internal needs of the facilities. Urban planning also could be of assistance in short-range planning on elements such as site selection, community and demographic characteristics for bed need estimates and financing arrangements.

Long-range health facility plans normally are not prepared for most communities, but should be quite useful. For example, the lack of well defined hospital service areas indicates that construction of a new small hospital to serve a new growing suburban area is not necessary if there is

reasonably good access to some other hospital in the community. Instead, it is important to plan sufficiently far in advance to anticipate the need for a new major hospital so that a site of adequate size in the proper location can be acquired while land is available. Then as growth warrants, a site would be available for construction of a hospital of adequate size to provide necessary services. As further growth warrants, the site would be adequate for hospital expansion.

Research Needs

There has not been a precise establishment of generally recognized standards. A considerable amount of research will be required before such standards can be established. Research appears to be needed in at least the following areas:

1. Land Use Relationships. Little is known about the relationship of hospitals and related health facilities to adjoining land uses or the effect of one use upon the other. This fact is reflected in zoning ordinances that seem to be uncertain as to where to permit health facilities.
2. Geographic Distribution. Research should be conducted concerning hospitals and related health facilities locations with respect to major centers of activity such as the central business district, major industrial districts, high

density residential areas and low density residential areas, and whether hospitals provide adequate service in these areas or whether they could be better located to serve major centers of activity.

3. Acceptable Noise Level. Two of the location criteria present something of an opposing problem. On one hand hospitals should be on or near major streets and on the other hand they should be located away from streets to avoid excessive noise. An acceptable noise level at hospital buildings should be established and research should establish how landscaping or good building insulation will solve the problem.
4. Traffic Generating Capacity. Health facilities should be located on the major street system in relation to the traffic they generate. General figures on traffic generation based on number of beds are available. More precise data should be developed.
5. Parking. Data is needed concerning the amount of parking currently provided and the amount of parking that should be provided. Units of measurement should be established that would best describe parking need.
6. Site Size. Research is needed concerning major variables that affect site size, the relationship

of each variable to site size, and how these variables can be related to individual health facilities.

7. Model Zoning Provisions. Model zoning provisions should be written that would be applicable to most communities based on research findings from the above items.
8. State Enabling Legislation. Model state enabling legislation should be written that would allow local units of government working individually or collectively, to build, lease, purchase, own and operate hospitals and related health facilities.

Research for the above items should materially assist urban planning programs related to health facilities planning. However, it is necessary to have more than just general or theoretical planning principles and standards. Experience in using the principles and standards tailored to individual or local circumstances is necessary to gage their validity, usefulness and effectiveness.

Policy Recommendations

Findings of this thesis indicate that the following health facility planning policies should be observed:

1. All communities should establish and implement a continuing health facilities planning program.
2. Existence of an active health planning council

should be a federal requirement for distribution of Hill-Burton funds.

3. Urban planning and health planning agencies should establish methods for improved communication of information about mutual problems and activities.
4. Local health planning and urban planning officials should coordinate planning activities for solutions to common problems.
5. Planning standards need to be established and followed.
6. Uniform state enabling legislation for action at the local level should be enacted.
7. Universities should add emphasis to health planning in their urban planning curriculum.

Thesis Conclusion

Research and findings included herein establish as valid the thesis: Urban planning has not been significantly concerned with health facilities, but should be and can be involved in planning and coordinated development of health care institutions. Successful health facility planning programs can be achieved by applying procedures and principles, conducting needed research and observing the policy recommendations as established by research for this paper.

APPENDICES

APPENDIX A

TRENDS IN HEALTH FACILITIES AS A SOCIAL INSTITUTION

This appendix presents a study and analysis of health facility trends as a background for an understanding of planning problems.

Summary

A summary of data and conclusions contained in this appendix is the following:

1. For about the past two decades the number of hospital beds has increased at a rate slightly less than the rate of national population increase. There has been a relatively small increase in the total number of hospitals since 1950.
2. There has been a change in the concept of hospital development and use with a resulting increase in the number of acute general hospitals and a decrease in all types of special hospitals.
3. Ownership patterns of hospitals have been changing with a decrease of proprietary hospitals and since 1950 a substantial increase of

local publicly owned hospitals.

4. Numerous variations in state enabling legislation pertaining to hospital financing, construction, maintenance and operation indicates an apparent urgent need for model hospital enabling legislation to serve as a guide for individual states.
5. The rate of hospital utilization has been increasing, but this rate is affected by a wide range of local variables, including demographic and economic factors.
6. Hospitals have an important impact on local economy because of a large number of employees and large payroll and other expenses.
7. Federal aid has been an important, but not major source of hospital construction funds.
8. There is a substantial shortage nationally of nursing home beds and a need for a realignment of types of facilities with additional skilled and personal care beds and fewer residential care beds.
9. Long-term hospitals are typically large institutions that contain nearly half of all hospital beds but admit less than three percent of all hospital patients. The number of long-term hospitals has been decreasing recently with a major decline in the number of

tuberculosis hospitals.

Growth of Hospitals in the United States

There is no standard definition of hospitals or an official agency to compile statistics on hospitals. However, several agencies, with slightly varying definitions of a hospital, have compiled data on the extent of hospital service. The agencies have included the Census Bureau that made a special listing in 1940 of institutions in which deaths occur, and the American College of Surgeons that maintained a record of hospitals meeting their standard of approval. However, for various reasons, data from these agencies are not usable for the purpose of studying growth trends.

The best statistical information available comes from an annual registry of hospitals maintained by the American Medical Association from 1909 to 1953 and the American Hospital Association starting in 1946. Each of these registries contain, in addition to a listing of each registered hospital, numerous statistical summaries on the extent of hospital service. There was a slight difference in the number of hospitals registered by each agency in their overlapping years of publication, but this difference is relatively insignificant.

The American Hospital Association attempts to register every hospital in the United States and to obtain a complete record of statistical information from each hospital

annually. Those institutions not meeting the Association's definition of a hospital are excluded from registration. The accuracy of the data may be illustrated by the example of a response rate of 93.5 percent to questionnaires for the 1964 annual survey. Data for non-reporting hospitals is estimated by the Association. A summary of the Association's current definition of a hospital acceptable for registration is that it must have at least six beds for the sick who stay an average of more than 24 hours. There must be an organized medical staff, round the clock nursing service, diagnostic x-ray services, clinical laboratory services, and minimal surgical or obstetrical facilities or relatively complete diagnostic and treatment facilities. The hospital must offer services more intensive than those required merely for room, board, personal services and general nursing care.[1]

In 1909, there were 4,359 registered hospitals and by 1965, there were 7,123 hospitals, or an increase of more than 2,700 hospitals. However, there had been a fluctuation in the number of hospitals during that period. The number of hospitals reached a fairly constant number of just over 6,800 during the 1920's, decreased to a low of just over 6,100 during the depression, temporarily increased during World War II, and then increased to approximately 6,800 hospitals by 1950. The temporary increase in hospitals during World War II was a direct result of an urgent need for

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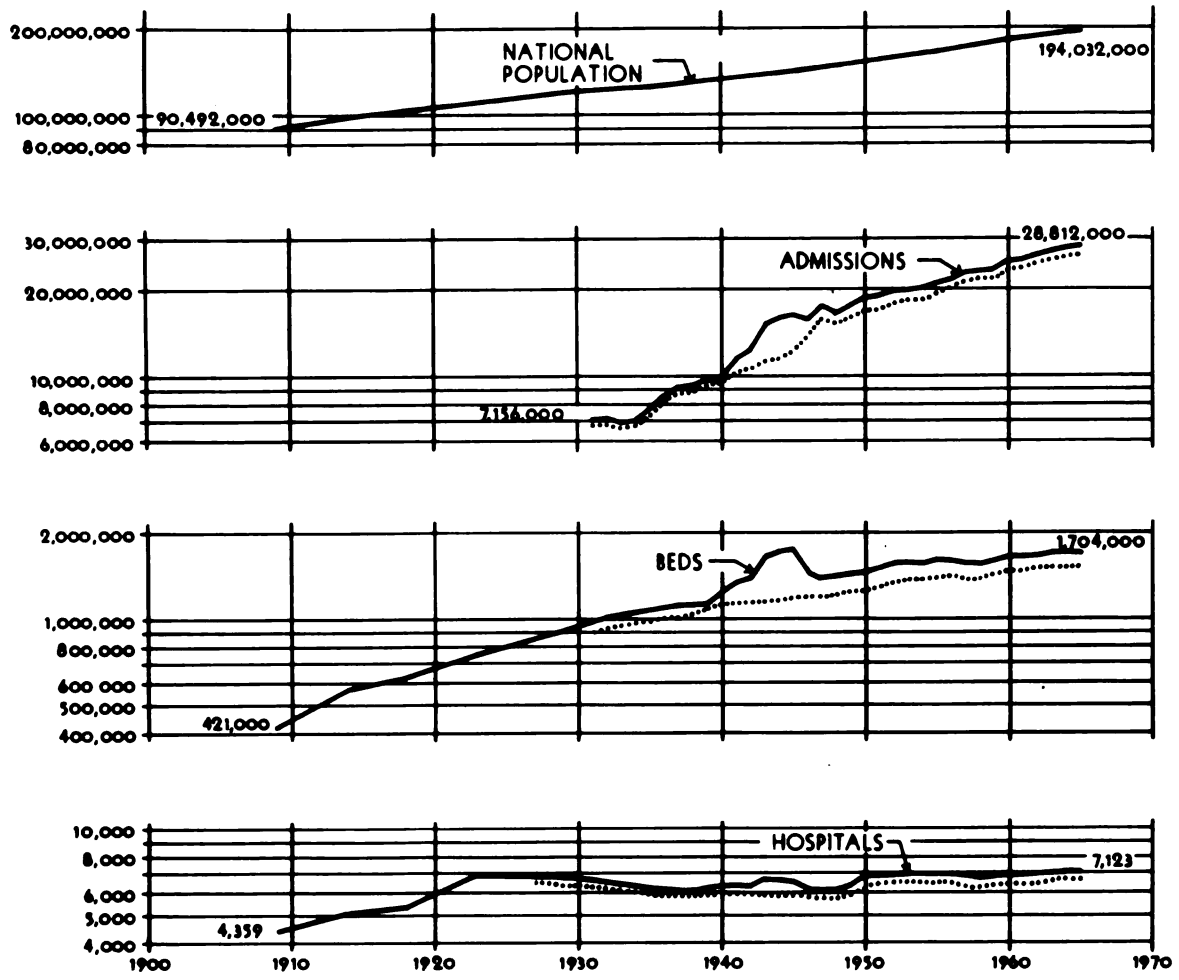
[1]Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1966), p. 17.

military hospitals.

From 1950 to 1965 there was a total increase of 335 hospitals or an average addition of 21 per year. The relative stability in the total number of hospitals, however, tends to present an inaccurate picture of hospital growth. The number of beds have been increasing at a higher rate than the number of hospitals, and admissions have been increasing at a higher rate than the increase in beds (see Figure 2). For about the last two decades, though, the rate of increase in beds has been slightly less than the rate of population growth.

FIGURE 2

TREND IN HOSPITAL GROWTH



SOURCE: HOSPITALS, JOURNAL OF THE AMERICAN HOSPITAL ASSOCIATION, GUIDE ISSUE, PART TWO, AUGUST 1, 1966, PP. 439-441; JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, MAY 15, 1954, PP. 256 AND 262; U.S. BUREAU OF THE CENSUS, STATISTICAL ABSTRACT OF THE UNITED STATES: 1965 (86TH EDITION) WASHINGTON D.C., 1965, P. 5.

In order to obtain a better indication of the growth of new hospitals, a study was made of the list of hospitals registered by the American Hospital Association for 1964. This list includes the date of establishment of each hospital. The trend in establishment of new hospitals that were still operating in 1964 is shown in Table 2.

TABLE 2

TREND IN ESTABLISHMENT OF SURVIVING HOSPITALS

Date of Establishment	Number and Established Surviving	Total in Continuous Operation	Age in 1964
Unknown	249	7,034	?
1960-1964	419	6,785	0-5
1950-1959	1,515	6,366	6-15
1940-1949	941	4,851	16-25
1930-1939	668	3,910	26-35
1920-1929	896	3,242	36-45
1910-1919	712	2,346	46-55
1900-1909	554	1,634	56-65
1890-1899	391	1,080	66-75
1880-1889	289	689	76-85
1870-1879	158	400	86-95
1860-1869	103	242	96-105
1850-1859	71	139	106-115
1732-1849	68	68	116-233

Source: Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1965), pp. 17-263.

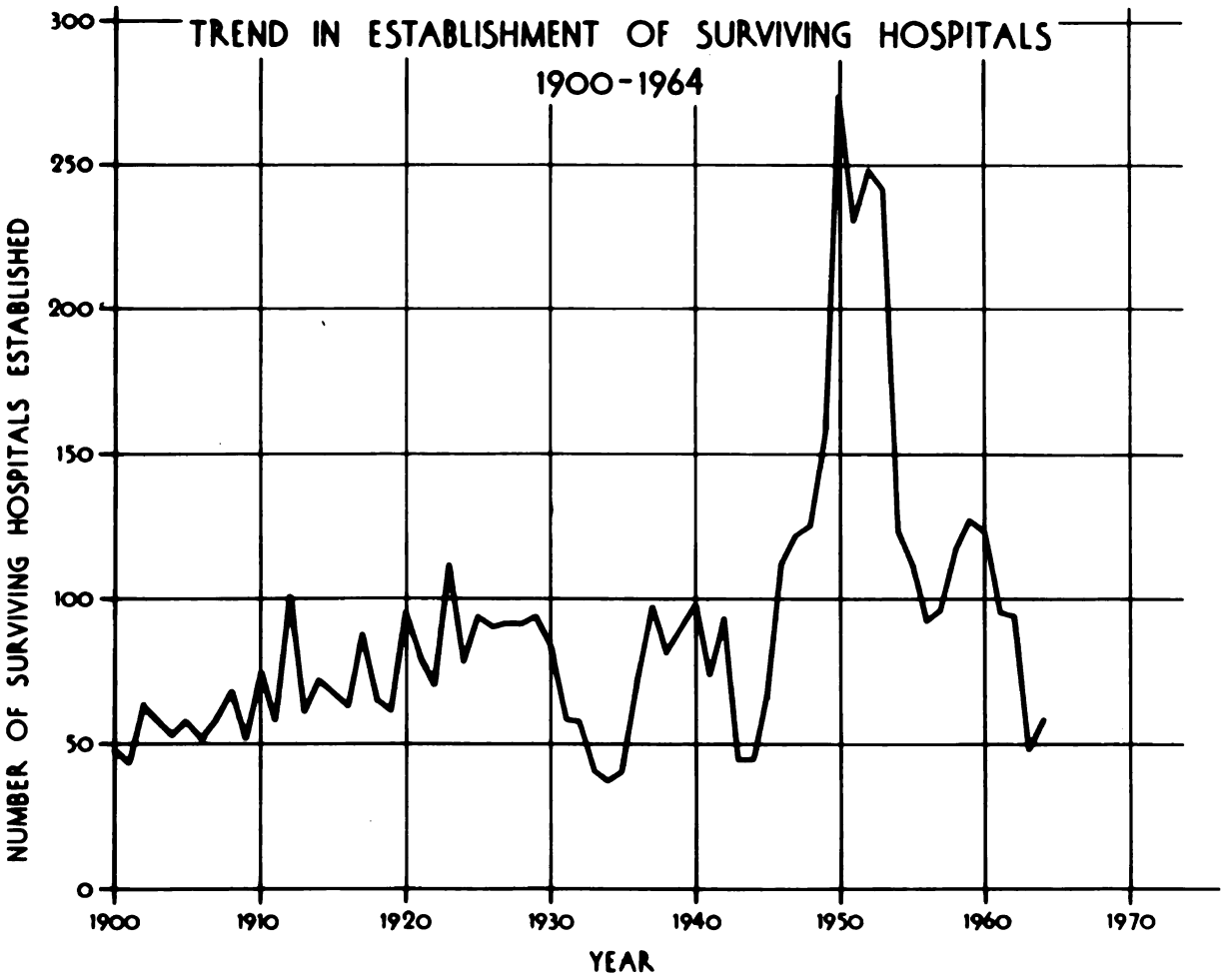
The trend of establishment of hospitals still operating in 1964, shows an increase in every decade, except the depression years of 1930-1939, until 1960. The number of hospitals established from 1960 to 1964 indicates that for the first time a reversal of this trend is occurring. In

order to obtain a better indication of this trend, Figure 3 was prepared to show the trend in establishment of surviving hospitals by year during this century. Until 1929, there was a relatively constant trend toward an increase in the number of hospitals established each year. As a result of the depression there was a drop in hospital establishment to a low of 37 new hospitals in 1934. During the war years, a large number of hospitals were established, but many of these were military hospitals and were discontinued after the war so that the effect was the establishment of few continuing hospitals.

Congress was aware of the problems of new hospital construction and in 1946, passed the Hill-Burton Act in an effort to stimulate new hospital construction. As illustrated in Figure 3, this effort was quite successful in the late 1940's and early 1950's. A peak of new hospital construction was reached in 1950, when 274 surviving hospitals were established. However, since 1953, there has been a rapid decline in the number of new hospitals established.

At the end of World War II, there were a large number of fairly small rural communities in the United States that did not have hospitals. The original intent of the Hill-Burton Act was to assist these rural communities in building hospitals. Most of the Hill-Burton funds went to rural communities in the late 1940's and 1950's. In the early 1960's the Hill-Burton emphasis partially changed toward also giving assistance to larger urban areas for

FIGURE 3



SOURCE: HOSPITALS, JOURNAL OF THE AMERICAN HOSPITAL ASSOCIATION, GUIDE ISSUE, PART TWO, AUGUST 1, 1965, PP. 17-263.

rehabilitation and additions to older existing hospitals as well as some construction of new hospitals. The partial change in emphasis on the use of Hill-Burton funds occurred fairly recently and it is difficult to determine its effect on the rate of new hospital construction. Since urban hospitals are generally larger, and thus more expensive, this change in emphasis apparently is at least partly responsible for the recent decline in the number of new hospitals. Table 3 indicates past emphasis on the use of Hill-Burton funds.

TABLE 3

GENERAL HOSPITAL PROJECTS AIDED BY HILL-BURTON FUNDS
JUNE 30, 1965

Size of Community	New Facilities		Additions & Alterations	
	Projects Percent	Beds Percent	Projects Percent	Beds Percent
Under 10,000	63.5	42.4	32.8	24.0
10,000-49,999	19.2	28.2	30.9	34.7
50,000-99,999	4.5	8.2	10.2	12.3
100,000-249,999	5.4	10.6	11.1	12.5
250,000 or more	7.4	10.6	15.0	16.5

Source: U.S., Department of Health, Education and Welfare, Public Health Service, Hill-Burton Progress Report, July 1, 1947-June 30, 1965 (Washington, D.C.: Government Printing Office, 1965), p. 28.

Under a variable matching fund formula that takes into account local need and ability to pay, Federal participation, under the Hill-Burton program, may range from one-third to two-thirds of the total cost of constructing and equipping

health and medical facilities. In 1963, the Hill-Burton share amounted to a little over one-third of the total construction cost where Federal participation was involved. The largest share of new construction was accomplished without Federal aid, however:[2] (See Table 4)

TABLE 4

SOURCE OF HOSPITAL CONSTRUCTION FUNDS 1963

Source of Funds	Percent of Funds
Direct Federal	4.4
Non-Federal	
Total	82.2
Without Federal Aid	58.4
Hill-Burton Sponsor's Share	23.8
Hill-Burton Federal Share	13.3

Source: U.S., Department of Health, Education and Welfare, Public Health Service, Health, Education and Welfare Trends: 1964 Edition (Washington, D.C.: Government Printing Office, 1964), p. 34.

For the past several years about one-third of the construction dollars have been for public hospitals and the remainder for voluntary and private hospitals.[3]

Trend in Type of Hospital

Changes in the type of hospital being built have occurred over the past few decades as shown in Table 5.

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[2]U.S., Department of Health, Education and Welfare, Public Health Service, Health, Education and Welfare Trends: 1964 Edition (Washington, D.C.: Government Printing Office, 1964), pp. 34-35.

[3]Ibid.

TABLE 5

CHANGES IN TYPE OF HOSPITAL 1930-1965

Type of Hospital	1930	1965	Percent Change
General	4,302	5,871	+36.4
Nervous and Mental or Psychiatric	561	527	- 6.1
Tuberculosis	515	185	-61.1
Maternity	151	51	-66.2
Industrial	155	NA	NA
Eye, Ear, Nose and Throat	73	32	-56.2
Children's	62	60	- 3.3
Orthopedic	64	46	-25.0
Isolation	88	NA	NA
Convalescent and Rest	162	78	-51.9
Hospital Departments of Institutions	460	103	-77.5
All Other	126	170	+39.6
Total	6,719	7,123	+ 6.0

Source: Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1966), and Journal of the American Medical Association (May 15, 1954), pp. 261-262.

It is clear that there has been a change in the concept of hospital development and use. While there has been only a small increase in the total number of hospitals, there has been a major increase in the number of general hospitals with a decrease in special hospitals. Those hospitals for which data is not available in 1965, have decreased to an insignificant number. A few new special hospitals will be built in the future, such as children's and new heart, stroke and cancer centers, but the present tendency will continue and the vast majority of new hospitals will be general hospitals.[4]

[4]Robert E. Reichert, M. D., Member Northern Kentucky Hospital Study Committee, Interview, Covington, Kentucky, July 17, 1966.

Trend in Hospital Ownership

Changes in hospital ownership from 1935 to 1965 are shown in Table 6 and illustrated in Figure 4. Federal and State hospitals have increased little during the period shown except for an increase of Federal hospitals during the World War II years. The number of proprietary hospitals, or those hospitals that are privately owned and operated for a profit, have decreased nearly fifty percent. There has been

TABLE 6

CHANGE IN HOSPITAL OWNERSHIP 1935-1965

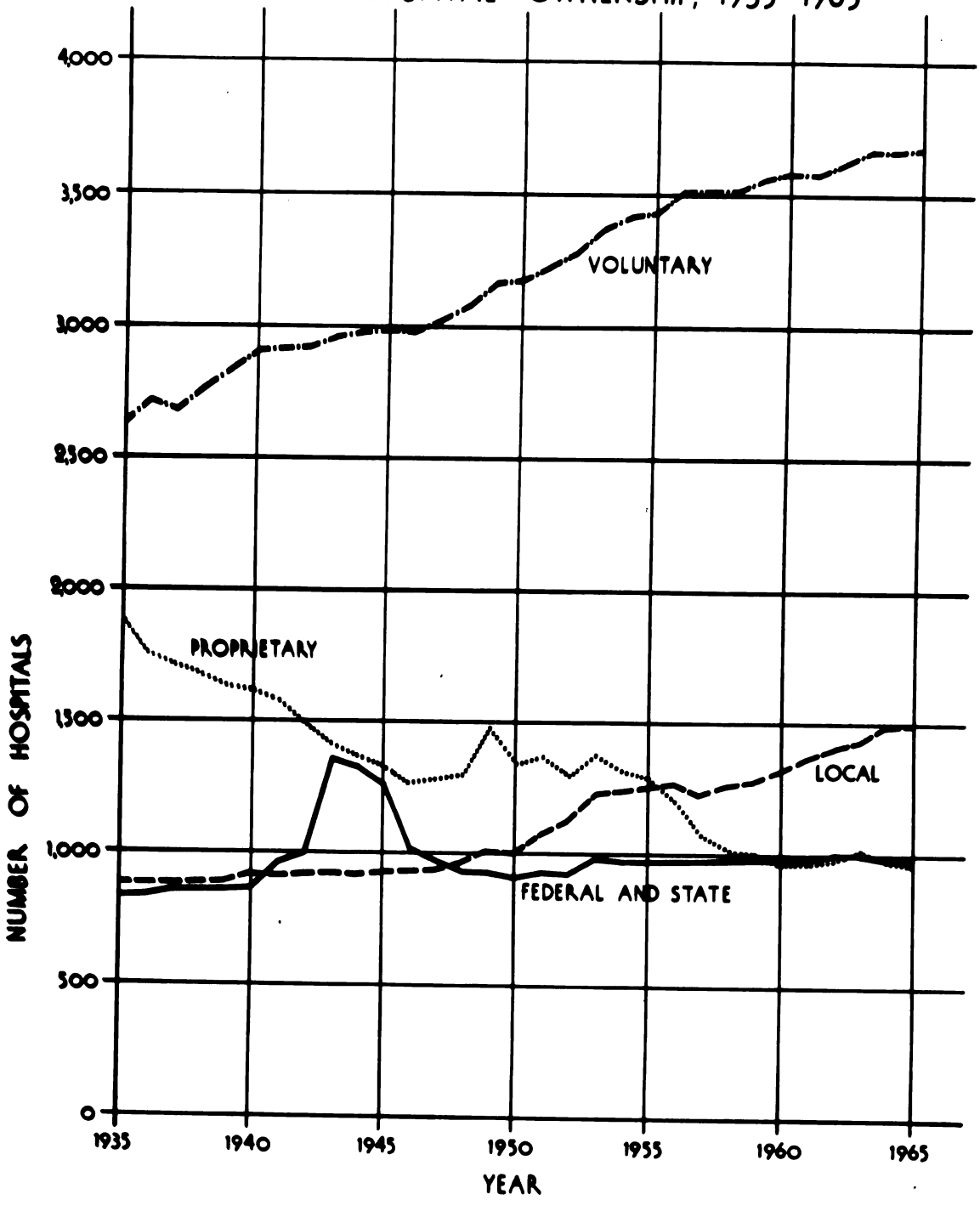
Type of Ownership	1935	1965	Percent Change
Federal	316	443	+ 40.2
State	526	546	+ 3.8
Sub-total	842	989	+ 18.9
County	490	854	+ 74.4
City	328	339	+ 3.8
City-County	64	77	+ 20.3
Hospital District	59*	225	+282.0
Sub-total	882	1,495	+ 69.6
Total Governmental	1,724	2,484	+ 44.0
Church Related	970	1,266	+ 30.6
Voluntary Non-Profit Associations	1,670	2,404	+ 44.0
Sub-total	2,640	3,670	+ 39.0
Proprietary	1,882	969	- 48.5
Total Non-Governmental	4,522	4,639	+ 1.9
Grand Total	6,246	7,123	+ 14.0

*As of 1953--Not included in 1935 totals.

Source: Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1966), pp. 444-446; Journal of the American Medical Association (May 15, 1954), pp. 285-260.

FIGURE 4

TREND IN HOSPITAL OWNERSHIP, 1935-1965



SOURCE: HOSPITALS, JOURNAL OF THE AMERICAN HOSPITAL ASSOCIATION, GUIDE ISSUE, PART TWO, AUGUST 1, 1947 TO AUGUST 1, 1966; JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, MAY 15, 1964, PP. 258-260.

a relatively constant rate of increase of voluntary hospitals during the past 30 years. This increase included both church-related hospitals and hospitals owned by voluntary non-profit associations. Growth of local publicly owned hospitals started to occur after World War II. City-county and city owned hospitals have shown a little growth, while there has been a substantial increase of county owned hospitals. A relatively recent development has been the formation of hospital districts for the purpose of establishing new hospitals.

The previous study of growth trends indicated that a large number of new hospitals were started in the early years of this century, but the depression and World War II considerably reduced non-federal hospital construction. The depression revealed that additional financial support was necessary. The more recent decline of proprietary hospitals and increase of voluntary and local hospitals would seem to indicate that communities are beginning to recognize a responsibility to establish and maintain their own medical care facilities. The growth of local hospitals by counties and hospital districts would tend to indicate a growing awareness that local hospitals should be developed with a community wide financial support rather than highly localized support.

In 1963, the Public Health Service published a summary of State enabling legislation pertaining to hospital

financing, construction, maintenance and operation.[5] According to this summary, 41 states had enacted such legislation. There was an extremely wide variation in the type of legislation enacted. Several states specifically permitted State matching grants to the Federal Hill-Burton funds. Several states permit the formation of hospital districts, associations, or authorities. Many of the districts are given taxing powers and the power to issue bonds. Other states permit joint action by counties and/or cities to establish hospitals. However, there were also several states that did not permit joint action by two or more local governmental units, but in some cases allow an individual unit to establish a hospital. In some states public funds may be used only for nonsectarian hospitals, but in other states public funds may be used to establish or support any voluntary or non-profit hospital.

Most states give some attention to permitting local governmental units to appropriate funds and/or construct medical care facilities for the care of the indigent. There is substantial special legislation on hospitals. In some instances the legislation permits establishment of special hospitals. The more common type of special legislation is designed for one local governmental unit or a combination of local governmental units to permit these governments to

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[5]U.S., Department of Health, Education and Welfare, Public Health Service, Procedures for Areawide Health Facility Planning: A Guide for Planning Agencies (Washington, D.C.: Government Printing Office, 1963), pp. 101-110.

build and operate hospitals. It is apparent that enabling legislation in such states is not adequate to permit the establishment of hospitals with public support on a regional basis.

There is an apparent urgent need for model hospital enabling legislation to serve as a guide for individual states. Urban areas are growing so rapidly that solution to urban problems requires joint action by two or more local governmental units. The major apparent need for hospital legislation is to permit joint solutions to problems and needs.

Hospital Size Distribution

In the past 15 years there has been a change in the size of short-term general and special hospitals. There has been a decrease in small hospitals and an increase in the number of larger hospitals as shown in Table 7.

TABLE 7

HOSPITAL SIZE 1950 AND 1965
SHORT-TERM GENERAL AND SPECIAL HOSPITALS

Hospital Size	1950		1965		Percent Change
	Number	Percent	Number	Percent	
Under 50 beds	2,333	46.3	2,007	35.0	-14.0
50-99	1,173	23.4	1,482	25.8	+26.4
100 and over	1,525	30.3	2,247	39.2	+47.4
Total	5,031	100.0	5,736	100.0	+14.0

Source: Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1966), p. 442; and (August 1, 1951), p. 10.

Larger hospitals play the dominant role in providing hospital services. Hospitals of 100 or more beds account for less than two-fifths of all hospitals, they have over three-fourths of all hospital beds and admit over three-fourths of all patients that are hospitalized. Relatively few hospitals with less than 50 beds are accredited, but nearly all hospitals of 100 beds or more are accredited by the Joint Commission on Accreditation of Hospitals, an agency composed of five national health organizations.[6]

There is a considerable variation in the average hospital size throughout the country. In general, those states with the greatest degree of urbanization have the highest average hospital sizes and the primarily rural states have the smallest average hospital sizes. For example, in 1960, the average hospital size ranged from 51.1 beds in Idaho to 208.2 beds in New York. The average hospital size increased in all but five states between 1950 and 1960. Four of the states where decreases occurred are primarily rural in character, but surprisingly the fifth state was California where the average hospital size decreased from 136.1 beds in 1950 to 131.8 beds in 1960.[7]

Hospital Utilization

There has been an increasing intensity in utilization

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[6]Hospitals, op. cit., pp. 442 and 472.

[7]Gerald D. Rosenthal, The Demand for General Hospital Facilities, Hospital Monograph Series No. 14 (Chicago, Illinois: American Hospital Association, 1964), p. 48.

of short-term general and special hospitals in the past two decades as indicated in Table 8. Selected indicators are summarized in Figure 5 for 1964.

TABLE 8

HOSPITAL UTILIZATION 1950 AND 1965
NON-FEDERAL SHORT-TERM GENERAL AND SPECIAL HOSPITALS

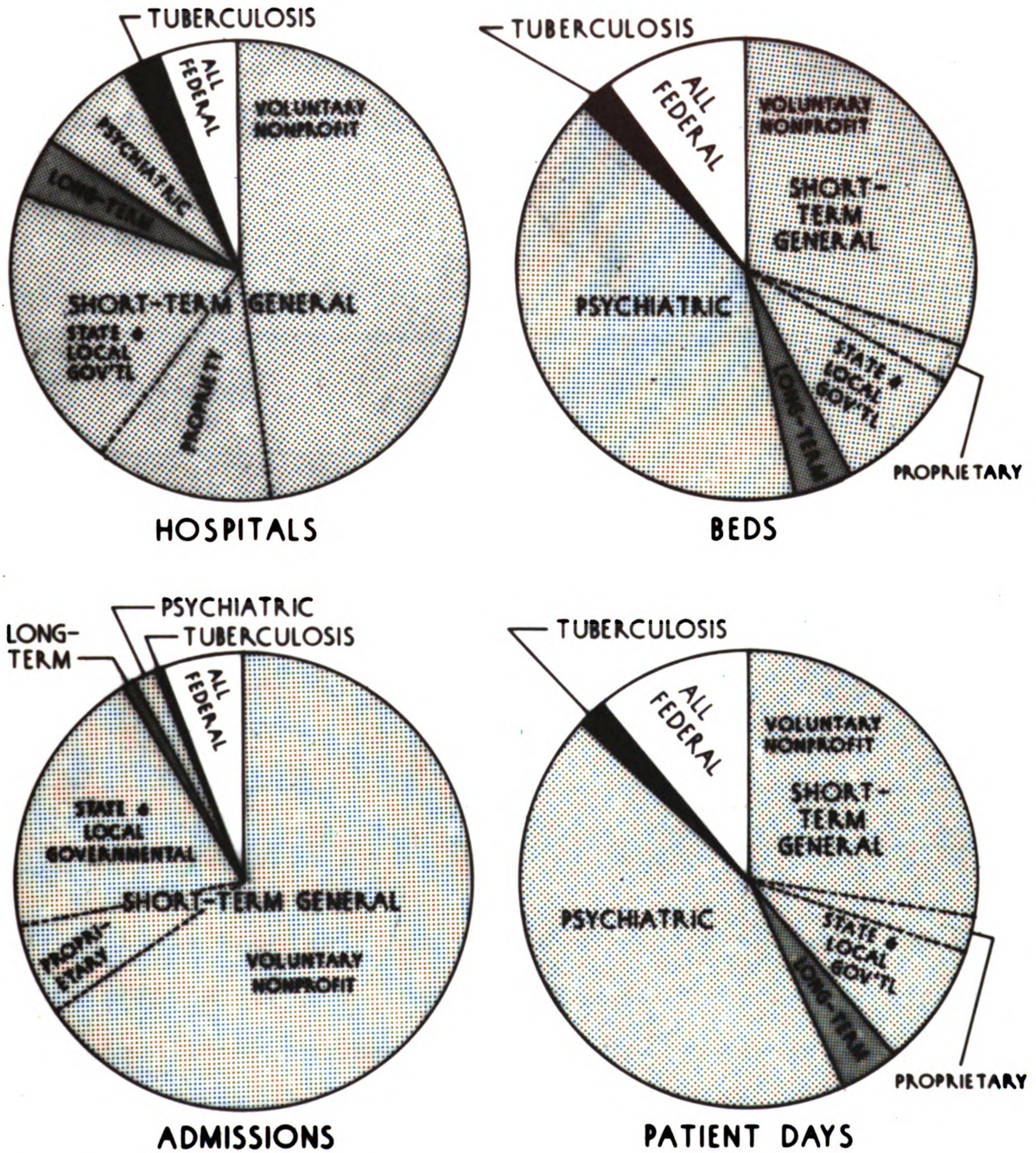
Year	Beds Per 1000 Population	Patient Days Per 1000 Population	Admissions Per 1000 Population	Average Length of Stay (Days)	Occupancy (Percent)
1950	3.4	897	110.2	8.1	73.7
1965	3.8	1,071	137.9	7.8	76.0

Source: Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1966), pp. 438-448; Statistical Abstract of the United States (1965), p. 5; Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1966), pp. 428 and 432.

After remaining relatively constant at 3.4 to 3.5 beds per 1000 persons for a number of years, the number of hospital beds in relation to the population is beginning to show a small increase. However, hospital admissions and patient days have shown a relatively steady increase for the past two decades. A patient's average length of stay in a hospital decreased until the early 1950's and has remained relatively constant since then. The increasing use of hospitals without a decrease in average length of stay has resulted in an increase in the percentage of occupancy in hospitals and has created bed shortages in some areas.

There are numerous variations in hospital usage. One

FIGURE 5 - DISTRIBUTION OF HOSPITALS, BEDS, AND SELECTED UTILIZATION INDICATORS BY MAJOR TYPE OF SERVICE, 1964.



SOURCE: HOSPITALS, JOURNAL OF THE AMERICAN HOSPITAL ASSOCIATION, GUIDE ISSUE, PART TWO, AUGUST 1, 1965, P. 432.

type of variation in utilization is by hospital ownership. For example, in 1950 the average length of stay varied from 5.6 days in proprietary hospitals to 10.7 days in State and local government hospitals. This variation had narrowed, though, by 1964 when the range was 6.2 to 8.5 days for the same hospitals. A more significant variation occurs by the size of the hospital as shown in Table 9 for 1965.

TABLE 9

HOSPITAL UTILIZATION BY HOSPITAL SIZE 1965
NON-FEDERAL SHORT-TERM GENERAL AND SPECIAL HOSPITALS

Hospital Size	Occupancy (Percent)	Average Length of Stay (Days)
Under 25 beds	53.0	5.8
25-49	62.3	6.0
50-99	67.9	6.5
100-199	74.6	7.1
200-299	79.6	7.6
300-399	81.2	8.2
400-499	82.2	8.5
500 and over	80.8	10.9
Average	76.0	7.8

Source: Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1966), p. 442.

It is apparent that larger hospitals are utilized much more efficiently than small hospitals. Many larger hospitals operate with an occupancy rate of over 90 percent.[8] Even though pressure from greater hospital admissions has

[8]Ray E. Brown, "Factors Affecting Hospital Cost and Use," address delivered at the Ohio Hospital Association Convention, April 5, 1960.

increased the percentage of occupancy in hospitals, there are also public pressures for convenient rather than efficient use that help to hold down the yearly occupancy rate. For example, it was found that in 1958, hospital occupancy was 15 percent less on weekends than other days of the week, 16 percent less during the heavy vacation month of August as compared with February, 13 percent lower during the holiday month of December as compared with January, and 14 percent less during the summer season of July, August and September as compared with the winter season of January, February and March.[9]

There are also variations by state in hospital utilization rates as shown in Table 10 for 1960.

TABLE 10

UTILIZATION RANGES FOR ALL STATES 1960
NON-FEDERAL SHORT-TERM GENERAL AND SPECIAL HOSPITALS

Variable	High	Mean	Low
Patient days per 1000 population	1,333.7	950.9	657.0
Admissions per 1000 population	181.4	132.9	108.9
Average length of stay (days)	9.7	7.2	5.1

Source: The Demand for General Hospital Facilities, American Hospital Association Monograph No. 14 (1964), p. 26.

Hospital utilization rates are also affected by various demographic and economic factors. For example, it was found

[9] Ibid.

that in Cleveland, Ohio, non-white medical and surgical patients stay in the hospital longer than white patients, but non-white obstetrical patients stay a shorter time than white patients.[10] Age is a factor in hospital utilization since a high percentage of the elderly, as compared to the rest of the population, occupy hospital beds. The percentage of women in child-bearing years will affect the number of obstetrical patients. The degree to which patients can afford hospitalization will have some effect upon utilization rates. This economic factor is determined by income levels and the amount of hospital insurance that the people of a community have purchased. Hospital insurance varies by a considerable amount. In 1960, the amount of hospital insurance coverage by state ranged from 39.4 percent to 89.6 percent.[11]

Another factor affecting utilization of hospitals is the geographic origin of the patient. With the exception of emergency and accident cases, an individual hospital will not necessarily serve a well defined service area. For example, it was found that in the Cleveland, Ohio, area patients often bypass the hospital nearest them and travel considerable distances to receive care.[12] Studies in the

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[10]Citizens Study Committee, Northeast Ohio, Finding Facts to . . . Fight "Feelings" About Hospitalization "Abuses" . . . and . . . Determine Hospital Expansion Needs, Parts II, IV, XI and XII (summary prepared by Hospital Care Corporation, Cincinnati, Ohio, 1959), p. 2.

[11]Rosenthal, op. cit., p. 26.

[12]Citizens Study Committee, Northeast Ohio, op. cit., p. 4.

Greater Cincinnati area indicated that conditions are quite similar to the Cleveland area and that there is even quite a bit of crossing of the Ohio-Kentucky state line to receive hospital care.[13] In both communities a hospital's "reputation," the economic level of patients, and accessibility appear to be important factors affecting utilization as well as the hospital's location in relation to a service area.

The essence of the above discussion is that on a national basis there is an increasing rate of utilization of hospitals. However, the degree of utilization of an individual hospital is affected by a wide range of local and regional factors. While planning could be guided by national trends, it is necessary that local characteristics be fully considered in planning for hospital growth or expansion. The above discussion also indicates the need to plan for a hospital system that would not be overbuilt and have the serious problem of too many empty beds that may be prohibitively expensive to maintain.

The Hospital as an Element of Local Economy

Hospitals at times have been called a "big business" with good justification: the capital investment in a hospital is high and a large number of employees and funds are required to operate a hospital. The magnitude of the "business" that hospitals operate makes them an important

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[13]Jack Cronin, Assistant Director, Greater Cincinnati Hospital Council, Interview, Cincinnati, Ohio, July 19, 1966.

element in the local economy. Much criticism that has been levied against hospitals in recent years is concerned with rapidly rising hospital costs. Much of the impetus behind recent hospital planning efforts has been an attempt to achieve the most efficient hospital system possible so that the rise in hospital costs will be slowed down as much as possible.

An indication of the rapidly rising hospital costs is shown in Table 11.

TABLE 11

INCREASES IN HOSPITAL COSTS 1950 TO 1964
NON-FEDERAL SHORT-TERM GENERAL AND SPECIAL HOSPITALS

	1950	1964	Percent Increase
Total expense per patient day	$ 15.62	$ 41.58	166
Total expense per patient stay	$127.26	$320.17	152
Payroll expense as % of total expense	56.7%	61.7%	9
Total payroll expense (millions)	$1,203	$5,151	328
Total employees*	662,456	1,332,714	101
Average payroll expense per employee	$1,816	$3,865	113
Number of employees* per 100 patients	178	242	36

*Full-time equivalent in 1964.

Source: Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1965), p. 441.

Since 1950 a patient's hospital cost has increased two and one-half times. A major portion of this cost is for the

employees needed to provide all of the services required in today's hospital. The number of employees has been increasing so that it now takes over 2.4 employees to care for each patient. The average employee's pay has also been increasing, but still is quite low. The result is that hospitals employ a very large number of persons who are in the nation's lowest income groups. It is generally anticipated that the cost per patient day will soon rise to $100.[14]

There are also significant variations in the number of employees, hospitalization cost and the value of the hospital physical plant by the size of the hospital as shown in Table 12. As the size of a hospital increases, there is a corresponding increase in the number of employees per patient, payroll expense per patient and total expense per patient. Smaller hospitals are unable to provide the many specialized services that larger hospitals offer and this is probably in large part the reason for increasing employees, and costs in larger hospitals. The lack of special services in small hospitals and higher costs in large hospitals would tend to indicate that there should be some optimum range of hospital size.

A hospital represents a considerable investment. Even the smallest hospitals must have a building of substantial size to reflect their average value. Any building of such size cannot help but have an important and even dominant influence on the adjoining land use pattern.

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[14]Robert E. Reichert, M. D., op. cit.

TABLE 12

HOSPITAL PERSONNEL, EXPENSES AND ASSETS BY HOSPITAL SIZE 1964
NON-FEDERAL SHORT-TERM GENERAL AND SPECIAL HOSPITALS

Hospital Size	Hospitals	Full-Time Personnel* Per 100 Patients	Payroll Expenses Per Patient Day	Total Expenses Per Patient Day	Average Hospital Plant Assets (in Thousands)
Under 25 beds	583	231	$19.22	$34.67	$ 180
25-49	1,480	216	19.70	35.53	420
50-99	1,449	225	21.35	37.22	870
100-199	1,095	238	23.78	39.50	1,960
200-299	542	248	26.81	43.24	4,040
300-399	286	251	27.12	43.47	5,950
400-499	122	252	27.82	44.15	7,960
500 and over	155	252	29.74	44.97	13,610
Total	5,712	242	$25.65	$41.58	$ 1,950

*Full-time equivalent. Excludes residents, interns and students.

Source: Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1965), p. 451.

Nursing Homes

Nursing homes are basically an extension of hospital service at a lower level of cost and care. Thus, a study of nursing homes becomes an integral part of a study of health facilities. In 1961, the U. S. Public Health Service conducted a nation-wide survey to obtain data on nursing homes.[15] Nursing home care can be defined as:

> Skilled Nursing Homes that have a medical staff or medical staff equivalent and have continuous nursing service under professional nurse direction.
>
> Personal Care Homes that provide safe hygienic, sheltered living for residents not capable of or desiring fully independent living. They furnish regular and frequent, but not continuous, medical and nursing service and they furnish continuous supportive, restorative and preventive health services.
>
> Residential Care Homes involve primarily only room and board.

Regulations under the Medicare law are such that only skilled nursing homes will qualify as extended-care facilities that are eligible to receive Medicare patients. Many hospital-oriented nursing homes will be able to meet the Medicare requirements, but many other nursing homes will not

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[15] U.S., Department of Health, Education and Welfare, Public Health Service, Characteristics of Nursing Homes and Related Facilities: Report of a 1961 Nationwide Inventory (Washington, D.C.: Government Printing Office, 1963).

be able to meet the requirements without a considerable improvement of facilities and service.[16]

The 1961 inventory by the Public Health Service indicated that there were 23,000 nursing homes and related facilities. This total is 2,000 less than those counted in 1954. However, there was a 32 percent increase in beds during the same period. Changes in facilities by the primary type of care are shown in Table 13.

Since about 85 percent of the occupants of nursing homes are 65 years of age or older, comparisons of bed availability are based on this age group. There are significant regional variations in the supply of skilled nursing care beds per 1000 persons aged 65 and over ranging from 3.6 in North Carolina to 50.0 in the State of Washington. The great differences are attributed to varying economic and demographic factors as illustrated in Tables 14 to 17.

From these tables it is apparent that the supply of skilled nursing homes tends to increase with the average per capita income, the amount of old-age assistance payments, the proportion of persons aged 65 years and over, and the percentage of persons living in urban areas.

As with hospitals, there is a wide size range of skilled nursing care facilities as shown in Table 18. There is a high percentage of small facilities, but the larger facilities play the more dominant role. Of thirty states

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[16]John Carlova, "Medicare: How Hospitals are Preparing," Medical Economics (March 21, 1966), pp. 51-52.

TABLE 13

CHANGES IN NURSING HOMES AND RELATED FACILITIES BY PRIMARY TYPE OF CARE
1954 TO 1961

Primary Type of Care	1954		1961		Percent Change	
	Facilities	Beds	Facilities	Beds	Facilities	Beds
Skilled Nursing	7,000	180,000	9,700	338,700	+38.6	+88.2
Personal	9,000	190,000	11,100	207,100	+23.4	+ 9.0
Residential	9,000	80,000	2,200	47,000	-75.6	-56.7
Total	25,000	450,000	23,000	592,800	- 8.0	+31.7

Source: U.S., Department of Health, Education and Welfare, Public Health Service, Characteristics of Nursing Homes and Related Facilities: Report of a 1961 Nationwide Inventory (Washington, D.C.: Government Printing Office, 1963).

TABLE 14

SKILLED NURSING CARE BEDS IN RELATION
TO PERCENT OF POPULATION AGED 65 YEARS AND OVER 1961

Percent Population Aged 65 and Over	Number of States	Skilled Nursing Care Beds Per 1,000 Population Aged 65 and Over
Less than 6.0	4	6.7
6.0-6.9	5	7.4
7.0-7.9	6	14.8
8.0-8.9	7	15.8
9.0-9.9	12	24.0
10.0 and over	18	24.9

TABLE 15

SKILLED NURSING CARE BEDS IN RELATION
TO PER CAPITA INCOME 1961

Per Capita Income of State	Number of States	Skilled Nursing Care Beds Per 1,000 Population Aged 65 and Over
Less than $1,750	11	9.7
$1,750-1,999	11	15.8
2,000-2,499	19	25.4
2,500 and over	10	24.0

Source (Tables 14 and 15): U.S., Department of Health, Education and Welfare, Public Health Service, Characteristics of Nursing Homes and Related Facilities: Report of a 1961 Nationwide Inventory (Washington, D.C.: Government Printing Office, 1963).

TABLE 16

SKILLED NURSING CARE BEDS IN RELATION
TO RURAL AND URBAN POPULATION DISTRIBUTION 1961

Percent Rural Population	Number of States	Skilled Nursing Care Beds Per 1,000 Population Aged 65 and Over
50 and over	18	11.7
40-49	11	23.9
30-39	14	23.3
Less than 30	9	22.4

TABLE 17

SKILLED NURSING CARE BEDS IN RELATION
TO OLD-AGE ASSISTANCE PAYMENTS 1961

Annual OAA Payments Per Recipient, 1960	Number of States	Skilled Nursing Care Beds Per 1,000 Population Aged 65 and Over
Less than $500	4	8.9
$ 500 - 699	11	12.3
700 - 899	15	22.2
900 - 1,099	15	23.6
1,100 and over	7	28.4

Source (Tables 16 and 17): U.S., Department of Health, Education and Welfare, Public Health Service, Characteristics of Nursing Homes and Related Facilities: Report of a 1961 Nationwide Inventory (Washington, D.C.: Government Printing Office, 1963).

TABLE 18

SIZE DISTRIBUTION OF SKILLED NURSING CARE FACILITIES
1961

Size of Facility	Percent of Facilities	Percent of Beds
Under 10 beds	10.3	1.9
10-24	39.7	19.8
25-49	33.5	33.1
50-99	12.2	23.3
100-249	3.7	15.0
250 and over	0.6	6.9

Source: U.S., Department of Health, Education and Welfare, Public Health Service, Characteristics of Nursing Homes and Related Facilities: Report of a 1961 Nationwide Inventory (Washington, D.C.: Government Printing Office, 1963).

reporting on the minimum size required for a license, all states would license skilled nursing homes with five beds or more. Several states would issue licenses with homes having two or three beds and two states would issue a license to a nursing home having only one bed. In contrast there are a few large facilities of over 500 beds.

Skilled nursing homes maintain a relatively high average occupancy rate of 86 percent or about the same as the average occupancy rate for long-term general hospitals in 1961. The average occupancy rate ranged from under 80 percent in nine states to over 95 percent in four states. National figures are not available on the average length of stay in nursing homes. However, a 13-state study in 1953-54 indicated that the average length of stay is one year with

one-third of the patients staying less than six months and seven percent staying over five years. A similar study of the average length of stay in Michigan in 1957 yielded nearly identical results.[17]

The vast majority (87 percent) of skilled nursing homes are privately owned. Public, church related, and other voluntary non-profit homes each account for approximately 4.5 percent of the remaining homes. A similarity with hospitals is that proprietary homes are the smallest and the public homes are the largest. The average size of all skilled nursing homes in 1961 was 24 beds compared to 19 beds in 1954. Most of residential care homes are small proprietary facilities.

There are relatively few nursing homes that provide special services such as those required by mentally confused patients or convalescent children. In 1961, there were 281 such homes representing slightly over 3 percent of all nursing home beds in 31 states. There were also 193 specialized care homes to serve patients with mental illness, but the majority of these were located in 2 states. Children's convalescent homes were reported in 14 states, but had declined from 52 such homes in 1954 to 27 homes in 1961.

The Medicare law permits transfer of patients to extended-care facilities after three consecutive days of

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[17]U.S., Department of Health, Education and Welfare, Public Health Service, Nursing Homes and Related Facilities Fact Book (Washington, D.C.: Government Printing Office, 1963), p. 53.

hospitalization.[18] Because of this provision of the law, extended-care facilities have become important for dealing with problems of hospital cost and utilization. The cost of care for elderly patients is less in extended-care facilities than in hospitals, and has been found to be as little as one-third the cost of hospital care. Many of these patients currently are not being transferred because of a lack of insurance coverage.[19] Most insurance policies provide for hospital care, but not for extended care unless the patient is in a hospital.[20]

A major difficulty with extended-care facilities is that there are not enough beds. The Department of Health, Education and Welfare estimates that there are almost 400,000 acceptable beds, but that 900,000 beds are needed. Medicare requirements for an extended-care facility are rather stiff. Some existing facilities can meet these requirements, but others can't. Several approaches are starting to be taken to overcome the bed deficiency in extended-care facilities. One approach is the improvement of existing facilities or development of new facilities that are not directly associated

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[18]When transferred, the patient is eligible for a stay of up to 20 days in the extended-care facility at no cost to himself. He can stay up to an additional 80 days at a cost of $5 per day. This section of the law became effective on January 1, 1967.

[19]John Carlova, "Medicare: How Hospitals are Preparing," Medical Economics (March 21, 1966), p. 48.

[20]Robert E. Reichert, M. D., Member Northern Kentucky Hospital Study Committee, Interview, Covington, Kentucky, July 17, 1966.

with a hospital. Hospitals are also becoming involved in providing extended-care facilities. These are being developed as separate facilities on the hospital grounds or in a location close to the hospital. Other hospitals prefer to install extended-care facilities in their present structures, either by an expansion of the structure or conversion of acute beds to extended-care beds.[21] There are advantages to hospitals in having extended-care facilities as an integral part of the hospital since a dual use of some personnel and ancillary facilities should be possible. As a recognition of this fact, Michigan Hill-Burton funds for extended-care facilities had been granted only to those facilities developed adjacent to a hospital as of August, 1966.[22]

Long-Term Hospitals

Long-term hospitals include psychiatric, tuberculosis and general hospitals, as well as other special hospitals, such as chronic, convalescent, and orthopedic facilities. There are some short-term psychiatric hospitals, but for the purpose of this discussion all psychiatric hospitals are included. There are relatively few long-term hospitals as they constitute less than 14 percent of all hospitals. Admissions to long-term hospitals amounted to only 2.4 percent of all hospital admissions in 1964. However, psychiatric

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[21]Carlova, op. cit., pp. 49-57.

[22]Keith Rathbon, Administrative Analyst, Michigan Department of Health, Interview, Lansing, Michigan, August 4, 1966.

hospitals are large institutions that contained nearly 41 percent of all hospital beds in 1964. All long-term hospitals contained just over 47 percent of all hospital beds.[24]

Since 1950, there was a decrease in the number of all types of long-term hospitals with the greatest decrease occurring in tuberculosis hospitals as shown in Table 19.

TABLE 19

CHANGE IN NON-FEDERAL LONG-TERM HOSPITALS
1950-1964

Type of Hospital	1950	1964	Percent Change
Psychiatric	551	487	-11.6
Tuberculosis	398	187	-53.0
General and other special	412	300	-27.2
Total	1,361	974	-28.4

Source: Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1965), p. 449.

General and other special hospitals, however, had only a relatively small decrease in the number of beds and admissions. During the same time there was a small increase in psychiatric beds and a 51 percent increase in admissions to psychiatric hospitals. Psychiatric hospitals have the highest average occupancy rate of all hospitals, but this rate has declined from a peak of 97.9 percent in 1950 to 91.4 percent in 1964. There has been a major decline in the occupancy rate of tuberculosis hospitals from 86.1 percent

[24]Hospitals, Journal of the American Hospital Association, Guide Issue, Part Two (August 1, 1965), p. 432.

in 1950 to 71.8 percent in 1964. The occupancy rate of general and other special long-term hospitals has remained fairly constant at around 85 percent.[25] The size distribution of long-term general, tuberculosis, chronic and convalescent hospitals is somewhat similar to short-term general hospitals, except that there are very few long-term hospitals of less than 50 beds. Psychiatric hospitals, however, are quite large. Approximately two-thirds of these facilities have 500 beds or more.[26]

Long-term hospitals will pose fewer urban planning problems than other hospitals or related health facilities. The only major increase of long-term facilities anticipated will be psychiatric hospitals. This will involve improvement and expansion of existing hospitals or construction of large new facilities rather than a proliferation of small hospitals.[27] However, in the health facility planning process for any community, it is important that consideration be given to the full range of health facilities.

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[25] Ibid., p. 449.

[26] Ibid., p. 452.

[27] Robert E. Reichert, M. D., op. cit.

APPENDIX B

FORMULAS FOR CALCULATING FUTURE BED NEEDS

The Federal formula under the Hill-Burton program for calculating future bed needs is as follows:

Step 1: Multiply the current area use rate (patient days per 1000 population per year) by the projected area population (in thousands) and divide by 365 to obtain a projected area average daily census, or:

$$\text{average daily census} = \frac{\text{average annual patient days per 1000 population} \times \text{projected population in 1000}}{365}$$

Step 2: Divide the projected area average daily census by an occupancy factor; .80 occupancy factor for general hospitals, and .90 occupancy factor for long-term care facilities.

Step 3: Add an error variable of 10. Thus the formula for future bed needs becomes:

$$\text{Future bed needs} = \frac{\text{average daily census}}{.80 \text{ (or } .90)} + 10$$

Federal regulations permit a modification of this formula if prior approval is obtained from the Surgeon General.

The Public Health Service in its publication, Procedures for Areawide Health Facility Planning: A Guide for Planning Agencies, presents a more detailed method of calculation, parts of which are as follows.

The basic formula suggested is:

$$\text{Number of beds needed} = \frac{\text{Projected annual patient days in the target year}}{365 \times \text{Average annual occupancy goal}}$$

It is suggested that patient days may be calculated as follows:

Patient days = Admission rate X population X average stay,
or
= Annual admissions X average stay,
or
= Use rate X population

Admission rate = Annual admissions/unit of population

Average stay = Patient days/admission

Admissions = Admission rate X population

Use rate = Annual patient days/unit of population

It is suggested that calculation of patient days in the target year should use the following basic formula:

$$\text{Projected patient days in the target year} = \text{Current patient days per 1000 population} \times \text{Projected population in 1000 for the target year}$$

Depending upon the degree of detail required, it is suggested that the projected patient days can be calculated by the following age groupings for each sex: under 15, 15-24, 25-44, 45-64, 65-74, and 75 and over.

It is further suggested that general hospital bed needs should be calculated by major clinical service as follows:

$$\text{Projected obstetrical patient days} = \text{Current average length of stay per delivery} \times \text{Projected number of deliveries}$$

$$\text{Projected number of deliveries} = \text{Projected number of females age 15-44 in thousands} \times \text{Current deliveries per 1000 females age 15-44}$$

$$\text{Projected pediatric patient days} = \text{Projected patient days for males under age 15} + \text{Projected patient days for females under age 15}$$

$$\text{Projected medical and surgical patient days} = \text{Total projected patient days} - \text{Sum of projected obstetrical and pediatric patient days}$$

The number of beds for each major clinical service is then calculated by using the first formula present above. Total general hospital needs is the sum of the needs by major clinical service.

Long-term bed needs are calculated in a similar manner except that they are based on the population age 65 and over as follows:

$$\text{Projected long-term average daily census} = \text{Projected population age 65 and over} \times \frac{\text{Current long-term patients}}{\text{population age 65 and over}}$$

$$\text{Projected long-term bed needs} = \frac{\text{Projected long-term average daily census}}{\text{Desirable occupancy rate}}$$

A method was presented for modifying the long-term and acute bed needs based on the assumptions that a certain percent of

long-term patients could be transferred from acute general hospitals as follows:

$$\text{Revised projected short-term patient days (medical, surgical and pediatric)} = \text{Projected patient days} \times \text{Percentage attributable to acute care}$$

$$\text{Revised projected average daily census (medical, surgical and pediatric)} = \frac{\text{Revised projected short-term patient days}}{365}$$

$$\text{Revised short-term bed needs} = \frac{\text{Revised projected average daily census (medical, surgical and pediatric)}}{\text{Desirable occupancy rate}} + \text{Projected obstetrical bed need}$$

$$\text{Additional long-term patient days} = \text{Medical, surgical and pediatric patient days} \times \text{Percent attributable to long-term care}$$

$$\text{Additional long-term average daily census} = \frac{\text{Additional long-term patient days}}{365}$$

$$\text{Revised number of long-term beds needed} = \frac{\text{Additional long-term average daily census}}{\text{Desirable occupancy rate}} + \text{Basic long-term bed need}$$

The Michigan method of calculating future bed needs uses the same basic formulas presented above, but does not distinguish need by major clinical service. The Michigan method departs from the prescribed Federal formula in an attempt to recognize regional variances in utilization rates and an attempt to apply projected utilization rates against projected population rather than the Federal requirement of applying current utilization rates against projected population.

APPENDIX C

SUGGESTED LIST OF DATA FOR LONG-RANGE HEALTH FACILITY PLANNING

I. EXISTING FACILITIES

- A. Location.
- B. Number of Beds.
  - 1. Short-term general and special hospitals.
    - (a) Medical-Surgical Service.
    - (b) Obstetrics Service.
    - (c) Pediatrics Service.
    - (d) Other Services.
- C. Planned and programmed change in bed inventory same as Item B with target dates.
  - 1. Additions.
  - 2. Removals.
- D. Ownership.
- E. Age.
  - 1. Year of Original Construction.
  - 2. Year of Major Additions with number of beds added.
- F. General Building Condition.
  - 1. Structural.
  - 2. Functional.

G. Building Floor Area.

1. Total Area.

2. Ground Floor Area.

H. Building Height.

I. Site Size.

J. Number of Parking Spaces.

1. Doctors.

2. Personnel.

3. Visitors.

4. Out-Patient Clinic.

5. Emergency and Admitting.

6. Loading.

II. UTILIZATION

A. Admissions (or discharges).

1. Short-term general and special hospitals.

(a) Medical-Surgical Service.

(b) Obstetrics Service.

(c) Pediatrics Service.

(d) Other Services.

2. Extended-Care Facilities.

3. Long-term Hospitals.

B. Patient Days - Same as for Item A.

C. Trend data on Items A and B (where possible).

D. Patient origin - by relatively small analysis areas such as census tract or postal zone.

E. Percent patients transferable from acute general hospitals to extended-care facilities.

F. Use of Parking Facilities.

1. Number of Employees - for each shift.
2. Out-patient clinic visits.
3. Number of doctors on regular staff.
4. For Items 1 to 3 the following:
   (a) Method of travel.
      (1) Personal car.
      (2) Car pool.
      (3) Public transit.
      (4) Walk.
   (b) Peak parking period.

III. POPULATION

A. Distribution - Obtain all population data by small analysis area selected for patient origin study.

B. Number, Age and Sex.

1. Number under 15 years.
2. Females 15-44 years.
3. Total 15-64 years.
4. Number 65 years and over.

C. Projections - Same as for Item B.

D. Income groups.

IV. COMMUNITY DATA

A. Comprehensive Plan.

1. Land Use - Existing and Planned.
2. Transportation Facilities - Existing and Planned.

3. Utilities - Existing and Planned.

B. Topography and Ground Features.

C. Hospital Neighborhood Conditions, including use, age, condition and value of adjacent property.

D. Urban Renewal Plans.

E. Local Laws - Especially Zoning Ordinances.

V. FINANCIAL DATA

A. Use and distribution of prepayment plans.

B. Resources available for capital improvements.

VI. OTHER INFORMATION

A. Location of doctors' offices and number of doctors per office.

B. Location of nursing homes.

C. History.

D. Hospital Planning Council organization.

E. Local organization under Hill-Burton State Plans.

F. State Enabling Legislation.

G. Federal Legislation.

BIBLIOGRAPHY

BIBLIOGRAPHY

Books

Bartholomew, Harland. Land Uses in American Cities. Cambridge, Mass.: Harvard University Press, 1955.

Commission on Hospital Care. Hospital Care in the United States. Cambridge, Mass.: The Commonwealth Fund, Harvard University Press, 1957.

Jackson, Laura G. Hospital and Community Studies in External Relationships of the Administrator. New York: The Macmillan Company, 1964.

Nicholson, Edna E. Planning New Institutional Facilities for Long-Term Care. New York: G. P. Putnam & Sons, 1956.

Rosenfield, Isadore. Hospitals - Integrated Design. New York: Progressive Architecture Library, Reinhold Publishing Company, 1947.

U.S. Department of Health, Education and Welfare. Public Health Service. Design and Construction of General Hospitals. New York: F. W. Dodge Corporation in collaboration with Modern Hospital Publishing Company, Chicago, Illinois, 1953.

Wheeler, E. Todd. Hospital Design and Function. New York: McGraw-Hill Book Company, 1964.

Reports - Published

American Society of Planning Officials, Planning Advisory Service. Nursing Homes. Information Report No. 185. Chicago, Illinois: American Society of Planning Officials, 1964.

_____. Off-Street Parking Requirements. Information Report No. 182. Chicago, Illinois: American Society of Planning Officials, 1964.

_____. Zone Locations for Hospitals and Other Medical Facilities. Information Report No. 50. Chicago, Illinois: American Society of Planning Officials, 1953.

Baltimore City Planning Commission. Proposed Zoning Ordinance. Baltimore, Maryland, 1962.

Boylan, Myles. Site Location Study Gratiot Community Hospital: A Description and Appraisal of the Factors that Influence the Selection of a Site for the Proposed Community Hospital. East Lansing, Michigan, 1953.

Cape May County Planning Board. County Government: Structure and Building Space Needs. Cape May County, New Jersey, 1960.

Chicago Plan Commission and the Office of the Housing and Redevelopment Coordinator in Cooperation with the Medical Center Commission and the Chicago Park District. The Medical Center District Planning Analysis and Recommendations. Chicago, Illinois, 1949.

Citizens Study Committee, Northeast Ohio. "Findings" About Hospitalization "Abuses" . . . and . . . Determine Hospital Expansion Needs, Parts II, IV, XI and XII Summary. Cincinnati, Ohio: Hospital Care Corporation, 1959.

Detroit Medical Center Citizens Committee. The Detroit Medical Center. Detroit, Michigan, 1958.

Inter-County Regional Planning Commission. Standards for New Urban Development. Denver, Colorado, 1960.

Lansing City Planning Board. Comprehensive Master Plan: Lansing and Environs. Lansing, Michigan: Ladislas Segoe and Associates, 1958.

Levin, David R. Parking Requirements in Zoning Ordinances: A Supplement to Bulletin 24, Bulletin 99. Washington, D.C.: Highway Research Board, National Research Council, 1955.

_____. Requirements for Off-Street Automobile Parking Facilities in Zoning and Other Local Ordinances, Bulletin No. 24. Washington, D.C.: Highway Research Board, National Research Council, 1950.

Maryland - National Capital Park and Planning Commission. Hospital Study for Prince George's County, Md. Silver Springs, Maryland, 1965.

Medical Center Commission State of Illinois. A Look to the Future Medical Center District -- Chicago. Chicago, Illinois, 1949.

Michigan Health Facilities Planning Council. A Guide to Long-Range Planning for Institutional Long-Range Planning and Development Committees. Lansing, Michigan, 1960.

_____. Guide and Suggested Procedures for the Development and Operation of Regional and Metropolitan Area Health Facilities Planning Councils. Lansing, Michigan, 1965.

_____. Guide and Suggested Procedures for Use by a Health Facility Long-Range Planning Committee, A Working Draft. Lansing, Michigan, 1965.

North Carolina Department of Conservation and Development, Division of Community Planning. Community Facilities Plan, Mount Airy, North Carolina. Raleigh, North Carolina, 1961.

_____. Community Facilities Plan, Salisbury, North Carolina. Raleigh, North Carolina, undated (early 1960's).

Oakland City Planning Commission. Medical Center Hill. Oakland, California, 1959.

Rosenthal, Gerald D. The Demand for General Hospital Facilities. Hospital Monograph Series No. 14. Chicago, Illinois. American Hospital Association, 1964.

Tri-County Regional Planning Commission, Lansing, Michigan. Health and Welfare Facilities an Inventory -- June 1964, Part III Community Facilities Study. Lansing, Michigan, 1964.

Journals or Magazines

Carlova, John. "Medicare: How Hospitals are Preparing." Medical Economics. March 21, 1966, p. 48.

Haire, Edgar B. "Fitting the Hospital into the Regional Plan." Hospitals, Journal of the American Hospital Association. May 1, 1966, pp. 47-52.

Hospitals, Journal of the American Hospital Association. Guide Issue, Part Two (August 1, 1956, August 1, 1961, August 1, 1965, August 1, 1966).

Journal of the American Medical Association. May 15, 1954.

Rosenfeld, E. D., M. D. "Regional Organization of Hospital Services." Hospitals, Journal of the American Hospital Association. May 1, 1966, p. 41.

Public Documents

Joint Committee of the American Hospital Association and Public Health Service. Areawide Planning for Hospitals and Related Health Facilities. Washington, D.C.: U.S. Department of Health, Education and Welfare, Public Health Service, Government Printing Office, 1961.

_____. Areawide Planning of Facilities for Long-Term Treatment and Care. Washington, D.C.: U.S. Department of Health, Education and Welfare, Public Health Service, Government Printing Office, 1963.

Michigan Department of Public Health. Michigan State Plan for Hospital and Medical Facilities Construction, 1965-66. Lansing, Michigan, 1966.

New York, N. Y. Zoning Resolution. 1961.

U.S. Department of Health, Education and Welfare. Public Health Service. Characteristics of Nursing Homes and Related Facilities: Report of a 1961 Nationwide Inventory. Washington, D.C.: Government Printing Office, 1963.

_____. Elements of Progressive Patient Care. Washington, D.C.: Government Printing Office, 1959.

_____. Health, Education and Welfare Trends: 1964 Edition. Washington, D.C.: Government Printing Office, 1964.

_____. Hill-Burton Progress Report, July 1, 1947 - June 30, 1965. Washington, D.C.: Government Printing Office, 1965.

_____. Nursing Homes and Related Facilities Fact Book. Washington, D.C.: Government Printing Office, 1963.

_____. Principles for Planning the Future Hospital System: A Report on Proceedings of Four Regional Conferences. Washington, D.C.: Government Printing Office, 1959.

_____. Procedures for Area Wide Health Facility Planning: A Guide for Planning Agencies. Washington, D.C.: Government Printing Office, 1963.

_____. Public Health Service Regulations -- Part 53: Pertaining to the Construction and Modernization of Hospital and Medical Facilities. Washington, D.C.: Government Printing Office, December 29, 1964 as amended through August 11, 1965.

_____. Supplement to the Public Health Service Regulations -- Part 53: Pertaining to the Construction and Modernization of Hospitals and Medical Facilities. Washington, D.C.: Government Printing Office, August 11, 1965.

_____. The Progressive Patient Care Hospital: Estimating Bed Needs. Washington, D.C.: Government Printing Office, 1963.

U.S. Department of Commerce. Bureau of the Census. Statistical Abstract of the United States: 1964. 85th Edition. Washington, D.C.: Government Printing Office, 1965.

_____. Statistical Abstract of the United States: 1965. 86th Edition. Washington, D.C.: Government Printing Office, 1966.

Unpublished Material

Brown, Ray E. "Factors Affecting Hospital Cost and Use." Address delivered at the Ohio Hospital Association Convention, April 5, 1960.

Greater Cincinnati Hospital Council. Studies of Long-Term Patients that could be transferred to extended-care facilities from acute general hospitals in Northern Kentucky, May, 1965 and June, 1966.

Harland Bartholomew and Associates. Memorandum on off-street parking requirements in recent zoning ordinances. St. Louis, Missouri, 1962.

Interviews

Cronin, Jack. Assistant Director, Greater Cincinnati Hospital Council. Cincinnati, Ohio, July 19, 1966.

Drummond, Malcolm. Associate Partner, Harland Bartholomew and Associates. By telephone. St. Louis, Missouri, July 19, 1966.

Rathbon, Keith. Administrative Analyst, Michigan Department of Health. Lansing, Michigan, August 4, 1966.

Reichert, Robert E., M. D. Member, Northern Kentucky Hospital Study Committee. Covington, Kentucky, July 17, 1966.

Roth, George. Potter, Tyler, Martin and Roth, Architects. Cincinnati, Ohio, July 20, 1966.

Sibley, Hiram. Executive Director, Hospital Planning Council for Metropolitan Chicago, Inc. Chicago, Illinois, June 7, 1968.