

# **THE PHARMACIST WORKFORCE IN NORTH CAROLINA**

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A Report Produced by the Cecil G. Sheps Center for Health Services Research  
University of North Carolina at Chapel Hill  
August 2002



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*Funded by the North Carolina Area Health Education Centers (NC AHEC) Program*

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*August 2002*

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UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL



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## Executive Summary

In February 2001, The University of North Carolina's Board of Governors and Office of the President asked the North Carolina Area Health Education Centers (NC AHEC) Program to undertake a study of the pharmacist workforce in the state. The NC AHEC then contracted with the Cecil G. Sheps Center for Health Services Research (Sheps Center) at the University of North Carolina at Chapel Hill to complete the study. The goals of the study were to:

1. Compile and analyze data on the pharmacist workforce in North Carolina to provide decision-makers with the information needed for state-wide educational and health policy planning efforts;
2. Describe the demand for, and supply/distribution of, pharmacists in the state;
3. Estimate whether an imbalance exists between the demand for, and supply of, pharmacists in North Carolina;
4. Determine if there are particular geographic areas of the state or employment settings that may be experiencing imbalances more profoundly than others; and
5. Identify policy options to address workforce issues identified by the study.

***Goal 1: Compile and analyze data on the pharmacist workforce in North Carolina to provide decision-makers with the information needed for state-wide educational and health policy planning efforts.***

Data were collected and analyzed from a wide variety of sources. Data on the supply and distribution of pharmacists in the state were derived from licensure data housed by the North Carolina Health Professions Data and Analysis System at the Sheps Center. The number, type and location of pharmacies in North Carolina were ascertained by analyzing data on pharmacy permits issued by the North Carolina Board of Pharmacy. Demand for pharmacy services was estimated using population data from the Census as well as data available from IMS Health on the volume, primary payer type and location of retail prescriptions dispensed in the state. Educational data were obtained from both the University of North Carolina School of Pharmacy and the Campbell University School of Pharmacy. Approximately ten interviews were conducted with key pharmacy workforce stakeholders. Internet and literature searches were also performed. When possible, US pharmacist workforce, educational and prescription data were collected, analyzed and compared to North Carolina numbers.

This report has been shared in draft form, and will be disseminated in final form, with state-level organizations that play a key role in the education and regulation of the pharmacist and pharmacy technician workforce. The report will also be sent to professional and governmental agencies at both the state and national level that are involved in the education, regulation and reimbursement of the pharmacist and pharmacy technician workforce.

***Goal 2: Describe the demand for, and supply/distribution of, pharmacists in the state.***

North Carolina's population has grown nearly 20% in the last decade and almost one quarter of the state's counties saw their 65-and-over population increase by 22% or more. This aging, growing population has increased the demand for pharmaceuticals. Direct-to-consumer advertising (DTC) has also been on the rise during this period and a recent Kaiser Family Foundation report found that one in eight Americans has obtained a prescription from their doctor in response to DTC. Between 1991 and 2000, the number of prescriptions dispensed per capita in retail settings in North Carolina increased 81%. Adjusting for population growth during this period, there was a 52% increase in prescription drugs dispensed in retail settings, from 7.5 prescriptions per person in 1991 to 11.4 prescriptions per person in 2000.

Camden was the only county in North Carolina without an actively practicing pharmacist in 2000. On average, there were 8.6 pharmacists per 10,000 population in the state in 2000, but the pharmacist supply was heavily concentrated in a few of the state's counties. In the last decade, 45 of North Carolina's counties did not increase their supply of pharmacists rapidly enough to keep pace with population growth.

By examining the relative growth rates of the population (up 19%), number of retail prescriptions dispensed per capita (up 52%) and the number of retail pharmacists per 10,000 population (down 3%), it is clear that supply of retail pharmacists has not kept pace with the population's increased demand for prescription drugs. Between 1991 and 2000, the average pharmacist's workload increased 57%. This translates into the pharmacist filling one prescription every five minutes in the year 2000, compared to one every eight minutes in 1991. While the volume of prescriptions dispensed has increased, so too have the expectations of pharmacists to counsel patients and resolve third-party billing issues.

***Goal 3: Estimate whether an imbalance exists between the demand for, and supply of, pharmacists in North Carolina.***

There are clear indications of an imbalance between the demand for, and supply of, pharmacists in the state. We have chosen to label the current situation an "imbalance" because there is no generally accepted method for either determining whether a shortage exists or quantifying the exact magnitude of the shortage. This caveat aside, important issues confront the pharmacist workforce in North Carolina.

Pharmacist workforce stakeholders report unfilled vacancies, rising compensation, difficulty in recruiting and retaining faculty and clinical preceptors, a reduction in the number of hours pharmacies are open due to staffing shortages, and increased job/role dissatisfaction stemming from pressure to fill more prescriptions.

Contributing to the current workforce imbalance are the following factors: the relatively recent move to the Doctor of Pharmacy (PharmD) as the minimum credential for entry into the workforce; the expansion of the pharmacist's role to include disease state management and patient counseling; changing workforce demographics; and increased opportunities for pharmacists to work in non-traditional, non-dispensing roles.

The transition from the BS in Pharmacy to the PharmD has not only decreased the overall number of pharmacy school graduates in the state, but also decreased the pool of new entrants into the dispensing pharmacist workforce, because of the program's focus on preparing students for further education, residencies and research.

Pharmacists worked seven fewer hours per week in 2000 than they did in 1980. There were more female than male pharmacists in the workforce for the first time in 2000. Women tend to work fewer hours than their male counterparts at all ages, with the greatest differential occurring during the child-bearing years when, on average, women work seven fewer hours per week. Pharmacist employment settings and job types have changed dramatically over the past twenty years. There has been a sharp decline in the number of pharmacists working in independent pharmacies. There has been an equally sharp increase in the percent of the workforce working in unspecified "other" employment settings. This change is likely due to the move to the PharmD and the program's emphasis on clinical pharmacist roles, coupled with an increasing demand for pharmacists in clinical research organizations, pharmaceutical companies and other non-dispensing employment settings. The sum of these educational, demographic and employment shifts has been a decreasing supply of dispensing pharmacists in a time of increased need.

***Goal 4: Determine if there are particular geographic areas of the state or employment settings that may be experiencing imbalances more profoundly than others.***

Evident in the workforce is a clear imbalance between educational programs' emphases on preparing pharmacists for clinical and research roles and the needs of the market where the biggest demand is for retail pharmacists to work in chain drug stores. The result of this imbalance is a retail pharmacist workforce that is increasingly dissatisfied with their jobs because they are not utilizing the clinical skills taught to them in the PharmD program. The data clearly show that pharmacists in retail settings face large and increasing workloads. Dispensing and administrative functions related to third-party billing consume much of the pharmacist's time, leaving little time for more professionally satisfying functions like patient counseling.

There are clear imbalances in the supply of pharmacists in rural versus urban areas of the state. On average in 2000, there were 6.5 pharmacists per 10,000 population in rural areas compared to 9.5 pharmacists per 10,000 population in urban areas. Rural pharmacists are more likely than their urban

counterparts to be male and to be sole-owners or partners practicing in independent pharmacies. Pharmacists in rural areas have higher workloads, while rural pharmacies have lower volumes of prescriptions. When the independent community pharmacist retires or leaves, it may be problematic for the rural area to attract a new pharmacist as a replacement. The state-wide decline in independent pharmacies is of particular concern in rural areas because the proportion of independent pharmacies is greater there than in urban areas. While independent pharmacies in urban areas have often been replaced or bought out by chain pharmacies, it is unclear what will happen in rural areas when a local independent pharmacy closes. Rural citizens may be at higher risk for losing access to pharmacy services.

***Goal 5: Identify policy options to address workforce issues identified by the study.***

A panel of pharmacist workforce experts assembled in March 2002 to provide feedback and interpretation of the data contained in this report. The group identified potential options for addressing the current workforce imbalance.

The panel's consensus was that there is a pharmacist shortage in North Carolina, but that it is specific to certain settings (i.e. retail and hospital) and populations (i.e. rural). They felt that a simple increase in the available supply of pharmacists would not solve the identified imbalances.

The panel cited widespread dissatisfaction in retail dispensing roles (which frequently lack patient-counseling and medication management opportunities due to intense working conditions), high dispensing volumes and burdensome administrative tasks as deterrents to pharmacists entering dispensing positions. In addition, they said pharmacists were being lured from retail and hospital settings to growing opportunities in non-traditional, non-dispensing roles (e.g. clinical trials) that allow pharmacists to use the breadth of their training.

The only short-term solution the panel could determine was to expand the utilization of pharmacy technicians; whose education and qualifications for practice, they felt, need to be standardized. The pharmacy technician's scope of practice, roles and responsibilities need to be clearly defined by the Board of Pharmacy, and pharmacists need to be better educated about the best use of pharmacy technicians in practice.

The panel also expressed concern about the unmet need in the state for medication management and patient counseling. Although pharmacists are being trained in these areas, there is generally no reimbursement mechanism for non-dispensing roles; therefore, it is not economically viable to perform these functions. Despite these limitations, the group felt that pharmacists must continue to support and share with one another best practices and models, particularly any data available on the monetary and clinical benefits of these clinical functions.



# **THE PHARMACIST WORKFORCE IN NORTH CAROLINA**

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## Introduction

### 4. *Background*

In February 2001, The University of North Carolina's Board of Governors and Office of the President asked the North Carolina Area Health Education Centers (NC AHEC) Program to undertake a study of the pharmacist workforce in the state. The NC AHEC then contracted with the Cecil G. Sheps Center at the University of North Carolina at Chapel Hill (Sheps Center) to complete the study. The goals of the study are to:

- ◆ Compile and analyze data on the pharmacist workforce in North Carolina to provide decision-makers with the information needed for state-wide educational and health policy planning efforts;
- ◆ Describe the demand for, and supply/distribution of, pharmacists in the state;
- ◆ Estimate whether an imbalance exists between the demand for, and supply of, pharmacists in North Carolina;
- ◆ Determine if there are particular geographic areas of the state, or employment settings that may be experiencing imbalances more profoundly than others; and
- ◆ Identify policy options to address workforce issues identified by the study.

### 5. *Methodology*

Data in this report were derived from a number of sources:

- ◆ Pharmacist licensure data housed by the North Carolina Health Professions Data and Analysis System at the Sheps Center at UNC-CH;
- ◆ Pharmacy permit files and other data housed at the North Carolina Board of Pharmacy;
- ◆ Prescription data from IMS Health\*;
- ◆ Educational data from the University of North Carolina at Chapel Hill, Campbell University and the American Association of Colleges of Pharmacy;
- ◆ Population data from the Census;
- ◆ Interviews with key pharmacist workforce stakeholders; and
- ◆ Internet and bibliographic searches.

*\*Note: The prescription data obtained from IMS Health are for retail settings only and do not include prescriptions dispensed in hospitals, clinics, long-term care facilities or mail-order operations. Therefore, a portion of the report describes workload issues, changes in supply and other characteristics specific to the retail pharmacist workforce. However, stakeholders familiar with the pharmacist workforce in North Carolina felt that the trends experienced in the retail setting (i.e. dispensing pressures, increasing administrative responsibilities, etc.) were generalizable to hospitals, clinics and other pharmacist employment settings.*

## ***6. A Shortage of Pharmacists in North Carolina?***

During interviews with stakeholders around the state, respondents perceived there to be a pharmacist shortage in North Carolina. One interviewee went so far as to say that the word “severe” would not be strong enough to convey the seriousness of the current situation. Other interviewees noted the following shortage indicators:

- ◆ Unfilled vacancies in major employment settings such as retail and hospital pharmacies;
- ◆ Increasing salaries and sign-on bonuses;
- ◆ A reduction in the number of hours pharmacies are open due to staffing shortages;
- ◆ Difficulty in recruiting and retaining faculty in pharmacy schools;
- ◆ Difficulty in recruiting and retaining preceptors within the North Carolina Area Education Centers (AHEC) Program; and
- ◆ Job/role dissatisfaction in retail and other settings stemming from increased pressure to fill more prescriptions with fewer pharmacists, and limited time for patient counseling and disease management.

## 7. *A Technical Note on the Use of the Term “Shortage”.*

In addition to reporting indicators of a shortage, this report details quantitative data that suggest an imbalance in the supply of, and demand for, pharmacists in the state. In this report, the current situation is labeled as an “imbalance” because there is no generally accepted method for either determining whether a shortage exists or for quantifying the exact magnitude of such a shortage.

This caveat aside, important issues confront the pharmacist workforce in North Carolina. This report summarizes trends in the factors affecting both the demand for, and supply of, pharmacists in the state.

### ***The Demand Side***

(factors affecting the demand for pharmacist services)

- ◆ Growing population
- ◆ Aging population
- ◆ New drugs
- ◆ New uses for old drugs
- ◆ Direct-to-consumer advertising
- ◆ Changes in prescription drug coverage
- ◆ Increased (and unmet) demand for pharmacists to provide patient counseling and disease state management

### ***The Supply Side***

(factors affecting the supply of pharmacist services)

- ◆ Fewer graduates from North Carolina pharmacy schools
- ◆ Changes in the demographics of the pharmacist workforce
- ◆ Increasing employment opportunities beyond traditional dispensing functions
- ◆ Declining job satisfaction due to increasing administrative and dispensing workloads
- ◆ Evolving and expanding role of pharmacy technicians

## THE DEMAND SIDE

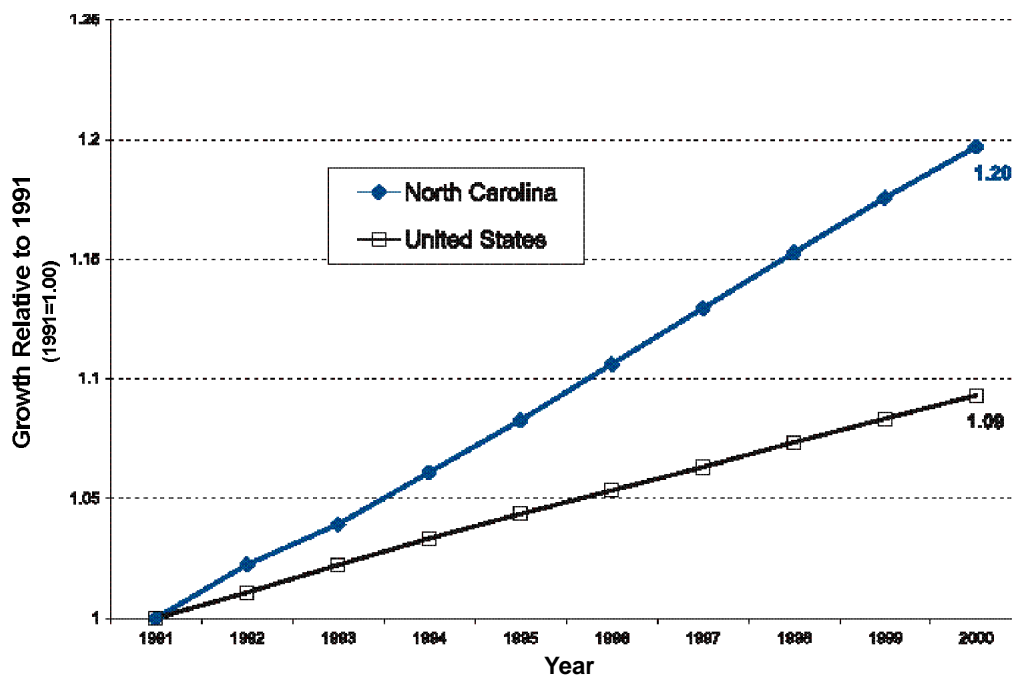
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## The Demand Side

### 8.1 The Growing, Aging Population in North Carolina

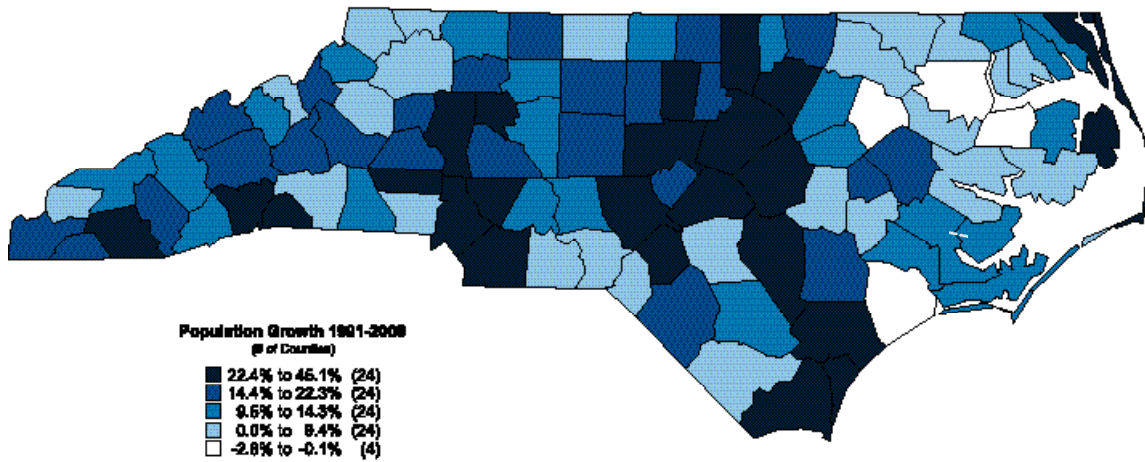
- ◆ North Carolina's population has grown nearly 20% in the last decade, double the US population growth rate (**Figure 1**).
- ◆ Examining North Carolina's population growth in the last decade by county reveals that generally, the counties that have experienced the sharpest growth rates are those surrounding the state's major metropolitan centers of Raleigh, Charlotte and Wilmington (**Figure 2**).
- ◆ The state's 65 and older residents comprise 12% of the state's total population and their numbers have grown by 18% in the last decade. Nearly a quarter of North Carolina's counties saw their 65 and older population grow by over 22% (**Figure 3**).
- ◆ While the state's oldest residents — the 85 and older population — comprise just 1.2% of North Carolina's total population, they have experienced the fastest growth rate of any age group in the past decade. Between 1991 and 1995, the state's 85 and older growth rate was tracking with the United States overall, however, in 1996, the state's rate overtook the national one. Since 1991, this age group has grown 40% (**Figure 4**).
- ◆ Examining the distribution of this growth by county reveals that a quarter of North Carolina's counties saw their 85 and older population swell by more than 50% (**Figure 5**).

**Figure 1. Population Growth Relative to 1991, United States and North Carolina, 1991-2000**



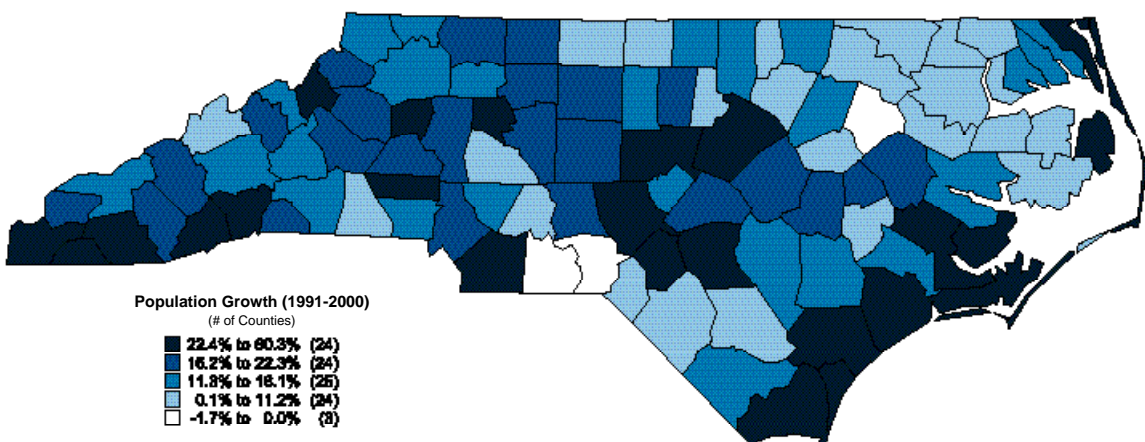
Note: US Data are based on 1990 Census; North Carolina Data are based on both 1990 and 2000 Census.  
 North Carolina 2000 data are Census counts for April 1, 2000.  
 Source: US Bureau of the Census; North Carolina Office of State Planning.

Figure 2. Percent Change in Population,  
by NC County, 1991-2000



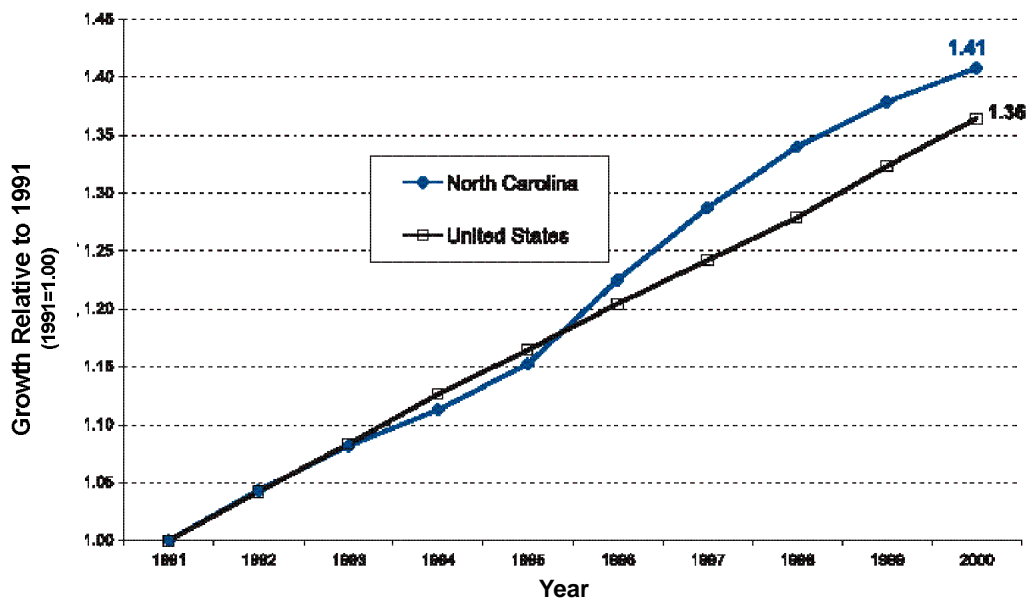
Source: North Carolina Health Professions Data and Analysis System;  
North Carolina Office of State Planning, 2002.  
Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
Cecil G. Sheps Center for Health Services Research.

Figure 3. Percent Change in Population Over the  
Age of 65, by NC County, 1991-2000



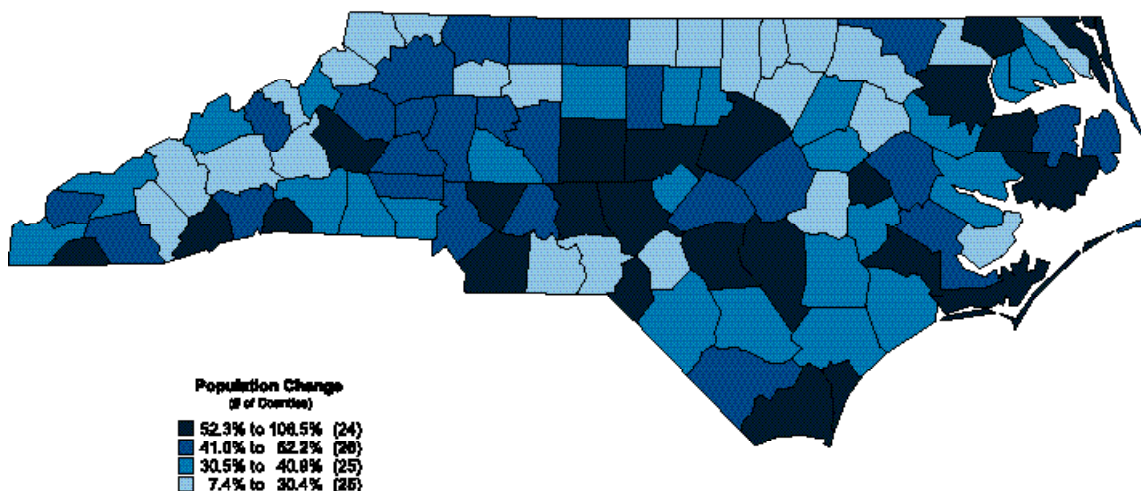
Source: North Carolina Health Professions Data and Analysis System;  
North Carolina Office of State Planning, 2002.  
Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
Cecil G. Sheps Center for Health Services Research.

Figure 4. Growth of Population Over the Age of 85 Relative to 1991, US and NC, 1991-2000



Source: US Bureau of the Census; North Carolina Office of State Planning  
 US Data are based on 1990 Census; North Carolina Data are based on both 1990 and 2000 Census.  
 North Carolina 2000 data are Census counts for April 1, 2000.

Figure 5. Percent Change in Population Over the Age of 85, by NC County, 1991-2000



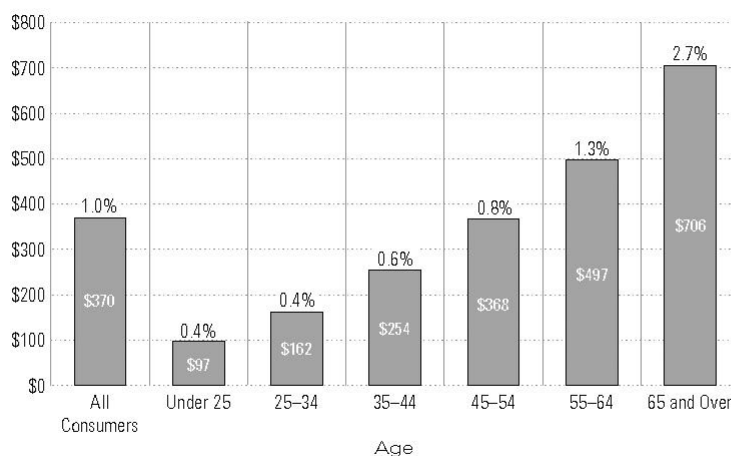
Source: North Carolina Health Professions Data and Analysis System;  
 North Carolina Office of State Planning, 2002.  
 Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
 Cecil G. Sheps Center for Health Services Research.



## 8.2 The Medicare Population

- ◆ This report highlights the 65 & older Medicare-eligible population because they make up 12.3% of North Carolina's population and are high-volume consumers of pharmaceutical services. National data suggest that in 1999, this age-group spent 2.7% of their total household income on prescription drugs, more than double any other age-group (Figure 6).
- ◆ According to the Kaiser Family Foundation, in 1998, 27% of the US Medicare-eligible population lacked insurance coverage for prescriptions. It is likely that a similar proportion of North Carolina's Medicare-eligible population is without prescription coverage (Figure 7).
- ◆ Studies show that Medicare-eligibles with prescription drug coverage use almost up to twice as many drugs as those without prescription drug coverage (Figure 8). If federal or state governments soon take action to provide some form of prescription drug benefit for the elderly, this will likely increase demand for prescription drugs.

**Figure 6. Average Annual Consumer Expenditures for Drugs in Dollars and as a Percent of Total Household Expenses by Age, United States, 1999**

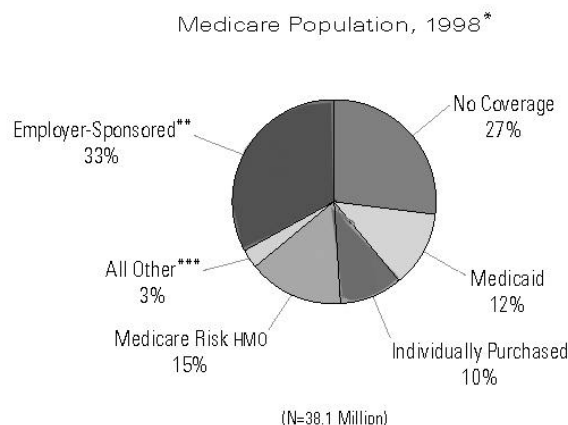


Note: Expenditures consist of the transaction costs of goods and services acquired; includes both prescription and non-prescription drug out-of-pocket expenses, but excludes insurance premiums for drug coverage programs. Percents are proportions of total household expenditures (spending) for all goods and services.

Source: The Bureau of Labor Statistics (BLS), Consumer Expenditure Surveys 1999, BLS website: [www.bls.gov](http://www.bls.gov), 7 February 2001.

Excerpted with permission from 'Prescription Drug Trends: A Chartbook Update' Kaiser Family Foundation, November 2001

**Figure 7. Percent of Medicare Population with Prescription Coverage, United States (1998)**



Note:

\*Medicare Population data are based on the non-institutionalized population and include those who were enrolled in Medicare at some point during the year.

\*\*Employer-Sponsored within the Medicare Population = beneficiaries who had only employer-sponsored supplemental insurance and those who had both employer-sponsored and individually purchased supplemental insurance.

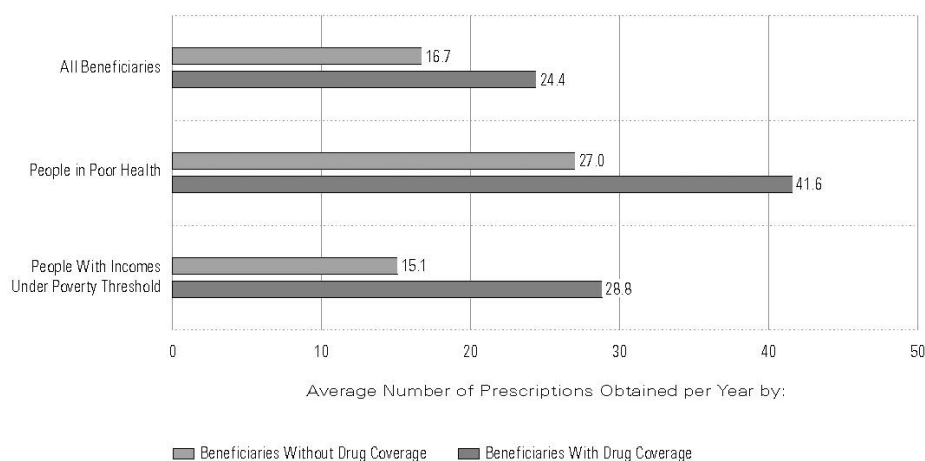
\*\*\*All other within the Medicare Population = other public programs such as Veterans Affairs, Department of Defense, State Pharmaceutical Assistance Programs for low-income elderly, and non-risk HMOs.

Source: Non-elderly coverage from US Department of Health and Human Services, Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey Household Component. Total non-elderly population from the US Census Bureau at [www.census.gov](http://www.census.gov).

Medicare coverage and population from Poisal, J.A., and Murray, L. "Growing Differences Between Medicare Beneficiaries With and Without Drug Coverage," *Health Affairs*, 20 (Mar/Apr 2001):74-85, based on the 1998 Medicare Beneficiary Survey.

Excerpted with permission from 'Prescription Drug Trends: A Chartbook Update' Kaiser Family Foundation, November 2001

**Figure 8. Average Number of Prescriptions Obtained by Medicare Beneficiaries with and without Drug Coverage, US, 1998**



Note: Medicare Beneficiaries With Drug Coverage = beneficiaries with all types of supplemental coverage for prescription drugs (ie., Medicare risk HMO, Medicaid, employer-sponsored, and individually purchased plans). The 1998 poverty thresholds were Aged/Single, \$7,818; Aged/Family \$9,862.

Source: Poisal, JAand Murray, L. "Growing Differences Between Medicare Beneficiaries With and Without Drug Coverage," *Health Affairs*, 20 (Mar/Apr 2001):74-85, based on the 1998 Medicare Beneficiary Survey.

Excerpted with permission from 'Prescription Drug Trends: A Chartbook Update' Kaiser Family Foundation, November 2001

### 8.3 Direct-to-Consumer Advertising

- ◆ A 2001 Kaiser Family Foundation report found that about one in eight Americans has obtained a prescription drug from their doctor in response to direct-to-consumer (DTC) advertising. The same document reported that the pharmaceutical industry spent \$1.57 billion on DTC television ads in 2000, and an additional \$898,000 on other types of ads. By comparison, in 1994, the pharmaceutical industry's total advertising was \$266 million (American Health Line 11/30/2001).
- ◆ Seven of the top ten drugs with the highest dollar amounts spent on DTC advertising in the United States were also in the top twenty drugs by number of prescriptions dispensed, suggesting that DTC spending may have an impact on drug usage (**Figure 9**).
- ◆ An aging population is shaping what types of drugs are being marketed. **Figure 10** shows the top 20 drugs in the United States by number of prescriptions dispensed in 2000. The top three drugs, Lipitor, Premarin and Synthroid are drugs used predominantly for older patients. In addition, increasing research and development budgets have resulted in more specialized drugs (e.g. Zoloft, Paxil, Prozac) being used for disorders that previously had few pharmaceutical treatments available, or treatments whose side-effects outweighed their positive effects. Over half of the drugs on this list were first marketed in the last decade.

***One in eight Americans has obtained a prescription drug from their doctor in response to direct-to-consumer advertising.***

Figure 9. Top Ten Prescription Drugs by Spending for Direct-to-Consumer Advertising, United States, 2000

Rank	Drug	Total DTC (\$Thousand)	Top 200 Ranking
1	Vioxx & Unbranded Arthritis	\$159,491	20
2	Claritin Family & Unbranded Allergy	\$117,538	9
3	Viagra & Unbranded Erectile Dysfunction	\$108,735	45
4	Prilosec	\$107,450	5
5	Paxil	\$ 92,050	14
6	Zocar & Unbranded High Cholesterol	\$ 90,856	17
7	Celebrex & Unbranded Arthritis	\$ 80,072	11
8	Flonase	\$ 73,451	50
9	Prempro & Unbranded Menopause	\$ 69,583	18
10	Allegra	\$ 66,926	31

Total DTC Promotional Spending \$2,467,099

Note: Top 200 Ranking based on total prescriptions dispensed.

Source: DTC advertising amounts from IMS Health, a healthcare information company & CMR, Competitive Media Reporting and Publishers Information Bureau Integrated Promotional Services, Pharmaceutical DTC Spend, Year 2000.

Top 200 rankings by number of prescriptions dispensed from IMS Health, Inc., National Prescription Audit Plus, published in *Pharmacy Times*, April 2001.

Excerpted with permission from 'Prescription Drug Trends: A Chartbook Update' Kaiser Family Foundation, November 2001

Figure 10. Drug Rankings by Number Dispensed, United States, 2000

Rank	Product	Indication	Dispensed Prescriptions (Million)	Brand or Generic?	Year First Marketed
1	Lipitor (Pfizer/Warner Lambert)	Cholesterol-lowering	48.8	B	1997
2	Premarin (Wyeth-Ayerst)	Hormone Replacement	46.8	B/G	1964
3	Synthroid (Knoll)	Thyroid Replacement	43.5	B/G	1963
4	Hydrocodone w/APAP (Watson)	Narcotic Analgesic	36.5	G	1977
5	Prilosec (Astra-Merck)	Anti-ulcerant (PPI)	32.1	B	1989
6	Norvasc (Pfizer)	Calcium Channel Blocker (for Hypertension)	30.8	B	1992
7	Glucophage (Bristol-Myers Squibb)	Anti-diabetic Agent	27.4	B	1995
8	Albuterol (Warrick)	Bronchodilator	27.4	G	1982
9	Claritin (Schering)	Antihistamine	26.5	B	1993
10	Zoloft (Roerig/Pfizer)	Anti-depressant (SSRI)	25.2	B	1992
11	Celebrex (Searle/Pharmacia)	Anti-inflammatory	24.7	B	1999
12	Prevacid (TAP)	Anti-ulcerant (PPI)	24.4	B	1995
13	Prozac (Dista/Lilly)	Anti-depressant (SSRI)	24.1	B	1987
14	Paxil (GlaxoSmithKline)	Anti-depressant (SSRI)	24.0	B	1993
15	Trimox (Apothecon)	Antibiotic	23.4	G	1977
16	Zestril (AstraZeneca)	ACE Inhibitor (for Hypertension)	22.6	B	1988
17	Zocar (Merck)	Cholesterol-lowering	22.4	B	1992
18	Prempro (Wyeth-Ayerst)	Hormone Replacement	22.3	B	1995
19	Zithromax (Pfizer)	Antibiotic	22.0	B	1986
20	Vioxx (Merck)	Anti-inflammatory	20.5	B	1999

Note:

B = Brand name (drug has remaining patent life; no generic versions available)

B/G = Brand name product but generics available

G = Generic

Rankings and number of prescriptions represent total prescriptions dispensed through independent, chain, foodstore, long-term care, and mail order pharmacies.

Source: Sonderagger Research Center analysis, based on: Dispensed Prescriptions from IMSHealth, Inc., *National Prescription Audit Plus*, March 2001. Year First Marketed from Top 200 listing published in *Pharmacy Times*, April 1999, and the Food and Drug Administration, [www.fda.gov](http://www.fda.gov).

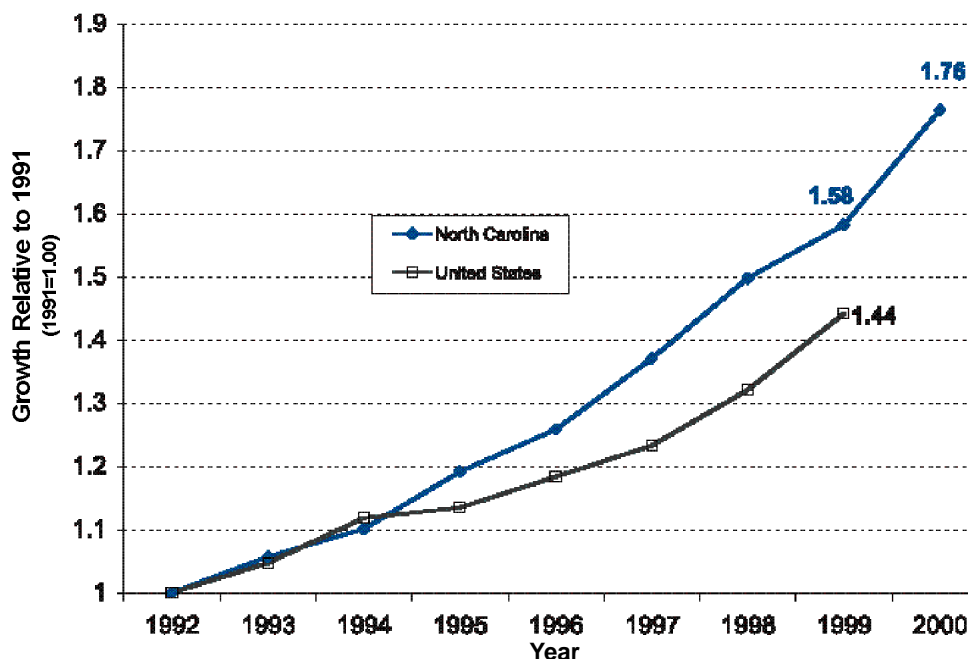
Excerpted with permission from 'Prescription Drug Trends: A Chartbook Update' Kaiser Family Foundation, November 2001

#### **8.4 Prescriptions Dispensed per Population**

- ◆ As the population has grown, so has the demand for prescriptions. Between 1992 and 2000, the number of prescriptions dispensed in retail settings in North Carolina increased 76% from 52 million to just below 92 million prescriptions (**Figure 11**).
- ◆ **Figure 11** shows that the number of prescriptions dispensed annually in United States has increased significantly as well, though between 1992 and 1999 North Carolina experienced a 14% larger growth rate than the nation (HRSA, 2000).
- ◆ Adjusting for population growth, the annual number of prescriptions dispensed per North Carolina resident has grown 35% over the last 10 years from an average of 7.5 prescriptions per person in 1991 to 11.4 per person in 2000 (**Figure 12**).

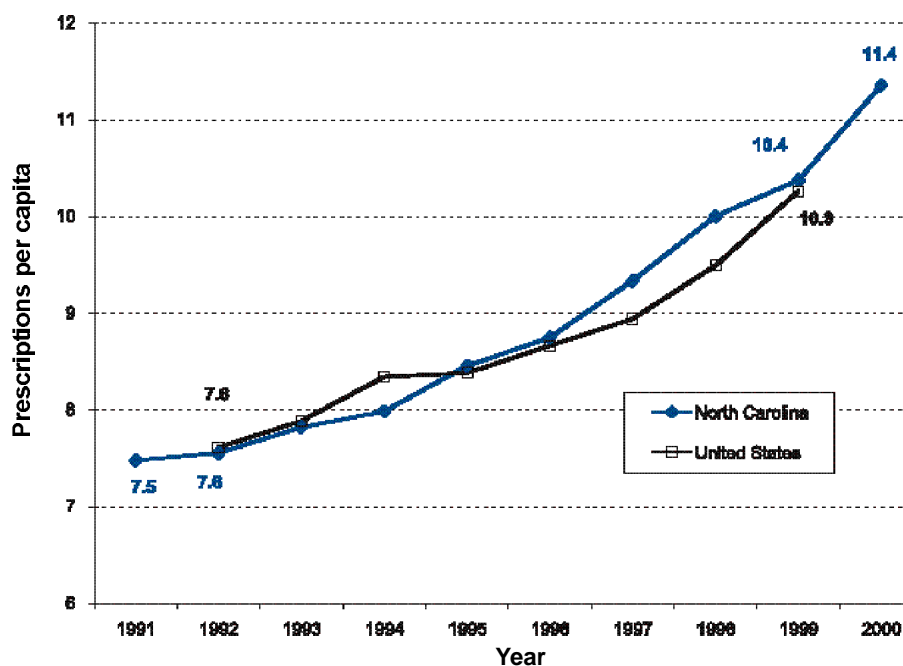
***The roles of pharmacists in hospitals have changed. Hospital pharmacists are playing ever more important roles in medication management and clinical care. These skills have been necessary to care for patients with increasing acuity and increasing complexity of medications.***

Figure 11. Annual Retail Prescription Growth Rate Relative to 1992, United States and North Carolina



Source: NC prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed. US data from IMS Health as reported in *The Pharmacist Workforce: A Study of the Supply and Demand for Pharmacists*, HRSA2000.

Figure 12. Annual Retail Prescriptions Dispensed Per Capita, US and NC, 1991-2000



Source: NC prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed. US data from IMS Health as reported in *The Pharmacist Workforce: A Study of the Supply and Demand for Pharmacists*, HRSA2000. Population data are from the North Carolina State Data Center (Log into North Carolina) and the US Census Bureau and are April 2000 Census numbers.

## THE SUPPLY SIDE

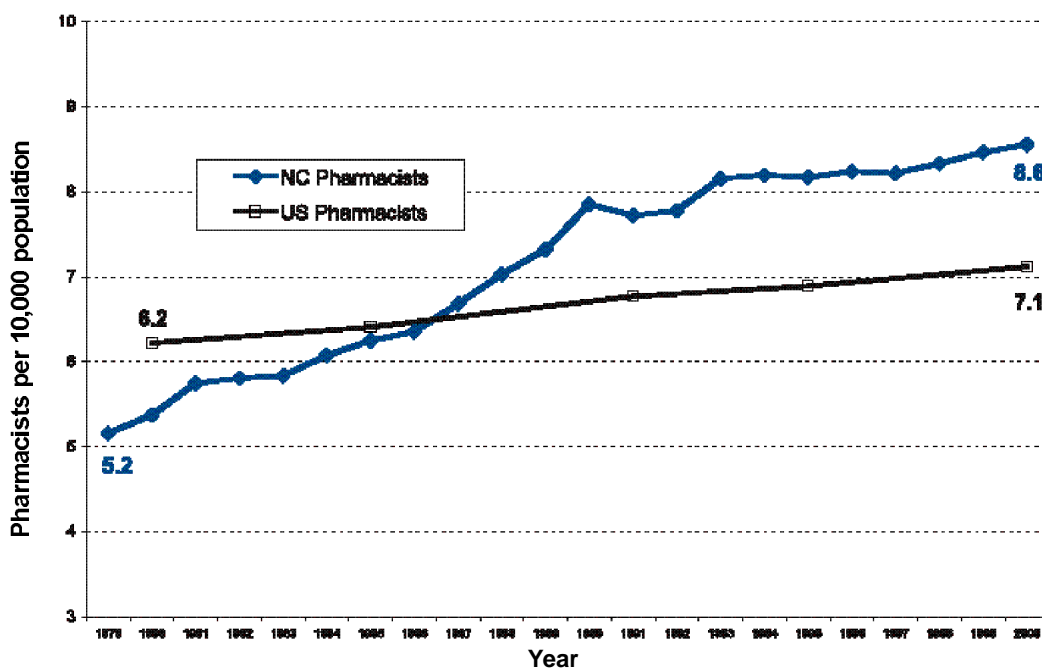
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## The Supply Side

### 9.1 The Supply and Demand of Pharmacists in North Carolina

- Examining the ratio of pharmacists per 10,000 population over the past 22 years reveals four different trend periods: rapid growth from 1979-1990; a slight decrease from the existing upward trend in 1991 and 1992; a “holding steady” period from 1993-1997; and then a marginally increasing supply since 1998 (**Figure 13**).
- Camden is the only North Carolina county that did not have an actively practicing pharmacist in 2000 (**Figure 14**). The supply of pharmacists in the state is heavily concentrated in a few areas. Only 16 of the state’s counties have more than the state average number of 8.6 pharmacists per 10,000 population; this is the case because Durham is distorting the average with nearly 29 pharmacists per 10,000 population.
- In the last decade, 45 of North Carolina’s counties did not increase their supply of pharmacists rapidly enough to keep pace with population growth (**Figure 15**).

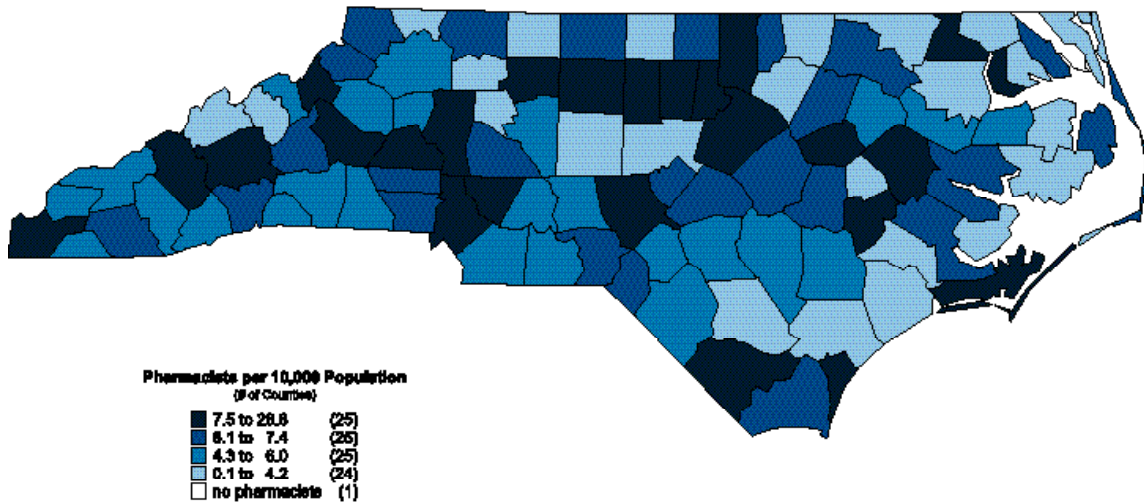
Figure 13. Pharmacists per 10,000 Population  
US and NC, 1979-2000



Source: North Carolina Health Professions Data and Analysis System, 2002; HRSA, Bureau of Health Professions; US Bureau of the Census; North Carolina Office of State Planning.  
US Data from HRSA Factbook for 1975-1985; BHP Pharmacist Supply Model for 1991-2000 as reported in *The Pharmacist Workforce: A Study of the Supply and Demand for Pharmacists*, HRSA2000. Figures include all licensed active pharmacists.

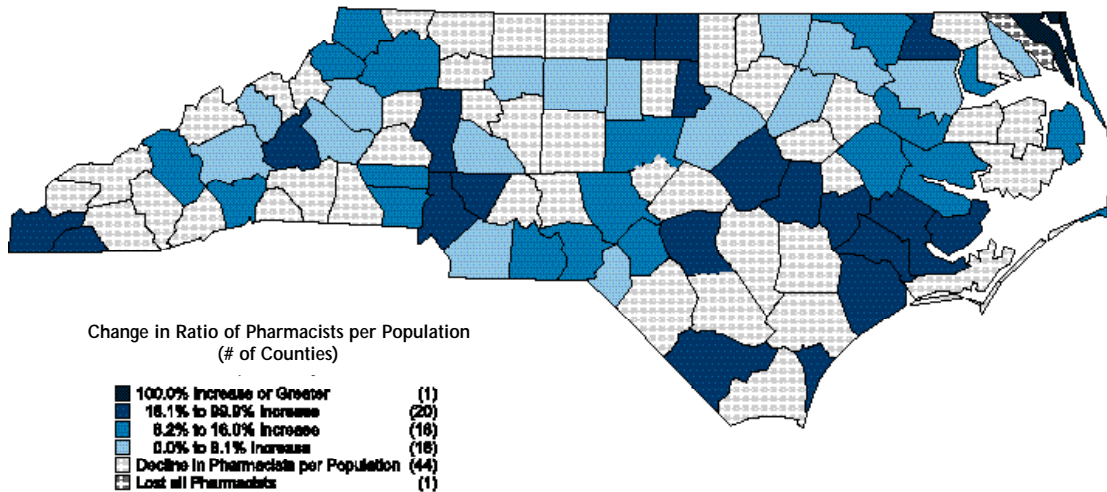


Figure 14. Active Pharmacists per 10,000 Population, by NC County, 2000



Source: North Carolina Health Professions Data and Analysis System;  
North Carolina Board of Pharmacy;  
North Carolina Office of State Planning, 2002.  
Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
Cecil G. Sheps Center for Health Services Research.

Figure 15. Percent Change in Ratio of Active Pharmacists per 10,000 Population, by NC County, 1991-2000



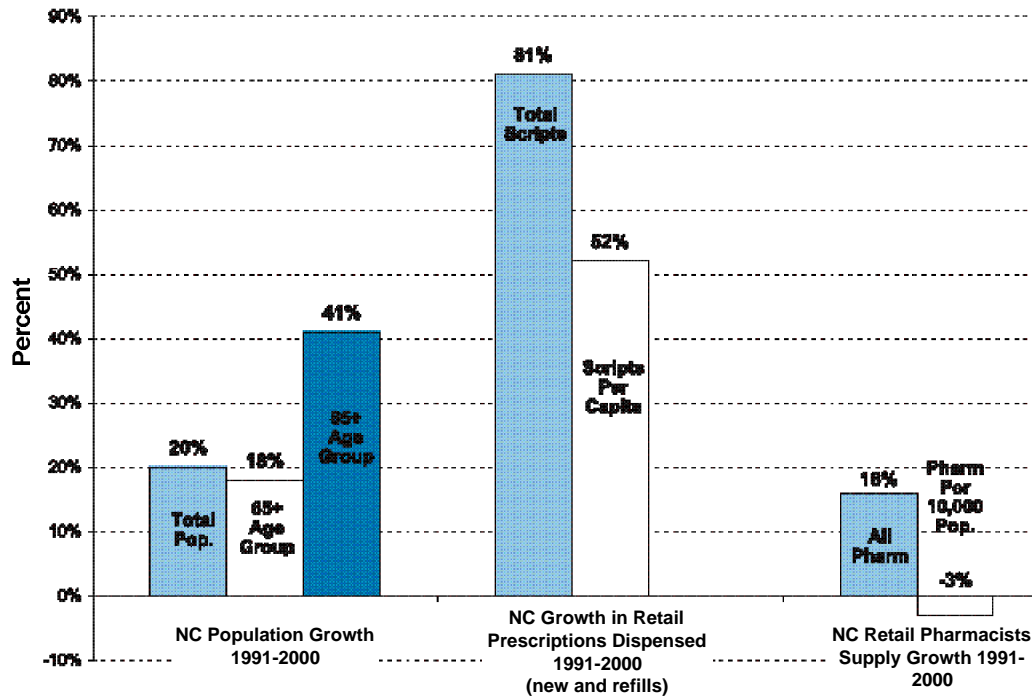
Source: North Carolina Health Professions Data and Analysis System;  
North Carolina Board of Pharmacy;  
North Carolina Office of State Planning, 2002.  
Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
Cecil G. Sheps Center for Health Services Research.

## ***9.2 Retail Prescriptions Dispensed per Retail Pharmacist***

- ◆ By examining the relative percent growth rates in the last decade of the state's population, retail drugs dispensed and the number of retail pharmacists (**Figure 16**), it becomes clear that the state's supply of pharmacists working in retail settings has not kept pace with the population's increased demand for prescription drugs.
- ◆ In 1991, the average retail pharmacist in the state dispensed 15,359 prescriptions, but by 2000, this workload had increased 57% to 24,062 prescriptions (**Figure 17**). Assuming that on average, pharmacists work about 2,000 hours annually, this means that in the year 2000, they were dispensing about 12 prescriptions every hour, or one every 5 minutes.
- ◆ In 1992, the average retail pharmacist in North Carolina dispensed 15,817 prescriptions annually, compared with a national average of 17,438 (HRSA, 2000). By 1999, both the NC and US workforces were dispensing just under 23,000 prescriptions per year (22,533 and 22,914 prescriptions respectively). This translated into 11.3 prescriptions per hour for North Carolina pharmacists, a rate comparable to the US average of 11.5 prescriptions per hour (**Figure 17**).
- ◆ From 1992 to 1999, the US retail pharmacist workload increased 31%. By comparison, over the same time period the average workload of North Carolina pharmacists increased 42% (**Figure 17**).

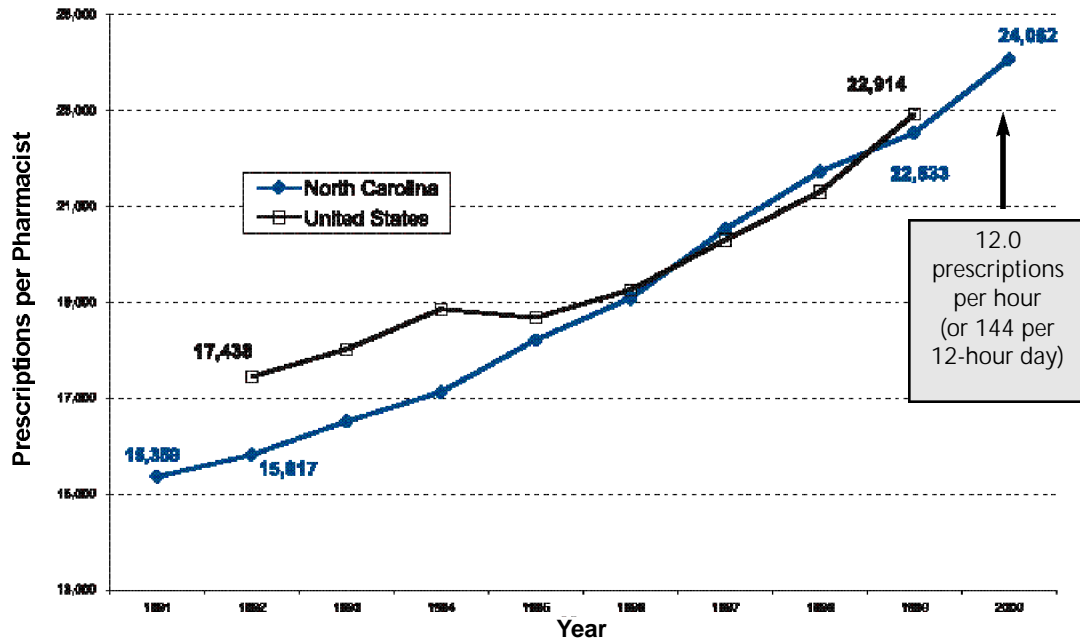
***In the year 2000, the average  
North Carolina retail pharmacist  
was dispensing 12 prescriptions  
every hour, or one every  
five minutes . . .***

Figure 16. Summary of Retail Trend Data, NC, 1991-2000



Source: NC prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed. Population data are from the North Carolina State Data Center (Log into North Carolina). Pharmacist data are from the NC Health Professions and Data Analysis System.

Figure 17. Annual Retail Prescriptions Dispensed Per Retail Pharmacist, US and NC, 1991-2000



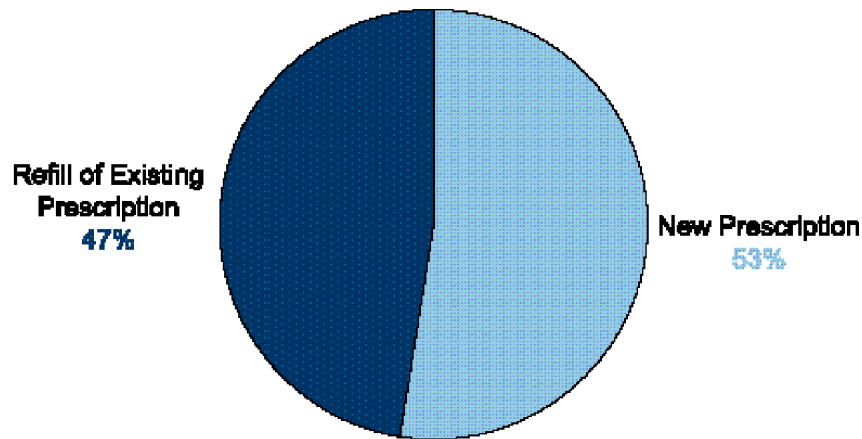
Source: NC prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed. North Carolina pharmacist data are from the NCHealth Professions Data and Analysis System. US data from IMS Health as reported in *The Pharmacist Workforce: A Study of the Supply and Demand for Pharmacists*, HRSA2000.

### 9.3 *The Pharmacists Role Beyond Dispensing: Patient Counseling and Administrative Functions*

- ◆ Pharmacists function in a number of different roles, depending on the practitioner's employment setting. The average pharmacist processes and dispenses prescriptions (40-45% time); counsels patients about proper drug use, potential interactions and side effects, compliance, etc. (20-25% time); deals with administrative issues such as third-party billing questions (20%); and fulfills other obligations, including: communicating with physicians, compounding drugs, ordering supplies (10-20% time) (NC Board of Pharmacy). Many of the pharmacists' current activities could be performed by ancillary personnel.
- ◆ While patient counseling is important (and mandated by the North Carolina Board of Pharmacy) for all dispensed drugs, it is particularly important for new prescriptions. Numerous studies have shown the importance of patient counseling in reducing drug interactions, increasing patient compliance and decreasing unnecessary hospitalizations. (Snowden, 2000). **Figure 18** illustrates that 53% of all retail prescriptions dispensed in metropolitan areas in North Carolina are new prescriptions and therefore require patient counseling. This statistic highlights the dilemma facing retail pharmacists as they attempt to make patient counseling a priority in the face of growing workloads.
- ◆ The administrative burden on pharmacists has also been increasing. Resolving third-party billing issues has become more of a concern as the percent of prescriptions paid for by these payers has increased from just under 10% in 1990 to 65% in 2000 (**Figure 19**).

***Emphasis in retail settings is often on dispensing and administrative tasks, rather than on management and patient counseling.***  
***“If you talked to the average pharmacist today, they do not feel like they are doing what they were trained to do. . . (they’re) too bogged down with technical duties, they want to be out with patients.”***  
***- Educator***

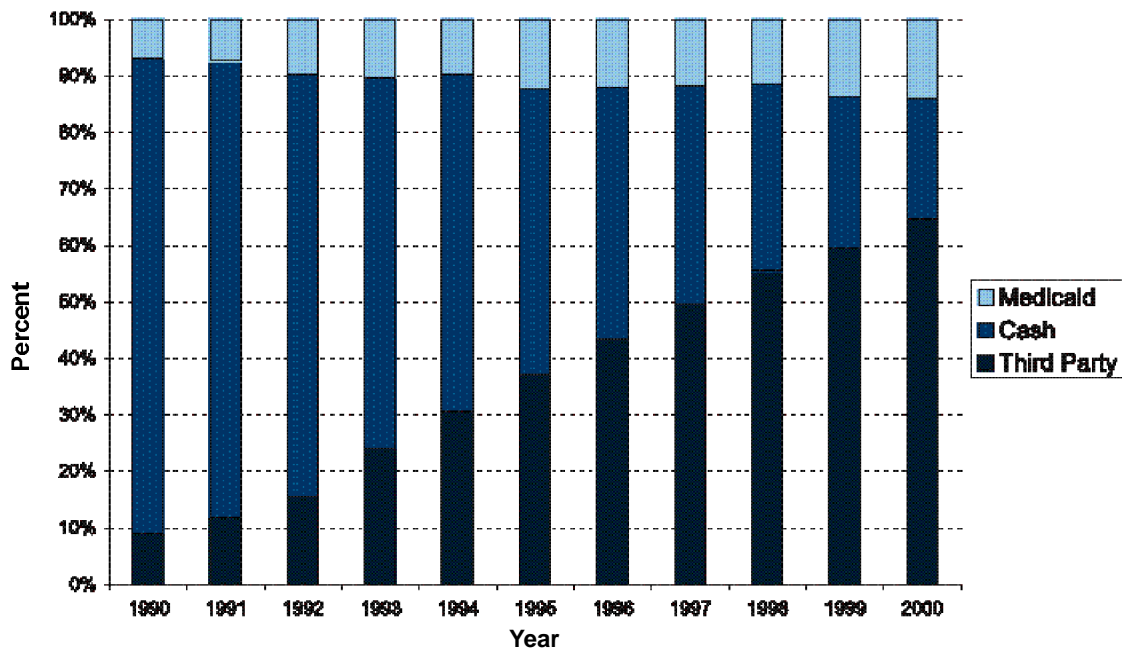
Figure 18. Retail Prescriptions Dispensed in NC in Metropolitan Statistical Areas in 2000: New vs. Refill



**Total Retail Prescriptions Dispensed in North Carolina's Metropolitan Areas in 2000 = 77,881,800**

Source: Prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed.

Figure 19. Annual Retail Prescriptions Dispensed, Percent by Primary Payer Type, NC 1991-2001



Source: Prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed.



# **NORTH CAROLINA'S PHARMACIST WORKFORCE**

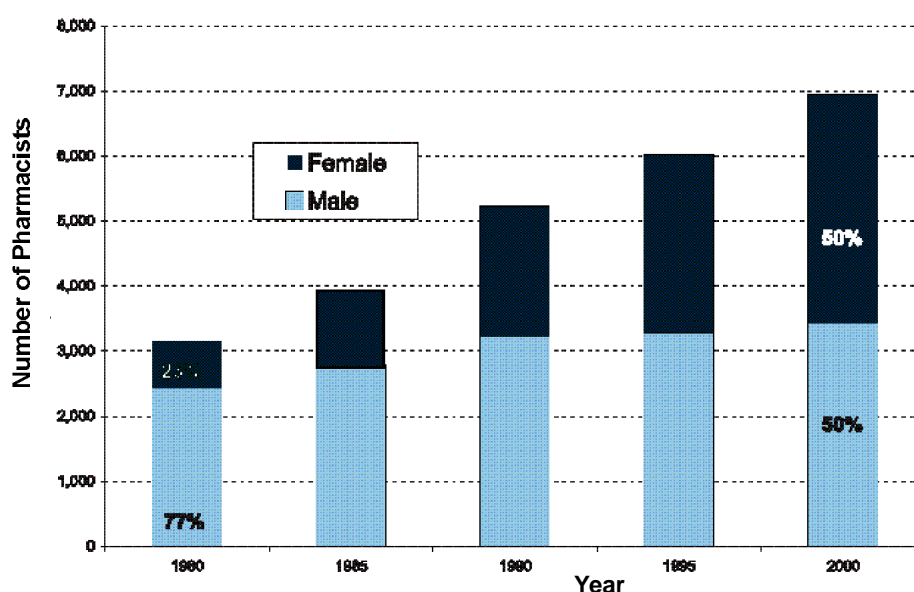
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## Demographic Characteristics

### 10.1.1 Sex and Age

- ◆ Historically, the pharmacist workforce has been dominated by males, but change has been swift (**Figure 20**). For the first time in 2000, there were more female than male pharmacists (3,461 versus 3,456 respectively) in the North Carolina workforce.
- ◆ In North Carolina, the demographic shift becomes even more striking when examining the current workforce by age group and sex. In 2000, over 70% of the pharmacists under 31 years of age were women, but women represented less than 5% of the workforce 71 years of age or older (**Figure 21**).
- ◆ A similar shift has occurred on the national level. Women comprised just 18% of the active pharmacist workforce in 1980, but 46% were women in 2000. For the past twenty years, the percentage of women in North Carolina's pharmacy workforce has consistently been higher than the national percentage. (*The Pharmacist Workforce: A Study of the Supply and Demand for Pharmacists*, HRSA, 2000. Data from HRSA Factbook, BHP<sub>r</sub> Pharmacist Supply Model).
- ◆ The average age of male and female pharmacists in the North Carolina workforce was 5 years older in 2000 than it was in 1980. However, because female pharmacists are 10 years younger than their male counterparts (mean ages of 36 and 46 respectively) and the number of women in the workforce has been increasing rapidly, the mean age of the total pharmacist workforce has only increased by two years from 1980-2000 (**Figure 22**).

**Figure 20. Active In-State Pharmacists by Sex, NC 1980-2000**



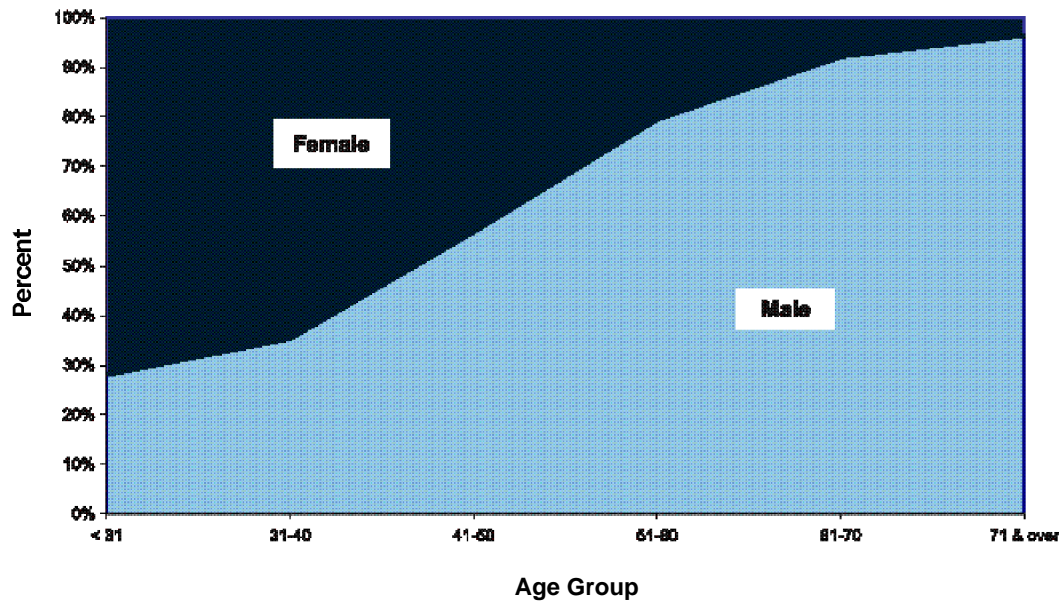
Note: Data are unavailable for 22 individuals in 1980, and for 18 individuals in 1990.

Source: North Carolina Health Professions Data and Analysis System, 2002:

*Cecil G. Sheps Center for Health Services Research, UNC-CH*

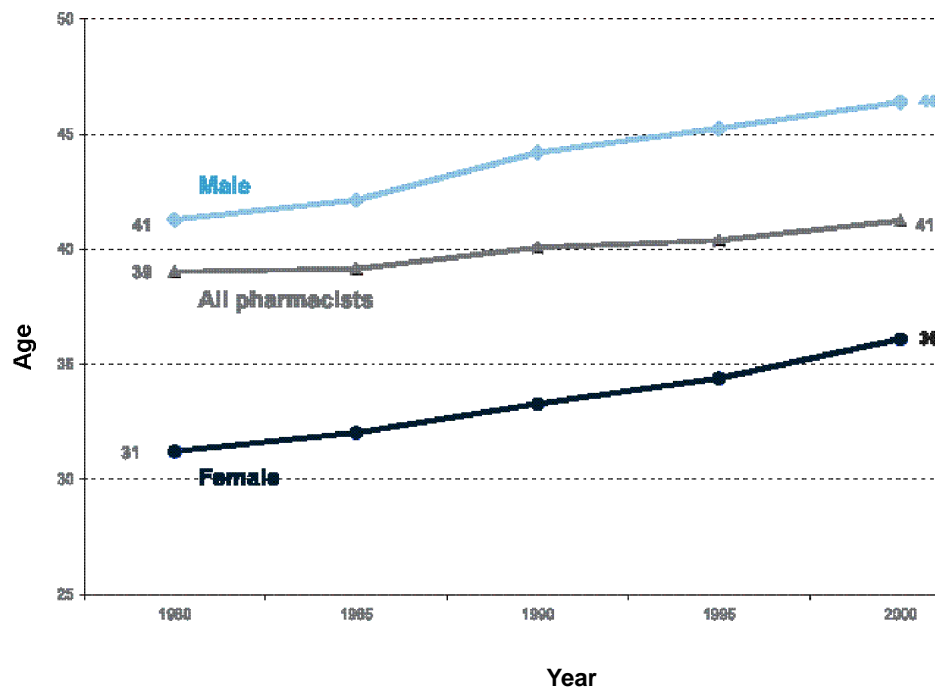


Figure 21. Active In-State Pharmacists by Age Group and Sex, NC 2000



Note: Total Active Pharmacists in 2000=6,917  
Source: North Carolina Health Professions and Data Analysis System, 2002.

Figure 22. Average Age of Active In-State Pharmacists by Sex, NC 1980-2000

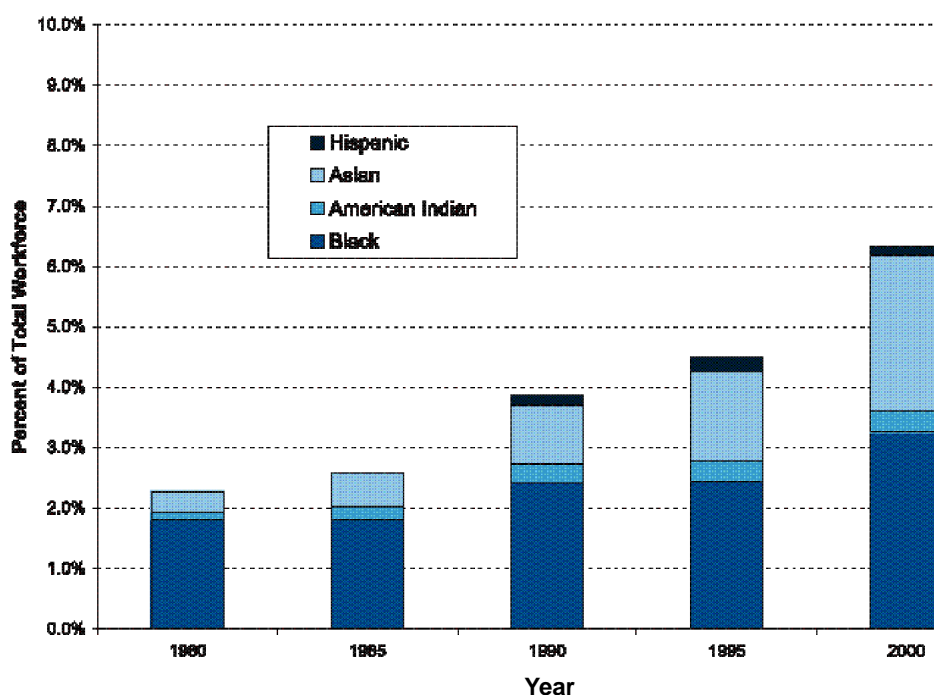


Note: Age data are unavailable for 1 pharmacist in 1980, 3 in 1985, 13 in 1990, and 1 in 1995.  
Source: North Carolina Health Professions and Data Analysis System, 2002.

### 10.1.2 Race and Ethnicity

Figure 23 shows that the North Carolina pharmacist workforce is predominantly white (97% white in 1980 and 94% white in 2000). Asians have made the greatest gains, while African-Americans have increased from just 1.3% to 3.3% of the total workforce. In 2000, there were nine Hispanic pharmacists. The makeup of the North Carolina pharmacist workforce does not match the racial and ethnic makeup of the general population.

**Figure 23. Percent of Total Pharmacist Workforce by Race/Ethnicity, Non-White Pharmacists, NC 1980-2000**

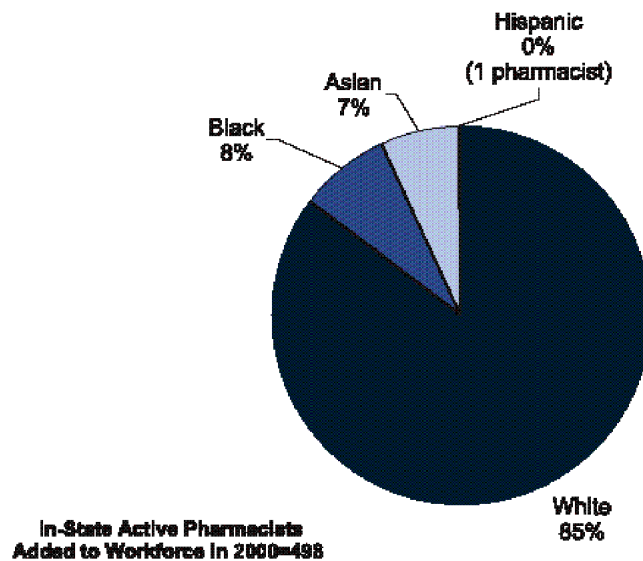


Note: Race/ethnicity data are unavailable for 29 pharmacists in 1980, and 1 in 1990.  
Source: North Carolina Health Professions and Data Analysis System, 2002.

### 10.1.2 Race and Ethnicity (continued)

Examining pharmacists new to the North Carolina workforce in 2000 shows why change in the racial composition of the entire workforce has been so incremental; 85% of these individuals were white, 8% were African-American, 7% were Asian, and just one Hispanic pharmacist was added to the workforce between 1999 and 2000 (**Figure 24**).

**Figure 24. Active, Instate Pharmacists Added to the Workforce, NC 2000**



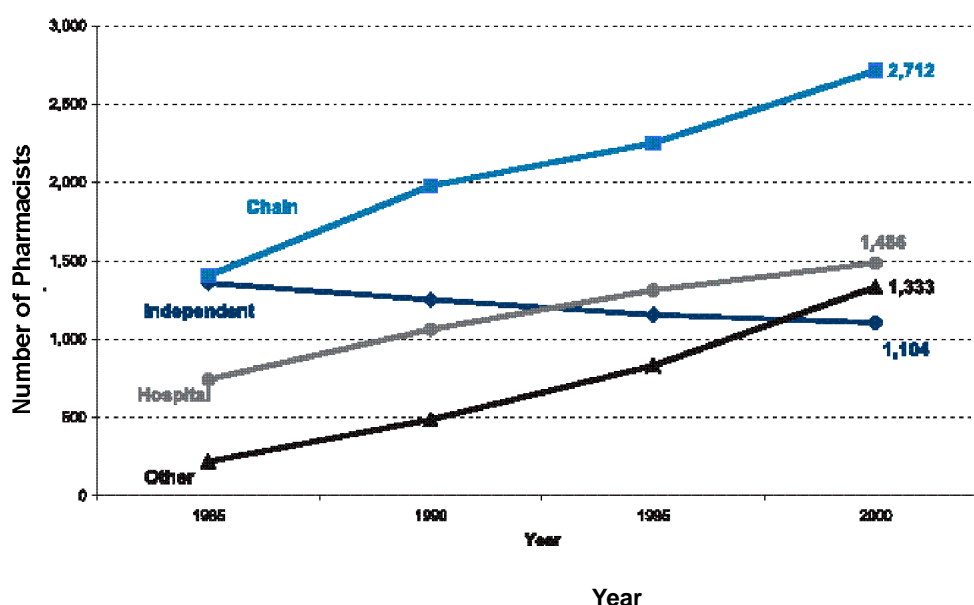
Source: North Carolina Health Professions and Data Analysis System, 2002.

## Employment Characteristics

### 10.2.1 Employment Setting

In 1980, an equal number of NC pharmacists worked in chain drug stores as in independent pharmacies (**Figure 25**). Since 1980, the number of independent pharmacies has declined rapidly, and in 2000, most pharmacists worked for chain drug stores (39.2%), hospitals (21.5%), or in “other” employment settings (19.3%). In 2000, only 16.0% worked in independent pharmacies.

Figure 25. Active In-State Pharmacists in NC, Employment Setting, 1985-2000



Note: “Other” includes government, manufacturing, wholesale (1985 only), teaching, research, sales, health department (1995 & 2000 only), nursing home and an unspecified “other” category. Employment setting data are missing for 188 pharmacists in 1985, 430 in 1990, 442 in 1995, and 282 in 2000.

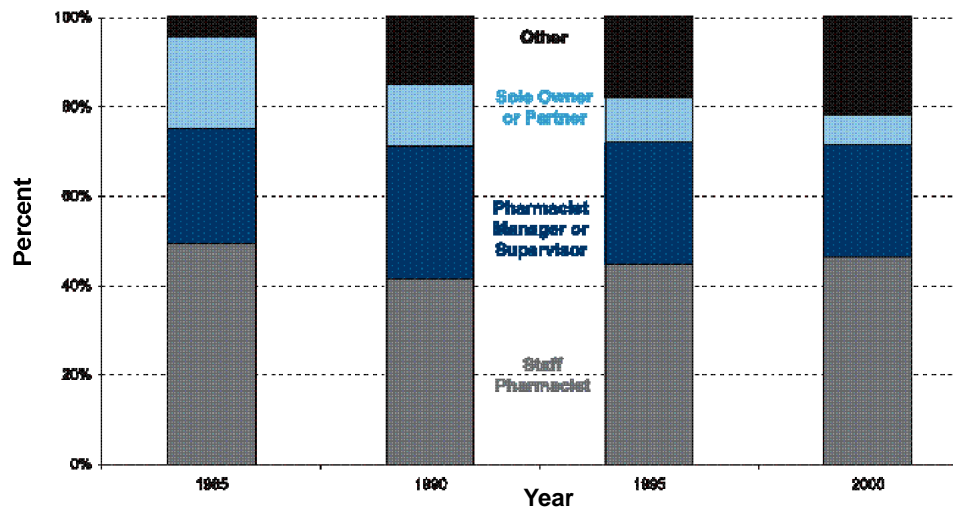
Source: North Carolina Health Professions and Data Analysis System, 2002.

### 10.2.2 Job Type

There has been a decline in the percentage of pharmacists who claim that they are sole-owner managers or partners (i.e. those with a financial stake in their pharmacy businesses). In North Carolina, the percentage of pharmacists who were either sole-owners or partners declined from 20% of the workforce in 1985 to 6% in 2000 (**Figure 26**).

While the proportion of the pharmacists who work as staff in pharmacies has not changed, there has been rapid growth in the percent of the workforce in “other” forms of employment (**Figure 26**).

**Figure 26. Active In-State Pharmacists in NC, Job Type, 1985-2000**

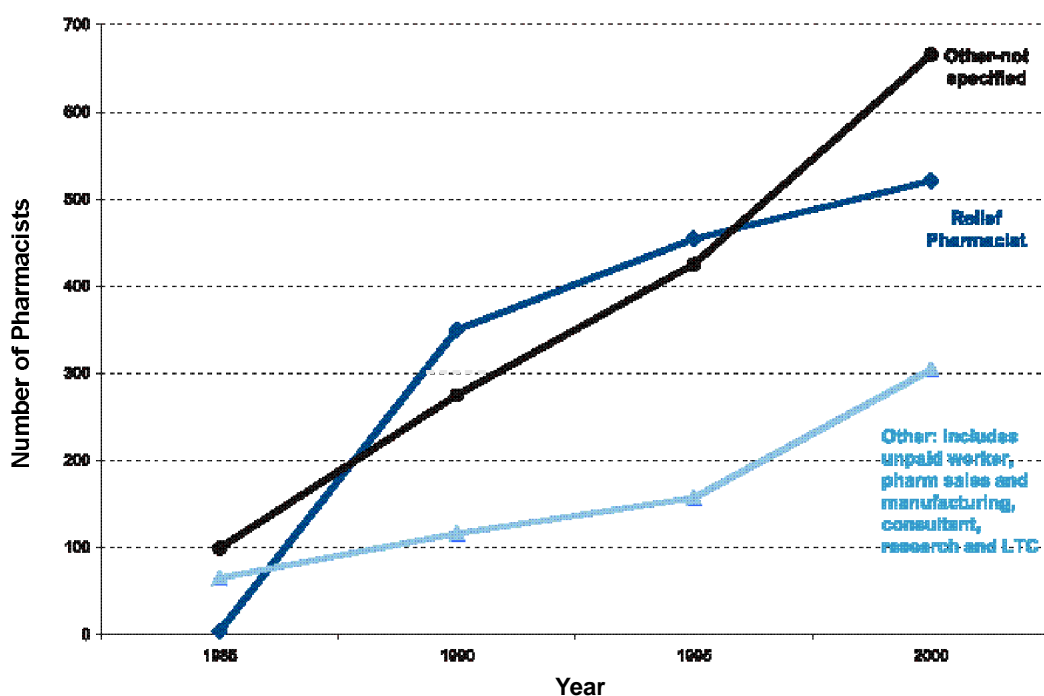


Note: “Other” includes relief pharmacists, unpaid workers, sales, consultants, manufacturing, research, long-term care, and an unspecified “other” category. Job type data are missing for 74 pharmacists in 1985, 251 in 1990, 180 in 1995, and 93 in 2000. Source: North Carolina Health Professions and Data Analysis System, 2002.

### 10.2.3 Non-Traditional Job Types and Settings

Examining the “other” category more closely reveals that there has been strong growth in the number of relief pharmacists; this has undoubtedly been the result of more opportunities for part-time work at chain drug stores (**Figure 27**). The other striking trend has been the increase in the number of pharmacists working in unspecified “other” forms of employment. This is most likely a result of the move to the Doctor of Pharmacy (PharmD) program with its emphasis on non-traditional roles, in addition to the increasing number of clinical research organizations/pharmaceutical companies that employ pharmacists (i.e. individuals are selecting “other” on the licensure form because there is no place to indicate that they are working as an “Ask the Pharmacist”-type setting, or as a drug information/liaison pharmacist in a pharmaceutical company).

**Figure 27. Active In-State Pharmacists in NC, with “Other” Job Type, 1985-2000**



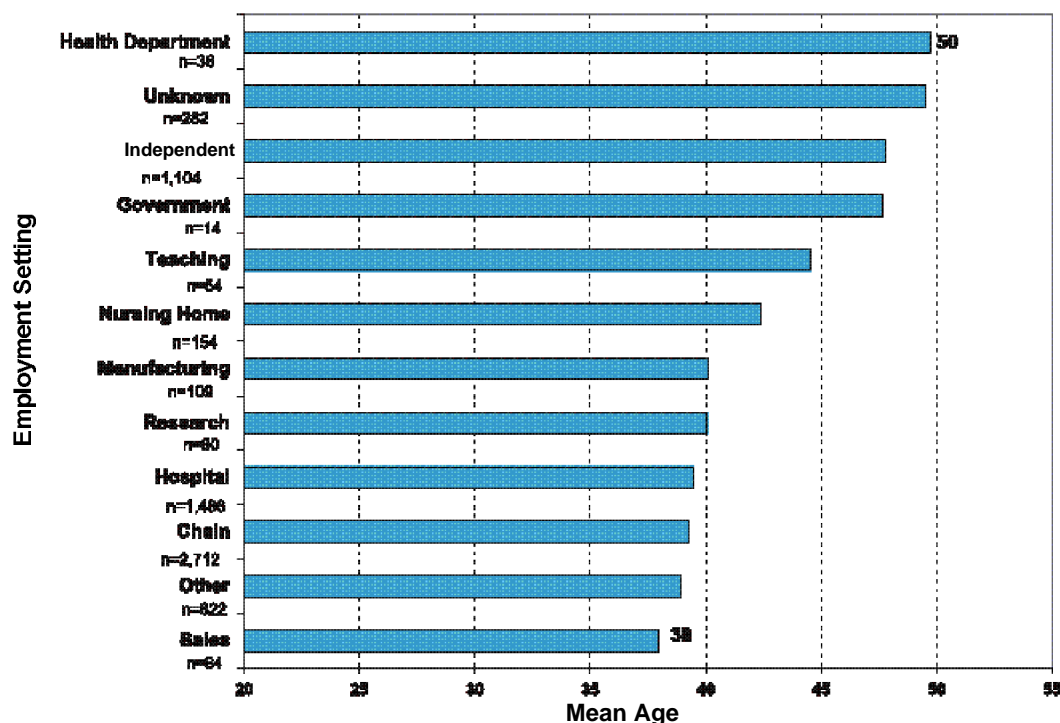
Note: Job type data are missing for 74 pharmacists in 1985, 251 in 1990, 180 in 1995, and 93 in 2000.  
Source: North Carolina Health Professions and Data Analysis System, 2002.

### 10.2.4 Job Type and Setting By Age

- ◆ Older pharmacists tend to work in health departments and independent drug stores; younger pharmacists tend to work in chain drug stores, sales, and “other” positions (Figure 28).
- ◆ Pharmacists working as sole-owner managers are the oldest, at an average of 53 years of age, followed by partner-managers at age 50 (Figure 29). Interestingly, the average age of relief pharmacists is also 50, suggesting that some older workers may be easing out of the workforce by working in this part-time capacity.

***The number of pharmacists working in “other” non-dispensing, non-traditional roles has increased dramatically since 1985.***

Figure 28. Mean Age of Active In-State Pharmacists, by Employment Setting, NC 2000

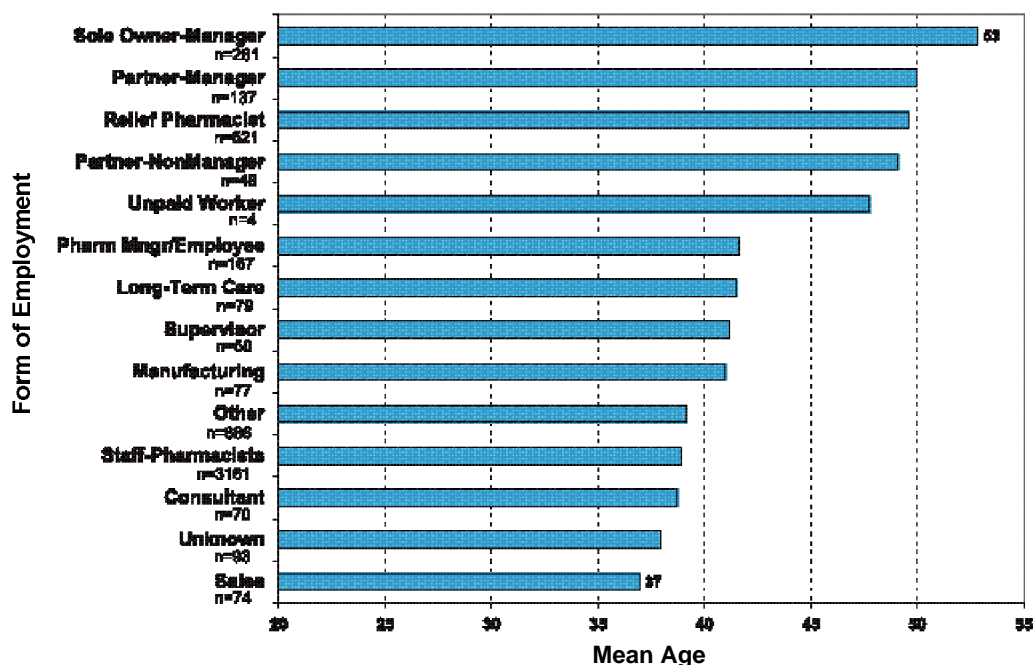


Note: There were a total of 6,917 active, in-state pharmacists in 2000; their average age was 41.

Employment setting data are missing for 282 pharmacists in 2000.

Source: North Carolina Health Professions and Data Analysis System, 2002.

Figure 29. Mean Age of Active In-State Pharmacists, by Form of Employment, NC 2000



Note: There were a total of 6,917 active, in-state pharmacists in 2000; their average age was 41.

Job type data are missing for 93 pharmacists in 2000.

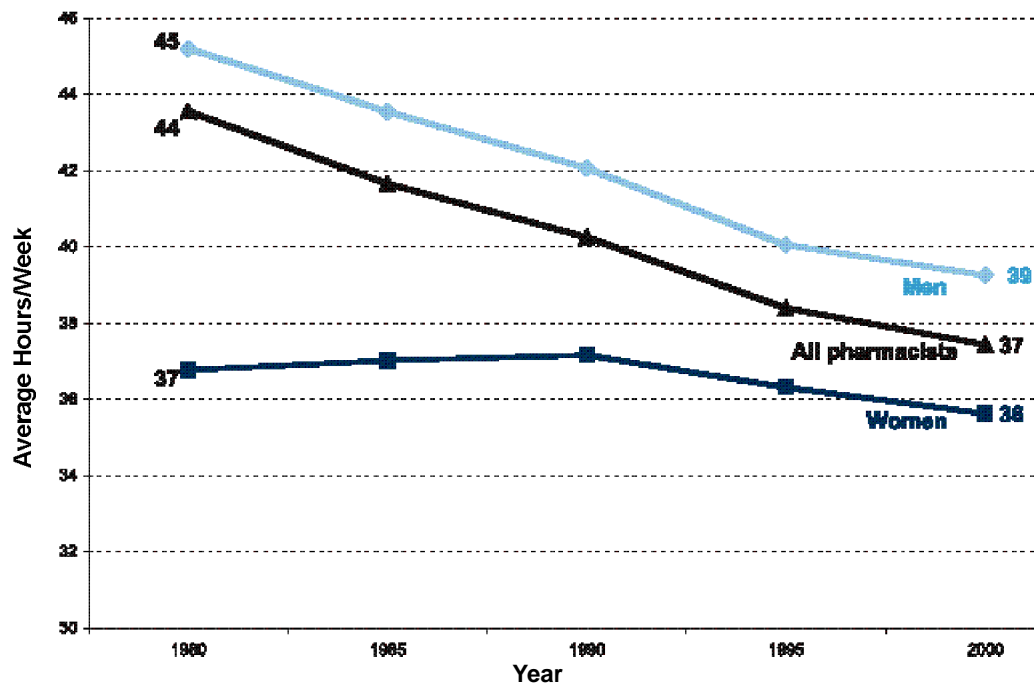
Source: North Carolina Health Professions and Data Analysis System, 2002.



### 10.2.5 Hours Worked by Age and Sex

- ◆ One of the most striking characteristics of this workforce has been the decline in the average number of hours worked in the past twenty years. The average pharmacist worked seven fewer hours in 2000 than she/he worked in 1980 (**Figure 30**).
- ◆ The child-rearing (31-40) and older age cohorts (61 & over) in North Carolina work the fewest hours (**Figure 31**).
- ◆ Women in North Carolina work shorter hours than their male counterparts at all ages, but the difference is greatest between the ages of 31-50 (during which years, women, on average, work seven fewer hours than their male counterparts of the same age) (**Figure 32**).
- ◆ The differential in hours worked by men and women is evident at the national level as well. Between 1979 and 1998, male pharmacists in the United States reported an average work week of 44.1 hours per week; females averaged 37.2 hours per week. Female pharmacists were also more likely to work part-time (27.9%) compared to their male counterparts (11.4%) (Walton, 2000 cited in *The Pharmacist Workforce: A Study of Supply and Demand for Pharmacists*, HRSA, 2000).

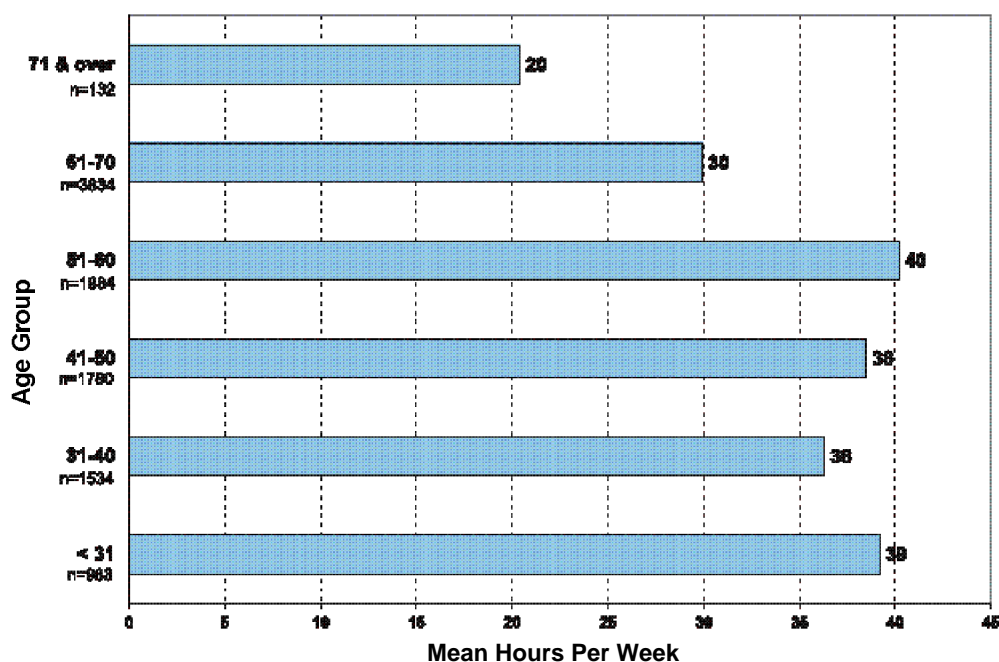
**Figure 30. Average Hours Worked per Week by Active In-State Pharmacists, by Sex, NC 1980-2000**



Note: Data on number of hours worked per week are missing for 339 pharmacists in 1980, 249 in 1985, 364 in 1990, and 141 in 2000.

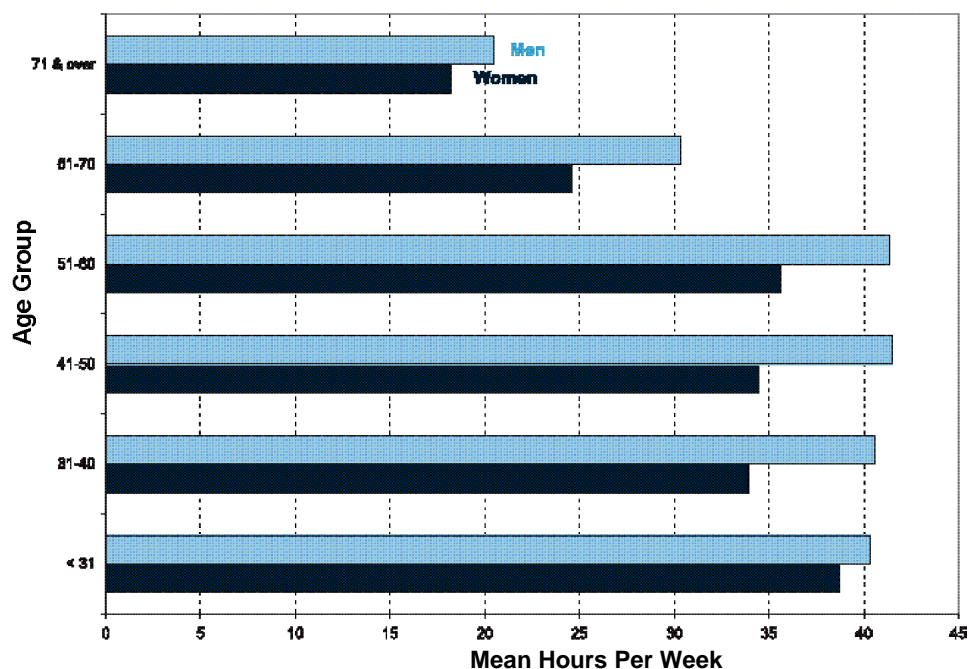
Source: North Carolina Health Professions and Data Analysis System, 2002.

Figure 31. Average Hours Worked by Active In-State Pharmacists, by Age Group, NC 2000



Note: Data on number of hours worked per week are missing for 141 pharmacists in 2000.  
Source: North Carolina Health Professions and Data Analysis System, 2002.

Figure 32. Average Hours Worked by Active In-State Pharmacists, by Age Group and Sex, NC 2000



Note: Data on number of hours worked per week were missing for 77 women and 64 men.  
Source: North Carolina Health Professions and Data Analysis System, 2002.

## Pharmacist Educational Programs in North Carolina

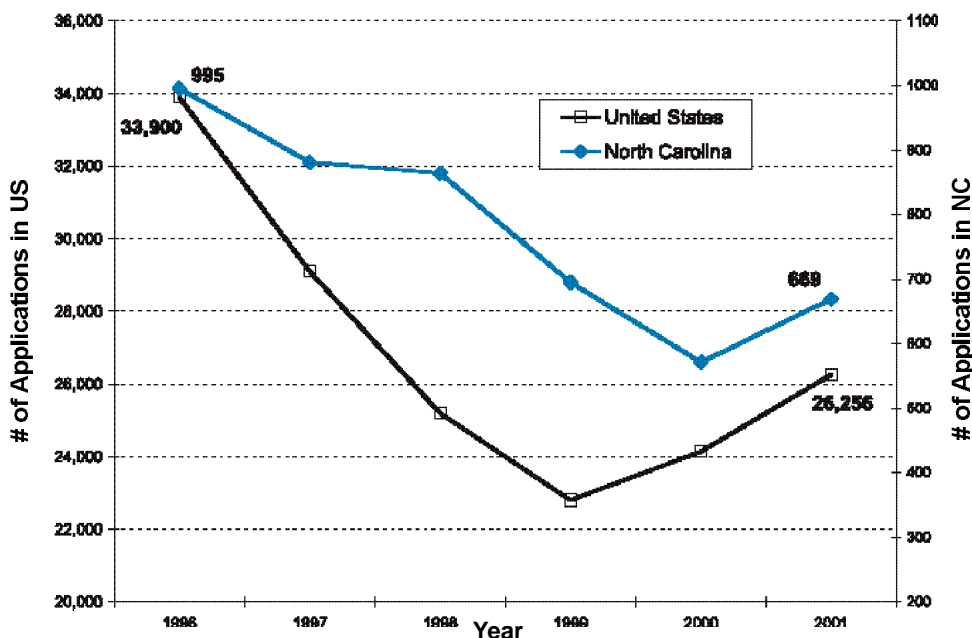
### 10.3.1 Pharmacist Education in North Carolina

- ◆ There are two pharmacy schools in North Carolina: one at the University of North Carolina at Chapel Hill (UNC-CH) and the other at Campbell University. UNC-CH has had a school of pharmacy since the last decade of the 19th century and Campbell's program opened in 1990.
- ◆ Historically, the BS has been the professional degree in pharmacy. However, in 1997, UNC-CH followed the lead of pharmacy programs in other states and switched to the PharmD. Campbell has had the PharmD since its inception in 1990.

### 10.3.2 Applications to Pharmacy Schools

- ◆ The number of students applying to the country's pharmacy schools has fluctuated over the years. Prior to the late 1990's, applicants had been steadily increasing, reaching peak applications in 1994. The late 1990s saw a considerable drop in the number of applications, and by 1999, applications had dropped more than 33% from the 1994 peak (American Association of Colleges of Pharmacy, as reported in *The Pharmacist Workforce: A Study of Supply and Demand for Pharmacists*, HRSA, 2000).
- ◆ The decline in applications can be attributed to the pharmacy degree conversion from the BS degree to the PharmD, declining monetary and non-monetary rewards in many health professions and more attractive opportunities in other industries. North Carolina saw the same decline in applications in the late 1990s, as did the United States (Figure 33). However, recent figures suggest that the decline in applications may have ceased, as US and North Carolina schools of pharmacy have seen an increase in the number of pharmacy applicants in the last year.

**Figure 33. Growth Rate of Applications to Schools of Pharmacy, US and NC, 1996-2001 (Academic Years)**

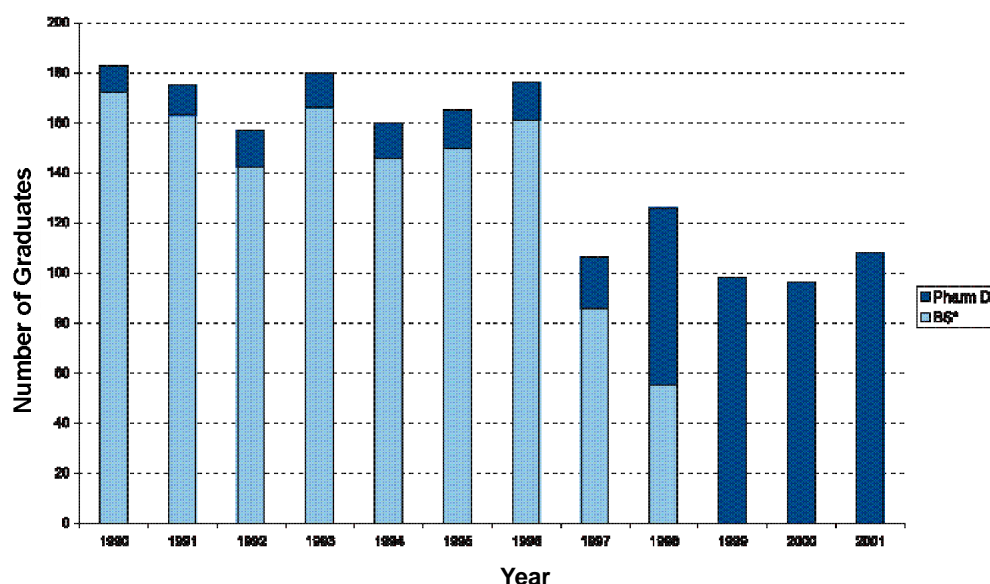


Source: Data from American Association of Colleges of Pharmacy (AACP). NC data from AACP and UNC-CH School of Pharmacy.

### 10.3.3 Graduates of North Carolina Pharmacy Programs

- ◆ **Figure 34** shows the number of graduates from UNC-CH's pharmacy school by degree. The conversion to the PharmD in 1997 resulted in a substantial decrease in the annual number of graduates, from an average of 170 per year in the period between 1990-1996 down to an average 107 graduates per year since 1997. The school maintained the same number of faculty when it established the more intensive and longer PharmD program necessitating a decrease in class sizes.
- ◆ The enrollment at Campbell has been steadily increasing since 1990, and the school now graduates nearly 90 students per year (**Figure 35**).
- ◆ Together, Campbell and UNC-CH matriculated nearly 250 students per year, up until 1996. In 1997, this number dropped below 200 students. It rebounded slightly in 1998, but has since hovered around 190. (**Figure 36**).
- ◆ **Figure 37** shows that retention of graduates from North Carolina pharmacy schools is good. An examination of North Carolina pharmacist licensure data reveals that between 1995 and 1999, on average, 72% of Campbell's graduates and 77% of UNC's graduates became licensed in the state within two years post-graduation.
- ◆ A recent survey conducted of UNC-CH School of Pharmacy graduates provides additional evidence of strong demand for pharmacists in the market. According to the 2001 UNC-CH Graduate Exit Survey, more than two-thirds of UNC-CH's graduates received two firm job offers before accepting their current position (**Figure 38**).

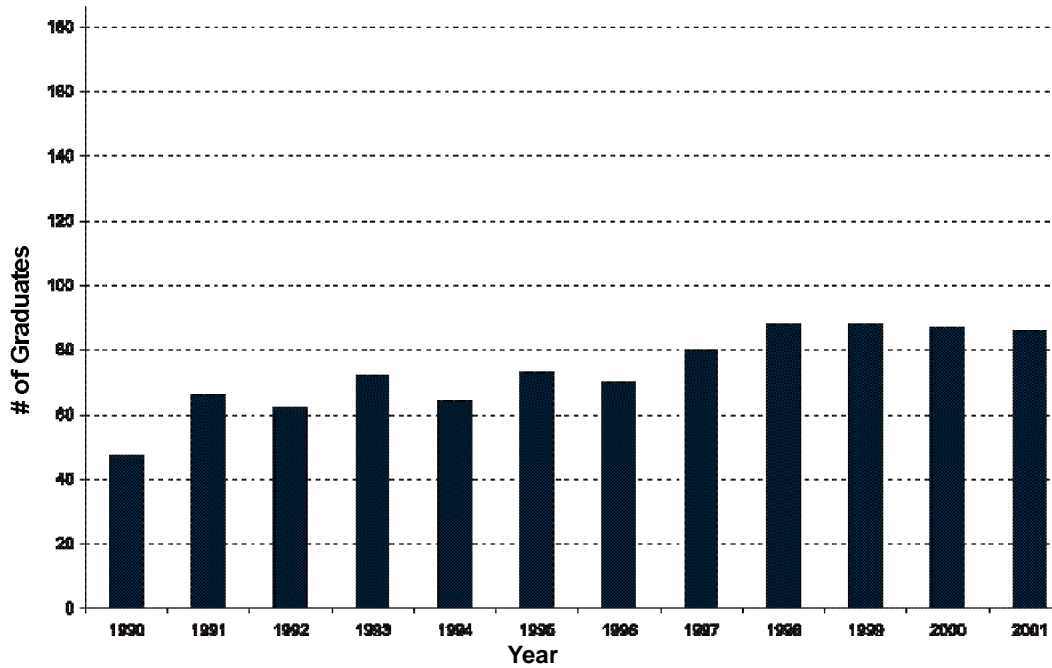
**Figure 34. Graduates from UNC School of Pharmacy, by Degree, 1990-2001**



Source: North Carolina Health Professions Data and Analysis System, 2002; UNC-CH School of Pharmacy.

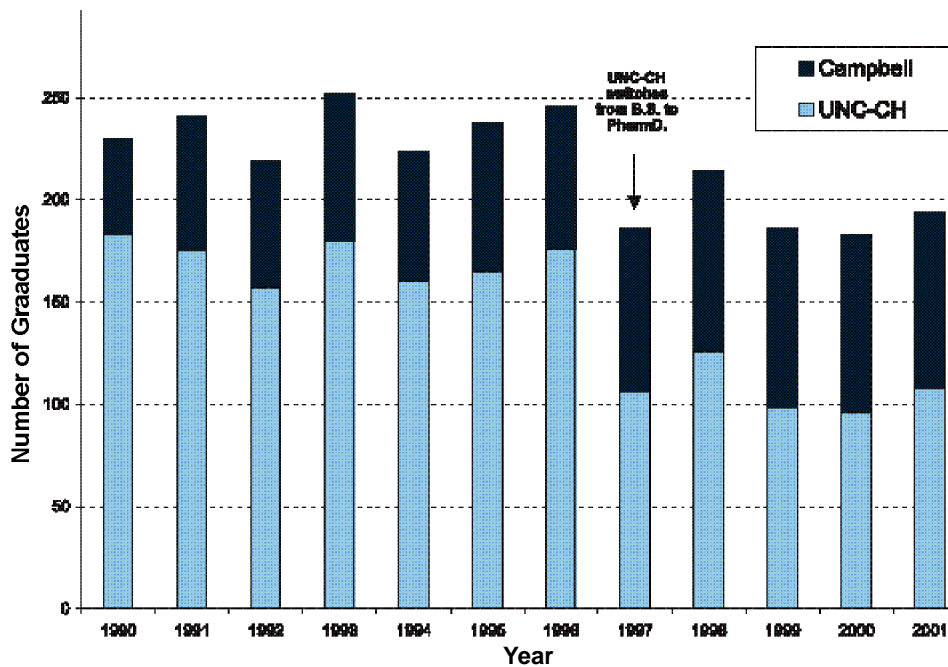
\*Notes: Students who graduated with a BS pharmacy degree from UNC and later obtained a PharmD degree have been counted only once in year PharmD degree was earned, and have been excluded from BS totals as follows: 1990 (7 BS were subtracted), 1991 (1), 1992 (6), 1993 (5), 1994 (9), 1995 (11).

Figure 35. PharmD Graduates from Campbell University School of Pharmacy, 1990-2001



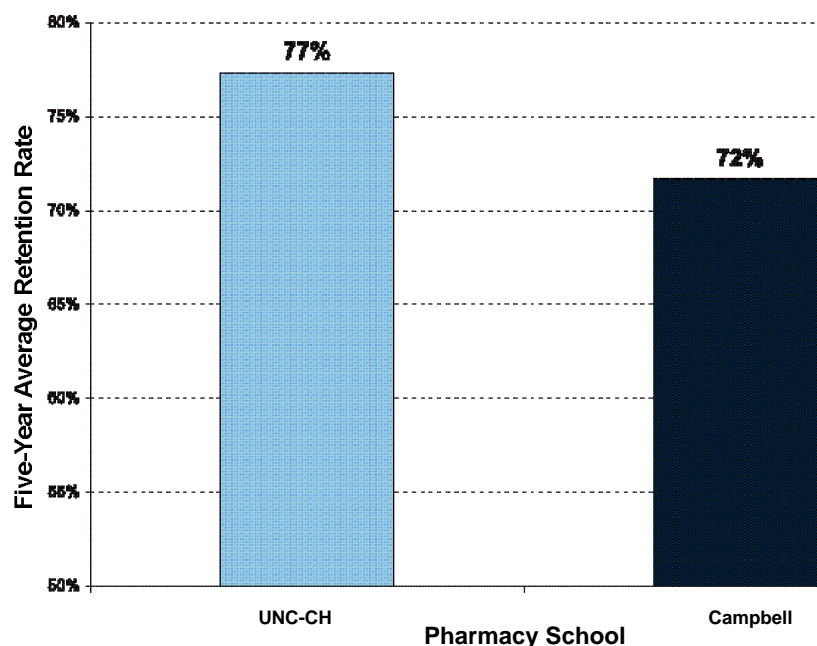
Source: North Carolina Health Professions Data and Analysis System, 2002; Campbell University School of Pharmacy.

Figure 36. Total Graduates from Pharmacy Schools in North Carolina 1990-2001



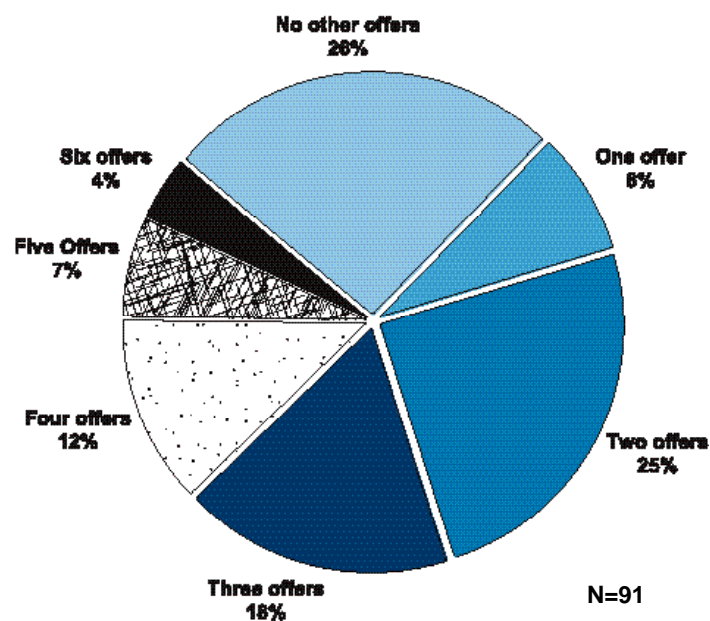
Source: North Carolina Health Professions Data and Analysis System, 2002; Campbell University School of Pharmacy; UNC-CH School of Pharmacy.

**Figure 37. Percent of NC Graduates Who Become Liscensed in NC Within 2 Years of Graduation (Five-Year Average Retention Rate, 1995-1999)**



Source: North Carolina Health Professions Data and Analysis System, 2002.

**Figure 38. Percent of UNC Pharmacy Graduates Receiving Job Offers, 2001**



Note: Responses were not received from 18 graduates.

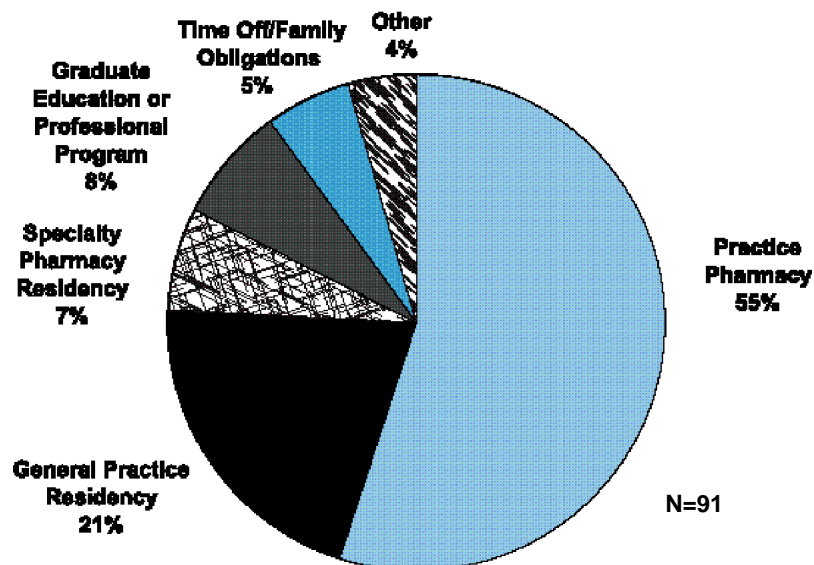
Source: UNC-CH School of Pharmacy Exit Survey of 2001 Graduates.



### 10.3.4 Post PharmD Education: Residencies

- ◆ The availability of, and demand for, post-graduate training in pharmacy residencies and fellowships has increased significantly over the last few years in the United States and North Carolina. For the past nine years, there have been more applicants to residency programs than available positions (*The Pharmacist Workforce: A Study of Supply and Demand for Pharmacists*, HRSA, 2000).
- ◆ Pharmacists trained beyond the PharmD degree are important to furthering the research and clinical base of practice, as well as to provide faculty for training programs. However, an important consequence of the increasing demand for PharmDs to pursue advanced training is the reduction in the number of pharmacists available to dispense prescriptions and work in retail drug settings.
- ◆ Presently, 20% of national pharmacy graduates pursue post-graduate training each year (HRSA, 2000). In North Carolina, there are approximately 40 pharmacy residencies, including both general and specialized programs (North Carolina Association of Pharmacists).
- ◆ Graduates of the UNC-CH pharmacy program are more likely than US graduates to pursue a residency. Nationally, about 20% of pharmacy school graduates pursue post-graduate training each year (HRSA 2000) According to a survey of graduates of UNC's School of Pharmacy in 2001, 28% of respondents planned to enter into a residency. The majority (21%) of these were entering general practice residencies while the remaining 7% entered specialty practice residencies (**Figure 39**).

**Figure 39. Post-Graduation Plans for Graduates of UNC School of Pharmacy, 2001**



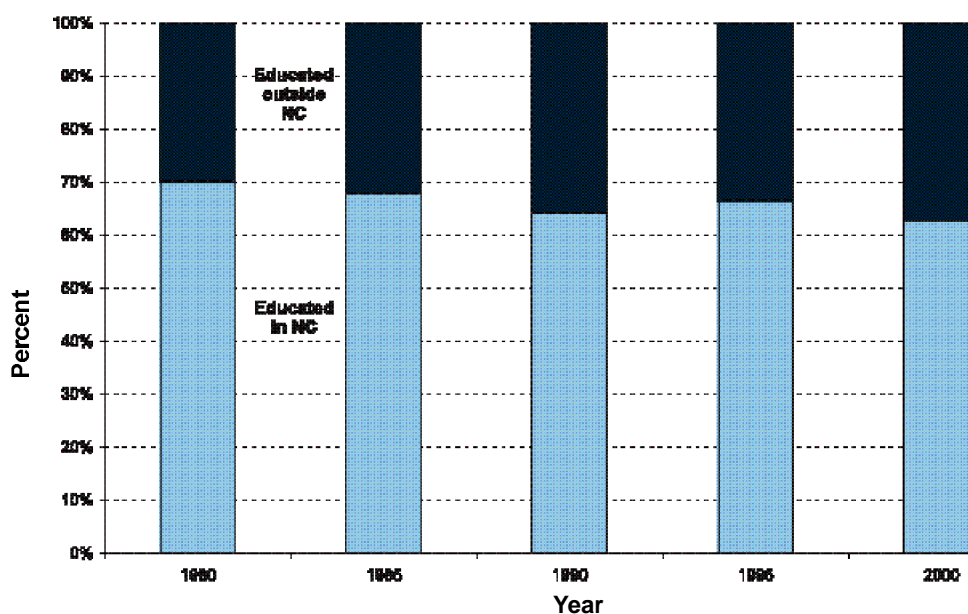
Note: Responses were not received from 18 graduates.  
Source: UNC-CH School of Pharmacy Exit Survey of 2001 Graduates.

## Educational Characteristics

### 10.4.1 Where Were North Carolina Pharmacists Educated?

- ◆ About 70% of the workforce licensed to practice in the state in 1980 received their pharmacy education in North Carolina. By 2000, this number had dropped to 62% (**Figure 40**).
- ◆ 11% of actively practicing pharmacists in 2000 received their pharmacy education in a border state (**Figure 41**).
- ◆ Examining those pharmacists who are new to the workforce in 2000 shows a completely contrasting picture—only 35% received their pharmacy education in NC (**Figure 42**).
- ◆ **Figure 43** shows that we have filled our state's need for pharmacists by importing them from other states. The 498 new pharmacists added to the workforce between 1999 and 2000 came from a wide variety of educational programs: Pennsylvania (9%), South Carolina (7%), outside the US (5%), Georgia, Ohio, and New York (each at 4%), Virginia (3%), West Virginia, Florida, Michigan, and Indiana (each at 2%).
- ◆ Of the new pharmacists educated in-state, a decreasing percentage of them are from UNC-CH (**Figure 44**).

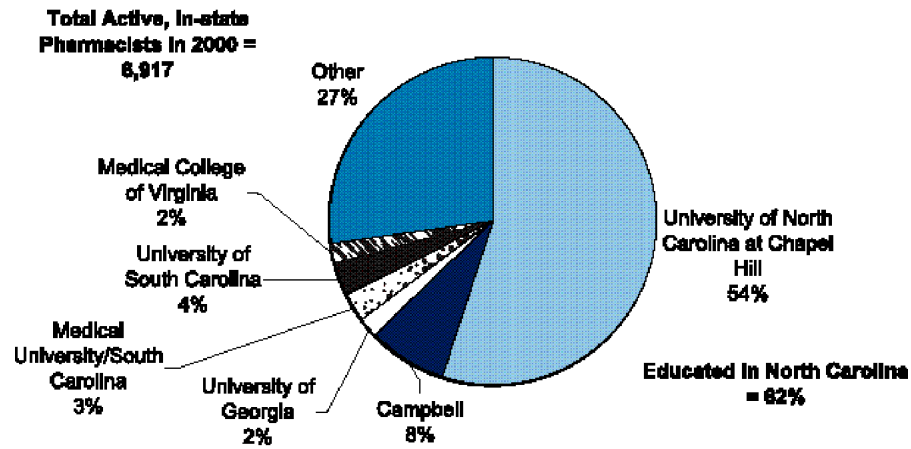
**Figure 40. Percent of Active In-State Pharmacists Educated in and Outside NC, 1980-2000**



Note: Educational data are missing for 47 pharmacists in 1980, 9 in 1985, 33 in 1990, and 6 in 2000.  
Source: North Carolina Health Professions Data and Analysis System, 2002.



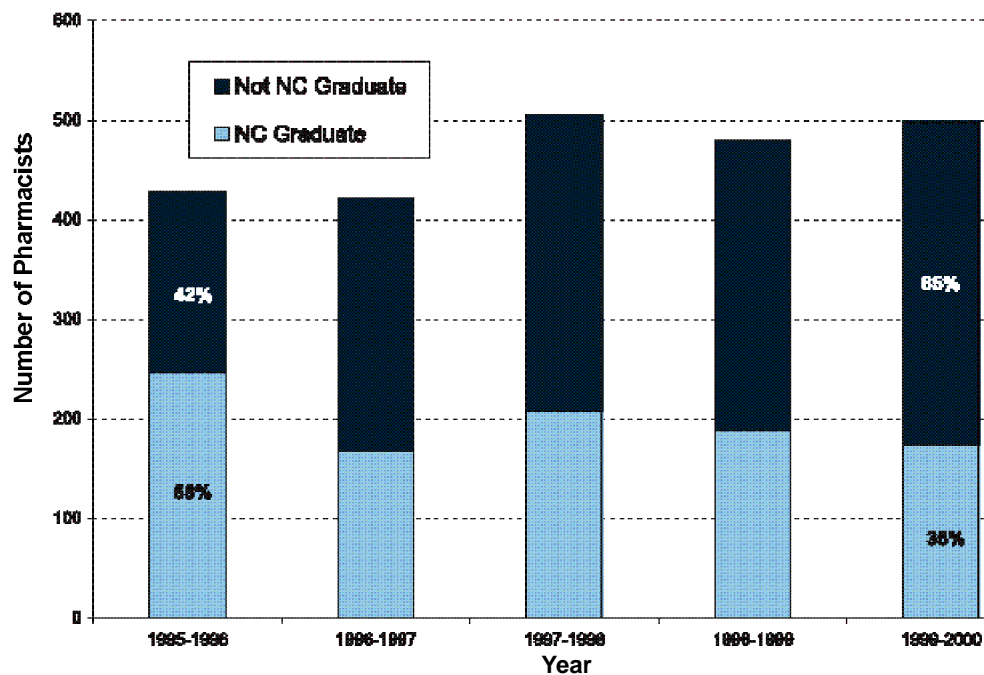
Figure 41. Active In-State Pharmacists, by Location of Basic Education Program, NC 2000



Note: Educational data are missing for 6 individuals.

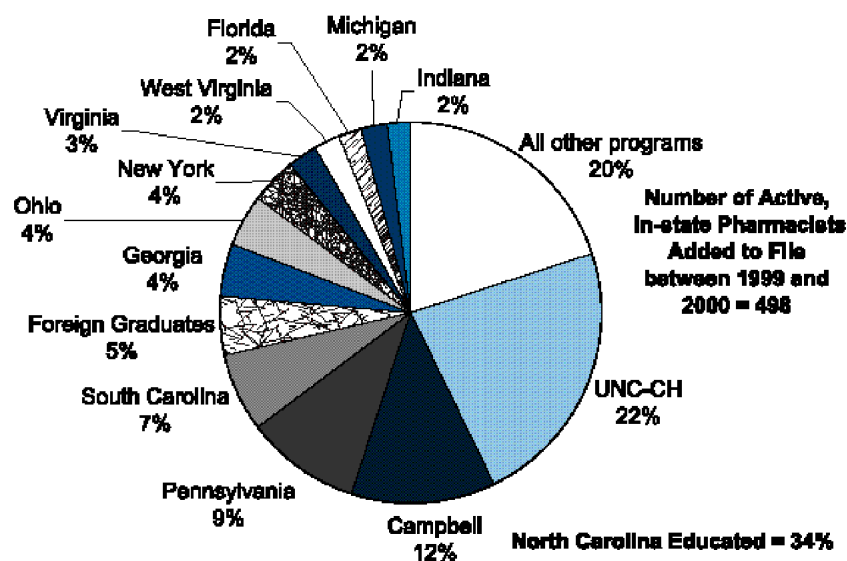
Source: North Carolina Health Professions Data and Analysis System, 2002.

Figure 42. Active Pharmacists Added to Workforce Each Year: Location of Education Program, NC 1995-2000



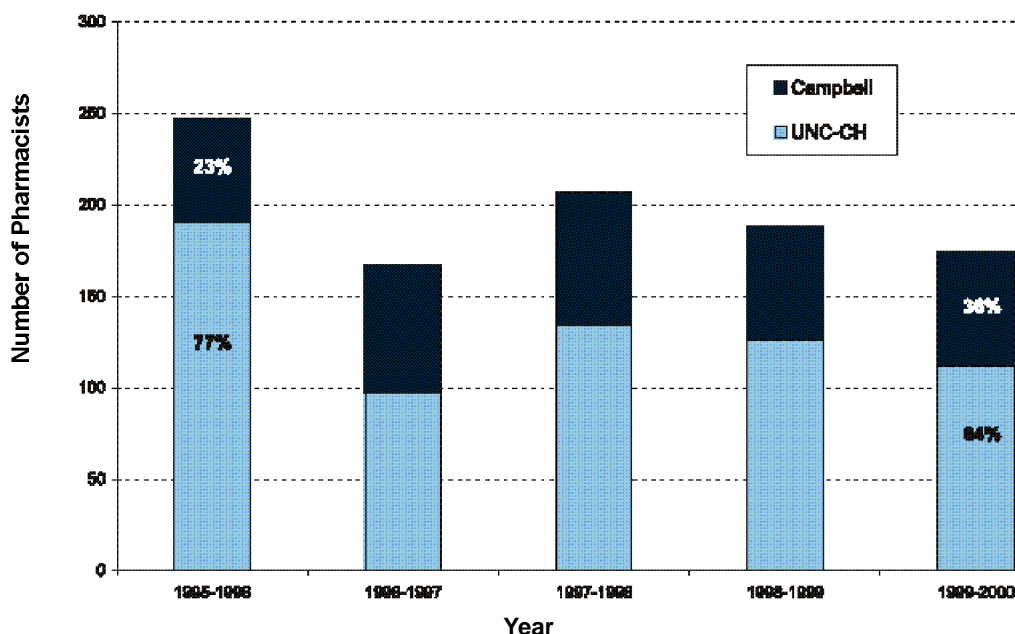
Source: North Carolina Health Professions Data and Analysis System, 2002.

Figure 43. Pharmacists Added to Workforce:  
Location of Basic Education Program, NC 2000



Source: North Carolina Health Professions Data and Analysis System, 2002.

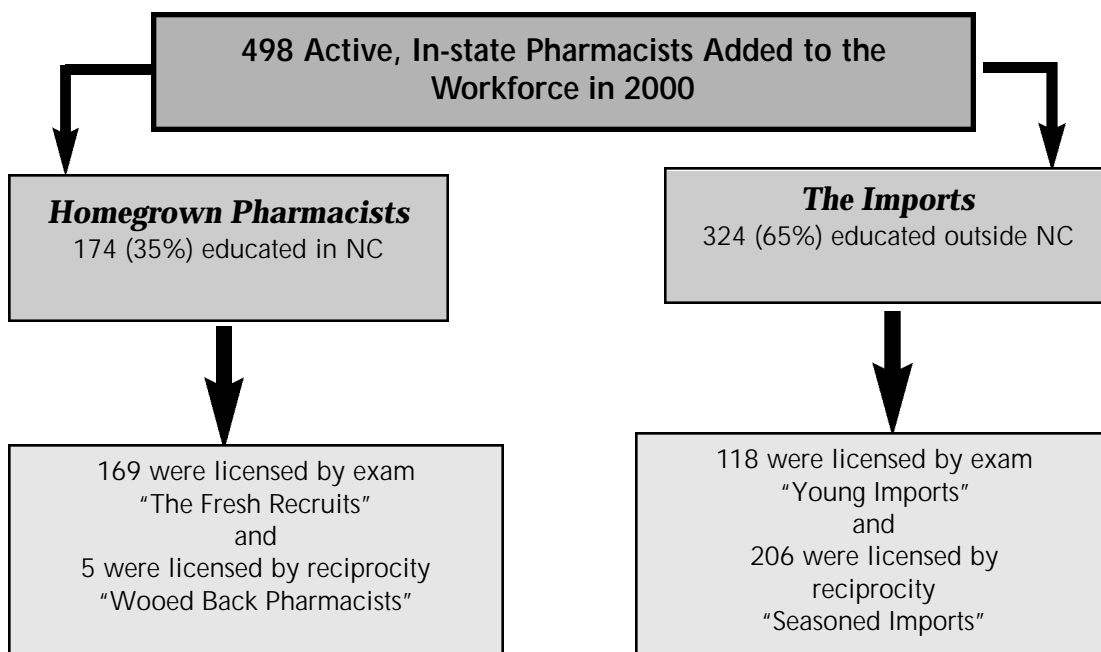
Figure 44. Breakdown of Active Pharmacists Added to Workforce Each Year Who Are NC Educated:  
UNC-CH vs. Campbell, 2000



Source: North Carolina Health Professions Data and Analysis System, 2002.

### ***10.4.2 Homegrown versus Imported Pharmacists: Pharmacists Added to the Workforce Between 1999 and 2000***

Pharmacists can become licensed in two ways: by exam and by reciprocity. The majority of individuals who take the exam are new graduates (some individuals who have been out-of-active practice may also take the exam but they are a very small minority). Individuals who become licensed by reciprocity are those pharmacists who have been actively practicing in other states. It is interesting to see that 117 (36%) of the pharmacists who were educated outside the state took the exam—this means that NC imported them immediately following completion of their educational programs.



***North Carolina educated pharmacists  
are more likely than graduates  
of programs outside the state  
to practice in rural and  
health professionals shortage areas.***

### 10.4.2 Homegrown versus Imported Pharmacist (continued)

- ◆ Further analysis of the 498 newly licensed pharmacists in 2000 reveals that (see Figure 45):
- ◆ Many of the state's pharmacists who were not North Carolina educated (i.e. the young and seasoned imports) were either educated in, or practiced in, Pennsylvania and South Carolina. Fourteen percent of the young imports were foreign graduates.
- ◆ The young imports are more likely than their NC counterparts to be practicing in a chain setting, suggesting that many of these individuals may be recruited directly from their programs by the chain industry.
- ◆ North Carolina educated pharmacists are more likely than graduates of programs outside the state to work in a non-metropolitan and health professional shortage areas.
- ◆ Pharmacists licensed by reciprocity are older and less likely to have the PharmD credential.

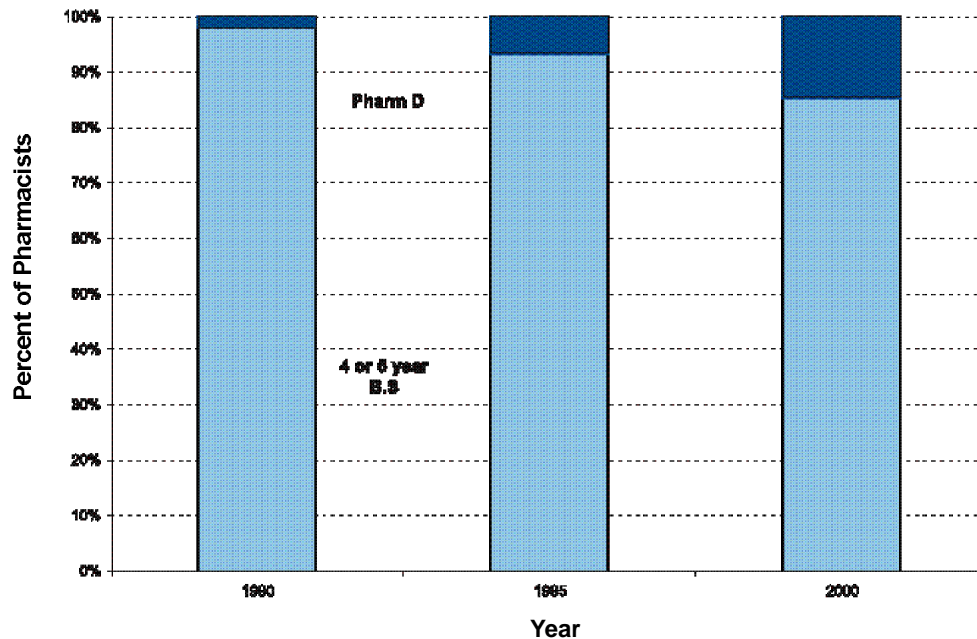
Figure 45. Characteristics of Pharmacists Added to NC Workforce, NC 2000

	<i>NC Educated</i>		<i>Educated Outside of NC</i>	
	<i>"The Fresh Recruits"</i>	<i>"Wooded Back Pharmacists"</i>	<i>"Young Imports"</i>	<i>"Seasoned Imports"</i>
<b>Number (and Reciprocity method)</b>	169 (by exam)	5 (by reciprocity)	118 (by exam)	206 (by reciprocity)
<b>Average Age</b>	28	35	28	37
<b>First License in NC</b>	75%	60%	91%	83%
<b>PharmD</b>	78%	20%	62%	11%
<b>Basic Education</b>	UNC-CH 63% Campbell 37%	UNC-CH 100%	PA 18 % Foreign 14 % SC 9 %	PA 13 % SC 11 % OH 7 % GA 7 %
<b>State of Reciprocity</b>	N/A	VA 40 % CA, PA, TN 20 % (each)	N/A	PA 11 % SC 11 % GA 8 %
<b>Graduated in 99/00</b>	75%	0%	82%	5%
<b>Staff Pharmacist or Pharmacy Manager/Employee</b>	80%	80%	87%	62%
<b>Employed in Chain</b>	48%	40%	64%	48%
<b>Practice in Non-MSA</b>	29%	60%	11%	17%
<b>Practice in HPSA (half or part county)</b>	61%	20%	59%	51%

### 10.4.3 Degree

- ◆ The percentage of the total workforce with the PharmD has been slowly increasing in the last decade (**Figure 46**).
- ◆ Of the new pharmacists added to the workforce, a slight majority (55%) have the BS (**Figure 47**).
- ◆ Many of the new pharmacists added to North Carolina's workforce graduated from BS programs. In 2000, 72% of pharmacists who were new to the NC workforce and educated outside the state, held the BS degree (**Figure 48**). The percentage of imported pharmacists holding the BS degree is likely to decrease in the future as BS-trained pharmacists age out of the workplace.

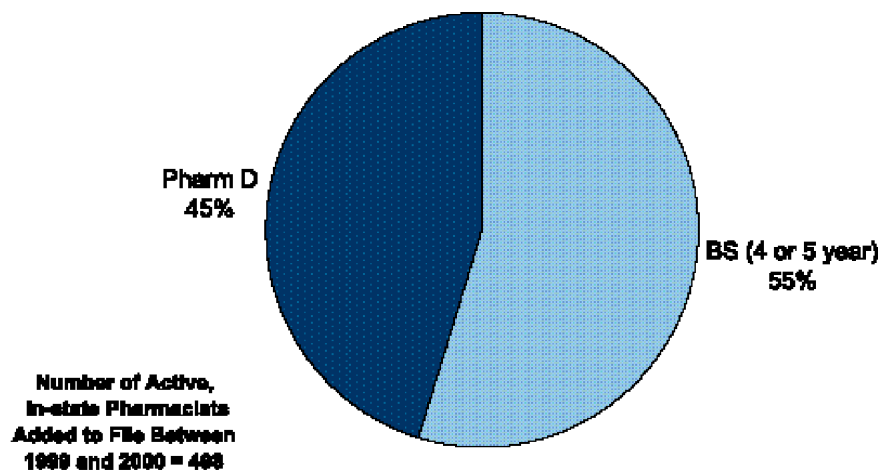
**Figure 46. Active In-State Pharmacists by Basic Education Degree, NC 1990-2000**



Note: Does not include pharmacists with an unknown educational degree or those who have a PhG/C/D from before 1940 or a DPh from Cuba.

Source: North Carolina Health Professions Data and Analysis System, 2002.

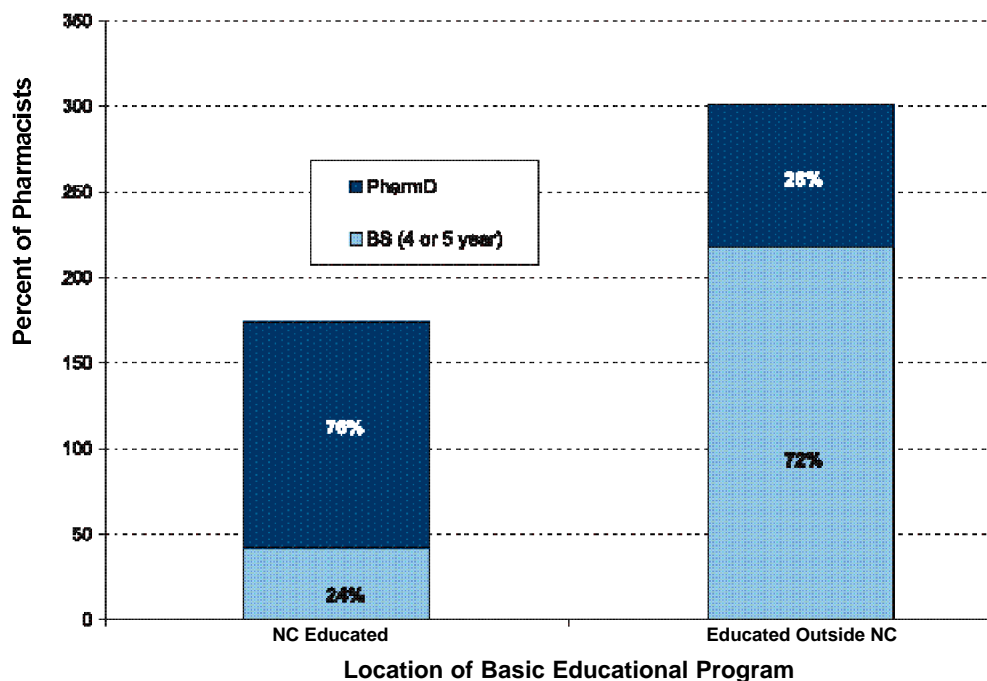
**Figure 47. Active In-State Pharmacists Added to NC Workforce Between 1999 and 2000: Basic Educational Degree**



Note: Education data were unavailable for 22 individuals.

Source: North Carolina Health Professions Data and Analysis System, 2002.

**Figure 48. Pharmacists Added to Workforce Basic Educational Degree By Location of Education Program, NC 2000**



Note: Data do not include one pharmacist holding a DPh from Cuba and 22 individuals educated outside NC for whom degree information is missing.

Source: North Carolina Health Professions Data and Analysis System, 2002.

# PHARMACY TECHNICIANS

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## Pharmacy Technicians

### 11.1 *Job Function and Role*

- ◆ A pharmacy technician works under the supervision of a pharmacist. The majority of pharmacy technicians in North Carolina work in hospital pharmacies, retail pharmacies, and home health care pharmacies.
- ◆ In retail settings, pharmacy technicians may stock and inventory prescription and over-the-counter medications, maintain written or computerized patient medication records, count or pour medications into dispensing containers, type prescription labels, prepare insurance claim forms, and manage the cash register. In hospitals, they may have additional responsibilities such as assembling a 24-hour supply of medication for each patient, repackaging medications, preparing commercially unavailable prescriptions, preparing sterile intravenous medications, maintaining nursing station medications and operating computerized dispensing and/or robotic machinery.
- ◆ A pharmacy technician's work must be checked by a pharmacist before a medication can be dispensed to a patient.
- ◆ A survey of community pharmacies completed in 1996, and then repeated in 1999, revealed that pharmacists who were aided by pharmacy technicians spent less time devoted to dealing with third-party plans, administrators, and formulary requirements than did pharmacists who did not utilize technicians. Those with technician support spent 9.5% of the day (work day=9.6 hours) dealing with third-party insurance issues, whereas pharmacists lacking technician support spent 11.8% of the day on these tasks (Drug Topics, 1996).
- ◆ According to Arthur Andersen's *Pharmacy Activity Cost and Productivity Study*, over two-third's of a technician's time in retail pharmacies is spent on presenting, processing and preparing prescriptions for patients.

### 11.2 *Regulation*

- ◆ Pharmacy technicians are regulated at the state level and certification is available through the national association, The Pharmacy Technician Certification Board (PTCB). Documentation, including registration, licensure or certification, is required in approximately 50% of states. Sixty-nine percent of states enforce a technician-to-licensed pharmacist ratio (HRSA, 2000).
- ◆ According to the Bureau of Labor Statistics, an estimated 5,990 pharmacy technicians were employed in North Carolina during 2000 (BLS, 2000). The number of technicians that are actually employed in the North Carolina workforce will soon become clearer because the General Assembly recently passed regulations requiring that pharmacy technicians register with the North Carolina Board of Pharmacy as of January 1st 2002 (G.S. 90-85.21(a)). As of January 2002, the Board had registered 2,500 technicians.



### **11.2 Regulation (continued)**

- ◆ Registration is an important first step in the definition, standardization and regulation of pharmacy technicians in North Carolina. Current regulations governing the pharmacy technician have been described as somewhat vague and will need to be revised and augmented as the profession gains momentum and organization.
- ◆ Pharmacists in North Carolina may supervise up to two registered pharmacy technicians. The number of PTCB certified pharmacy technicians a pharmacist may supervise is not limited.

### **11.3 Education**

There are no federal educational or training requirements for pharmacy technicians. As of July 1, 2002, North Carolina pharmacy technicians must, however, have completed a training program (either through a formal education or on-the-job training program) that includes pharmacy terminology, pharmacy calculations, dispensing systems and labeling requirements, pharmacy laws and regulations, record keeping and documentation and the proper handling and storage of medications (NC Board of Pharmacy Newsletter, April 2002, Item 1155).

In North Carolina, there are a number of educational avenues to become a pharmacy technician. Formal community college educational training programs last one to two years, and include laboratory, clinical and classroom components that prepare students for careers in clinical or retail pharmacies. Programs are offered at the following community colleges in North Carolina:

- Brunswick Community College
- Caldwell Community College & Technical Institute
- Cape Fear Community College
- Davidson County Community College
- Durham Technical Community College
- Fayetteville Technical Community College
- James Sprunt Community College
- Nash Community College

A number of community colleges also offer short-term certificates through continuing education departments.

Technician training can also be pursued through an on-the-job training program in a hospital or retail pharmacy under the direction of a pharmacist manager. On-the-job training programs vary in length and scope.



# PHARMACIST EMPLOYMENT LOCATIONS

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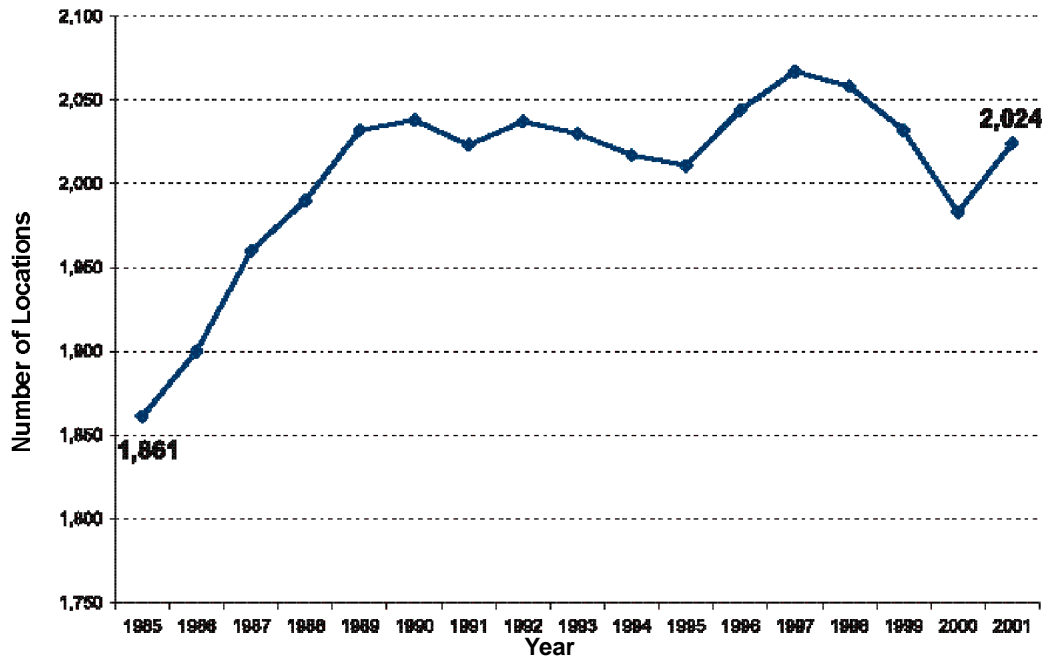
## Pharmacist Employment Locations

### ***12.1 Historical Trends in the Number of Pharmacist Employment Locations***

- ◆ All pharmacies in North Carolina are required to annually obtain a permit to practice from the North Carolina Board of Pharmacy. Pharmacies that operate outside North Carolina but ship, mail or deliver drugs into the state are also required to annually obtain a permit from the Board. These permit data provide important information on the employment locations of pharmacists in North Carolina.
- ◆ The number of pharmacies in the state has shown a varied trend with alternating periods of growth and decline (**Figure 49**).
- ◆ **Figure 50** shows the familiar trend toward chain and “other” type employment settings and away from independents over the past twenty years.

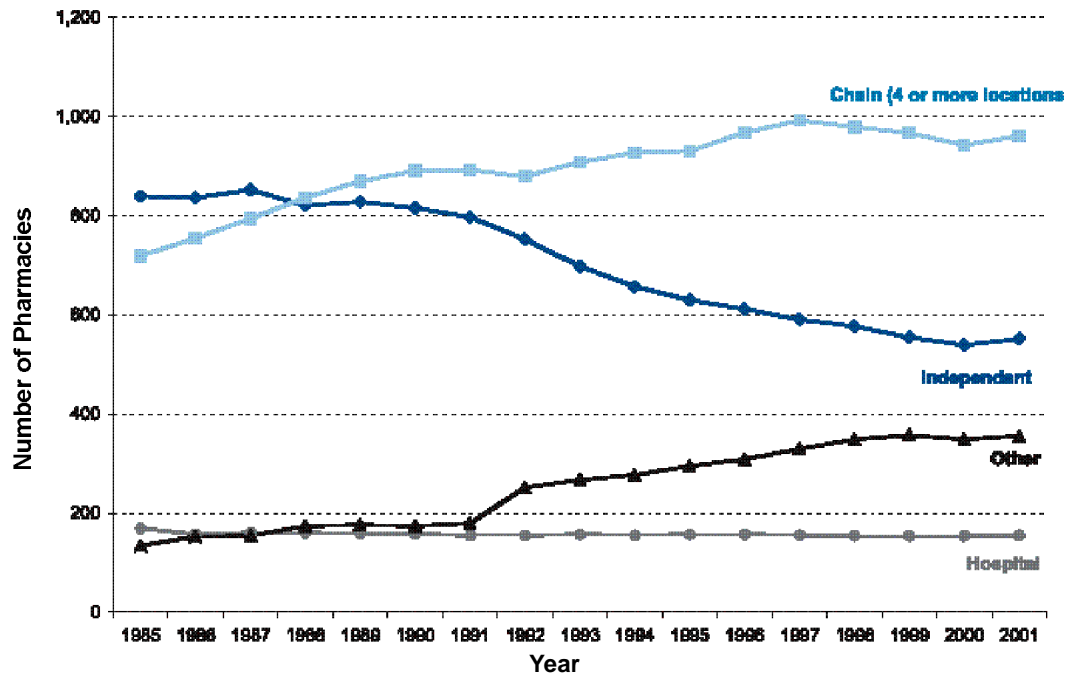
***In 1985, more pharmacists were employed in independent pharmacies than in chains. Since 1985, the number of pharmacists employed in independent pharmacies has declined significantly and the number working in “other” non-traditional settings such as pharmaceutical companies, clinical research organizations and physician offices has increased.***

Figure 49. Total In-State Locations Employing Pharmacists, NC 1985-2001



Note: Data are for locations with permits on roster with the NC Board of Pharmacy as of September 30th of each year.  
Source: North Carolina Health Professions Data and Analysis System, 2002.

Figure 50. In-State Locations Employing Pharmacists, by Type, 1985-2001



Note: Data are for locations with permits on roster with the NC Board of Pharmacy as of September 30th of each year.  
Source: North Carolina Health Professions Data and Analysis System, 2002.

### ***12.2 Geographic Distribution of Pharmacies in North Carolina***

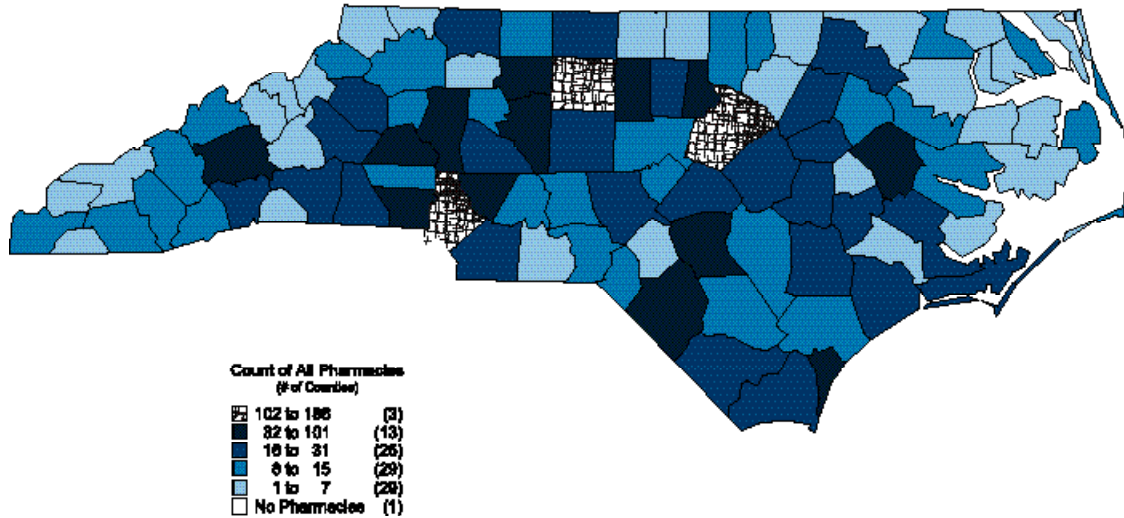
- ◆ In 2000, North Carolina's eastern and western counties had smaller numbers of locations employing pharmacists than other parts of the state (Figure 51).
- ◆ Figure 52 shows that the "other", non-traditional type pharmacist locations are predominantly located in major metropolitan areas (i.e. Asheville, the Triangle, the Triad, and Wilmington, etc).
- ◆ Camden is the only county in North Carolina that does not have a retail pharmacy (Figure 53). In 2000, Mecklenberg, Wake and Guilford counties had the highest number of retail pharmacies with 142, 110 and 74 establishments respectively.
- ◆ Figure 54 shows that there is little variation in the county level counts of retail pharmacies relative to population. The vast majority of counties (91) have between one and three retail pharmacies per 10,000 population.

### ***12.3 Workload for Retail Pharmacies and Pharmacists***

- ◆ The number of retail prescriptions dispensed per retail pharmacy has increased 106% in the past decade, from 30,026 prescriptions dispensed annually in 1991 to 62,000 prescriptions annually in 2000 (Figure 55).
- ◆ Slightly more than 30% of North Carolina counties average just one to two retail pharmacists per retail pharmacy (Figure 56).

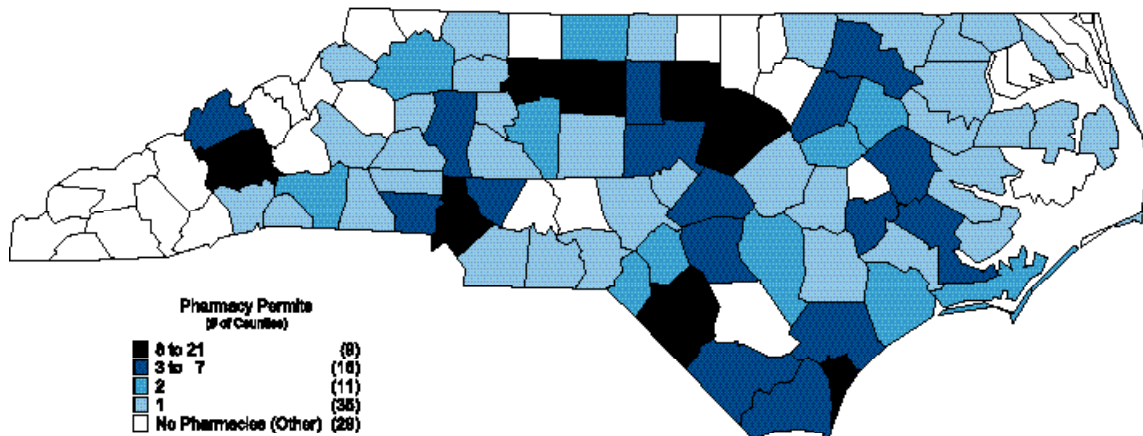
***If pharmacist services become more difficult to access at local storefronts, due to closures or reduced hours, customers may turn to out-of-state mail-order operations as a means to obtain their prescriptions, resulting in a loss of tax revenue for the state.***

Figure 51. Locations Employing Pharmacists, by NC County, 2000



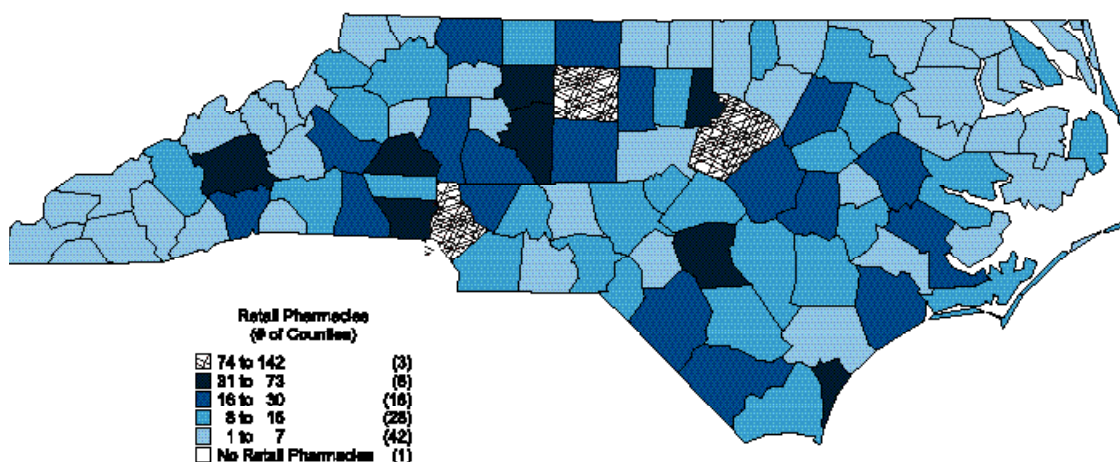
Note: Data are for locations with permits on roster with the NC Board of Pharmacy as of September 30, 2000.  
 Source: North Carolina Health Professions Data and Analysis System, 2002.  
 Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
 Cecil G. Sheps Center for Health Services Research.

Figure 52. "Other" Type Pharmacist Employment Locations, by NC County, 2000



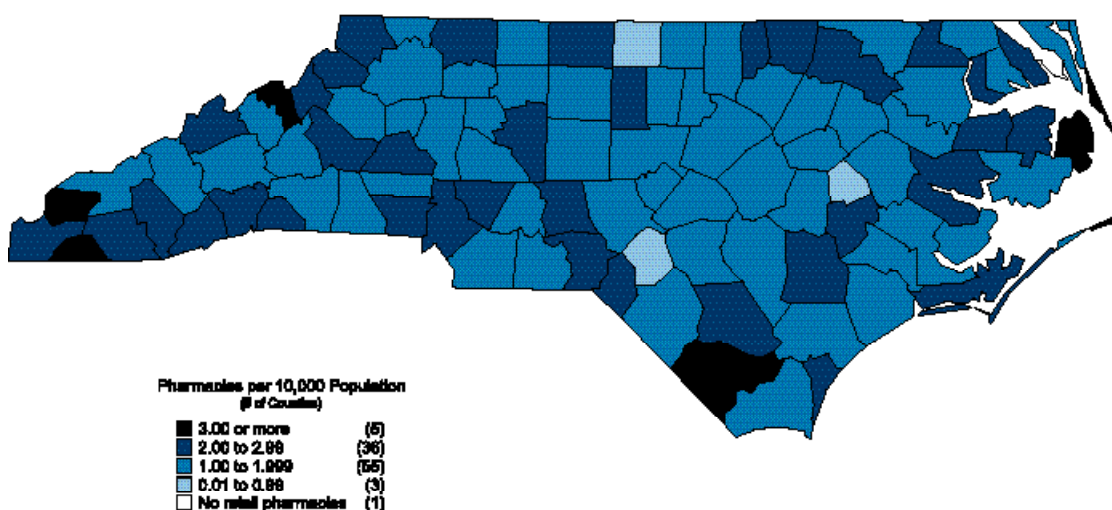
Note: Data are for locations with permits on roster with the NC Board of Pharmacy as of September 30, 2000.  
 Source: North Carolina Health Professions Data and Analysis System, 2002.  
 Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
 Cecil G. Sheps Center for Health Services Research.

Figure 53. Retail Pharmacies, by NC County, 2001



Note: Data are for locations with permits on roster with the NC Board of Pharmacy as of September 30, 2000.  
 Source: North Carolina Health Professions Data and Analysis System, 2002.  
 Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
 Cecil G. Sheps Center for Health Services Research.

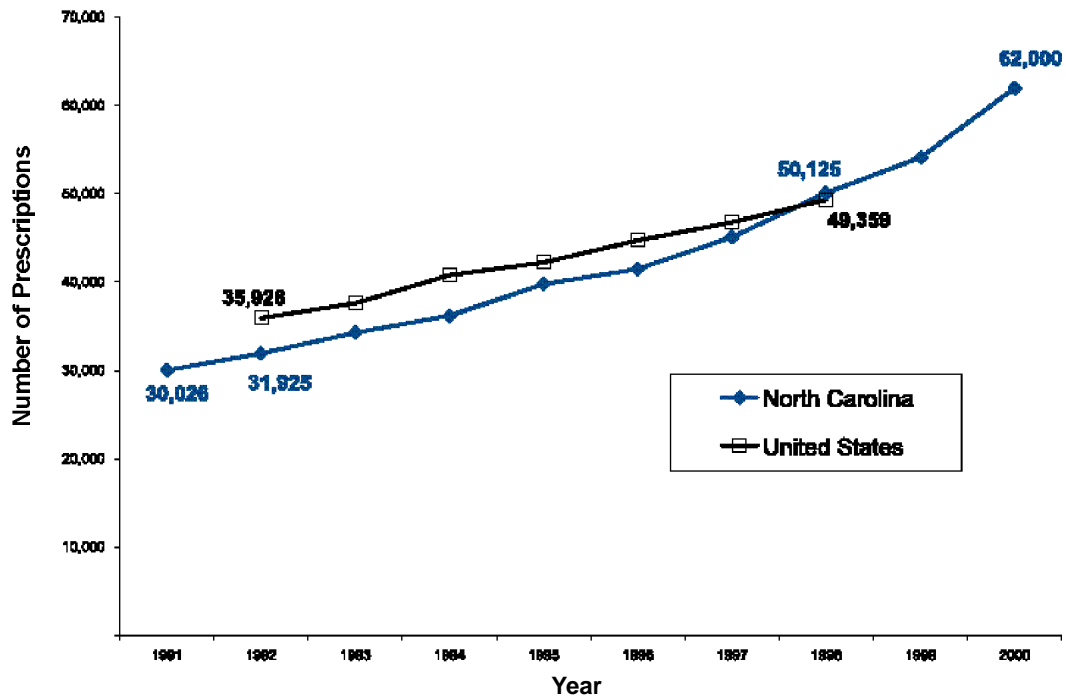
Figure 54. Retail Pharmacies, per 10,000 Population, by NC County, 2000



Note: Pharmacy data are for locations with permits on roster with the NC Board of Pharmacy as of September 30, 2000.  
 Source: North Carolina Health Professions Data and Analysis System;  
 North Carolina State Data Center (Log Into North Carolina), 2002.  
 Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
 Cecil G. Sheps Center for Health Services Research.

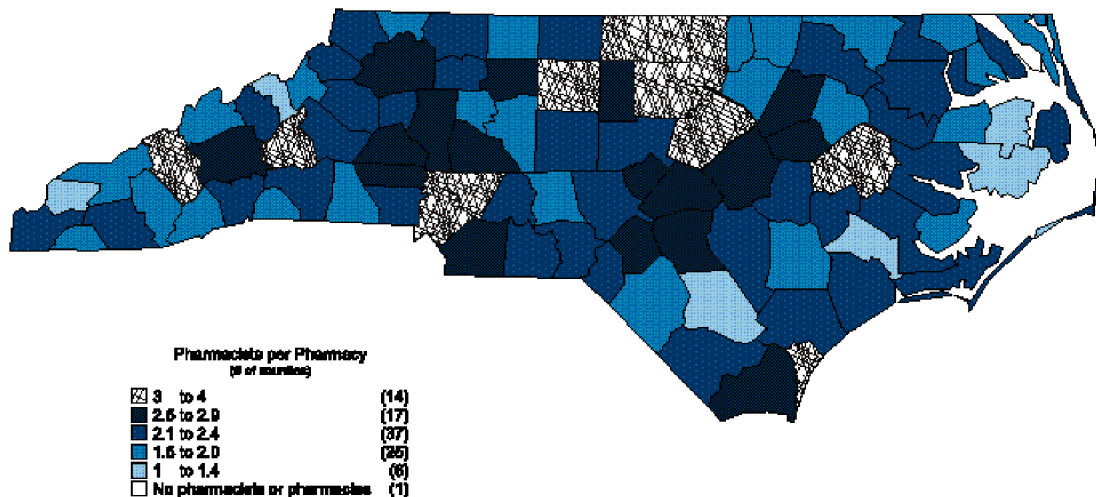


Figure 55. Annual Retail Prescriptions Dispensed per Retail Pharmacy, US and NC 1991-2000



Source: NC prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed. US data from the National Association of Chain Drugstores, Industry Profile, 1999 as reported in *The Pharmacist Workforce: A Study of the Supply and Demand for Pharmacists*, HRSA, 2000. North Carolina pharmacy data are for locations with permits on roster with the NC Board of Pharmacy as of September 30 of each year.

Figure 56. Retail Pharmacists per Retail Pharmacy, by NC County, 2000



Note: Pharmacy data are for locations with permits on roster with the NC Board of Pharmacy as of September 30, 2000.  
Source: North Carolina Health Professions Data and Analysis System, 2002.  
Produced by: North Carolina Health Professions Data and Analysis System, 2002.  
Cecil G. Sheps Center for Health Services Research.



# THE RURAL PERSPECTIVE

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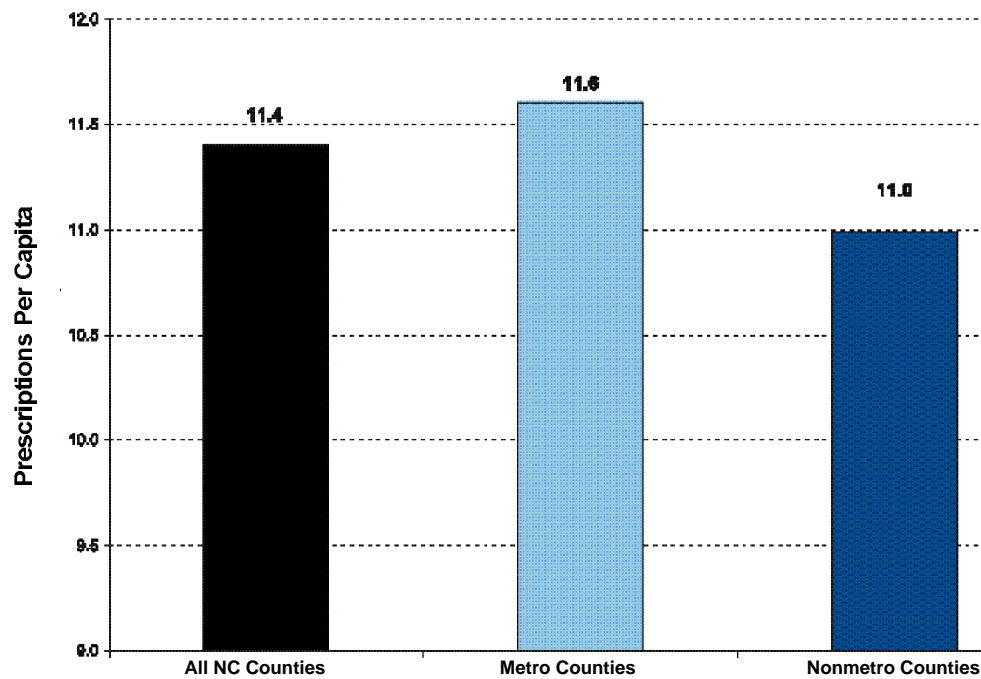
## The Rural Perspective

### ***13.1 Pharmacist Demand and Supply in Rural Areas***

Thus far this report has focused on imbalances in the overall supply and demand for pharmacists in the state. This section will provide a brief overview of the effect of the current imbalance in rural areas of North Carolina.

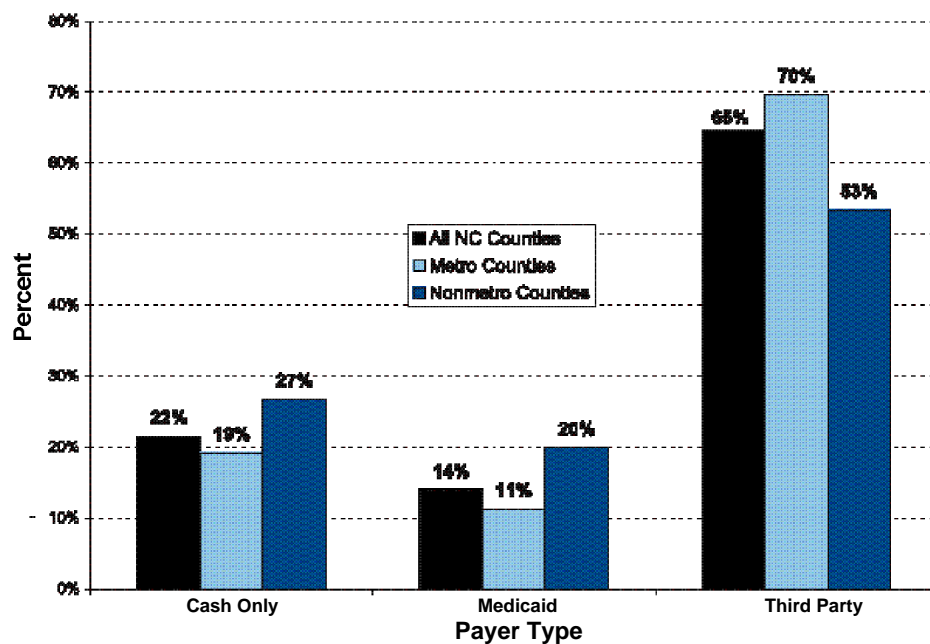
- ◆ A recent study of rural pharmacy services in Minnesota, North Dakota and South Dakota did not specifically address pharmacist supply issues but “identified the shortage of rural pharmacists as a key policy issue” (Casey, Klingner and Moscovice 2001, page 61). The 2000 HRSA report on the pharmacist workforce suggested that rural areas often face unique challenges in recruiting and retaining pharmacists (*The Pharmacist Workforce: A Study of the Supply and Demand for Pharmacists*, HRSA 2000). It is unclear how the relatively recent move to the PharmD as the minimum credential for entry into the workforce, the expansion of the pharmacist’s role to include disease state management and patient counseling, changing workforce demographics and increased opportunities for pharmacists to work in non-traditional, non-dispensing roles will affect access to rural pharmacy services.
- ◆ On average, individuals living in nonmetropolitan North Carolina counties are dispensed fewer prescriptions per person (11.0 prescriptions) each year than individuals living in metropolitan counties (11.6 prescriptions) See **Figure 57**. There are also important differences in reimbursement patterns for rural pharmacists with a greater proportion of retail prescriptions being paid for by Medicaid (20% in rural vs. 11% in urban) and cash (27% in rural vs 19% in urban) See **Figure 58**. These differences likely reflect the fact that rural Medicare beneficiaries are less likely to have prescription drug coverage than their urban counterparts and are more likely to pay for prescriptions out-of-pocket. These data suggest that the lower numbers of prescriptions dispensed per population in rural areas may reflect a pent-up demand for prescription drugs.

**Figure 57. Annual Retail Prescriptions per Capita: Metropolitan vs. Nonmetropolitan Counties, NC 2000**



Source: NC prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed. Population data are from the North Carolina State Data Center (Log Into North Carolina).

**Figure 58. Percent of Retail Prescriptions Paid by Primary Payer Type: Metropolitan vs. Nonmetropolitan Counties, NC 2000**



Source: NC prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed.

### ***13.2 Rural Retail Pharmacy and Pharmacist Workload***

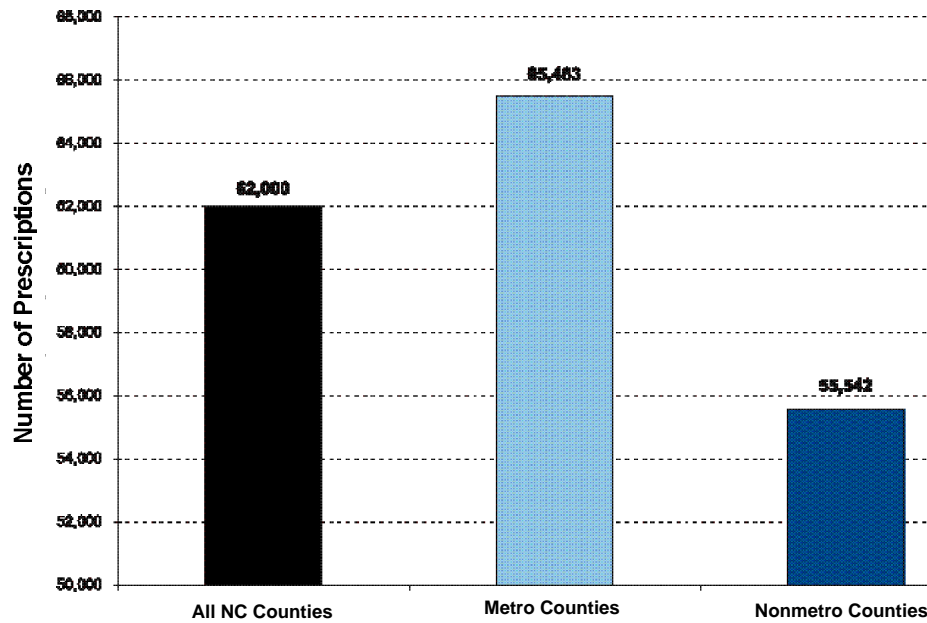
Rural retail pharmacies dispensed 15.2% fewer prescriptions in 2000 than urban retail pharmacies (**Figure 59**). In the same year, retail pharmacists in rural North Carolina counties dispensed 4.3% more prescriptions than the average pharmacist working in urban counties (**Figure 60**).

Assuming a 40-hour work week for both settings, this translates into 12.4 prescriptions per hour for the rural pharmacist and 11.9 per hour for the urban pharmacist. Rural pharmacists may be working longer hours due to reduced availability of relief coverage.

The difference in annual prescriptions dispensed per pharmacy means lower revenue due to a smaller dispensing volume. Lower revenues increase rural pharmacies' vulnerability to economic downturns and changes in prescription drug benefit reimbursement policies. It also decreases a rural pharmacy's ability to offer increased compensation to pharmacists as a recruitment/retention tool.

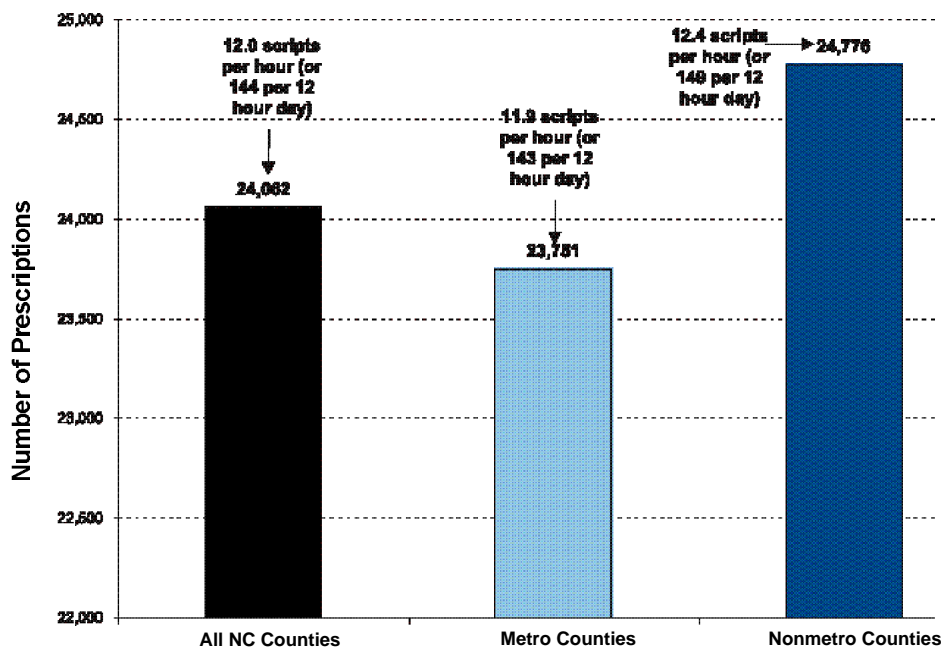
***In rural communities that lack a hospital or health department, there are fewer health professionals than in urban areas. Pharmacists are often an important provider of health care information. As a result, the loss of a pharmacy or pharmacist in a rural community is of critical concern.***

**Figure 59. Annual Retail Prescriptions Dispensed per Retail Pharmacy: Metropolitan vs. Nonmetropolitan Counties, NC 2000**



Source: NC prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed. Pharmacy data are for locations with permits on roster with the NC Board of Pharmacy as of September 30, 2000.

**Figure 60. Annual Retail Prescriptions Dispensed per Active Retail Pharmacist: Metropolitan vs. Nonmetropolitan Counties, NC 2000**

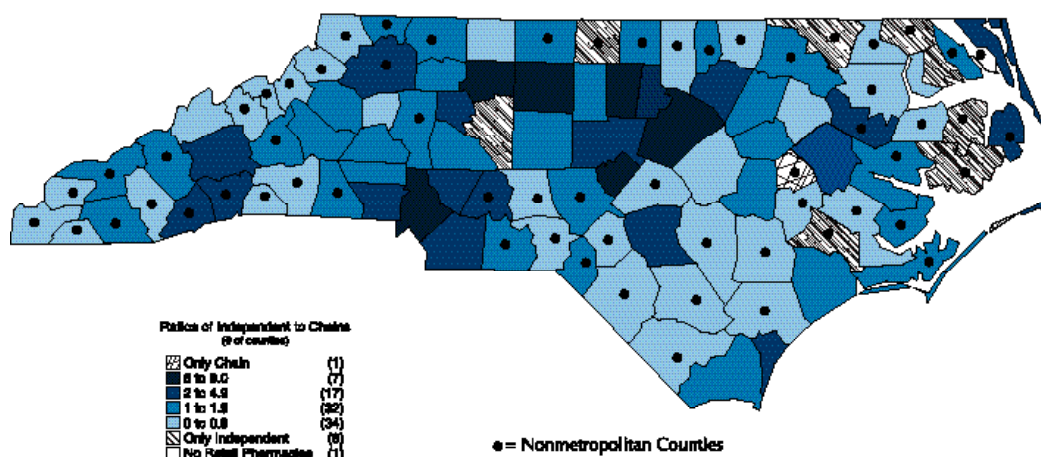


Source: NC prescription data are from IMS Health (*Retail Method of Payment*) and include retail dispensed prescriptions only. Data do not include prescriptions dispensed at hospitals, clinics, long-term care facilities or mail-order operations. Data include new prescriptions and refills dispensed. Pharmacist data are from the NC Health Professions Data System.

### 13.3 Pharmacist Supply, Job Type and Employment Settings

- ◆ Nationally, rural areas are often at a disadvantage in attracting adequate numbers of healthcare providers. North Carolina is no exception. On average in 2000, there were 6.5 pharmacists in rural areas, versus 9.5 pharmacists per 10,000 population in urban areas of the state.
- ◆ Rural areas historically have a higher ratio of independent to chain pharmacies and many independents have a solo pharmacist/owner (HRSA, 2000). **Figure 61** shows the relative dominance of independent versus chain pharmacies for North Carolina counties. Independents are still the main type of pharmacy available in rural counties, where the population is smaller: there are fewer pharmacies and fewer pharmacists to staff them. Chains are dominant in the metropolitan counties of the state, where population density is higher and there are more pharmacists per population.

Figure 61. Ratio of Chain Pharmacies to Independent Pharmacies, by NC County, 2000



Note: Pharmacy data are for locations with permits on roster with the NC Board of Pharmacy as of September 30, 2000.

Source: NC Health Professions Data and Analysis System, 2002.

Produced by: North Carolina Health Professions Data and Analysis System, 2002.

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### 13.3 Pharmacist Supply, etc. (continued)

- ◆ It follows then that pharmacists in rural North Carolina counties are more likely to be working in independent pharmacies (30%) than pharmacists in urban counties (12%) (**Figure 62**). They are also less likely to be in non-traditional, or "other" type employment settings (7% compared to 14%). Both of these conditions may be due to a lower level of penetration by both chain pharmacies and the pharmaceutical industry into rural areas.
- ◆ Pharmacists working in rural counties of North Carolina in 2000 were more likely to be sole-owners or partner managers (11%) than their urban counterparts (4%) (**Figure 63**). They also were less likely to be working in other non-traditional "other" pharmacy roles in urban counties of the state.

**Figure 62. Employment Setting of NC Pharmacists: Metropolitan vs. Nonmetropolitan Counties, 2000**

Setting	Nonmetropolitan	Metropolitan
Independent Drug Stores	30%	12%
Chain Drug Stores	39%	39%
Nursing Home	2%	2%
Hospital	18%	23%
Government	0%	0%
Manufacturing	0%	2%
Teaching	1%	1%
Other	7%	14%
Sales	0%	1%
Research	0%	2%
Health Department	0%	1%
Unknown	4%	4%
<b>Total</b>	<b>100%</b>	<b>100%</b>

Note: Data are for active, in-state pharmacists. Employment setting data are missing for 69 pharmacists practicing in nonmetropolitan counties and 213 pharmacists in metropolitan counties.

Source: North Carolina Health Professions Data and Analysis System, 2002.

**Figure 63. Job Type for NC Pharmacists: Metropolitan vs. Nonmetropolitan Counties, 2000**

Job Type	Nonmetropolitan	Metropolitan
Sole Owner-Manager	7%	3%
Partner/Manager	4%	1%
Partner/Nonmanager	1%	0%
Supervisor	0%	1%
Pharm Mgr/Employee	28%	23%
Staff	43%	47%
Volunteer	0%	0%
Sales	1%	1%
Manufacturing	0%	1%
Consultant	1%	1%
Relief	8%	7%
Other	3%	12%
LTC	2%	1%
Unknown	1%	2%
<b>Total</b>	<b>100%</b>	<b>100%</b>

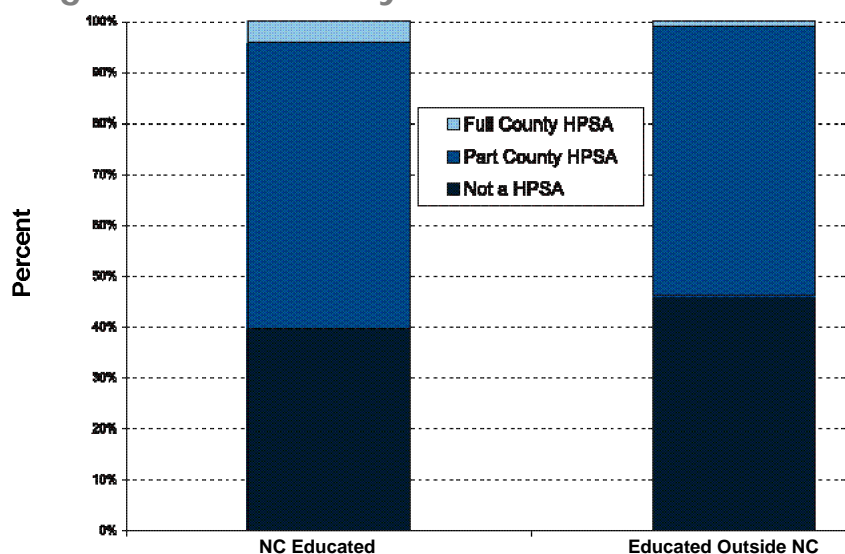
Note: Data are for active, in-state pharmacists. Job type data are missing for 11 pharmacists practicing in nonmetropolitan counties and 82 pharmacists in metropolitan counties.

Source: North Carolina Health Professions Data and Analysis System, 2002.

### 13.4 Education

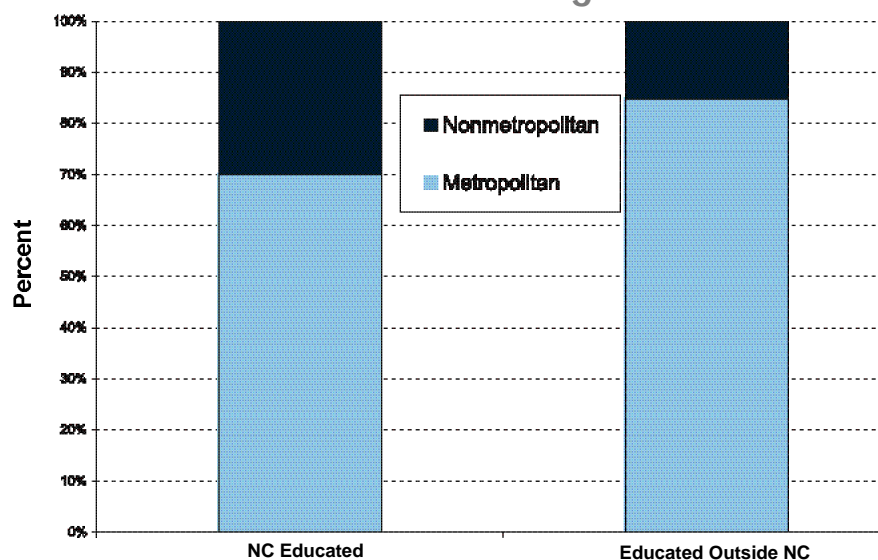
- ◆ **Figure 64** shows that NC graduates are not much more likely to practice in a health professional shortage area than pharmacists who received their pharmacy education outside the state.
- ◆ **Figure 65** shows that graduates from NC pharmacy education programs are more likely than those educated outside the state to practice in a non-metropolitan area.

**Figure 64. Pharmacists Added to the NC Workforce in 2000: Employment Location's Shortage Designation Status by Location of Education Program**



Source: North Carolina Health Professions Data and Analysis System, 2002.

**Figure 65. Pharmacists Added to the NC Workforce in 2000: Employment Location by Location of Education Program**



Source: North Carolina Health Professions Data and Analysis System, 2002.

## Comments from the Pharmacy Workforce Panel of Experts

On March 28, 2002 a panel of key pharmacy workforce stakeholders met at the Sheps Center for Health Services Research to discuss the interim findings of the Sheps Center's Pharmacist Workforce Study. The panel was comprised of representatives from the pharmacist and pharmacy technician workforce and included practitioners, educators, employers, and regulators. A preliminary draft of this report was distributed to panel members who were asked to assess whether an imbalance exists between the demand for, and supply of, pharmacists in North Carolina, and if there are particular geographic areas of the state or employment settings that may be experiencing imbalances more profoundly than others. Additionally, the panel discussed and identified policy options to address workforce issues raised by the study.

Panel members unanimously felt that there is an imbalance in the supply of, and demand for, pharmacists in North Carolina. More specifically, the panel identified a shortage of dispensing pharmacists in North Carolina's rural areas, both in retail and hospital settings. The panel agreed a simple increase in the number of pharmacists would not solve the imbalance for a variety of reasons, which include: widespread dissatisfaction with retail positions, growing availability of non-dispensing roles that make better use of pharmacists' training, increased availability of higher paying jobs in other sectors, and larger numbers of PharmD graduates going into residencies.

### *The Demand Side*

- ◆ Panel members felt the increased volume of prescriptions dispensed by the state's pharmacists could be attributed to rapid population growth and to a fundamental shift in the role of drug therapy in health care.
- ◆ There was general consensus that pent-up demand for prescriptions in the Medicare population exists. If federal or state legislators institute a prescription drug coverage plan for the elderly, it could mean a significant increase in the demand for prescriptions from Medicare beneficiaries who currently lack prescription benefits. However, panel members expressed doubt that plans for prescription drug benefits currently under discussion, which include income limitations and maximum benefits, will be far reaching enough to make a substantial impact on demand.
- ◆ Changes in health care insurance coverage have also pushed up prescription volume. Third-party payers require prescriptions to be filled more often for smaller quantities. Additionally, the panel agreed that decreasing reimbursements from third-party payers and reductions in

Medicaid payments contribute to lower margins for pharmacies and put pressure on pharmacists to increase dispensing volumes in order to maintain profitability. For rural pharmacies, which have lower dispensing volumes and a larger percentage of payments from Medicaid, staying economically viable is becoming increasingly difficult.

- ◆ In rural areas, where fewer health care professionals practice, pharmacists play a larger clinical and patient counseling role. In communities that do not have a hospital or health department, the pharmacies are often the first place people go for health care. As a result, the potential loss of a rural pharmacy or pharmacist is a critical concern.

### **The Supply Side: NC's Pharmacist Workforce** ***Changing Roles***

Panelists recognized that changing pharmacist roles, from strictly dispensing roles to more clinical functions, have contributed to the imbalance in the supply of, and demand for pharmacists. New and changing roles have increased the need for pharmacists in hospitals and have opened up opportunities for non-traditional, non-dispensing careers (e.g. 'ask-the-pharmacist', clinical trials etc.) resulting in a reduction in the number of pharmacists going into retail. The group attributed this shift to the growing importance of pharmaceuticals in health care, the emergent need for medication management, and the strong emphasis on clinical training in current pharmacist training programs. Nearly all pharmacy programs across the United States have recently upgraded to the PharmD from the bachelor's degree. The group acknowledged the inherent dilemma created by training pharmacists to meet demands of clinical roles while the market need continues for pharmacists in retail settings, where the emphasis is increasingly on dispensing productivity and administrative tasks.

#### **Hospital Pharmacists**

- ◆ Hospital pharmacists have experienced a rapid increase in their work volume and intensity in the last decade. Hospital pharmacists are playing ever more important roles in the management of medication and clinical care. There has been increased recognition in the value of the pharmacist's role in preventing adverse drug reactions. The acuity of patients in hospitals has increased over the years. Sicker patients are requiring more medications and medications of increasing complexity. These patients require increased involvement from all healthcare providers, including pharmacists. As one practitioner noted, "The roles of hospital pharmacists have changed. In the eighties, we were merely dispensing prescriptions. Today, we are still dispensing, but now we are performing disease management, continuity of care programs, etc."

## Changing Roles (continued)

### Retail Pharmacists

- ◆ In the retail setting, pharmacists with training in clinical functions and medication management are frequently unable to use this training. Although the average retail pharmacist works fewer hours per week than two decades ago (down from 44 hours to 37) demands on those pharmacists have both increased and intensified the work. The number of prescriptions filled annually by an average retail pharmacist, who is now more likely to be an employee rather than an owner or manager, has increased 57% in the last decade. High volumes of dispensing and administrative tasks necessary to maintain revenue take up the majority of a retail pharmacist's day. As a result, contact with patients is minimal.
- ◆ Panelists acknowledged the disjunction between the pharmacist role, as taught in pharmacy school, and the current-day reality. Lack of patient contact and utilization of medication management training results in job dissatisfaction for the average retail pharmacist. As one educator said, "If you talked to the average pharmacists today, they do not feel like they are doing what they were trained to do. When we were trained ... it was for a distributive function. Now, they are not happy because they are too bogged down in their technical duties, they want to be out with patients."
- ◆ There is significant concern that widespread frustration results in high turnover rates and causes attrition from the profession. Pharmacists see a discrepancy between pharmacy practice taught in pharmacy programs and pharmacy practice in the real world. In some instances, this has led to burnout. Another detrimental effect is the possibility that new graduates may be discouraged from entering dispensing roles. Panelists expressed doubts that the shortage of retail pharmacists can be fixed without addressing the issue of job satisfaction.

### Residencies

- ◆ Progressively larger portions of PharmD graduates pursue residencies upon graduation. A possible result is the profession's growing clinical orientation and shift away from dispensing. PharmDs are looking to refine and specialize their skills and to set themselves apart from other graduates. Employers, such as hospitals, are looking for graduates with more real-world experience in areas such as patient care.
- ◆ The growing trend of post-graduation residencies supports the argument that an increase in enrollments to pharmacy schools alone will not meet the need for dispensing pharmacists in retail settings. Most residencies are in hospitals -- and, although most graduates of hospital residencies will ultimately enter practice in a hospital -- immediate entry into the workforce is delayed by the residency's duration. Furthermore, many residency graduates will seek non-dispensing positions as administrators and clinicians.

***Indicators of Inadequate Supply***

- ◆ Panel members shared anecdotes illustrating the imbalance in the supply of pharmacists in areas of the state. There were examples of persistent vacancies and pharmacies having to close early because shifts were not covered. Stores that were once open for first, second and third shifts have had to reduce hours because of difficulty staffing the pharmacist positions. One panelist noted that "...the danger of the pharmacist not showing up is that there are drugs that are ready to go and patients that need to pick them up, but can't get them. That's a public health and safety issue that I think does not jump out of the data."
- ◆ Participants expressed concerns about rapidly increasing salaries and the difficulties employers are having recruiting pharmacists to work in retail settings. Rising salaries were viewed as a shortage indicator and partly attributed to the abundance of other well-paying non-retail and non-dispensing positions available for trained pharmacists in what has been, until recently, a strong economy. Compensation is of particular concern for the economic viability of small, rural, independent and hospital pharmacies, which may not be able to offer salaries high enough to attract pharmacist staff in a highly competitive market. Even with large percentages of market share, some rural pharmacies have difficulty in attracting new pharmacists to replace retiring pharmacists.

***Additional Consequences of Imbalance***

- ◆ Another serious consequence of having an insufficient supply of dispensing pharmacists is the lack of time spent counseling patients. Pharmacists overburdened with high volumes of dispensing and administrative tasks are frequently unable to spend adequate time counseling patients and scrutinizing prescriptions to prevent possible adverse drug reactions.
- ◆ Additionally, if pharmacist services become more difficult to access at local storefronts, customers will turn to other methods to obtain prescriptions. Panelists noted that North Carolina could lose potential tax revenues from local businesses as more and more people choose to obtain prescriptions through out-of-state mail-order pharmacies.

***Solutions to Imbalance*****◆ Improving economic viability of non-dispensing roles**

The panel recognized there is an unmet need for pharmacists to fill non-dispensing roles, such as medication management and patient counseling in North Carolina. They acknowledged that pharmacists are being trained to meet these needs, but the current system does not reward or encourage counseling. Pharmacists are generally not reimbursed for patient counseling or other medication management, and economic mechanisms must be established to make this critical role viable from a business standpoint. One panelist explained, "Even if it is not about money, it is about money. We need to make some of the things that pharmacists are trained to do financially viable. The thing that pharmacists do brings in money. If setting up disease management programs brings in more money than filling prescriptions -- that would be the business to set up. You cannot sustain a business that is not going to make any money. You have to ensure that there is reimbursement for it somewhere."

- ◆ To address pharmacists' dissatisfaction with work conditions in retail settings, pharmacists, pharmacies and policy-makers must continue to support the best practices and successful models of community pharmacies which allow pharmacists to use the breadth of their training. The panel advocated sharing and supporting models of non-dispensing functions that can illustrate the monetary benefits of pharmacist services to overall systems. It will be necessary to address the issue of redistribution of savings, where a program (or insurance company) may spend more on its pharmaceutical budget, but as a result, spends far less in other types of patient care. An example would be medication management programs for asthma or diabetes. A panelist noted, "The Asheville [Asheville pediatric-asthma management] project is still saving about \$1000 per patient/year. It continues to demonstrate that there is a financial benefit. We would show that drug use goes up, but you are saving costs in other areas. If you are only looking at a drug budget, you don't see the money saved."

**◆ Increased Utilization of Pharmacy Technicians**

The utilization of pharmacy technicians varies widely across North Carolina. The multidisciplinary approach in which pharmacist technicians work alongside pharmacists has been more widely adopted in hospital pharmacies and more in some retail chain pharmacies in North Carolina than others. The panel agreed that one short-term solution to the shortage of dispensing pharmacists is to expand the utilization of pharmacy technicians in retail settings.

- ◆ The use of technicians would allow pharmacists to do the kind of work that they have been trained for in PharmD programs, such as patient

counseling and disease management. These services are increasingly needed as the role of drug therapy in health care grows. A panelist explained, "There are so many things that the pharmacist cannot do, like patient counseling and disease management, because they are busy doing all of the things that they have to do. The person with nearly no training is in contact with the patient. The technician can easily do everything behind the counter and then the pharmacist can interface with the patient."

◆ **Professionalization & Standardization**

The panel strongly agreed that the professionalization of pharmacy technicians is necessary to enable the expansion and development of their role in pharmacy practice. The group listed important components of this process, including: standardizing education and training of pharmacy technicians across different programs, setting uniform qualifications, and requiring certification with the Pharmacy Technician Certification Board (PTCB) (a requirement of registration with the North Carolina Board of Pharmacy). Panelists felt that professionalization should include a clear definition and expansion of the roles and responsibilities of pharmacy technicians (e.g. through rules and legislation). Two quotes from pharmacy technicians illustrate the importance of increased standardization.

- "There has to be a standard for technicians. We are not going to go away. We are not here to take anyone's job. We only want to be part of the health care team."
- "The pharmacists have to help the techs get us to where they want us to be. Then you have to decide what our job is. To give me two or three more pharmacists won't make my job any better. It has to be a smooth operating system. We need to have standards for the techs that everyone is accountable for, and the employer holds all accountable for the same standards."

- ◆ Panelists also proposed standardizing all pharmacy technician education programs with training requirements based on roles and responsibilities as defined by the Board of Pharmacy and the PTCB. Mechanisms recognizing best practices in education (community colleges and in-house hospital training) were also recommended.

◆ **Multidisciplinary Pharmacy Training and Marketing**

Both the general public and the pharmacy field in general have a lack of understanding of the role of the pharmacy technician. Education of pharmacists, employers, pharmacist educators, and the public about the role of pharmacy technicians was also cited as a necessary step. The North Carolina Area Health Education Centers Program (NC AHEC) and the community colleges should take a strong role in this. A panelist said,



"If the profession itself is not comfortable with pharmacy techs, nor will the public be so. There needs to be some education of both the pharmacists and the public."

- ◆ Educators on the panel stressed integrating the utilization of pharmacy technicians into PharmD programs as an important step towards fostering broader employment and roles for pharmacy technicians. The multidisciplinary training system currently used by dentists and dental assistants was a method echoed by the panel members as a model to base pharmacist and pharmacy technician training. One educator noted that "We need to go with the dentist system of training dentists with dental assistants. You cannot train pharmacists in the absence of technicians."
- ◆ Panelists said that employers may be resistant to the professionalization of pharmacy technicians which could become a hurdle to the expansion of their use. Employers may be unwilling to pay for the training or salaries of credentialed pharmacy technicians. Mandatory certification could result in criticism from employers who may be unwilling to encourage or reward certification. In addition, employers may create a different ancillary position to avoid the regulations.
- ◆ There is little incentive for potential pharmacy technician students to obtain a degree or certification if there is no reward for the investment of their time and funds. In addition, many of the existing community college pharmacy technician programs are below capacity. Programs have trouble recruiting new technician students because salaries are low and many employers do not reward technicians who obtain formal training and certification.
- ◆ **Electronic physician prescription submission**  
Electronic physician prescription submission was mentioned as a way of reducing demands on retail pharmacists, but panelist felt that this would possibly only transfer issues that pharmacists are currently encountering (high volume, high administrative burden, limited time for patient counseling) to the physician workforce.

## Panel Members

The panel was comprised of representatives from educational programs, employers, professional associations, regulatory agencies and practitioners.

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## Conclusions

### *Is there an imbalance?*

Yes, quantitative and anecdotal data presented in this report show that there is an imbalance in the supply of, and demand for, pharmacists practicing in retail, rural and hospital settings. The data also indicate that African-American and Hispanic/Latino pharmacists, as well pharmacists who can communicate in a language other than English, are underrepresented in the workforce.

It is difficult to predict whether this imbalance will continue into the future. The current economic recession may actually improve the supply of pharmacists in the state. Lucrative job opportunities available in non-pharmacy fields, such as business and computer science (which may have lured pharmacists from the active workforce in the recent past) are on the decline. As job opportunities in competing fields diminish due to the recession, educational programs in these areas compete less with pharmacy schools for qualified applicants. In fact, the recent upturn in the number of applicants to North Carolina pharmacy schools in the last year suggests a renewed interest in the pharmacy profession. Additionally, if chain drug stores are forced to close storefronts due to economic factors related to the recession, the demand for retail pharmacists may be diminished (although access to pharmacy services in these counties may become an issue). At the time this report was released, North Carolina had still not passed a budget, making difficult to determine whether there will be changes in Medicaid reimbursement policies that would affect pharmacist supply. Congress continues to debate a Medicare prescription drug benefit plan that has the potential to increase the demand for pharmacy services in North Carolina.

### *What can be done?*

Despite uncertainty about whether the current imbalance will persist, it is important to identify steps that could be taken to ameliorate the current situation and to address important pharmacist workforce issues. The evidence gathered in this study suggests multiple options for addressing the current imbalance:

- ◆ **Increase the number of days supply allowed for Medicaid covered prescriptions from 30 days to 100 days.** This would decrease the demand for pharmacist services, particularly in counties with a high number of Medicaid eligibles.
- ◆ **Establish new pharmacy program(s).** The 2001 legislative session of the North Carolina General Assembly mandated a feasibility study of placing a new pharmacy school at Elizabeth City State University (ECSU). In March 2002, the University of North Carolina Board of Governors reviewed the feasibility study conducted by three external experts and forwarded a recommendation to the General Assembly to establish a cooperative pharmacy program between ECSU and the University of North Carolina at Chapel Hill. The General Assembly is currently considering the issue. In

the meantime, East Carolina University has requested permission from the UNC Board of Governors to plan a pharmacy school.

Establishing a new pharmacy school, whether through a cooperative agreement or as a stand-alone school, is a long-term solution to the imbalance and raises a number of important considerations. Given the time that it takes to plan and build a new facility, hire faculty, and graduate students, this is not an immediate solution to the current imbalance. It will however, improve the future supply of pharmacists in the state.

Discussions about whether, and where, to open a new pharmacy school should take into consideration the following issues:

- The actual number of full-time equivalent graduates who will go into retail and hospital dispensing roles will be diminished by the increasing number of graduates pursuing non-dispensing "other" type jobs, as well as the increasing number of pharmacists choosing to work part-time.
  - The issue of whether there is an adequately trained applicant pool is important. As alluded to above, the current recession and diminishing job opportunities in competing fields has likely increased the applicant pool. Increased efforts to recruit students from underrepresented minority groups would increase the applicant pool and enlarge the diversity of the workforce.
  - The issue of where to open a pharmacy program should take into account that graduates typically settle in greater numbers around their training program. For example, placing a program where there is a shortage of pharmacists (in the rural, northeastern and eastern parts of the state) will draw students from the local communities who are more likely to stay and practice there after graduation. Location considerations should also include whether an adequate infrastructure exists for clinical placements and preceptors.
- ◆ **Increase funding to the state's loan repayment/forgiveness program** to encourage pharmacists to practice in geographic areas and settings with low pharmacist per population ratios. The North Carolina Student Loan Program for Health, Science and Mathematics, administered by the NC Education Assistance Authority, offers loan forgiveness to pharmacy students who practice in underserved areas post-graduation. In the past year, 132 of the 450 students received awards in pharmacy programs.
  - ◆ **Expand the use of pharmacy technicians.** Increased use of pharmacy technicians would reduce the pharmacist's administrative and dispensing workload, allowing pharmacists to spend more time on non-dispensing functions such as patient counseling and medication management. This would improve pharmacist job satisfaction, patient compliance and outcomes. To achieve this goal, educators, employers and practitioners must work together to:

- Augment the existing pharmacist curriculum to include information on the utilization of pharmacy technicians in various practice settings.
  - Standardize pharmacy technician training, certification and scope of practice through regulation by the North Carolina Board of Pharmacy.
  - Establish incentives or requirements for employers to hire credentialed technicians.
- ◆ **Increase the use of technology** in order to reduce the administrative and dispensing burden on dispensing pharmacists. Examples might include increased use of electronic physician prescription submission and robotics.
- ◆ **Seek reimbursement for patient counseling and non-dispensing functions** as a way to improve pharmacist job satisfaction, particularly in retail settings. This might be achieved by:
- Encouraging dissemination of best practice models where pharmacists play a more active role in patient counseling, disease state management and medication management.
  - Encouraging better tracking and dissemination of data that show the monetary and patient outcome benefits in settings where pharmacists have an increased clinical role.

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