An Assessment and Supplemental Interpretation of Health Status in the East Tennessee Region

by

Jason Little

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Table Of Contents

ASSESSMENT

I. Preface

II. Introduction

III. Methodology

IV. Population

V. Per Capita Income

VI. The Social Environment

VII. The Natural Environment

VIII. Getting The Best Start In Life

- A. Family Planning
- B. Teenage Pregnancy
- C. Pre-Natal Care
- D. Low Birth Weight
- E. Infant Mortality

IX. Building On The Best Start In Life

- A. WIC (Women, Infants, And Children)
- B. Breastfeeding
- C. Immunizations And Vaccine Preventable Diseases
- D. Fluoridated Water

X. Maximizing The Disease-Free State (Staying Healthy)

- A. Tuberculosis
- B. Sexually Transmitted Diseases
- C. Heart Disease

Table Of Contents

(Continued)

D. Cancer

E. Unintentional Injuries

F. Strokes

XI. Addendum

A. Motor Vehicle Crashes

B. Suicides

C. Homicides

D. Lung Cancer

E. Breast Cancer

F. Births To Adolescents

G. Childhood Poverty

SUPPLEMENTAL INTERPRETATION

I. Introduction

II. County Interpretations

III. Regional Graph

IV. Tuberculosis

V. Breastfeeding

Jason Little
University Honors 458

An Assessment and Supplemental Interpretation of Health Status in the East Tennessee Region

ABSTRACT:
To give an initial indication of health status in the fifteen counties of the East Tennessee Region, a health assessment is presented based on an earlier document completed in 1991 by an East Tennessee task force. This earlier document included data for over 25 health status and health service indicators-ranging from pre-natal care to cancer mortality. The more recent assessment uses the same indicators and methodology as its predecessor with several notable changes. The most recent data available have been gathered for a five year period rather than for a one year period; graphs and tables are included to better explain the data; and the county level assignments have been modified. These level assignments depict the severity of each indicator based on how each county compares to the region rates, state rates, US rates, and the year 2000 goals. Thus, counties needing improvement in particular areas are clearly outlined.

In addition to the assessment, a supplemental interpretation of the data is provided. The assessment depicts indicators on a county basis. The supplement shows counties and, thus, the region as a whole on an indicator basis so that a rudimentary picture of health in these areas can be drawn. The counties are ranked and peculiarities in the figures are highlighted. The region was then broken into four status designations similar to the county levels used in the assessment. Status I includes the indicators for which the region must improve by more than 50% of its current level to reach the year 2000 goals. Status II and III are indicators needing an intermediate range of improvement. Status IV includes those indicators for which the region has already surpassed the year 2000 goals.

The results of the study show that there is still a need for improvement in many areas of health status in rural East Tennessee. Therefore, a final discussion of the literature is given for those indicators receiving a Status I rating. Those indicators are tuberculosis and breastfeeding rates and efforts to improve these two indicators are reviewed. This narrative focuses on the current trends in intervention and on expert opinions surrounding the barriers to success.

An Assessment of Health Status in the East Tennessee Region

Second Edition

May 1997

PREFACE

"A Health Assessment of the East Tennessee Region" was first completed and printed in December of 1991. The following document then is not the product of new innovation but is rather an update on a past plan. The subsequent sections entitled "Introduction" and "Methodology" are taken from the first edition of this report. These sections describe how the ideas and the blueprint for this assessment originated. This document follows the same general pattern and uses the most recent editions of the same studies included in the previous work. In the first printing of this report, the data were generally taken from 1986-1990 studies. This document is compiled from the most current data available in each area, usually 1990-1995. It is also worthwhile to note that the first edition of "A Health Assessment of the East Tennessee Region" was published when the Region was composed of 22 counties. The East Tennessee Region is now made up of 15 counties which are herein presented.

INTRODUCTION

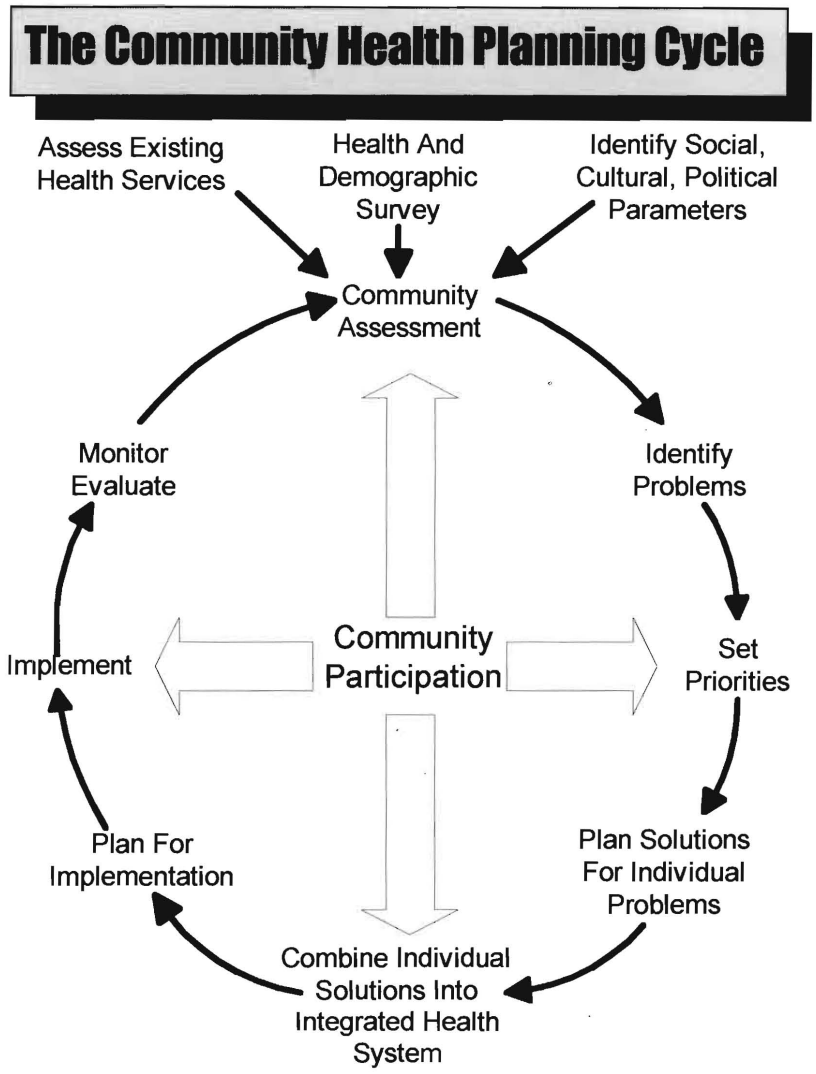
In June 1991, a Task Force designated by the Tennessee Public Health Association met to begin considering how Tennessee would respond to the Institute of Medicine's 1988 report on the Future of Public Health. The discussion of the report extended to include the Health Objectives for the Nation for the year 2000. As a result of this and subsequent meetings, each Region was encouraged to take a hard look at itself -- at the health status of the population, availability and utilization of health services, and further to develop priorities in planning to make the best use of scarce resources.

The East Region pulled together its own task force to address these issues, with the immediate goal of performing a thorough health assessment of the region in preparation for the November 1991 annual meeting of the TPHA. For a period of six weeks, this regional task force reviewed an extensive amount of health and health-related data specific for the region's 22 counties. The results of this health assessment were presented in Nashville at the TPHA meeting: rather than focusing on a single priority issue, the task force emphasized the importance of the process of health planning by a presentation and discussion of the methodology.

This booklet contains the results of the task force's regional health assessment. While this assessment considers many health indicators it is by no means all-inclusive; this assessment should serve more as an impetus to explore these issues at the local level in greater detail, rather than being seen as a comprehensive, "last word" picture of health in East Tennessee. The purpose of distributing this information is to help stimulate the process of health planning at the local level. Indeed it is at that level that the next steps in health planning -- making priorities, then developing, implementing, and evaluating programs are best carried out.

METHODOLOGY

The following diagram depicts what the task force was actually involved in -- the health planning cycle -- which takes one from assessment, to program development, implementation, and evaluation.



In the assessment process, one attempts to describe the health status of a population by reviewing available data as well as by collecting new data through health and demographic surveys. In the short time given to the task force to complete this assessment, the focus was on making the best use of available data rather than attempting to gather new data.

In the assessment process, many health status and health services indicators were reviewed. Recognizing that health outcome is most often the result of many complex interactions, and that individual indicators of health status are difficult to interpret, the data were organized by grouping individual indicators into major, or common areas. For

example, low birth weight as an individual indicator is difficult to fully appreciate without knowledge of the adequacy of pre-natal care, and vice-versa. Both low birth weight and pre-natal care can be extremely important predictors of infant morbidity and mortality -- and it is precisely because of the association between these individual health status indicators that a more meaningful approach to the data can be made by grouping indicators into common areas. We looked at it from the perspective of an individual being conceived, born, then, making it through childhood to adulthood, and finally dying.

Thus, we organized our data by grouping health status and health services indicators into one of three major areas:

1. *Getting the Best Start in Life* -- data related to pre-conception through birth, and early infancy:

- Family Planning
- Teenage Pregnancy
- Pre-natal Care
- Low Birth Weight
- Infant Mortality

2. *Building on the Best Start in Life* -- data related to infancy and early childhood:

- Infant Mortality
- Breastfeeding
- WIC (Women, Infant, and Children)
- Immunizations and Vaccine Preventable Diseases
- Oral Health (Used fluoridated water totals in the recent edition as opposed to DMFS score)

3. *Maximizing the Disease-Free State (Staying Healthy)* -- data related to adult morbidity and the major causes of mortality:

- Tuberculosis
- Sexually Transmitted Diseases
- Heart Disease
- Strokes
- Cancer
- Unintentional Injuries

In order to more fully appreciate these data, that is, to put the data in the proper context, we also looked at two other major areas in regard to health.

- The Social Environment -- Poverty and Education
- The Natural Environment -- Geography, and Air, Land, and Water Pollution

We believed that if we were successful in describing each county's current status relating to these major areas, then we would have made a very strong start on the health planning cycle.

What were we really interested in -- what did we want to see in the data? Recall that this assessment was requested not only to stimulate Tennessee's response to the Future of Public Health, but also as a first step towards engaging in the Health Objectives for the Year 2000. In order to begin on that road to the year 2000, however, it is critically important that we know where we are today. We wanted to be able to not only see where we -- at the county level were, but to be able to compare and contrast this to our regional summary data, state, and national data, and then further contrast this with the health objectives for the year 2000.

METHODOLOGY (Recent Edition)

Data for each individual health indicator were compiled. For most indicators, data covering three to five years have been included, because interpreting rates can often be difficult when limited to one year or to small numbers. For each indicator the county, regional, state, and national figures were determined. In addition, the appropriate health objective for the year 2000 was noted. Since we were most interested in comparing situations at the county level, a scale was developed to denote the severity related to each indicator. A level number I, II, III, or IV was thus assigned to each county (for each indicator) on the basis of how that county compares to the regional, state, US, and Year 2000 figures. A Level I designation means that the county specific rate is more severe than the regional, state, and US figure. That is, Level I counties are in the worst situation for that particular health indicator. A Level II designation indicates counties with intermediate rates -- a rate which may be less severe than the region and state, but more severe than the US figure. Level III indicates counties with rates better than the regional, state, and US rates. While Level III denotes those counties which have surpassed the regional, state, and US totals, it also indicates that the county has not yet reached the Year 2000 objective, however. Level IV then indicates counties which have met the Year 2000 objective -- that is the best situation. The only time that an exception is taken with these level assignments is when either the regional, state, or US figure has already surpassed the Year 2000 goal. In this case, the Year 2000 goal is used as the upper boundary for the Level III designation and the related regional, state, or US total becomes the figure by which Level IV is measured. This was the case in the following six reports:

- Teenage Pregnancy (Surpassed by regional total)
- Fluoridated Water (Surpassed by regional total and state total)
- Motor Vehicle Mortality (Surpassed by US total)
- Homicide (Surpassed by regional total)
- Lung Cancer (Surpassed by US total)
- Breast Cancer (Surpassed by US and regional total)

Following this process of assigning levels I, II, III, or IV for each individual health indicator by county, a summary scoring is then made for each of the major areas according to the number of individual indicators with Level I designation.

Because geography is felt to be of great importance in relation to health status and health services, all of the data have been "mapped." In the following pages a brief explanation of the methodology for each indicator will be made, followed by tables and maps indicating Level I, II, III, or IV designation as well as line graphs demonstrating trends in the data. In all of the maps, red will be used for Level I counties, blue for Level II, green for Level III, and yellow for Level IV. When we present summary maps for the major areas then the legend changes somewhat. The red thus serves as a red flag that a county is in a very dire situation.

As background to the health assessment, tables on the following pages describe population and per capita income by county (TDH 1990-1995).

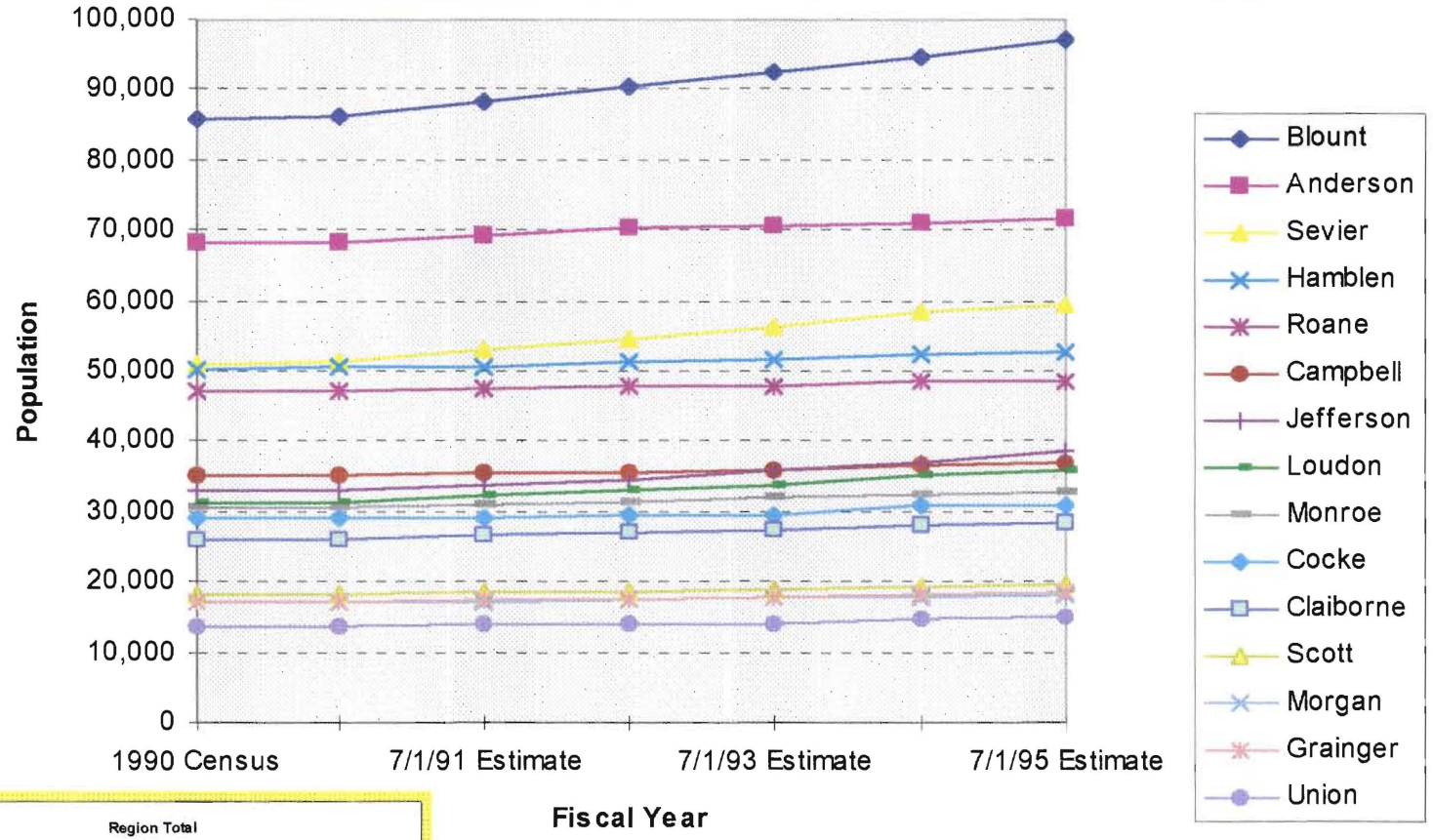
Population Estimates For The East Tennessee Region

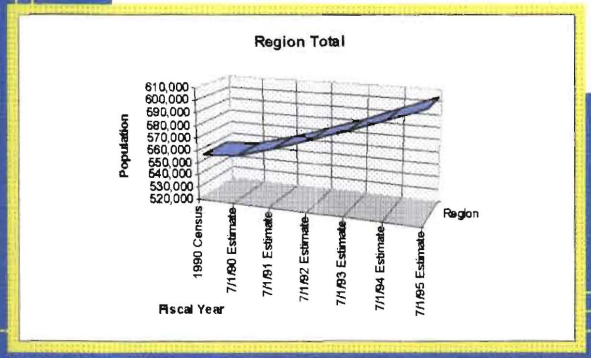
County	*1990 Census*	*7/1/1990 Estimate*	*7/1/1991 Estimate*	*7/1/1992 Estimate*	*7/1/1993 Estimate*	*7/1/1994 Estimate*	*7/1/1995 Estimate*	*Change In Number 1990-1995*	*Rank By 1995 Estimate*
Anderson	68,250	68,397	69,242	70,425	70,773	71,140	71,663	3,413	15
Blount	85,969	86,288	88,361	90,466	92,610	94,546	97,014	11,045	11
Campbell	35,079	35,151	35,393	35,637	36,083	36,485	37,033	1,954	33
Claiborne	26,137	26,185	26,619	27,038	27,492	28,118	28,542	2,405	47
Cocke	29,141	29,183	29,226	29,417	29,684	30,815	31,110	1,969	43
Grainger	17,095	17,146	17,456	17,772	17,923	18,209	18,667	1,572	62
Hamblen	50,480	50,612	50,666	51,411	51,711	52,376	52,763	2,283	21
Jefferson	33,016	33,120	33,837	34,454	36,007	36,965	38,838	5,822	30
Loudon	31,255	31,412	32,220	33,198	33,904	35,104	35,927	4,672	35
Monroe	30,541	30,594	30,837	31,327	31,958	32,358	32,867	2,326	39
Morgon	17,300	17,335	17,398	17,645	17,967	18,066	18280	980	64
Roane	47,227	47,229	47,650	47,903	48,025	48,546	48,607	1,380	22
Scott	18,358	18,375	18,577	18,801	19,010	19,277	19,550	1,192	60
Sevier	51,043	51,372	53,094	54,606	56,430	58,281	59,542	8,499	17
Union	13,694	13,739	13,951	14,026	14,207	14,689	15,147	1,453	74
Regional Total	554,585	556,138	564,527	574,126	583,784	594,975	605,550	50,965	
State Total	4,877,203	4,890,644	4,949,510	5,019,629	5,092,762	5,176,214	5,254,051	378,848	

Population Estimates For The East Tennessee Region And Knox County

	1992	*1993*	*1994*	*1995*
Male	432,116	433,763	435,366	437,147
Female	466,870	469,577	472,231	475,063
Black	43,648	44,172	44,632	45,245
White	846,588	850,283	853,942	857,764

Population

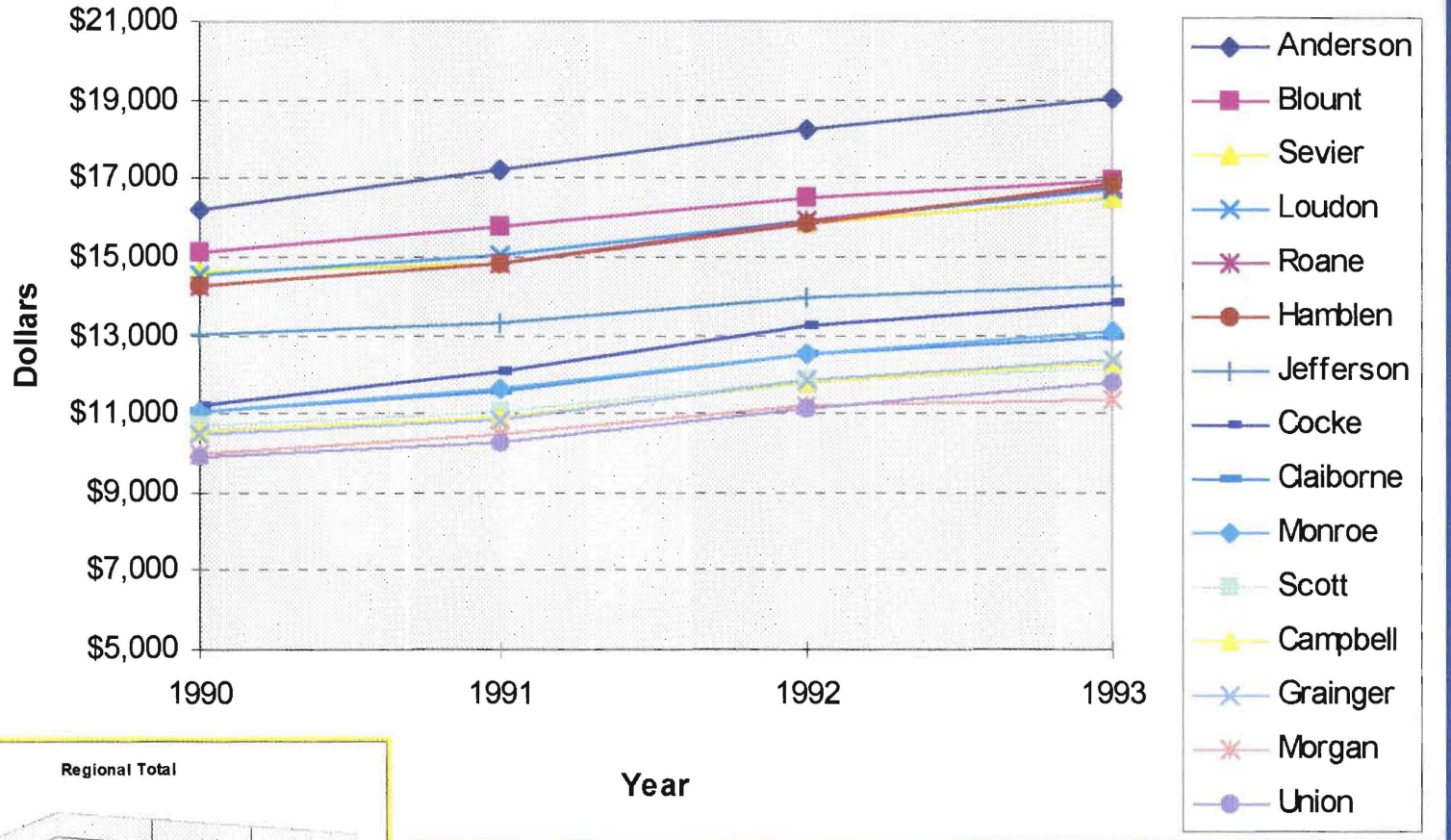

100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Population
1990 Census
7/1/91 Estimate
7/1/93 Estimate
7/1/95 Estimate
Fiscal Year
Blount
Anderson
Sevier
Hamblen
Roane
Campbell
Jefferson
Loudon
Monroe
Cocke
Claiborne
Scott
Morgan
Grainger
Union

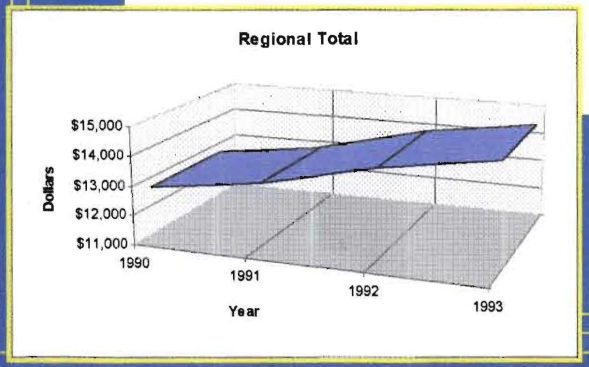

Region Total
610,000
600,000
590,000
580,000
570,000
560,000
550,000
540,000
530,000
520,000
Population
1990 Census
7/1/90 Estimate
7/1/91 Estimate
7/1/92 Estimate
7/1/93 Estimate
7/1/94 Estimate
7/1/95 Estimate
Region
Fiscal Year

Per Capita Income

County	*1990*	*1991*	*1992*	*1993*	*Percent Change 1990-1993*	*Rank in State*
Anderson	$16,247	$17,267	$18,255	$19,076	17.4%	6
Blount	$15,163	$15,794	$16,542	$16,941	11.7%	19
Campbell	$10,608	$10,960	$11,805	$12,285	15.8%	87
Claiborne	$11,117	$11,570	$12,542	$12,935	16.4%	77
Cocke	$11,258	$12,082	$13,233	$13,847	23.0%	59
Grainger	$10,537	$10,836	$11,883	$12,393	17.6%	83
Hamblen	$14,243	$14,861	$15,848	$16,844	18.3%	21
Jefferson	$13,026	$13,306	$13,990	$14,298	9.8%	54
Loudon	$14,537	$15,070	$15,966	$16,756	15.3%	24
Monroe	$11,112	$11,655	$12,504	$13,127	18.1%	74
Morgon	$9,977	$10,480	$11,227	$11,375	14.0%	92
Roane	$14,274	$14,881	$15,916	$16,782	17.6%	23
Scott	$10,708	$11,101	$11,842	$12,200	13.9%	89
Sevier	$14,606	$14,810	$15,880	$16,490	12.9%	25
Union	$9,920	$10,299	$11,166	$11,820	19.2%	91
Regional Total	$12,621	$13,130	$14,039	$14,610		
State Total	$15,905	$16,501	$17,647	$18,439		
US Total	$18,666	$19,201	$20,137	$20,800		

Per Capita Income





The Social Environment

The context within which we look at health is the social and natural environment. Our summary piece on the social environment is to consider poverty levels and percentage graduating from high school. We devised a scale to rate counties based on these social indicators simply by multiplying the percentage above poverty by the percentage graduating from high school. In this section, maps for poverty and education are presented individually before the social environment summary.

Data:

Poverty Levels – Percent of the population living below the federal poverty line; Tennessee Department of Economic and Community Development, 1990

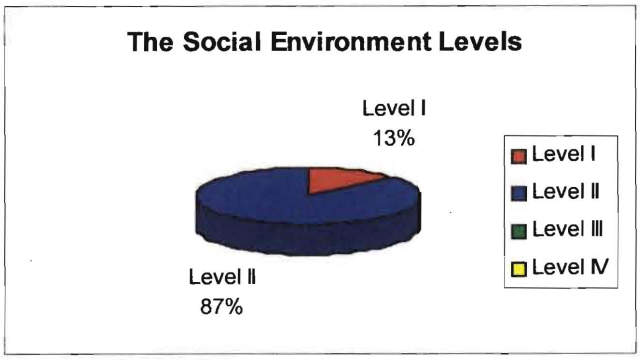
High School Graduation Rates – US census, 1990

Level Designations:

- Levels I, II, and III were assigned on the basis of a poverty-education scale devised by the following:

(1-poverty level) x (high school graduation rate)

Level I: < 60.6
Level II: 60.6 - 75.2
Level III: > 75.2

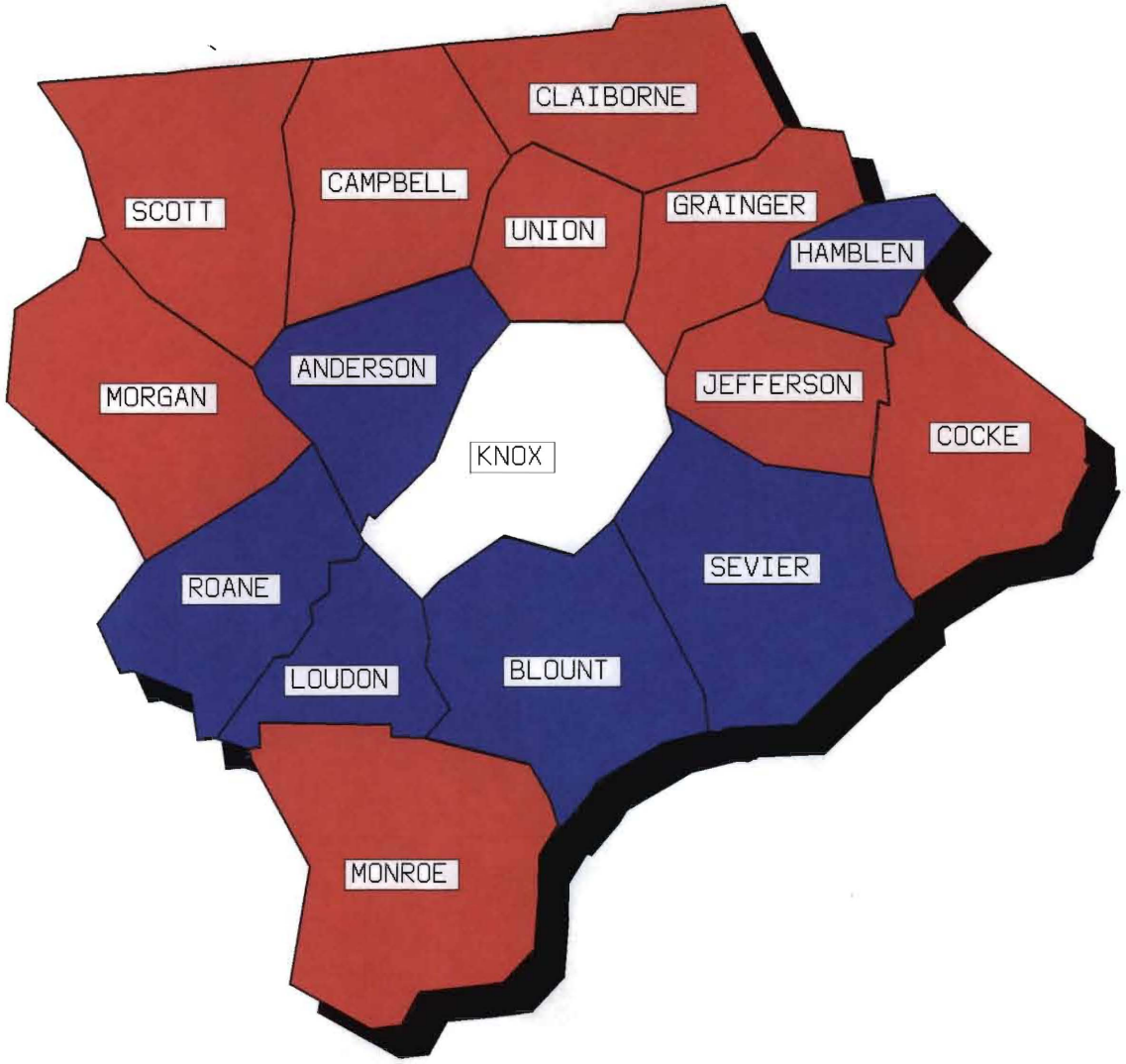


The Social Environment

County	*Poverty Rate*	*% Graduating From High School (≥ 25)*	*% Graduating From High School (18-24)*	*Levels*
Anderson	14.3	62.2	69.1	I
Blount	12.4	57.1	71.6	III
Campbell	26.8	37.5	56.7	I
Claiborne	25.7	38.8	63.1	I
Cocke	25.3	40.1	54.2	I
Grainger	20.5	34.4	56.5	I
Hamblen	13.9	51.0	62.9	II
Jefferson	15.1	48.3	74.8	II
Loudon	13.6	48.7	65.9	II
Monroe	17.8	39.2	55.7	I
Morgan	20.2	40.5	63.3	I
Roane	16.0	54.1	67.5	II
Scott	27.8	37.7	56.4	I
Sevier	13.2	50.9	60.2	II
Union	21.3	36.2	52.3	I
Regional Total	18.9	44.8	62.9	
State Total	15.7	57.9	72.3	
US Total	13.1			

EDUCATION

Percent Of Population With High School Education, 1990



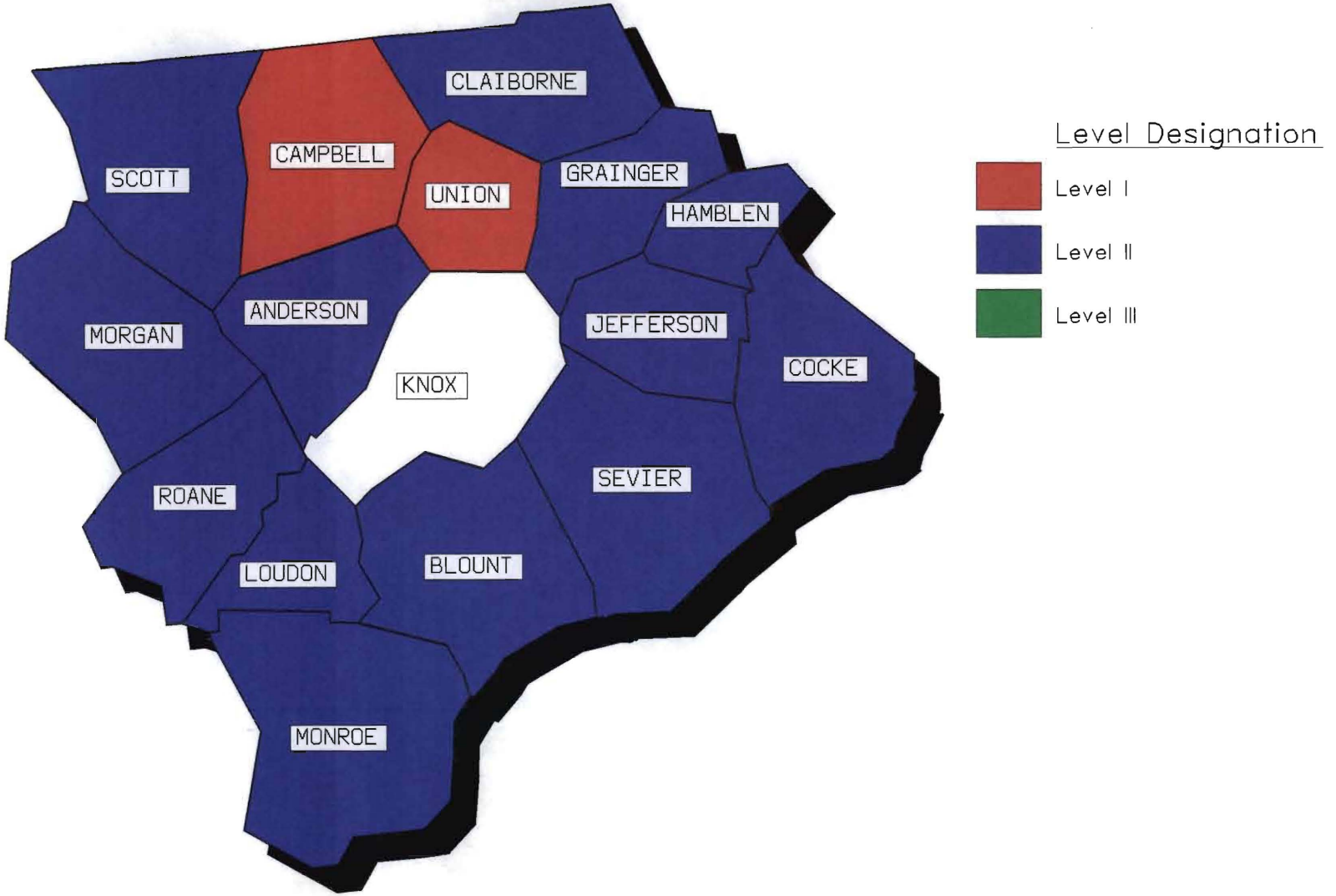
Level Designation

- Level I <60.6
- Level II 60.6–75.2
- Level III >75.2

Percent Totals
ETR = 60.6%
State = 67.1%
US = 75.2%

THE SOCIAL ENVIRONMENT

Poverty And Education



The Natural Environment

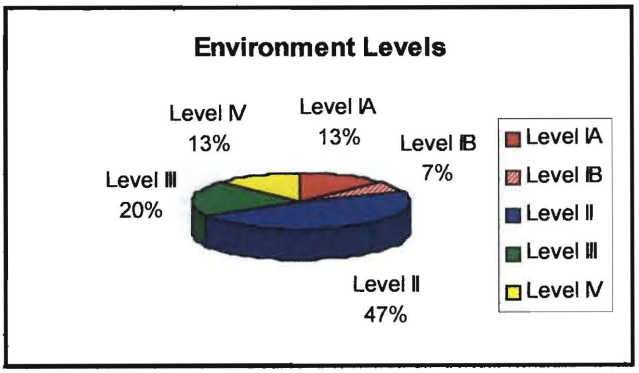
Because of the complexity of pollution, it is very difficult, if not impossible, to produce a summary map that can depict the overall status of the environment. The one indicator used in this report is based on the amount of waste discharged -- and reported -- by the manufacturing sector. Manufacturers are required to report on the toxic releases of some 300 chemicals into the air, water, or land. This report is called the Toxic Release Inventory. It is important to note, however, that agricultural non-point pollution is not included in this report.

Data:

Pounds per square mile of waste discharged to air, water, and land. Tennessee Department of Environment and Conservation, 1994.

Level Designation:

Level IA: 3,920 - 165,099
Level IB: 1,093 - 3,919
Level II: 253 - 1,092
Level III: 5 - 252
Level IV: 0-4



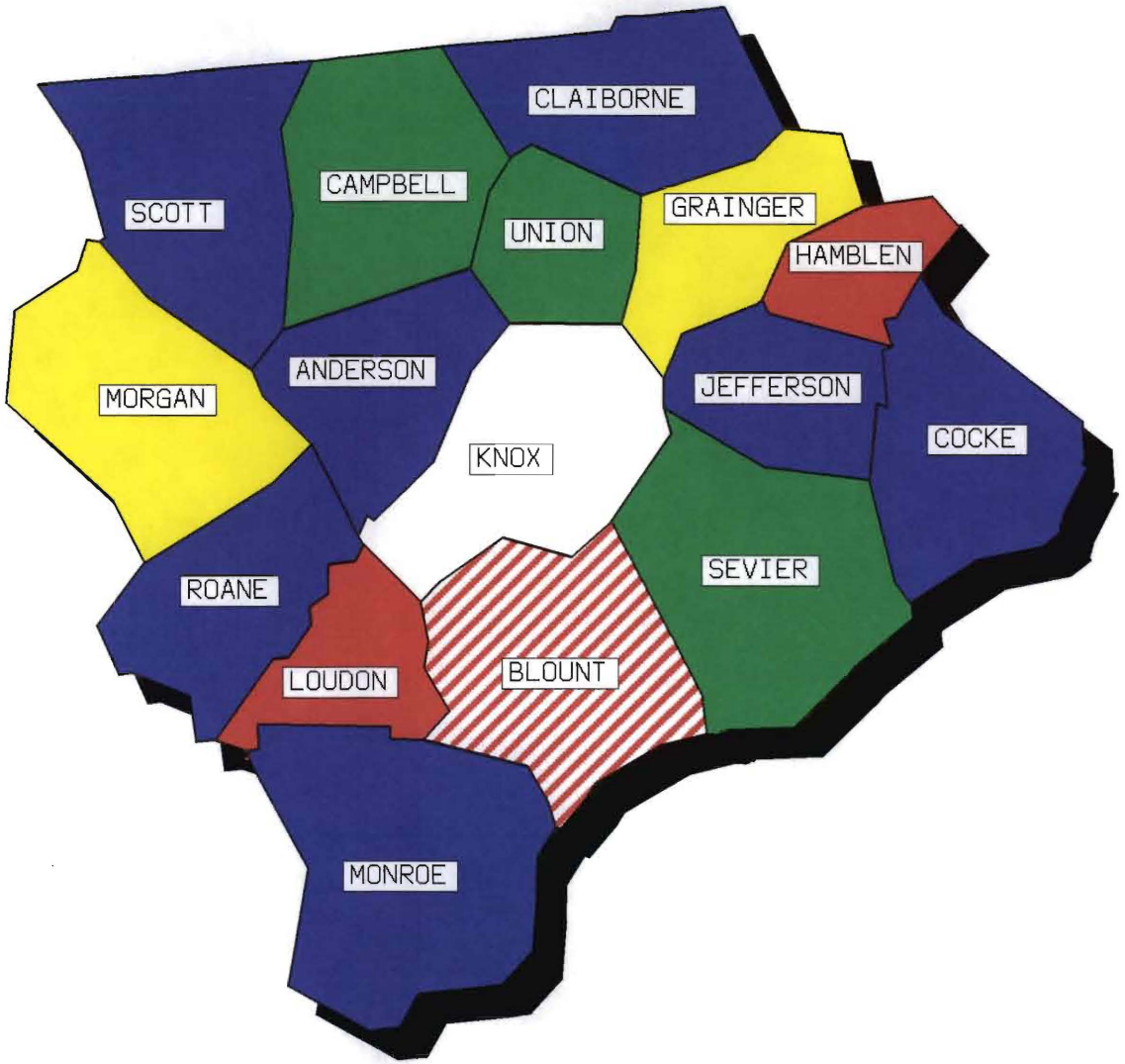
THE NATURAL ENVIRONMENT
Toxic Release Inventory, 1994

County	*Air Non-Point Releases*	*Air Point Releases*	*Water Releases*	*Land Releases*
Anderson	55,832	185,703	401	0
Blount	101,003	1,018,248	226	1,800
Campbell	5	65,100	0	0
Claiborne	265	170,333	0	0
Cocke	45,875	85,996	9	0
Grainger	0	0	0	1,000
Hamblen	2,844,889	20,757,214	20,815	136,600
Jefferson	46,975	205,979	0	0
Loudon	143,798	2,418,025	755	5,200
Monroe	45,891	471,152	151	0
Morgan	250	250	0	0
Roane	3,409	129,419	0	0
Scott	61,140	194,188	0	0
Sevier	1,920	66,163	10	0
Union	26,797	9,386	0	0

County	*Total Onsite Releases*	*Area Per Square Mile*	*Pounds Per Square Mile*
Anderson	241,936	339	714
Blount	1,121,277	558	2,010
Campbell	65,105	479	136
Claiborne	170,598	432	395
Cocke	131,880	432	305
Grainger	1,000	273	4
Hamblen	23,759,518	156	152,305
Jefferson	252,954	265	955
Loudon	2,567,778	235	10,927
Monroe	517,194	648	798
Morgan	500	523	1
Roane	132,828	357	372
Scott	255,328	528	484
Sevier	68,093	590	115
Union	36,183	218	166
Regional Total	29,322,172	6033	4,860
State Total	155,000,000	42,144	3,678

THE NATURAL ENVIRONMENT

Pounds Per Square Mile Of Waste Discharged To Air, Water, And Land, 1994



Level Designation

- (3,920–165,099)
- (1,093–3,919)
- (253–1,092)
- (5–252)
- (0–4)

Total Pounds/Mile^2

ETR = 4,860

State = 3,678

Getting the Best Start In Life

The following health status/health services indicators are included in this section:

- Family Planning
- Teen Pregnancy
- Pre-Natal Care
- Low Birth Weight
- Infant Mortality

Family Planning

Family Planning services are assessed on the basis of the percent of the target population that is currently being served. The federal department charged with administering family planning services regularly updates the target population figures. This target population is comprised of all females, ages 15-19, and all women below the poverty level for ages 20-44.

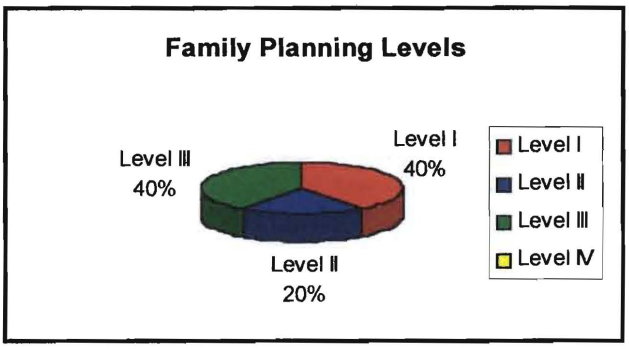
Data:

Percent of target population being served, FY 1990-1995, by county health departments. TDH, East Tennessee Regional Office.

Level Designation:

There were no family planning statistics available for the United States or for the Year 2000 level. Therefore, a Southern total is used in place of the US figure and the levels are assigned without a Year 2000 figure.

Level I: <40.9%
Level II: 40.9% - 46.4%
Level III: >46.4%
Level IV: N/A



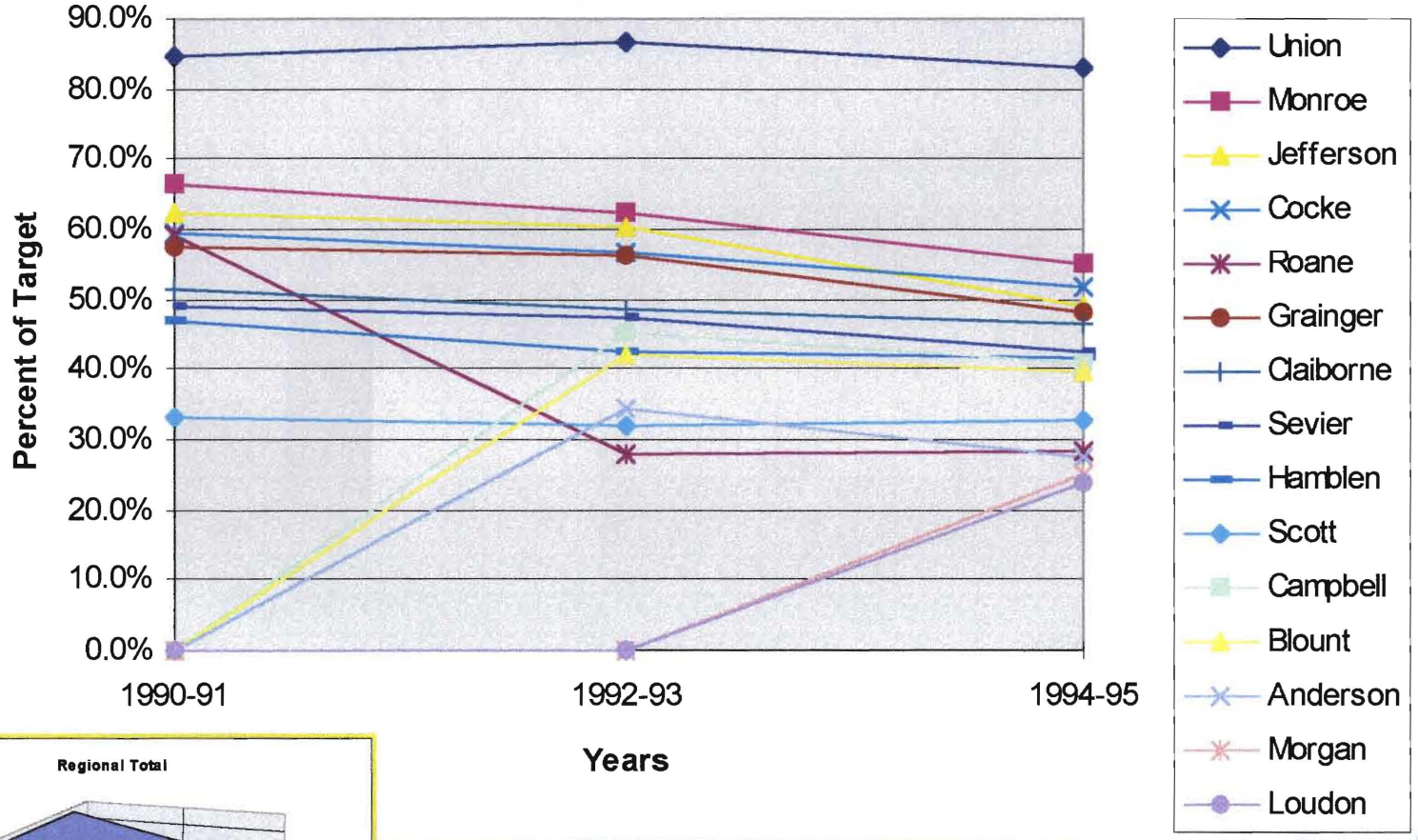
Family Planning

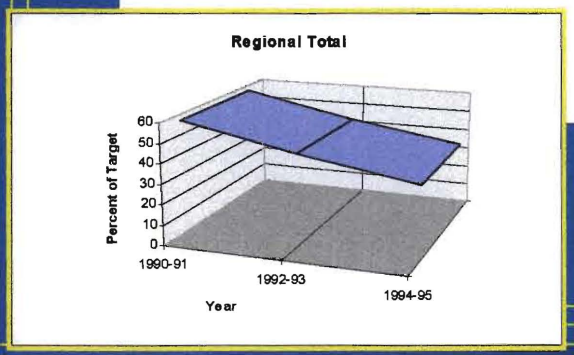
County	*Target Population*	*Patients Served FY 90*	*Percent of Target FY 90*	*Patients Served FY 91*	*Percent Of Target FY 91*	*County*	*Target Population*	*Patients Served FY 92*	*Percent Of Target FY 92*	*Patients Served FY 93*	*Percent Of Target FY 93*
Anderson	N/A	N/A	N/A	N/A	N/A	Anderson	2,710	7	0.2	929	34.3
Blount	N/A	N/A	N/A	N/A	N/A	Blount	3,650	198	5.4	1,541	42.2
Campbell	N/A	N/A	N/A	N/A	N/A	Campbell	1,930	89	4.6	875	45.3
Claiborne	1,660	858	51.7	845	50.9	Claiborne	1,660	820	49.4	790	47.6
Cocke	1,660	981	59.0	993	59.8	Cocke	1,660	925	55.7	957	57.7
Grainger	880	492	55.9	518	58.8	Grainger	880	479	54.4	513	58.3
Hamblen	2,530	1,168	46.2	1,207	47.7	Hamblen	2,530	1,103	43.6	1,055	41.7
Jefferson	1,350	824	61.0	864	64.0	Jefferson	1,350	824	61.0	809	60.0
Loudon	N/A	N/A	N/A	N/A	N/A	Loudon	740	N/A	N/A	249	33.6
Monroe	1,430	945	66.0	960	67.1	Monroe	1,430	888	62.1	896	62.7
Morgan	N/A	N/A	N/A	N/A	N/A	Morgan	770	N/A	N/A	150	19.5
Roane	904	565	62.5	503	55.6	Roane	1,970	470	23.9	636	32.3
Scott	1,390	456	32.8	467	33.6	Scott	1,390	443	31.9	453	32.6
Sevier	2,230	1,115	50.0	1,075	48.2	Sevier	2,230	1,032	46.3	1,081	48.5
Union	740	623	84.2	629	85.0	Union	740	621	83.9	664	89.7
Regional Total	14,774	8,061	54.6	8,027	54.3	Regional Total	25,640	7,899	30.8	11,598	45.2
State Total	233,550	135,271	57.9	136,954	58.6	State Total	233,550	130,594	55.9	121,008	51.8
*Southern Region Total			44.1		47.2	*Southern Region Total			45.7		45.7

County	*Target Population*	*Patients Served FY 94*	*Percent Of Target FY 94*	*Patients Served FY 95*	*Percent Of Target FY 95*	*Average Percent Of Target For FYs 92-95*	*Levels*
Anderson	2,930	446	15.2	776	26.5	19.0	I
Blount	3,700	1,313	35.5	1,295	35.0	29.5	I
Campbell	1,980	801	40.5	661	33.4	31.0	II
Claiborne	1,580	732	46.3	690	43.7	48.3	III
Cocke	1,650	743	45.0	800	48.5	54.3	III
Grainger	980	425	43.4	394	40.2	51.8	III
Hamblen	2,310	948	41.0	934	40.4	43.4	II
Jefferson	1,770	699	39.5	624	35.3	53.5	III
Loudon	1,320	257	19.5	370	28.0	27.0	I
Monroe	1,680	854	50.8	758	45.1	59.0	III
Morgan	930	215	23.1	255	27.4	23.3	I
Roane	2,120	639	30.1	579	27.3	38.6	I
Scott	1,170	432	36.9	353	30.2	33.0	I
Sevier	2,440	898	36.8	941	38.5	44.7	II
Union	750	560	74.7	573	76.4	82.3	III
Regional Total	27,310	9,962	36.5	10,003	36.6	43.0	
State Total	243,280	102,661	42.2	96,201	39.5	51.0	
*Southern Region Total			45.4			45.6	
Y2000						90	

*A more recent statistic for the US percentage was not available, so the Southern Regional Total was used. This figure was taken from an average of family planning in Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee.

Family Planning





Teenage Pregnancy

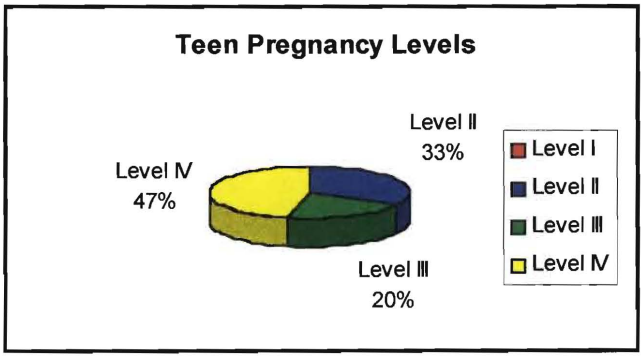
Teenage Pregnancy Rates for 15-17 year old females are determined by summing the number of fetal deaths, abortions, and live births to females ages 15-17 and dividing by the number of females ages 15-17 in the population. This is usually expressed in the form of a rate per thousand ages 15-17.

Data:

Average of rates for 1990-1994; TDH Vital Statistics

Level Designation:

Level I: >75.1
Level II: 50 - 75.1
Level III: 48.4 - 49.9
Level IV: <48.4



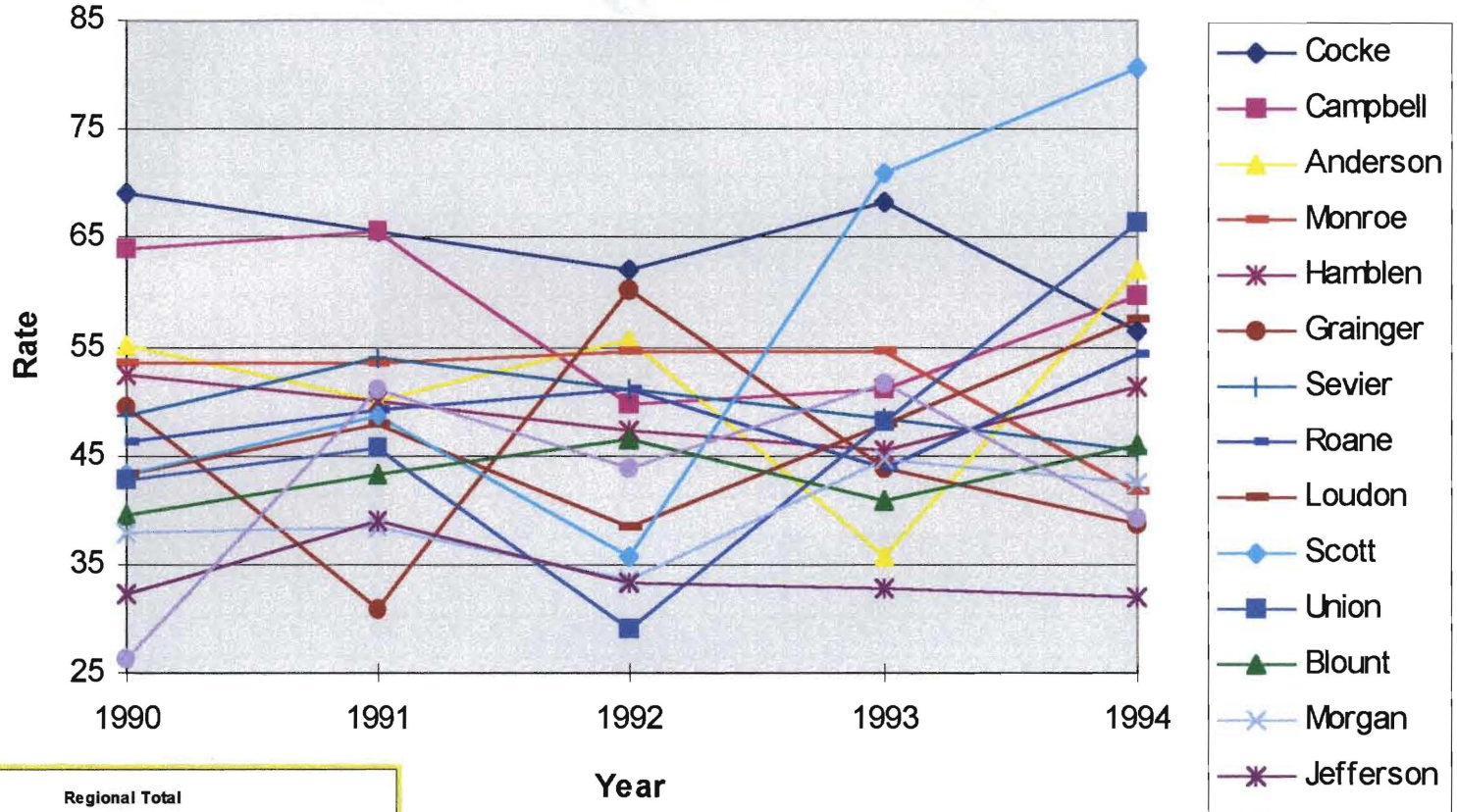
Teen Pregnancy

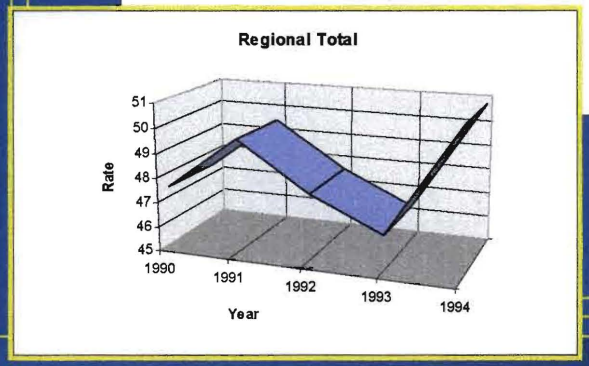
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	75	55.1	68	50.1	75	55.6
Blount	70	39.4	77	43.4	82	46.4
Campbell	55	64.0	55	65.5	41	49.8
Claiborne	17	26.3	33	51.2	28	43.7
Cocke	45	69.0	42	65.5	39	62.2
Grainger	18	49.6	11	30.9	21	60.2
Hamblen	60	52.4	56	49.9	52	47.3
Jefferson	27	32.2	32	38.9	27	33.4
Loudon	27	43.3	30	48.0	24	38.5
Monroe	42	53.6	41	53.5	41	54.7
Morgan	15	37.9	15	38.4	13	33.7
Roane	47	46.3	49	49.1	50	51.2
Scott	19	43.2	21	48.8	15	35.8
Sevier	53	48.7	59	54.1	56	51.2
Union	13	42.8	14	45.8	9	29.0
Regional Total	583	47.4	603	49.6	573	47.7
State Total	6,360	60.1	6,433	60.9	5,951	56.5
US Total		75.5		74.6		

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	48	35.7	83	62.1	70	51.7	II
Blount	72	40.9	81	46.1	76	43.2	IV
Campbell	41	51.0	47	59.8	48	58.1	II
Claiborne	33	51.7	25	39.2	27	42.4	IV
Cocke	42	68.3	34	56.4	40	64.4	II
Grainger	15	43.7	13	38.6	16	44.6	IV
Hamblen	49	45.5	54	51.3	54	49.3	III
Jefferson	26	32.7	25	32.1	27	33.9	IV
Loudon	30	48.0	36	57.6	29	47.1	IV
Monroe	40	54.5	30	41.8	39	51.7	II
Morgan	17	44.6	16	42.6	15	39.4	IV
Roane	42	43.8	51	54.4	48	48.9	III
Scott	29	71.1	32	80.6	23	55.4	II
Sevier	53	48.4	50	45.5	54	49.6	III
Union	15	48.1	21	66.5	14	46.5	IV
Regional Total	552	46.4	598	50.9	582	48.4	
State Total	5,865	55.9	5,730	54.7	6,068	57.6	
US Total						75.1*	
Y2000						50	

*Two year average from 1990-1991 for the US total

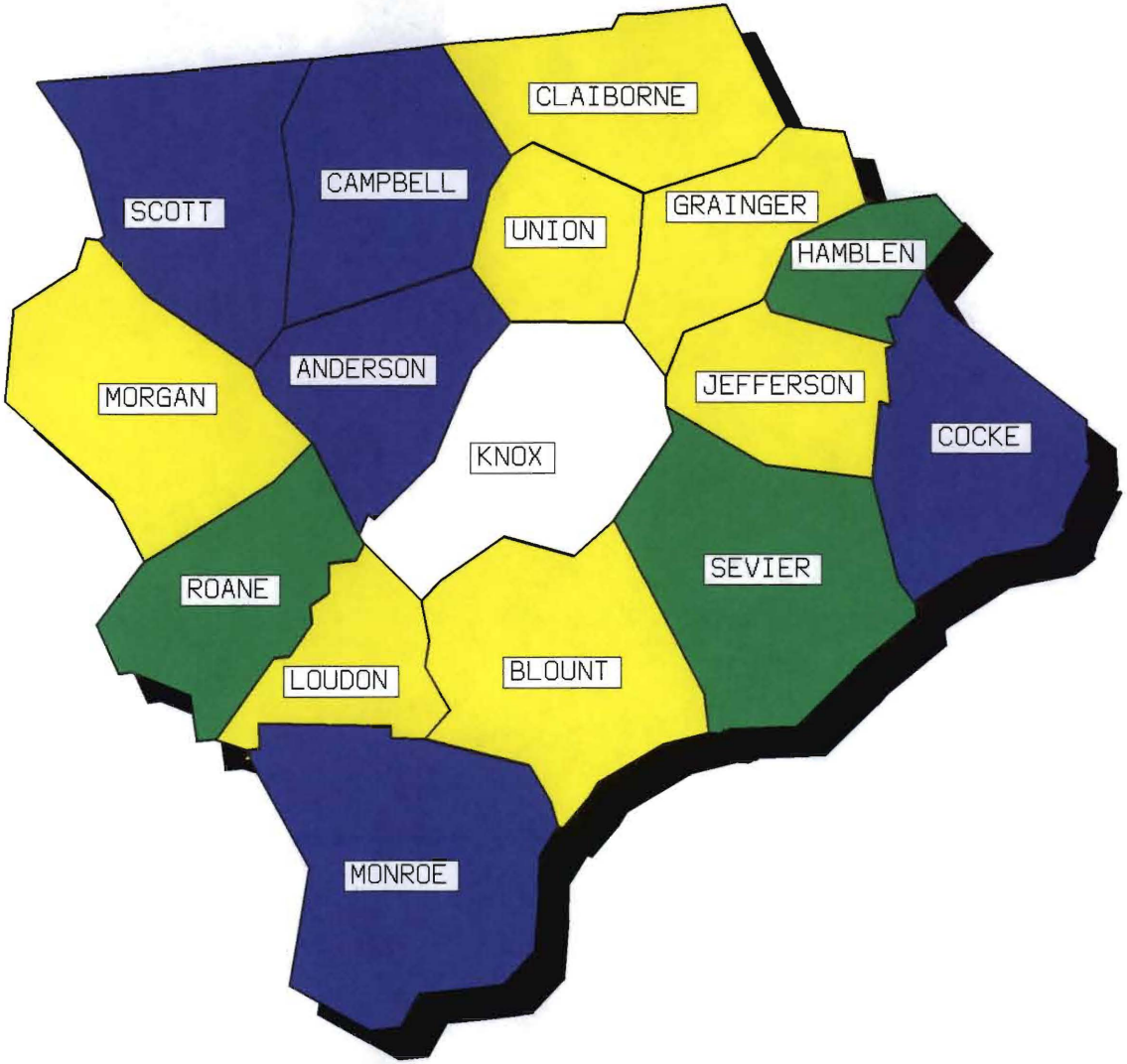
Teen Pregnancy





TEEN PREGNANCY

Pregnancies Of 15–17 Year Old Females Per 1,000 Population; 1990–94 Average



Level Designation

- Level I >75.1
- Level II 50–75.1
- Level III 48.4–49.9
- Level IV <48.4

Rate Totals	
ETR	48.4
State	57.6
US	75.1
Y2000	50

Pre-Natal Care

The adequacy of pre-natal care is measured by the Kessner Index, which classifies care according to the number of visits, gestational age, and trimester that care began. As a minimum for being classified as "adequate," care must begin in the first trimester.

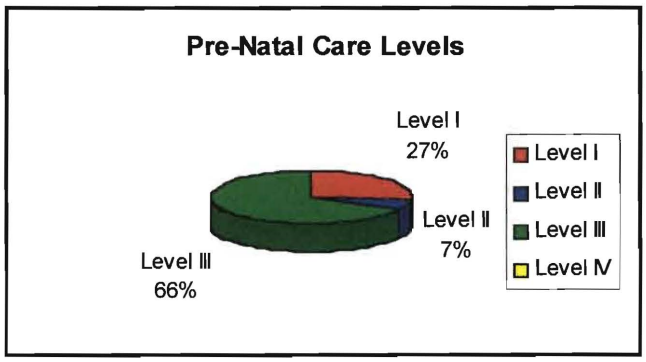
Pre-natal care is often expressed in the form of a rate, that is, the percent of live births in which pre-natal care began in the first trimester.

Data:

Number of women beginning care in the first trimester divided by the number of live births, 1990-1994 (thus a five year average); TDH Vital Statistics

Level Designation:

Level I: <78
Level II: 78 - 80.1
Level III: 80.2 - 90
Level IV: >90



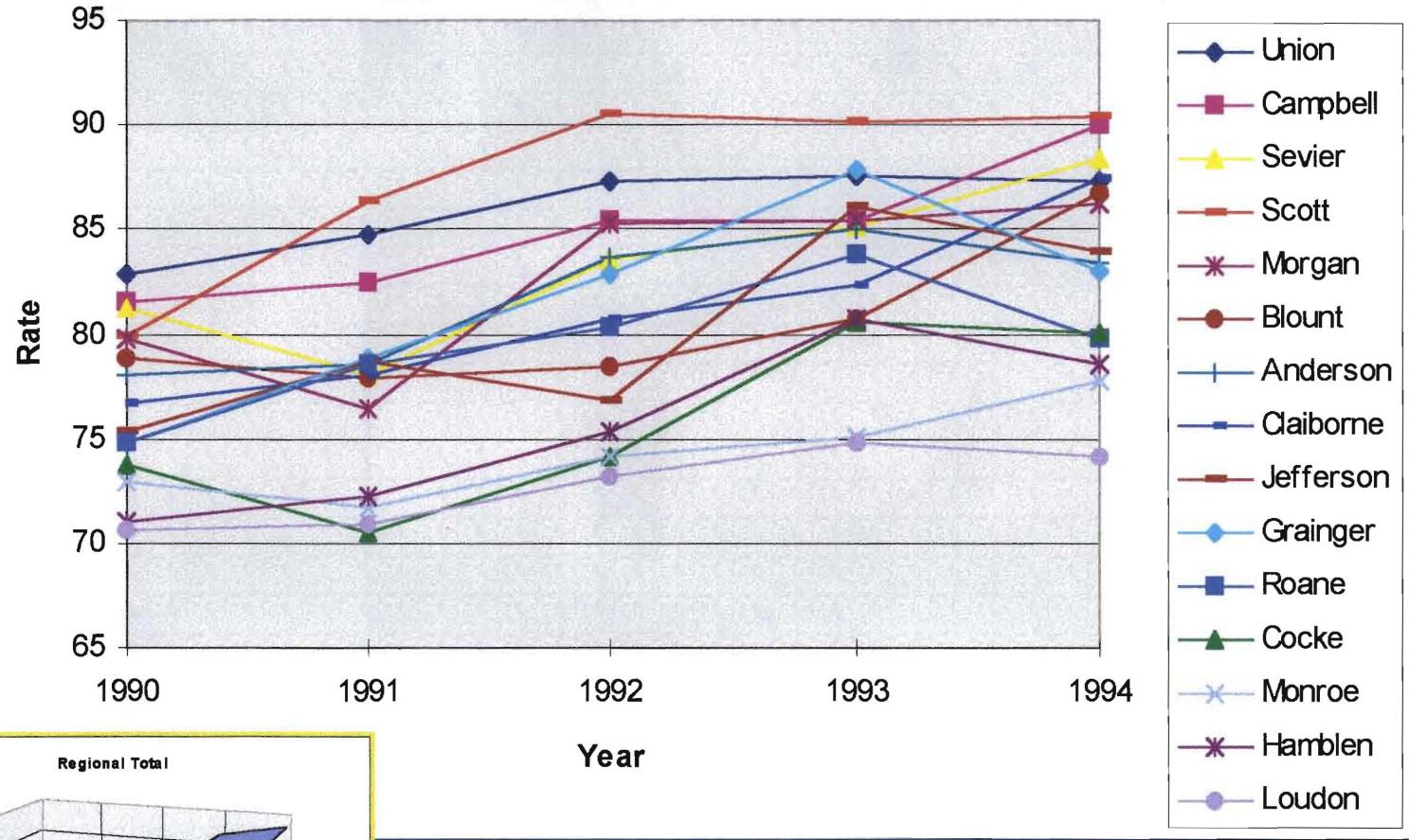
Pre-Natal Care

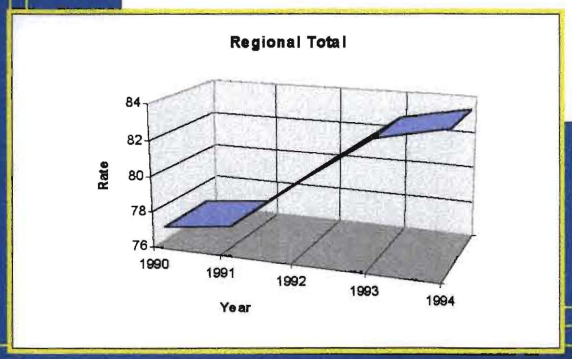
County	1990			1991			1992		
	Number Receiving Care In 1st Trimester	*Number Of Live Births*	*% Live Births Receiving Care 1st Trimester*	*Number Receiving Care In 1st Trimester*	*Number Of Live Births*	*% Live Births Receiving Care 1st Trimester*	*Number Receiving Care In 1st Trimester*	*Number Of Live Births*	*% Live Births Receiving Care 1st Trimester*
Anderson	673	863	78.0	741	943	78.6	767	916	83.7
Blount	901	1,142	78.9	880	1,130	77.9	908	1,158	78.4
Campbell	380	466	81.5	405	491	82.5	395	462	85.5
Claiborne	266	347	76.7	286	366	78.1	287	355	80.8
Cocke	300	407	73.7	279	396	70.5	305	411	74.2
Grainger	157	210	74.8	164	208	78.8	194	234	82.9
Hamblen	526	741	71.0	530	733	72.3	540	716	75.4
Jefferson	304	403	75.4	306	389	78.7	322	419	76.8
Loudon	602	427	70.7	283	399	70.9	279	381	73.2
Monroe	323	443	72.9	314	438	71.7	301	406	74.1
Morgan	182	228	79.8	186	243	76.5	168	197	85.3
Roane	377	504	74.8	434	552	78.6	450	560	80.4
Scott	234	293	79.9	260	301	86.4	239	264	90.5
Sevier	598	736	81.3	537	688	78.1	624	747	83.5
Union	155	187	82.9	140	165	84.8	131	150	87.3
Regional Total	5,678	7,397	76.8	5,745	7,442	77.2	5,910	7,378	80.1
State Total	57,098	74,870	76.3	56,920	74,392	76.5	57,065	73,560	77.6
US Total									78

County	1993			1994			5 Year Average			
	Number Receiving Care In 1st Trimester	*Number Of Live Births*	*% Live Births Receiving Care 1st Trimester*	*Number Receiving Care In 1st Trimester*	*Number Of Live Births*	*% Live Births Receiving Care 1st Trimester*	*Number Receiving Care In 1st Trimester*	*Number Of Live Births*	*% Live Births Receiving Care 1st Trimester*	*Levels*
Anderson	708	833	85.0	639	766	83.4	706	864	81.6	III
Blount	895	1,107	80.8	997	1,148	86.8	916	1,137	80.6	III
Campbell	413	483	85.5	396	440	90.0	398	468	84.9	III
Claiborne	303	368	82.3	318	364	87.4	292	360	81.1	III
Cocke	328	407	80.6	330	412	80.1	308	407	75.8	I
Grainger	197	224	87.9	190	229	83.0	180	221	81.6	III
Hamblen	543	673	80.7	587	747	78.6	545	722	75.5	I
Jefferson	353	410	86.1	335	399	84.0	324	404	80.2	III
Loudon	335	448	74.8	327	441	74.1	305	419	72.8	I
Monroe	334	445	75.1	312	401	77.8	317	427	74.3	I
Morgan	201	235	85.5	181	210	86.2	184	223	82.5	III
Roane	446	532	83.8	462	579	79.8	434	545	79.5	II
Scott	236	262	90.1	217	240	90.4	237	272	87.2	III
Sevier	603	708	85.2	677	766	88.4	608	729	83.4	III
Union	176	201	87.6	144	165	87.3	149	174	85.9	III
Regional Total	6,071	7,336	82.8	6,112	7,307	83.6	5,903	7,372	80.1	
State Total	58,037	72,923	79.6	58,689	73,147	80.2	57,562	73,778	78.0	
US Total			79			80			79.0*	
Year 2000									90.0	

*Three year average from 1992-1994 for the US total

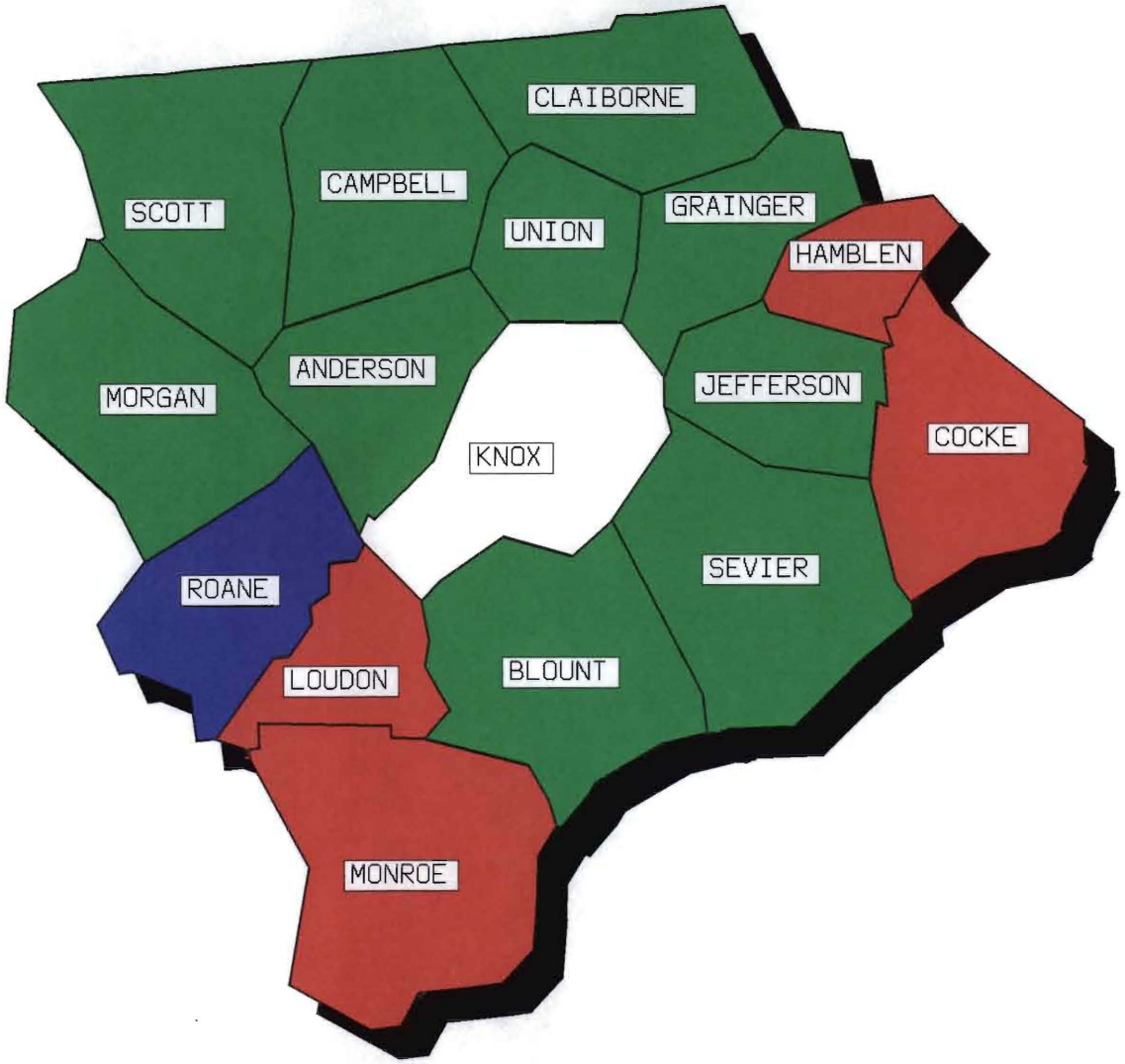
Pre-Natal Care





PRE-NATAL CARE

Percent Of Births In Which Care Began In The First Trimester, 1990-1994



Level Designation

- Level I <78
- Level II 78-80.1
- Level III 80.2-90
- Level IV >90

Percent Totals

ETR = 80.1%

State = 78%

US = 79%

Y2000 = 90%

Low Birth Weight

	1990			1991			1992		
County	*Number Low Birth Weight*	*Number Live Births*	*% Low Birth Weight*	*Number Low Birth Weight*	*Number Live Births*	*% Low Birth Weight*	*Number Low Birth Weight*	*Number Live Births*	*% Low Birth Weight*
Anderson	59	863	6.8	75	943	8.0	70	916	7.6
Blount	72	1,142	6.3	77	1,130	6.8	62	1,158	5.4
Campbell	31	466	6.7	36	491	7.3	35	462	7.6
Claiborne	15	347	4.3	19	366	5.2	27	355	7.6
Cocke	35	407	8.6	34	396	8.6	32	411	7.8
Grainger	31	210	14.8	20	208	9.6	14	234	6.0
Hamblen	49	741	6.6	66	733	9.0	45	716	6.3
Jefferson	23	403	5.7	23	389	5.9	31	419	7.4
Loudon	33	427	7.7	29	399	7.3	28	381	7.3
Monroe	29	443	6.5	29	438	6.6	30	406	7.4
Morgan	12	228	5.3	26	243	10.7	14	197	7.1
Roane	37	504	7.3	37	552	6.7	34	560	6.1
Scott	20	293	6.8	30	301	10.0	16	264	6.1
Sevier	62	736	8.4	56	688	8.1	58	747	7.8
Union	13	187	7.0	13	165	7.9	19	150	12.7
Regional Total	521	7,397	7.0	570	7,442	7.7	515	7,378	7.0
State Total	6,160	74,870	8.2	6,572	74,392	8.8	6,265	73,560	8.5
US Total									7.1

	1993			1994			5 Year Average			
County	*Number Low Birth Weight*	*Number Live Births*	*% Low Birth Weight*	*Number Low Birth Weight*	*Number LivewBirths*	*% Low Birth Weight*	*Number Low Birth Weight*	*Number Live Births*	*% Low Birth Weight*	*Levels*
Anderson	61	833	7.3	45	766	5.9	62	864	7.2	II
Blount	98	1,107	8.9	89	1,148	7.8	80	1,137	7.0	III
Campbell	38	483	7.9	33	440	7.5	35	468	7.4	II
Claiborne	30	368	8.2	27	364	7.4	24	360	6.6	III
Cocke	46	407	11.3	51	412	12.4	40	407	9.7	I
Grainger	11	224	4.9	14	229	6.1	18	221	8.1	II
Hamblen	47	673	7.0	81	747	10.8	58	722	8.0	II
Jefferson	32	410	7.8	22	399	5.5	26	404	6.5	III
Loudon	25	448	5.6	32	441	7.3	29	419	7.0	III
Monroe	30	445	6.7	28	401	7.0	29	427	6.8	III
Morgan	21	235	8.9	12	210	5.7	17	223	7.6	II
Roane	40	532	7.5	55	579	9.5	41	545	7.4	II
Scott	22	262	8.4	20	240	8.3	22	272	7.9	II
Sevier	61	708	8.6	71	766	9.3	62	729	8.4	II
Union	20	201	10.0	15	165	9.1	16	174	9.2	I
Regional Total	582	7,336	7.9	595	7,307	8.1	557	7,372	7.6	
State Total	6,403	72,923	8.8	6,455	73,147	8.8	6,371	73,778	8.6	
US Total			7.2			7.3			7.2	
Year 2000									5.0	

Low Birth Weight

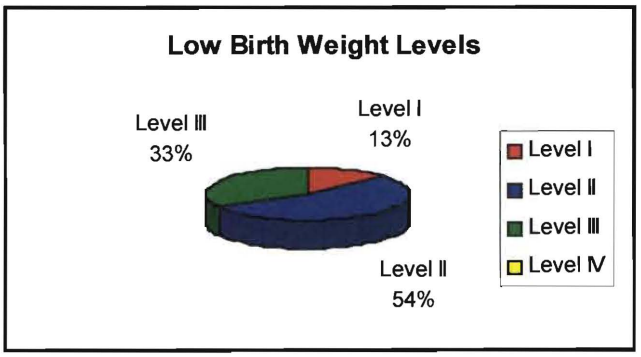
Low Birth Weight is defined as a live birth weighing less than 2500 grams. The low birth weight rate is expressed as the percentage of all live births that weigh less than 2500 grams.

Data:

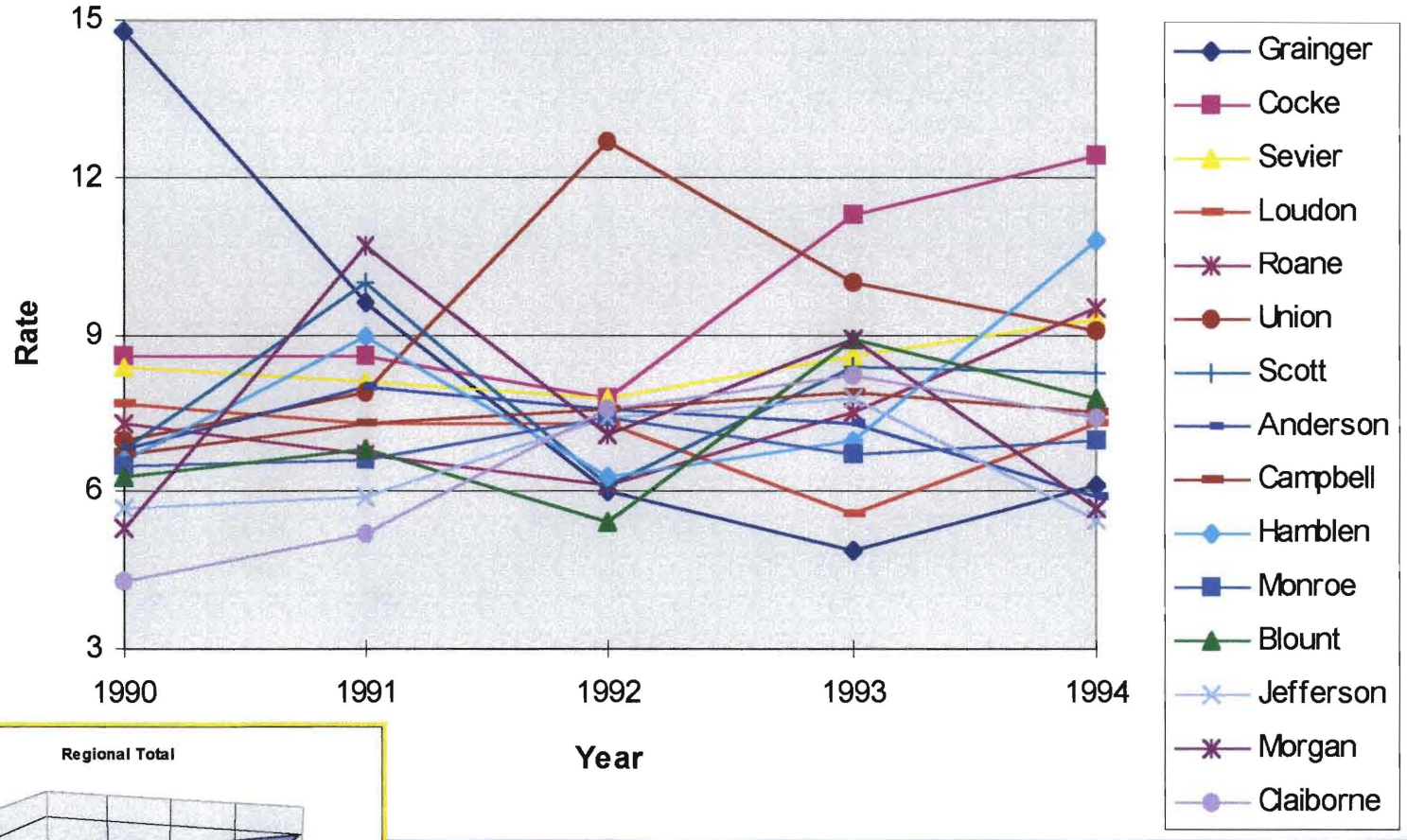
Number of low birth weight infants 1990-1995, divided by the number of live births 1990-1995; TDH

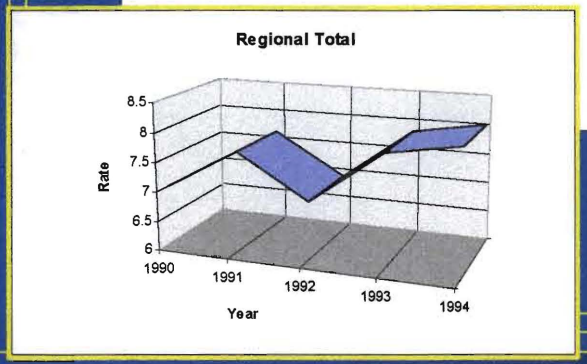
Level Designation:

Level I: >8.5
Level II: 7.2 - 8.6
Level III: 5 - 7.1
Level IV: <5



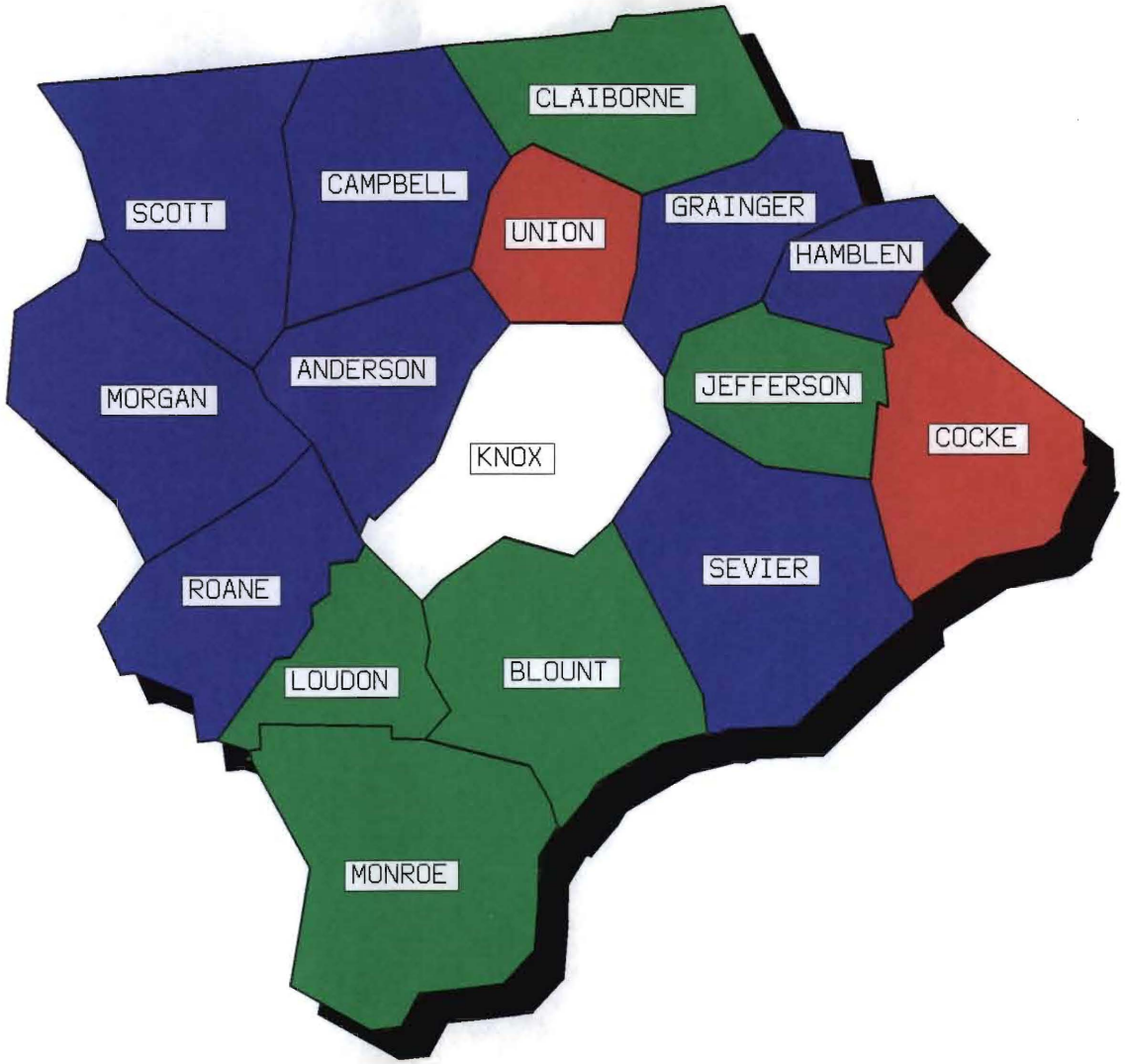
Low Birth Weight





LOW BIRTH WEIGHT

Percent Of Live Births < 2500 grams; 1990–1994 Average



Level Designation

- Level I >8.6
- Level II 7.2–8.6
- Level III 5–7.1
- Level IV <5

Rate Totals

ETR = 7.6

State = 8.6

US = 7.2

Y2000 = 5.0

Infant Mortality

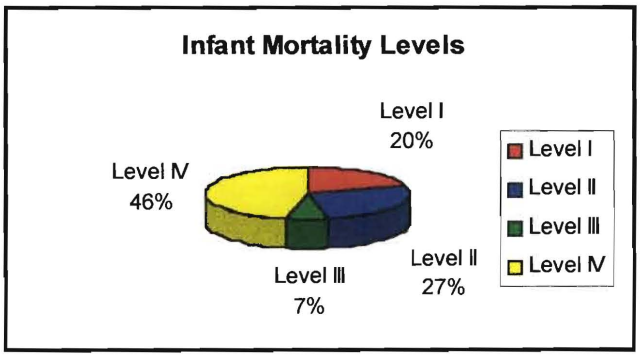
Infant Mortality rate is actually a ratio of the number of infant deaths (>0-1 year) to live births, expressed as a "rate" per thousand live births. Infant deaths in this country are relatively infrequent occurrences; it is often difficult to interpret as a rate when the numbers of deaths and live births are small. For example, the IMR for the US in 1993 was 8.4 -- that is 8.4 infant deaths for every 1000 live births. In 1993 the IMR in Morgan County was 0, and in 1994 it was 9.5. It is helpful to note though that in Morgan in 1993 there were no infant deaths and 235 live births, while in 1994 there were 2 infant deaths and 210 live births. Because IMR is often used as an overall health indicator, knowledge about the numbers behind the rates is absolutely critical. Five year averages were used in this report in an attempt to avoid misinterpretation of rates.

Data:

Infant deaths 1990-1994 divided by the number of live births for the same time period, expressed as a rate per thousand live births; TDH Vital Statistics.

Level Designation:

Level I: > 9.6
Level II: 7.4-9.6
Level III: 7.0-7.3
Level IV: < 7.0

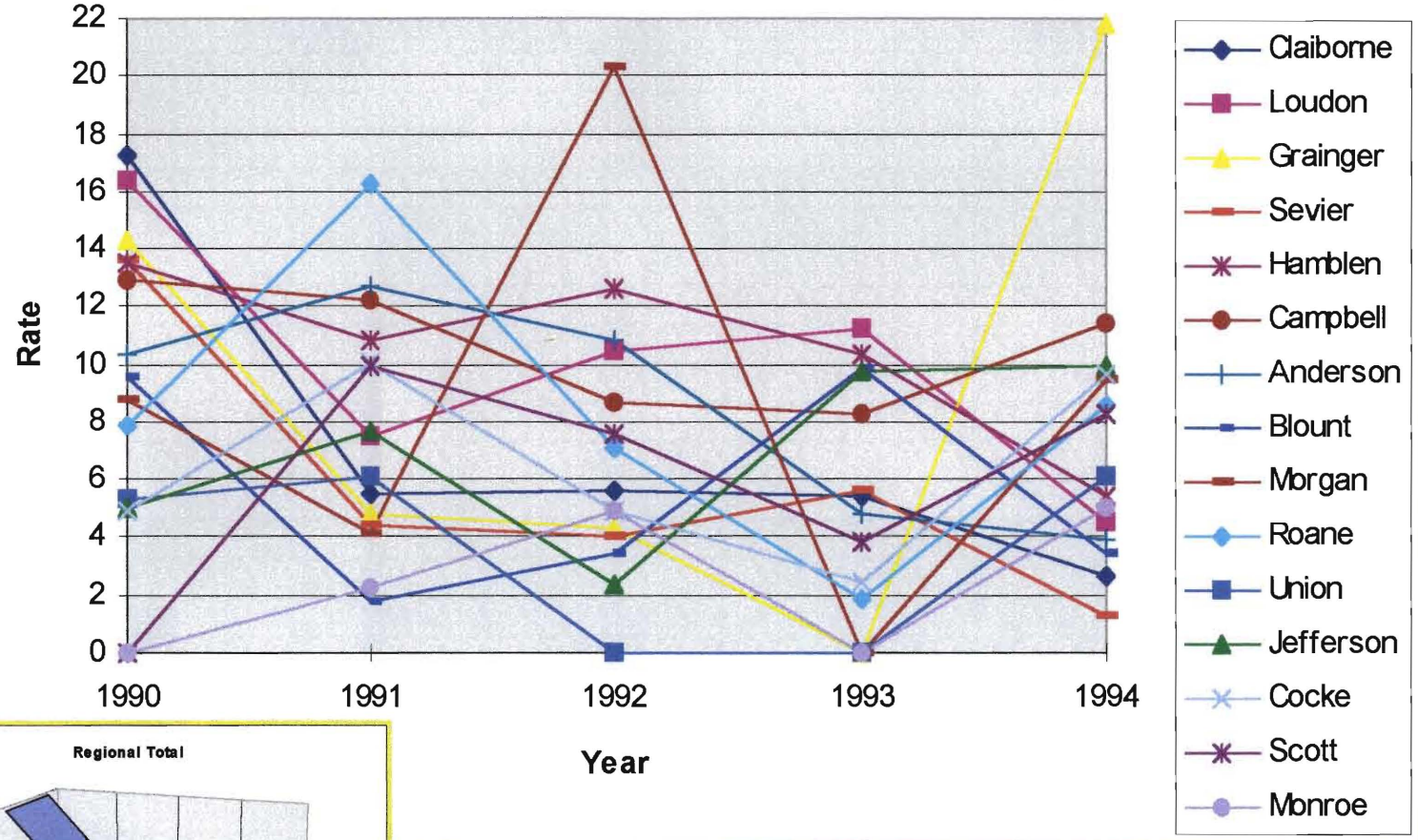


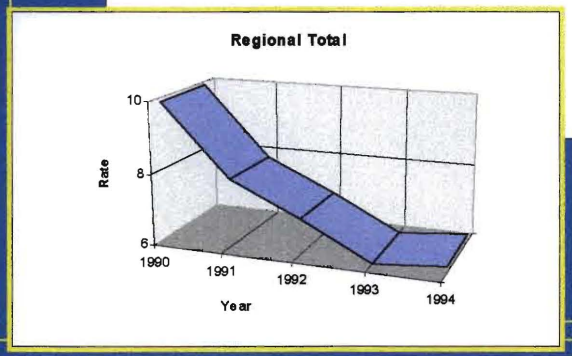
Infant Mortality

	1990			1991			1992		
County	*Deaths*	*Births*	*Rate*	*Deaths*	*Births*	*Rate*	*Deaths*	*Births*	*Rate*
Anderson	9	863	10.4	12	943	12.7	10	916	10.9
Blount	11	1,142	9.6	2	1,130	1.8	4	1158	3.5
Campbell	6	466	12.9	6	491	12.2	4	462	8.7
Claiborne	6	347	17.3	2	366	5.5	2	355	5.6
Cocke	2	407	4.9	4	396	10.1	2	411	4.9
Grainger	3	210	14.3	1	208	4.8	1	234	4.3
Hamblen	10	741	13.5	8	733	10.9	9	716	12.6
Jefferson	2	403	5.0	3	389	7.7	1	419	2.4
Loudon	7	427	16.4	3	399	7.5	4	381	10.5
Monroe	0	443	0	1	438	2.3	2	406	4.9
Morgan	2	228	8.8	1	243	4.1	4	197	20.3
Roane	4	504	7.9	9	552	16.3	4	560	7.1
Scott	0	293	0	3	301	10.0	2	264	7.6
Sevier	10	736	13.6	3	688	4.4	3	747	4.0
Union	1	187	5.3	1	165	6.1	0	150	0
Regional Total	73	7,397	9.9	59	7,442	7.9	52	7,376	7.0
State Total	770	74,870	10.3	738	74,392	9.9	691	73,560	9.4

	1993			1994			5 Year Average			
County	*Deaths*	*Births*	*Rate*	*Deaths*	*Births*	*Rank*	*Deaths*	*Births*	*Rank*	*Levels*
Anderson	4	833	4.8	3	766	3.9	7	864	8.8	II
Blount	11	1,107	9.9	4	1,148	3.5	6	1,137	5.6	IV
Campbell	4	483	8.3	5	440	11.4	5	468	10.7	I
Claiborne	2	368	5.4	1	364	2.7	3	360	7.2	III
Cocke	1	407	2.5	4	412	9.7	2	407	6.4	IV
Grainger	0	224	0	5	229	21.8	2	221	9.0	II
Hamblen	7	673	10.4	4	747	5.4	7	722	10.5	I
Jefferson	4	410	9.8	4	399	10.0	3	404	6.9	IV
Loudon	5	448	11.2	2	441	4.5	4	419	10.0	I
Monroe	0	445	0	2	401	5.0	1	427	2.3	IV
Morgan	0	235	0	2	210	9.5	2	223	8.1	II
Roane	1	532	1.9	5	579	8.6	5	545	8.4	II
Scott	1	262	3.8	2	240	8.3	2	272	5.9	IV
Sevier	4	708	5.6	1	766	1.3	4	729	5.8	IV
Union	0	201	0	1	165	6.1	1	174	3.5	IV
Regional Total	44	7,336	6.0	45	7,307	6.2	55	7,372	7.4	
State Total	685	72,923	9.4	648	73,147	8.9	707	73,778	9.6	
US Total			8.4						8.7	
Year 2000									7.0	

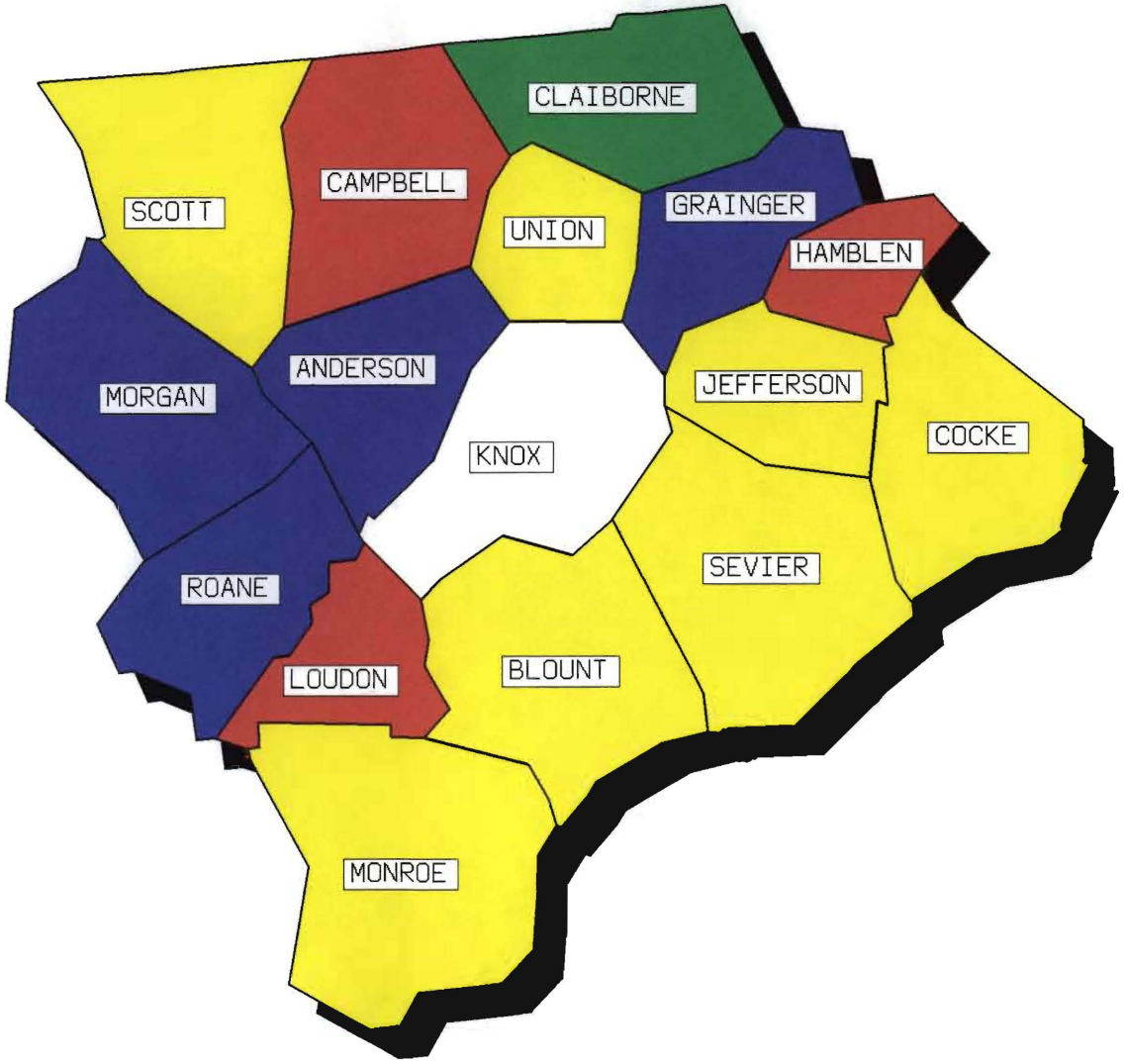
Infant Mortality





INFANT MORTALITY

Infant Deaths Per 1,000 Live Births; 1990–1994 Average



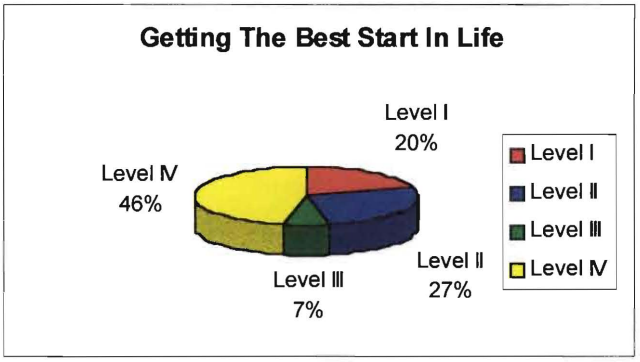
Level Designation

- Level I >9.6
- Level II 7.4–9.6
- Level III 7–7.3
- Level IV <7

Rate Totals
ETR = 7.4
State = 9.6
US = 8.7
Y2000 = 7.0

Summary – Getting The Best Start In Life

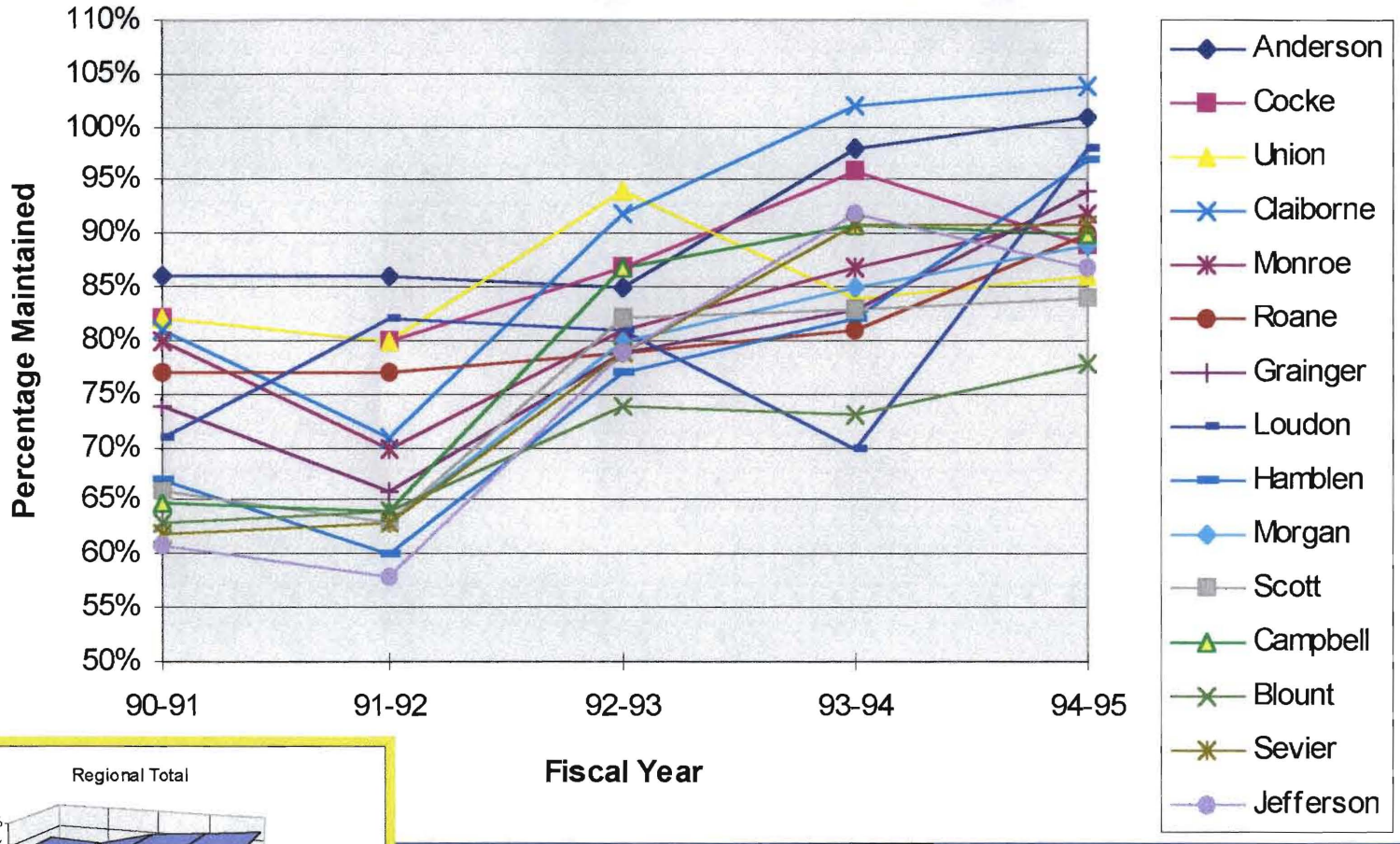
The individual health indicators – family planning, teenage pregnancy, pre-natal care, low birth weight, and infant mortality – are grouped in an effort to show the overall situation for getting the best start in life. The best "pre-natal care," it is argued, is adequate family planning. When a woman does become pregnant – whether unplanned or planned – and chooses to continue the pregnancy, then quality pre-natal care becomes very important. When she does deliver, the perinatal morbidity and mortality are strongly determined by the birth weight.

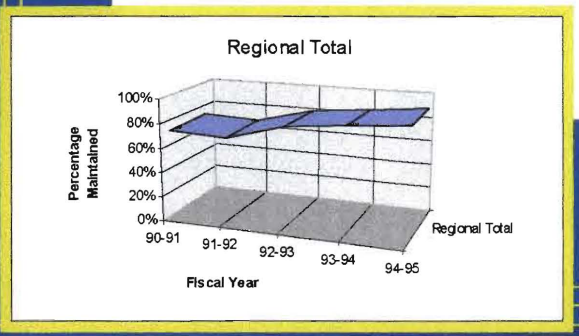


Summary - Getting the Best Start in Life
(By Level Designations)

County	*Family Planning*	*Teen Pregnancy*	*Pre-Natal Care*	*Low Birth Weight*	*Infant Mortality*	*Number of Level I*
Anderson	I	II	III	II	II	1
Blount	I	IV	III	III	IV	1
Campbell	II	II	III	II	I	1
Claiborne	III	IV	III	III	III	0
Cocke	III	II	I	I	IV	2
Grainger	III	IV	III	II	II	0
Hamblen	II	III	I	II	I	2
Jefferson	III	IV	III	III	IV	0
Loudon	I	IV	I	III	I	3
Monroe	III	II	I	III	IV	1
Morgan	I	IV	III	II	II	1
Roane	I	III	II	II	II	1
Scott	I	II	III	II	IV	1
Sevier	II	III	III	II	IV	0
Union	III	IV	III	I	IV	1
Regional Total	40.9	48.4	80.1	7.6	7.4	
State Total	46.4	57.6	78	8.6	9.6	
US Total	45.6	75.1	79	7.2	8.7	
Y2000	90	50	90	5.0	7.0	

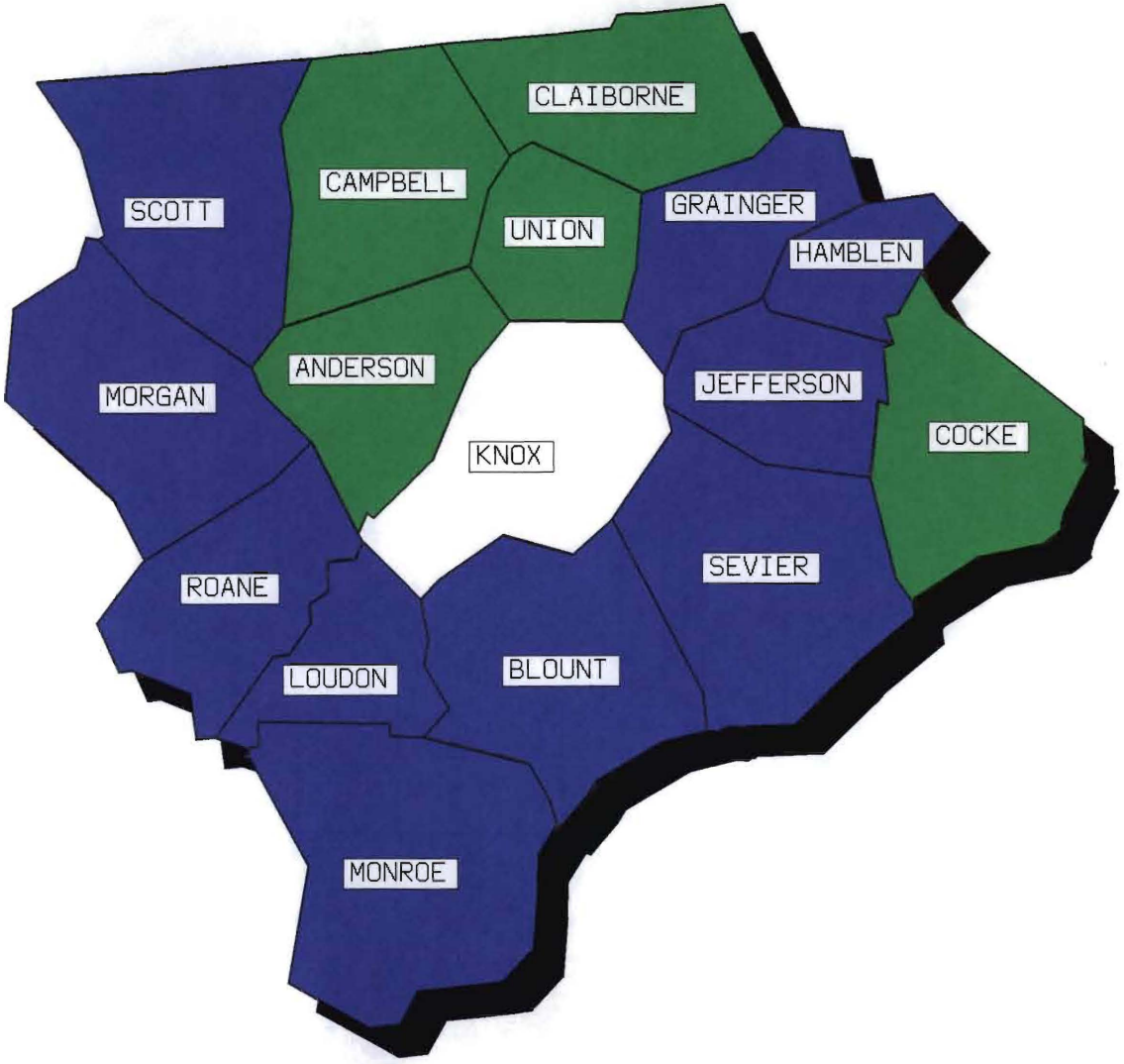
WIC


110%
105%
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
Percentage Maintained
90-91
91-92
92-93
93-94
94-95
Fiscal Year
Anderson
Cocke
Union
Claiborne
Monroe
Roane
Grainger
Loudon
Hamblen
Morgan
Scott
Campbell
Blount
Sevier
Jefferson


Regional Total
100%
80%
60%
40%
20%
0%
Percentage Maintained
90-91
91-92
92-93
93-94
94-95
Fiscal Year
Regional Total

WIC SERVICES

Percent Of Eligibles Maintained On WIC, FY 1993–1995



Level Designation

- Level I <73
- Level II 73–87
- Level III >87
- Level IV N/A

Percent Total	
ETR	87%
State	73.3%
US	N/A
Y2000	N/A

Breastfeeding

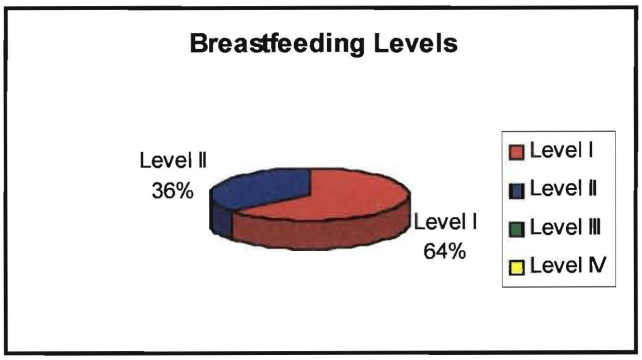
Breastfeeding rates are measured by determining the percentage of women breastfeeding at the 6 week post-partum WIC visit. Again, this relates both to poverty levels (since WIC eligibility is based in part on income) and service provision to those who are eligible. These breastfeeding rates must be interpreted by taking both poverty levels and WIC service provision into account. This is not an accurate estimate of overall breastfeeding rates, since it is known that rates differ according to socio-economic status. It does provide information on those at greatest risk – i.e., the poor.

Data:

Percent of women being certified for WIC at the 6 week post-partum visit who are currently breastfeeding, 1991-1995, TDH

Level Designation:

Level I: <19.9
Level II: 19.9 - 55.2
Level III: 55.3 - 75
Level IV: >75



Breastfeeding

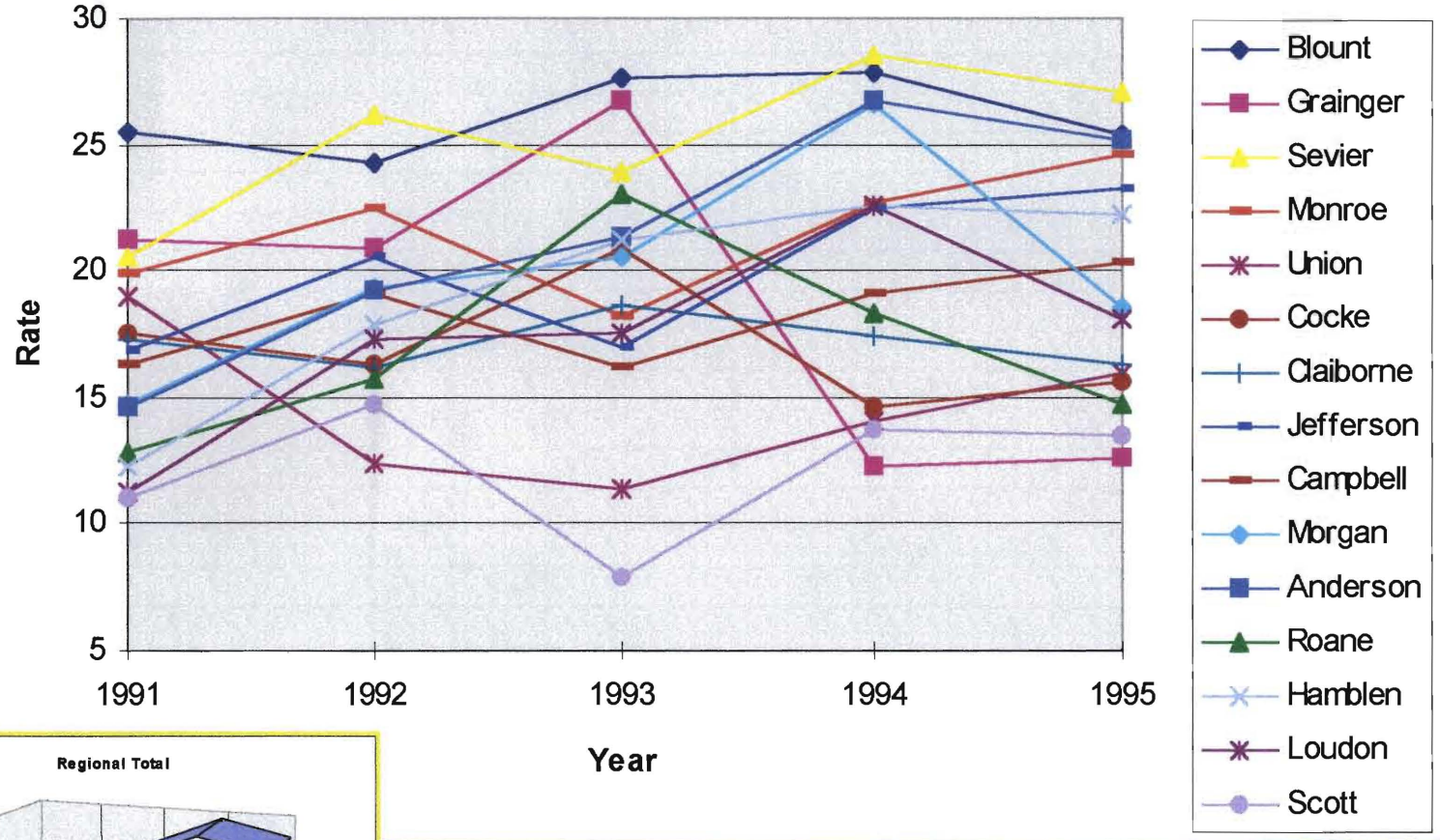
Percent of Women on WIC Breastfeeding at the 6 Week Post-partum Period

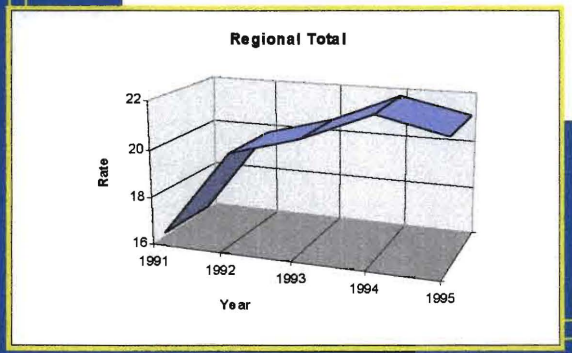
County	*1991*	*1992*	*1993*	*1994*	*1995*	*5 Year Average*	*Levels*
Anderson	14.6	19.2	21.4	26.8	25.2	21.4	II
Blount	25.5	24.3	27.6	27.9	25.4	26.1	II
Campbell	16.3	19.1	16.2	19.1	20.4	18.2	I
Claiborne	17.3	16.2	18.7	17.5	16.3	17.2	I
Cocke	17.6	16.3	20.9	14.6	15.6	17.0	I
Grainger	21.2	20.9	26.7	12.3	12.6	18.7	I
Hamblen	12.3	17.9	21.2	22.6	22.3	19.3	I
Jefferson	16.9	20.6	17.0	22.5	23.3	20.1	II
Loudon	11.3	17.3	17.6	22.6	18.1	17.4	I
Monroe	19.9	22.5	18.2	22.7	24.6	21.6	II
Morgan	14.8	19.3	20.6	26.6	18.6	20.0	II
Roane	12.9	15.8	23.1	18.3	14.7	17.0	I
Scott	11.0	14.7	7.9	13.8	13.5	12.2	I
Sevier	20.6	26.2	24.0	28.5	27.1	25.3	II
Union	19.0	12.4	11.4	14.1	16.0	14.6	I
Regional Total	16.2	19.9	20.7	21.9	21.3	20.0	
State Total	16.1	19.5	20.4	21.4	22.1	19.9	
US Total	53.3	54.2	55.9	57.4	N/A	55.2	
Y2000	for	low	income			75	

*1994 Total for Tennessee

** 1992 Total for US

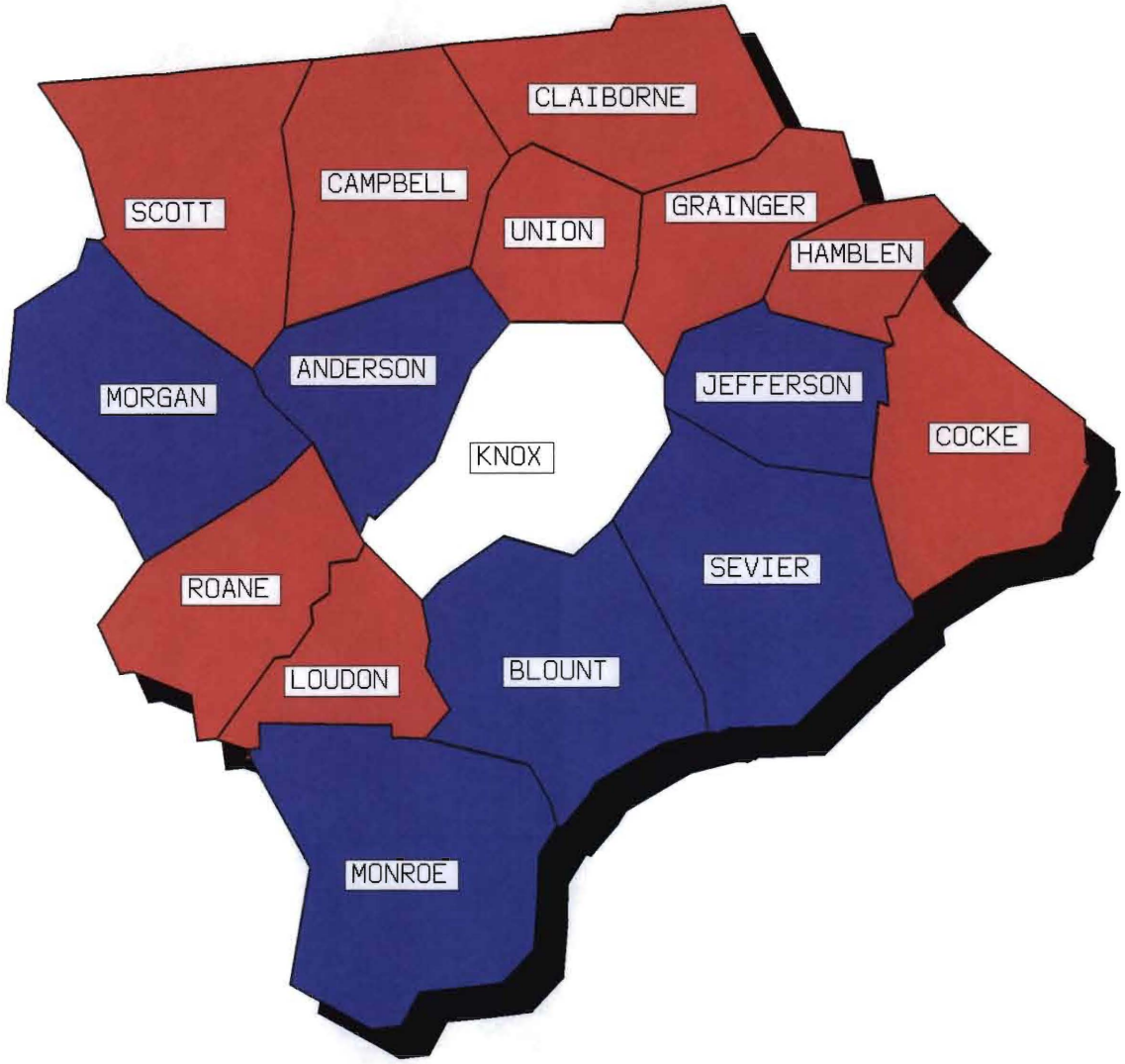
Breastfeeding





BREASTFEEDING

Rates For Women Enrolled In WIC, 1991–1995



Level Designation

- Level I <19.9
- Level II 19.9–55.2
- Level III 55.3–75
- Level IV >75

Rate Totals

ETR = 20

State = 19.9

US = 55.2

Y2000 = 75

Immunizations And Vaccine Preventable Diseases

Information for this indicator comes from a mix of health services status data. The following data sets were reviewed:

1. School Surveys – This is a self reported survey of immunization status of public and non-public school students (kindergarten and first grade) and children enrolled in Head Start programs in 1994 and 1996.

2. 24 Month Old Surveys – Each year TDH performs a survey of immunization status amongst 24 month old children. The data in this report are based on each county's "contribution" to the surveys done between 1993-1995. In some instances a county may have had only a few children in total in these three years of surveys.

3. Vaccine Preventable Diseases – The number of cases of such diseases over a three year period 1993-1995.

Data:

Separate levels are assigned for the data in 1, 2, and 3 above:

Level Designation:

1. School Surveys:
   - Level I: < 81.7
   - Level II: 81.7 - 84
   - Level III: 84.1 - 95
   - Level IIV: >95

2. 24 Month Surveys:
   - Level I: <81.4
   - Level II: 81.4 - 85.8
   - Level III: 85.9 - 90
   - Level IV: >90

3. Vaccine Preventable Disease:
   - Level I: 3 or more cases over the last 3 years
   - Level II: 2 cases over the last 3 years
   - Level III: 1 case over the last 3 years
   - Level IV: No cases over the last 3 years

Immunizations and Vaccine Preventable Diseases

	School Survey		24 Month Survey			Vaccine Prevent. Disease		
County	*1994*	*1996*	*7993*	*1994*	*1995*	*1993*	*1994*	*1995*
Anderson	90	89	80	75	90.5	0	0	0
Blount	87.5	95	87.5	100	95.5	1	0	0
Campbell	77.7	88.5	77	88.8	88.8	0	0	2
Claiborne	100	100	80	80	100	0	0	2
Cocke	100	100	100	87.5	100	0	0	2
Grainger	66.6	80	62	88.8	100	0	0	0
Hamblen	86	80	85.7	100	100	3	0	0
Jefferson	85.7	75	83	100	87.5	0	0	1
Loudon	91.6	87.5	92	46	87.5	1	0	0
Monroe	77.7	80	77	100	88.8	1	0	0
Morgan	100	88.8	100	100	75	0	0	0
Roane	76	78	71	76.9	77.7	2	0	0
Scott	77	93	88	100	100	0	0	1
Sevier	85	85	89	87.5	85	0	0	1
Union	50	50	50	83	50	0	0	0
Regional Total	83.3	84.6	81.4	87.5	88.4	8	0	9
State Total	78.6	84.7	78.6	80.8	84.7	206	58	203

Vaccine Preventable Diseases

	Measles			Mumps			Pertusis			Tetanus		
County	*1993*	*1994*	*1995*	*1993*	*1994*	*1995*	*1993*	*1994*	*1995*	*1993*	*1994*	*1995*
Anderson	0	0	0	0	0	0	0	0	0	0	0	0
Blount	0	0	0	0	0	0	1	0	0	0	0	0
Campbell	0	0	0	0	0	0	0	0	2	0	0	0
Claiborne	0	0	0	0	0	1	0	0	1	0	0	0
Cocke	0	0	0	0	0	0	0	0	2	0	0	0
Grainger	0	0	0	0	0	0	0	0	0	0	0	0
Hamblen	0	0	0	1	0	0	2	0	0	0	0	0
Jefferson	0	0	0	0	0	0	0	0	1	0	0	0
Loudon	0	0	0	0	0	0	1	0	0	0	0	0
Monroe	0	0	0	0	0	0	1	0	0	0	0	0
Morgan	0	0	0	0	0	0	0	0	0	0	0	0
Roane	0	0	0	2	0	0	0	0	0	0	0	0
Scott	0	0	0	0	0	0	0	0	1	0	0	0
Sevier	0	0	0	0	0	0	0	0	1	0	0	0
Union	0	0	0	0	0	0	0	0	0	0	0	0
Regional Total	0	0	0	3	0	1	5	0	8	0	0	0
State Total	0	28	0	18	8	5	173	22	209	2	0	0
US Total	221	707	261	1630	1322	840	6132	3590	4315	N/A	N/A	N/A

Immunizations and Vaccine Preventable Diseases

	School Survey		24 Month Survey		Vaccine Prevent. Disease		
County	[1] *% Complete*	*Level*	[2] *% Complete*	*Level*	[3] *Average Case/Year*	*Level*	[4] *Summary Level*
Anderson	89.5	III	81.2	I	0	IV	III
Blount	91.3	III	94.3	IV	.3	III	III
Campbell	83	II	84.9	II	.7	II	II
Claiborne	100	IV	86.7	III	.7	II	III
Cocke	100	IV	95.9	IV	.7	II	III
Grainger	73.3	I	83.6	II	0	IV	II
Hamblen	83	II	95.2	IV	1	I	II
Jefferson	80.4	I	90.2	IV	.3	III	III
Loudon	89.6	III	75.2	I	.3	III	III
Monroe	78.9	I	88.6	III	.3	III	III
Morgan	94.4	III	91.7	IV	0	IV	IV
Roane	77	I	75.2	I	.7	II	I
Scott	85	III	96	IV	.3	III	III
Sevier	85	III	87.2	III	.3	III	III
Union	50	I	61	I	0	IV	II
Regional Total	84		85.8		5.7		
State Total	81.7		81.4		155.7		
US Total	N/A		N/A		6339		
Y2000	95		90				

[1] 2 Year Average for 1994 & 1996

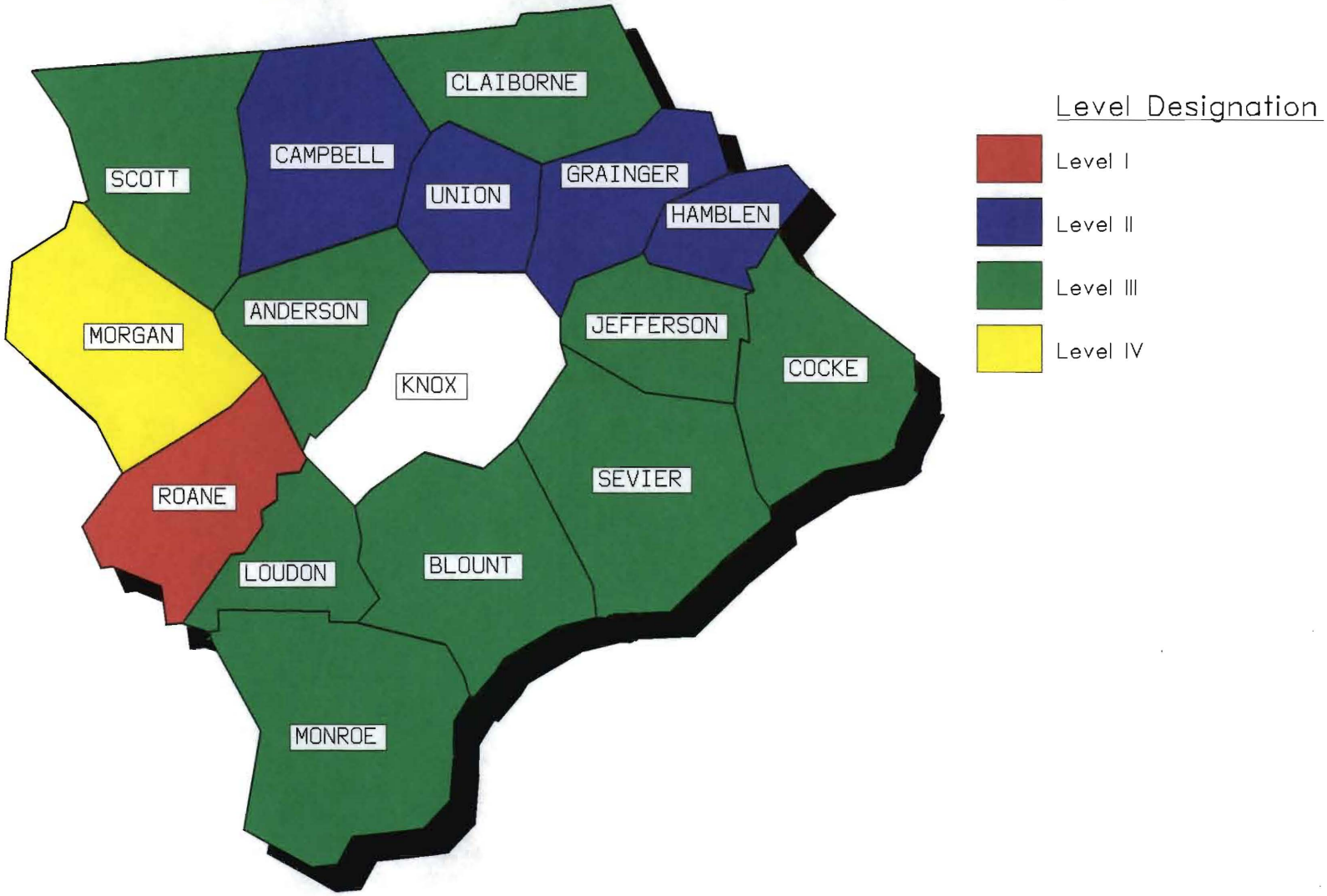
[2] 3 Year Average 1993-1995

[3] 3 Year Average 1993-1995; Levels I - (3 or more cases over last 3 yrs.); II - (2 cases over last 3 yrs.); III - (1 case over last 3 yrs.); IV - (0 cases over last 3 yrs.)

[4] Summary based on relatively equal consideration of 24 month survey and vaccine preventable diseases, with slightly less consideration given to school survey.

IMMUNIZATIONS AND VACCINE PREVENTABLE DISEASES

Based On School Surveys ('94 & '96), 24 Month Surveys ('93–'95), And Vaccine Preventable Disease Statisitcs ('93–'95)



Fluoridated Water

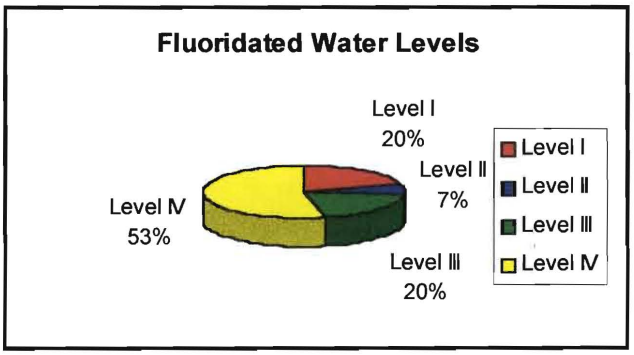
The data in this report do not show what percentage of the total county population receive fluoridated water but rather what percentage of the population serviced by public water utilities have the fluoride added. There might still be a portion of the population who use well water or other sources that would not be reflected in these figures.

Data:

Percent of those serviced by public water utilities who receive fluoridated water, 1994, Department of Environment and Conservation, Water Division

Level Designation:

Level I: <62.1
Level II: 62.2 - 83.1
Level III: 83.2 - 93.9
Level IV: >94



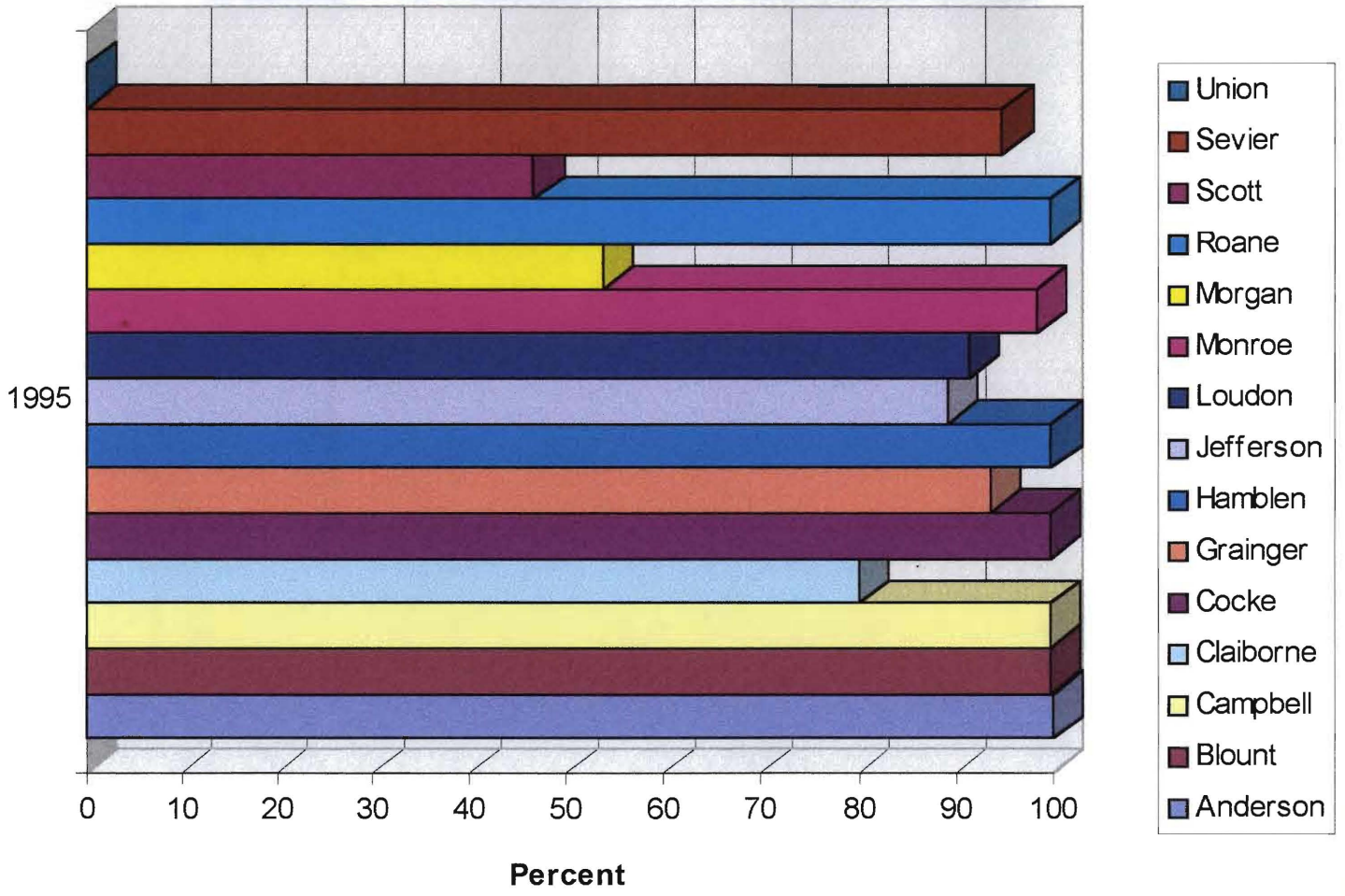
Fluoridated Water

County	*1995*	*Levels*
Anderson	100	IV
Blount	99.7	IV
Campbell	99.7	IV
Claiborne	80.0	II
Cocke	99.7	IV
Grainger	93.7	III
Hamblen	99.9	IV
Jefferson	89.2	III
Loudon	91.4	III
Monroe	98.4	IV
Morgan	53.8	I
Roane	99.8	IV
Scott	46.7	I
Sevier	94.9	IV
Union	0	I
Regional Total	83.1	
State Total	93.9*	
US Total	62.1**	
Y2000	75	

*1994 Total for Tennessee

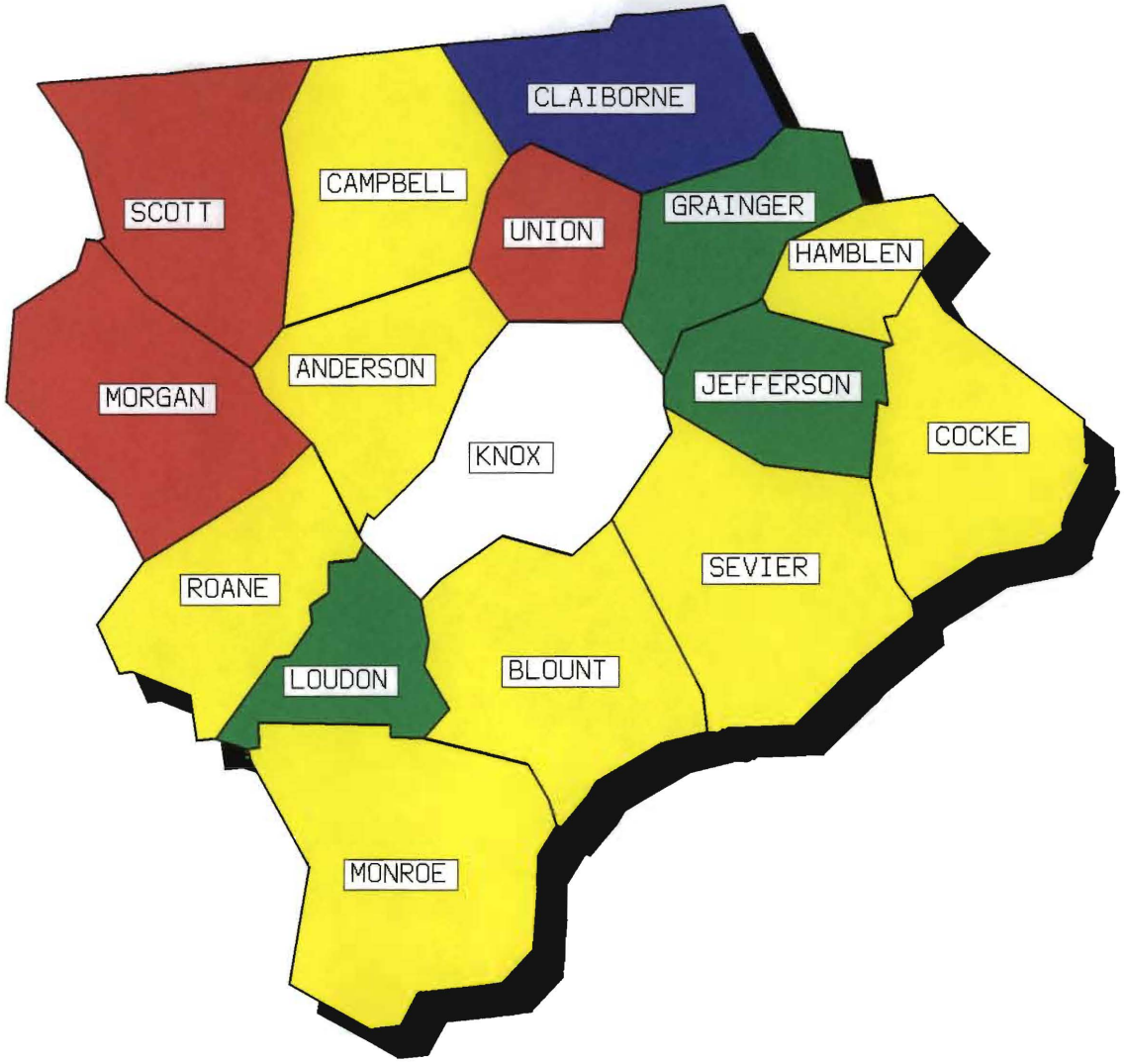
** 1992 Total for US

Fluoridated Water



FLUORIDATED WATER

Percent of Those On Public Utilities Who Receive Fluoridated Water, 1995



Level Designation

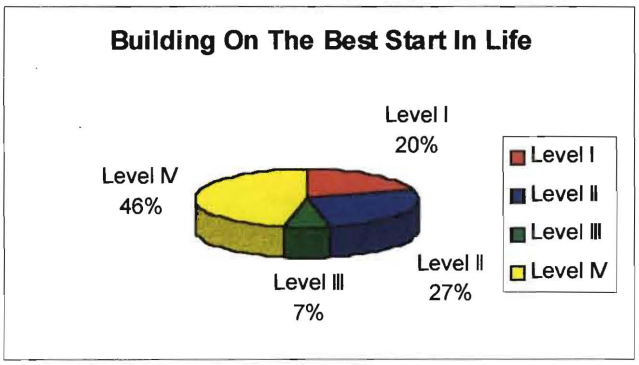
- Level I <62.1
- Level II 62.2–83.1
- Level III 83.2–93.9
- Level IV >94

% Served By Public Utilities

ETR = 83.1%
State 93.9%
US = 62.1%
Y2000 = 75%

Summary – Building On The Best Start In Life

Data on WIC Services, Breastfeeding, Immunizations and Vaccine Preventable Diseases, And Fluoridated Water are grouped for the summary map of this major area. As with the summary on getting the best start in life, counties are mapped according to the number of individual level I indicators that each county had.

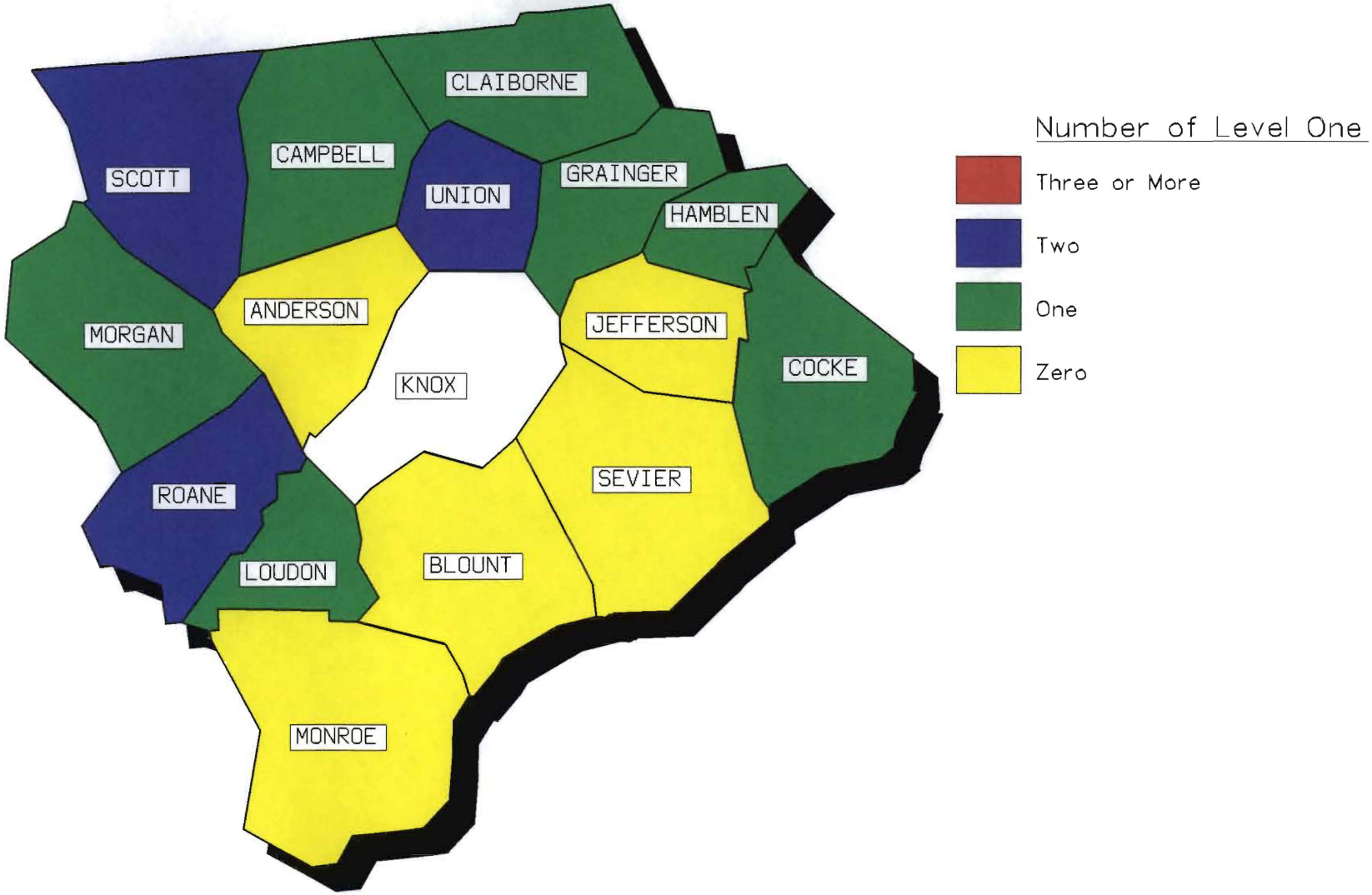


Summary - Building On The Best Start In Life
(By Number Of Level I Designations, Plus Infant Mortality)

County	*WIC*	*Breastfeeding*	*Immunizations And Vaccine Preventable Disease*	*Fluoridated Water*	*Number of Level I*	*Infant Mortality*
Anderson	III	II	III	IV	0	II
Blount	II	II	III	IV	0	IV
Campbell	III	I	II	IV	1	I
Claiborne	III	I	III	II	1	III
Cocke	III	I	III	IV	1	IV
Grainger	II	I	II	III	1	II
Hamblen	II	I	II	IV	1	I
Jefferson	II	II	III	III	0	IV
Loudon	II	I	III	III	1	I
Monroe	II	II	III	IV	0	IV
Morgan	II	II	IV	I	1	II
Roane	II	I	I	IV	2	II
Scott	II	I	III	I	2	IV
Sevier	II	II	III	IV	0	IV
Union	III	I	II	I	2	IV
Regional Total	87	20.0		83.1		7.4
State Total	73.3	19.9		93.9		9.6
US Total		55.2		62.1		8.7
Y2000		75		75		7.0

BUILDING ON THE BEST START IN LIFE

Summary Of WIC, Breastfeeding Rates, Immunization Levels, And Fluoridated Water, 1990–1995



Maximizing the Disease-Free State (Staying Healthy)

The following health status/health services indicators are included in this section:

Morbidity:

- Tuberculosis
- Sexually Transmitted Diseases

Mortality:

- Heart Disease
- Strokes
- Cancer
- Unintentional Injuries

Tuberculosis

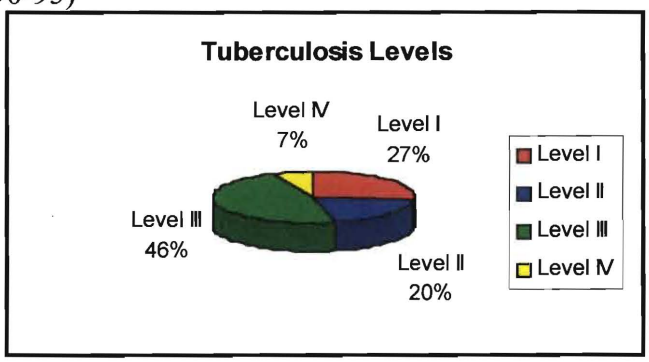
TB cases -- pulmonary and extra-pulmonary -- reported to the State for the years 1990-1995 are presented. The levels were determined using an average of 1992-1994. No US figures were available for 1995, so all data from that year were excluded from the average.

Data:

Cases per 100,000 population, TDH (1990-95)

Level Designation:

Level I: > 10.8
Level II: 7.4 - 10.8
Level III: 3.5 - 7.3
Level IV: <3.5

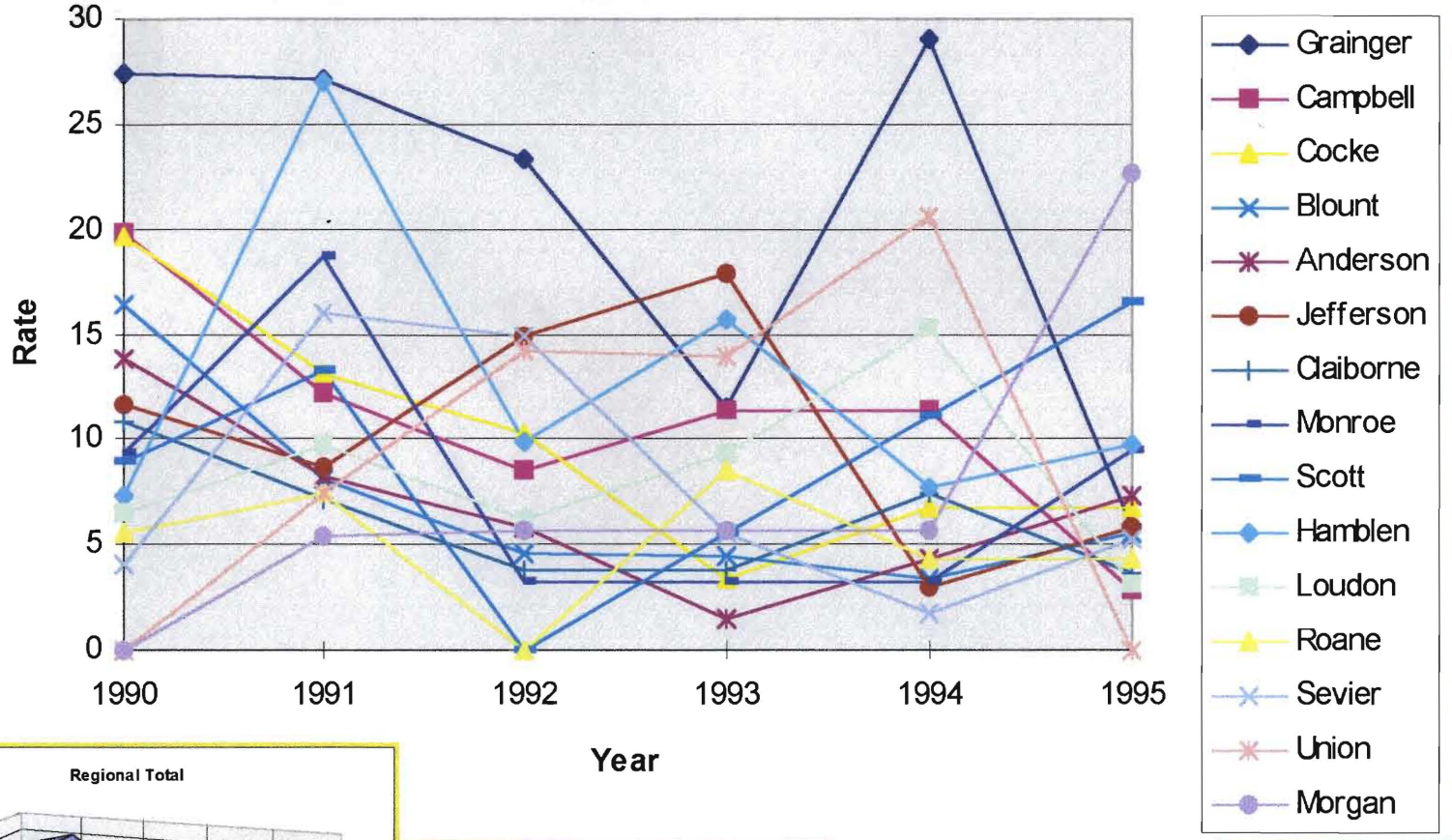


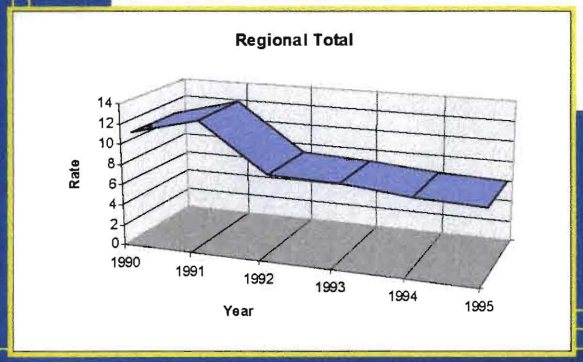
Tuberculosis

	1990			1991			1992			1993		
County	*Cases*	*Rates per 100,000*	*County Rank*	*Cases*	*Rates per 100,000*	*County Rank*	*Cases*	*Rates per 100,000*	*County Rank*	*Cases*	*Rates per 100,000*	*County Rank*
Anderson	10	13.9	7	6	8.3	57	4	5.9	59	1	1.5	79
Blount	14	16.4	22	7	8.1	58	4	4.6	67	4	4.5	70
Campbell	8	19.8	13	5	12.2	33	3	8.6	51	4	11.4	37
Claiborne	3	10.9	47	2	7.2	66	1	3.8	70	1	3.8	73
Cocke	6	19.7	14	4	13.1	28	3	10.3	44	1	3.4	75
Grainger	5	27.4	4	5	27.2	3	4	23.3	8	2	11.6	36
Hamblen	4	7.3	62	15	27.0	4	5	9.9	47	8	15.7	18
Jefferson	4	11.7	41	3	8.7	55	5	15.0	24	6	17.9	16
Loudon	2	6.5	69	3	9.8	48	2	6.3	57	3	9.3	44
Monroe	3	9.4	53	6	18.7	13	1	3.2	73	1	3.2	76
Morgan	0	0		1	5.4	78	1	5.7	62	1	5.7	62
Roane	3	5.6	73	4	7.4	63	0	0	91	4	8.6	50
Scott	2	9.0	57	3	13.3	27	0	0	92	1	5.5	66
Sevier	2	4.1	78	8	16.0	18	8	15.0	23	3	5.5	67
Union	0	0		1	7.4	64	2	14.2	26	2	14.0	29
Regional Total	66	10.7		73	12.4		43	7.7		42	7.5	
State Total	598	11.8		574	11.3		527	10.7		555	11.2	

	1994			1995				
County	*Cases*	*Rates per 100,000*	*County Rank*	*Cases*	*Rates per 100,000*	*County Rank*	*Average Rate 92-94*	*Levels*
Anderson	3	4.4	70	5	7.3	43	3.9	III
Blount	3	3.4	73	5	5.6	54	4.2	III
Campbell	4	11.4	30	1	2.9	72	10.5	II
Claiborne	2	7.5	52	1	3.7	65	5.0	III
Cocke	2	6.8	59	2	6.8	47	6.8	III
Grainger	5	29.0	5	1	5.8	52	21.3	I
Hamblen	4	7.8	46	5	9.8	29	11.1	I
Jefferson	1	3.0	77	2	5.9	51	12.0	I
Loudon	5	15.4	16	1	3.1	70	10.3	II
Monroe	1	3.2	75	3	9.5	30	3.2	IV
Morgan	1	5.7	64	4	22.7	9	5.7	III
Roane	2	4.3	71	2	4.3	62	5.4	III
Scott	2	11.1	34	3	16.6	15	5.5	III
Sevier	1	1.8	82	3	5.3	56	7.4	II
Union	3	20.6	10	0	0.0	93	12.9	I
Regional Total	39	6.9		38	6.7		7.4	
State Total	519	10.4		465	9.2		10.8	
US Total							10.3	
Year 2000							3.5	

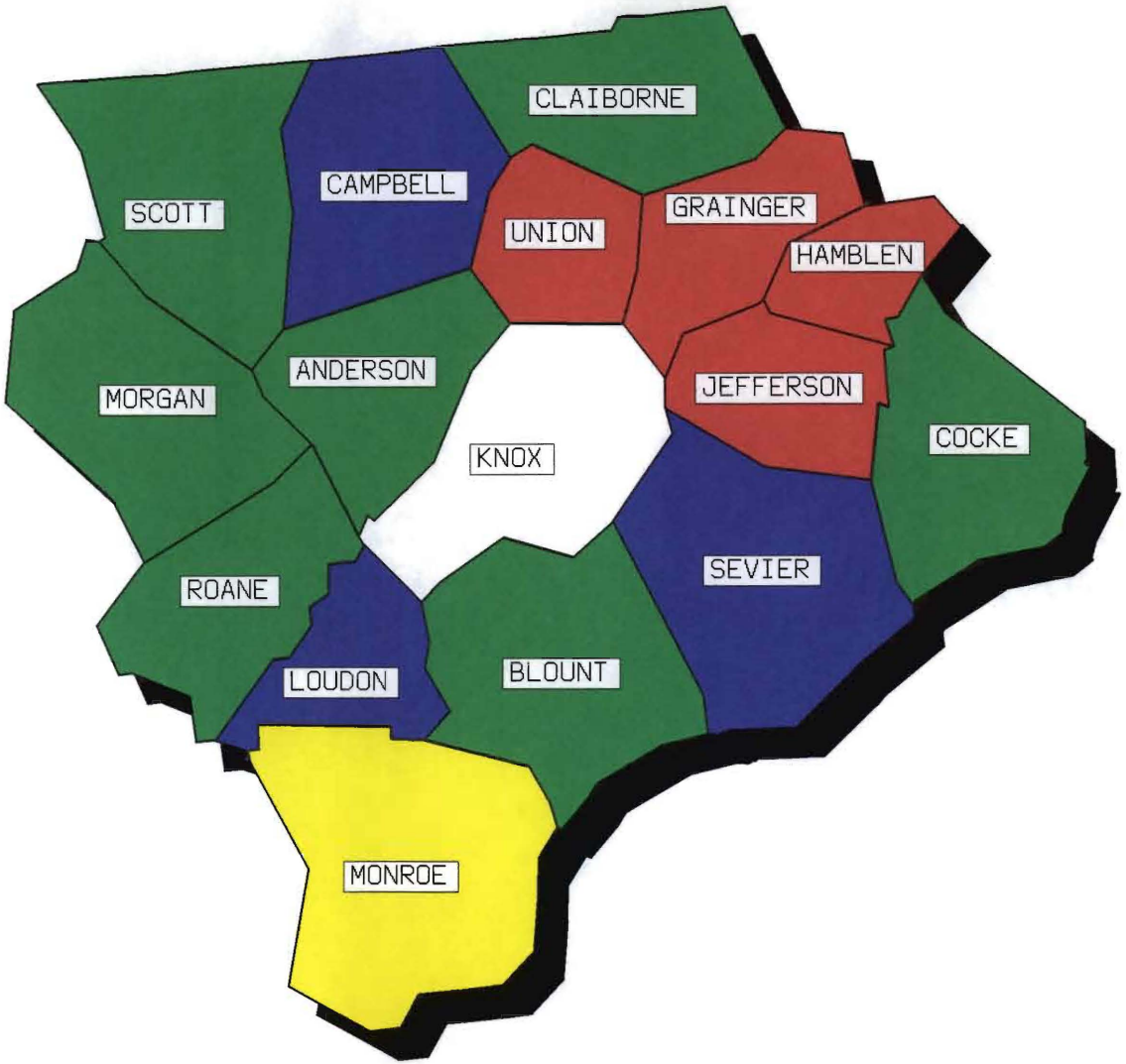
Tuberculosis





TUBERCULOSIS

1992–1994 Average; Cases Per 100,000 Population



Level Designation

- Level I >10.8
- Level II 7.4–10.8
- Level III 3.5–7.3
- Level IV <3.5

Rate Totals	
ETR	7.4
State	10.8
US	10.3
Y2000	3.5

Sexually Transmitted Diseases

Syphilis (Primary and Secondary) and Gonorrhea cases reported to the State for a six year period (1990-1995) are presented. These rates are calculated as race-specific rates as well as total rates.

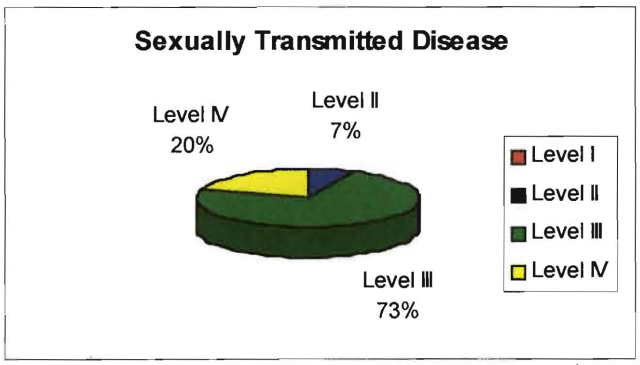
Data:

Cases of syphilis (Primary and Secondary) and gonorrhea per 100,000 population; yearly average over the six year period 1990-1995, TDH (CDC)

Level Designation:

Assignment of levels for STDs did not follow the usual pattern:

Level I: Each Black/White Rate > Corresponding Black/White State Rate
Level II: Each Black/White Rate > Corresponding ETR Rate
Level III: At Least 1 Black or White Rate > Corresponding ETR Rate
Level IV: Each Black/White Rate < Corresponding ETR Rate

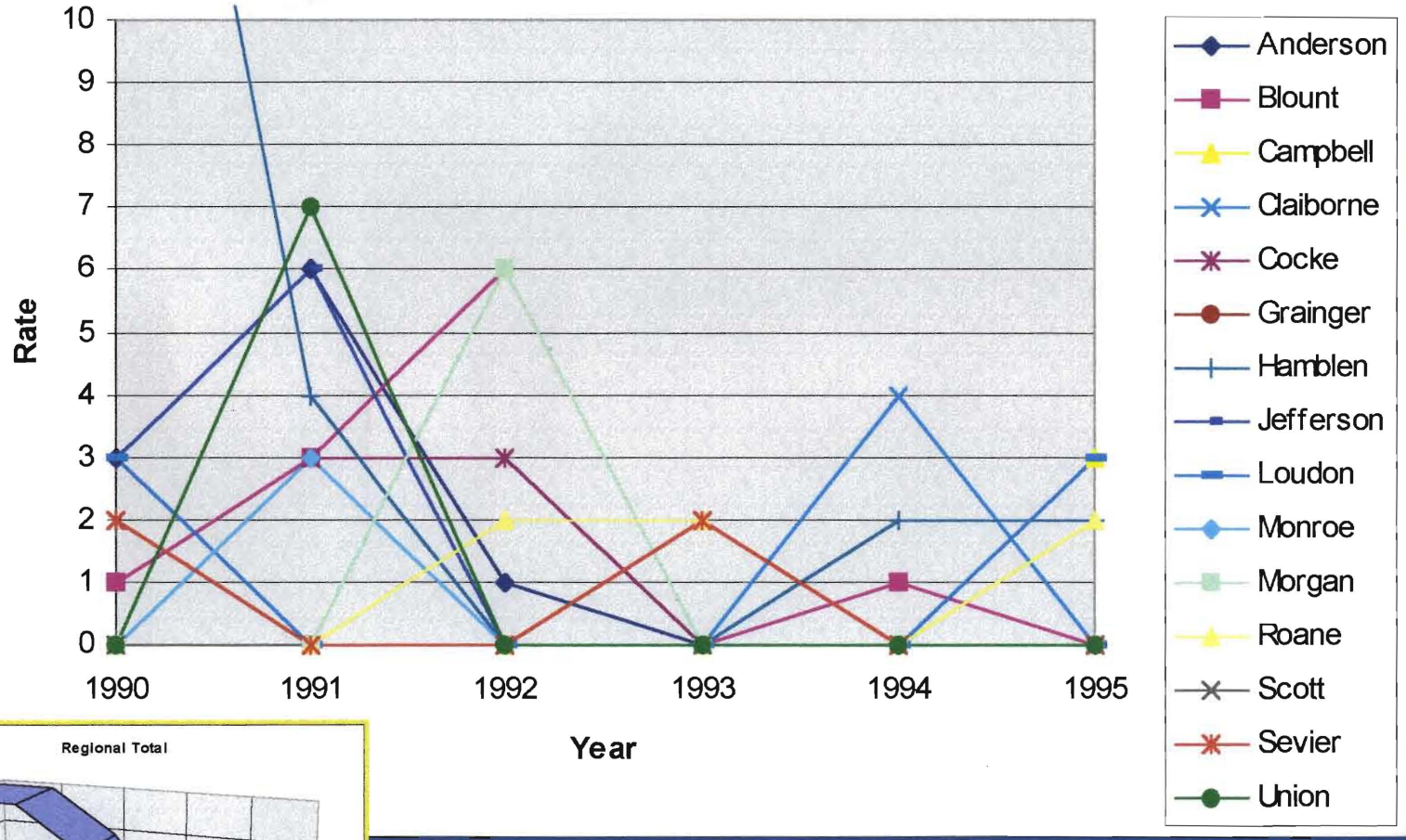


Syphilis

	1990				1991				1992				1993			
County	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*
Anderson	2	3	1	36	4	6	4	143	1	1	1	35	0	0	0	0
Blount	1	1	1	36	3	3	2	70	5	6	5	173	0	0	0	0
Campbell	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Claiborne	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cocke	0	0	0	0	1	3	0	0	1	3	0	0	0	0	0	0
Grainger	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hamblen	10	20	8	344	2	4	1	43	0	0	0	0	0	0	0	0
Jefferson	1	3	0	0	2	6	1	107	0	0	0	0	0	0	0	0
Loudon	1	3	1	250	0	0	0	0	0	0	0	0	0	0	0	0
Monroe	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0
Morgan	0	0	0	0	0	0	0	0	1	6	1	344	0	0	0	0
Roane	0	0	0	0	0	0	0	0	1	2	0	0	1	2	0	0
Scott	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sevier	1	2	1	463	0	0	0	0	0	0	0	0	1	2	0	0
Union	0	0	0	0	1	7	1	33333	0	0	0	0	0	0	0	0
Regional Total	16	3	12	92	14	3	9	68	9	2	7	52	2	0	0	0
State Total	2,061	42	1,928	248	3,573	73	3,354	427	2,786	56	2,571	324	1,156	23	1,062	133
US Total					42716	17.2	36136	122.3	34003	13.4	28996	96.7	26352	10.4	22605	76.5

	1994				1995				5 Year Average		
County	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Rate*	*Black Rates*	*White Rates*
Anderson	0	0	0	0	0	0	0	0	1.7	35.6	.3
Blount	1	1	1	33	0	0	0	0	1.8	52	.2
Campbell	0	0	0	0	1	3	0	0	5	0	.5
Claiborne	1	4	0	0	0	0	0	0	.7	0	.7
Cocke	0	0	0	0	0	0	0	0	1	0	1.3
Grainger	0	0	0	0	0	0	0	0	0	0	0
Hamblen	1	2	1	42	1	2	1	42	4.7	78.5	1
Jefferson	0	0	0	0	0	0	0	0	1.5	17.8	1
Loudon	0	0	0	0	1	3	0	0	1	41.7	.5
Monroe	0	0	0	0	0	0	0	0	.5	0	.5
Morgan	0	0	0	0	0	0	0	0	1.5	57.3	0
Roane	0	0	0	0	1	2	0	0	1.5	0	1
Scott	0	0	0	0	0	0	0	0	0	0	0
Sevier	0	0	0	0	0	0	0	0	.7	77.2	.3
Union	0	0	0	0	0	0	0	0	1.2	5555.5	0
Regional Total	3	1	2	15	4	1	1	7	1.7	39	.5
State Total	2,333	47	2,118	262	2,035	40	1,856	228	46.8	270.3	2.3
US Total	20618	8.1	17843	59.5					12.3	88.8	1.4
Y2000									10	65	

Syphilis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Rate
1990
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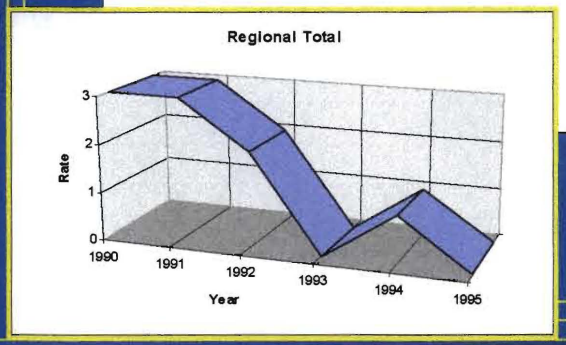
1993
1994
1995
Year
Anderson
Blount
Campbell
Claiborne
Cocke
Grainger
Hamblen
Jefferson
Loudon
Monroe
Morgan
Roane
Scott
Sevier
Union


Regional Total
Rate
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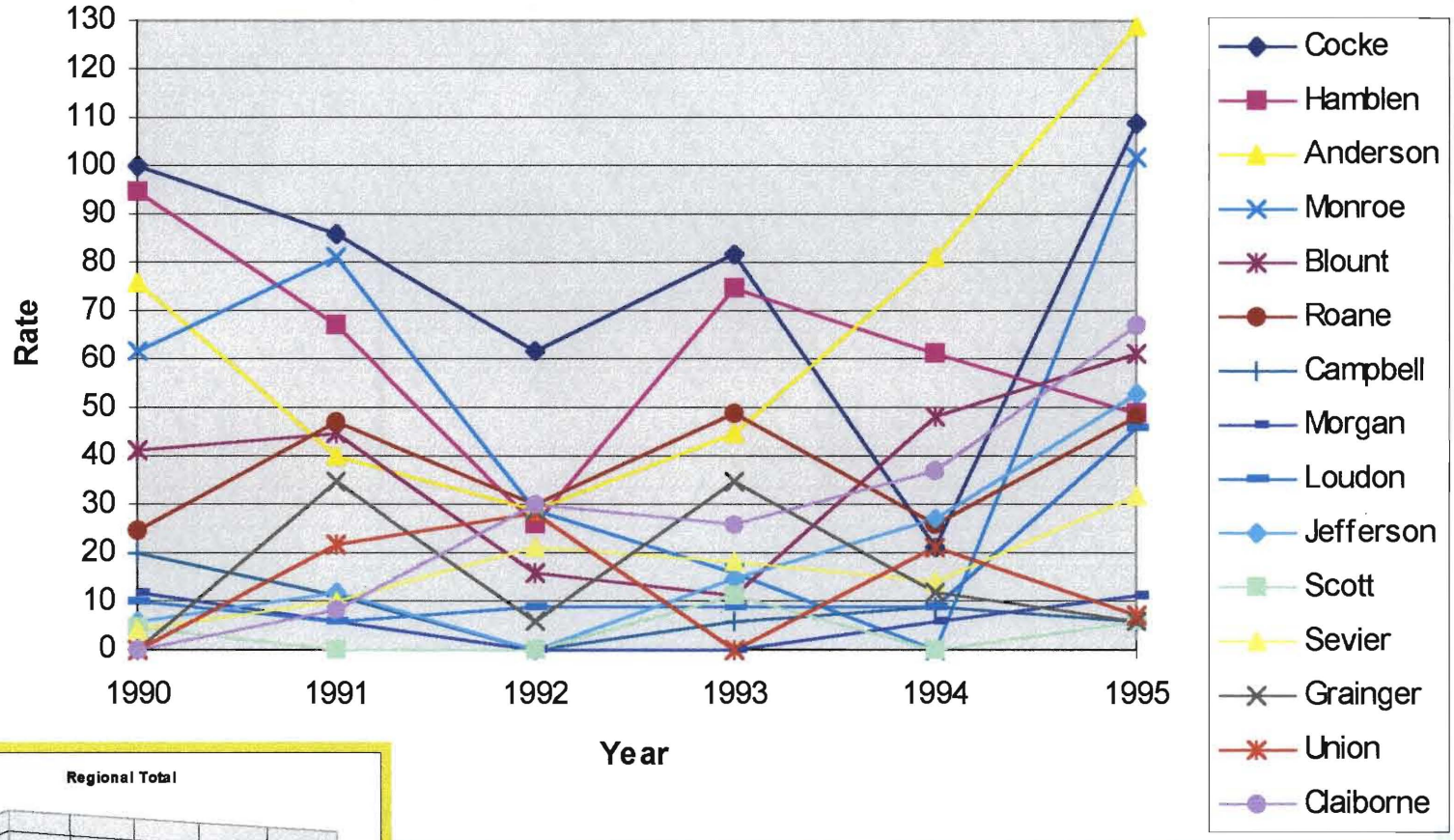
Year

Gonorrhea

	1990				1991				1992				1993			
County	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*
Anderson	52	76	31	1,122	27	40	15	537	20	29	15	532	31	45	15	527
Blount	35	41	9	323	39	45	18	634	14	16	4	138	10	11	4	136
Campbell	7	20	0	0	4	11	0	0	0	0	0	0	2	6	0	0
Claiborne	0	0	0	0	2	8	1	394	8	30	0	0	7	26	0	0
Cocke	29	100	3	489	25	86	0	0	18	62	1	161	24	82	1	159
Grainger	0	0	0	0	6	35	3	2,941	1	6	0	0	6	35	2	1980
Hamblen	48	95	26	1,119	34	67	20	855	13	26	4	170	18	75	19	803
Jefferson	2	6	2	215	4	12	1	107	0	0	0	0	5	15	3	319
Loudon	3	10	0	0	2	6	0	0	3	9	0	0	3	9	0	0
Monroe	19	62	7	840	25	81	11	1,310	9	29	1	119	5	16	1	118
Morgan	2	12	1	377	1	6	0	0	0	0	0	0	0	0	0	0
Roane	12	25	3	206	22	47	10	684	14	30	6	409	23	49	14	952
Scott	1	5	0	0	0	0	0	0	0	0	0	0	2	11	0	0
Sevier	2	4	0	0	5	10	0	0	11	21	1	403	10	18	0	0
Union	0	0	0	0	3	22	0	0	4	28	0	0	0	0	0	0
Regional Total	212	38	82	627	199	36	79	597	109	19	33	247	160	28	59	436
State Total	19928	409	17774	2284	21101	430	18558	2363	15732	319	14001	1766	14285	288	12708	1588
US Total					548291	239.5	449609	1714.1	469364	198.7	382743	1407.8	380381	165.8	3808357	1215.2

	1994				1995				5 Year Average		
County	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Cases*	*Total Rate*	*Black Cases*	*Black Rate*	*Total Rate*	*Black Rate*	*White Rates*
Anderson	55	81	32	1,115	88	129	61	2,093	66.7	987.7	25.7
Blount	43	48	23	766	55	61	21	686	37	447.2	22
Campbell	3	9	1	730	2	6	0	0	24.3	121.7	8.3
Claiborne	10	37	0	0	18	67	0	0	28	65.7	4
Cocke	6	21	2	317	32	109	5	775	76.7	316.8	69.2
Grainger	2	12	1	990	1	6	0	0	15.7	985.2	6.8
Hamblen	31	61	13	546	25	49	17	707	62.2	700	28.3
Jefferson	9	27	6	640	18	53	8	844	18.8	354.2	9.2
Loudon	3	9	0	0	15	46	4	941	14.8	156.8	13
Monroe	0	0	0	0	32	102	13	1,512	53.2	669.5	29.5
Morgan	1	6	0	0	2	11	0	0	5.8	62.8	4
Roane	12	26	6	407	22	48	10	672	37.5	555	20.8
Scott	0	0	0	0	1	6	0	0	3.7	0	3.7
Sevier	8	14	2	712	18	32	6	1,974	16.5	514.8	13.2
Union	3	21	0	0	1	7	1	12,500	13	2083.3	11.8
Regional Total	187	33	87	637	314	55	146	1,048	34.8	598.7	20
State Total	15745	315	13646	1690	13894	276	10977	1346	339.5	1839.5	41.2
US Total	382899	166.8	309404	1219.3					192.7	1389.1	34.3
Y2000									225	1300	

Gonorrhea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Year
Cocke
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Campbell
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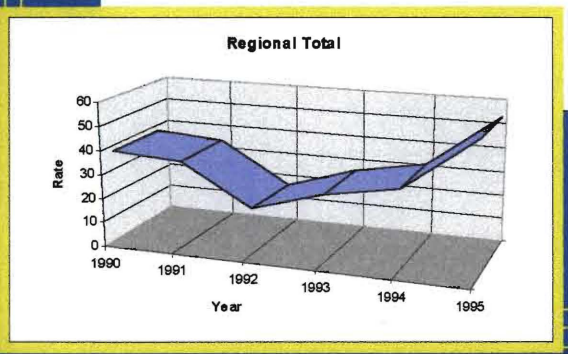
Loudon
Jefferson
Scott
Sevier
Grainger
Union
Claiborne


Regional Total
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Rate
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1993
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1995
Year

Sexually Transmitted Diseases

County	*Summary Levels*
Anderson	III
Blount	III
Campbell	IV
Claiborne	IV
Cocke	III
Grainger	III
Hamblen	II
Jefferson	IV
Loudon	IIb
Monroe	III
Morgan	III
Roane	III
Scott	IV
Sevier	III
Union	I

Level I:
Each Black/White Rate > Corresponding State Rates

Level II:
All Black/White Rates > Corresponding ETR Rates

Level III:
At Least 1 Black/White Rate > Corresponding ETR Rates

Level IV:
All Black/White Rates < Corresponding ETR Rates

	Syphilis			Gonorrhea		
	Total	Black	White	Total	Black	White
ETR	1.7	39	.5	34.8	598.7	20
State	46.8	270.3	2.3	339.5	1839.5	41.2
US	12.3	88.8	1.4	192.7	1389.1	34.3
Y2000	10	65		225	1300	

Mortality from the Four Leading Causes of Death

Heart Disease, Cancer, Injuries, and Strokes

The following data are provided by the Division of Vital Statistics for the leading causes of death. These rates are age adjusted on the 1940 U.S. population, which is the same population used for adjustment in the Healthy People 2000 objectives. For each of these major causes of death, the level designations follow the pattern described in the methods section and is based on a five year average.

Data:

Age-adjusted deaths per 100,000 population, 1990-1994, TDH Vital Statistics

Level Designation:

Heart Disease:

- Level I: >163.7
- Level II: 144.8 - 163.7
- Level III: 100 - 144.7
- Level IV: <100

Cancer:

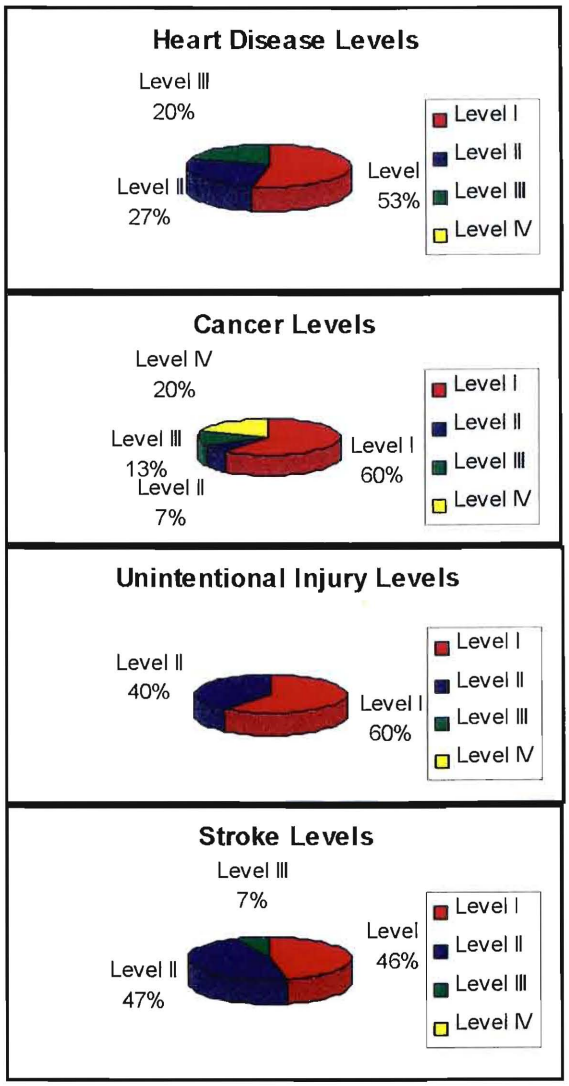
- Level I: >142.3
- Level II: 132.9 - 142.3
- Level III: 130 - 132.8
- Level IV: <130

Injuries:

- Level I: >46.6
- Level II: 29.9 - 46.6
- Level III: 29 - 29.8
- Level IV: <29

Strokes:

- Level I: >34.7
- Level II: 26.4 - 34.7
- Level III: 20 - 26.3
- Level IV: < 20



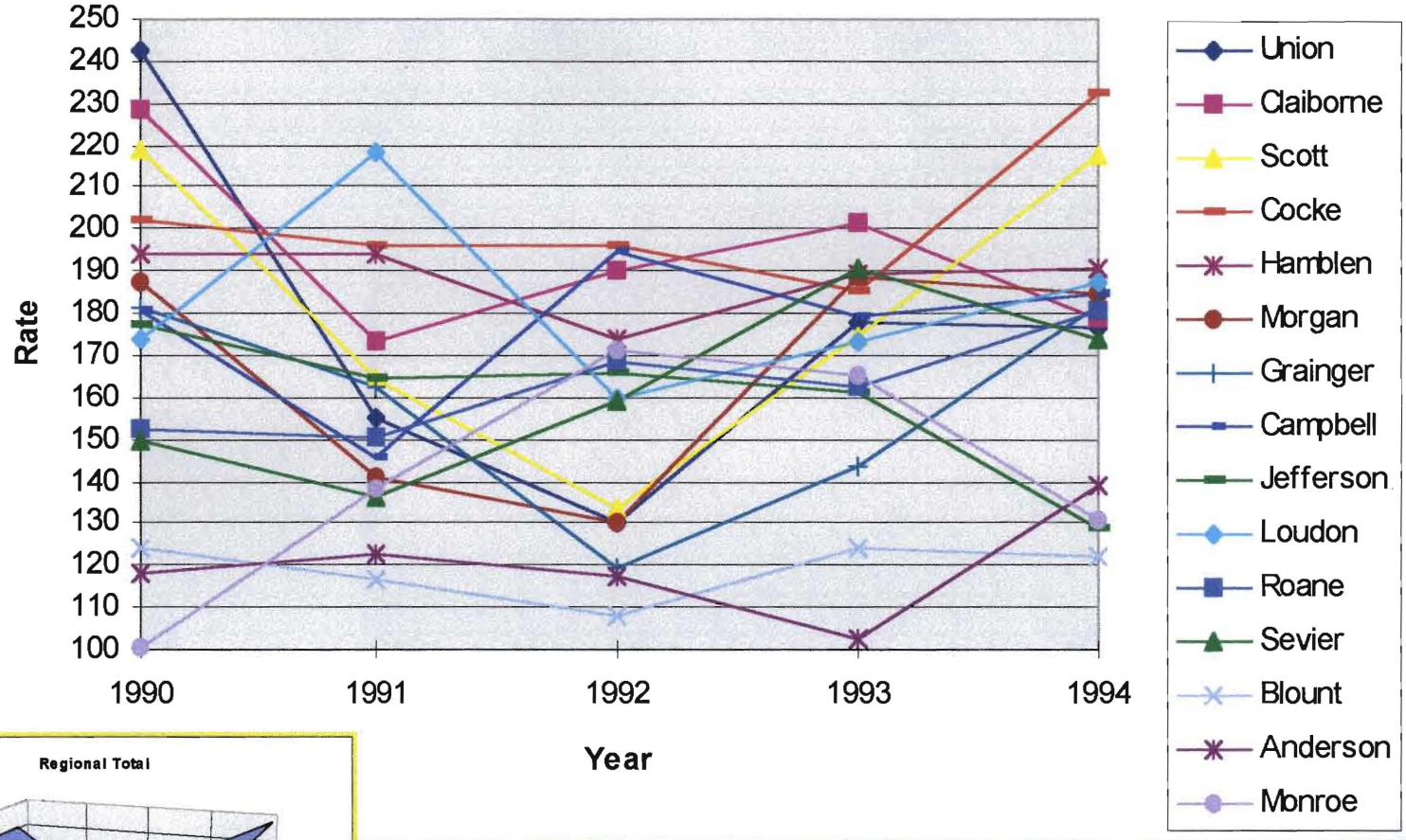
Heart Disease

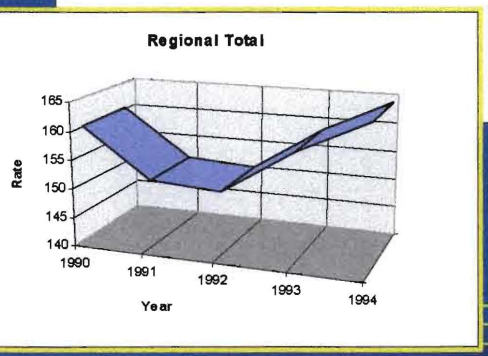
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	179	118.2	184	122.9	201	117.7
Blount	229	124.0	217	117.0	226	108.4
Campbell	130	180.8	117	145.5	136	194.9
Claiborne	111	228.2	88	173.1	100	189.9
Cocke	112	202.0	110	196.0	108	195.9
Grainger	54	181.7	54	162.4	39	119.8
Hamblen	173	194.5	182	194.4	159	174.2
Jefferson	120	177.4	102	164.7	119	166.0
Loudon	117	174.3	136	218.4	108	160.1
Monroe	58	101.0	85	138.2	109	171.3
Morgan	56	187.4	44	141.1	39	130.0
Roane	157	152.8	168	150.6	177	168.9
Scott	66	219.2	50	164.7	40	133.4
Sevier	143	149.8	129	136.3	167	158.9
Union	53	242.5	34	155.4	34	130.1
Regional Total	1,758	160.2	1,700	151.8	1,762	151.1
State Total	15,415	169.1	15,358	164.8	14,895	157.4
US Total						144.3

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	170	102.6	226	139.1	192	120.2	III
Blount	239	123.9	252	121.9	233	119.1	III
Campbell	128	179.6	130	184.9	128	177.3	I
Claiborne	109	201.5	95	178.9	101	194.1	I
Cocke	102	185.7	130	232.7	112	202.4	I
Grainger	49	143.7	61	182.1	51	157.7	II
Hamblen	187	189.2	170	190.8	174	188.3	I
Jefferson	113	161.3	97	128.6	110	159.2	II
Loudon	123	173.6	136	187.4	124	182.8	I
Monroe	104	165.2	88	130.7	89	141.7	III
Morgan	55	189.0	60	184.5	51	166.8	I
Roane	168	162.6	190	180.6	172	163.1	II
Scott	55	175.0	70	217.4	56	181.9	I
Sevier	201	191.1	185	173.8	165	162.6	II
Union	49	177.8	45	176.4	43	175.8	I
Regional Total	1,852	158.8	1,935	164.5	1,801	157.3	
State Total	15,844	164.2	16,082	163.1	15,519	163.7	
US Total	2,268,553	145.3				144.8*	
Y2000						100	

*Two year average from 1992-1993 for the US totals

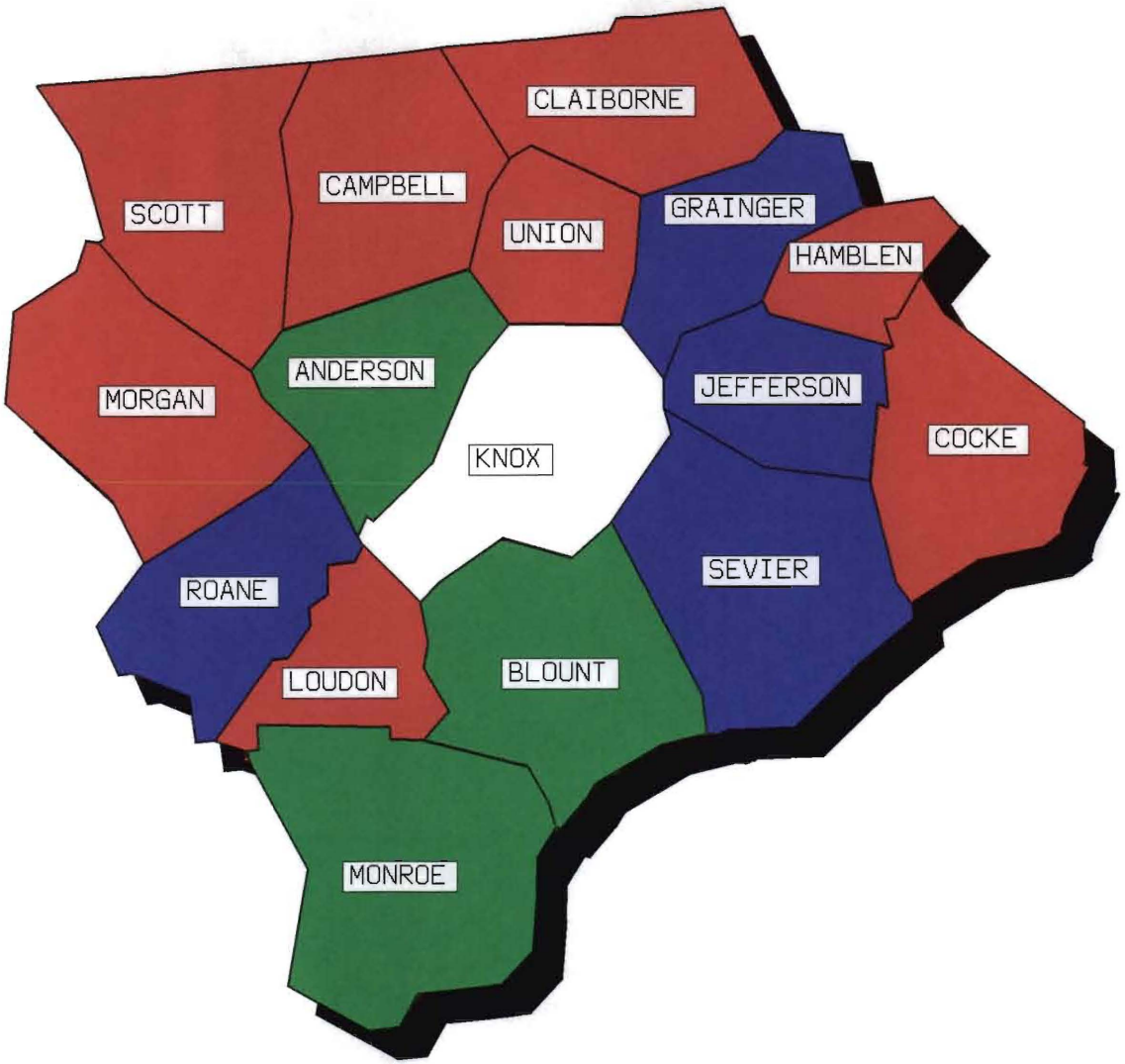
Heart Disease





HEART DISEASE

1990–1994 Average, Age Adjusted Rates; Deaths Per 100,000 Population



Level Designation

- Level I >163.7
- Level II 144.8–163.7
- Level III 100–144.7
- Level IV <100

Rate Totals	
ETR	157.3
State	163.7
US	144.8
Y2000	100

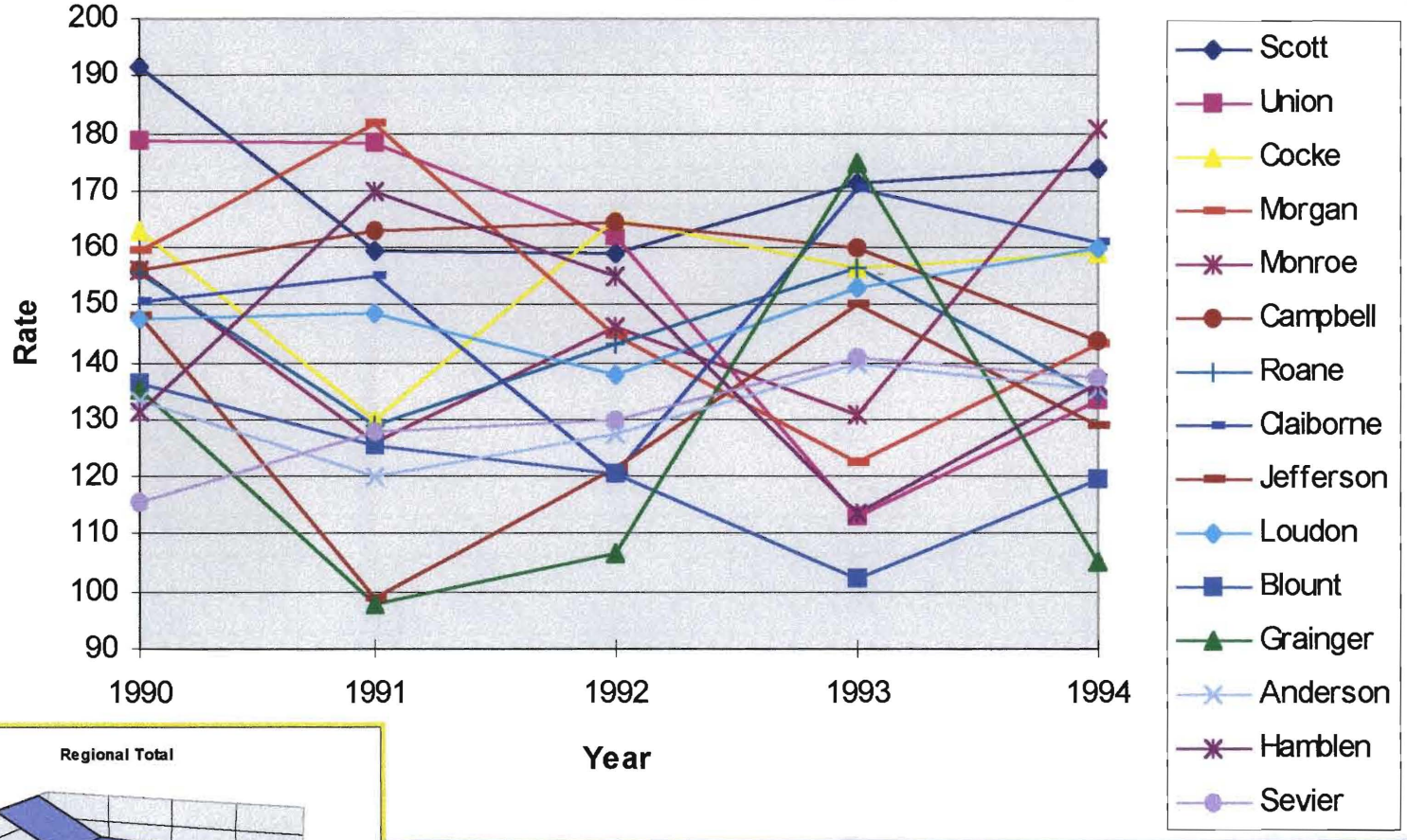
Cancer Mortality

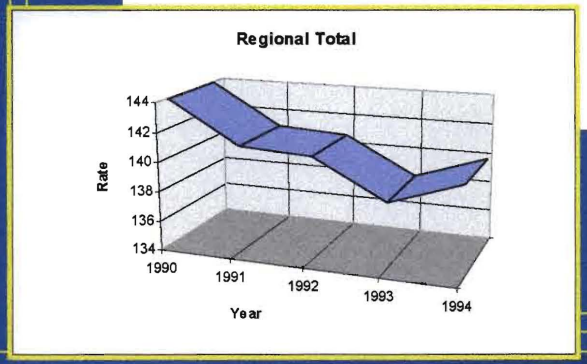
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	167	133.3	152	120.0	164	127.3
Blount	194	136.5	189	125.6	192	120.8
Campbell	87	155.9	90	163.2	100	164.3
Claiborne	57	150.7	62	155.2	53	120.8
Cocke	72	162.8	59	130.1	74	164.9
Grainger	39	135.3	30	97.7	32	106.8
Hamblen	95	131.2	133	170.1	124	155.2
Jefferson	80	148.1	57	99.1	68	121.6
Loudon	75	147.7	84	148.9	75	137.9
Monroe	82	156.2	62	125.9	73	146.3
Morgan	38	159.6	42	181.7	37	145.0
Roane	121	155.7	108	129.0	129	143.2
Scott	48	191.8	42	159.4	43	159.1
Sevier	89	115.8	106	128.1	110	130.2
Union	34	178.8	32	178.4	29	162.0
Regional Total	1,278	144.0	1,248	135.9	1,303	137.2
State Total	10,504	142.0	10,611	141.2	10,777	140.9
US Total						133.1

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	179	140.0	176	135.3	168	131.1	III
Blount	159	102.2	197	119.6	186	120.6	IV
Campbell	92	160.1	89	143.6	92	157.2	I
Claiborne	70	170.6	70	161.0	62	151.3	I
Cocke	78	156.8	80	159.0	73	154.8	I
Grainger	50	175.0	32	105.3	37	124.0	IV
Hamblen	92	113.8	113	136.4	111	141.2	II
Jefferson	88	150.1	71	129.0	73	129.6	IV
Loudon	92	153.2	89	160.0	83	149.6	I
Monroe	66	130.8	98	181.0	76	148.1	I
Morgan	30	122.4	38	143.5	37	149.9	I
Roane	133	156.4	118	134.4	122	143.8	I
Scott	44	171.5	46	173.7	45	171.1	I
Sevier	126	140.7	126	137.2	111	130.8	III
Union	28	113.4	30	133.2	31	152.1	I
Regional Total	1,327	138.4	1,373	140.0	1,306	139.0	
State Total	11,073	142.7	11,405	144.8	10,874	142.3	
US Total		132.6				132.9*	
Y2000						130	

*Two year average from 1992-1993 for the US total

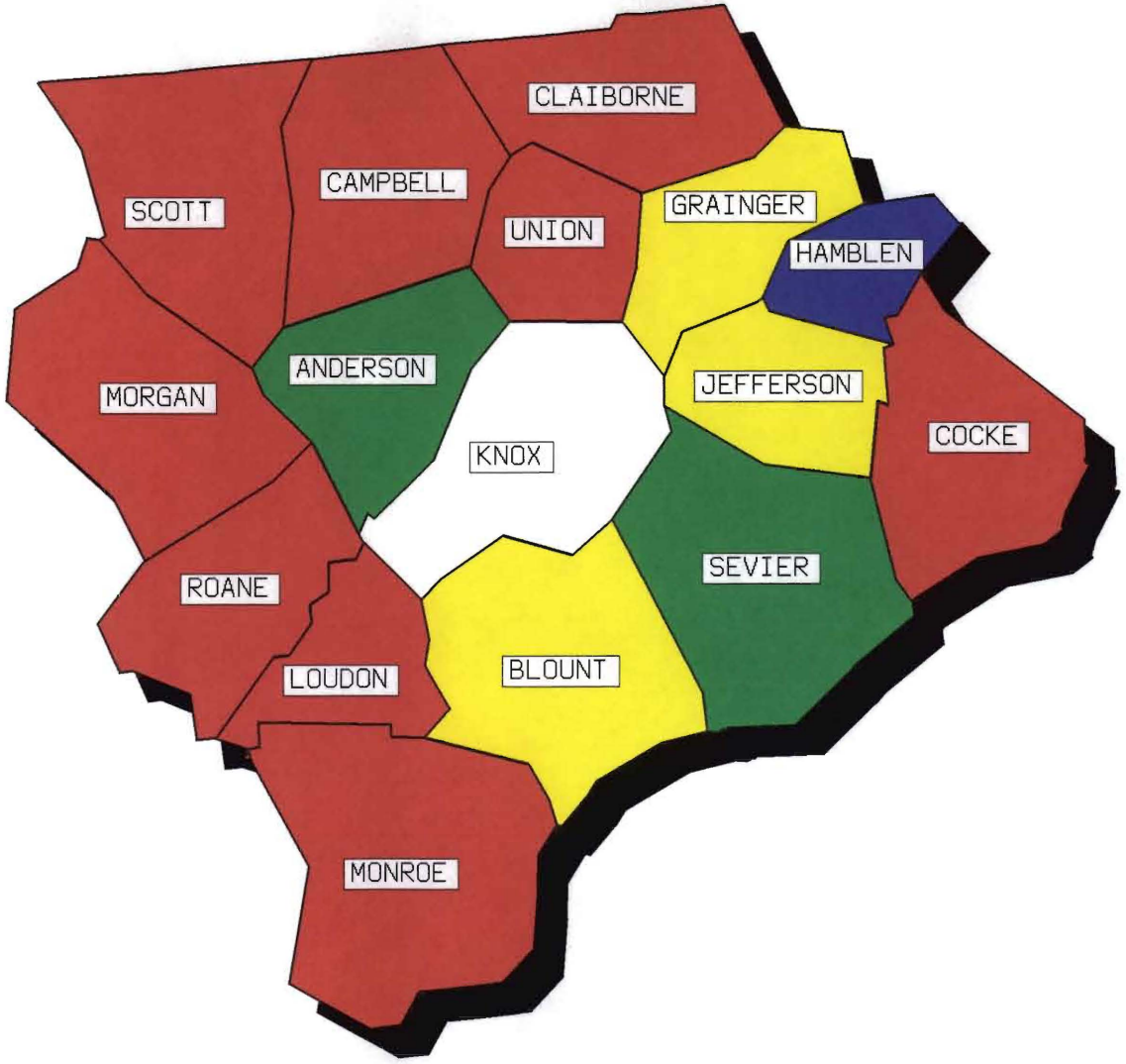
Cancer


200
190
180
170
160
150
140
130
120
110
100
90
Rate
1990
1991
1992
1993
1994
Year
Scott
Union
Cocke
Morgan
Monroe
Campbell
Roane
Claiborne
Jefferson
Loudon
Blount
Grainger
Anderson
Hamblen
Sevier


Regional Total
144
142
140
138
136
134
Rate
1990
1991
1992
1993
1994
Year

CANCER

1990–1994 Average, Age Adjusted Rates; Deaths Per 100,000 Population



Level Designation

- Level I >142.3
- Level II 132.9–142.3
- Level III 130–132.8
- Level IV <130

Rate Totals	
ETR	139
State	142.3
US	132.9
Y2000	130

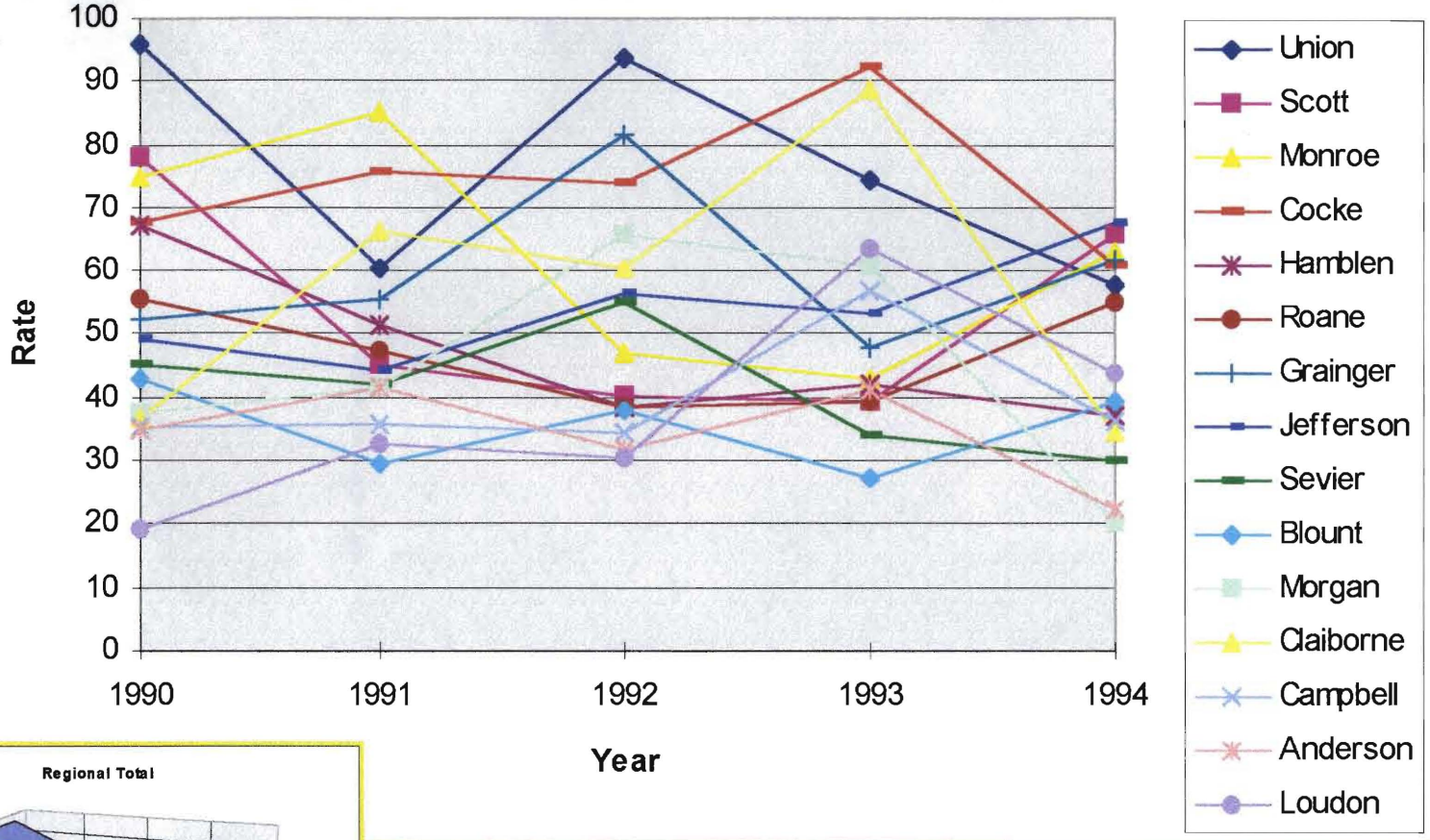
Unintentional Injuries

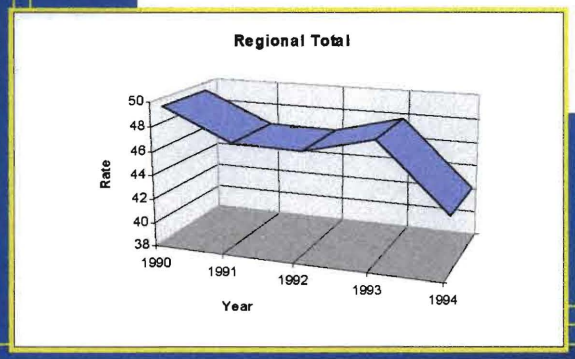
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	28	34.9	30	41.5	22	31.8
Blount	41	43.1	30	29.5	39	38.2
Campbell	14	35.6	15	35.8	13	34.7
Claiborne	12	36.8	17	66.5	17	60.6
Cocke	23	67.7	24	75.8	25	74
Grainger	9	52.4	9	55.7	14	81.8
Hamblen	35	67.1	31	51.4	23	38.4
Jefferson	17	49.5	18	44.5	21	56.3
Loudon	9	19.3	11	32.8	12	30.3
Monroe	27	74.8	26	85.1	17	47
Morgan	9	37.8	9	41.5	13	66
Roane	29	55.4	25	47.5	25	38.7
Scott	15	77.9	9	45.2	8	40.4
Sevier	25	45.2	24	42.3	32	55.3
Union	13	96	9	60.4	13	93.8
Regional Total	306	49.3	287	46.7	294	46.6
State Total	2,264	41.2	2,135	38.2	2,153	37.8
US Total						29.4

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	34	41.3	19	22.5	26	34.4	II
Blount	31	27.3	42	39.4	36	35.5	II
Campbell	21	56.9	14	36.2	15	39.7	II
Claiborne	24	88.7	11	34.5	17	57.4	I
Cocke	28	92.2	20	61.2	24	74.1	I
Grainger	10	48	15	61.9	11	60.2	I
Hamblen	25	42.3	20	37.1	27	47.4	I
Jefferson	21	53.2	23	67.5	20	54.1	I
Loudon	21	63.5	13	43.8	14	38	II
Monroe	18	43.1	21	63.4	20	62.5	I
Morgan	12	61.2	4	20.2	10	45.2	II
Roane	17	39.6	28	55.3	25	47.4	I
Scott	8	39.6	14	65.8	11	53.6	I
Sevier	23	34.1	21	29.9	25	41.3	II
Union	10	74.5	9	57.7	11	76.6	I
Regional Total	303	48	274	42.6	293	46.6	
State Total	2,346	41.6	2,331	41.1	2,246	40	
US Total		30.3				29.9*	
Y2000						29	

*Two year average from 1992-1993 for the US total

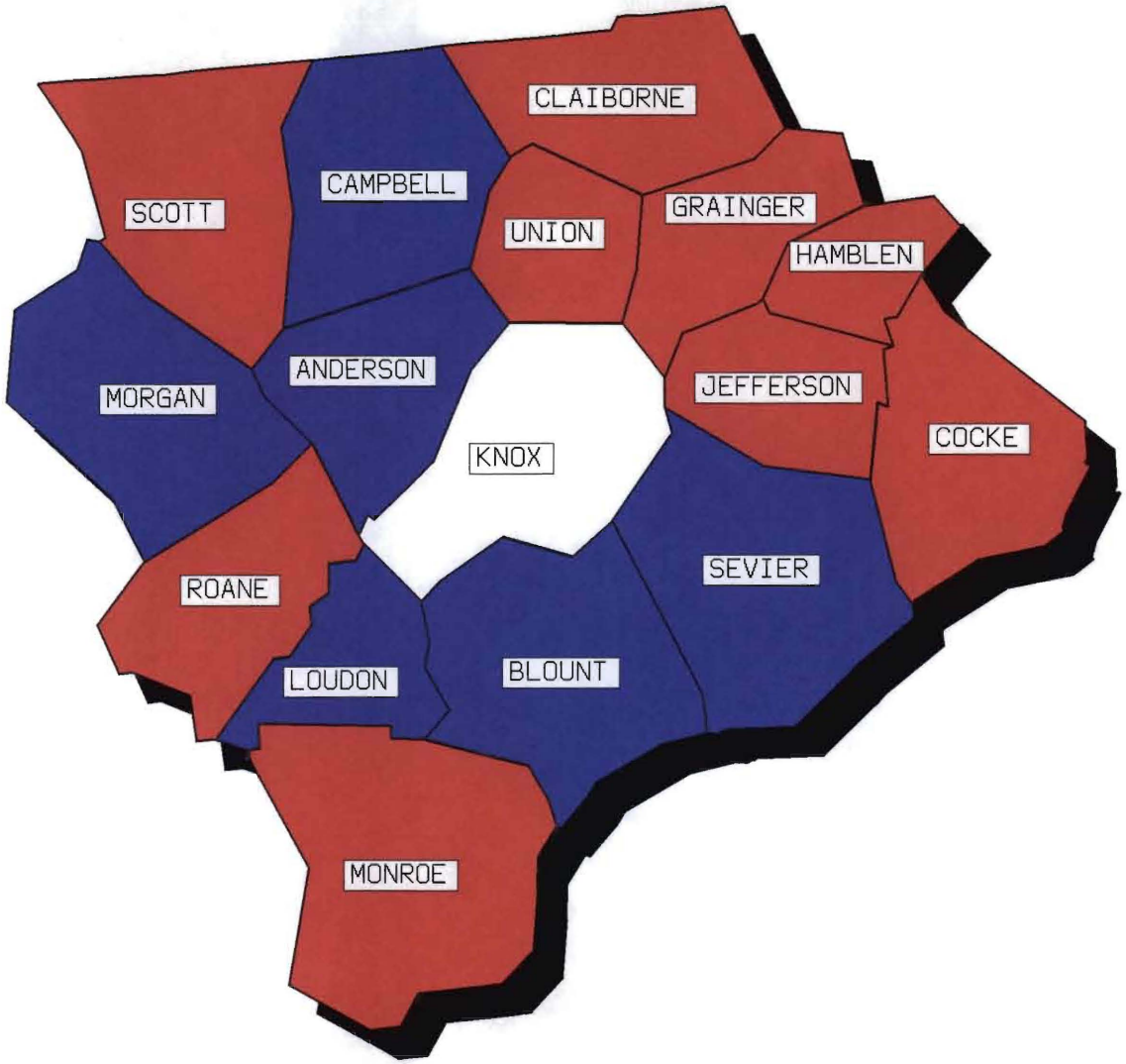
Unitentional Injuries





UNINTENTIONAL INJURIES

1990–1994 Average, Age Adjusted Rates; Deaths Per 100,000 Population



Level Designation

- Level I >46.6
- Level II 29.9–46.6
- Level III 29–29.8
- Level IV <29

Rate Totals

ETR = 46.6
State = 40
US = 29.9
Y2000 = 29

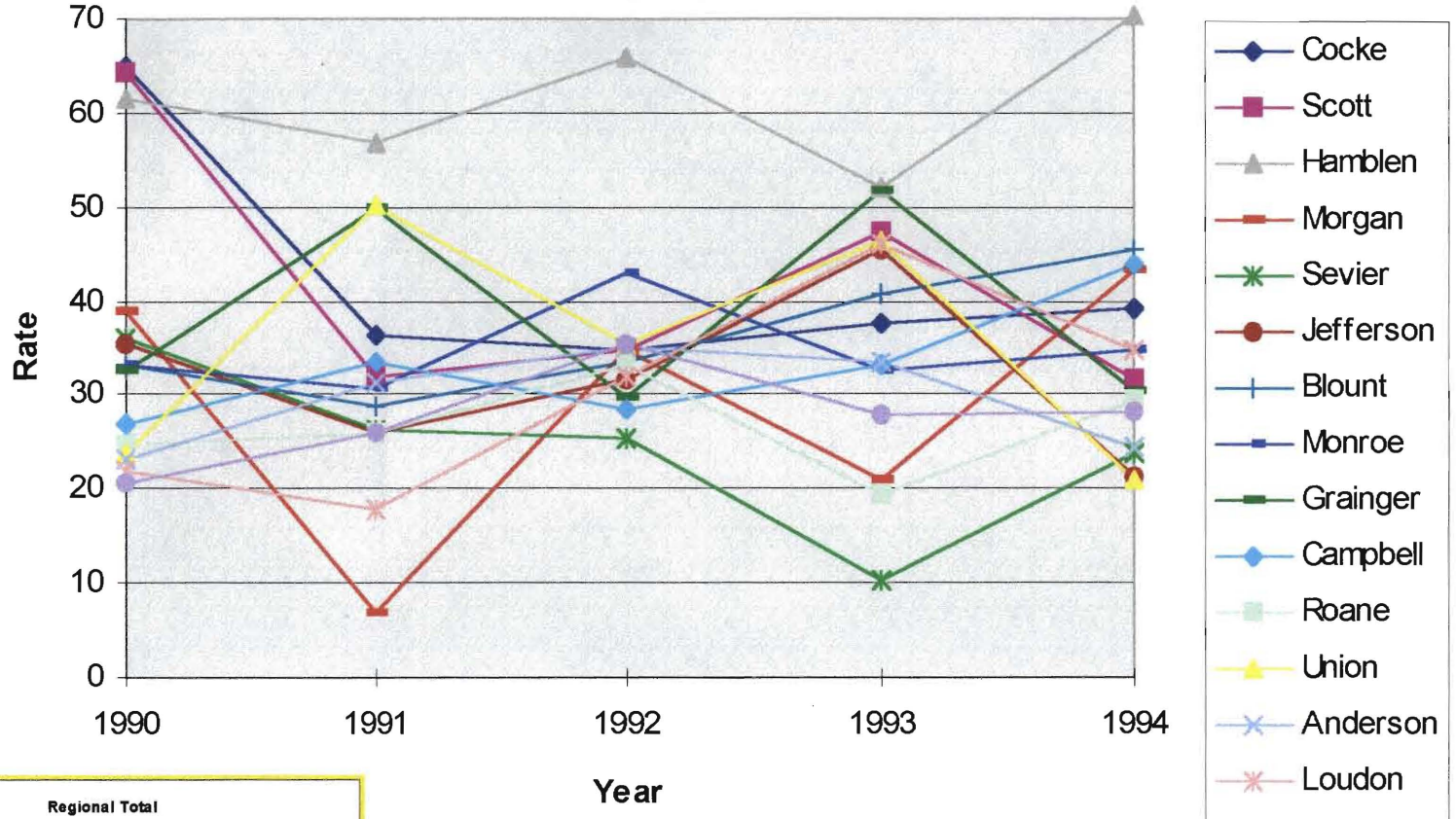
Strokes

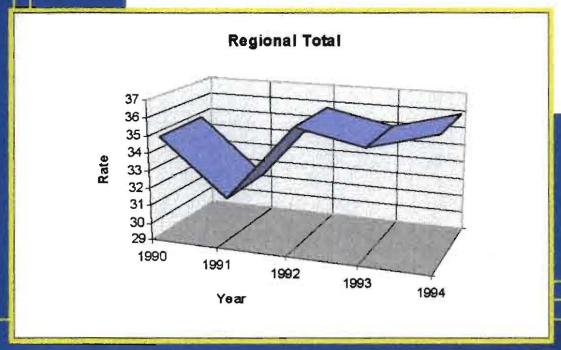
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	44	23.2	55	31.4	60	35.2
Blount	74	33.3	69	28.9	79	33.7
Campbell	26	26.9	32	33.6	24	28.7
Claiborne	12	20.8	14	25.9	23	35.5
Cocke	36	65.0	24	36.3	27	34.9
Grainger	14	32.7	17	49.9	14	29.9
Hamblen	64	61.5	61	56.7	71	65.8
Jefferson	27	35.5	19	26.1	24	31.8
Loudon	16	22.0	16	18.0	23	32.0
Monroe	26	33.2	25	30.9	32	43.1
Morgan	13	38.9	4	6.8	8	34.8
Roane	28	24.8	29	25.9	42	33.3
Scott	21	64.5	12	32.1	14	34.8
Sevier	36	36.1	30	26.5	28	25.3
Union	7	23.9	10	50.1	9	35.6
Regional Total	444	34.7	417	31.5	478	35.9
State Total	3,622	35.1	3,482	32.6	3,746	34.5
US Total						26.2

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	64	33.7	51	24.4	55	29.6	II
Blount	91	40.7	104	45.6	83	36.6	I
Campbell	28	33.2	44	43.9	31	33.2	II
Claiborne	15	27.8	19	28.1	17	27.7	II
Cocke	27	37.7	27	39.2	28	42.6	I
Grainger	23	51.8	12	30.4	16	38.9	I
Hamblen	63	52.2	85	70.4	69	61.4	I
Jefferson	36	45.6	19	21.2	25	32.0	II
Loudon	35	46.1	23	35.0	23	30.7	II
Monroe	21	32.7	22	34.8	25	34.9	I
Morgan	11	21.0	17	43.2	11	29.0	II
Roane	27	19.6	34	29.5	32	26.6	II
Scott	15	47.4	13	31.8	15	41.9	I
Sevier	10	10.4	30	23.9	27	24.2	III
Union	12	46.5	7	21.0	9	35.5	I
Regional Total	478	35.1	507	36.1	465	34.7	
State Total	3,824	34.7	4,036	35.5	3,742	34.5	
US Total	150,108	26.5				26.4*	
Y2000						20	

*Two year average from 1992-1993 for the US total

Strokes


70
60
50
40
30
20
10
0
Rate
1990
1991
1992
1993
1994
Year
Cocke
Scott
Hamblen
Morgan
Sevier
Jefferson
Blount
Monroe
Grainger
Campbell
Roane
Union
Anderson
Loudon
Claiborne


Regional Total
37
36
35
34
33
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Rate
1990
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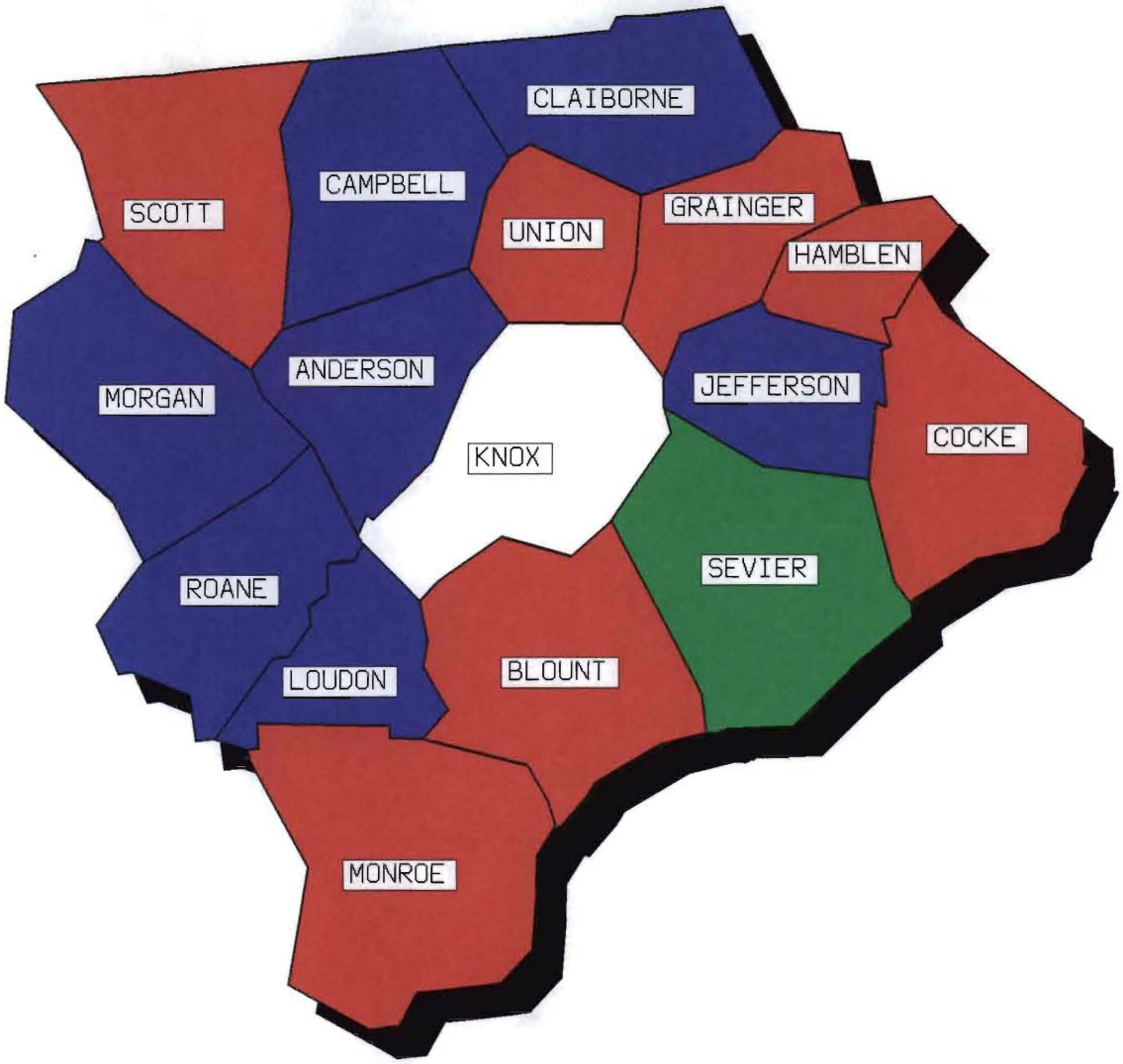
1992
1993
1994
Year

STROKES

1990–1994 Average, Age Adjusted Rates; Deaths Per 100,000 Population



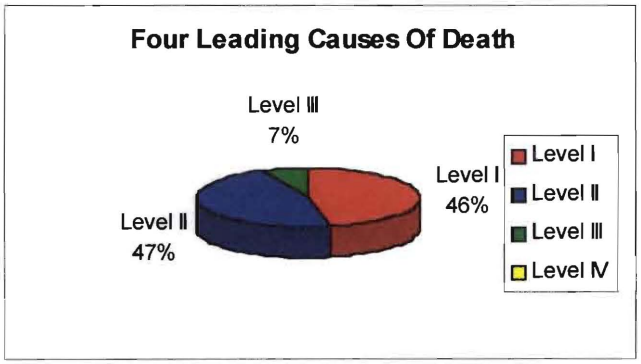
Level Designation

- Level I >34.7
- Level II 26.4–34.7
- Level III 20–26.3
- Level IV <20

Rate Totals
ETR = 34.7
State = 34.5
US = 26.4
Y2000 = 20

Summary – Mortality From Four Leading Causes Of Death

This serves as the summary for the major area "Maximizing the disease-free state;" counties are mapped according to the number of level I indicators for the four causes of death as presented above. This should serve as proxy for much of the adult morbidity – hypertension, diabetes mellitus, and hypercholesterolemia – and can also serve as an index of morbidity from smoking.



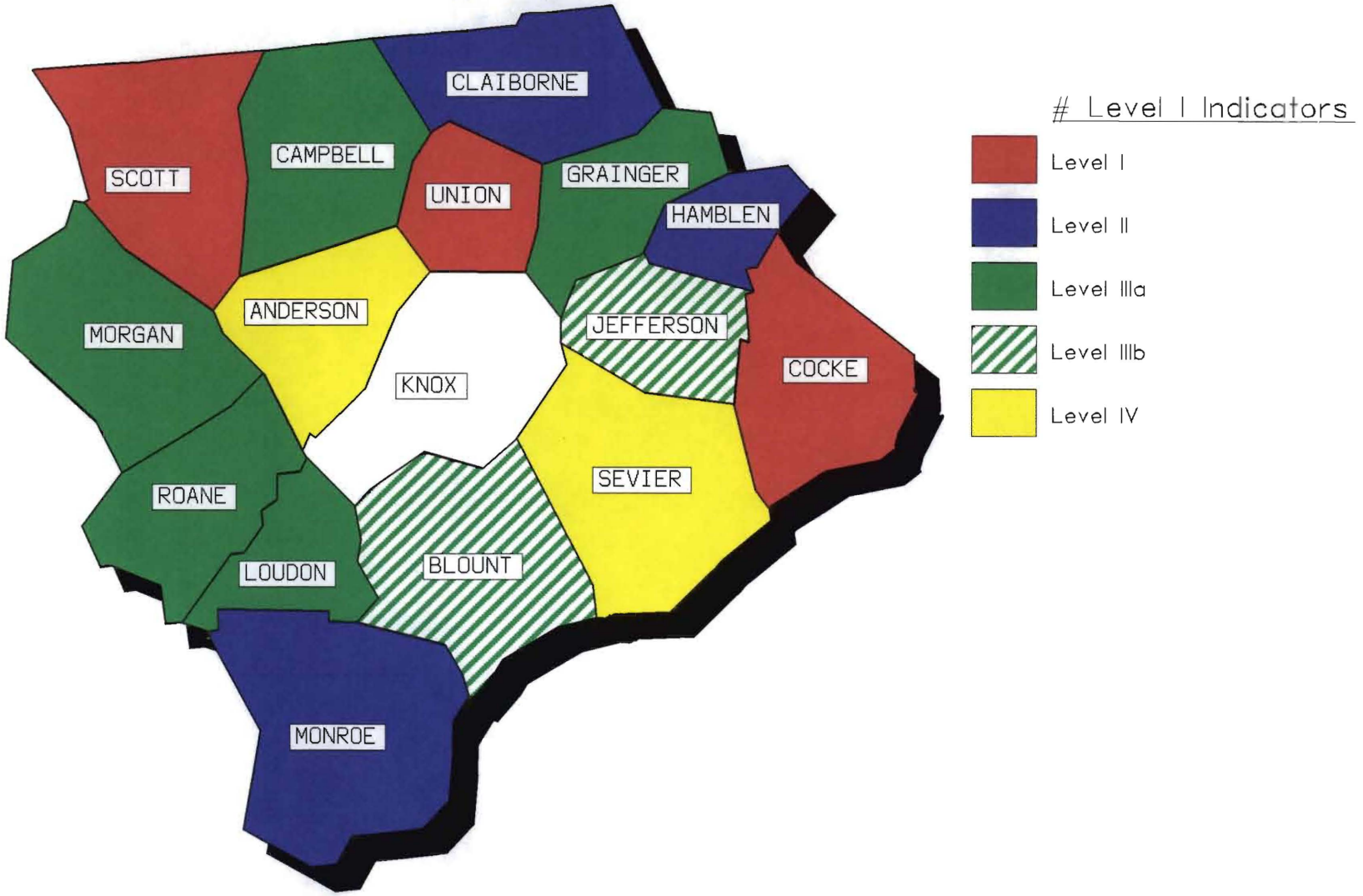
Mortality From The Four Leading Causes Of Death

(1990-94, Age Adjusted Deaths Per 100,000 Population)

	Heart Disease		Cancer		Injuries		Strokes		
County	*Rate*	*Level*	*Rate*	*Level*	*Rate*	*Level*	*Rate*	*Level*	*# of Level I*
Anderson	120.2	III	131.1	III	34.4	II	29.6	II	0
Blount	119.1	III	120.6	IV	35.5	II	36.6	I	1
Campbell	177.3	I	157.2	I	39.7	II	33.2	II	2
Claiborne	194.1	I	151.3	I	57.4	I	27.7	II	3
Cocke	202.4	I	154.8	I	74.1	I	42.6	I	4
Grainger	157.7	II	124.0	IV	60.2	I	38.9	I	2
Hamblen	188.3	I	141.2	II	47.4	I	61.4	I	3
Jefferson	159.2	II	129.6	IV	54.1	I	32	II	1
Loudon	182.8	I	149.6	I	38	II	30.7	II	2
Monroe	141.7	III	148.1	I	62.5	I	34.9	I	3
Morgan	166.8	I	149.9	I	45.2	II	29	II	2
Roane	163.1	II	143.8	I	47.4	I	26.6	II	2
Scott	181.9	I	171.1	I	53.6	I	41.9	I	4
Sevier	162.6	II	130.8	III	41.3	II	24.2	III	0
Union	175.8	I	152.1	I	76.6	I	35.5	I	4
Regional Total	157.3		139		46.6		34.7		
State Total	163.7		142.3		40		34.5		
US Total	144.8		132.9		29.9		26.4		
Y2000	100		130		29		20		

MORTALITY FROM THE FOUR LEADING CAUSES OF DEATH

Heart Disease, Cancer, Unintentional Injuries, and Strokes
1990–1995 Age Adjusted Rates Per 100,000 Persons

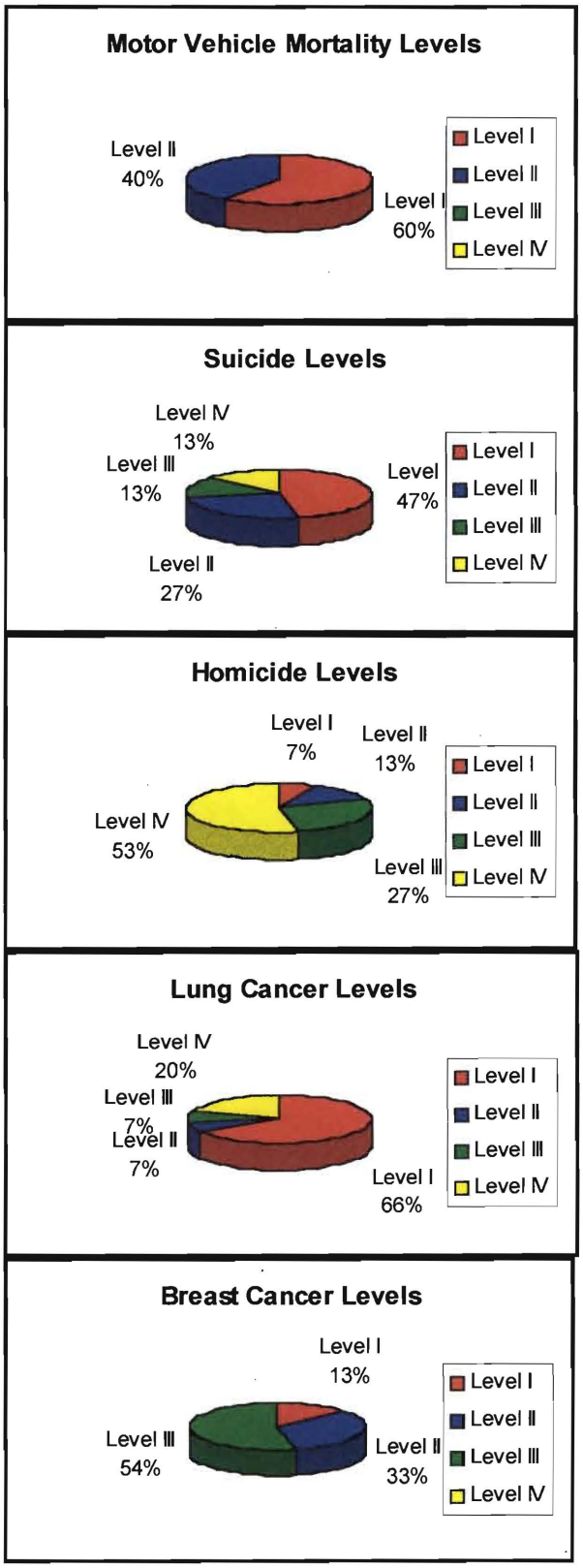


Addendum

This addendum includes data for specific causes of mortality, as well as additional information on teenage pregnancy and poverty. These data round out the set of indicators, developed by the Centers for Disease Control, that will facilitate tracking progress toward meeting the Health Objectives for the Year 2000.

Level Designation:

- Motor Vehicle Crashes, Mortality, 1990-1994, TDH:
  - Level I: >29.8
  - Level II: 16.8 - 29.8
  - Level III: 15.9 - 16.7
  - Level IV: <15.9
- Suicides, 1990-1994, TDH:
  - Level I: >12.9
  - Level II: 11.2 - 12.9
  - Level III: 10.5 - 11.1
  - Level IV: <10.5
- Homicides, 1990-1994, TDH:
  - Level I: >11.8
  - Level II: 7.2 - 11.8
  - Level III: 5.5 - 7.1
  - Level IV: <5.5
- Lung Cancer, Mortality, 1990-1994, TDH:
  - Level I: >48.5
  - Level II: 42 - 48.5
  - Level III: 40.8 - 41.9
  - Level IV: <40.8
- Breast Cancer, Mortality, 1990-1994, TDH:
  - Level I: >22.5
  - Level II: 20 - 22.5
  - Level III: 11.9 - 19.9
  - Level IV: <11.9
- Births to Adolescents (ages 10-17 years) as a % of total births, 1993, Department of Economic and Community Development:
  - No Level Designation
- Childhood Poverty (% of persons <18 years of age below the poverty level), 1990 TDH:
  - No Level Designation



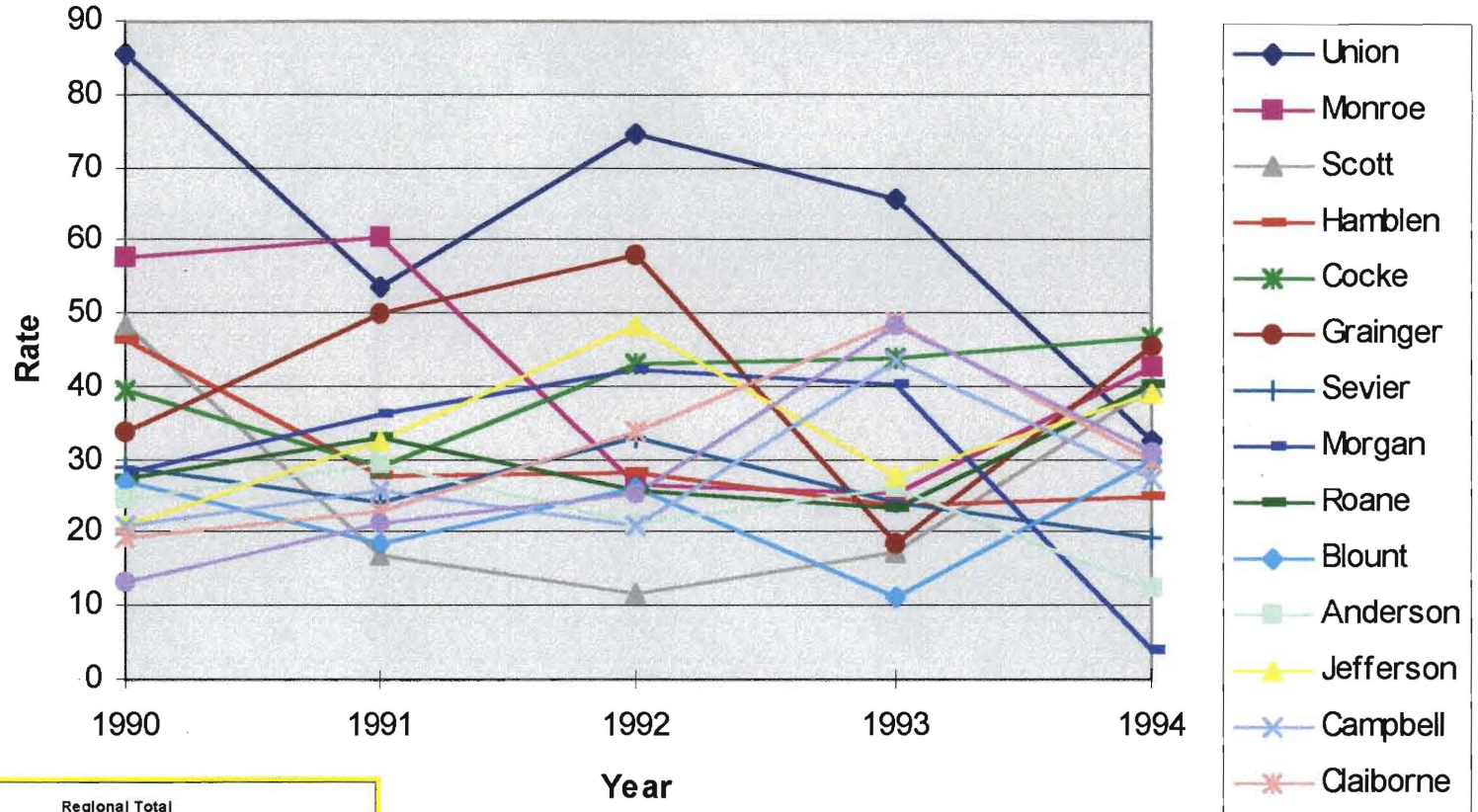
Motor Vehicle Mortality

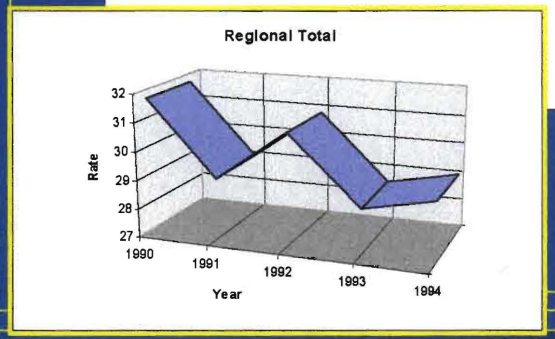
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	16	24.6	17	29.4	13	21.2
Blount	25	27.2	16	18.5	23	26.2
Campbell	7	20.9	9	25.8	7	20.8
Claiborne	6	19.3	6	23.1	9	33.9
Cocke	12	39.7	9	28.9	13	43.0
Grainger	5	33.7	8	50.2	10	58.1
Hamblen	24	46.4	16	27.9	15	28.3
Jefferson	8	21.0	13	32.7	16	48.5
Loudon	6	13.4	6	21.3	9	25.5
Monroe	19	57.9	19	60.7	8	26.6
Morgan	6	28.3	7	36.4	7	42.5
Roane	14	27.3	15	33.0	13	25.7
Scott	9	48.4	4	17.1	2	11.6
Sevier	15	29.2	14	24.1	17	33.2
Union	11	85.7	7	53.7	10	74.7
Regional Total	183	31.7	166	29.1	172	30.9
State Total	1,210	24.3	1,167	23.3	1,194	23.5
US Total						15.8

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	16	26.2	9	12.6	14	22.8	II
Blount	11	11.1	26	29.8	20	22.5	II
Campbell	14	43.7	9	27.5	9	27.6	II
Claiborne	14	48.7	8	29.9	9	30.9	I
Cocke	13	43.8	12	47.0	12	40.4	I
Grainger	4	18.4	10	45.5	7	41.4	I
Hamblen	13	23.9	12	25.2	16	30.4	I
Jefferson	11	27.7	13	39.3	12	33.8	I
Loudon	14	48.5	8	31.1	9	28.0	II
Monroe	10	25.4	13	42.7	14	42.5	I
Morgan	7	40.3	1	4.1	6	30.2	I
Roane	9	23.6	18	40.3	14	30.0	I
Scott	4	17.4	7	39.8	5	26.8	II
Sevier	15	24.3	10	19.2	14	26.0	II
Union	8	65.9	4	32.7	8	62.6	I
Regional Total	163	28.6	160	29.1	169	29.8	
State Total	1,203	24.0	1,261	24.9	1,207	24.0	
US Total		16.0				15.9*	
Y2000						16.8	

*Two year average from 1992-1993 for the US total

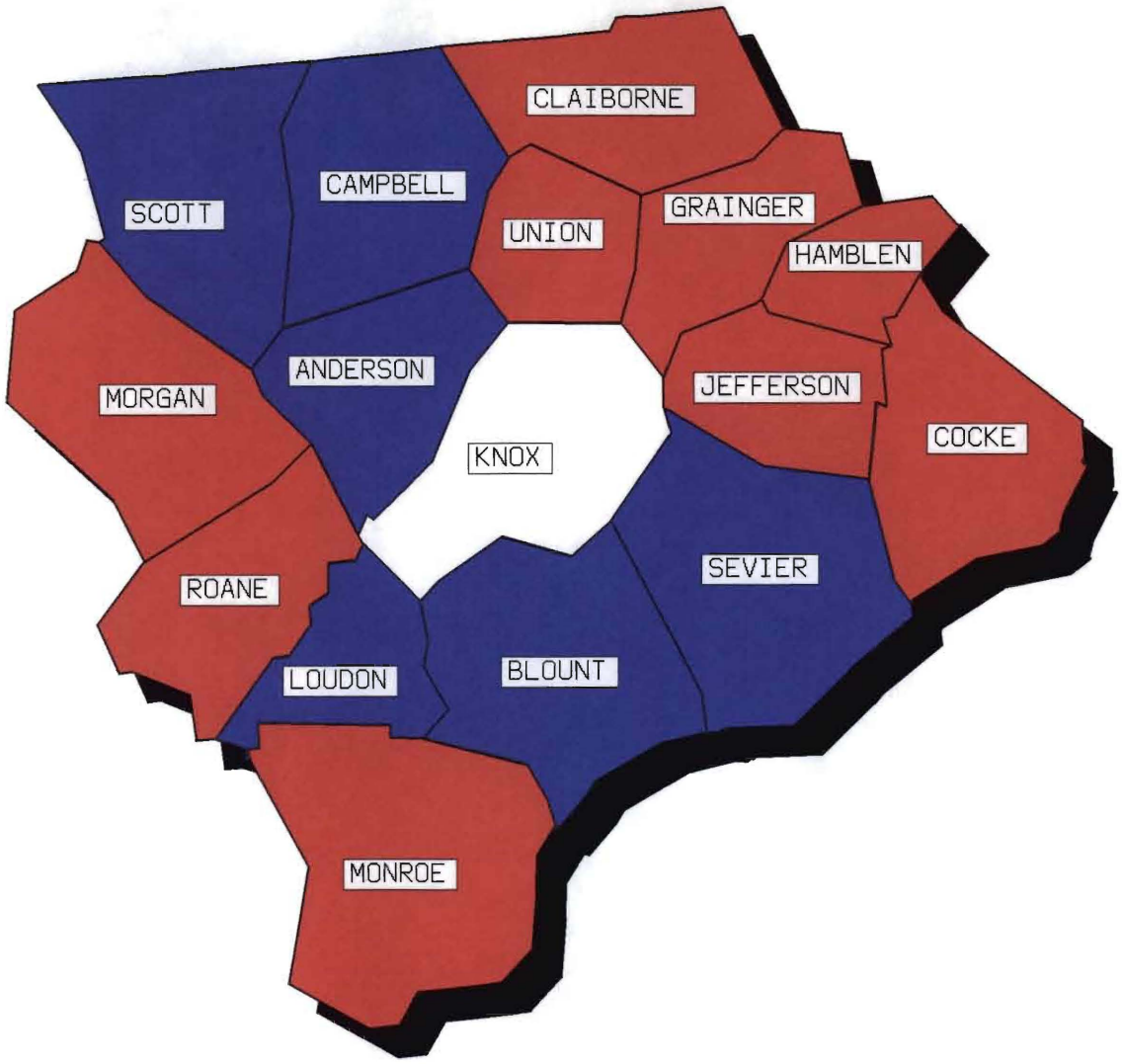
Motor Vehicle Crashes





MOTOR VEHICLE MORTALITY

1990–1994 Average, Age Adjusted Rates; Deaths Per 100,000 Population



Level Designation

- Level I >29.8
- Level II 16.8–29.8
- Level III 15.9–16.7
- Level IV <15.9

Rate Totals	
ETR	29.8
State	24.0
US	15.9
Y2000	16.8

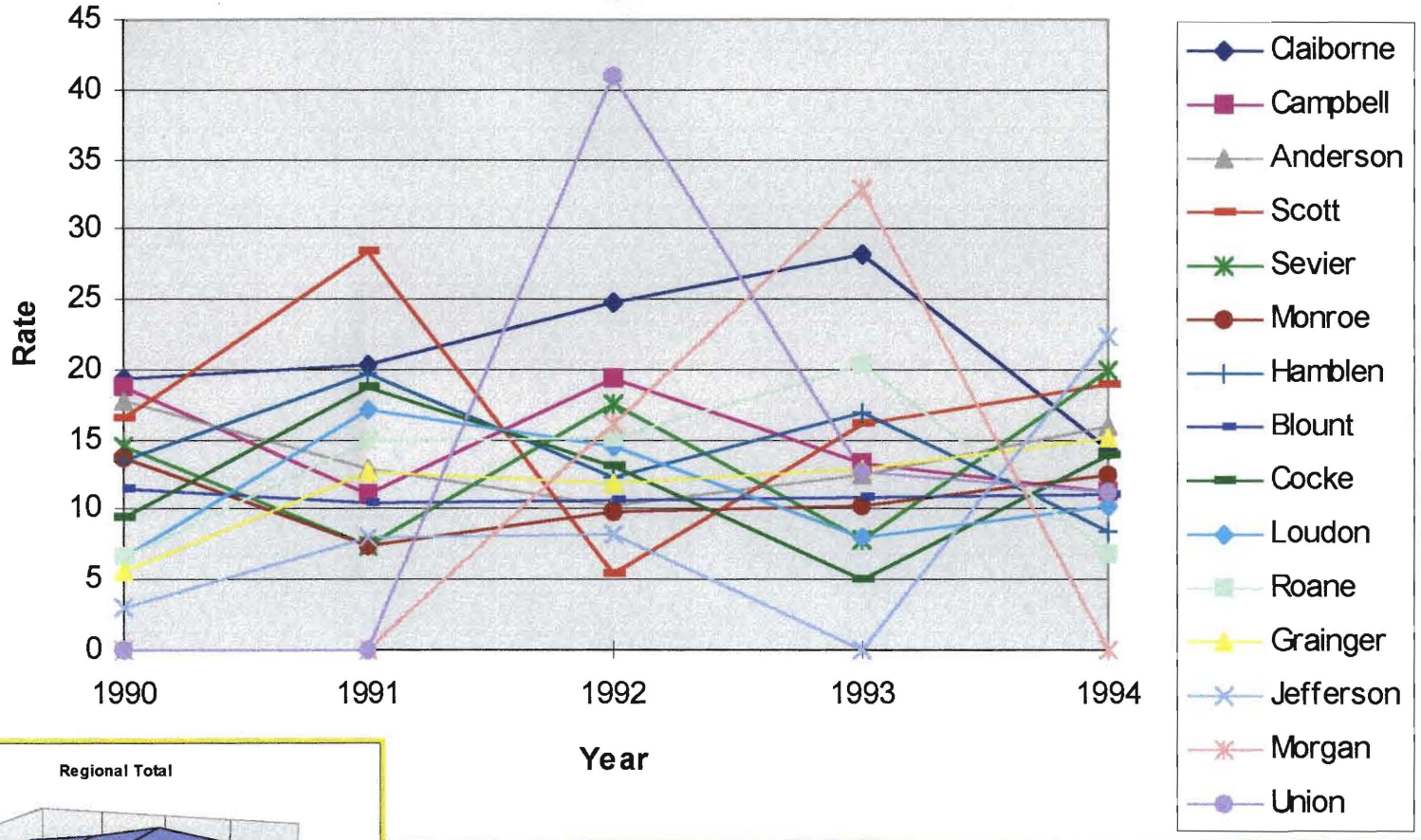
Suicide

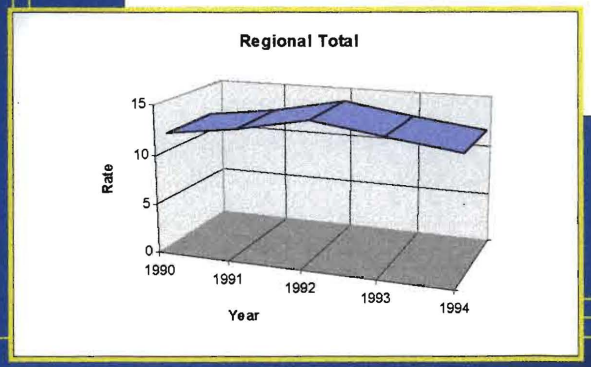
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	13	17.7	10	13.0	9	10.3
Blount	10	11.6	9	10.5	11	10.7
Campbell	8	18.7	4	11.0	7	19.3
Claiborne	7	19.4	7	20.4	7	24.9
Cocke	3	9.4	6	18.7	4	13.1
Grainger	1	5.6	2	12.7	2	11.9
Hamblen	7	13.5	11	19.7	6	12.4
Jefferson	1	3.0	3	8.0	3	8.2
Loudon	2	6.6	6	17.1	6	14.6
Monroe	4	13.7	2	7.5	3	9.8
Morgan	0	0	0	0	3	16.2
Roane	4	6.6	7	15.0	10	15.2
Scott	3	16.5	5	28.4	1	5.4
Sevier	8	14.6	4	7.5	10	17.6
Union	0	0	0	0	6	41.0
Regional Total	71	11.7	76	12.7	88	14.1
State Total	654	12.4	681	12.6	657	12.3
US Total						11.1

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	9	12.5	12	16.0	11	14.0	I
Blount	10	10.8	12	11.1	10	11.0	III
Campbell	6	13.3	4	11.4	6	14.7	I
Claiborne	8	28.3	4	14.3	7	21.4	I
Cocke	2	5.1	5	14.0	4	12.1	II
Grainger	2	12.9	3	15.1	2	11.6	II
Hamblen	9	17.0	5	8.5	8	14.3	I
Jefferson	0	0	7	22.5	3	8.3	IV
Loudon	3	8.0	5	10.3	4	11.3	II
Monroe	4	10.2	4	12.5	3	10.8	III
Morgan	6	32.9	0	0	2	9.8	IV
Roane	10	20.4	4	6.8	7	12.8	II
Scott	4	16.2	3	19.0	3	17.1	I
Sevier	5	7.9	11	19.9	8	13.5	I
Union	2	12.8	2	11.2	2	13.2	I
Regional Total	80	13.0	81	13.0	79	12.9	
State Total	699	13.1	663	12.2	671	12.5	
US Total		11.3				11.2*	
Y2000						10.5	

*Two year average from 1992-1993 for the US total

Suicide


45
40
35
30
25
20
15
10
5
0
Rate
1990
1991
1992
1993
1994
Year
Claiborne
Campbell
Anderson
Scott
Sevier
Monroe
Hamblen
Blount
Cocke
Loudon
Roane
Grainger
Jefferson
Morgan
Union


Regional Total
15
10
5
0
Rate
1990
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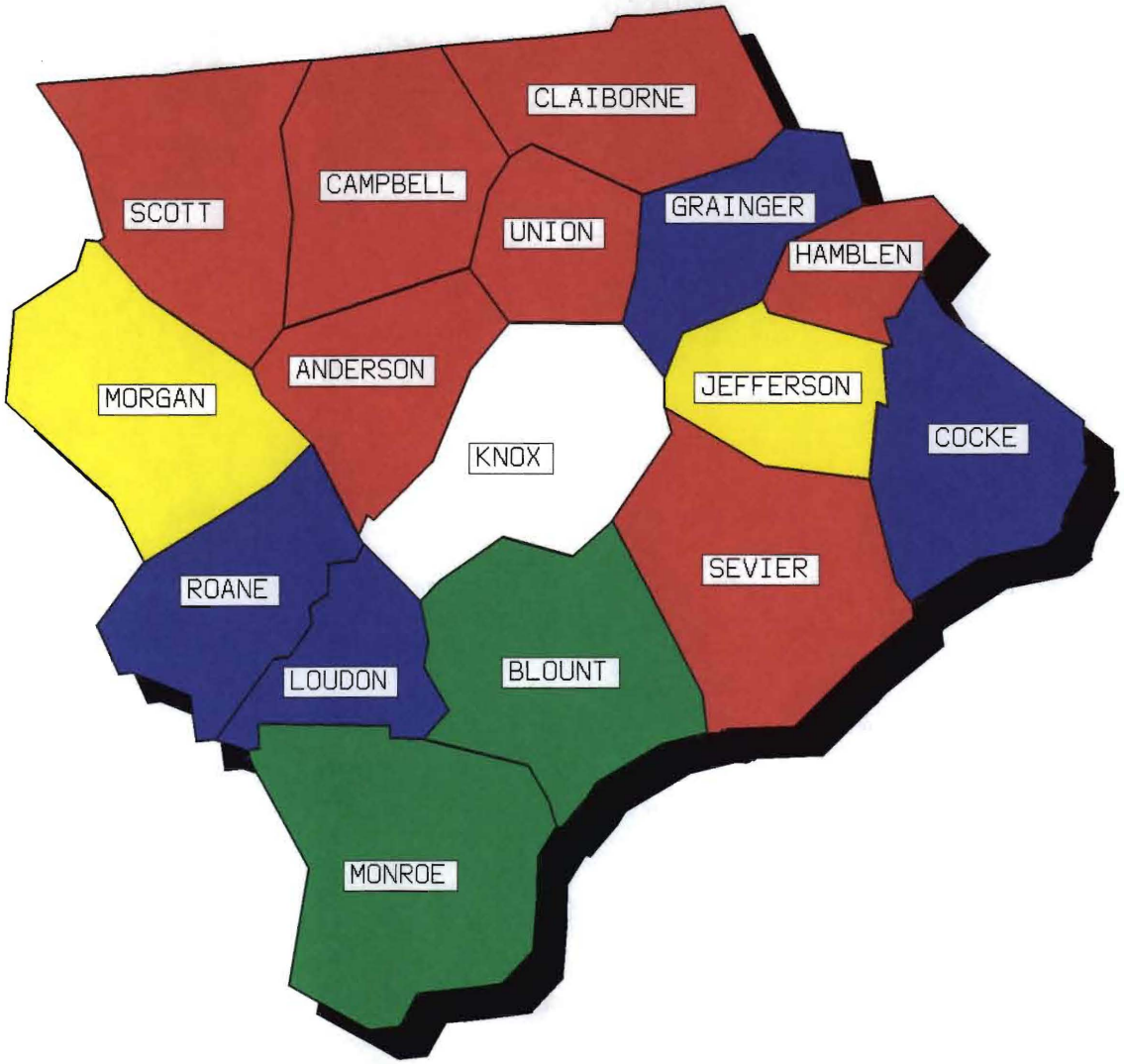
1992
1993
1994
Year

SUICIDE

1990–1994 Average, Age Adjusted Rates; Deaths Per 100,000 Population



Level Designation

- Level I >12.9
- Level II 11.2–12.9
- Level III 10.5–11.1
- Level IV <10.5

Rate Totals

ETR = 12.9
State = 12.5
US = 11.2
Y2000 = 10.5

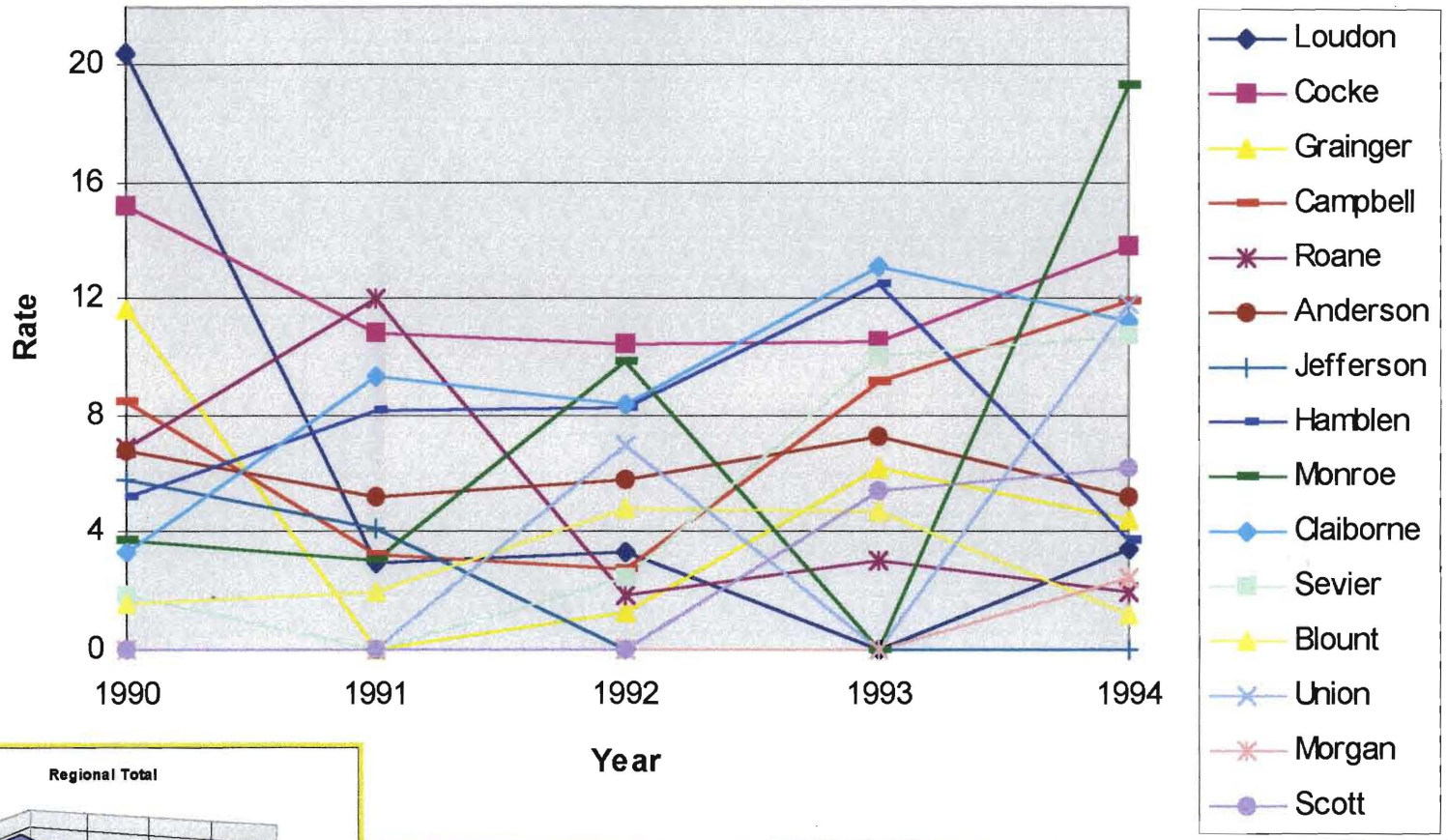
Homicide

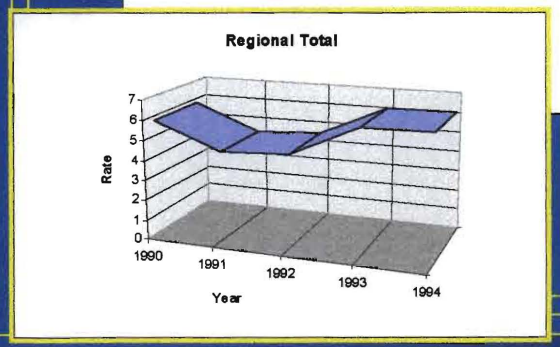
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	4	6.8	4	5.2	4	5.8
Blount	2	1.6	3	2.0	4	4.8
Campbell	3	8.5	1	3.3	1	2.8
Claiborne	1	3.4	3	9.4	2	8.4
Cocke	5	15.2	3	10.9	3	10.5
Grainger	2	11.6	0	0	1	1.3
Hamblen	3	5.2	4	8.2	4	8.3
Jefferson	2	5.8	2	4.1	0	0
Loudon	6	20.4	1	3.0	1	3.4
Monroe	1	3.7	1	3.1	3	9.9
Morgan	0	0	0	0	0	0
Roane	3	6.9	6	12.0	1	1.9
Scott	0	0	0	0	0	0
Sevier	1	1.9	0	0	1	2.5
Union	0	0	0	0	1	7.0
Regional Total	33	5.8	28	4.5	26	4.7
State Total	564	11.6	584	12.1	568	12.0
US Total						10.5

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	5	7.3	4	5.2	4	6.1	III
Blount	4	4.7	1	1.2	3	2.8	IV
Campbell	3	9.2	4	11.9	2	7.1	III
Claiborne	3	13.1	3	11.2	2	9.0	II
Cocke	3	10.6	4	13.8	4	12.2	I
Grainger	1	6.2	1	4.4	1	4.8	IV
Hamblen	6	12.5	2	3.7	4	7.6	II
Jefferson	0	0	0	0	1	1.9	IV
Loudon	0	0	1	3.5	2	6.1	III
Monroe	0	0	5	19.3	2	7.1	III
Morgan	0	0	1	2.5	0	0.5	IV
Roane	1	3.1	1	2.0	2	5.2	IV
Scott	1	5.4	1	6.2	0	2.3	IV
Sevier	6	10.1	6	10.8	3	5.1	IV
Union	0	0	2	11.8	1	3.9	IV
Regional Total	33	6.2	36	6.3	31	5.5	
State Total	583	12.2	547	11.4	569	11.8	
US Total		10.7				10.6*	
Y2000						7.2	

*Two year average from 1992-1993 for the US total

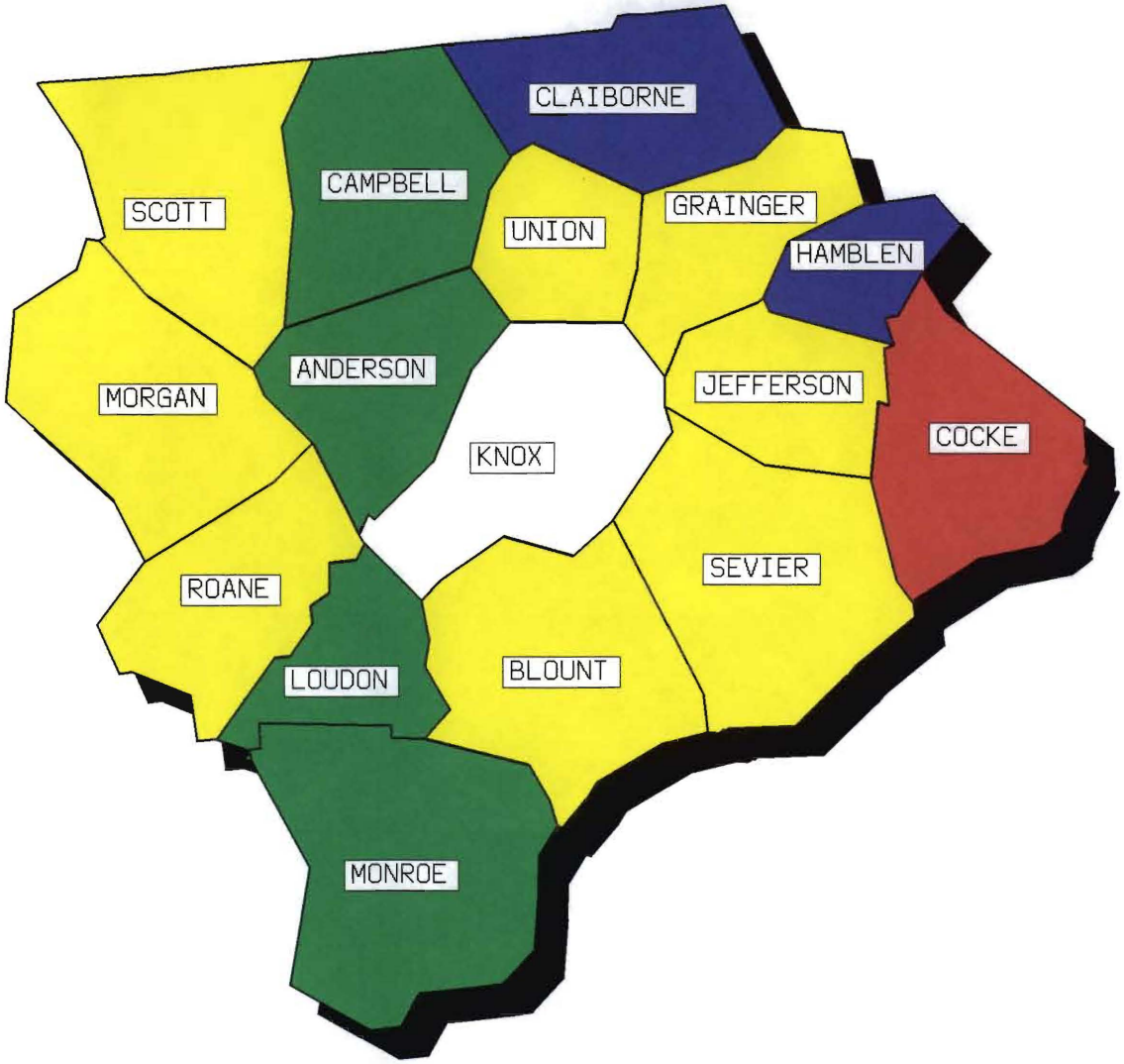
Homicide


20
16
12
8
4
0
Rate
1990
1991
1992
1993
1994
Year
Loudon
Cocke
Grainger
Campbell
Roane
Anderson
Jefferson
Hamblen
Monroe
Claiborne
Sevier
Blount
Union
Morgan
Scott


Regional Total
Rate
7
6
5
4
3
2
1
0
1990
1991
1992
1993
1994
Year

HOMICIDE

1990–1994 Average, Age Adjusted Rates; Deaths Per 100,000 Population



Level Designation

- Level I >11.8
- Level II 7.2–11.8
- Level III 5.5–7.1
- Level IV <5.5

Rate Totals

ETR = 5.5
State = 11.8
US = 10.6
Y2000 = 7.2

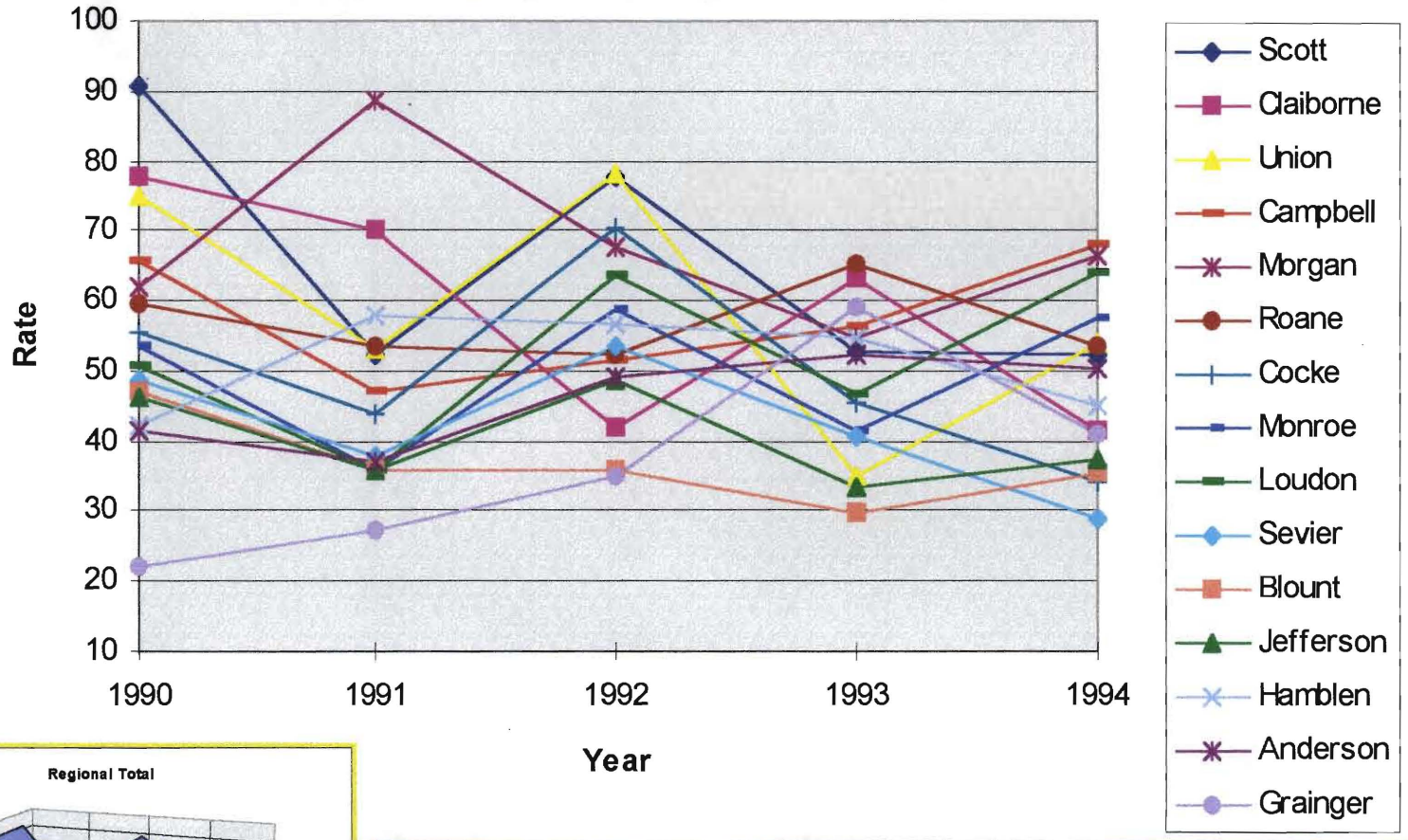
Lung Cancer

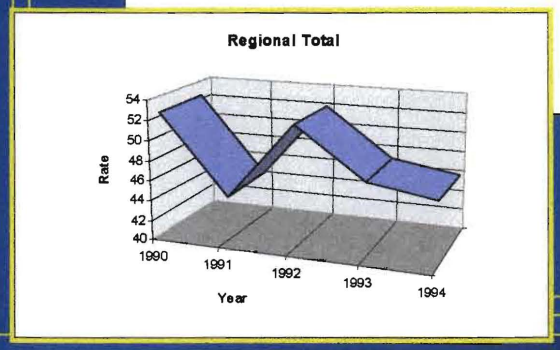
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	45	41.4	47	37.2	56	49.0
Blount	64	47.2	50	35.7	51	35.7
Campbell	37	65.8	28	47.3	31	51.6
Claiborne	25	77.8	24	70.1	16	42.0
Cocke	26	55.5	19	44.0	30	70.5
Grainger	7	22.3	7	27.2	9	35.2
Hamblen	31	42.4	42	58.1	45	56.7
Jefferson	23	46.4	21	36.0	25	48.6
Loudon	26	50.9	19	35.9	31	63.8
Monroe	27	53.5	15	35.8	27	58.9
Morgan	14	62.2	20	88.5	16	67.8
Roane	46	59.7	44	53.7	47	52.2
Scott	21	90.7	12	52.2	21	77.8
Sevier	35	48.8	27	37.8	43	53.4
Union	12	74.9	10	53.0	13	78.4
Regional Total	439	52.4	385	44.5	461	52.2
State Total	3,368	48.5	3,286	46.4	3,460	47.9
US Total						40.8

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	64	52.3	61	50.2	55	46.0	II
Blount	44	29.9	54	35.3	53	36.6	IV
Campbell	31	56.3	39	68.2	33	57.8	I
Claiborne	24	63.2	19	41.4	22	58.4	I
Cocke	20	45.7	16	34.2	22	49.9	I
Grainger	16	59.4	11	40.9	10	37.2	IV
Hamblen	42	54.8	36	45.3	39	51.5	I
Jefferson	19	33.3	19	37.5	21	40.2	IV
Loudon	24	46.8	33	63.9	27	52.3	I
Monroe	20	41.3	29	57.6	24	49.5	I
Morgan	13	54.9	16	66.7	16	67.9	I
Roane	52	65.2	44	53.7	47	56.9	I
Scott	14	52.7	13	52.5	16	64.9	I
Sevier	35	40.8	27	28.8	33	41.7	III
Union	9	34.9	12	54.1	11	58.4	I
Regional Total	427	47.3	429	46.3	428	48.5	
State Total	3,511	48.1	3,676	49.4	3,460	48.0	
US Total		40.8				40.8*	
Y2000						42	

*Two year average from 1992-1993 for the US total

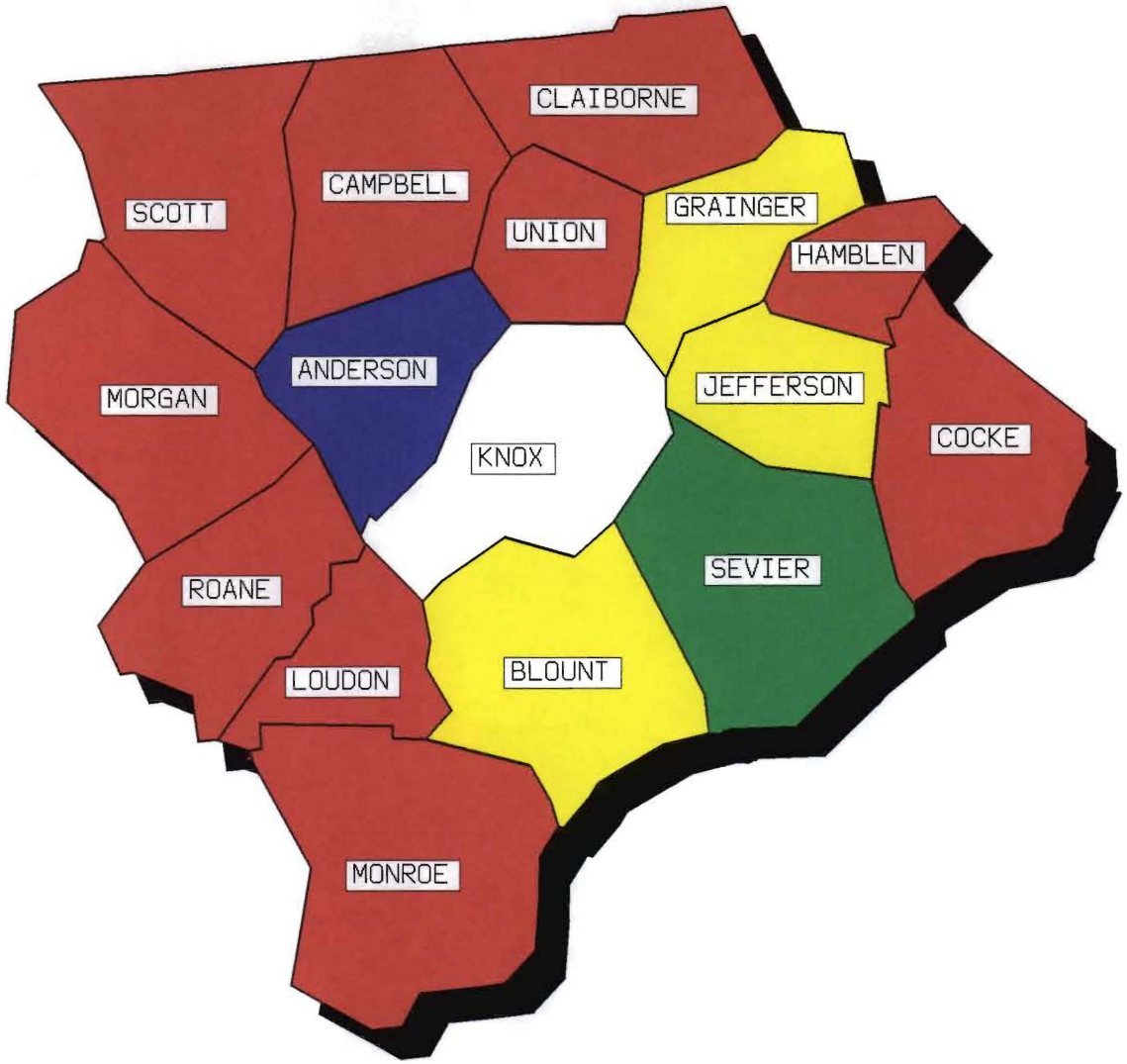
Lung Cancer


100
90
80
70
60
50
40
30
20
10
Rate
1990
1991
1992
1993
1994
Year
Scott
Claiborne
Union
Campbell
Morgan
Roane
Cocke
Monroe
Loudon
Sevier
Blount
Jefferson
Hamblen
Anderson
Grainger


Regional Total
Rate
54
52
50
48
46
44
42
40
1990
1991
1992
1993
1994
Year

LUNG CANCER

1990–1994 Average, Age Adjusted Rates; Deaths Per 100,000 Population



Level Designation

- Level I >48.5
- Level II 42–48.5
- Level III 40.8–41.9
- Level IV <40.8

Rate Totals
ETR = 48.5
State = 48.0
US = 40.8
Y2000 = 42.0

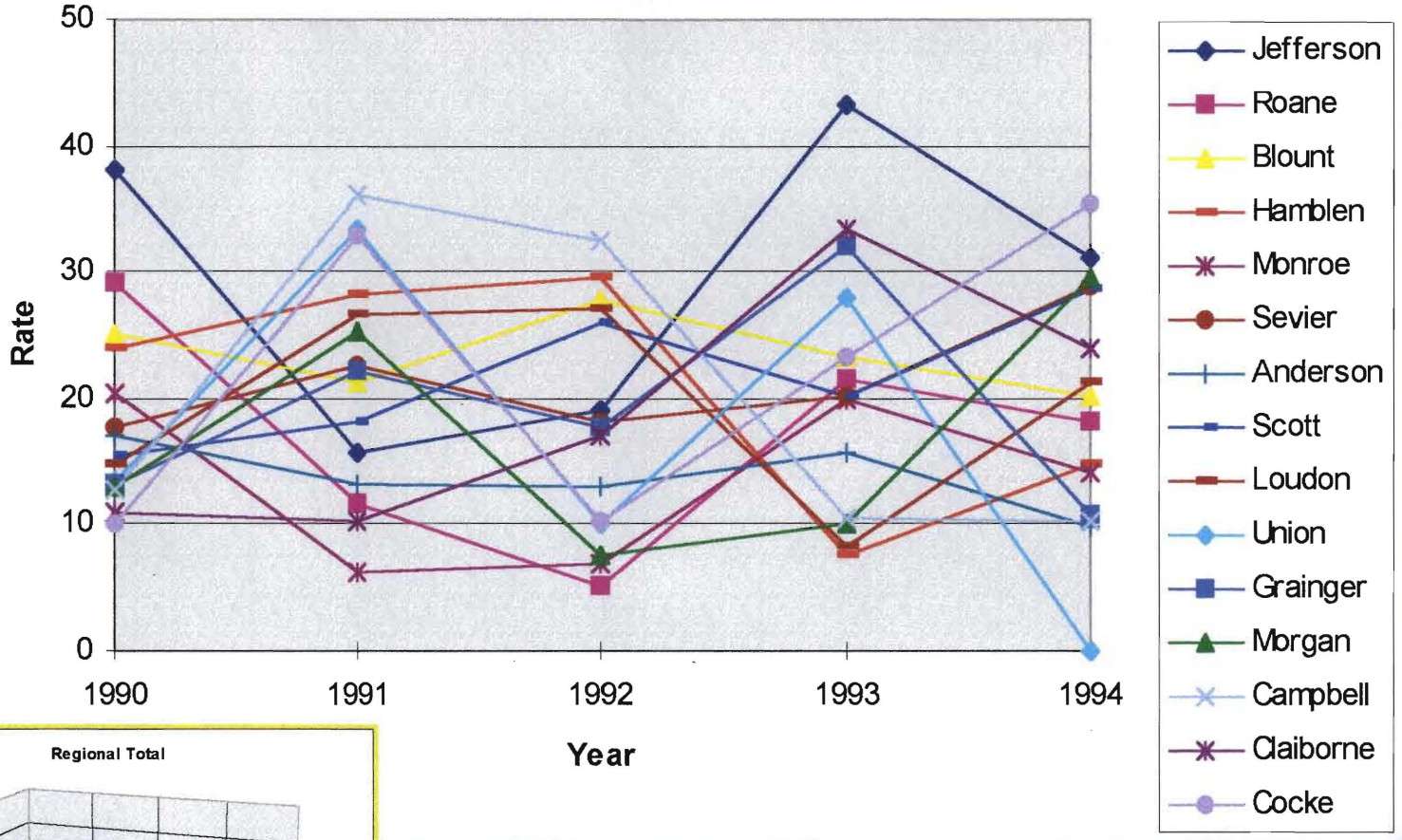
Breast Cancer

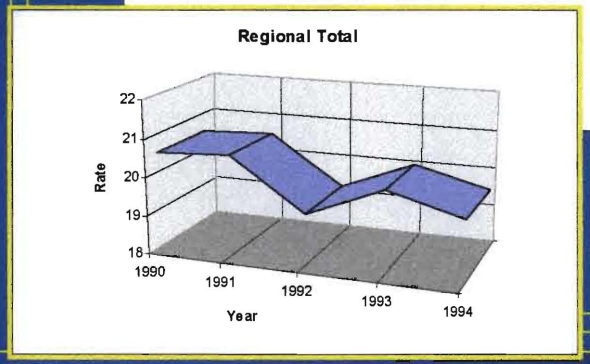
	1990		1991		1992	
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*
Anderson	11	17.1	11	13.3	11	13.1
Blount	15	25.2	17	21.2	23	27.7
Campbell	3	12.8	9	36.2	8	32.5
Claiborne	2	10.9	2	10.4	3	17.1
Cocke	2	10.2	5	33.0	4	10.4
Grainger	2	13.2	3	22.3	2	17.7
Hamblen	8	23.9	12	28.2	13	29.5
Jefferson	8	38.1	3	15.6	5	19.1
Loudon	5	14.7	8	26.7	9	27.1
Monroe	6	20.4	1	6.2	2	7.0
Morgan	1	12.9	3	25.3	1	7.6
Roane	10	29.1	3	11.7	3	5.2
Scott	2	15.4	2	18.1	3	26.0
Sevier	7	17.7	10	22.7	7	18.1
Union	1	13.5	3	33.5	1	10.0
Regional Total	83	20.5	92	20.6	95	19.3
State Total	831	22.9	853	22.7	846	22.0
US Total						11.8

	1993		1994		5 Year Average		
County	*Number*	*Rate*	*Number*	*Rate*	*Number*	*Rate*	*Levels*
Anderson	9	15.8	9	9.8	10	13.8	III
Blount	15	23.3	16	20.2	17	23.5	I
Campbell	3	10.5	4	10.4	5	20.4	II
Claiborne	7	33.4	7	24.0	4	19.3	III
Cocke	5	23.4	8	35.5	5	22.5	II
Grainger	5	32.0	1	10.7	3	19.1	III
Hamblen	3	7.7	6	14.7	8	20.7	II
Jefferson	11	43.2	7	31.1	7	29.4	I
Loudon	3	8.3	5	21.4	6	19.7	III
Monroe	5	19.9	5	14.2	4	13.6	III
Morgan	1	10.0	3	29.7	2	17.2	III
Roane	11	21.5	7	18.1	7	17.2	III
Scott	2	20.1	3	28.8	2	21.9	II
Sevier	10	20.2	12	28.9	9	21.6	II
Union	3	28.1	0	0	2	17.0	III
Regional Total	93	20.1	93	19.6	91	20.0	
State Total	893	22.4	921	22.6	869	22.5	
US Total		12.0				11.9*	
Y2000						20.6	

*Two year average from 1992-1993 for the US total

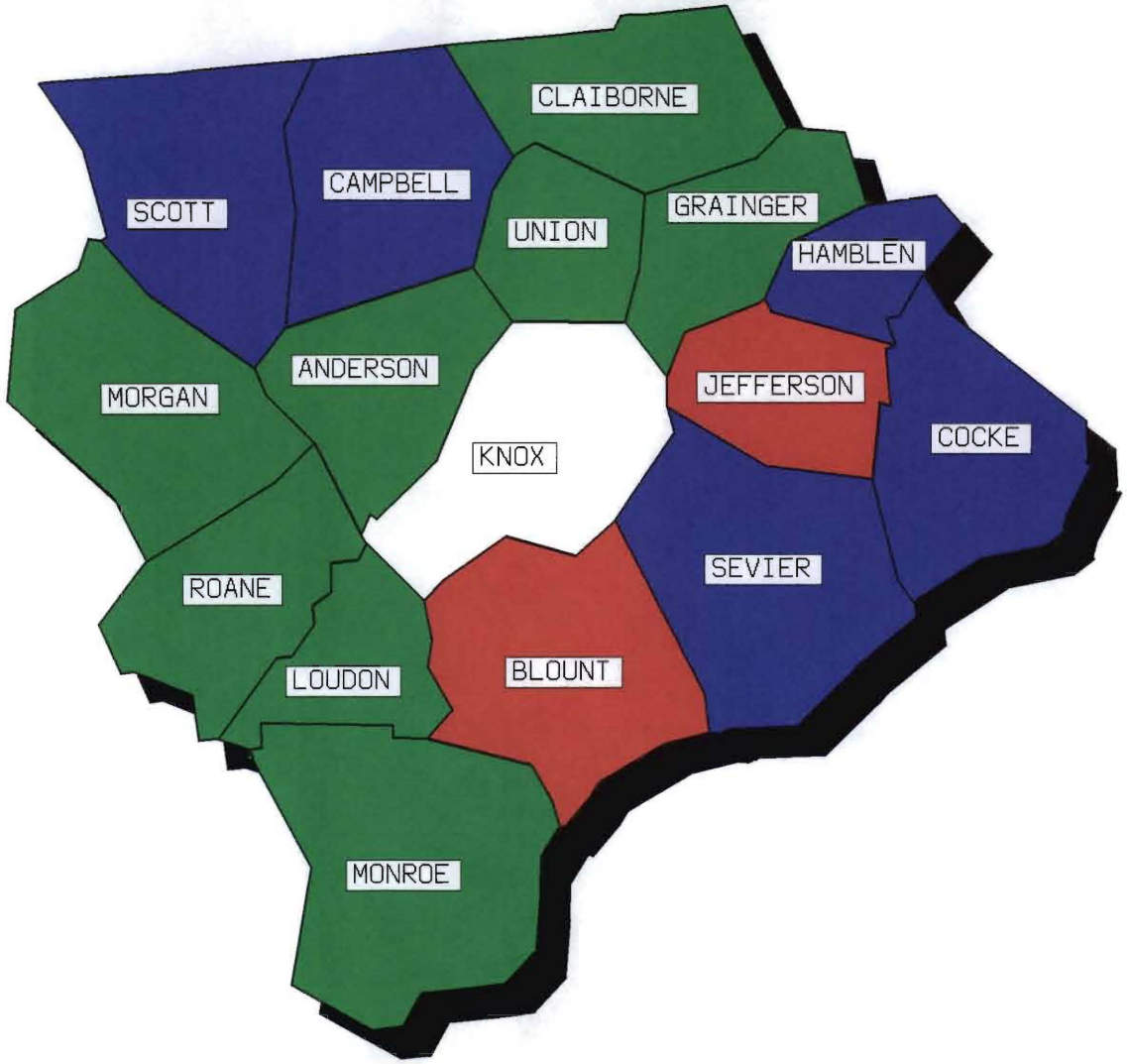
Breast Cancer





BREAST CANCER

1990–1994 Average, Age Adjusted Rates; Per 100,000 Population



Level Designation

- Level I >22.5
- Level II 20–22.5
- Level III 11.9–19.9
- Level IV <11.9

Rate Totals

ETR = 20%
State = 22.5%
US = 11.9%
Y2000 = 20.6%

Births to Adolescents

(Ages 10-17 Years)

As a Percentage of Total Births, 1993

County	*Births to Adolescents*	*Total Births*	*Percent of Total Births*
Anderson	833	37	4.4
Blount	1,107	58	5.2
Campbell	483	41	8.5
Claiborne	368	31	8.4
Cocke	407	33	8.1
Grainger	224	15	6.7
Hamblen	673	41	6.1
Jefferson	410	21	5.1
Loudon	448	24	5.4
Monroe	445	34	7.6
Morgan	235	14	6.0
Roane	532	30	5.6
Scott	262	27	10.3
Sevier	708	39	5.5
Union	201	13	6.5
Regional Total	7,336	458	6.6
State Total	72,923	4,729	6.5

Childhood Poverty

(Children Below the Age of 18, 1990)

County	*Number Below Poverty Level*	*Percent Below Poverty Level*
Anderson	3,206	20%
Blount	3,230	16.7%
Campbell	3,302	37.5%
Claiborne	2,049	31.3%
Cocke	2,294	33.5%
Grainger	1,047	25.9%
Hamblen	2,230	18.9%
Jefferson	1,230	17.6%
Loudon	1,285	17.6%
Monroe	1,671	22.1%
Morgan	1,025	23.4%
Roane	2,193	20.1%
Scott	1,741	33.4%
Sevier	1,894	15.9%
Union	894	24.9%
Regional Total	29,291	23.9%
State Total	247,366	20.7%

A Supplemental Interpretation of Health Status in the East Tennessee Region

by

Jason Little

May 1997

Supplemental Interpretation

An Assessment and Supplemental Interpretation of Health Status in the East Tennessee Region is intended to serve as a resource and a reference for all of those interested in health within the fifteen county region of East Tennessee. This project does not seek to ask a question, form a hypothesis, and then address the problem with answers. Instead, this document presents a myriad of facts in an organized and clear manner. Specific features and peculiarities within the data are highlighted in an attempt to stimulate individual questions Moreover, such questions will hopefully activate a desire to create one's own hypotheses and methods to counteract accentuated problems presented in the material. The list of possible questions that might arise after reading this document are limitless. Nevertheless, this project does not seek to completely answer any of them. Rather, it serves as a useful tool for all of those interested in health in the East Tennessee Region. Thus, its purpose is to act as a springboard for those involved in health planning, provoking and underscoring possible avenues of pursuit.

What follows is a supplemental interpretation. This supplement is intended to be an "executive summary" for the larger assessment. For the sake of clarity, it performs several functions that the assessment does not. First, it reorganizes the material in a concise manner. Then, it depicts health status in the counties and in the region as a whole with the use of bar graphs. Each graph is then analyzed with a narrative statement for each county which emphasizes specific highlights. Finally, a review of the literature is given surrounding the two health indicators needing the most improvement in the region.

In the assessment, over 25 health indicators are examined and presented on a county by county basis. The supplement conversely reviews each county on an indicator

basis. The graph for each county shows where that county ranks within the region for each indicator. A first place ranking in the region indicates the best overall situation for a given indicator not necessarily the highest rate. For example, Monroe County received a first place ranking in the infant mortality indicator with its rate of 3.5 deaths per 1,000 births. Since it is desirable to keep infant mortality at a minimum, Monroe County received a first place score for having the lowest rank. In addition to rankings, the graphs also indicate level designations assigned in the assessment. In the assessment, Levels I-IV were allocated based on how each county compared to the regional rate, state rate, national rate, and year 2000 goal in each indicator. A Level I county implied extremely severe situations while a Level IV county designation was representative of superb health status. Thus, in the supplement one can examine a graph and distinguish level variance among the indicator rankings.

The final graph in the supplement illustrates how the region as a whole performed in the indicators. Each indicator is depicted based on its percentage distance from the year 2000 objectives. Similar to the level assignment for the counties, each indicator on this regional graph is assigned a status level. Status I indicators are those in which the region needs to improve by more than 50% of its current rate to reach the year 2000 goal. Status II indicators include those in which the region must improve by levels between 20% and 50%. Status III is assigned to indicators needing 20% improvement or less. Finally, Status IV indicators are those that have already surpassed the year 2000 objective. There were four of these for the region.

The last part of the supplement reviews the literature dealing with the Status I indicators. There were two of these, tuberculosis and breastfeeding rates. Here, an

overview of the indicators is given and special attention is given to the barriers to success and the intervention efforts happening around the country. This review is provided in order to offer possible health planning strategies which might be utilized when addressing these priority level indicators.

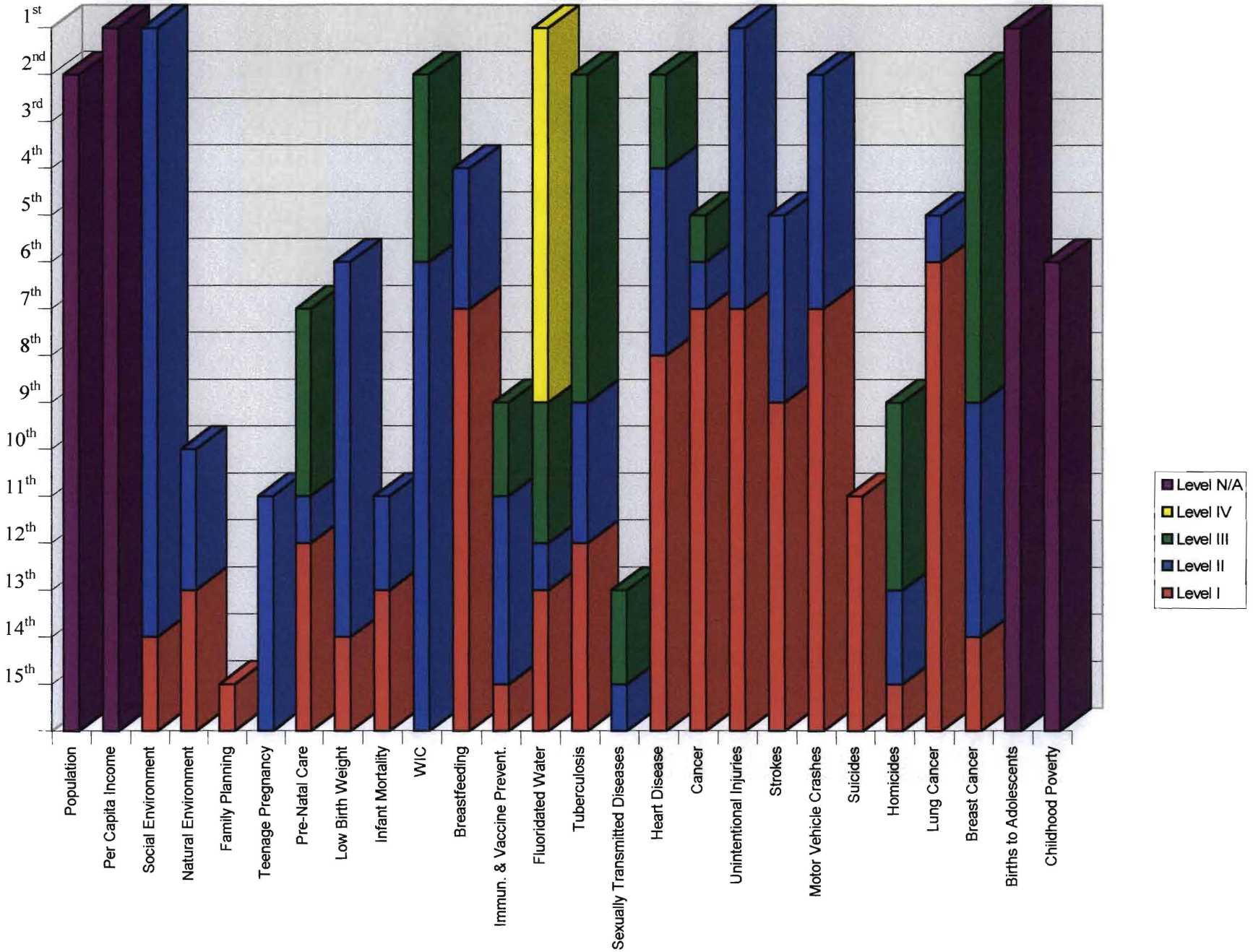
Anderson County

Ranking first in per capita income and a close second to Blount County in overall health status according to the assessment, Anderson County faired relatively well. Anderson's few low points were found in the areas of suicides, sexually transmitted diseases, infant mortality, and teenage pregnancy. The lowest indicator by far, however, was family planning in which Anderson County was ranked last in the region. Since socioeconomic status relates directly to health outcome, one would expect Anderson County to rarely rank low in any indicator. Nevertheless, it should be considered that family planning is a health service indicator rather than a health status indicator. Therefore, it is more of a preventative aid rather than an unfortunate result, and this serves as a possible excuse as to why Anderson deviated considerably from the gradient of socioeconomic status when family planning rates were considered.

This is not to say that family planning is not important. Some estimates indicate that $4.40 in welfare and health service costs could be saved for every dollar spent on family planning (*Midcourse Review* 50). Poor outcomes in the categories of low birth weight and infant mortality can be attributable to poor family planning services (*Healthy Review 1994* 31). Although Anderson County did not rank last in low birth weight and infant mortality as it did in family planning, it did rate relatively low. Adequate family planning also helps to abate the instances of sexually transmitted diseases. Analogously, the graph on the following page demonstrates that Anderson County received its second lowest ranking after family planning in the area of sexually transmitted diseases.

In any family planning program, one of the chief purposes is to educate individuals and to prevent unwanted teenage pregnancies. Despite the relatively low amount of family planning, the county still did very well in the birth to adolescent indicator listed in the addendum. In fact, Anderson County was first place in its birth to adolescent rates which included all births to women aged 10-19. However, instances of pregnancy in the population of women age 15-17 brought different results. In this population, Anderson County was eleventh place with a rate of 51.7 for every 1,000 women in that age group. Abortions might be responsible for part of the discrepancy since one indicator compares birth rates and the other pregnancy rates. Nevertheless, an even better explanation for the discrepancy could be due in part to the fact that only one year of data was collected for birth to adolescents.

Anderson County



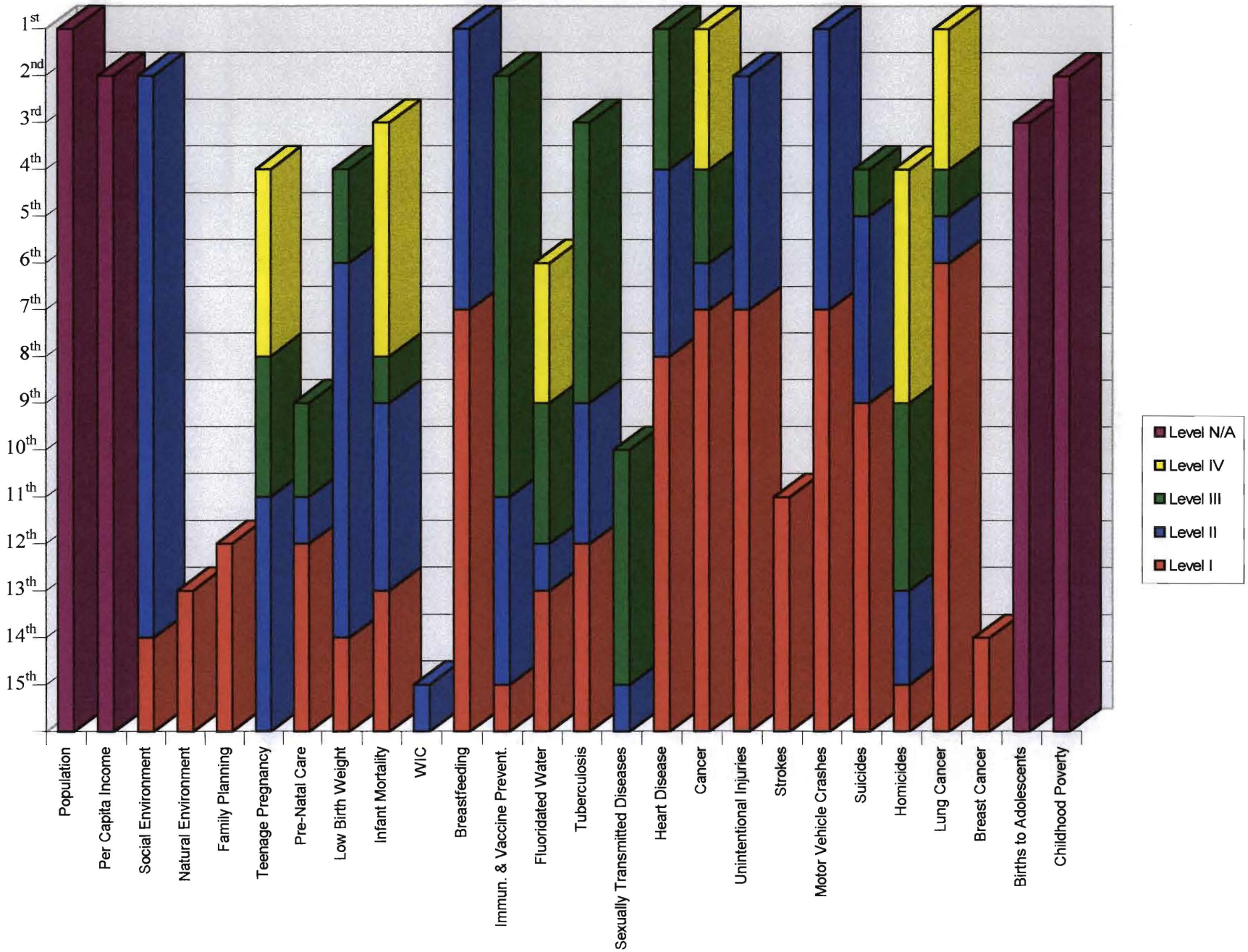
Blount County

Blount County was the second wealthiest county in the region when examining per capita income. It also had the second best social environment situation and the second best childhood poverty ranking. With such exceptional numbers, one would expect Blount County to perform well in the assessment, and indeed it did. Blount received six first place standings in the list of health indicators. Three of these first place rankings were issued in the mortality categories of heart disease, all cancers, and lung cancer. These indicators help to illustrate the superior health status of this county relative to others in the region. Family planning, WIC rates, and breast cancer are among the indicators in which Blount performed the worst. However, family planning and WIC rates are health service indicators and do not necessarily reflect measurements of poor health outcome. Blount County's fourteenth place ranking in breast cancer, on the other hand, certainly needs improvement and seems peculiar when compared to how well the county rated in other mortality indicators.

An article in the *Journal of the American Medical Association* cites that in the early 20th century, populations in higher socioeconomic groups also had higher rates of coronary heart disease (3143). The article suggests that heart disease and social status are now inversely related due to behaviors such as smoking and eating red meat that are no longer associated with higher-end socioeconomic groups. This philosophy is supported by Blount County's assessment, since it received a first place ranking in both lung cancer and heart disease. The article continues to state that there are two specific diseases which are more common today in higher socioeconomic groups. The first is malignant

melanoma which might reflect the recreational tanning practices of the upper middle class. The second is breast cancer which the article attributes to "differences in childbearing patterns." This is an interesting commentary since Blount County placed eleventh in all malignant neoplasms. Furthermore, Blount County was second to last in the area of breast cancer. Obviously this trend was not supported throughout the assessment. Anderson County received a second place ranking in breast cancer. In possible defense of this theory, the article does state that though breast cancer rates are inversely related to socioeconomic status, survival of the disease is positively related. Since the breast cancer rates in the assessment are mortality rates, it could be argued that Anderson County may have had better instances of forcing the disease into remission in its residents.

Blount County



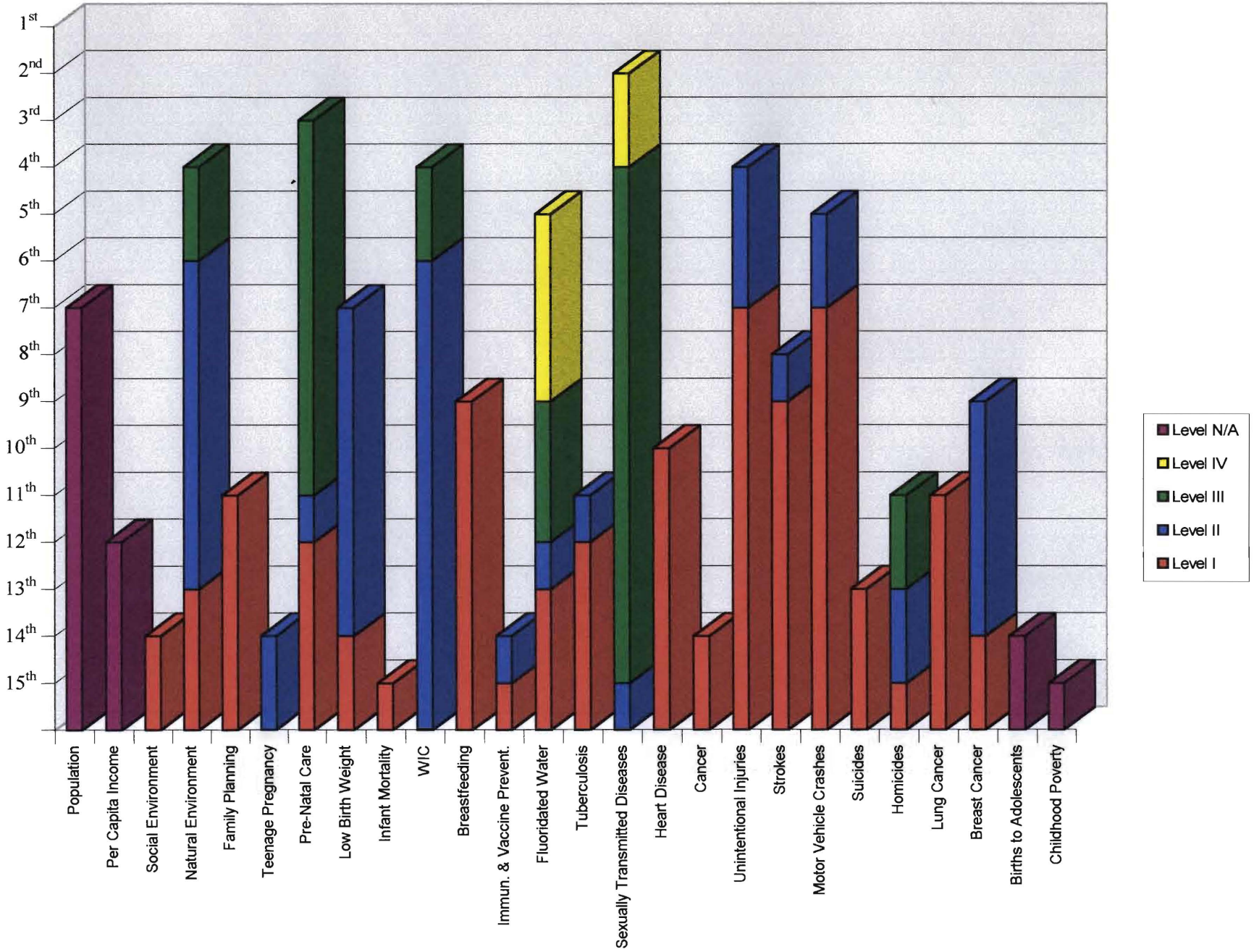
Campbell County

Campbell County has a very low socioeconomic background when compared to the rest of the region. It ranked twelfth in per capita income and fourteenth in the social environment category. In addition, Campbell had the worst childhood poverty rate in the region. The presence of such a high childhood poverty rate might help explain why other indicators in the "Getting the Best Start in Life" and "Building on the Best Start in Life" were so poor. For instance, Campbell County ranked fourteenth in teenage pregnancy and fourteenth in immunizations and vaccine preventable diseases. It ranked last in infant mortality.

Despite these low marks, there were some bright spots in Campbell County's picture. The county placed second in sexually transmitted diseases, and despite its childhood poverty ranking, it provided pre-natal care at the third best level in the region. This level of pre-natal care could help explain its high ranking of seventh in the low birth weight category. Moreover, the ordering for the unintentional injuries indicator across the region seems to resemble the social environment gradient very closely. The largest exception to this is Campbell County's fourth place ranking in unintentional injuries. Upon initial interpretation, such a performance might be perceived as simply good luck. However, the National Center for Injury Prevention and Control, a division of the Centers for Disease Control and Prevention includes motor vehicle crashes, fires, burns, falls, drownings, and poisonings as the leading causes of deaths from unintentional injuries (Injury Prevention 1). In addition, the Center states that approximately 50% of all deaths from motor vehicle crashes and 40% of deaths from residentional fires involve drugs or

alcohol. Such a high rank in this category could indicate accomplished behavioral and health practices. Thus, it should not be dismissed as an indicator measuring only luck or as an indicator sharing little correlation with other health status indicators.

Campbell County



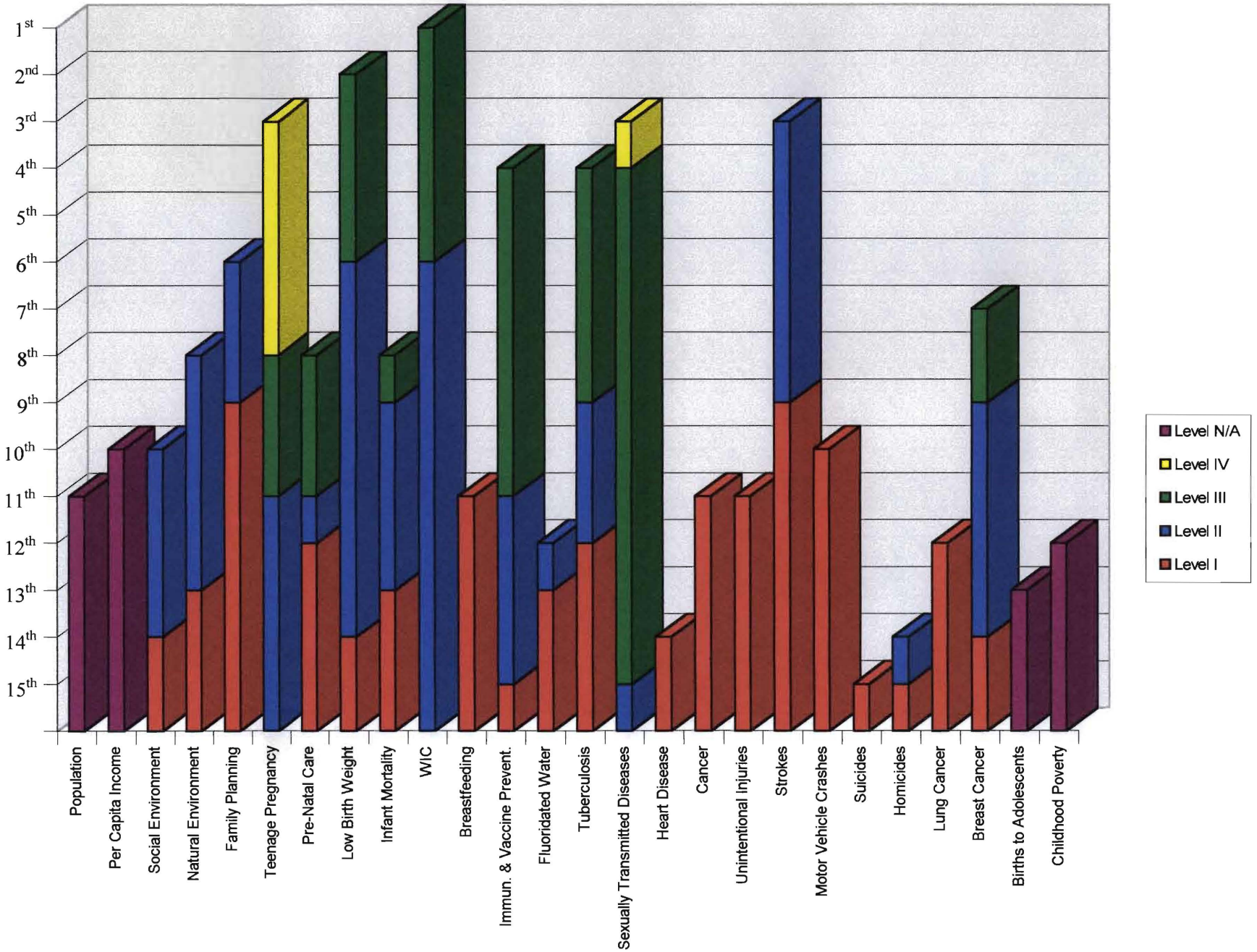
Claiborne County

With its tenth place standing in the socioeconomic status indicators, Claiborne County rose above this tenth place level in the "Getting the Best Start" and "Building on the Best Start" categories, ranking higher than tenth in all but two of the indicators. The two indicators in which they fell short were the eleventh place finish in breastfeeding rates and the twelfth place rank in fluoridated water. Nevertheless, Claiborne County posted an impressive second place ranking in low birth weight and a third place ranking in teenage pregnancy. It was also one of only four counties that did not receive a Level I designation in the "Getting the Best Start in Life" category.

Claiborne's most notable accomplishment was its first place rank in the WIC indicator. Claiborne County had the third worst poverty rate in the region; the poorer the county is, the more people that are eligible for WIC. Despite its large population of qualified WIC clients, Claiborne County served an unbelievable 99% of them. The county ranked eleventh in childhood poverty. However, providing the WIC program to so many of these children most likely helped these kids to "build on the best start in life."

Two of the more striking deficiencies in Claiborne County's assessment are the county's very low marks in homicides and suicides. Claiborne was fourteenth in homicide rates and fifteenth in suicide rates. In reference to suicide rates, Claiborne County received a Level I designation with a rate of 21.4 deaths per 100,000 people. Not only was the county last in suicide rates, but all other counties receiving a Level I designation in this indicator had an average suicide rate of 14.5 per 100,000 population. It was by far the worst county on the basis of this indicator.

Claiborne County



Cocke County

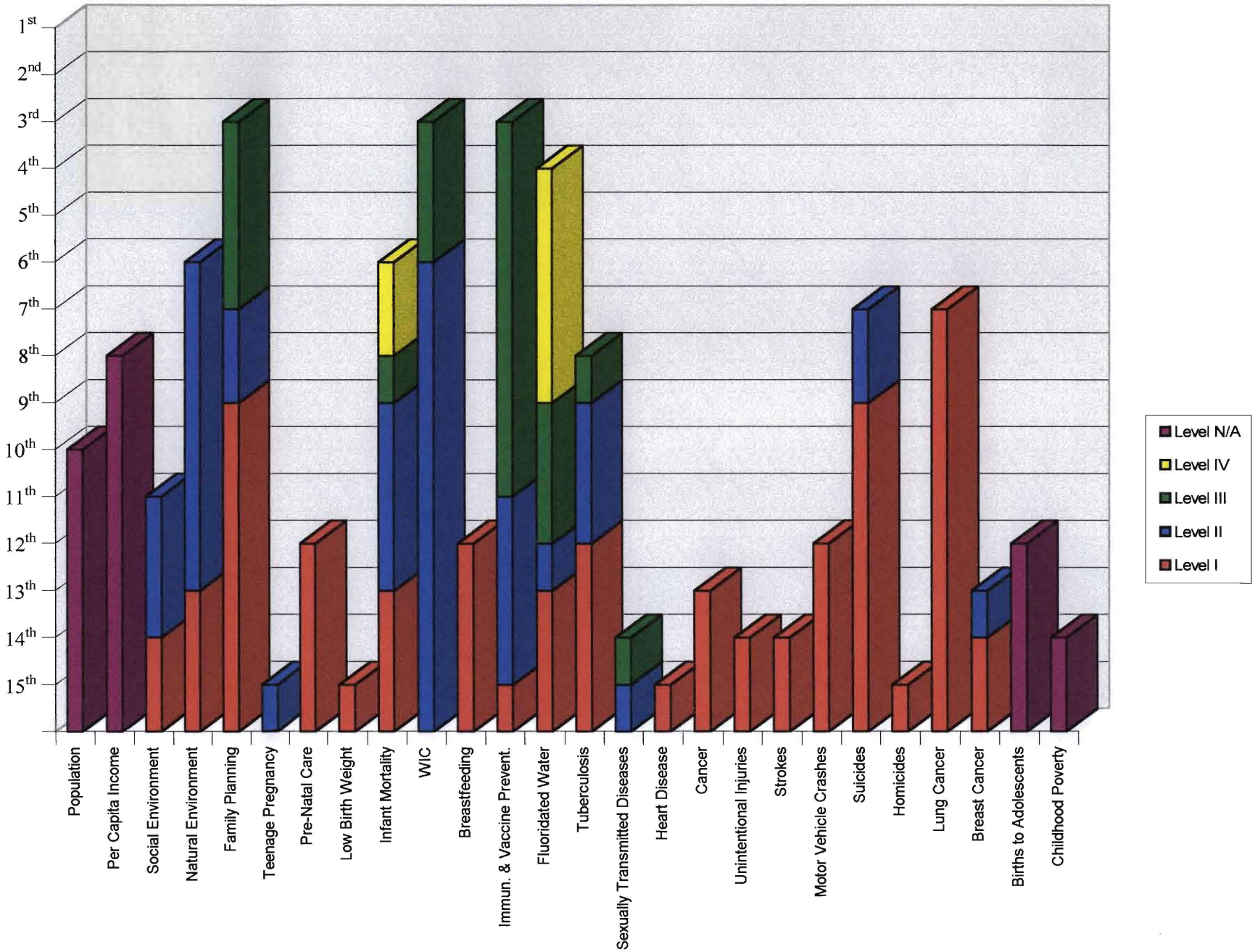
At first glance, the socioeconomic situation of Cocke County does not look terribly bad. The county ranked eleventh in social environment and a very respectable eighth in per capita income. Nevertheless, a more specific evaluation reveals that Cocke was the second worst county in the region when examining childhood poverty. Furthermore, 25.3% of Cocke County residents live below the poverty line compared to the regional average of 18.9%, a state average of 15.7%, and a U.S. average of 13.1%.

The county performed adequately in the health service indicators by ranking in the top half of the region in many indicators including family planning, WIC, immunizations and vaccine preventable diseases, and fluoridated water. However, the health status indicators were much worse. It received a Level I designation in all of the leading causes of death indicators. In fact, it was thirteenth in cancer and breast cancer, fourteenth in sexually transmitted diseases, unintentional injuries, and strokes, and last place in heart disease, homicides, low birth weight, and teenage pregnancy. Cocke was the only county in the region to receive a Level I in homicide.

The last place rankings in both teenage pregnancy and low birth weight point to a association supported in medical literature. That association is the direct correlation between adolescent pregnancy and low birth weight. Whether this connection is a reflection of a poor socioeconomic background among teens or whether it suggests biological problems associated with youth is not clearly known (Fraser, Brockert, and Ward 1113) Nevertheless, Cocke County seems to support this connection. There are obviously other factors, including those in the assessment, like family planning and pre-

natal care which also contribute to low birth weight. Therefore, the assessment did possess exceptions to the aforementioned direct link between teen pregnancy and low birth weight, yet the relationship differs in rank only slightly in most counties.

Cocke County



Grainger County

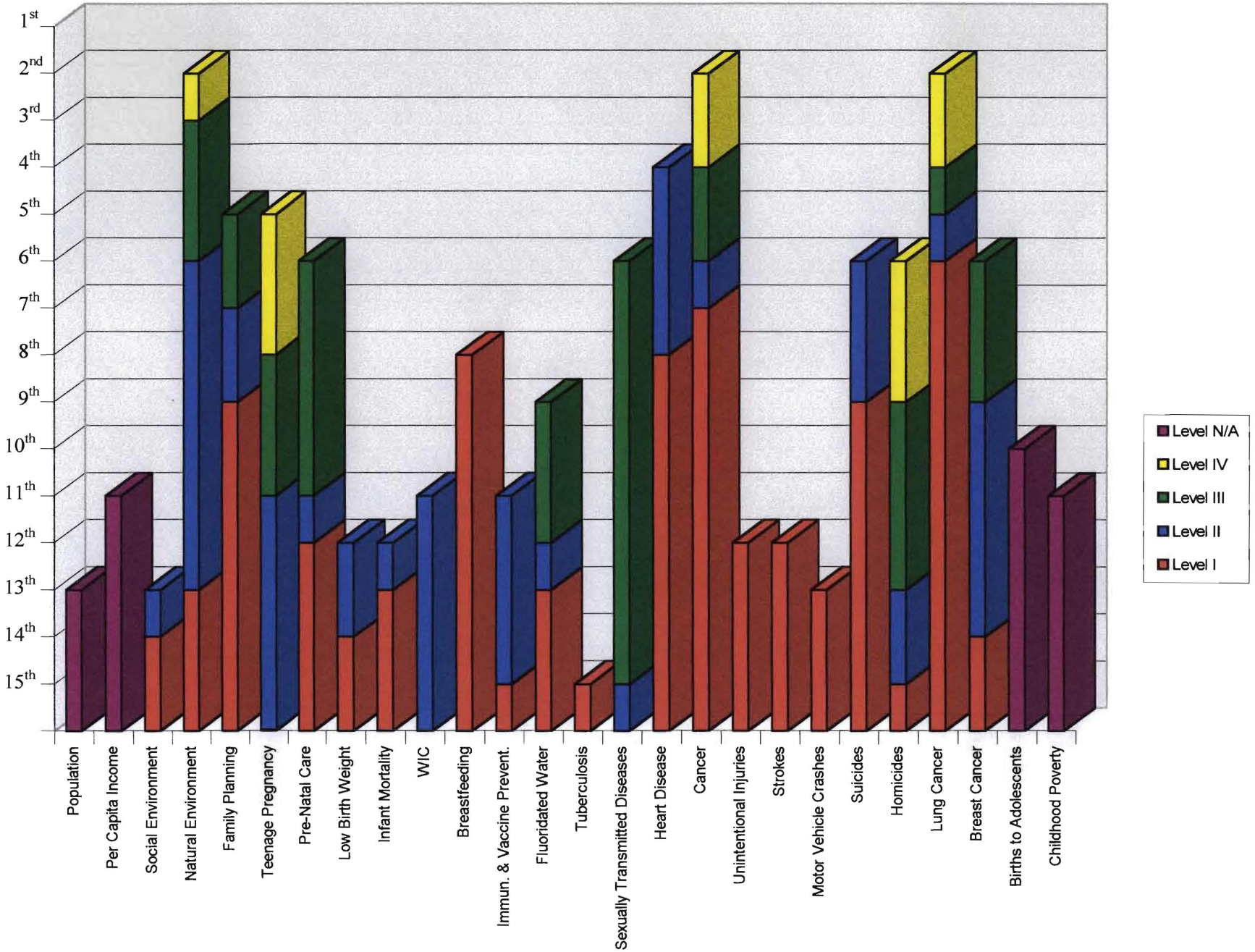
Grainger County ranked thirteenth in the region when set against the backdrop of socioeconomic status. Its relatively low score in this category can be attributed more to its low education rates than to its poverty rates. Regardless, the county only performed worse than its socioeconomic rank of thirteenth in one indicator. This indicator was tuberculosis, and Grainger County ranked last in a field all of its own. The county had an incredibly high tuberculosis rate of 21.3 per 100,000 population. To put this high rate in perspective, Union County ranked fourteenth with a distant rate of 12.9. This low rate is even more problematic when one considers that the regional tuberculosis average was farther away from its year 2000 goal than any other indicator in the assessment.

Aside from its dismal tuberculosis indicator, Grainger County performed rather well in other important categories. It ranked second in cancer rates and surpassed the year 2000 goal of 130 cases per 100,000 people with a lower rate of 124. It was the only low-end county in the social environment indicator to perform well in cancer rates. The county also exceeded initial indications, achieving high marks in other mortality indicators including heart disease, lung cancer, breast cancer, suicides, and homicides. Grainger also performed well in sexually transmitted diseases, family planning, teenage pregnancy, and pre-natal care.

With better than average results in family planning, teenage pregnancy, and pre-natal care, Grainger still ranked twelfth in both low birth weight and infant mortality. To its credit, the county had a low birth weight rate of 14.8 percent of all live births in 1990. This rate decreased over the five years of the assessment, so that the five year average was 8.1. On the other hand, Grainger posted rates of 4.8, 4.3, and 0 in infant mortality in the years

1991, 1992, and 1993. However, in 1994, the rate escalated to 21.8, increasing its five year average to 9.0.

Grainger County



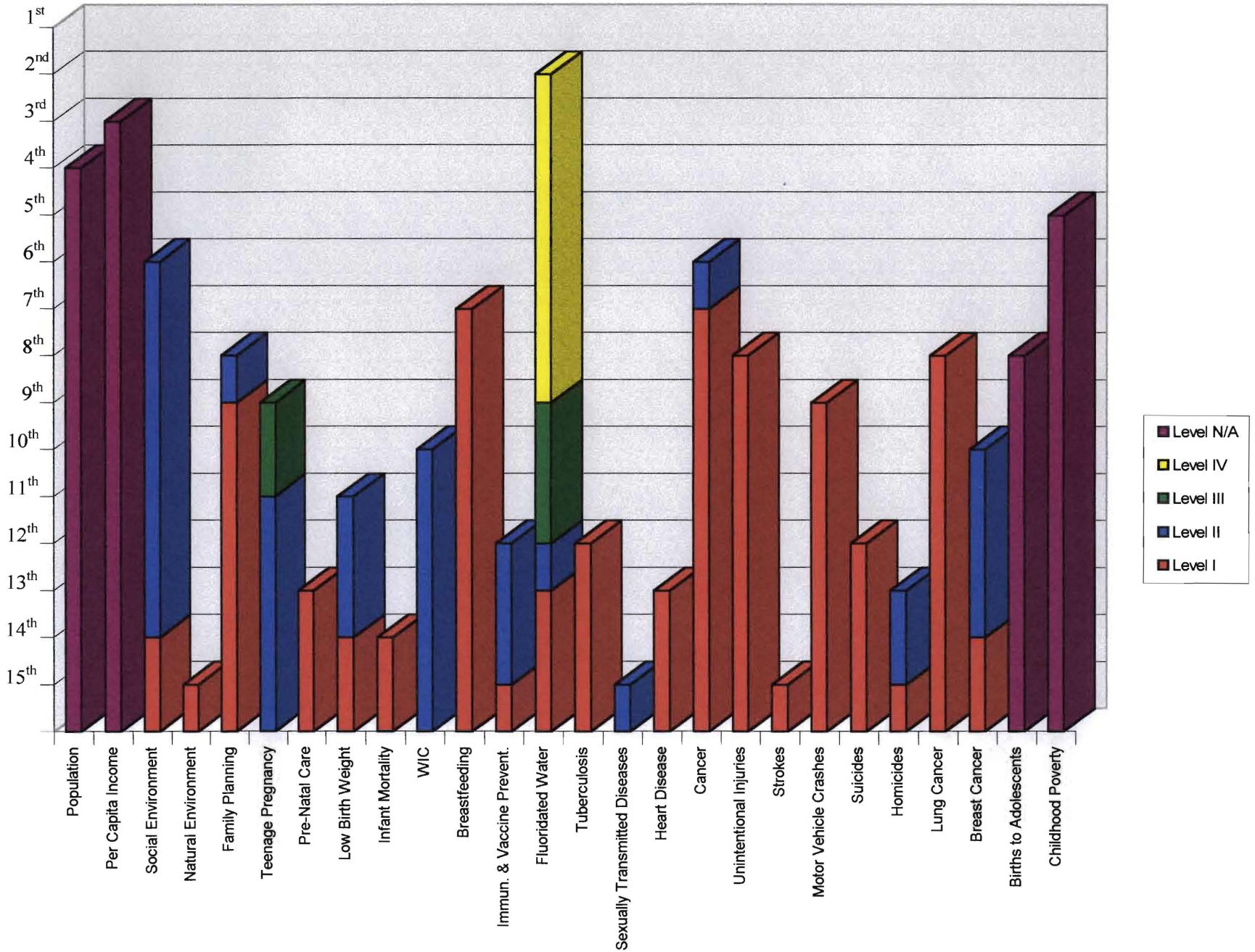
Hamblen County

Hamblen County had the third best per capita income in the region. It also had a commendable social environment ranking of sixth and a childhood poverty ranking of fifth. Yet, based on this information, the county posted surprisingly lower than anticipated numbers in most indicators. The county received only one Level IV designation and that was in fluoridated water. This was not an outstanding accomplishment when one considers that 53% of the region also achieved this goal. What is more, the county received eleven Level I designations which is second in severity only to Union County's twelve Level I standings.

Hamblen County's record in the "Maximizing the Disease Free State" category points to some serious problems. The county had the worst record in the region for sexually transmitted diseases and strokes. Heart disease was also a concern at a rate of 188.3 cases per 100,000 people, a level far more severe than the regional, state, and U.S. total for this indicator. While heart disease and stroke rates have improved continuously over the last 25 years, there remains a higher incidence of mortality among blacks and other minority groups (*Healthy People* 392-395) Blacks also experience a disproportionate amount of sexually transmitted diseases. While certainly not a complete explanation for Hamblen County's poor rates, the county has one of the highest percentages of minority residents in the region. Minorities comprise 5% of the population in the county (*Tennessee's Health* 129). While this is not a staggering number, it may contribute to the county's rank when compared to other counties which have a lower socioeconomic standing but a much lower percentage of minorities.

In the sexually transmitted diseases indicator, the county recorded ten cases of syphilis in 1990 with a rate of 4.7 per 100,000 persons, the worst rate in the region. The next closest county was Blount with a respectively distant rate of 1.8. Hamblen County was also the worst county in the region when examining the natural environment. Hamblen's total pounds of toxic release was 152,305 per square mile. The next closest county to Hamblen's terrible pollution ranking was Loudon with 10,927 pounds. The extent of Hamblen's pollution problem is even more visible when it is noted that twelve other counties released pollution at a level less than 1000 pounds per square mile.

Hamblen County



Jefferson County

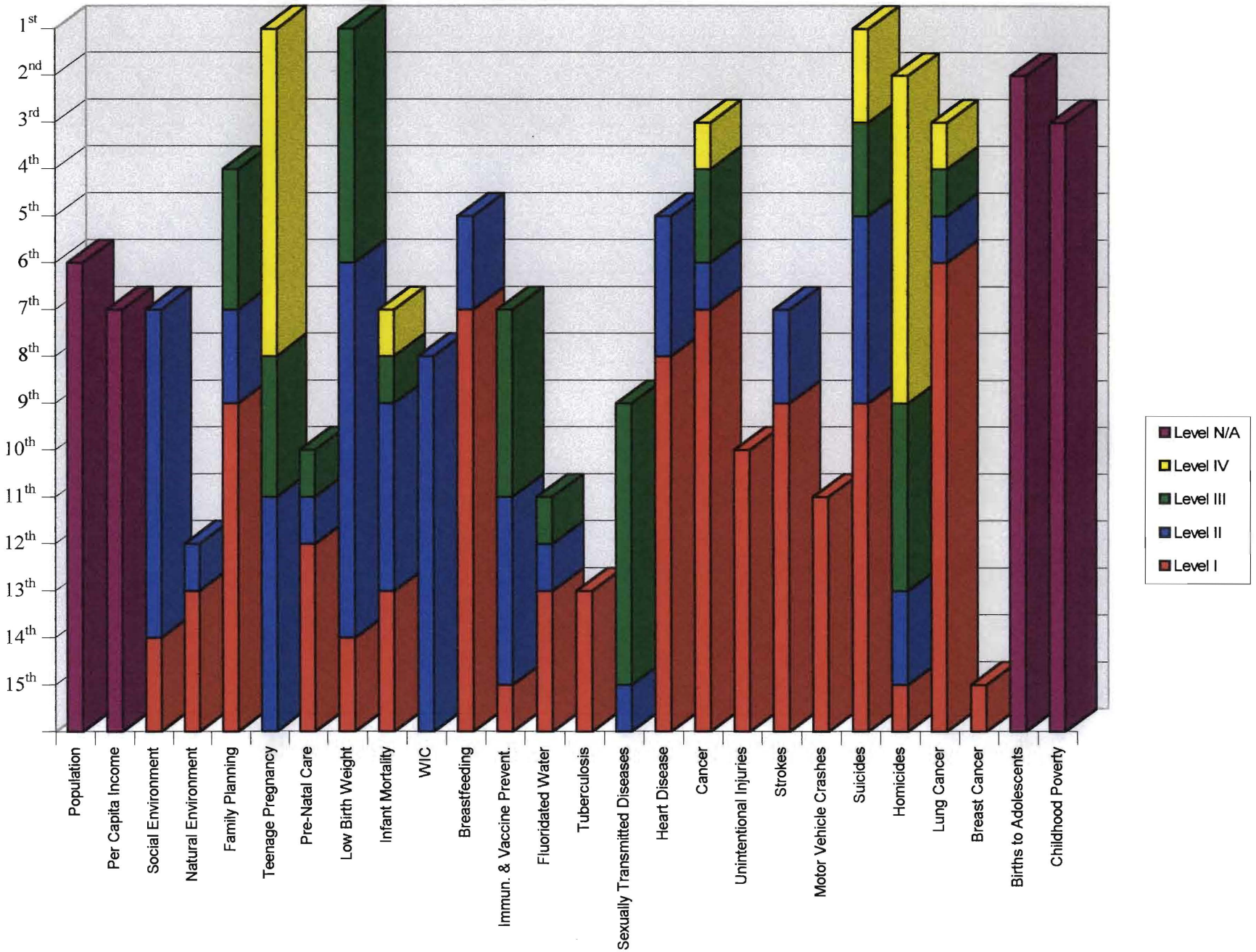
Jefferson County was the county in the middle of the socioeconomic hierarchy. It placed seventh in per capita income and seventh in the social environment. Furthermore, the county was poised to do well in the later stage indicators, since Jefferson County had the best overall situation when examining all of the indicators in the "Getting the Best Start in Life" category. In this classification, Jefferson posted two Level IV assignments and two first place rankings while receiving no Level I designations in any indicator.

Along with this better than average performance in "Getting the Best Start in Life," the county also performed a little better than average in the "Four Leading Causes of Death" indicators. Jefferson County received a sub-par tenth place standing in unintentional injuries, but earned a seventh place stroke ranking, a fifth place heart disease ranking and a third place Level IV ranking in cancer. Similarly, it received a Level IV designation in the addendum indicators of lung cancer and homicides.

Jefferson County also received a first place ranking and a Level IV designation in the suicide indicator. The eighth leading cause of death in America is suicide. It claims the lives of approximately 30,000 people per year. Although Jefferson County did not have the best socioeconomic status in the region, its moderate level may have contributed a great deal to its number one rank in suicide, since low socioeconomic levels, stress, and unemployment are some of the main contributing factors to suicide (*Healthy People* 210). There is not one intervention that has been shown to greatly reduce suicide. It seems that the best way to reduce instances of suicide can be found by trying to eliminate the methods of committing the act. Catalytic converters that reduce the lethal emissions of

car exhaust, education, and limits on the number of medications given to patients may be helpful (Gunnell and Frankel 1227). One of the most favorable responses to reducing the suicide rate seems to be the early diagnosis and treatment of those with mental disorders (*Healthy People* 210). This knowledge makes Jefferson County's achievement all the more remarkable since there is not a single psychiatric specialist in the county (*Tennessee' Health* 183).

Jefferson County



Loudon County

Loudon County achieved a better than average result in the socioeconomic indicators when compared to the rest of the region. It ranked fifth in per capita income and fourth in the social environment indicator. Its childhood poverty rate was fourth best in the region, and its overall poverty rate of 13.6% was better than both the regional and state average.

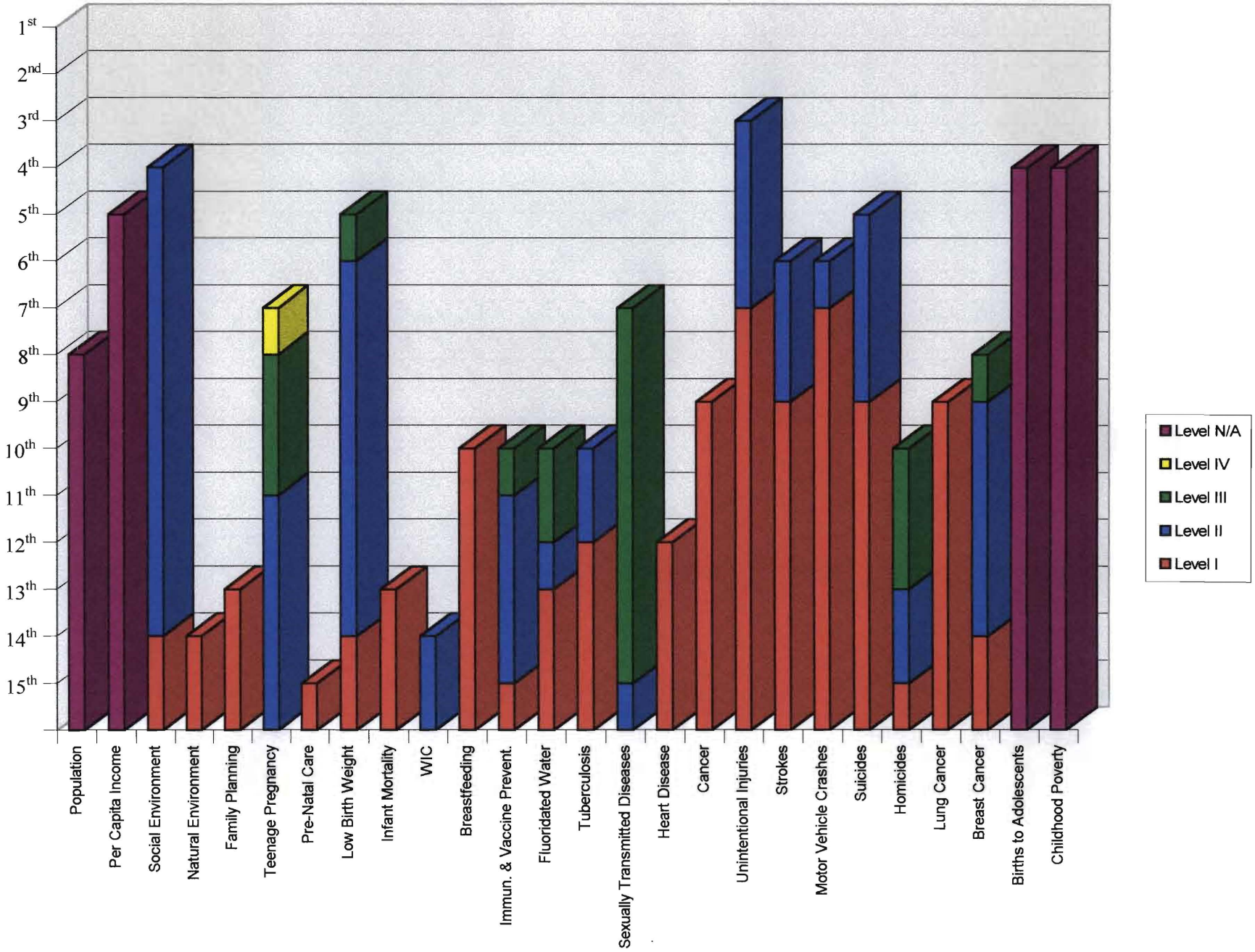
With a better than average social environment, the county accordingly posted better than average rankings in teenage pregnancy and low birth weight, holding the seventh and fifth place spots respectively. Besides those two indicators, however, the rest of the "Getting the Best Start in Life" indicators faired much worse. In fact, Loudon County was the only county in the region that received three Level I designations for indicators in the "Getting the Best Start in Life" category.

The addendum depicts two indicators which are also related to "Getting the Best Start in Life." The birth to adolescents and childhood poverty indicators both list Loudon County in the fourth place spot. This is a very good illustration of a common relationship throughout the assessment. With the exception of Anderson County, the rankings for birth to adolescents and childhood poverty were never far apart when examined for each county.

There is a very feasible explanation for this. In the United States, around two-thirds of all births to adolescents occur outside of marriage (*Family Health Council* 1). According to a documented trend in the state of Missouri, in 1983, 53.9% of births to teenagers occurred out of wedlock, while in 1993, 75.4% of all teenagers giving birth

were unmarried (*Step by Step* 1). This study further shows that over half of the kids living in homes with one parent are poor. Thus, high instances of birth to unwed teens translates into high rates of poverty and welfare dependency for these families. A report issued by the Office of Child Development at the University of Pittsburgh states that there is a direct correlation between families living in poverty and births to unwed mothers. Furthermore, according to the Family Health Council, Inc. a private, non-profit public health organization in Pittsburgh, Pennsylvania, "Children born out-of-wedlock are four times more likely to grow up poor and the fact that unwed mothers average eight years on welfare, as opposed to four years for all other recipients. There is an extraordinary high probability that families headed by unwed, teen mothers will spend some, and perhaps most of their lives in poverty. Poor adolescents are more likely to become pregnant than other teenage girls. Increasingly, social analysts are beginning to view poverty as both a cause and a consequence of teenage childbearing" (*Family Health Council* 1) Therefore, it is evident that public health must seek to break the cycle of adolescent pregnancy if issues such as childhood poverty are to be addressed in Loudon County as well as in others.

Loudon County



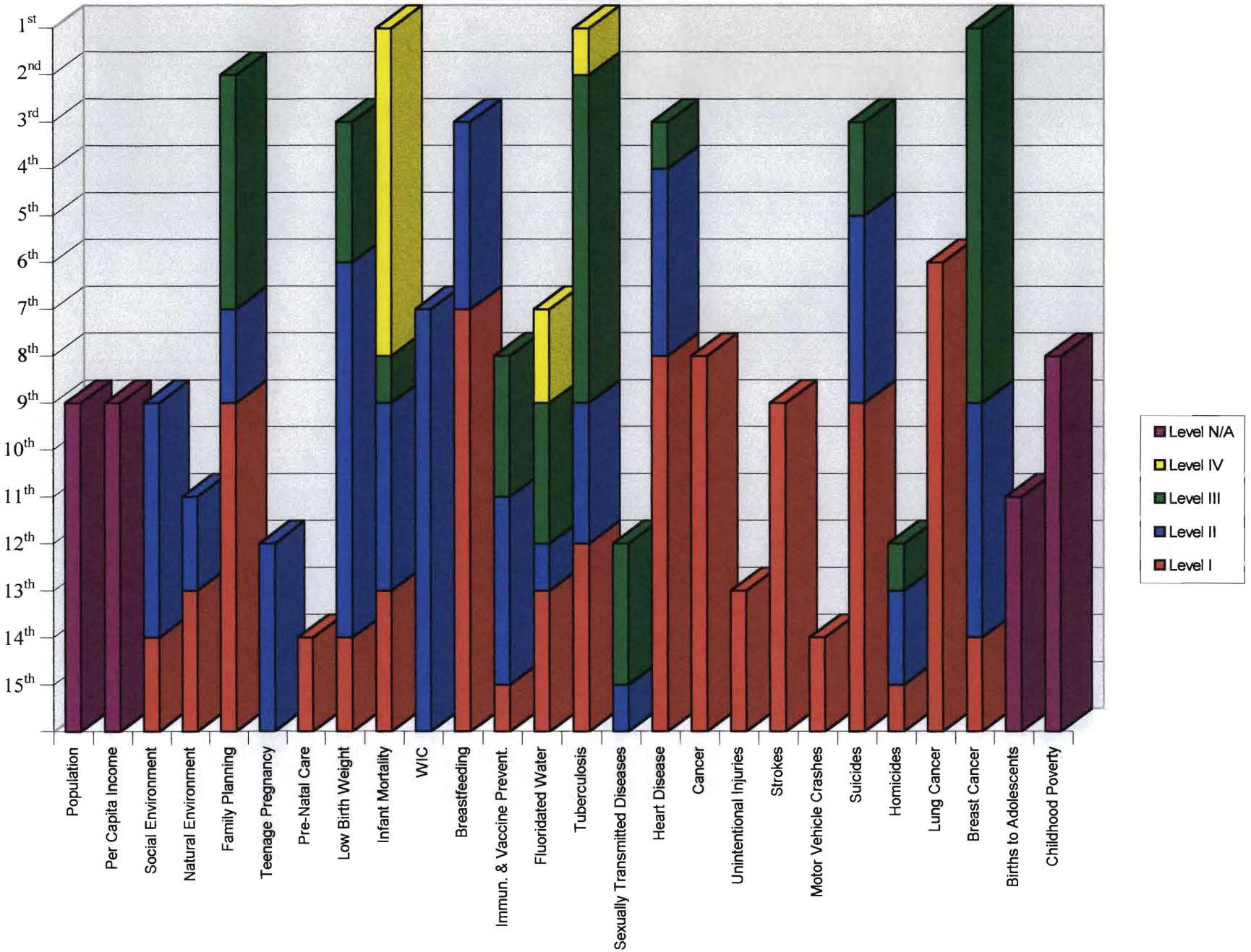
Monroe County

As a county situated in a middle range of socioeconomic status within the region, Monroe County was on both sides of the median range in terms of its individual indicators. Moreover, Monroe County was, in most cases, the complete antithesis of the regional rankings, doing well in the indicators in which the region as a whole performed poorly and doing poorly in the indicators wherein the region did the best. For instance, in teenage pregnancy, the county earned a meager twelfth place ranking within the region. The region, as a whole, surpassed the year 2000 goal by 3%. In pre-natal care, Monroe County received a fourteenth place standing with its rate of 74.3 percent of all births having received care in the first trimester. The region, on the other hand, achieved an average of 80.1 for pre-natal care and must only improve by 11% to reach the year 2000 goal of 90.0. While the county's homicide rate was not objectionable, it still only earned Monroe County a twelfth place standing in the region. However, the region surpassed the year 2000 goal for homicide by 31%.

Monroe County did not receive low marks in all of the indicators. The county received a first place Level IV standing in low birth weight, while the region still needs to improve by 34% in this indicator to reach the year 2000 projection. Heart disease was another bad indicator for the region. An improvement of 37% beyond the current level is needed to reach the Year 2000 goal. Monroe County received a third place ranking in heart disease with a rate which was not only better than the region, but the state and US average as well. Breastfeeding rates among low income Americans was the indicator which needed the most improvement within the region. In this area, the region must

improve by 73% in order to reach the year 2000 goal. Monroe County, however, received the third best rank in the region for breastfeeding rates. Tuberculosis was another Status I indicator for the region, yet Monroe County placed first with low rates of TB and was the only county in the region to surpass the year 2000 goals.

Monroe County



Morgan County

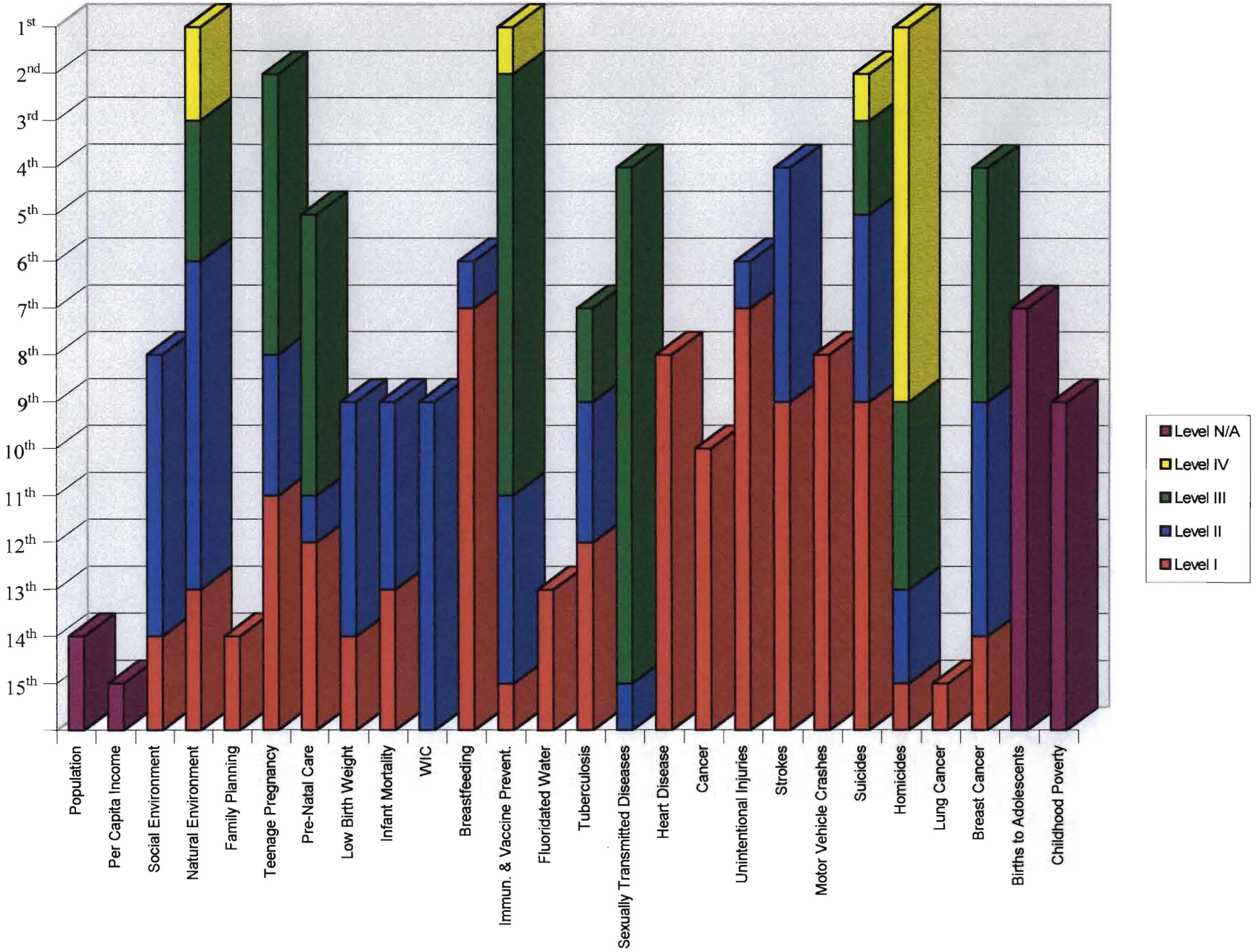
The per capita income of Morgan County was the worst in the region and $7,000 below the state average. Its poverty levels, on the other hand, were around 20%, placing Morgan County in the median range within the region. These median poverty levels are representative of Morgan County's overall performance in the assessment. That is, the county ranked somewhere in the middle for most indicators in the assessment. The glaring exception to this fact is Morgan's last place ranking in lung cancer with a rate of 67.9. Also below average, was the county's fluoridated water rate. Only 53.8% of the residents who were served by public water utilities received fluoride in their water.

Morgan County did have several features worthy of emulation. First, for the five year period of the assessment, there was only one homicide in the county. This was the best situation in the region, and the county's homicide rate was 0.5 per 100,000 people. In addition, Morgan County was virtually pollution-free according to the toxic release inventory. Morgan was the number one county in the natural environment indicator, averaging only one pound of toxic release per square mile.

Morgan County's other notable Level IV achievement was its first place ranking in immunizations and vaccine preventable diseases. In a CDC survey of major cities across the nation, it was found that only 10-42 percent of two year old children are adequately immunized. One reason for this is the fractured health care system for children in America. Multiple providers and financial barriers leave low income families bouncing between the public and private sector in search of immunizations. One series of shots might be given at a hospital emergency room while the follow-up shots might be obtained from a local health department. Accountability problems in this multi-provider system

frequently leave poorer children under-immunized (Halfon, Inkelas, and Wood 464) Thus, Morgan County's situation was all the more laudable, since the county had the lowest income ranking while managing to achieve much better results in the immunization surveys and cases of vaccine preventable disease.

Morgan County

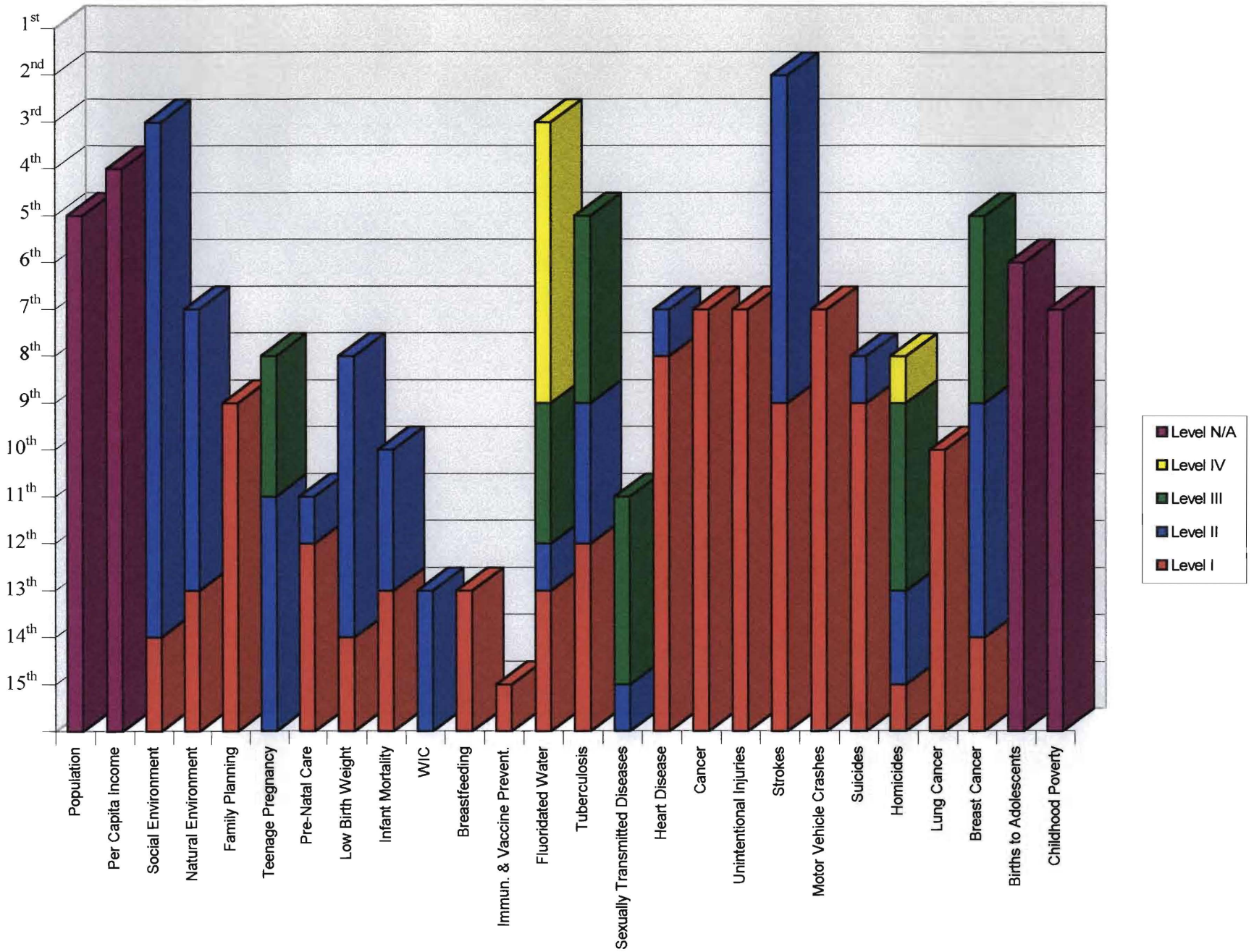


Roane County

Despite Roane County's better than average ranking in per capita income and the social environment, fourth and third respectively, the county rarely occupied higher than an average spot in any indicator ranking. Fluoridated water, tuberculosis, strokes, and breast cancer were the overt exceptions, finishing a few rankings above the median line. Still, Roane County was located around the seventh and eighth place spots for most of the "Maximizing the Disease Free State" indicators as well as the Addendum indicators.

Roane County is one of only three counties in the region to receive two Level I designations in the "Building on the Best Start in Life" category. In this category, it received a thirteenth place rank in the WIC indicator and in the Breastfeeding indicator. Furthermore, with its last place rank in Immunizations and Vaccine Preventable Diseases, Roane County was the only county in the assessment to receive a Level I assignment in this indicator. Overall, Roane County did not receive any first place rankings, nonetheless, it had few scores which were exceptionally below average. Overall, Roane County is a good example of a middle range county in the assessment.

Roane County



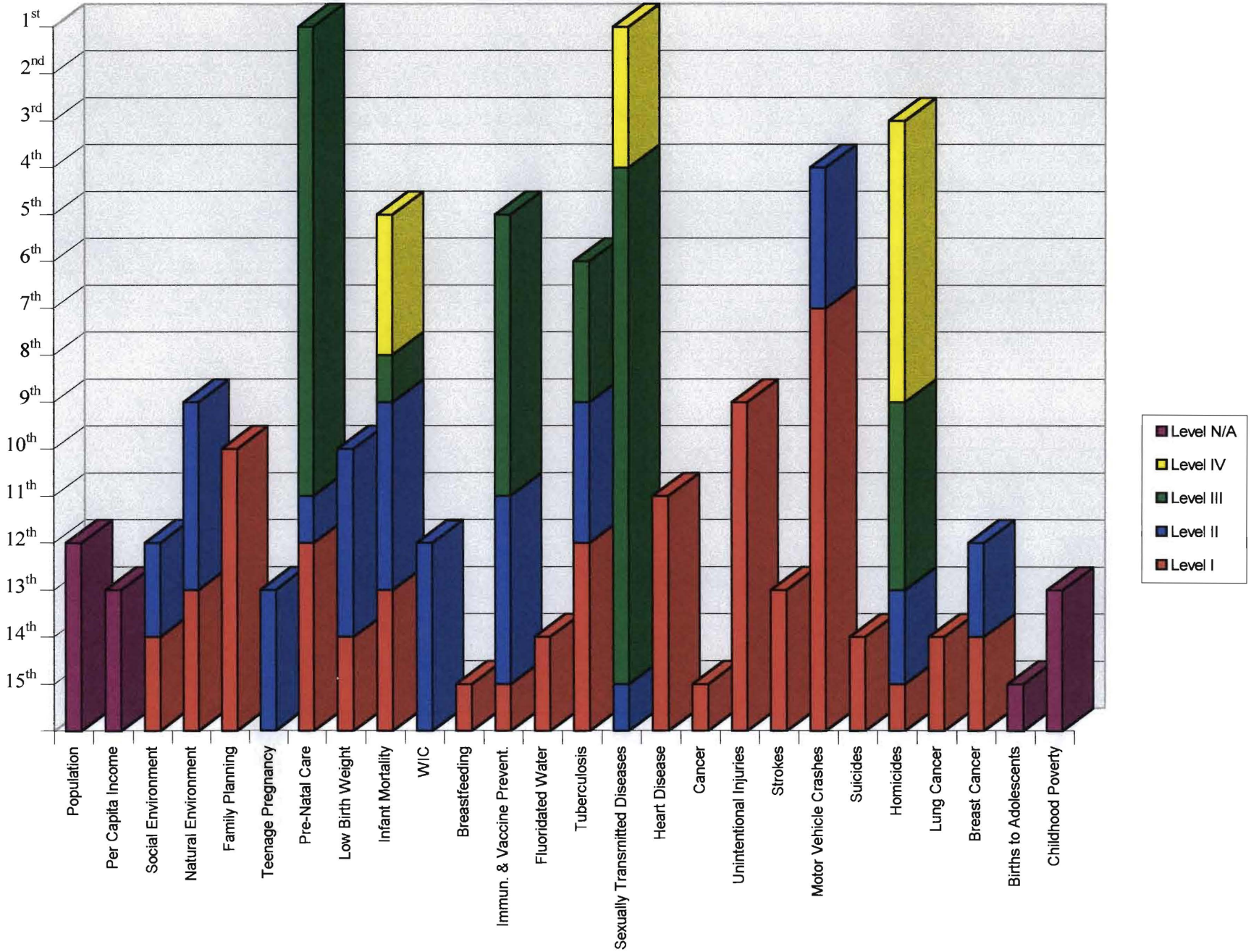
Scott County

Scott County is another example of a rural East Tennessee county with low socioeconomic status. The county is thirteenth in per capita income and twelfth in the Social Environment. Accordingly, Scott, along with Union and Cocke, were the only three counties to receive Level I designations in all of the indicators which dealt with the four leading causes of death. It was last in cancer and in breastfeeding rates. Suicides, lung cancer, births to adolescents, and fluoridated water were also very poor.

Scott County did have several noticeable achievements. A first place standing in pre-natal care, and other high rankings in infant mortality, immunizations and vaccine preventable diseases, tuberculosis, motor vehicle crashes, and homicides were all worthy accomplishments.

Possibly the most striking indicator, in Scott County, was sexually transmitted diseases. Here, Scott County was ranked first and was one of only two counties in the region to achieve a Level IV designation. Over a five year period, Scott had no cases of syphilis reported and a gonorrhea rate of 3.7 compared to a regional gonorrhea average of 34.8. Out of the over 12 million cases of sexually transmitted diseases that affect the United States annually, a disproportionate amount of them affect youth, the indigent, and minorities (*Healthy Review 1994* 117). With such low socioeconomic resources in the county, Scott's exceptional STD rate appears quite curious. Nevertheless, out of 48 cases of syphilis recorded within the East Tennessee Region between 1990 and 1994, 31 (or 65%) of those cases were African-Americans. Also, out of 1181 cases of gonorrhea, 486 (or 41%) were African-Americans. These facts are very significant since in 1994, Scott

Scott County



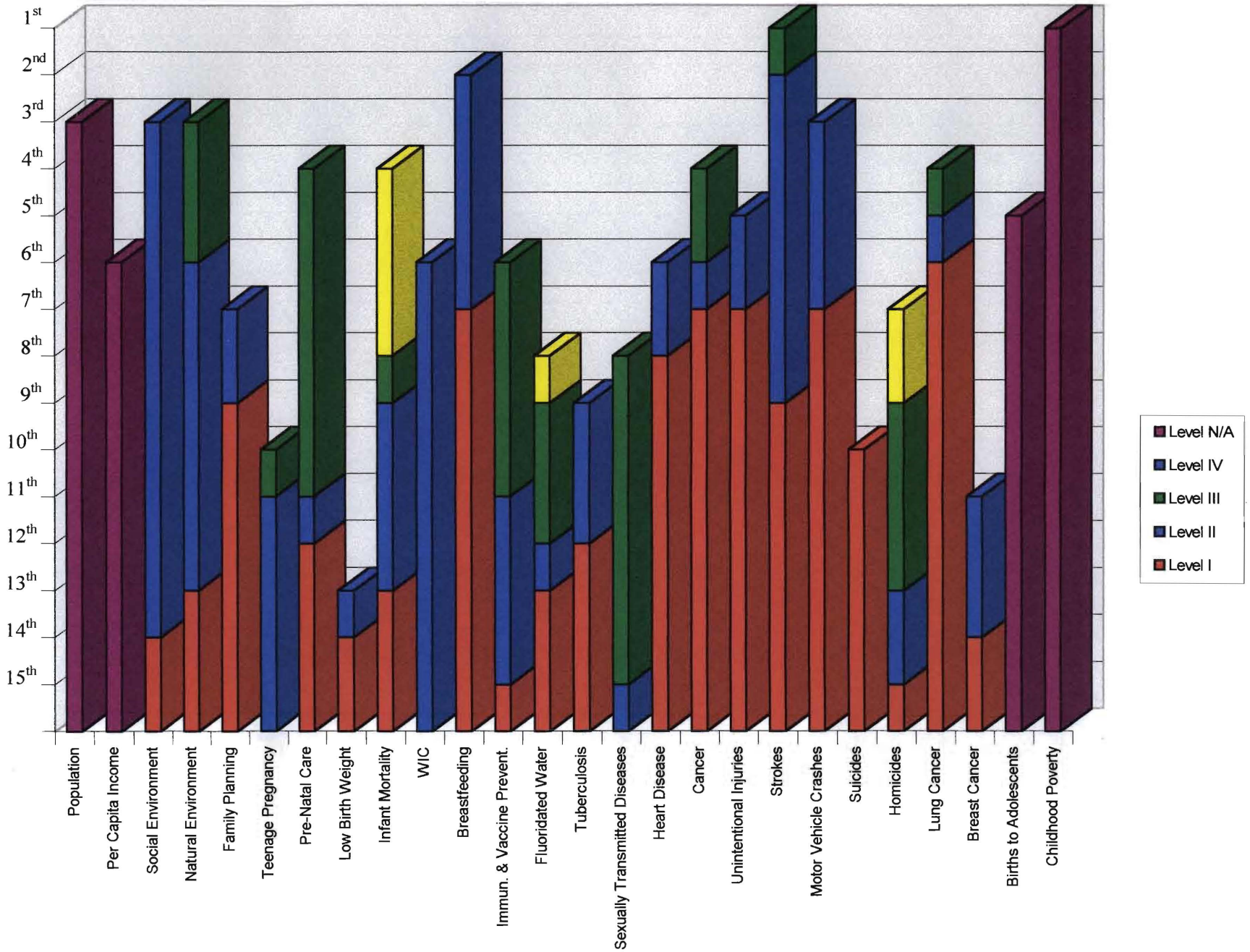
Sevier County

Sevier County had only the sixth best per capita income, yet it had the third best social environment and the number one childhood poverty ranking in the region. With such a low instance of poverty in the county, Sevier's relatively good performance in the assessment was not shocking. Even though the county only experienced first place rankings in strokes and childhood poverty, most other indicators were above average. Furthermore, Sevier County received only one Level I indicator throughout the assessment. This came in suicides, but the county was still the tenth best county in the region for this indicator.

Sevier County was the only county in the region besides Anderson County to receive no Level I designations in the "Maximizing the Disease Free State" category of indicators. Within this category, there were no Level IV counties for the stroke indicator. However, Sevier was the only county in the region to earn a Level III designation for Strokes. The absence of Level IV counties in the region is representative of a recurring trend. For the past 50 years, stroke mortality rates have been higher in the southeast region of the United States than in any other part of the country (Gillum and Ingram 665). It is difficult to say what causes such increased instances of strokes in this part of the country, but it is such a continual phenomenon that researchers refer to the Southeast as the, "Stroke Belt" (Howard et al. 1153). Regardless, the rate of stroke mortality needs to improve in both Sevier County and in the region where it must improve by 42% of its current level to reach the Year 2000 goal.

County only had 7 African-Americans in the whole county. Analogously, Union County has the worst social environment ranking in the region, yet it ranked fourth in sexually transmitted diseases. Once again, of possible significance is the fact that Union County had only six African-Americans in 1994 (Tennessee's Health 305). This statistic points to one possible strategy for STD prevention in other counties.

Sevier County



Union County

With the lowest social environment status and the second lowest per capita income in the region, there were few surprises in the overall poor performance of Union County. The county received twelve Level I designations, more than any other county in the region. Seven of these Level I designations were assigned to indicators in which the county placed fourteenth or fifteenth in the region. Even though the county received its fair share of Level I assignments, Union County's assessment was marked with several bright spots.

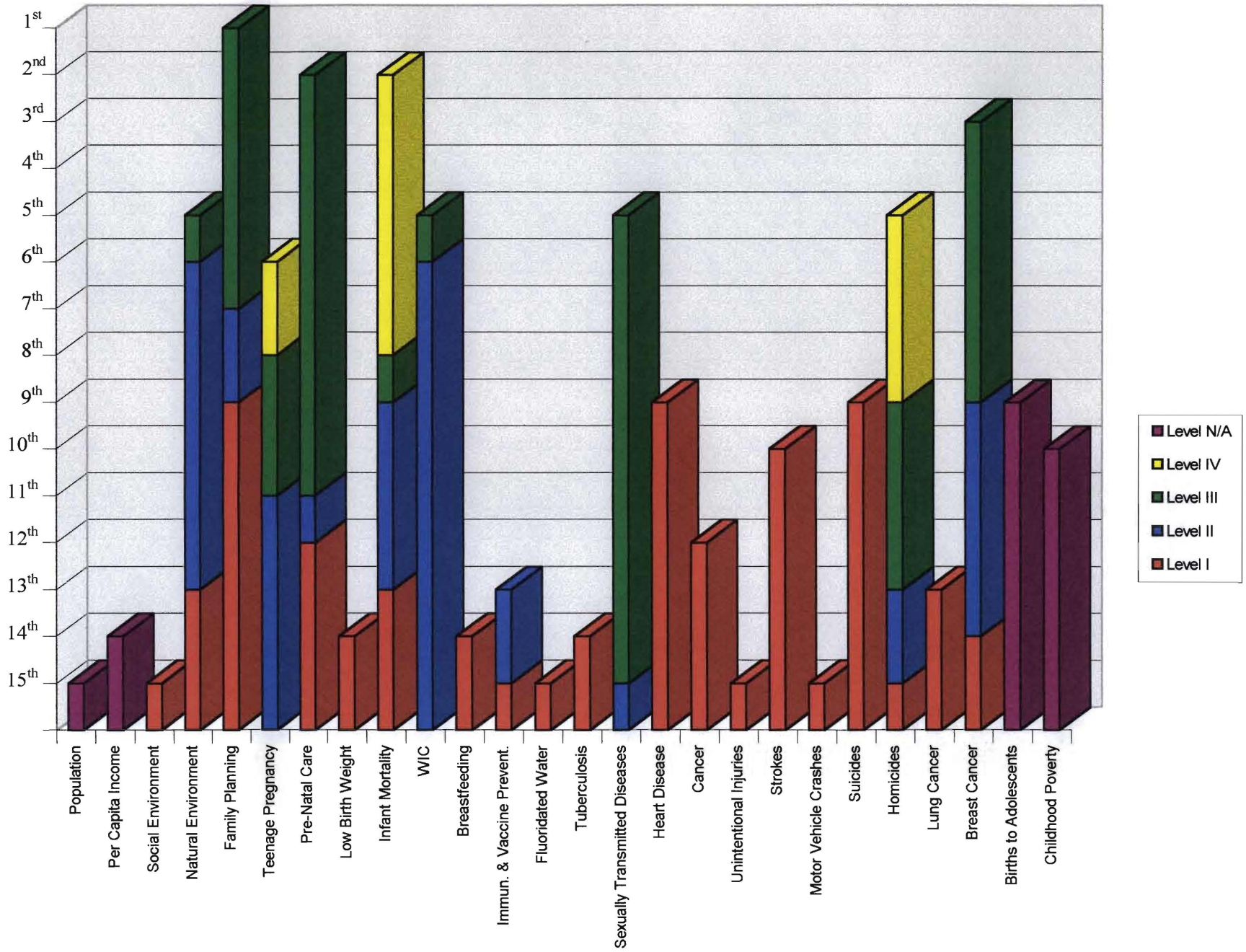
In fact, the county's highlights were more than just mediocre fourth or fifth place rankings. One might say, that when Union County did not strike out, it hit a homerun. For example, the county ranked first in family planning, serving 82.3% of the target population. The nearest county to Union in this category was Monroe County with a family planning rate of 59.0%. Additionally, Union County received a Level IV designation in teenage pregnancy and infant mortality. Moreover, the Year 2000 goal in infant mortality is 7.0% of all live births, while Union County has already reduced its instances of infant mortality to 3.5. Furthermore, the county had the second best ranking in pre-natal care. However, this rate, in addition to the exceptional performance in family planning and teenage pregnancy, still left Union County with a disappointing fourteenth place finish in low birth weight.

Union received a Level I designation in all of the four leading causes of death as well as in tuberculosis. Possibly its most notable Level I, however, was in the indicator

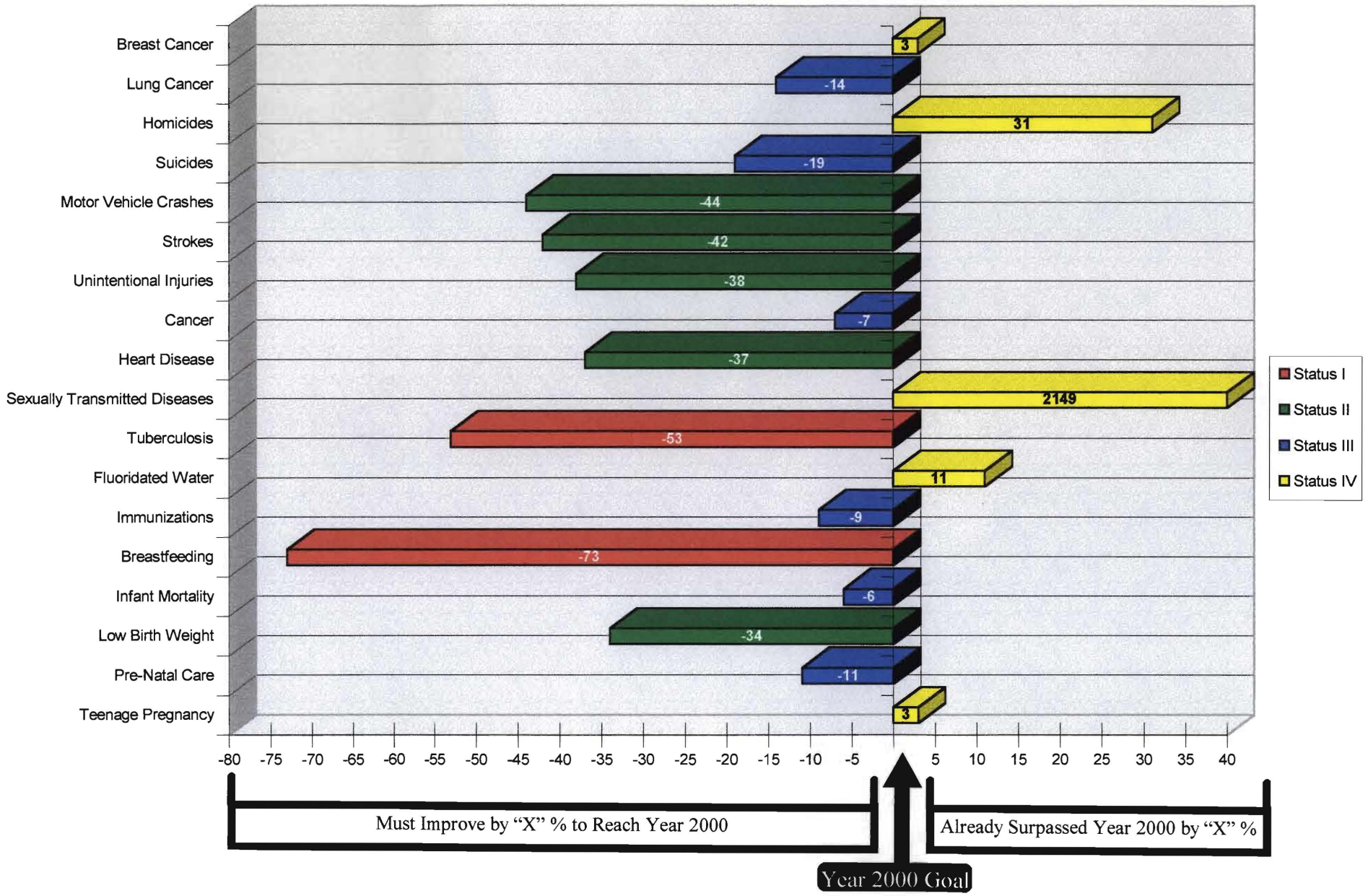
of fluoridated water. Here, it was not only in last place, but it was a true Level I county, since 0% of all residents who were served by public utilities received fluoridated water.

This is a potentially serious flaw, since the benefits of water-borne fluorides have proven to be the main form of prevention against dental carries for 50 years. Research continues to confirm fluoridated water's benefits regardless of age, race, socioeconomic background, etc. Yet, due to poor funding by the government, lack of mandated fluoridation by most states, lack of a centralized effort to focus on fluoridation, and a general misunderstanding about the effectiveness of fluoride, many counties around the country share Union County's predicament (Easley 348).

Union County



The East Tennessee Region's Progress Toward the Year 2000 Goals



Tuberculosis

For centuries, tuberculosis (TB) has claimed the lives of people around the world. In the early 1800's, 20% of all deaths in the United States were caused by TB (Simone 3). Today, there are 8 million new cases of tuberculosis in the world each year (*TB Fact Sheet* 2). Tuberculosis reporting across the country first began in 1953. From that time, until just over a decade ago, TB experienced an annual average reduction of 5.6%. In 1953, there were 84,000 cases reported. This figure had dropped to 22,255 cases by 1984. This consistent decreasing number of TB cases brought hope for eventual eradication of the disease. Nevertheless, such hope was somewhat stymied in 1985 when TB cases stopped moving in a downward trend. Tuberculosis cases increased by 14 % from 1985 through 1994 (Simone 3). In each year since 1984, the number of TB cases reported in America has been above 22,000 (*Drug Treatment* 1). To fully appreciate the extent of this turnaround, there were 25,701 new cases of TB reported in 1990. When examining trends set before 1985, the number of cases in 1990 was 9,883 larger than expected (Iseman, Cohn, and Sbarbaro 576).

Such a reversal from the anticipated results of the 1990s has left public health departments with the difficult task of slowing this pattern. The East Tennessee Region is no exception to this trend of increasing TB rates. According to this supplement, the region must improve by 53% if it is to reach the year 2000 goal of 3.5 cases of TB per 100,000 people. Even more challenging is the work that must be done in order to reach the goal of the CDC's Advisory Council for the Elimination of Tuberculosis which is complete elimination of TB in the United States by 2010 (Bayer and Dupris 308).

Causes

Tuberculosis is an air-borne disease which can be easily transmitted from one person to another. It can be contracted by simply breathing in the air of a contagious person who coughs or sneezes. The bacteria can then begin to grow inside the lungs and spread to other areas of the body. Carriers of TB will be more likely to spread the disease to those with whom they come in contact on a daily basis. These people include relatives, fellow employees, or friends (*Q &A about TB*). However, this has been the mode of transmission for centuries. To what, then, can the recent increase in tuberculosis cases throughout the United States be attributed?

Experts have been searching for explanations. Such answers can be traced to at least four main factors. According to a document published by the CDC entitled *Forging Partnerships to Eliminate Tuberculosis*, these factors are:

- The association of TB with the HIV epidemic
- Immigration from countries where TB is common
- The transmission of TB in congregate settings (e.g., health care facilities, correctional facilities, homeless shelters)
- The dismantling and subsequent deterioration of TB prevention and control programs when TB was no longer seen to be a threat (1)

An Institute of Medicine panel also reported that homelessness, destitution, drug abuse, and trouble reaching people with specific needs were also contributors to the problem (Annas 585).

Risk Factors

The above stated factors that directly relate to the resurgence of the tuberculosis disease put some persons at greater risks of contracting TB than others. Those with HIV experience the highest degree of risk (*Mississippi* 1). This is because approximately 10 to 15 million people have a tuberculosis infection which has not yet converted to active tuberculosis disease. However, 90% of new tuberculosis cases occur from those carriers of the TB infection whose immune system can no longer defend the body (*Drug Treatment* 1). Such is the case with people who have HIV. In fact, at the turn of the decade, 5% of all AIDS victims were also infected with tuberculosis, and 58% of those with TB were HIV positive (*The Connection* 1). HIV patients who are infected with TB have a 10% chance of progressing to a fatal case of TB each year they are alive. Furthermore, tuberculosis is one of the most common diseases that HIV patients acquire (Nunn and Kochi 7-8).

Minorities and the indigent also have a greater risk of catching the disease than the rest of the population. In 1990, the tuberculosis rate for the United States was at 9.4 per 100,000 population. At that same time in the mostly African-American community of Harlem, 90.7 per 100,000 people had tuberculosis. From 1985 to 1990, the rates among Hispanics, African-Americans, and Asian/Pacific Islanders severely increased while rates for caucasians declined. In 1990, the case rate in Harlem was just short of 200, four times the rate in New York City and twenty times the United States average (Bayer and Dupris 309). Substance abuse and alcohol abuse are also leading risk factors. Research has shown that over 20% of Hispanic and African-American intravenous drug users living in the inner city carry the TB infection (*Drug Treatment* 1).

Other risk categories include: "Foreign-born persons, the elderly, residents of long-term care facilities (e.g. correctional facilities and nursing homes), and persons with certain previous conditions (diabetes mellitus, silicosis, cancer of head or neck, leukemia, Hodgkin's Disease, end-stage renal disease, intestinal bypass and low body weight)" (*TB Care Guide* 3-5).

Preventive Therapy and Treatment of TB Disease

Preventive therapy has been shown to reduce the development of TB disease by over 90%. The medicine which is usually given for preventive therapy is called insoniazid or INH, and it is recommended for anyone who has the TB infection. It may also be given to those in many of the high risk groups above or to those who have come in contact with a TB carrier. When it is prescribed, INH is administered for six months to adults, nine months to children, and 12 months to HIV patients (*The Connection* 6).

There are other forms of prevention for special populations besides the administering of INH. For example, the foreign-born population bore an overwhelmingly large portion of the TB cases between 1986 and 1989. For this period, 22% of all TB cases were Foreign-born people. This magnitude of occurrance is the reason why all foreign-born persons seeking residence in the United States are tested for tuberculosis. As a further preventive measure, all of those who test positive for active tuberculosis disease are not allowed into the country (*Foreign-Born* 1).

If a patient has the tuberculosis disease, INH is still given. However, a regimen of three other drugs is also included. These drugs are rifampin (RIF), ethambutol (EMB), and pyrazinamide (PZA). This treatment is continued for months depending on the

person and his or her situation. The regimen must be carefully planned and adhered to, lest the patient become ill again because of remaining bacteria (*The Connection* 9).

Difficulty with Regular Treatment

The main problem with tuberculosis drug treatment is that many patients do not adhere to treatment regimens. Study after study has shown that approximately one-third of all tuberculosis patients do not take medication as prescribed. Additionally, the studies have also demonstrated that physicians and health care professionals are unable to distinguish between those who will follow the regimen and those who will not (Iseman, Cohn, and Sbarbaro 578). Not only are professionals not able to discern between those that will adhere and those that will not, but also some argue that certain populations cannot be expected to follow adequate treatment guidelines. A recent article in the Journal of Law and Medical Ethics states:

> Homelessness, by definition, means lack of permanent shelter. Whether a person lives on the streets, wanders from one SRO to another, or moves in and out of a congregate facility, medical care is rarely his or her first priority. The daily search for food and shelter belie the possibility of an organized schedule, appointment keeping or routine medical ingestion as is necessary with TB treatment. Alcoholism, drug dependence and psychiatric disturbances affect anywhere from 50 to 90 percent of the homeless, and the notion that persons so affected can remember and comply with clinic appointments and medication regimens is laughable (qtd. in Brudney).

Regardless, nonadherence is a serious threat to the reduction of tuberculosis. It is problematic, because it can translate into relapse, further contagiousness, or the development of drug resistance (*TB Care Guide* 28).

Drug resistance is another serious problem in the fight against tuberculosis. The first drug resistant outbreak was recorded in 1970. Between 1990 and 1992, there have been documented outbreaks in Florida, New York, and New Jersey (Simone 3). Nine

outbreaks in New York experienced an alarming 72%-89% death rate among those contracting the disease (Bayer and Dupris 310). Tennessee also has experienced bouts with multi-drug resistant TB. In 1996, the state documented 33 new cases of drug resistant tuberculosis. Due to the presence of such new strains, patients must be treated with more expensive and more toxic drugs in order to effectively combat all forms of TB(T.D.O.H. 1). In fact, one case of multi-drug resistance can total in excess of $200,000 to treat (*TB Monitor* 137).

Multi-drug resistance occurs when regular tuberculosis treatments can no longer kill the bacteria which cause the disease. Conditions resulting in this resistance include the improper consumption of TB medication, coming into contact with a multi-drug resistant disease patient, contracting TB a second time after completing treatment, and entering geographic areas where such cases are prevalent, like Haiti or Latin America (*Q & A about TB* 14). In the United States, cases involving this drug resistant TB have increased over the last 10 years. Moreover, in 1991, 14% of all TB cases in the United States were resistant to at least one drug (*Mississippi* 1). Finding ways to solve this problem and to stop such outbreaks continues to be a problem for health care professionals.

Approaches to Solving the Problem

Directly Observed Therapy

Directly Observed Therapy (DOT) is defined as, "observation of the patient by a health care provider or other responsible person as the patient ingests TB medications" (Etkind 77). This method of checks and balances allows the health provider to closely monitor and assure that patients are adhering to specific regimens. Such therapy can

occur in jails, AIDS clinics, shelters, the workplace, or in any area where patients reside or work. DOT can also be given by a variety of persons ranging from clergy or community leader to school teacher or social worker (*The Connection* 9). Although such a program is difficult to coordinate and maintain, the CDC's Advisory Council for the Elimination of Tuberculosis recommends that DOT be given in any area where treatment completion falls below 90% (Bayer and Dupris 317). Nevertheless, only between 10% and 12% of TB cases are treated with DOT in America (Iseman, Cohn, and Sbarbaro 578).

Different programs around the country have been quite successful in reducing the instances of tuberculosis through DOT. During the 70s and 80s, when others ceased paying attention to tuberculosis eradication, Baltimore continued working toward the goal of TB elimination (*TB Monitor* 136). From 1981 to 1992 Baltimore lowered its incidence of tuberculosis by 51%. Baltimore's program stressed outreach utilizing a door to door system of delivery. Accordingly, 90% of all its DOT is performed outside the clinical environment. This special service is what many believe helps in DOT. According to the Director of CDC's division of TB elimination, "While very often directly observed therapy implies just watching the individual ingest the medication, it is often the rapport established with the patient, facilitating referrals, and access to other services that really makes things happen."

Besides the important in-home function of Baltimore's DOT program, other elements of the program are worthy of emulation, as well. Contact investigations and case management are performed in areas such as nursing homes, correctional facilities, AIDS clinics, and substance abuse treatment clinics (*TB Monitor* 137). When patients

miss appointments, a nurse personally contacts the person to settle the matter. If a problem persists, then the patient is confined to a hospital room. Another part of Baltimore's DOT involved pharmacies in the city. All pharmacies in Baltimore were required by law to report when drug prescriptions are filled. In this manner, the health department obtains reinforcement in checking on the progress of patients. Similarly, the department knows that prescriptions are being refilled on time and that sufficient doses are present in the regimen (138).

New York has also integrated directly observed therapy into its battle against tuberculosis. They also sought difficult groups to reach like those at soup kitchens, government housing, and shelters. Essential to their program are several funding mechanisms allowing for Medicaid and other reimbursements for services rendered. Additionally, grants are given to "non-traditional providers" so that they can service the poor and uninsured. New York started DOT with 69 patients in the program in 1991 (N.Y.S.D.O.H. 1). By April of 1994, 1,300 people were receiving directly observed therapy with a 15% decline in reported cases of TB (*TB Monitor* 55).

The final example of a successful program documents one in Tarrant County, Texas. Here, *Improving Patient Adherence to Tuberculosis Treatment* states that the program included, "specially trained community-service aides; transportation of patients to clinics; delivery of drugs to the patient's residence, workplace, or other convenient sites; and intermittent regimens after an initial period of daily treatment" (19-20). Such examples give ideas about possible characteristics to integrate into programs which are attempting to halt the increase in tuberculosis cases.

Along with its documented successes, many studies conclude that DOT is also the least expensive way to treat patients as well. Research involving DOT, self-administered traditional therapy, and self-administered fixed-dose therapy found that DOT and fixed-dose were less expensive than the conventional therapy. When comparing cost, DOT was the cheapest; however, by decreasing the amount of capsules swallowed, fixed-dose was a close second. The results showed that 31 relapses and 3 deaths could be anticipated per 1,000 patients receiving DOT. 96 relapses and 8 deaths could be associated with the fixed-dose treatment, and 133 relapses and 13 deaths could be expected with the conventional treatment (Moore et al. 996). Furthermore, since directly observed therapy has been proven to reduce TB cases, the assistant commissioner of the New York City Public Health Department stated that further savings are realized when one recognizes that "every case successfully treated saves at least $25,000 [and] every hospitalization that can be avoided by DOT saves $15,000" (*TB Monitor* 57).

Despite the overwhelming evidence supporting the positive effect of directly observed therapy, it still has its critics. Annas states that:

> Requiring all persons to take therapy under direct observation because it is necessary for some is wasteful, inefficient, and gratuitously annoying, and it undercuts the legitimate desire to individualize treatment and to use the least restrictive and intrusive public health interventions...these legal interventions, however, concentrate on the victims of social neglect, rather than on the neglect itself." (588).

However, Annas' argument has flaws. The core principle and foundation of DOT *is* individualized treatment. Similarly, victims are often times curable, while curing social neglect unfortunately requires more than a few committed volunteers. Indeed, "given the

price of failure, in morbidity, mortality, and the cost of treating resistant strains of TB...we cannot afford not to try it [DOT]" (Bayer and Dupris 318).

Incentives

Another approach to the improvement of treatment success is the use of incentives which encourage the patient to correctly follow the prescribed regimen. After building a relationship with the patient and understanding the patient's needs and interests, the offering of incentives can be quite effective. However, some disagree with this method of patient encouragement, however. Their contention lies in the belief that incentives are bribes and that patients should not need an enticement to cure themselves and to rid the community of the threat of the disease. Moreover, patients may also feel that incentives are bribes. Yet, this sentiment is more likely to occur when a relationship has not been developed between the patient and the health care worker. Some examples of incentives are given below (*Adherence* 23).

Contact Investigation

The CDC reports that contact investigation is vital to the control of tuberculosis. Anyone who frequently comes into close contact with a contagious tuberculosis patient should be examined. Priority should be given to the "inner circle" of friends, relatives, and co-workers who interact with a patient on a daily basis. In addition, children and HIV patients should also receive high priority for contact investigations (*Core Curriculum* 60).

Education

Table 1

Incentives and Enablers
South Carolina TB Control Program

Money

Food
Applesauce (in which to mix medicine)
Fruit
Homemade cakes and cookies
Big Macs
French fries
Chicken snacks and dinners
Whole, uncooked chickens
Bread
Eggs
Pickles
Vienna sausages
Ice cream
Blow-Pops
Shrimp
Canned food
Oatmeal cakes
Pudding (in which to mix medicine)
Steak dinner
Sausage biscuits
Beverages
Soft drinks
Juices
Milk
Nutritional supplements (e.g., Ensure)
Coffee
Tea

Clothing
Socks
Gloves
Stockings
Sweaters
Coats

Automotive
Battery
Gasoline
Motor oil

Fishing Supplies
Fishing pole
Crickets
Worms

Household
Wood stove
Kerosene
Fuel oil for heat
Smoke alarm
Cooking utensils
Furniture

Services
Helping obtain birth certificate
Washing patient's clothes
Arranging building of wheelchair ramp
Installing wood stove
Helping obtain driver's license
Repairing bicycle

Transportation
Bus fare
Bicycle
Paying a friend for transportation
Staff transporting patient to doctor

Seasonal
Homemade Valentine cookies
Easter baskets
Christmas baskets (food)
Birthday cakes
Thanksgiving hams
Nurses dressed in Halloween costumes
Birthday cards

Children
Reading stories
Painting child's nails
Tea party with child
Playing games
Chewing gum
Charts with stars and stickers
Stuffed animals
Grab bag with assorted treats
School supplies
Storybooks
Basketball
Crossword puzzle books

Personal Care
Contraceptives (e.g., condoms)
Razor blades
Shaving cream
Face cream
Powder
Makeup
Nail polish
Obtaining non-TB medicines

Garden
Flowers
Flower bulbs

Source: *Using incentives and enablers in the tuberculosis control program.* Columbia: American Lung Association of South Carolina and South Carolina Department of Health and Environmental Control, Division of Tuberculosis Control, 1989.

Education is an important tool which can be used to change health practices in patients. Education, however, is not enough by itself. It helps to motivate patients to behave in a manner conducive to their well-being, but it must be combined with other forms of treatment if it is to be successful (*Adherence* 25). Facilitating open discussions with patients helps in the educational process. By determining the barriers to success to which a patient may ellude, the health professional can correctly advise the patient so as to achieve desirable outcomes (29). It is sometimes helpful to also involve family members or others in the educational process so that they can help in maintaining the patient's adherence and in offering needed support (31). Telephone and postcard reminders are also good ways to keep the patient informed of appointments and treatment procedures (32).

Partnerships

The shaping of partnerships can bring many different people together with the common goal of reducing tuberculosis. Such coalitions can educate the public, ensure that community leaders and health care professionals are knowledgeable of prevention needs, help train volunteers, advise local health planners, and provide screening and prevention services (*Core Curriculum* 62). Such networks are also often helpful when funding for incentives or treatment is needed. Finally, a community wide approach to tuberculosis is a great way to implement strategies aimed at reducing the transmission rate of TB throughout the community (*Partnerships* 5).

Legal Remedies

States have the authority to require health professionals to report all tuberculosis cases (Annas 586). Once identified, if a person misses appointments or DOT visits,

refuses medication, or takes medication inconsistently, court-ordered isolation, hospitalization, or confinement may be sought. Certain determinants must be present for such action to occur. And the rights of the patient should not be violated (*Adherence* 41).

A patient does have the right to be released when his tuberculosis is no longer communicable. The problem with this right is that patients who do not continue to appropriately treat the infection may develop a multi-drug resistant form of TB in the future. In this case, although they were released in a state when they no longer posed a threat to society, that infection can progress to a level harmful to the community if not cared for properly. However, the fact that a person might be a threat to others in the future is not reason enough to keep a person confined (Annas 587).

Regional Status

The tuberculosis rate for the region was 7.4 in the assessment. This rate must improve by 53% if the region is to reach the year 2000 goal of 3.5 cases of tuberculosis per 100,000 people. The drastic tuberculosis rate improvement that is needed earned the region a Status I level in the supplement. The situation is compounded when one considers that the rate of 7.4 was only an average of the rates between 1992-1994. This three year average was used in assigning level designation, because only three years of data were collected for the U.S. totals. If the regional tuberculosis rate was calculated using the data between 1990-1995, the rate would jump to 10.38. If calculated in this manner, the region would need to improve by 66% to reach the year 2000 goal.

The 1996 figures give reason for further alarm. In 1995, there were 38 cases of tuberculosis within the region. In 1996, the total increased by 42%, because the region experienced 55 cases of tuberculosis. This was the first regional increase in TB rates

since 1991. In a memo to health workers within the region, Dr. Paul Erwin, Director of the East Tennessee Region, cites the large increase in TB cases while stating that the exact reason for the dramatic climb cannot be pinpointed. Therefore, the region will enact new measures to control the increase of tuberculosis. These policies will begin on May 1, 1997, and they are similar to the ones presented herein. According to Erwin's memo, these new policies include:

- Administering directly observed therapy on all TB suspects and cases
- Administering preventive DOT on children and others at high risk for developing tuberculosis
- Assigning a designated nurse case manager for each TB suspect or case
- Reinterviewing all TB cases who are smear positive and/or have cavitary disease to insure all contacts have been evaluated
- Receiving, in person, medical records from the private practice community by communicable disease employees

In addition, long term goals will include:

- Providing education on tuberculosis in long-term care facilities
- Developing a class on skin testing
- Pursuing financial resources to serve as incentives (Erwin 1).

These are worthy goals and examples of fine strategic planning. Hopefully, the next assesment and supplemental interpretation will find that the goals served their purpose in reducng the cases of this deadly disease.

Breastfeeding

Breastfeeding rates for the East Tennessee Region are included in the assessment based on the percent of women participating in WIC who were breastfeeding at the six week post-partum period. Although the regional average improved every year from 1991 to 1994 and experienced only a small decrease in 1995, the region was still below national averages for that span of time. Furthermore, the regional level in relation to the year 2000 goal was the worst of any indicator in the assessment. The regional rate of 20% for breastfeeding WIC clients in the region must improve by 73% if it is to reach the year 2000 goal. This goal is a very ambitious projection, desiring that by the year 2000, 75% of all women breastfeed their babies in the early post-partum period. This includes a goal of 75% for low-income mothers, as well. If the East Tennessee region is to near this goal by the year 2000, health planning must look at aggressive strategies that health departments, hospitals, health professionals, and members of the community can follow.

Why Breastfeed?

An editorial in *The Lancet,* describes breastfeeding this way, "If a new vaccine became available that could prevent 1 million or more child deaths a year, and that was moreover cheap, safe, administered orally, and required no cold chain, it would become an immediate public health imperative. Breastfeeding could do all this and more" (1239).

Indeed, breastfeeding is like a vaccine. According to study after study, infants who are breastfed experience many favorable health situations above those babies who were fed artificial formulas. For instance, a Finnish study found that children who were breastfed are less likely to develop allergies than other children. Previously, allergies were thought to be mostly attributable to heredity. However, this study concludes that

Who Should Avoid Breastfeeding?

Despite the clear and apparent benefits of breastfeeding, *Healthy People 2000* does warn of some situations where breastfeeding is not advised. Mother who use drugs such as marijuana, PCP, or cocaine should not breastfeed. Breastfeeding is not appropriate when mothers drink more than small amounts of alcohol either. Babies should be formula-fed if the mother has been exposed to radioactive elements or cancer chemotherapy. Finally, mothers who have been diagnosed with the Human Immunodeficiency Virus are advised not to breastfeed, as well. (379).

Trends

Breastfeeding rates reached the lowest point in a downward migration in 1972 when only 22% of the population were breastfeeding (J. of ADA 468). During the last decade, breastfeeding rates in the United States continued to decline. In 1984, the percentage of women who were breastfeeding when discharged from the hospital was 62.5%. By 1989, that number had decreased to 52.2%. Similarly, the percentage of women still breastfeeding 6 months after delivery decreased from 27.5% in 1984 to 18.1% in 1989 (Bagwell et al. 801). Fortunately, however, this trend appears to have slowed according to numbers presented in the Assessment. Herein, a more optimistic movement is recorded as the rate improved over 4 percentage points in four years. The documented breastfeeding rates in the U.S. from 1991 to 1994 were 53.3%, 54.2%, 55.9% and 57.4% of the population respectively. Nevertheless, this growth does not appear to have the momentum capable of reaching 75% by the year 2000, however. If the level of breastfeeding in America is to improve greatly, special attention should be given to the groups of women most likely to use other methods of infant feeding.

The population least inclined to breastfeed are those women who are black, have a low education and income level, or who are below the age of 20 (Robinson et al. 1311). According to a Ross Laboratory study, only 25% of low-income mothers and 17% of African American mothers breastfeed their babies. These populations need to be the targets of increased promotion not only because they have poorer breastfeeding rates than other populations but also because they have the highest number of births (Martinez).

WIC: Problem or Solution?

The 57% of Americans who breastfeed tend to be the upper-class and the well-educated. Again the poor, especially poor youth, have the worst breastfeeding rates. Some blame WIC for this, saying that the governmental program promotes formula-feeding (Baumslag and Michaels 108). WIC, (the Special Supplemental Food Program for Women, Infants, and Children) was founded in 1972 to furnish food and counseling to low-income mothers and their babies (Riordan and Auerbach 19). Since that time, this program has become the largest buyer of baby formula in America. WIC purchases 40 percent of all manufactured infant milk sold in this country. In fact, it has been estimated that over $30 million dollars of formula was purchased in 1988 to feed WIC infants in their first month of life alone. As an obviously valued customer, the government receives special attention from these artificial milk companies. As an example, one large manufacturer publishes WIC's newsletter for clients entitled *WIC Currents* (Riordan and Auerbach 20).

Since WIC is such a large part of the formula industry, what, then is the program's effect on breastfeeding? The average breastfeeding rate among WIC clients nationally in 1992 was 38.4 % in the hospital and 8.9% at the end of 5 months of age.

This level varied across the different states, averaging 61.5% in the mountains and 25% in the central area of the Southeast (Lawrence 14). Although this is less than the national average of women who breastfeed, it must be remembered that WIC targets the population of mothers who traditionally have lower rates anyway. Nevertheless, a study of WIC program participants in Hawaii showed that once age, education level, and ethnicity were controlled for, there was no substantial variance between those deciding to breastfeed who were WIC clients and those who breastfed who were not (Novotny et al.293).

Toward the end of the last decade, breastfeeding promotion emerged as an important goal for the WIC program. Breastfeeding mothers now receive a higher priority for enrollment than do non-breastfeeding women. WIC provides these mothers with a larger variety of foods. In addition, breastfeeding mothers receive WIC benefits for one year. However, mothers who do not breastfeed only receive six months of service.

Other breastfeeding promotion initiatives among WIC programs include the training of WIC nutritionists in breastfeeding promotion and education. This was made possible through funds obtained in the 1980s. These monies also allowed for research to determine how the program could effectively encourage low-income women to breastfeed. Funding also paid for demonstration projects that have been shown to increase breastfeeding rates among WIC clients. In 1991, the WIC program further institutionalized its goal of breastfeeding promotion by applying a ban on all formula advertising within the WIC clinic or health department and mandated that all formula be stored out of sight from the WIC clients (Riordan and Auerbach 20). Thus, the WIC

program has made a very concerted effort to support breastfeeding. Furthermore, this has been done despite the fact that Congress provides $500 million for the buying and distributing of manufactured milk to WIC recipients and only $8 million for breastfeeding support (Lawrence 13).

Regardless of these programs, many still argue that the provision of formula to low-income mothers still inherently discourages breastfeeding. However, in addition to the previously cited Hawaii study that showed that WIC does not negatively impact a woman's decision to breastfeed, another recent study has shown that WIC participation before pregnancy can positively and significantly impact the initiation of breastfeeding after birth. Nonetheless, the study could show no correlation between WIC participation and the length of time that the mother breastfeeds. The study further suggests that greater results might be achieved if programs around the country encouraged more personal contact rather than relying too heavily on large class formats and videos. Additionally, one priority goal for WIC, the study says, should be promotion activities that not only encourage breastfeeding but use methods which effectively extend the duration of time that a mother breastfeeds (Schwartz et al. 731).

Barriers to Success

Ignorance of Professionals

A recent study in the Journal of the American Medical Association illustrated that many primary care physicians are ignorant as to why breastfeeding is important and what should be done to handle breastfeeding difficulties. This survey of over 3,000 persons in residency training and over 2,000 doctors found that few of them knew how to counsel mothers on the basics of breastfeeding such as using a breast pump or increasing low

milk supply. Therefore, many of these physicians advised switching to formula as a supplement. This of course dries up the mother's milk supply and makes breastfeeding impossible (472-476).

Formula Companies

Manufacturers of artificial milk have high stakes in whether or not a mother breastfeeds. Accordingly, it is to the advantage of such companies to see that breastfeeding is undesirable for mothers. Information distributed by these companies has long constituted the majority of feeding information available to mothers. Education on the value and training of breastfeeding has competed very poorly with the plethora of information, advertising, and propaganda published by formula companies (Corbalol and Gretel 187) Videos and pamphlets are even produced by companies which seem to encourage breastfeeding while they display improper techniques or relate incorrect advice which forces the mother to discontinue breastfeeding and switch to formula.

Marketing practices utilized by formula companies have even provoked sharp activism. In the late 1970's, the Nestle's Corporation was criticized for intentionally attempting to undermine the success of breastfeeding mothers. When the company did not respond to this criticism, proponents of the World Health Organization's International Code of Marketing of Breast-milk Substitutes led an international boycott of Nestle products from 1977 to 1984 (Chetley 38).

Hospital Policies

There are environmental and policy issues in the hospital setting that provide a stumbling block for breastfeeding. Visibly displayed formula products and advertisements contribute to the psychological factors that influence a mother's decision

to breastfeed or not in that critical beginning period after conception. The separation of the mother from the infant after birth, hospital imposed limits on the times and frequencies of breastfeeding, the routine feeding of infants with supplemental water or formula in the maternity ward, and the free samples of formula given to discharged patient in many hospitals intensify the negative affects that some hospital have on patients (Warm Chain 1240). Furthermore, the hospital care model is designed for the implementation of bottle-feeding. Given the fact that nursing and medical school programs rarely teach breastfeeding techniques and administrators rarely care to spend the money training these personnel, many hospitals continue to both directly and indirectly promote formula feeding in patients(Mulford, Chris 464).

Cultural and Societal Barriers

One of the most significant cultural barriers that inhibits a mother's tendency to breastfeed is the perception of the breast in American society. The breast is largely considered an object of sexuality rather than an object of maternal nurturing. This feeling is fueled by male attitudes, the media, and legislation that discourage mothers from feeling comfortable breastfeeding in any social or public setting (Rodriguez and Frazier 111).

Additionally, there are many misconceptions about breastfeeding. Some mothers who misunderstand, believe that breastfeeding will make the baby too dependent on the mother. They also fear that there will be a great deal of pain associated with this preferred method of infant feeding. The perception that many inconvenient rules about weight loss, smoking, etc. are attached to breastfeeding is another common reason for feeding with milk substitutes (Position of ADA 468).

One more way that breastfeeding is hampered under current societal conditions is through children's books and other reflection of popular culture which convey bottle-feeding as the norm.. These books often depict the mother using a bottle to feed her infant. Even those few books that include breastfeeding mothers in the story can unintentionally impair the message by the way it is depicted (Altshuler 293). Also, most baby dolls come with toy bottles. Bottles are seen on wrapping paper, nursery room wallpaper, greeting cards, the doors of infant care facilities, etc.

Possible Solutions

Legislation

The benefits of breastfeeding, because of such external factors are largely kept invisible from the public. The public persona about breastfeeding cannot improve, because mothers do not feel comfortable casually breastfeeding in public. (Mulford 467). Over the last several years, legislation has been passed clarifying the fact that breastfeeding is not indecent exposure. From 1993 to 1996, legislation was passed in over twelve states which said that a mother can breastfeed in any public place that she would otherwise have the right to be. Some states even provide avenues of recourse for those mothers who are prevented from breastfeeding. Florida and Texas enacted bills providing supportive policies for state employees desiring to breastfeed. Iowa and Idaho have statutes stating that breastfeeding mothers do not have to serve jury duty. Texas even offers incentives to private employers who support breastfeeding on the job (Baldwin and Friedman 164-167).

Inclusion of Significant Other

Another helpful aid in the encouragement of a mother to breastfeed is the involvement of a "significant other" in breastfeeding training and support. Education and counseling programs should seek to include the father or other supportive person who are important to the mother. Studies have shown that such additional support and knowledge about breastfeeding by someone close to the mother can play a significant role in the initiation of breastfeeding and the length of time that breastfeeding is continued (Kessler et al. 103).

Education

Studies show that breastfeeding education can be extremely helpful when it correctly helps mothers address concerns such as "weight loss, contraception, and mastitis" (Bagwell et al. 801). Education and breastfeeding promotion should be provided to youth, both male and female, through the school system. Also, education should be performed in pre-natal care settings, but it should further target mothers, fathers, and the mothers of adolescent teens in these pre-natal environments (Robinson et al. 1313).

WHO and UNICEF Initiatives

In 1989, the World Health Organization and United Nations International Children's Education Fund adopted the *Baby Friendly Initiative*. This initiative was developed in order to encourage, defend, and support breastfeeding. The Baby Friendly Initiative established ten steps to aid in staff training, the role of provided services, education, and the function of hospital discharge. These "Ten Steps to Successful Breastfeeding" were also established in 1989, and the WHO/UNICEF partnership encouraged all hospitals to adopt the measures. The hospitals which encouraged

breastfeeding and implemented the foundation of the "Ten Steps to Successful Breastfeeding" were awarded the title of Baby Friendly Hospital (Henschel 106). Today nearly 1,000 hospitals around the world have achieved this status according to *Breastfeeding* printed in 1996 (Henschel 108). The steps as outlined by the joint WHO/UNICEF statement are:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.

2. Train all health care staff in skills necessary to implement this policy.

3. Inform all pregnant women about the benefits and management of breastfeeding.

4. Help mothers initiate breastfeeding within half an hour of birth.

5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.

6. Give newborn infants no food or drink other than breast milk, unless medically indicated.

7. Practice rooming-in - allow mothers and infants to remain together 24 hours a day.

8. Encourage breastfeeding on demand.

9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.

10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from hospital or clinic (124).

Conclusion

If public health is to have a significant impact toward increasing growth in breastfeeding, many difficult obstacles must be overcome. Policies at the work place

need to be enacted which grant extended periods of maternity leave, part time employment options, facilities for the pumping of breast milk, and even on-site child care. Similarly, the country must undergo a cultural paradigm shift where breastfeeding is considered the norm instead of formula feeding. Just as partnerships were important in the war against tuberculosis, they could add substantial value to breastfeeding promotion efforts also. These partnerships and groups can work to support and counsel mothers, help sensitize the public to the needs and requirements of a breastfeeding population, and lobby for change at the work place and in all levels of government (Healthy People 2000 380). As the author of *The Lancet* quote noted, breastfeeding is not a mandated public health imperative, but its numerous benefits make it a vaccine worth working for both in the region and throughout the world.

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