

Developing Data Visualizations that Educate, Engage and Provoke

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Data Olympics, International Health Workforce Collaborative

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**THE CECIL G. SHEPS CENTER FOR
HEALTH SERVICES RESEARCH**

Why did we develop health workforce data visualizations?

- Began developing data visualizations in 2015 to increase access, interest and engagement with our data
- We are American!!-Give people quick, easy customizable access to the information most relevant to their profession, specialty or geographic area
- Encourage policy and decision makers in state to ***use data instead of anecdotes*** in health policy debates
- Increase dissemination by enabling users to download line charts, maps and tables

Today: showcase two data visualizations

DocFlows

DocFlows

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Are you interested in the migration of residents or physicians? ⓘ

☐ Residents

☒ Physicians

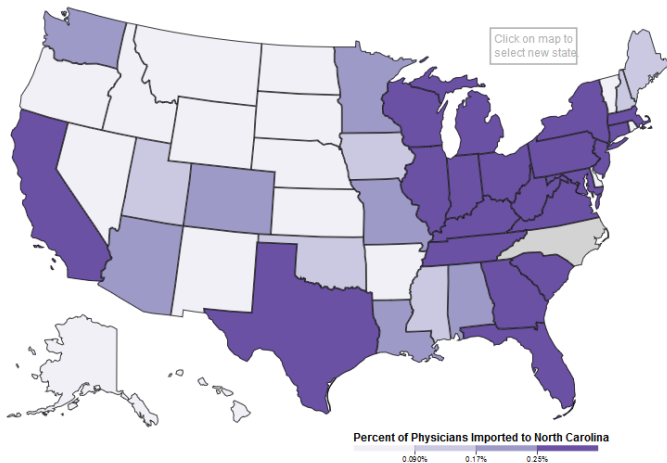
Which calculation? ⓘ

Import

Which specialty? ⓘ

All Specialties

Where is North Carolina importing physicians in all specialties from?



docflows.unc.edu

NC Health Workforce

SHEPS HEALTH
WORKFORCE NC

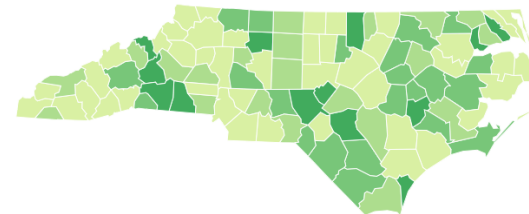
[Blog](#) [About](#) [Supply Data](#) [Other Publication](#)

North Carolina Health Professional Supply Data

Choose a profession

Licensed Practical Nurse

Licensed Practical Nurses per 10,000 Population by County, North Carolina, 2018



Profession Demographics for North Carolina

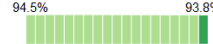
Rate per 10,000 Population



Total



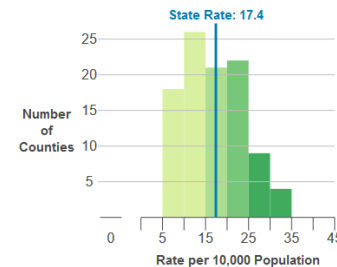
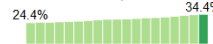
Percent Female



Percent 65 or Older



Percent Underrepresented Minority



Select a Year: 2018

See data by:

County

[DOWNLOAD AS IMAGE](#)

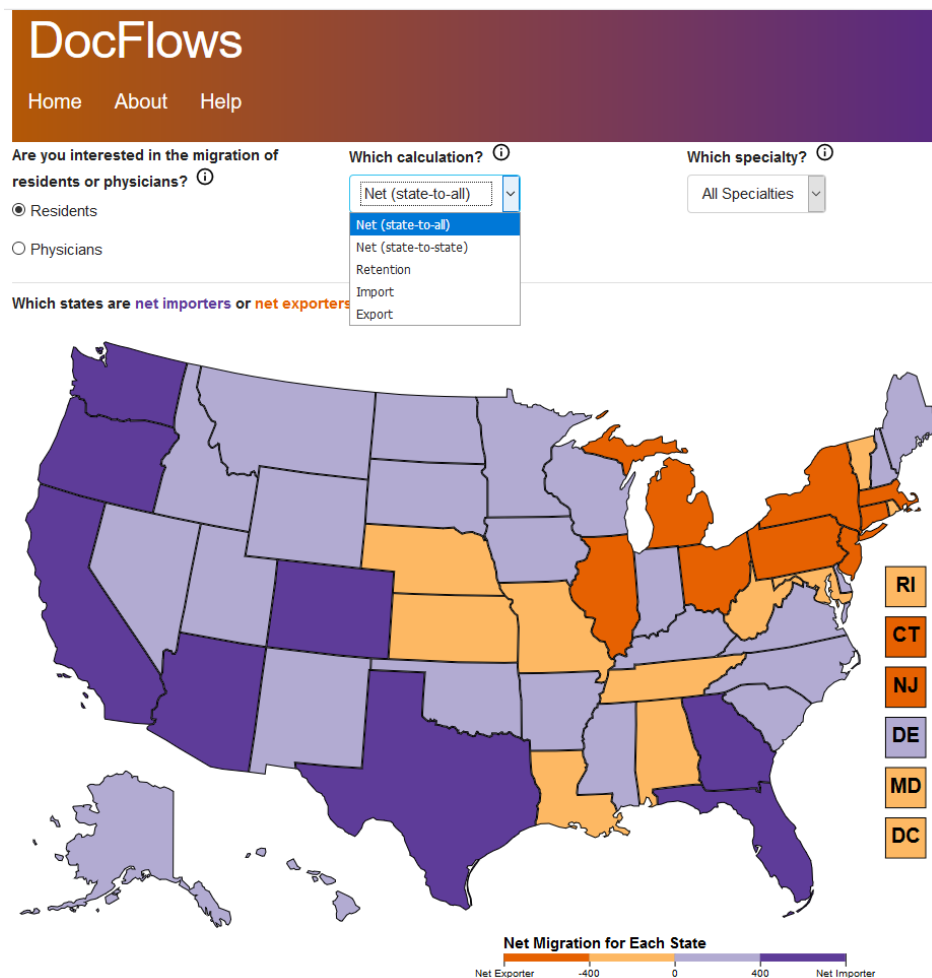
[DOWNLOAD DATA](#)

[TUTORIAL](#)

nchealthworkforce.unc.edu

DocFlows shows interstate flows of residents and actively practicing physicians between 2009 and 2015

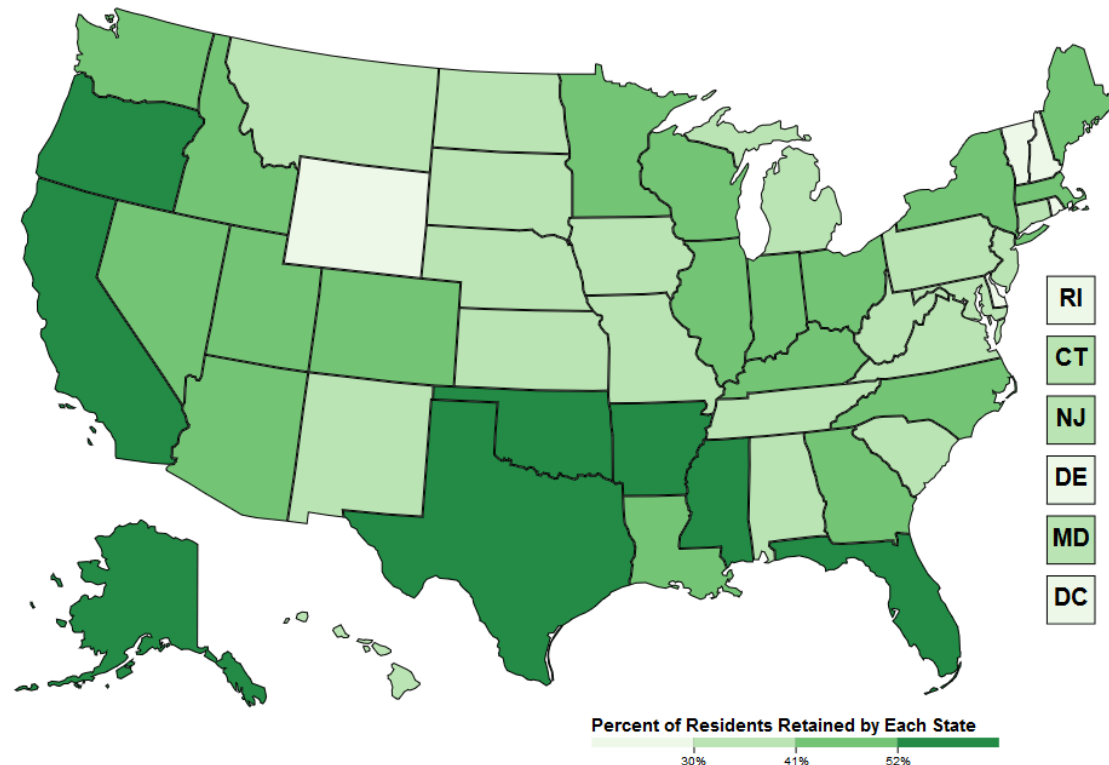
- States have idea of self-sufficiency but physician market is national
- Goal: help policy makers visualize geographic imbalances between funding of training and workforce needs
- This app is sub-titled “if I train more residents where are they likely to move”?



Can also look at retention: How well does each state retain residents who trained there?

- California (72%) and Texas (60%) had highest retention rates
- DC (23%), Rhode Island (23%) and Wyoming (18%) had lowest retention rates
- It was through this viz that Wyoming discovered that Colorado was “stealing” its residents

How well does each state retain its residents?



Similar approach could be used to visualize between country migration using OECD data

ORGANISATION
FOR ECONOMIC
CO-OPERATION
AND DEVELOPMENT



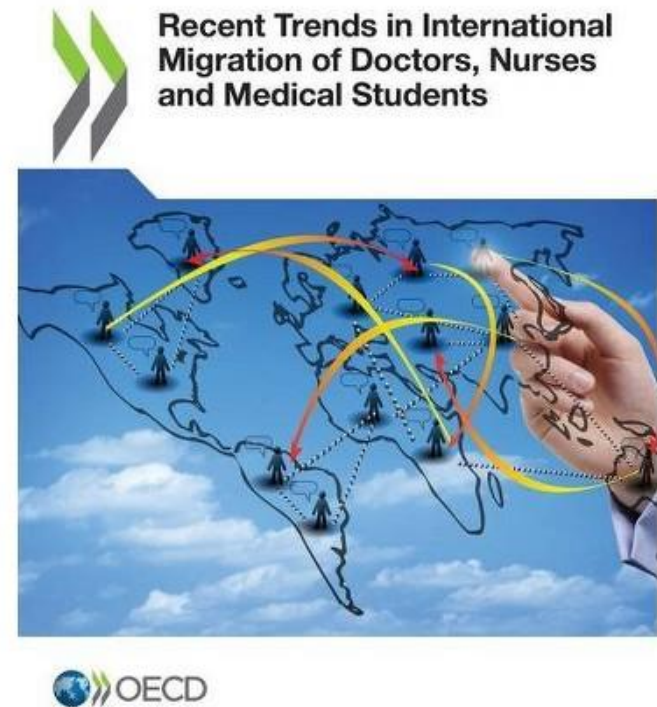
OECD.Stat

Health Workforce Migration: Foreign-trained doctors in United Kingdom by country of origin

Country					
Year	2014	2015	2016	2017	2018
Country of origin					
Total	49160	45732	47905	49164	51115
India	17011	15119	15517	15685	15870
Pakistan	5319	4980	5337	5575	5922
Nigeria	2190	2032	2182	2380	2831
Egypt	1736	1717	1798	2020	2268
Ireland	1860	1738	1770	1763	1755
Greece	1192	1279	1353	1387	1395
South Africa	1427	1314	1327	1324	1298
Iraq	1350	1225	1255	1233	1236
Sri Lanka	1372	1225	1243	1209	1200
Germany	1349	1199	1214	1180	1175
Italy	947	1040	1099	1117	1152
Romania	852	872	949	1037	1129
Sudan	730	734	769	848	936
Poland	825	774	832	875	914
Spain	795	734	762	758	736
Czech Republic	613	576	624	653	708
Bangladesh	528	500	542	593	654
Hungary	497	454	497	516	531
Myanmar	453	415	452	481	528
Australia	496	496	491	539	522
Russian	442	420	429	443	453
Syria	413	378	380	386	391
Netherlands	367	356	379	380	359
Bulgaria	321	309	327	342	352

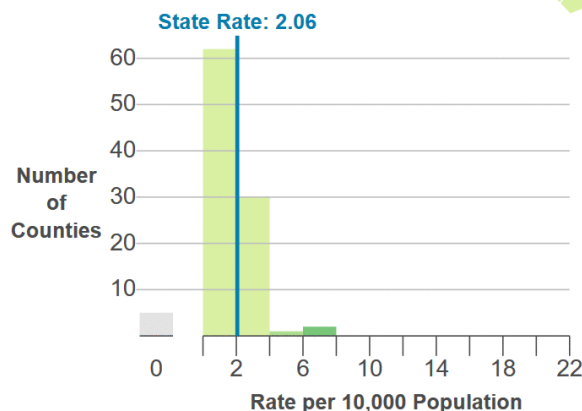
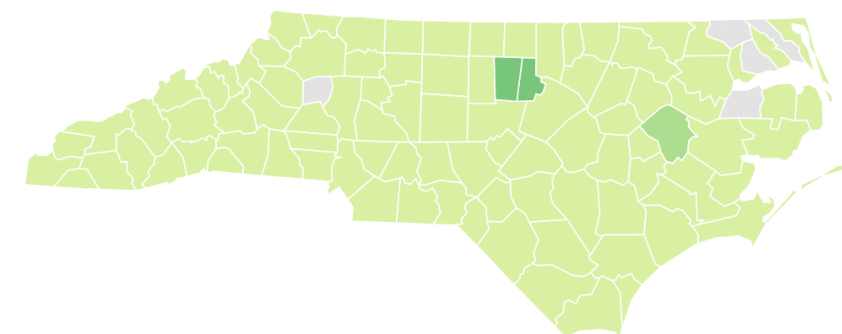
Data extracted on 18 Oct 2019 17:28 UTC (GMT) from OECD.Stat

These data show UK- foreign trained doctors by country of origin. Could visualize if/how flows have changed given Brexit

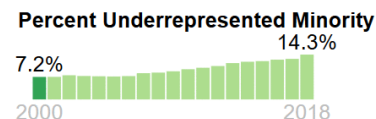
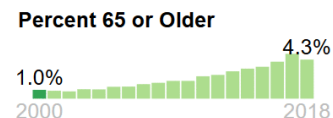
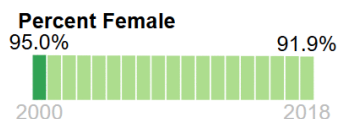
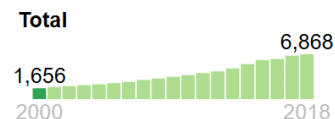
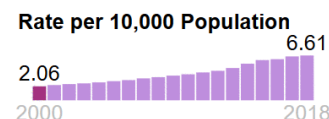


Our NC Health Workforce viz allows users to explore data on 21 health professions in NC from 2000-2018

Nurse Practitioners per 10,000 Population by County, North Carolina, 2000



Profession Demographics for North Carolina



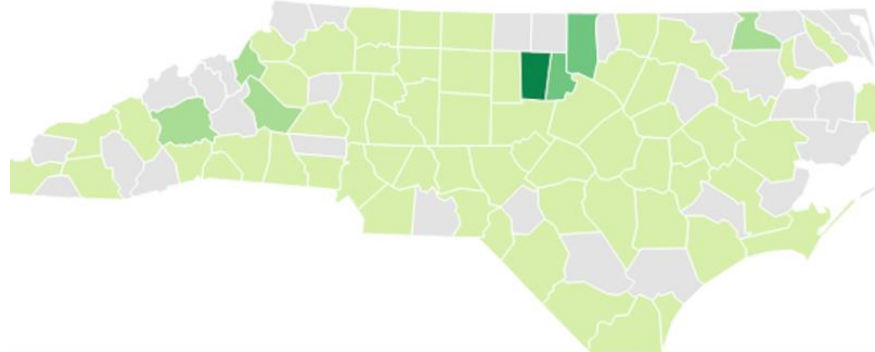
**SHEPS HEALTH
WORKFORCE NC**

Notes: Data include active, licensed nurse practitioners in practice in North Carolina as of October 31 of each year. Nurse practitioner data are derived from the North Carolina Board of Nursing. Population census data and estimates are downloaded from the North Carolina Office of State Budget and Management via NC LINC and are based on US Census data. Source: North Carolina Health Professions Data System, Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill. Created October 18, 2019 at <https://nchealthworkforce.unc.edu/supply/>.



Recruiting and Retaining Rural Health Providers

Physicians with a Primary Area of Practice of Psychiatry, General per 10,000 Population by County, North Carolina, 2018



Eastern NC mental health unit slated for closure



Dental therapy might not be what you think, but is it for

UNC Program Builds Rural Care Pipeline of Minority Doctors and Dentists

By LIZ SCHLEMMER & JASON DEBRUYN • AUG 1, 2018

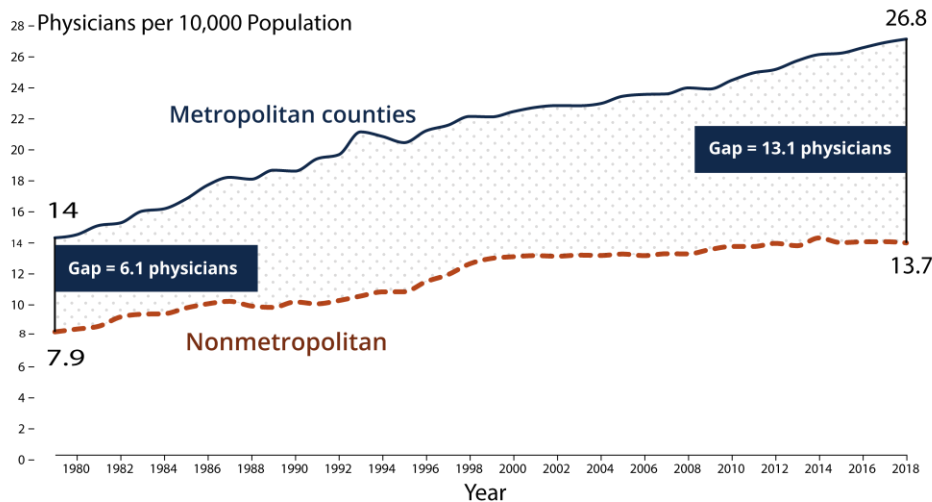
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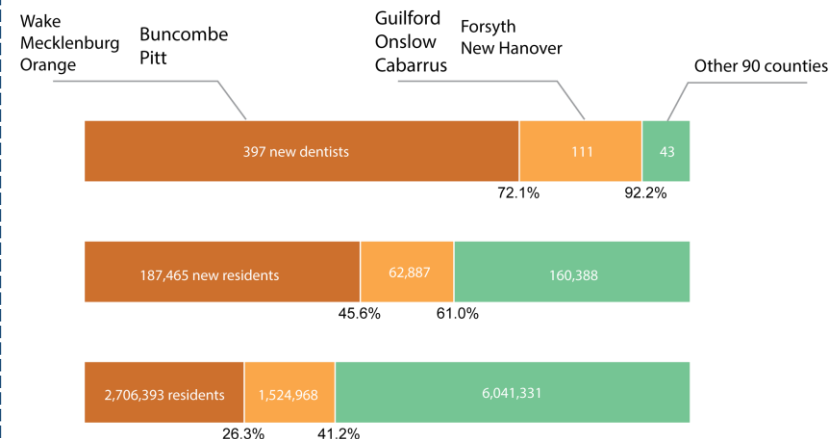
Students in the Medical Education Development (MED) Program (left to right) Jazmine Walker, Miguel Vasquez, Gloribel Vanegas, and Joshua Walker prepare to dissect a cadaver at UNC Chapel Hill on July 5, 2018.

Not everyone wants to play with the data. So we created micro-blogs featuring bitesize “story morsels” that not only educate and engage but sometimes provoke

The real issue is not a shortage of physicians. It's a growing disparity between rural and urban areas

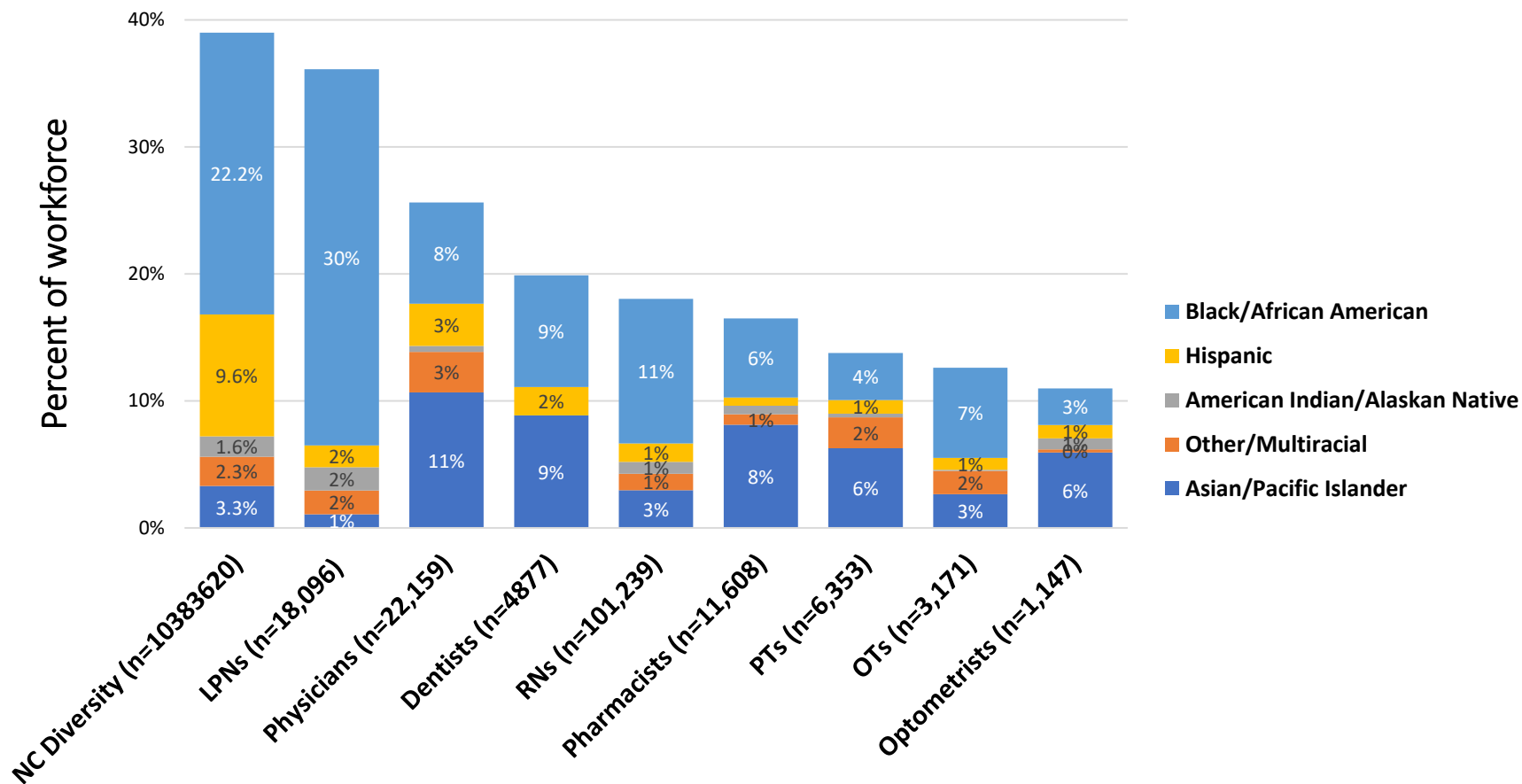


And while NC moved up from 47th to 37th in the nation in dentist supply, 72% of NC's dentist workforce growth occurred in 5 counties, 8% went to 90 counties



We take our role as “data agitators” seriously, for example: highlighting racial/ethnic disparities in workforce

**Diversity (Non-White) of NC Population versus Select Health Professions
North Carolina, 2016**



We don't just provoke people— we also make them happy

“Powerful! thanks. I work at...a network of community health clinics and we use Shep's data frequently to describe need for medical and dental clinicians.” - **Director, Planning and Strategy, Community Health Center**

“I am on your website to find a contact so we can make a data request to the Health Professions Data System for background data to be used in our HRSA training grant proposal. ... Instead, I find your interactive tool so I can download the data myself. Beautiful! Thank you for your service to the state.” - **Preventive Medicine clinician and researcher**

“This is exactly what we are looking for.” - **Legislative assistant to NC Senator** who called looking for the latest data on the number of primary care physicians per population in NC.

“You are phenomenal! Thank you so much!” - **AHEC Director** who called looking for data during a five-minute break from a meeting. We directed her to the website, and she had data on workforce supply when the meeting resumed.

★ **A faculty member at UNC School of Public Health** called the Sheps Center's main line to make a data request. As the call was being transferred, she found the data she needed on the HPDS data visualization website.

A slide for the techies

- Core technology is a JavaScript library called D3, which allows for the development of flexible data visualizations, unconstrained by predefined chart templates.
- Supply visualization also uses the JavaScript framework Vue.js
- All open source
- Code for visualizations on GitHub:
github.com/gallowayevan
- Prototype/develop on Observable, a JavaScript notebook environment:
observablehq.com



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