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Kentucky's Primary Care Workforce: Current Status and Output of New Trainees January 2020 Update

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Summary

Primary care is the backbone of American healthcare. Primary care (PC) physicians are especially cost-effective in preventing and managing illness and disability, and prolonging years of quality life. They also contribute significantly to the economy of their communities. Primary care shortages across the Commonwealth are severe. Kentucky ranks 43rd in the USA for its number of PC physicians per 100,000 people. The Commonwealth would have to add 246 primary care physicians annually to reach the US median by the end of 2029. Kentucky produces and retains only about 55 new PC physicians per year, recruiting 55 to 60 more from out of state. This total of 110 – 115 new physicians falls short of the 124 PC physicians that must be added annually to avoid *worsening* our shortage, and far below the 246 PC physicians that Kentucky would need to add each year to reach the US median in the coming decade.

Introduction

Increasing attention is being given to physician shortages and maldistribution nationwide. Kentucky and the nation face especially severe shortages of primary care physicians. In fact, Kentucky ranks 43rd among the United States in the size of its primary care workforce relative to its population (1,2).

Numerous studies have demonstrated that the value of healthcare and the overall health status of general populations rises with the ratio of primary care physicians to populations (3-6). The continued evolution toward value-based health care financing and provider reimbursement requires attention to, and correction of primary care shortages. Furthermore, primary care physicians add significantly to the economy of their communities (7).

The purpose of this updated report on primary care shortages is to: organize and present up-to-date data and information about the primary care workforce in Kentucky and the current trainee pipelines that supply new primary care physicians to Kentucky.

Current status of the primary care workforce in Kentucky

The growth and aging of the US population, implementation of the Affordable Care Act and advances in medical technology, combined with caps in federal funding for residency training, have led to critical shortages of physicians in the US. Physician shortages in multiple specialties, including primary care, are expected to further worsen over the next decade, due to physicians retiring or stepping down to part-time work. Kentucky's physician shortages are worse than those for the nation as a whole, with Kentucky ranking 36th among USA states for all physicians per 100,000 population, and 43rd for primary care physicians (1).

Calculating physician shortages by specialty is difficult, and wrought with arguable assumptions. That said, the report in 2013 by Deloitte, Inc. provided physician shortage data for Kentucky across various specialties. Although these analyses show shortages across many specialties, the report emphasizes shortages in Primary Care and Psychiatry/ Mental Health as most dire (8).

Methods: Analysis of Current Primary Care Workforce

For this report, we performed our own updated analyses of physician shortages focusing upon primary care. We used the Institute of Medicine's definition of primary care: *the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community* (9). Consistent with most contemporary work on the primary care workforce, we included only the following medical specialties in our analyses and discussions about

primary care: Family Medicine, Internal Medicine, Pediatrics, combined Internal Medicine/ Pediatrics, and Geriatric Medicine.

Our healthcare workforce data, including current state and future needs, were derived from the Kentucky Board of Medical Licensure, the AMA Masterfile, the US Census, the Kentucky Data Center, the US Health Resources and Services Administration, the American Osteopathic Association, the American Association of Medical Colleges, the Kentucky Board of Nursing, and the National Commission for Certification of Physician Assistants. The trainee data were obtained from the pertinent training programs in Kentucky, and from the National Residency Match Program.

Primary care physicians, nurse-practitioners and physician assistants practicing in Kentucky were tallied using the methods described below.

Primary care physicians: The following criteria were applied to the Kentucky Board of Medical Licensure (KBML) database to tally primary care physicians licensed by the KBML and practicing in Kentucky:

Specialty: Family Medicine, Internal Medicine, Pediatrics, or Geriatric Medicine *and no other* Internal Medicine or Pediatric subspecialty listed. No physician was counted twice. For example, a physician listing general internal medicine *and* general pediatrics as his or her specialties was counted only once.
Status: Active
Main site of employment address: In Kentucky
Main employment setting: Private practice, hospital-based, or employed outpatient, *and not* emergency medicine

***Advanced Practice Registered Nurses*:** The following criteria were applied to the Kentucky Board of Nursing (KBN) Licensure database to identify Nurse Practitioners licensed by the KBN, and practicing in primary care settings:

Specialty: Geriatric Medicine, Pediatric Medicine, and Public/ Community Health Medicine
Status: Active
Employment Address: In Kentucky
Main employment setting**:** Office, Clinic, Community Health
Type of licensure**:** APRN
Population focus: Adult, Family, Pediatric, Community Health

Primary Care Physician Assistants: This workforce was estimated using Kentucky licensure data and data published by the National Commission for Certification of Physician Assistants (PAs) (10). These data do not support mapping of primary care PAs by country, but they do provide a tally of PAs practicing primary care.

Estimates for Kentucky's primary care workforce needs in 2029 were derived from published studies of the impact of population aging, population growth, the Affordable Care Act and physician retirement on physician need (11,12), and Kentucky census data (13,14).

Results: Current Kentucky Primary Care Workforce

Tables 1 through 4 show quantitative data on the current primary care workforce in the Commonwealth, including physicians, nurse-practitioners and physician-assistants.

Kentucky ranks 43rd in the number of PC physicians per 100,000 population (or conversely the number of persons per PC physician) (1). These same benchmarking data show that in order to achieve the current national median of 1 PC physician per 1104 persons by then end of 2029, Kentucky would have to add 2,464 PC physicians to our workforce (i.e. add 246 PC physicians per year). Approaching this challenge more conservatively, we would have to add 124 physicians per year to not worsen our current shortage.

The data in **Table 4** also show continued mal-distribution of physicians around the state. For example, although approximately 40% of Kentuckians live in rural areas, only 17 % of PC physicians practice in rural areas. However, 42% of all active Kentucky Family Medicine physicians practice in a rural area. This reflects national data showing that US Family Medicine physicians distribute themselves according to the population (15).

TABLE 1. PRIMARY CARE PHYSICIANS PRACTICING IN KENTUCKY, AND SHORTFALLS

	2016	2018
Primary care physicians practicing in KY	2,696	2,825
Expected retirees in the coming decade	674	706
Number of additional PCP's needed in 10 years for shortages not to worsen	1,186	1,243[1]
Estimated Shortfall in 10 years (compared to the US median)	2,368	2,464[2]

[1] Includes expected retirees (706) + effects of population growth and aging (480) + effects of ACA (57)

[2] US median = 1104 persons per primary care physician

TABLE 2. PRIMARY CARE APRNS PRACTICING IN KENTUCKY

	2016	2019
APRNs practicing in KY (total)	4,177	4,279
Practicing Primary Care (PC)	234	280
Of the 280 PC APRNs: Practicing PC in HPSAs[1]	176	264
Of the 280 PC APRNs: Practicing PC in rural county	91	129

[1] Federally-designated primary care Health Professions Shortage Area

TABLE 3. PRIMARY CARE PAS PRACTICING IN KENTUCKY

	2016	2018
PAs practicing in KY (total)	1,164	1,074
Practicing Primary Care (PC)	305	308

TABLE 4: RATIO OF PRIMARY CARE PHYSICIANS TO KENTUCKY POPULATION 2018, BY COUNTY AND PRIMARY CARE HEALTH PROFESSIONS SHORTAGE AREAS (HPSAS) DESIGNATION

County	PCP	Ratio
Adair	7	1:2784
Allen	6	1:3488
Anderson	4	1:5636
Ballard	0	0:8039
Barren	31	1:1413
Bath	2	1:6189
Bell	16	1:1681
Boone	100	1:1307
Bourbon	15	1:1335
Boyd	50	1:960
Boyle	28	1:1069
Bracken	3	1:2756
Breathitt	6	1:2158
Breckinridge	5	1:4022
Bullitt	31	1:2589
Butler	2	1:6416
Caldwell	5	1:2528
Calloway	18	1:2162
Campbell	47	1:1968
Carlisle	1	0:4846
Carroll	4	1:2678
Carter	12	1:2262
Casey	4	1:3938
Christian	29	1:2428
Clark	23	1:1567
Clay	9	1:2263
Clinton	4	1:2569
Crittenden	4	1:2271
Cumberland	5	1:1341
Daviess	60	1:1673
Edmonson	1	1:12226
Elliott	2	1:3762
Estill	5	1:2855
Fayette	343	1:939
Fleming	7	1:2064
Floyd	40	1:906.8
Franklin	35	1:1442
Fulton	3	1:2064
Gallatin	2	1:4388
Garrard	5	1:3505
Grant	11	1:2271
Graves	11	1:3375

County	PCP	Ratio
Grayson	18	1:1464
Green	5	1:2213
Greenup	31	1:1146
Hancock	0	0:8801
Hardin	60	1:1801
Harlan	16	1:1670
Harrison	10	1:1878
Hart	5	1:3751
Henderson	37	1:1241
Henry	5	1:3201
Hickman	0	0:4520
Hopkins	33	1:1380
Jackson	2	1:6716
Jefferson	619	1:1246
Jessamine	17	1:3140
Johnson	13	1:1738
Kenton	139	1:1190
Knott	2	1:7646
Knox	11	1:2839
Larue	3	1:4735
Laurel	27	1:2229
Lawrence	9	1:1747
Lee	3	1:2190
Leslie	5	1:2067
Letcher	17	1:1314
Lewis	5	1:2668
Lincoln	5	1:4891
Livingston	3	1:3090
Logan	11	1:2460
Lyon	3	1:2694
Madison	46	1:1983
Magoffin	4	1:3135
Marion	8	1:2424
Marshall	11	1:2853
Martin	5	1:2290
Mason	11	1:1561
McCracken	72	1:908
McCreary	4	1:4366
McLean	1	1:9201
Meade	5	1:5631
Menifee	2	1:3228
Mercer	4	1:5380

County	PCP	Ratio
Metcalfe	0	0:10107
Monroe	7	1:1523
Montgomery	18	1:1552
Morgan	5	1:2638
Muhlenberg	14	1:2201
Nelson	28	1:1630
Nicholas	0	0:7130
Ohio	9	1:2687
Oldham	33	1:2013
Owen	2	1:5383
Owsley	1	1:4435
Pendleton	4	1:3643
Perry	26	1:1021
Pike	70	1:841
Powell	3	1:4125
Pulaski	51	1:1264
Robertson	0	0:2134
Rockcastle	11	1:1518
Rowan	19	1:1290
Russell	11	1:1616
Scott	27	1:2032
Shelby	20	1:2371
Simpson	6	1:3018
Spencer	1	1:18108
Taylor	16	1:1519
Todd	3	1:4081
Trigg	5	1:2889
Trimble	2	1:8697
Union	6	1:2445
Warren	84	1:1534
Washington	3	1:4042
Wayne	9	1:2302
Webster	1	1:13018
Whitley	33	1:1097
Wolfe	4	1:1816
Woodford	8	1:3296

PC HPSA's are denoted in blue (can be any type of HPSA- geographic, facility, or special population).

Production of Primary Care Physicians in Kentucky

Methods

The data presented here were obtained from all pertinent training programs based in Kentucky. We then applied estimates from the literature of the proportions of physicians that practice primary care: 90% of Family Medicine physicians, 21% of Internal Medicine physicians, and 45% of Pediatric physicians (16, 17). Lacking practice data for physicians with combined Internal Medicine/Pediatrics board certification, we estimated a 50% rate for primary care practice among these physicians, who in any case comprise a small portion of the total. The emergence of Hospitalists (physicians trained for primary care who focus their careers on acute care in hospitals) makes it likely that our estimates for the current production of PC physicians are inflated above the actual primary care physician workforce numbers.

Results

Tables 5a, 5b, 5c show that over the past 5 years, Kentucky's three medical school have produced an average of 177 graduates per year who enter a residency program in one of the specialties that comprise primary care. Applying the best available estimates of the percent of these graduates who actually go on to practice primary care reduces this output to 89 per year for the three schools combined (**see Table 6**). Based upon the past five years, about 23% of all Kentucky medical school graduates can be expected to practice primary care if current conditions remain static. It is important to note that the total number of medical students admitted to our three medical schools has grown from a five-year average of 390 per year, to 500 per year starting in 2020 (28% percent growth). Thus, if the 23% rate of ultimate primary care practice holds, in the last few years of this decade we can expect 115 (.23 x 500) Kentucky medical school graduates to be entering primary care practice each year.

But how many of these medical school graduates will practice in Kentucky? Data from the KBML show that 52% of active primary care physicians in Kentucky graduated from medical school in Kentucky. If that ratio is stable, Kentucky's three medical schools will eventually produce an estimated 60 graduates per year (.52 x 115) who will go on to practice primary care <u>in Kentucky</u>.

Graduate medical education (residency) is a more immediate and reliable source of new primary care physicians than estimates derived from counts of medical students. **Table 7** shows that we can expect 90 new primary care physicians per year to come out of the Commonwealth's residency programs. **Table 8** shows that we can expect to retain 46% of the graduates of Kentucky residency programs (41 physicians). We do not have data for estimating how many will be Kentucky medical school graduates.

Another way to estimate the retention rate of physicians who complete their residency training in Kentucky is to apply data on the retention of <u>Family Medicine</u> residency graduates. For Kentucky, these data support an average of 61% retention of graduates of Kentucky Family Medicine residency programs (19). Applying this relatively high retention rate to <u>all</u> graduates of Kentucky residency programs in primary care specialties, we estimate that an average of 55 new primary care physicians, trained in Kentucky, will be added to the Commonwealth's primary care workforce each year, *unless the number of residency training slots grows*. If trends on out-of-state physician recruitment hold, roughly half of new primary care physicians will come from other states. In that case, we can estimate that 55 new PC

physicians per year from other states will be added to the 55 produced here, for a total of 110 new PC physicians per year. This falls short of the 124 new PC physicians needed each year to avoid worsening our shortage. We are at risk of falling further behind the US median primary care physician workforce. To reach the US median by 2029, Kentucky must add 246 new PC physicians per year (see Table 1).

TABLE 5: KENTUCKY MEDICAL SCHOOL GRADUATES ENTERING PRIMARY CARE SPECIALTY RESIDENCIES: 2012-2016

A. University of Kentucky College of Medicine
B. University of Louisville School of Medicine
C. University of Pikeville Kentucky College of Osteopathic Medicine

TABLE 5 A. (UK)	2019	2018	2017	2016	2015	TOTAL
Family Medicine	11 7.6%	10 7.5%	9 6.2%	4 3.6%	6 5.2%	**40** **6.2%**
Pediatrics	8 5.6%	16 12.0%	12 8.3%	10 9.0%	10 8.6%	**56** **8.6%**
Internal Medicine	34 23.6%	17 12.8%	13 9.0%	18 16.2%	22 19.1%	**104** **16.0%**
Medicine-Pediatrics	7 4.5%	9 6.8%	7 4.9%	10 9.0%	4 3.4%	**37** **5.7%**
Total	**60** **42%**	**52** **39%**	**41** **28%**	**42** **38%**	**42** **37%**	**237** **37%**

TABLE 5 B. (U OF L)	2019	2018	2017	2016	2015	TOTAL
Family Medicine	18 12.7%	10 6.9%	16 11.0%	17 10.5%	19 11.9%	**80** **10.7%**
Pediatrics	12 8.4%	14 9.7%	17 11.7%	19 11.8%	16 10.0%	**78** **10.5%**
Internal Medicine	25 17.6%	21 14.5%	18 12.4%	19 11.8%	21 13.2%	**104** **13.9%**
Medicine-Pediatrics	5 3.5%	6 4.1%	3 2.1%	4 2.4%	7 4.4%	**25** **3.3%**
Total	**60** **42%**	**51** **35%**	**54** **37%**	**59** **37%**	**63** **40%**	**287** **38%**

TABLE 5 C. (PIKEVILLE)	2019	2018	2017	2016	2015	TOTAL
Family Medicine	30 25.2%	38 29.7%	34 26.6%	42 37.1%	27 40.9%	**171** **30.9%**
Pediatrics	4 3.4%	8 6.3%	11 8.6%	9 7.9%	1 1.5%	**33** **5.9%**
Internal Medicine	36 30.3%	41 32.0%	32 25.0%	27 23.8%	15 22.7%	**151** **27.3%**
Medicine-Pediatrics	2 1.7%	0 0.0%	2 1.6%	1 0.8%	1 1.5%	**6** **1.1%**
Total	**72** **61%**	**87** **68%**	**79** **62%**	**79** **69.9%**	**44** **66.6%**	**361** **65%**

TABLE 6: ESTIMATED NUMBER OF KENTUCKY MEDICAL SCHOOL GRADUATES 2015-2019 WHO WILL PRACTICE PRIMARY CARE, REGARDLESS OF WHERE THEY COMPLETE RESIDENCY TRAINING

SPECIALTY	TOTAL MATCHED OVER 5 YEARS	ESTIMATED NUMBER THAT WILL PRACTICE PRIMARY CARE
Family Medicine	291	90% = 262
Pediatrics	167	45% = 75
Internal Medicine	359	21% = 75
Medicine-Pediatrics	68	50% = 34
Total	**885**	**446 over 5 years = 89 per year**

TABLE 7: KENTUCKY RESIDENCY PROGRAMS: MAXIMUM NUMBER OF GRADUATES IN SELECTED SPECIALTIES IN 2019

SPECIALTY	TOTAL RESIDENCY PROGRAMS	ESTIMATED NUMBER THAT WILL PRACTICE PRIMARY CARE
Family Medicine	61	90% = 55
Pediatrics	36	45% = 16
Internal Medicine	63	21% = 13
Medicine-Pediatrics	11	50% = 6
Total	**163**	**90**

TABLE 8: RETENTION OF KENTUCKY PHYSICIAN TRAINEES

RETENTION **KENTUCKY MEDICAL SCHOOL GRADUATES** **KENTUCKY RESIDENCY GRADUATES**	
KY medical school graduates active in KY = 4,130 = 41.6% of all (9,936) physicians active in KY	
Total KY medical school graduates active in US	8,947
Percent of active KY medical school graduates who are active in KY	46.2%
KY residency graduates active in KY = 3,682 = 37.1 % of all (9936) physicians practicing in KY	
Total KY residency graduates active in the US	8,061
Percent of KY residency graduates who are active in KY	45.7%
Note: (1) data includes US allopathic and osteopathic schools, and international schools (2) 'active' = working at least 20 hours per week in any combination of patient care, research, teaching and/or administration	
Source: AAMC Data Book April 2016 (18)	

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