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The Closing of Homer G. Phillips Hospital and Its Effect on the Infant Mortality Rate of the City of Saint Louis

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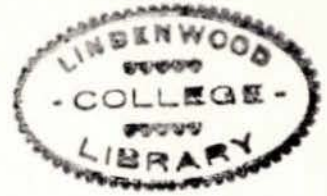
THE CLOSING OF HOMER G. PHILLIPS HOSPITAL
AND ITS EFFECT ON THE INFANT MORTALITY RATE
OF THE CITY OF SAINT LOUIS

CHARLES E. CRAWFORD, JR., B.S.

A Culminating Project Presented to the Faculty of the Graduate School
of the Lindenwood Colleges in Partial Fulfillment of
the Requirements for the Degree of
Master of Science

1983

Thesis
C856C
1983



This project is dedicated to Ruth Jackson Crawford,
my wife and best friend, whose faith and encouragement
enabled me to complete this work.

Advisors

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Faculty Advisor

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ABSTRACT

The infant mortality statistics in any country reflect the social and economic well-being of its citizens. In the United States the infant mortality rate is regarded as a key indicator of the level of health of the population and by implication, as a measure of the effectiveness of the nation's health delivery system. Further, it is believed by public health workers in our country:

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The effect on the infant mortality rate as related to the closing of the Holt House care public hospital to an increasingly depressed community is observed. Statistical analysis of the data available in this study indicate that the closing of this hospital had little or no effect on the infant mortality rate of the service area of this hospital for the time period under observation.

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ABSTRACT

The infant mortality statistics in any country reflect the social and economic well-being of its citizens. In the United States the infant mortality rate is regarded as a key indicator of the level of health of the population and by implication, as a measure of the effectiveness of the nation's health delivery system. Further, it is believed by some that infant mortality is the single most important public health problem in this country.

The effect on the infant mortality rate as related to the closing of the only acute care public hospital in an economically depressed community is observed. Statistical analysis of the data available to this study indicate that the closing of this hospital had little or no effect on the infant mortality rate of the service area of this hospital for the time period under observation.

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CHAPTER I

INTRODUCTION

The closing of a major public acute care facility in an economically depressed urban area such as north Saint Louis may be expected to have many effects. These effects may be social, medical, legal, economic, political or others. These effects may be simple or very complex, and very often the effects are far-reaching, affecting the lives of many people both inside and outside of the immediate area served by that facility.

RESEARCH SETTING

The primary objective of this study is to observe the effects of the closing of Homer G. Phillips Hospital on the infant mortality rate in Saint Louis and particularly in the Northside area formally served by this hospital as indicated on map 1.

The setting to be studied is the health care system of a large metropolitan area (population 507,995). Since 1970 the population of this area has had the highest percent of families in poverty and the highest resident death rate due to cancer, heart disease, cerebrovascular disease, cirrhosis of the liver, homicide, influenza/pneumonia, and diseases of early infancy of nine counties in the region. Detailed health status for this area is generally not available, however, Map 2 indicates the percentage of persons who

perceived their health status to be "poor" or "very poor" when surveyed in 1975.

HYPOTHESIS:

The closing of the only public acute care health facility in an economically depressed community will have a negative effect on the infant mortality rate of that community.

ALTERNATE HYPOTHESIS:

The closing of the only public acute care health facility in an economically depressed community will have little or no significant effect on the infant mortality rate of that community.

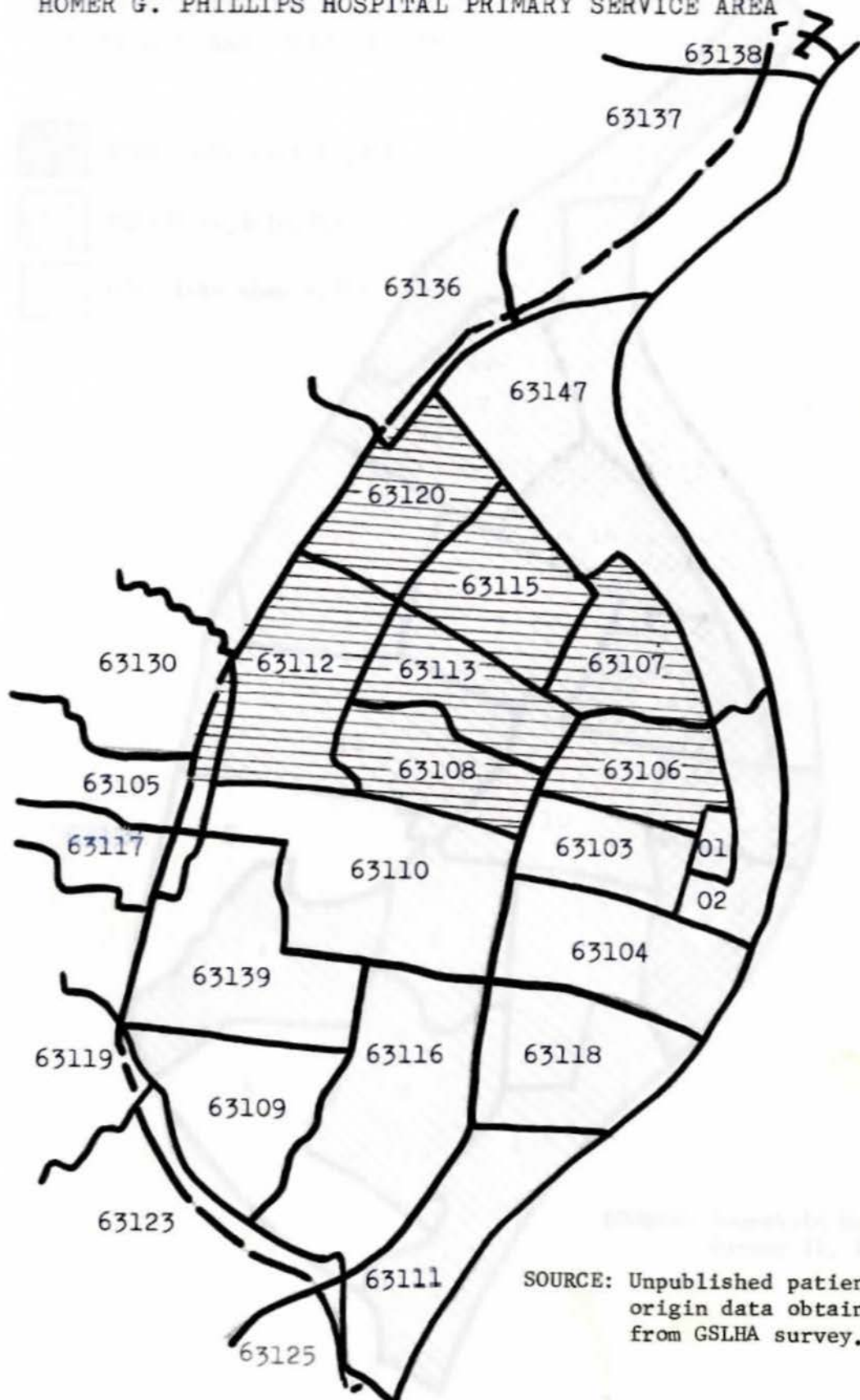
METHOD:

The effect on the infant mortality rate caused by the closing of Homer G. Phillips Hospital as an acute care facility will be examined in the following ways:

- 1) Statistical analysis will be made of the infant mortality rates during a 3 year period immediately before and a 3 year period immediately after the closing of this hospital.

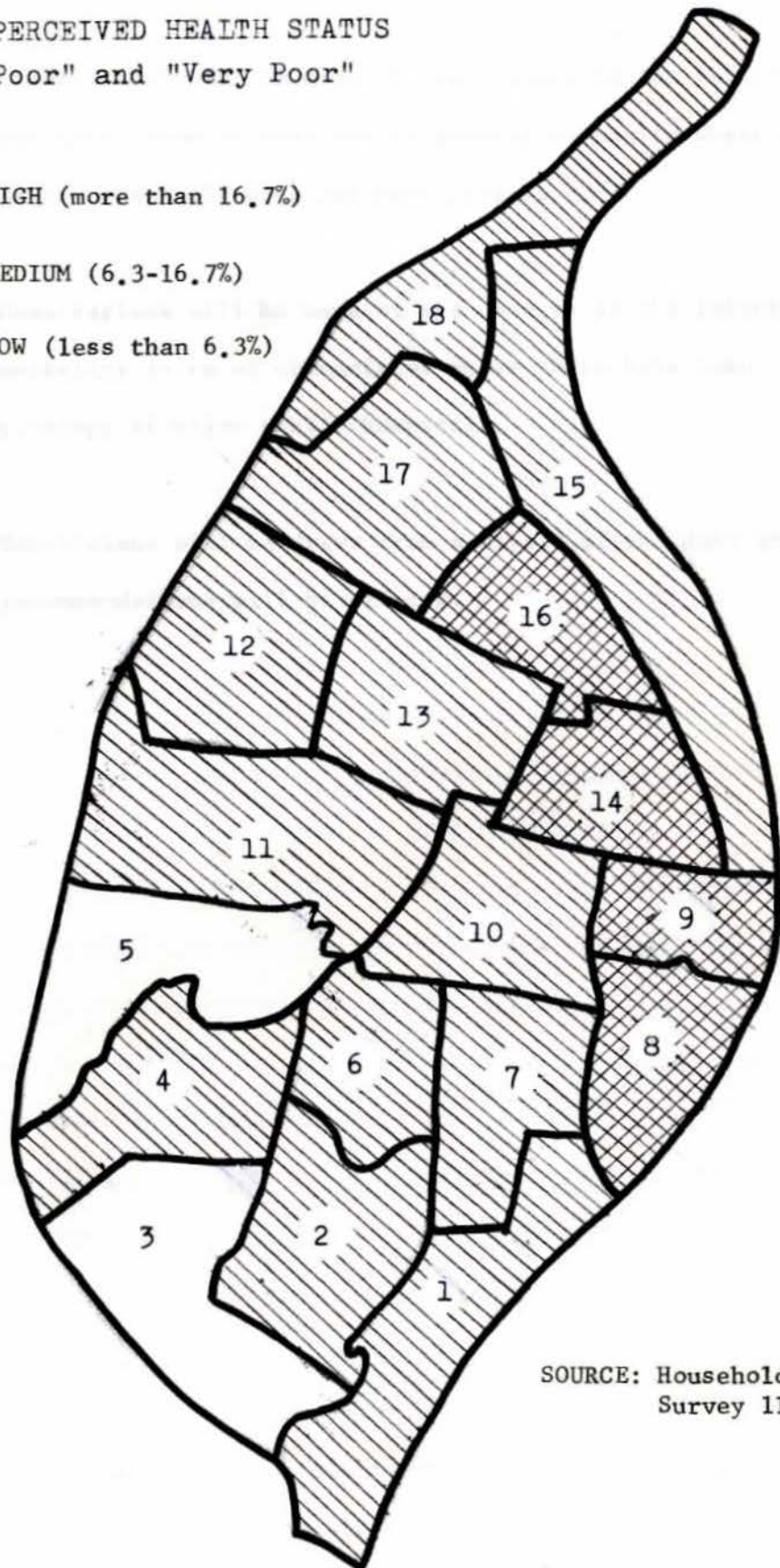
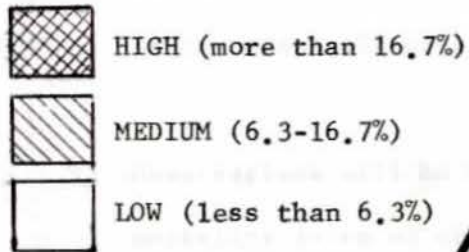
MAP 1

HOMER G. PHILLIPS HOSPITAL PRIMARY SERVICE AREA



SOURCE: Unpublished patient origin data obtained from GSLHA survey.

MAP 2

SELF PERCEIVED HEALTH STATUS
% "Poor" and "Very Poor"

SOURCE: Household Health Survey 11, 1975.

- 2) A comparison will be made of the changes in the infant mortality rate as observed in another community where major public hospitals have not been closed.
- 3) Observations will be made of the changes in the infant mortality rates of communities where there have been closings of major public hospitals.
- 4) Conclusions will be drawn from analysis of the data and recommendations will be offered.

CHAPTER II

BACKGROUND

On August 17, 1979 Homer G. Phillips Hospital was closed as an acute care health facility. The closing of the only public hospital on the city's Northside caused much consternation, particularly in the predominantly black community which was served by this hospital. Map 2 delineates the primary service area of Homer G. Phillips. The closing received much media coverage because of the political ramifications of this move.

The historical importance of Homer G. Phillips Hospital to the black community is worthy of note. Actually, the history of Homer G. Phillips Hospital began long before the hospital became a reality. During the early 1900's (Davis, 1970, p. 9) members of Saint Louis' black community became increasingly sensitive to the inequality of the medical training programs open to Blacks in the city. They protested that taxes from black citizens supported municipal hospitals where only white physicians were trained. Attempts by the black community to bring about a change in hospital policy to provide for the training of black and white physicians simultaneously at the same institution were met by threats of strike by white doctors at city hospital (Davis, 1970, p. 11).

In 1914 a committee of seventeen concerned black physicians, led by Dr. C. K. Robinson, appealed to and convinced city officials to purchase the vacant Barnes Hospital buildings at Garrison and

Lawton Avenues on their behalf for the express purpose of establishing a health care facility for black doctors and their patients. Upon completion of some much needed renovations, the facility was named City Hospital No. 2 and began admitting patients in November, 1919. Scarcely two years after the hospital was opened, however, it became apparent that this old 177 bed facility was too small to fulfill its real need. The committee of seventeen was reorganized and the battle for what is now Homer G. Phillips Hospital began.

It is said that the single most important force behind the acquisition of a new hospital for blacks was Homer G. Phillips. Phillips, born in 1880 at Sedalia, Missouri, was the son of a Methodist minister. He attended Howard University Law School and later became a power in Saint Louis republican politics. In 1922 Phillips gave his support to an \$87 million city bond issue with the understanding that \$1 million of that amount would be used to build a new city hospital for blacks. After the bond issue passed, attempts were made to break the original pledge and to use the funds to build a less costly "colored annex" to City Hospital No. 1. Phillips fought these efforts as attempts to divert funds and to renege on the promises which had been made to gain his support and the support of the black community in passing the bond issue. In an unrelated incident (Floyd, 1979, p. 20), Phillips was killed on June 18, 1931 as he waited for a streetcar to carry him downtown to his law offices. Phillip's fight for the new hospital was carried on by others and finally the Saint Louis Aldermanic Public Welfare Committee voted to construct a new hospital on the near north side and to name it Homer G. Phillips Hospital. Construction began in 1932 and the hospital was finally completed and dedicated on

Monday, February 22, 1937 (Davis, 1970, p. 12).

The struggle to reopen Homer G. Phillips Hospital began immediately after it was closed on August 17, 1979. The Ad Hoc Committee to Save Homer G. Phillips Hospital and All Public Hospitals, a parent organization of the Campaign for Human Dignity, filed a class action suit in federal court charging that the city violated Title VI of the 1964 Civil Rights Act by depriving the predominantly black Northside of its only public hospital (Thompson, 1982, p. 1). The Campaign for Human Dignity collected more than 48,000 signatures on a petition to place the issue of reopening the hospital before the voters in April, 1981. The question of reopening Homer G. Phillips Hospital turned into a "political football" causing grief and friction throughout the city.

This kind of citizen response is not a new concept (Hyman, 1975, p. 241). Traditionally citizen participation has been limited to the political arena, primarily through the tools of letter writing, voting, and campaign activities. This traditional form of participation is defined by Dr. Sidney Verba (Hyman, 1975, p. 242) as "referring to acts by those not formally empowered to make decisions--acts being intended to influence the behavior of those who have such decisional power."

In planning the closing of health care institutions, most health care planners have to deal with the conflicting self-interests of various individuals and organizations as the planning and implementation activities get underway. At this point, there may be some thought about the public interest versus the private interest. Public interests, according to Spiegel and Hyman (Spiegel, 1978, pp. 306-307), are served if the decision furthers the ends of the whole public rather than the

ends of some specific sector. Private and special interests are served by decisions that further the ends of some part of the public at the expense of the ends of the larger public. Spiegel and Hyman further point out that powerful interest groups strongly represent their adherents to make sure that their areas of interest are not encroached upon in any implementation activity.

According to a recent survey (Sutin, 1982, p. 11) Saint Louis now has 1,740 hospital beds south of U. S. Highway 40. North Saint Louis has only two hospitals with a total of 499 beds, Saint Luke's East and Central Medical Center. This survey does not include the Barnes Hospital complex just north of Highway 40 and east of Kingshighway, nor the Saint Louis University medical complex on South Grand Boulevard north of Interstate 44 and City Hospital.

Since 1968 six hospitals formally located on the north or near northside of Saint Louis have either moved to the more affluent Saint Louis County or have closed. Of these hospitals, five were private (Missouri Baptist, DePaul, Faith, Christian, and Community) while Homer G. Phillips was a public hospital, a part of the City of Saint Louis health and hospitals system. During this same time period, only one hospital, Central Medical Center, came into being. Thus, north Saint Louis had a net loss of five hospitals in a period of less than fifteen years.

Since the closing of Homer G. Phillips Hospital as an acute care facility, the Hospital Division has provided outpatient services at Max C. Starkloff (City Hospital) and Homer G. Phillips Hospital. Clinical speciality services such as family planning, obstetrics, gynecology, prenatal, post-partum, surgery, pediatrics, post-hospitalization follow-

up, and other clinical support services are available at these facilities. Fully equipped emergency medical services are also provided at both facilities on a 24-hour basis. The idea of providing more outpatient services seems to be in keeping with a national trend which has shown that the number of hospital outpatient visits has more than quadrupled during the last decade (Rosenberg, 1982, p. 154). Most of these increases have been due to the emergence of the hospital Emergency Room as the afterhours doctor's office. With new technology enabling more care to be given on an outpatient basis, and with insurance coverage expanding to pay for it, many hospitals have begun to provide a wide range of ambulatory services. In 1980 more than 3,000 of the nation's hospitals were operating at least one organized ambulatory care program (Rosenberg).

It is believed by some health care professionals that the aforementioned ambulatory services at Home G. Phillips Hospital have not been fully utilized primarily because many people in the community do not realize that the facilities are available to them. They mistakenly believe that the closing of Homer G. Phillips meant the loss of all facilities at that institution.

Chapter III

LITERATURE REVIEW

A review of the literature revealed many instances in which political, social, economic and other effects could be caused by the closing of public hospitals but we could find no data addressed specifically to measuring the effects such closings may have had on health indicators such as infant mortality rates.

As early as 1964 Clifford touched on the problem when he demonstrated that reduction of infant mortality hinges on the prevention of prematurity (Clifford, 1964, pp. 243-249). Clifford's conclusions were, "The prevention of prematurity, in turn, can only come by improving the existing maternity services and by providing such services where they do not exist."

Carl Erhardt (Erhardt, et al., 1970, p. 751) presented data which indicated that infants delivered in municipal hospitals experience the highest early (under seven days) neonatal mortality. Erhardt and his colleagues conjectured that lower mortality among the infants of mothers in lying-in services is probably accounted for as much by the character of their environment and their socio-economic status as by the quality of their care. The Saint Louis experience for the year 1976 is presented in table 1.

Philadelphia General Hospital was an 803 bed municipal hospital, similar in many respects to Homer G. Phillips Hospital. A major teaching institution for decades, it began to go into decline in the

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Table 1
 Recorded Live Births, Recorded Fetal Deaths and
 Resident Fetal Deaths by Race and Place of Delivery
 Saint Louis, Missouri 1976

| Place of Delivery | Recorded Live Births | | | Recorded Fetal Deaths | | | Residential Fetal Deaths | | |
|----------------------|-------------------------|--------------|---------------|--------------------------|-----------|---------------|-----------------------------|-----------|---------------|
| | Total | White | Non- White | Total | White | Non- White | Total | White | Non- White |
| Barnes Group | 3,569 | 1,179 | 2,390 | 36 | 18 | 18 | 18 | 3 | 15 |
| Booth Memorial | 172 | 148 | 24 | 1 | 1 | 0 | 0 | 0 | 0 |
| Deaconess | 1,035 | 581 | 454 | 9 | 4 | 5 | 3 | 2 | 1 |
| DePaul | 2 | 0 | 2 | 2 | 0 | 2 | 0 | 0 | 0 |
| Jewish | 1,560 | 659 | 901 | 14 | 4 | 10 | 8 | 1 | 7 |
| Lutheran | 780 | 757 | 23 | 10 | 10 | 0 | 5 | 5 | 0 |
| City | 1,360 | 513 | 847 | 21 | 3 | 18 | 21 | 3 | 18 |
| Phillips | 1,097 | 5 | 1092 | 15 | 0 | 15 | 13 | 0 | 13 |
| St. Luke's | 0 | 0 | 0 | 4 | 0 | 4 | 4 | 0 | 4 |
| Home | 17 | 15 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Unknown | 63 | 40 | 23 | 10 | 3 | 7 | 9 | 3 | 6 |
| TOTALS | 9,655 | 3,897 | 5,758 | 122 | 43 | 79 | 81 | 17 | 64 |

SOURCE: St. Louis Statistical
 Abstract, 1977.

1960's (Friedman, 1978, pp. 69-70). Some observers believed that the advent of Medicaid and Medicare, which theoretically allowed patients to be treated in any hospital they chose, was a major factor contributing to the decline in occupancy at Philadelphia General. Another factor cited was the inability of the city to continue to fund the hospital at the level necessary to maintain its aging physical plant and expensive teaching programs. The fact that this city's not-for-profit hospitals were treating a larger percentage of indigent and Medicaid patients may also have contributed to the decision to close the hospital.

Negative press reaction was only one of the many problems encountered. Hospital employees staged massive protests claiming that to close Philadelphia General Hospital would be to deny health care to the poor; a coalition of civic, community, and church organizations was formed to force the city to keep the hospital open; and the house staff protested the loss of a major teaching facility. The bitterness produced by the ensuing battle is still evident after almost 5 years after Philadelphia General was formally closed as an acute care hospital in June of 1977. The city has since inaugurated a system of HMO-like district health centers to meet its health care obligations, and the voluntary hospital system has tried to absorb as many former Philadelphia General patients as possible, but there is still public anger and resentment. We were unable to find studies of the impact this closing may have had on the infant mortality rate of Philadelphia.

In New York substantial attention was focused on the issue of hospital closure in 1976 when two of their municipal hospitals were shut down (Pleines, 1980, p. 16), and again more recently when concern about the viability of three hospitals in ghetto neighborhoods were revealed

in the newspapers. Large amounts of health care services, thousands of jobs, and real neighborhood pride were all serious issues at stake. When these hospitals closed, the affected communities, employees and medical staffs participated in demonstrations and other protest activities against termination of services at their institutions.

In another New York study, Dr. Jean Parker (Medical Tribune, 1983, p. 23) reported data which showed that ectopic pregnancy, the leading cause of maternal mortality, and consequently infant mortality, was three times higher among black women than among white women. Dr. Parker's data also showed that nonwhite maternal mortality rates declined from 113.1 in 1965-1969 to 48.7 in 1979-1981, a decline of 57 percent. For white women the rate dropped from 25.3 to 15.9 in this period, a drop of 37 percent.

New York has long been concerned about the infant mortality rate. In 1938, on the recommendation of the Special Committee on Infant Mortality of the Medical Society of the County of New York during its investigation into infant mortality, the board of health added to its reporting forms for births and fetal deaths a confidential medical report (Erhardt, et al., 1970, p. 743). It included a series of questions relating to the course of pregnancy and delivery and provided community information which could not otherwise have been conveniently and economically obtained. This may have been the beginning of systematic scientific reporting of data on infant mortality.

Kansas City's approach to their health care delivery problem is an interesting one. Like Saint Louis' aging Max Starkloff Hospital, K. C. General Hospital suffered from a poor physical plant, a factor which is said to have contributed greatly to the establishment of this

hospital's reputation of offering a poor quality of health care. Construction of the Truman Medical Center, the cornerstone of Kansas City's program that replaced the old Kansas City General Hospital, resulted from a series of events very similar to those which have taken place in Saint Louis recently. Following a study of the problems at Kansas City General, a non-profit corporation was formed to set up and run a public hospital system for the area. This group, called Truman Medical Center Corporation, worked with public officials from Kansas City and Jackson County to plan for a new facility. In 1967, a \$14 million county bond issue was passed. Passage of the bond issue, coupled with federal funds, financed construction of the Truman Medical Center which serves both Kansas City and Jackson County (Frye, 1982, p. 1).

Data show the use of outside specialists to manage hospitals has expanded greatly since the mid-1970's. Only ten years ago, very few hospitals contracted for their administrative chores to be done by outsiders. By 1980, however, there were 585 hospitals being managed under contract by outside organizations (Richards, 1981, p. 94).

In a report of a study by the Alpha Center (Mickel, 1982, p. 32) were predictions that fiscal problems that have threatened public hospitals through the 1970's will continue to threaten their survival in this decade. Added to their ongoing troubles is the current unhealthy economic climate, particularly for state and local governments whose treasures have been depleted by inflation and competing demands for support of nonhealth programs. "Public hospitals are hurt further by policies of the Reagan Administration that support cuts in federal assistance programs and shift responsibility for many health and social

programs to state and local governments without the resources or taxing authority to meet these new responsibilities," the report said.

Ironically, the study notes, the same economic and political forces that threaten urban public hospitals also generate increased demand for their services. Of the recent health cutbacks, those in Medicaid were the most serious for public hospitals. As more and more people lose eligibility for Medicaid coverage, more uninsured individuals will have no place to go for care except the public hospitals, this report noted. Public hospitals also are witnessing the effects of these federal and state Medicaid cuts through an upsurge in the incidence of "patient dumping," that is, transfers of uninsured patients from voluntary hospitals. The decline in the number of long-term care beds, the closure of state psychiatric hospitals, and cuts in ambulatory care and social welfare programs have been putting pressure on public hospitals (Mickel, et al., 1982, p. 32).

The Health Policy Analysis InterStudy of 1981 (Whalen, 1982, p. 45) looked at samples of hospital closings around the country. One of their conclusions was that in each of the identified closings, with only one or two exceptions, financial pressure was the dominant element precipitating closings. This study concerned itself with only the causes, not the effects of hospital closings.

Chapter IV

RESEARCH DESIGN

To assess the question of whether the closing of Homer G. Phillips Hospital had an effect on the infant mortality rate of the community which it served, a quasi experiment known as the time-series $O_1 O_2 O_3 X O_4 O_5 O_6$ design will be used. Observations of the infant mortality rates before and after the closing will be made. The periods of 1976 through 1978 (O_1, O_2 , and O_3) were chosen to represent the period immediately before the closing. The years of 1980 through 1982 (O_4, O_5 , and O_6) were chosen to represent that time period immediately after the closing. X in the time-series design represents the year 1979 which is the year in which the closing took place.

In a study such as this, certain political, administrative, and ethical considerations preclude use of a "true" experimental design involving random allocation of subjects to treatment and control groups. The time series design is particularly appropriate to use in evaluating programs or situations for which data have been collected for a number of previously consecutive time periods.

The use of the time-series design mode automatically eliminates the threat of the experimenter's own bias, if there be any. In that the data is archival, he can exercise no control over what has already happened to the subjects. Other advantages of this design are in its automatic control of maturational effects and partial control of history effects. This is due to having multiple measurements of the infant mortality rates before Homer G. Phillips Hospital was closed. As in

Shortell and Richardson's example (Shortell and Richardson, 1978, p. 55), if the change in infant mortality rate from period O_3 to O_4 were due to changes in the general health of expectant mothers, this effect should have also been observed in the earlier time periods, that is, between O_1 and O_2 and between O_2 and O_3 . Similarly, if the O_3 and O_4 decrease in infant mortality can be explained by a historical event such as extensive public media coverage of prenatal health care, this should also have been true in earlier time periods (O_1 to O_2 and O_2 to O_3) when similar historical events must have also occurred.

Most of the usual threats to the internal validity of this kind of study are not present or can be explained away.

- 1) History: There were no major historical changes taking place between the time data was collected related to the pre-closing and post-closing infant mortality rates. In order for history to be a plausible alternative explanation of O_3 to O_4 changes in infant mortality rates, the event would have to have been unique and specific for that time period only and not to immediately preceding time periods. We have no evidence of any such historical event, therefore, historical effects are eliminated as a threat to the internal validity of this study.
- 2) Maturation: All of the infants in this study were of the same age group, that is, less than one year of age at the time of death, therefore, maturation cannot be considered as a threat to the internal validity.
- 3) Testing: Because no pretests were given, testing effects can be eliminated as a threat to the internal validity.

Generally, testing will not be a threat because if O_2 to O_4 changes were due to testing effects, they should also have been observed during O_1 to O_2 and O_2 to O_3 time periods

- 4) Instrumentation: Because this study did not involve observers or interviewers as "instruments", the threat that the observer or interviewer may have experienced boredom or fatigue over the different observation periods is eliminated.
- 5) Selection: Since there is no control or comparison group, selection is not a factor. The two groups under study were from the same general population and were in naturally occurring groups. They were not randomly assigned to either group for this study.
- 6) Attrition: In this study attrition is controlled by the fact that the data is archival, therefore, none of the subjects had the opportunity to drop out of the study.
- 7) Regression: These effects are generally not a problem with time-series designs because such effects generally disappear over time. Thus, if women with high maternal risk factors had been deliberately selected, we would expect the infant mortality rate of this group to naturally regress upward toward the mean by the next time period and by the third time period before the closing of Homer G. Phillips will have demonstrated some stability.
- 8) Interaction: The threat to external validity by interaction of selection and testing factors, situational or multiple treatment effects is not present. The use of archival data

eliminated this possible threat.

Data for this study was obtained from published vital statistics of the City of Saint Louis, Saint Louis County, the State of Missouri, Statistical Abstract of the United States, 1981, and from other published sources. Some unpublished data from the Greater Saint Louis Health Systems Agency is also included in this study.

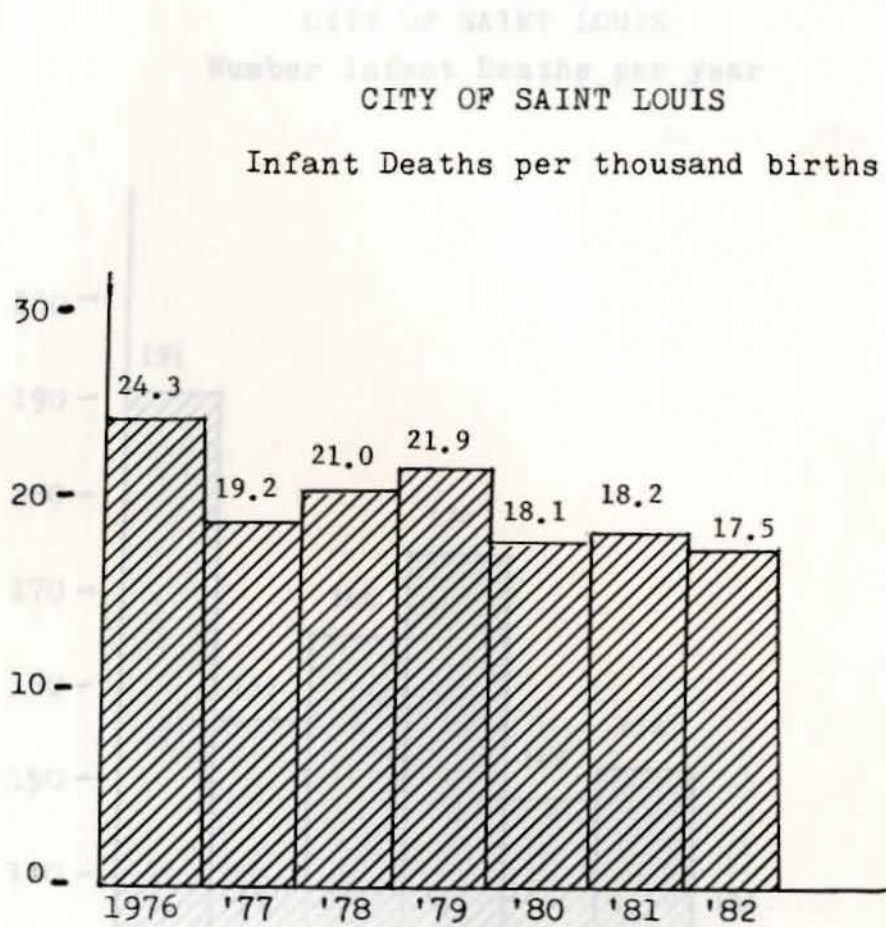
RESULTS

The bar graph of figure 1 demonstrates the changes in infant mortality (infant deaths per thousand births) for the time period under study. During the same time period (1976-1982) the total number of infant deaths per year in the city of Saint Louis showed a trend similar to that of the infant deaths per thousand births. This data is presented in the bar graph of figure 2.

A comparison of these statistics is made with data from Saint Louis County, an area which is generally considered to be affluent as opposed to economically depressed and has had no closing of major acute care hospitals during the time period under observation. The bar graphs of figures 3 and 4 present the infant deaths per thousand births and the total number of infant deaths per year for this area.

When this data is examined to compare the trend in infant deaths per thousand births in the two communities (Saint Louis City and Saint Louis County), it becomes readily apparent that the trends are rather similar. It is also apparent, however, from the bar graph of figure 5 that the total number of deaths per thousand births are consistently lower for Saint Louis County.

Figure 1

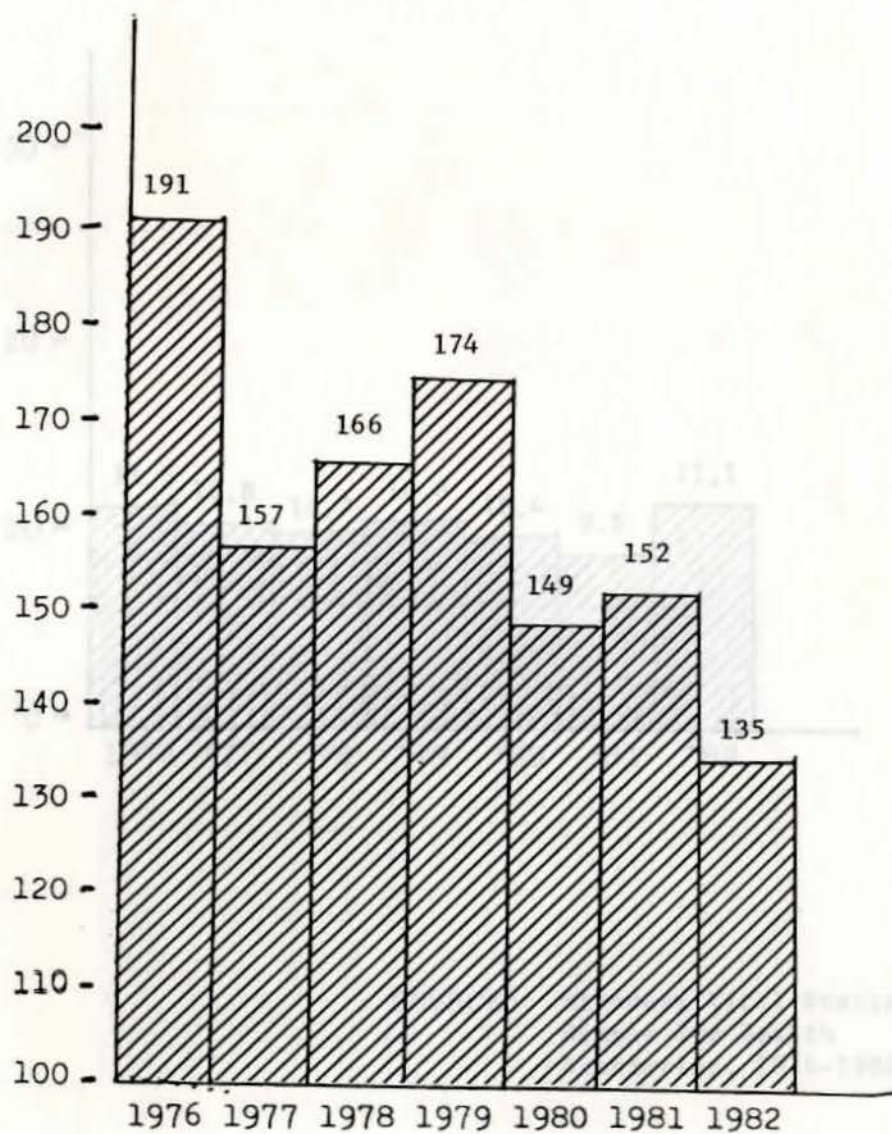


SOURCE: Missouri Vital Statistics
Center for Health
Statistics, 1976-1982.

SOURCE: Missouri Vital
Statistics, Center
for Health Statistics,
1976-1982.

Figure 2

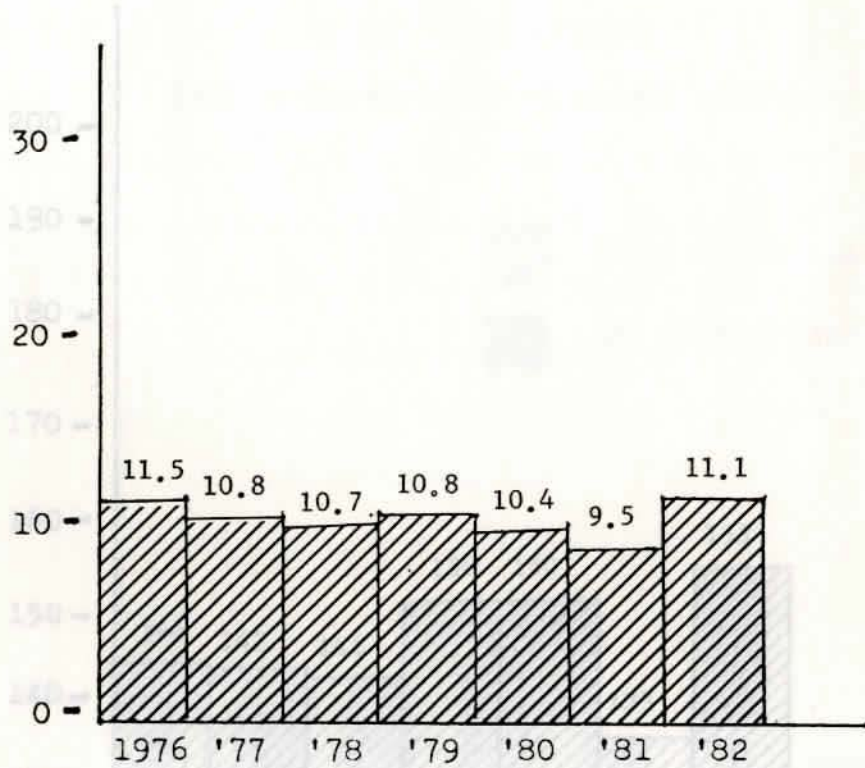
CITY OF SAINT LOUIS
Number Infant Deaths per year



SOURCE: Missouri Vital
Statistics, Center
for Health Statistics,
1976-1982.

Figure 3

SAINT LOUIS COUNTY
Number of Infant Deaths per thousand Births
SAINT LOUIS COUNTY
Infant Deaths per thousand births

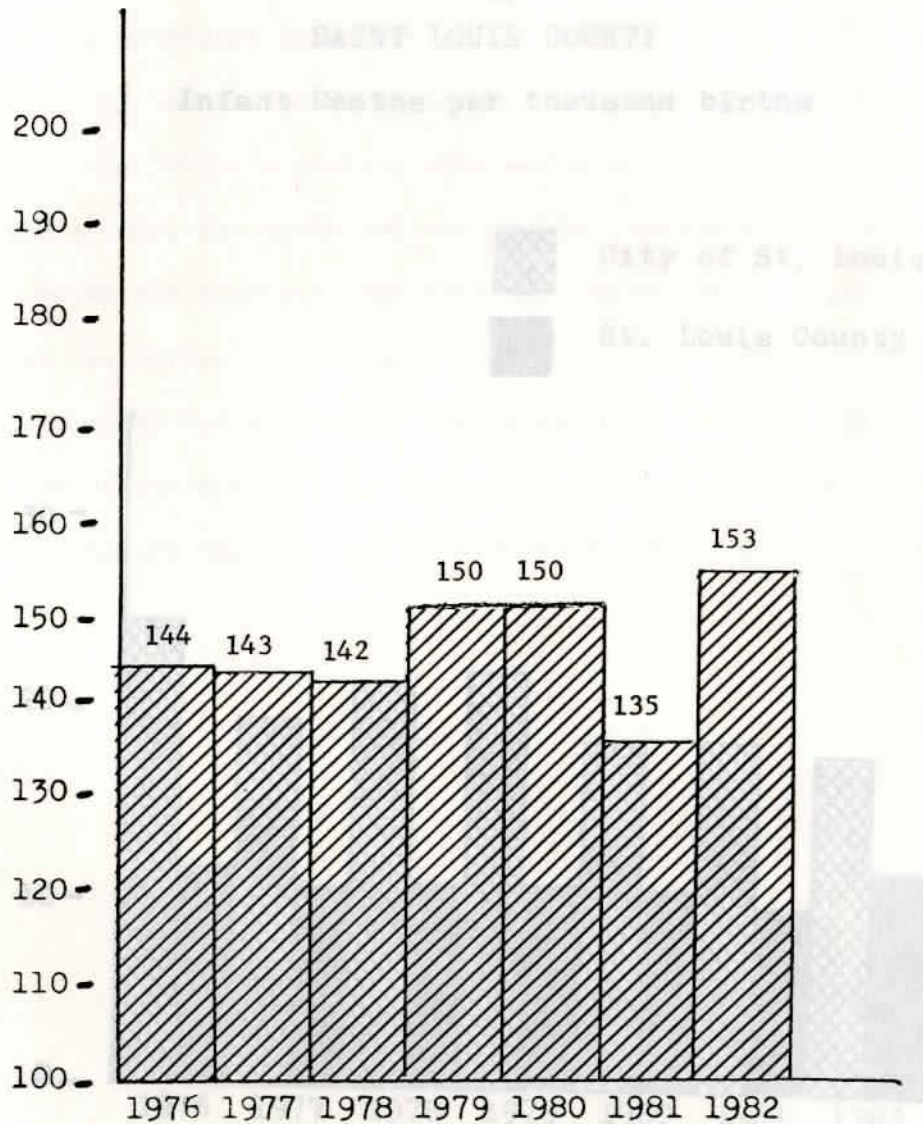


SOURCE: Missouri Vital Statistics,
Center for Health
Statistics, 1976-1982.

SOURCE: Missouri Vital
Statistics, Center
for Health Statistics,
1976-1982.

Figure 4

SAINT LOUIS COUNTY
 Number Infant Deaths per year



SOURCE: Missouri Vital Statistics, Center for Health Statistics, 1976-1982.

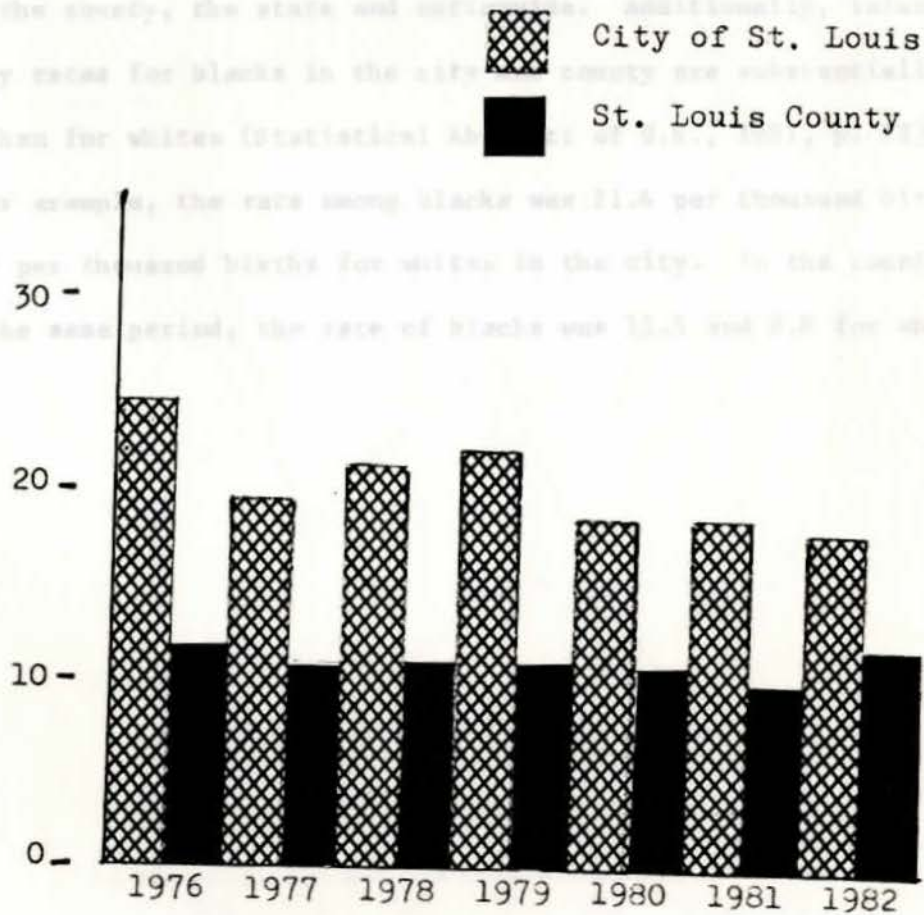
Figure 5

CITY OF SAINT LOUIS

and

SAINT LOUIS COUNTY

Infant Deaths per thousand births



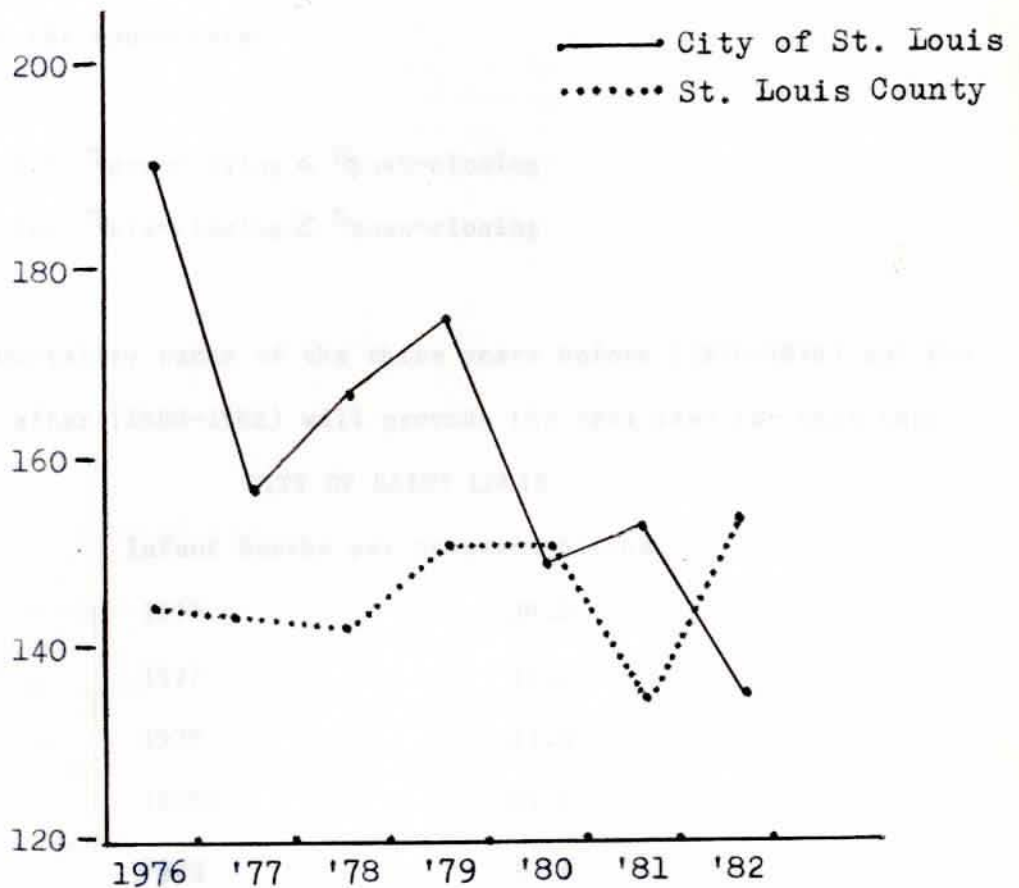
SOURCE: Missouri Vital Statistics
Center for Health
Statistics, 1976-1982.

When we examine the total number of infant deaths per year in these two communities during the period of 1976 through 1982, there appears to be a trend toward a higher number of death in the Saint Louis County area. This may be attributable to the fact taht during this time period the City of Saint Louis had a decrease in population while the County had a significant increase.

With 135 infant deaths reported in the City of Saint louis during 1982, the infant mortality rate was more than 33 percent higher than in the county, the state and nationwide. Additionally, infant mortality rates for blacks in the city and county are substantially higher than for whites (Statistical Abstract of U.S., 1981, p. 73). In 1981, for example, the rate among blacks was 21.4 per thousand births and 13.6 per thousand births for whites in the city. In the county, during the same period, the rate of blacks was 12.5 and 8.8 for whites.

Figure 6

Number of Infant Deaths per year



Source: Missouri Vital
Statistics, Center
for Health Statistics,
1976-1982.

TEST OF THE HYPOTHESIS

Our hypothesis is that the closing of Homer G. Phillips Hospital should have a significant negative effect on the infant mortality rate of Saint Louis. The alternate hypothesis is that the closing of Homer G. Phillips Hospital should have no significant negative effect or a positive effect on the infant mortality rate of Saint Louis. We will calculate the mean and standard deviation of the differences of the infant mortality rates of the two time periods and apply the one tail t-test to test the hypothesis.

$$H_0: \mu_{\text{pre-closing}} < \mu_{\text{post-closing}}$$

$$H_a: \mu_{\text{pre-closing}} \geq \mu_{\text{post-closing}}$$

The infant mortality rates of the three years before (1976-1978) and the three years after (1980-1982) will provide the data base for this test.

CITY OF SAINT LOUIS

Infant Deaths per thousand births

| | |
|-------|------|
| 1976 | 24.3 |
| 1977 | 19.2 |
| 1978 | 21.0 |
| 1979* | 21.9 |
| 1980 | 18.1 |
| 1981 | 18.2 |
| 1982 | 17.5 |

*1979 is the year in which Home G. Phillips was closed.

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The formula for the one-tailed test for our sample is:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

where

$$S_p^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

$$\therefore S_p \sqrt{S_p^2}$$

$$df = n_1 + n_2 - 2$$

and

n_1 = size of sample 1

n_2 = size of sample 2

\bar{X}_1 = mean of sample 1

\bar{X}_2 = mean of sample 2

S_1^2 = variance of sample 1

S_2^2 = variance of sample 2

S_p^2 = pooled variance of sample 1 and sample 2

BEFORE CLOSING

$$X_1 = 24.3 \quad 19.2 \quad 21.0$$

$$n_1 = 3$$

$$\bar{X}_1 = 21.5$$

$$S_{X_1} = \frac{(24.3 - 21.5)^2 + (19.2 - 21.5)^2 + (21.0 - 21.5)^2}{3 - 1}$$

$$= \frac{7.84 + 5.29 + 0.25}{2}$$

$$= 2.587$$

$$\therefore S_1^2 = 2.587^2$$

AFTER CLOSING

$$X_2 = 18.1 \quad 18.2 \quad 17.5$$

$$n_2 = 3$$

$$\bar{X}_2 = 17.9$$

$$S_{X_2} = \frac{(18.1 - 17.9)^2 + (18.2 - 17.9)^2 + (17.5 - 17.9)^2}{3 - 1}$$

$$= \frac{0.04 + 0.09 + 0.16}{2}$$

$$= 0.381$$

$$\therefore S_2^2 = 0.381^2$$

POOLED VARIANCE

$$S_p^2 = \frac{(3 - 1) 2.587^2 + (3 - 1) 0.381^2}{3 + 3 - 2}$$

$$= \frac{13.38 + 0.58}{4}$$

$$S_p^2 = 3.49$$

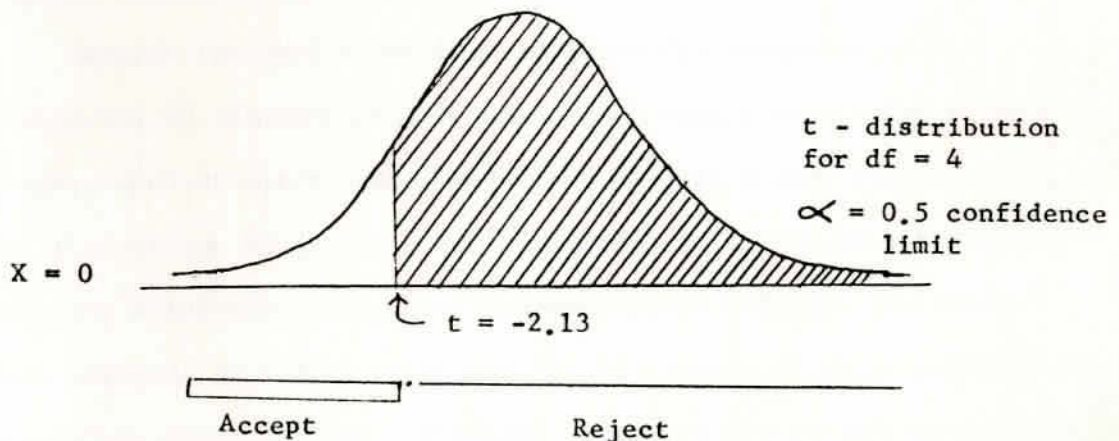
$$S_p = \sqrt{3.49} = 1.868$$

t test

$$t = \frac{21.5 - 17.0}{S_{pv} \sqrt{\frac{1}{3} + \frac{1}{3}}}$$

$$= \frac{3.6}{S_p \sqrt{\frac{2}{3}}}$$

$$= 2.35$$



CHAPTER 4

CONCLUSION

Even a casual observation of health, especially of child health, reveals that the fundamental goals of the health care industry are the reduction of infant mortality have been followed by mixed success by a relatively slow decline. The closing of Homer G. Phillips Hospital as a major care facility caused many to believe that this slow downward trend in the infant mortality rate would be adversely affected and that there would be a sharp increase in infant mortality and other health status.

DECISION

Data from this study tends to indicate that this was not the case. At least in the infant mortality rate is

Since $t = -2.35$ exceeds the limit of -2.13 we reject the hypothesis that the closing of Homer G. Phillips Hospital should have a significant negative effect on the infant mortality rate of the city of Saint Louis and accept the alterante hypothesis that the closing of Homer G. Phillips had little or no significant effect on the infant mortality rate of Saint Louis.

It is interesting to question as to whether the differences between health services groups, needs, and requirements.

Health care health services reflects the viewpoint of the consumer and is probably determined more by social values and social pressures than by health requirements or illness burden. Miller, 1971, p. 18). The actions of groups exert a powerful influence on the consumer's choice of alternatives and by health professionals influence the social values assigned to health services; the statements of child policy made by social leaders contribute to social pressures for health services. Health professionals generally seek attempts to successfully upgrade

Chapter V

CONCLUSION

Even a casual observation of health statistical data will reveal that the substantial gains of the early 20th century in the reduction of infant mortality have been followed in recent years by a relatively slow decline. The closing of Homer G. Phillips Hospital as an acute care facility caused many to believe that this slow downward trend in the infant mortality rate would be adversely affected and that there would be a sharp increase in infant mortality and other health status indicators. Data from this study tends to indicate that this has not been the case, at least so far as the infant mortality rate is concerned.

As we move into an era when optimal health services are demanded by almost every segment of the population, it becomes increasingly important to consider the ability of the health care industry, the city, state, and federal governments to meet the public expectations. A first step in evaluating this question is to recognize the differences between health service demands, needs, and requirements.

Demand for health services reflects the viewpoint of the consumer and is probably determined more by social values and social pressures than by health requirements or illness burden (Weile, 1972, p. 18). The actions of groups exert a powerful influence on the consumer's views: the standards set by health professionals modulate the social values assigned to health services; the statements of public policy made by social leaders modulate the social pressures for health services. Because professionals generally must attempt to continually upgrade

standards, and because social leaders must generally make policy which represents "progress", demands for health services in a socially aware society can always be expected to exceed any existing level of supply (Weil, 1972, p. 19).

The health service needs of a society are rarely equivalent to the health demands. Demands may exceed needs or needs may exceed demands. The need for health service is more the result of political evaluation than of professional judgment or of consumer-oriented value. Health needs are determined in large part by that level of care which will safeguard the public health, and will satisfy, but not necessarily meet, the demands for health services in a manner that is socially acceptable and economically feasible. Health needs do not necessarily reflect existing, average, or optimal levels of care (Weil, 1972, p. 19).

Health requirements generally represent the views of the health professional which are based on disease burden, the state of the art, and concepts of optimal social and individual preventive medicine.

The Saint Louis Post-Dispatch reported recently (Post-Dispatch, 28 March 1983, p. 1) the finding of the President's Commission on Health Care. Chief among its findings is the statement, that, "Society has an ethical obligation to ensure equal access to health care--even at a time of budget cutbacks and fiscal austerity." The Commission concluded that the federal government had the ultimate responsibility for seeing that this ethical obligation was met, "although it did not have to be involved in the health care of all Americans."

The focus of this study has been the impact of the closing of Homer G. Phillips Hospital as an acute care facility upon the infant

mortality rate of that hospital's service area. It is evident from the data available for this study that, while the city of Saint Louis still has an unacceptable level of infant mortality, the trend toward a slow decline in this rate has continued.

We cannot answer such questions as, "Would the decline in infant mortality rates have been greater had Homer G. Phillips Hospital not been closed?" Nor, do we have data to substantiate some popular beliefs that the infant mortality rate might have declined further had not federal cutbacks in maternal and infant care programs been instituted and the poor economy had its influence during this period.

The conclusion which we must draw, therefore, is that the closing of Homer G. Phillips Hospital as an acute care facility had little or no effect on the infant mortality rate of that hospital's service area for the period of time under observation.

GLOSSARY

Live Birth - Infant who shows any evidence of life after complete separation from mother irrespective of duration of pregnancy.

Fetal Death (Stillbirth) - Death of fetus which after complete birth shows no evidence of life.

Total Births - Live births plus fetal deaths.

Neonatal Death - Death of live-born infant in first 27 days.

Perinatal Death - Death of fetuses and newborns occurring before, during, and shortly after the period of birth (7 days).

Birth Rate - Number of live births per 1,000 persons.

Fetal Death Rate - All reportable fetal deaths per 1,000 live births.

Infant Death Rate - The number of live-born infant deaths per 1,000 live births.

Neonatal Death Rate - All live-born infant deaths which occur within the first 28 days of life per 1,000 live births.

Postnatal Death Rate - All live-born infant deaths from 28 days through the first year of life per 1,000 live births.

Perinatal Death Rate - All fetal deaths (501 gm and greater) and all neonatal deaths (early and late up to 28 days regardless of birth weight) per 1,000 live births.

VITA AUCTORIS

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He has been a member of the faculty of Washington University School of Medicine, Department of Pediatrics since 1956 and is presently Director of Research Technical Staff, Research Assistant in Pediatrics, and Chief Pediatric Cardiology Technologist.

APPENDIX A

Infant Mortality by Age, Missouri 1977

Age at Death Number of Deaths Absolute Percentage Cumulative Percentage Risk of Dying

Resident Perinatal, Infant, Neonatal, Postnatal

under 1 hour 75 7.0 7.0 951.13

1-23 hours and Maternal Deaths City of Saint Louis 107.25

1-6 days 250 26.8 60.6 15.18

| Year | Perinatal Deaths | Infant Deaths | Fetal Deaths | Neonatal Deaths | Postnatal Deaths | Maternal Deaths |
|------|------------------|---------------|--------------|-----------------|------------------|-----------------|
| 1976 | NA* | NA | 89 | NA | NA | NA |
| 1977 | NA | NA | 113 | NA | NA | NA |
| 1978 | NA | 174 | 90 | NA | NA | 1 |
| 1979 | 211 | 173 | 89 | 122 | 51 | 0 |
| 1980 | 187 | 151 | 95 | 92 | 59 | 2 |
| 1981 | 192 | 150 | 91 | 101 | 49 | 1 |
| 1982 | NA | 135 | NA | NA | NA | NA |

NA* Data not available

REFERENCE: Missouri, Perinatal Mortality in Missouri, 1977.

Source: Missouri Vital Statistics, Division of Health, 1977

APPENDIX B

Infant Mortality by Age, Missouri 1977

| Age at Death | Number Deaths | Absolute Percentage | Cumulative Percentage | Risk of Dying* |
|--------------------|---------------|---------------------|-----------------------|----------------|
| under 1 hour | 73 | 7.0 | 7.0 | 661.13 |
| 1-23 hours | 292 | 28.1 | 35.2 | 107.15 |
| 1-6 days | 258 | 24.9 | 60.0 | 15.12 |
| 7-27 days | 112 | 10.8 | 70.8 | 1.88 |
| 1-3 months | 141 | 13.6 | 84.4 | 0.54 |
| 3-5 months | 91 | 8.8 | 93.2 | 0.35 |
| 6-11 months | 62 | 6.0 | 100.0 | 0.12 |
| Total under 1 year | 1038 | 100.0 | 100.0 | 1.00 |

*Relative risk of dying for indicate time period compared with risk of dying for the whole first year of life, e.g., risk of dying during the first hour of life is 616 times the risk of dying during the average hour during the first year of life.

SOURCE: Schramm, Perinatal Mortality in Missouri, 1979.

APPENDIX C

Infant Mortality Rates - States 1960- 1978

MISSOURI

| 1960 | White 1970 | 1978 | 1960 | Black 1970 | 1978 |
|------|---------------|------|------|---------------|------|
| 21.4 | 17.0 | 12.2 | 45.6 | 34.5 | 29.2 |

(Deaths per 1000 live births by place of residence. Represents deaths under 1 year old, exclusive of fetal deaths.)

SOURCE: Statistical Abstract of the United States, 102nd ed., 1981.

| | | | |
|-------|---------|---------|---------|
| 1-9 | 21,202 | 78,099 | 27,435 |
| 10-14 | 27,228 | 37,380 | 22,508 |
| 15-19 | 17,770 | 21,932 | 26,293 |
| 20-24 | 14,217 | 20,512 | 19,625 |
| 25-29 | 8,704 | 18,061 | 27,027 |
| 30+ | 2,085 | 5,230 | 7,261 |
| Total | 125,805 | 272,214 | 185,489 |

SOURCE: Missouri Department of Social Services, Division of Health Statistics, 1980

APPENDIX D

Population Estimates by County, by Age, by Sex:

Missouri 1979

| CITY OF SAINT LOUIS | | | | |
|---------------------|----------------|----------------|----------------|--|
| Age in Years | Male | Female | Total | |
| Less than 5 | 19,313 | 18,387 | 37,700 | |
| 5-14 | 34,344 | 33,965 | 68,309 | |
| 15-24 | 44,269 | 47,450 | 91,919 | |
| 25-34 | 31,053 | 35,382 | 66,435 | |
| 35-44 | 21,336 | 26,099 | 47,435 | |
| 45-54 | 21,423 | 27,186 | 48,609 | |
| 55-64 | 22,970 | 31,223 | 54,193 | |
| 65-74 | 19,117 | 30,515 | 49,635 | |
| 75-84 | 8,966 | 18,061 | 27,027 | |
| 85+ | 2,085 | 5,256 | 7,341 | |
| Total | 224,876 | 273,524 | 498,400 | |

SOURCE: Missouri Department of Social Services, Division of Health Statistics, 1980.

SOURCE: Missouri Center for Health Statistics, Feb. 1981

APPENDIX E

Resident Infant Deaths by Age, Cause, and Race
With Rates per 1,100 Live Births: Missouri 1981

| Cause | Race | Number | Rate |
|---|---------|--------|------|
| Gastrointestinal Diseases | White | 3 | 0.0 |
| | Blk/Oth | 3 | 0.2 |
| | Total | 6 | 0.1 |
| Pneumonia and Influenza | White | 7 | 0.1 |
| | Blk/Oth | 2 | 0.2 |
| | Total | 9 | 0.1 |
| Congenital Anomalies | White | 198 | 3.1 |
| | Blk/Oth | 35 | 2.8 |
| | Total | 233 | 3.0 |
| Disorders Relating to Short Gestation and Unspecified Birthweight | White | 31 | 0.5 |
| | Blk/Oth | 12 | 1.0 |
| | Total | 43 | 0.6 |
| Birth Trauma | White | 13 | 0.2 |
| | Blk/Oth | 0 | 0.0 |
| | Total | 13 | 0.2 |
| Intrauterine-Hypoxia and Birth Asphyxia | White | 26 | 0.4 |
| | Blk/Oth | 12 | 1.0 |
| | Total | 99 | 1.3 |
| Respiratory Distress Syndrome | White | 82 | 1.3 |
| | Blk/Oth | 17 | 1.4 |
| | Total | 99 | 1.3 |
| Other Conditions Originating in the Perinatal Period | White | 187 | 2.9 |
| | Blk/Oth | 65 | 5.2 |
| | Total | 252 | 3.3 |
| Sudden Infant Death Syndrome | White | 85 | 1.3 |
| | Blk/Oth | 33 | 2.6 |
| | Total | 118 | 1.5 |
| Accidents | White | 13 | 0.2 |
| | Blk/Oth | 10 | 0.8 |
| | Total | 23 | 0.3 |
| All Other Causes | White | 103 | 1.6 |
| | Blk/Oth | 34 | 2.7 |
| | Total | 137 | 1.8 |

SOURCE: Missouri Center for Health
Statistics, Pub. No. 4.26.

APPENDIX F

Resident Perinatal, Infant, Fetal, Neonatal and
Postnatal Deaths by Regional Planning Commission
Rates per 1,000 Live Births: Missouri 1981

| Regional Planning Commissions | Peri- natal Deaths | Infant Deaths | Fetal Deaths | Neo- natal Deaths | Post- natal Deaths |
|-------------------------------------|--------------------------|------------------|-----------------|-------------------------|--------------------------|
| Major Metro Regions | | | | | |
| East-West Gateway | 16.7 | 12.6 | 7.8 | 8.9 | 3.7 |
| Mid-America | 16.4 | 12.4 | 7.8 | 8.6 | 3.8 |
| Minor Metro Regions | | | | | |
| Southwest Missouri | 17.2 | 12.5 | 8.5 | 8.7 | 3.8* |
| Mid-Missouri | 13.7 | 10.7 | 5.7 | 8.0 | 2.7* |
| MO-KAN | 16.1 | 10.4 | 10.9 | 5.2* | 5.2% |
| Nonmetro Regions | | | | | |
| Northwest Missouri | 19.1* | 15.0* | 9.6* | 9.6* | 5.5* |
| Green Hills | 16.4 | 17.2 | 4.1* | 12.3* | 4.9* |
| Missouri Valley | 24.1* | 13.6* | 15.1* | 9.0* | 4.5* |
| Northeast Missouri | | | | | |
| Mark Twain | 16.2* | 14.7* | 5.9* | 10.3* | 4.4* |
| Boonslick | 23.1 | 15.9 | 10.8 | 12.3 | 3.6* |
| | 14.5* | 10.6* | 6.6* | 7.9* | 2.6* |
| Ozark Gateway | | | | | |
| Kaysinger Basin | 18.4 | 11.4 | 10.1 | 8.3* | 3.1* |
| Show-Me | 16.4 | 13.1* | 9.0* | 7.4* | 5.7* |
| | 13.8 | 13.1 | 5.0 | 8.8* | 4.4* |
| South Central Ozark | | | | | |
| Meramec | 17.0 | 14.5 | 8.2* | 8.8* | 5.7* |
| Lake of the Ozarks | 17.5 | 11.0* | 9.7* | 7.8* | 3.2* |
| | 14.5 | 15.0 | 7.5* | 7.0* | 8.1* |
| Southeast Missouri | | | | | |
| Bootheel | 16.8 | 9.4 | 10.2 | 6.5* | 2.9* |
| Ozark Foothills | 21.0 | 16.9 | 10.7 | 10.4 | 6.5* |
| | 22.6 | 10.3* | 13.4* | 9.3* | 1.0* |
| STATE TOTAL | 16.9 | 12.7 | 8.2 | 8.7 | 3.9 |

*Rate unstable because it is based on fewer than 20 deaths

SOURCE: Missouri Center for Health
Statistics, Pub. No. 4.26.

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