

# Maine's Physician, Nurse Practitioner and Physician Assistant Workforce in 2014

## KEY FINDINGS

Among Maine's licensed physicians, nurse practitioners (NPs) and physician assistants (PAs) in 2014:

- There were 311 licensed physicians, 86 NPs, and 47 PAs in Maine for every 100,000 residents.
- The mean age of Maine's licensed physicians was 52 years, compared with 50 for NPs and 45 for PAs.
- Rural areas of Maine had fewer physicians, NPs and PAs per capita compared with urban areas. The lowest number of providers per capita were in Oxford, Sagadahoc and Somerset counties.

Among physicians in Maine who provided direct patient care in 2014:

- Physicians in generalist physician specialties represented 38% of Maine's total 3,637 practicing physicians.
- The number of physicians per capita in Maine varied greatly by county; there were more than twice as many generalists in the highest compared with the lowest physician density counties.
- 22% of all Maine's physicians graduated from one of the three medical schools affiliated with Maine Medical Center (University of New England College of Osteopathic Medicine, University of Vermont, or Tufts University School of Medicine).
- One quarter of all physicians, 41% of all generalists, and more than half of those in family medicine/general practice specialties completed a residency in Maine.

## INTRODUCTION

Maine's health care delivery and payment systems are undergoing major transformations similar to those occurring across the nation. Important questions for healthcare policy and planning include whether there will be enough health care providers in the right places and with the needed backgrounds and specialties to meet growing and changing demand. This brief offers information on the size and distribution of Maine's physician, nurse practitioner (NP), and physician assistant (PA) workforce, addressing the questions:

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- How many physicians, NPs and PAs are licensed in Maine?
- How are physicians, NPs and PAs distributed across the state?
- How many physicians, NPs and PAs are in Maine relative to the size of the population?
- How many physicians, by specialty, practice in Maine?
- What are the demographic characteristics of Maine’s practicing physicians?
- What proportion of Maine’s physician workforce graduated from the key medical schools with state affiliations?
- What proportion of Maine’s physician workforce completed an in-state residency?

This brief’s comparisons of physician, NP and PA supply are based on license data obtained from the Maine Board of Licensure in Medicine, the Maine Board of Osteopathic Licensure, and the Maine State Board of Nursing. These were the only available statewide source of data on NP and PA supply. Additional physician data came from the American Medical Association (AMA) Physician Masterfile for analyses of physicians involved in direct patient care (see Appendix - Methods). Because state license data do not distinguish between providers who are actively providing direct patient care and those who hold a license but are primarily involved in teaching, research, administration or otherwise not providing patient care, the estimates of physician supply derived from license records are higher than estimates of physician supply that are based on physicians providing direct patient care. Excluded from the analysis datasets were providers age 75 or older and, from data obtained from the AMA Masterfile, physicians employed by the federal government.

## PHYSICIANS, NPs, AND PAs LICENSED IN MAINE

### TOTAL NUMBER, AGE AND GENDER

In 2014 there were nearly five times more physicians with Maine licenses than NPs and almost ten times more physicians with Maine licenses than PAs (Table 1). Seventy percent of these physicians had in-state addresses compared with 90% of NPs and 96% of PAs. Because older providers often retain licenses but are not actively practicing, subsequent analyses using license data did not include providers age 75 years or older. Among licensed providers in Maine, 43% of physicians and 41% of NPs were age 55 or older. PAs, with an average age of 45 years, were the youngest workforce (Table 2).

**Table 1. All physicians, NPs and PAs with Maine licenses in 2014**

Licensed providers	#	Licensed providers with addresses in Maine	
		#	% in state
Physicians*	6,223	4,360	70.1%
NPs	1,272	1,146	90.2%
PAs	645	620	96.1%

\*Includes 5,285 allopathic and 938 osteopathic physicians

**Table 2. Demographic characteristics of licensed physicians, NPs and PAs in Maine in 2014**

Licensed providers with Maine addresses *	#	Mean age (years)	% age 55 or older	% female**
Physicians***	4,130	52	43.0%	NA
NPs	1,146	50	41.3%	NA
PAs	619	45	24.2%	56.3%

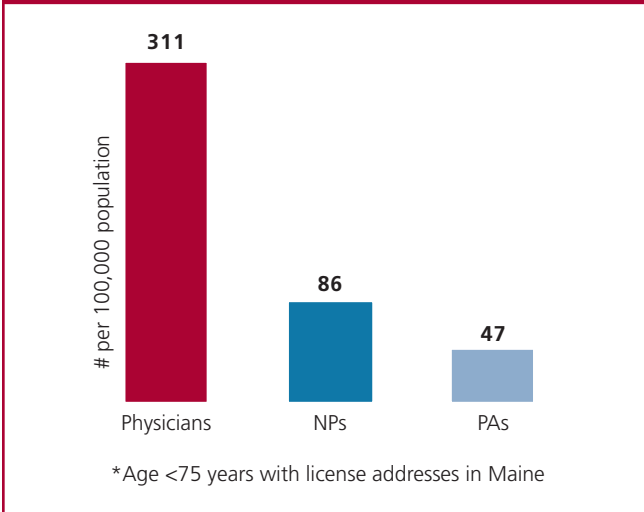
\*Exclusions: 230 physicians, 0 NPs and 1 PA age 75 or older.

\*\*Gender not available from Maine license records for all physicians and NPs

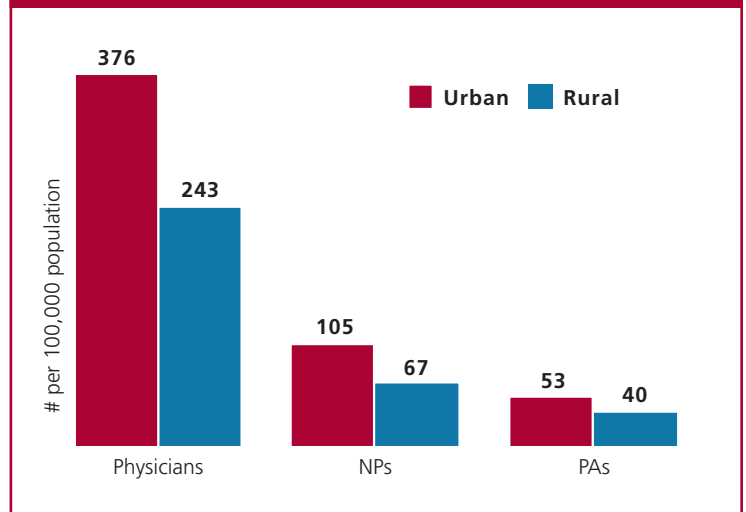
\*\*\* Includes 3,415 allopathic and 715 osteopathic physicians

For every 100,000 Maine residents there were 311 physicians, 86 NPs, and 47 PAs with licenses in Maine (Figure 1).

**Figure 1. Number of licensed physicians, NPs and PAs\* per 100,000 population in Maine in 2014**



**Figure 2. Urban and rural distribution of Maine's licensed physicians, NPs and PAs per 100,000 population in 2014**



## DISTRIBUTION

### Rural-urban distribution

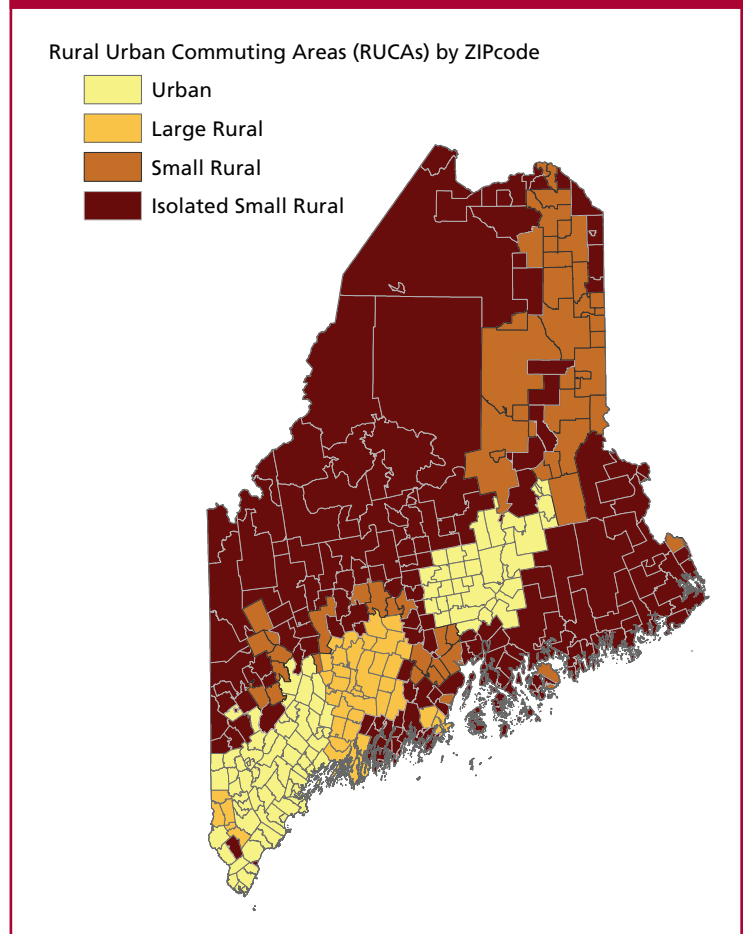
There were fewer licensed physicians, NPs and PAs per 100,000 population in rural compared with urban areas of Maine (Figure 2). Figure 3 illustrates where urban and rural areas are located in Maine. Among sub-rural areas, the per capita numbers were similar for each provider type in large rural and small rural areas, but were much lower in isolated small rural areas of Maine (Table 3).

### Distribution by county

The distribution of physicians, NPs and PAs throughout Maine varied greatly by county, although the largest numbers were in urban counties (Cumberland, Penobscot, and Kennebec) and the fewest were in Piscataquis, Sagadahoc and Washington counties (Table 4 and Figure 4).

There were 311 physicians, 86 NPs and 47 PAs with licenses in Maine for every 100,000 residents.

**Figure 3. Location of urban and rural areas in Maine**



**Table 3. Rural-urban distribution\* and number per 100,000 population of licensed physicians, NPs and PAs in Maine in 2014**

Licensed providers* by specialty	Urban Maine		Overall Rural Maine		Sub-Rural Areas of Maine					
	#	#/100,000 population	#	#/100,000 population	Large Rural		Small Rural		Isolated Small Rural	
					#	#/100,000 population	#	#/100,000 population	#	#/100,000 population
Physicians	2,532	376.4	1,598	243.4	694	289.7	423	302.3	481	173.7
NPs	704	104.6	442	67.3	171	71.4	103	73.6	168	60.7
PAs	359	53.4	260	39.6	118	49.3	60	42.9	82	29.6

\*Age <75 years with license addresses in Maine

\*\*Rural-urban determined using ZIP code RUCA taxonomy. Overall rural is a combination of the three sub-rural categories.

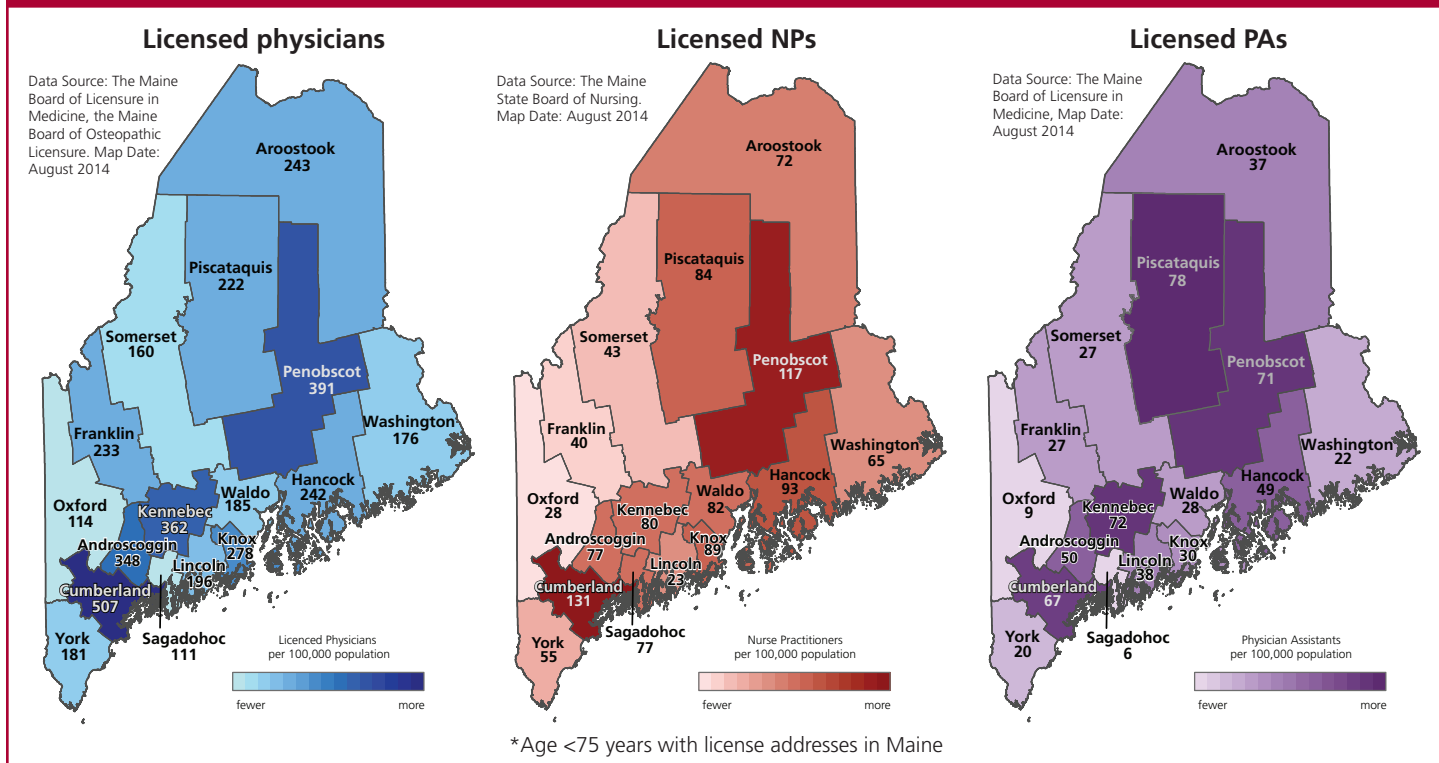
**Table 4. County distribution and number per 100,000 population: physicians, NPs and PAs licensed in Maine\* in 2014**

County	Licensed Physicians**		Licensed NPs		Licensed PAs	
	#	#/100,000 population	#	#/100,000 population	#	#/100,000 population
Androscoggin	374	347.5	83	77.1	54	50.2
Aroostook	169	242.8	50	71.8	26	37.4
Cumberland	1,448	506.6	373	130.5	191	66.8
Franklin	70	233.2	12	40.0	8	26.7
Hancock	128	242.4	49	92.8	26	49.2
Kennebec	440	362.0	97	79.8	87	71.6
Knox	110	278.0	35	88.5	12	30.3
Lincoln	67	196.4	23	67.4	13	38.1
Oxford	65	113.5	16	27.9	5	8.7
Penobscot	609	390.8	183	117.4	111	71.2
Piscataquis	37	221.5	14	83.8	13	77.8
Sagadahoc	39	111.0	27	76.8	2	5.7
Somerset	83	160.3	22	42.5	14	27.0
Waldo	72	185.1	32	82.3	11	28.2
Washington	57	175.8	21	64.8	7	21.6
York	362	181.0	109	54.5	39	19.5

\*Age <75 years with addresses in Maine

\*\*Includes allopathic and osteopathic physicians

**Figure 4. Number of licensed physicians, NPs and PAs\* per 100,000 population in Maine in 2014**



### Age by county

The age at which health care providers retire is influenced by many factors, making predictions difficult. Nonetheless, understanding the locations where large proportions of the workforce are nearing retirement age can help inform workforce planning. In half of Maine’s 16 counties, 50% or more of physicians were 55 or older; in four, 50% or more of NPs were 55 or older; and in two, 50% or more of PAs were age 55 or older (Table 5). By contrast, Androscoggin, Penobscot, and Somerset had some of the lowest percentages of health care practitioners age 55 or older.

In half of Maine’s counties, 50% or more of physicians were age 55 or older.

**Table 5. Percent of licensed physicians, NPs and PAs age 55 or older by county in Maine in 2014**

County	Percent of licensed providers age 55 or older*		
	Physicians**	NPs	PAs
Androscoggin	35.8%	31.3%	11.1%
Aroostook	47.3%	44.0%	34.6%
Cumberland	40.5%	37.5%	17.8%
Franklin	47.1%	50.0%	37.5%
Hancock	62.5%	42.9%	50.0%
Kennebec	46.4%	50.5%	32.2%
Knox	53.6%	45.7%	16.7%
Lincoln	50.7%	43.5%	46.2%
Oxford	50.8%	37.5%	80.0%
Penobscot	35.6%	40.4%	24.3%
Piscataquis	51.4%	50.0%	38.5%
Sagadahoc	53.8%	44.4%	0.0%
Somerset	37.3%	40.9%	14.3%
Waldo	59.7%	56.3%	36.4%
Washington	66.7%	42.9%	14.3%
York	45.6%	44.0%	15.4%

\*Among providers age <75 years with license addresses in Maine  
 \*\*Includes allopathic and osteopathic physicians.

# PHYSICIANS PROVIDING DIRECT PATIENT CARE

## NUMBER OF PHYSICIANS BY SPECIALTY

Analyses using data from the American Medical Association (AMA) Physician Masterfile provided information about the specialty, demographic characteristics, and medical education history of the 3,637 physicians (88% of the licensed physicians identified in Table 2) who provided direct patient care in Maine in 2014 (Table 6). Because some licensed providers do not provide direct patient care, the practicing supply is expected to be smaller than the licensed supply. Physicians in generalist physician specialties represent 38% of Maine's total practicing physician supply.

Estimates of Maine's per capita physician supply were higher than estimates of the national supply (Figure 5). In 2014, there were 274 practicing physicians per 100,000 population in Maine. The closest comparison available for the U.S. showed 226 practicing physicians per 100,000 U.S. population in 2012.<sup>1</sup> HRSA estimated that in 2010 there were approximately 66 primary care physicians per 100,000 U.S. population<sup>2</sup>; in 2014 Maine had more generalist physicians per capita, with 104 per 100,000 population. Taking into account the fact that the generalist physician grouping includes primary care providers plus other generalist physicians, as well as anticipating some growth in the national number of primary care providers since the 2010 estimate, Maine still appears to have higher generalist physician supply than the nation overall.

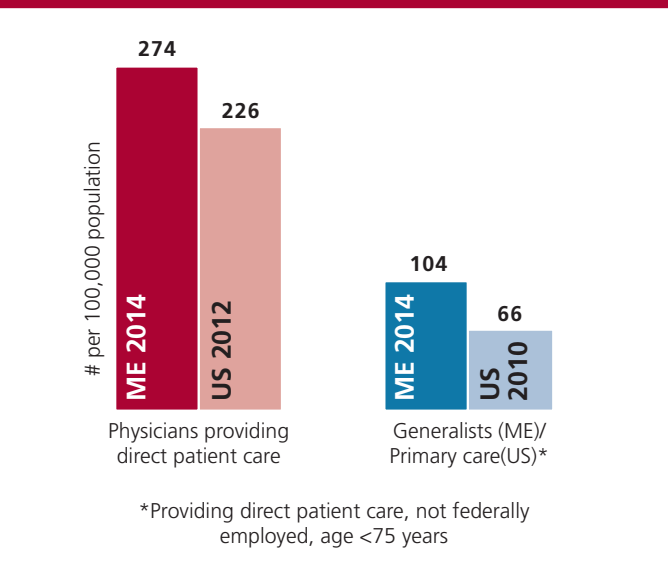
Estimates of Maine's per capita physician supply were higher than national physician per capita supply estimates.

**Table 6: Number of physicians providing direct patient care in Maine, overall and by specialty, in 2014**

Physicians providing direct patient care*	#	#/100,000 population
<b>Total</b>	3,637	273.6
<b>Generalists</b>	1,382	104.0
Family medicine/general practice	766	57.6
General internal medicine	416	31.3
General pediatrics	200	15.1
<b>Surgeons</b>	398	29.9
General surgery	128	9.6
Obstetrics-gynecology	163	12.3
Other surgery	107	8.1
<b>Psychiatrists</b>	221	16.6
<b>Other Specialists</b>	1,636	123.1

\*not federally employed, age <75 years, in Maine

**Figure 5. Maine compared with national estimates of physicians per 100,000 population**

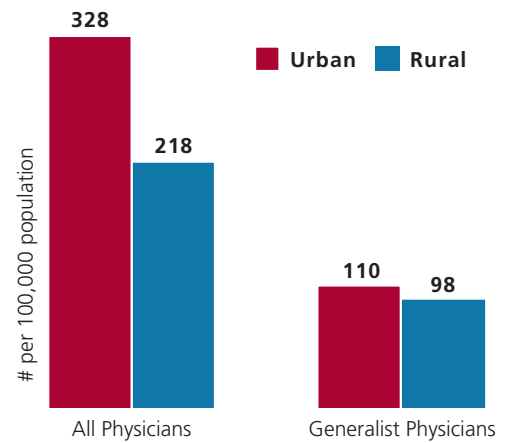


\*Providing direct patient care, not federally employed, age <75 years

## PHYSICIAN DISTRIBUTION

Fewer physicians provide direct patient care per 100,000 population in rural compared with urban areas of Maine, although there is more rural-urban parity among practicing generalist physicians (Figure 6). Table 7 details the rural-urban distribution of the state's physicians, overall and by specialty, and in addition shows their distribution among three sub-rural areas types: large rural, small rural and isolated small rural. While specialists generally congregate in urban areas where more specialty care services and larger hospitals are located, generalists practiced more evenly across Maine's urban and rural areas with the exception of isolated small rural areas.

**Figure 6. Maine physicians\* in urban and rural areas (total and generalist specialties) per 100,000 population in 2014**



\*Providing direct patient care, not federally employed, age <75 years

**Table 7. Maine physicians in urban, rural and sub-rural areas\* in 2014**

Physicians providing direct patient care**	Urban Maine		Overall Rural Maine		Sub-Rural Areas of Maine					
	#	#/100,000 population	#	#/100,000 population	Large Rural		Small Rural		Isolated Small Rural	
					#	#/100,000 population	#	#/100,000 population	#	#/100,000 population
<b>Total</b>	2,205	327.8	1,432	218.2	624	260.5	389	278.0	419	151.3
<b>Generalists</b>	737	109.6	645	98.3	268	111.9	164	117.2	213	76.9
Family medicine/ general practice	376	55.9	390	59.4	162	67.6	92	65.7	136	49.1
General internal medicine	245	36.4	171	26.1	70	29.2	46	32.9	55	19.9
General pediatrics	116	17.2	84	12.8	36	15.0	26	18.6	22	7.9
<b>Surgeons</b>	243	36.1	155	23.6	49	20.5	55	39.3	51	18.4
General surgery	67	10.0	61	9.3	20	8.4	22	15.7	19	6.9
Obstetrics- gynecology	93	13.8	70	10.7	22	9.2	26	18.6	22	7.9
Other surgery	83	12.3	24	3.7	7	2.9	7	5.0	10	3.6
<b>Psychiatrists</b>	142	21.1	79	12.0	50	20.9	15	10.7	14	5.1
<b>Other Specialists</b>	1,083	161.0	553	84.2	257	107.3	155	110.8	141	50.9

\*Rural-urban determined using ZIP code RUCA taxonomy. Overall rural is a combination of the three rural subcategories.

\*\*Not federally employed, age <75 years, in Maine

The number of Maine's practicing generalist physicians per 100,000 population ranged from 54 in Waldo county to 137 in Kennebec county.

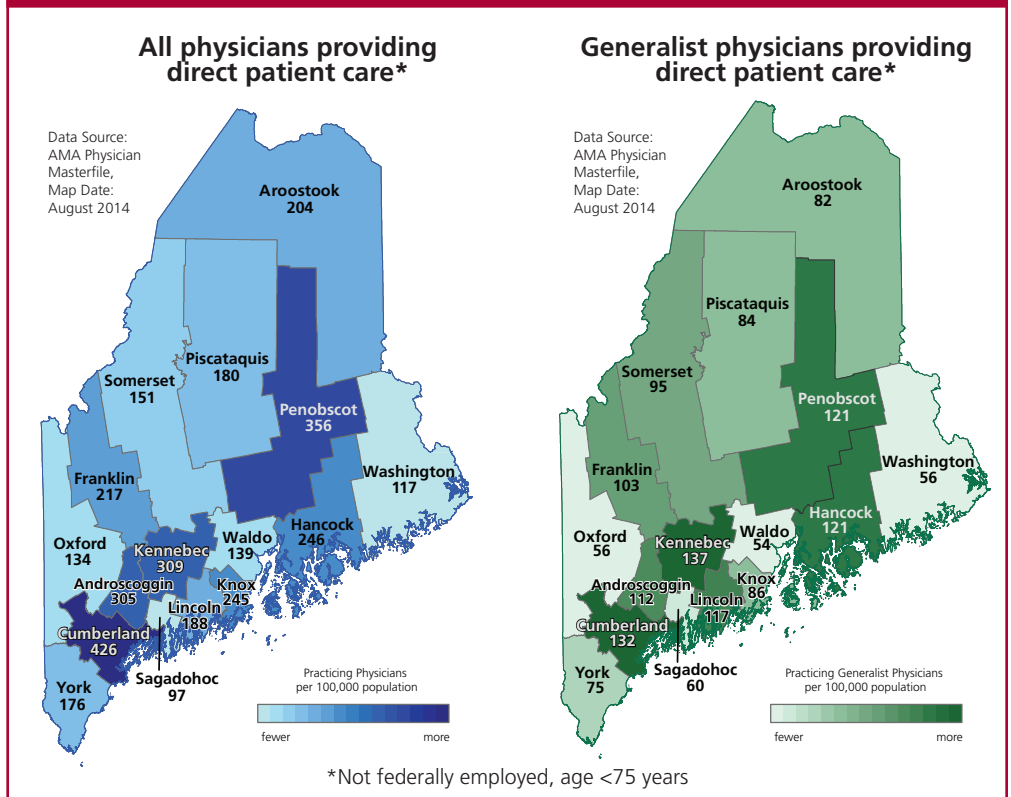
The per capita ratios of physicians providing direct patient care per 100,000 population varied greatly by county, from a high of 426 total practicing physicians per 100,000 population in Cumberland county to 97 in Sagadahoc, and from 137 practicing generalists per 100,000 population Kennebec county to 54 in Waldo (Figure 7).

### PHYSICIAN AGE AND GENDER

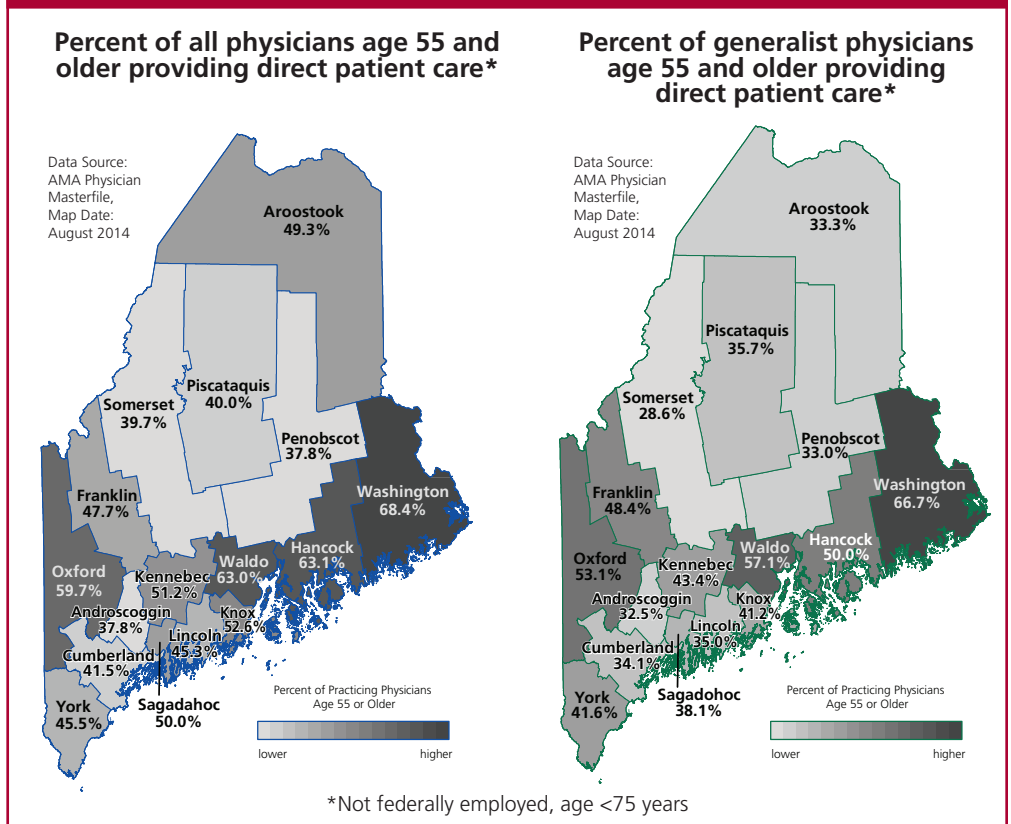
Many of Maine's rural counties had high percentages of physicians age 55 and older (e.g., Washington, Hancock, Waldo and Oxford) (Figure 8). More than half of all practicing physicians in six of Maine's 16 counties were age 55 or older in 2014. While generalist physicians were younger on average, in four counties half or more of the generalists were age 55 or older.

Overall, 34% of Maine's physicians providing direct patient care were female. Higher percentages of Maine's younger cohorts of practicing physicians were female (Table 8). Among physicians age 44 or younger, nearly half were female.

**Figure 7. Maine physicians per 100,000 population in 2014, by county**



**Figure 8. Maine physicians age 55 or older in 2014, by county**





**Table 8. Percent female among physicians providing direct patient care in Maine, by age group, in 2014\***

Physicians providing direct patient care	<35 yrs.		35-44 yrs.		45-54 yrs.		55-64 yrs.		65-74 yrs.	
	#	% female	#	% female	#	% female	#	% female	#	% female
<b>Total</b>	64	50.8%	406	47.0%	390	37.9%	297	26.0%	63	13.2%

\*Not federally employed, age <75 years, in Maine

Nearly half of Maine's physicians age 44 or younger are female.

## PHYSICIAN EDUCATION AND TRAINING

The top five medical schools from which Maine's 2014 physician workforce graduated are shown in Table 9. The highest percentage graduated from the University of New England College of Osteopathic Medicine (10%) followed by the University of Vermont College of Medicine (8%) and Tufts University School of Medicine (5%).

A quarter of Maine's physicians completed a residency in Maine, followed by Massachusetts, New York, Pennsylvania and California. Nearly 60% of Maine's practicing physician workforce completed a residency in one of these 5 states (Table 10).

**Table 9: Top 5 medical schools from which Maine's physicians graduated\***

	State	#	% of Maine's physicians graduating from school
University of New England College of Osteopathic Medicine	ME	351	9.7%
University of Vermont College of Medicine	VT	271	7.5%
Tufts University School of Medicine	MA	167	4.6%
University of Massachusetts Medical School	MA	109	3.0%
Dartmouth Medical School	NH	92	2.5%

\*Among Maine physicians in 2014 providing direct patient care, not federally employed, age <75 years.

**Table 10. Top 5 states where Maine physicians\* completed a residency**

State	#	% of Maine's physicians completing a residency in the state**
ME	855	25.3%
MA	416	12.3%
NY	394	11.7%
PA	250	7.4%
CA	106	3.1%

\*Among Maine physicians in 2014 providing direct patient care, not federally employed, age <75 years

\*\*Percentages are calculated based on physicians for whom residency state data were available. 263 cases (7.2%) were missing state.

More than a quarter (27%) of Maine’s overall practicing generalist physician supply in 2014 graduated from one of the three medical schools affiliated with Maine Medical Center since 1980: University of New England College of Medicine, Tufts, or the University of Vermont (Table 11). Thirty percent of physicians in family medicine/general practice specialties graduated from one of these 3 schools. One quarter of Maine’s practicing physicians, 41% of all generalists, and more than half (55%) of physicians in family medicine/general practice specialties completed a residency in Maine. Just 8% both graduated from one of the three affiliated medical schools and completed a residency in Maine. Among generalist physicians these percentages were higher: 27% graduated from one of the affiliated medical schools, 41% completed a residency in-state, and just 14% did both.

55% of Maine’s physicians in family medicine/general practice specialties and 41% of all generalist physicians completed a residency in-state.

**Table 11. Maine’s physicians in 2014 who graduated from a medical school in or near Maine\* and/or completed a residency in Maine**

Physicians providing direct patient care	Graduated from affiliated medical schools*		Completed a residency in Maine**		Graduated from affiliated medical school* and completed a residency in Maine	
	#	%	#	%	#	%
<b>Total</b>	789	21.7%	855	25.3%	275	8.2%
<b>Generalists</b>	377	27.3%	527	40.8%	186	14.4%
Family medicine/general practice	228	29.8%	380	55.4%	127	18.5%
General internal medicine	90	21.6%	91	22.2%	36	8.8%
General pediatrics	59	29.5%	56	28.4%	23	11.7%
<b>Surgeons</b>	69	17.3%	69	18.1%	15	3.9%
General surgery	19	14.8%	23	18.7%	3	2.4%
Obstetrics-gynecology	36	22.1%	42	26.9%	12	7.7%
Other surgery	14	13.1%	4	3.9%	0	0.0%
<b>Psychiatrists</b>	37	16.7%	62	28.7%	16	7.4%
<b>Other Specialists</b>	306	18.7%	197	13.3%	58	3.9%

\*Colleges affiliated with Maine Medical Center: University of New England College of Medicine (UNECOM), Tufts, or the University of Vermont.

\*\*Not federally employed, age <75 years, in Maine

\*\*\*Percentages are based on physicians for whom residency state data were available. There were 263 physicians for whom state of residency completion was missing and 0 were missing medical school.

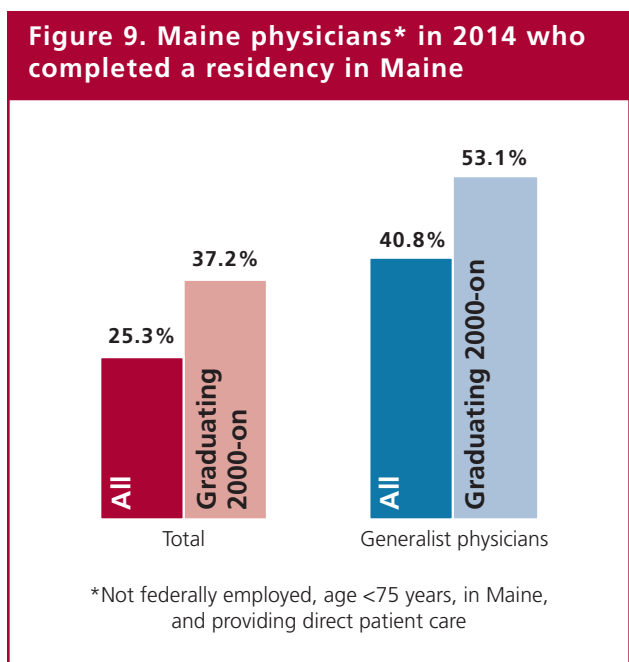
A higher percentage of physicians who graduated from medical school since 2000 completed residencies in Maine (Figure 9). It is not clear if this indicates a trend toward higher rates of post-residency retention by the more recent physician cohorts compared with older cohorts, or if there is a pattern for some physicians to remain in the state for a few years after completing residencies before migrating to other locations.

## SUMMARY AND POLICY IMPLICATIONS

Based on comparisons of provider licenses in 2014, Maine had 311 licensed physicians, 86 NPs, and 47 PAs in Maine for every 100,000 state residents. The mean age of Maine’s licensed physicians was 52 years, compared with 50 for NPs and 45 for PAs. Rural areas of Maine had fewer physicians, NPs and PAs per capita compared with urban areas. The lowest numbers of providers per capita were in Oxford, Sagadahoc and Somerset counties.

More detailed data obtained from the AMA Physician Masterfile supported analyses of physicians providing direct patient care in Maine. From these analyses it was found that Maine’s practicing physician supply, on a per capita basis, was somewhat larger than national averages, both overall and for generalist specialties. Physicians in generalist physician specialties represented 38% of Maine’s total 3,637 practicing physicians. While more total physicians were found to practice in urban areas, statewide there were similar numbers of generalists per capita in large and small rural areas compared with urban areas of Maine. Much smaller numbers of physicians per capita worked in isolated small rural areas of Maine. The number of generalist physicians per capita varied greatly by county, with more than twice as many in counties with the highest physician density (Cumberland, Penobscot, Hancock and Kennebec) compared with counties having the lowest density (Waldo, Oxford, Washington and Sagadahoc). Half or more of the physicians in many of Maine’s most rural counties were age 55 or older – indicating the potential for retirements to create gaps in future supply.

Nearly a quarter of Maine’s total physician supply graduated from medical school at one of the three colleges affiliated with Maine Medical Center: University of New England College of Medicine, Tufts, and the University of Vermont. One quarter of all of Maine’s physicians, 41% of generalists, and more than half in family medicine/general practice specialties completed a residency in Maine. Residency is known to be highly associated with the location where a physician eventually chooses to practice and of the population he or she prefers to serve, and is therefore a useful recruitment tool.<sup>3</sup> In 2012, Maine had a 50% retention rate (939 active physicians who completed a residency in Maine were practicing in-state from among the 1,894 nationwide who had completed a residency in Maine), and ranked 13th among states for retaining physicians who completed a residency in-state.<sup>1</sup> The analyses presented here show that higher percentages of Maine physicians who graduated from medical school in 2000 or later completed a residency in-state compared to the overall physician workforce. While the state is already quite successful in retaining physicians after residency, efforts specifically designed to retain these younger physicians could be a useful tool for health workforce development in Maine.



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## APPENDIX: METHODS

The data for licensed physicians, NPs and PAs were obtained from the Maine Board of Licensure in Medicine, the Maine Board of Osteopathic Licensure, and the Maine State Board of Nursing in June and July, 2014. The data for analyses of physicians providing direct patient care came from the American Medical Association (AMA) Physician Masterfile, accessed in April, 2014. There were 4,543 total allopathic and osteopathic physicians with Maine license records in the AMA dataset. Those selected for these analyses were the 3,637 with 1) an in-state practice address (or mail address, when practice was not available), 2) who were age 74 or younger, 3) provided direct patient care, and 4) were not a federal employee. Physicians were assigned specialties using the AMA dataset's "primary" and "secondary" specialty fields. The primary specialty was reassigned to the secondary specialty for about 6% of physicians when there was indication from the listed secondary specialty that the physician was likely to practice more specialized medicine than the primary specialty indicated. Physician specialties were grouped into "Generalists" (family medicine/general practice, general internal medicine and general pediatrics specialties), "Surgeons" (general surgery, obstetrics-gynecology and other surgery), and "Other Specialists". Data for psychiatrists were analyzed and reported separately.

State population data came from a custom-prepared file of selected 2014 population data with ZIP codes cross-referenced to counties.<sup>4</sup> Provider ZIP codes were linked the ZIP code approximation of the Rural Urban Commuting Area (RUCA) codes, version 2.0, to determine rural-urban status. RUCA codes classify ZIP codes into 33 categories according to core population and work commuter flow patterns.<sup>5</sup> The RUCA codes assigned to each category were: Urban=1.0, 1.1, 2.0, 2.1, 3.0, 4.1, 5.1, 7.1, 8.1 and 10.1; Large Rural=4.0, 4.2, 5.0, 5.2, 6.0 and 6.1; Small Rural=7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1 and 9.2; Isolated Small Rural=10.0, 10.2, 10.3, 10.4, 10.5 and 10.6. Any practice ZIP locations that did not link to the RUCA codes were attributed to RUCA codes by comparing the practice city, U.S. Postal Service city-ZIP lookup and the RUCA codes associated with the city ZIP codes.

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## SUGGESTED CITATION

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