

# NC Nursecast: Understanding the Nursing Workforce in North Carolina

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The recent pandemic has reaffirmed how important nurses are to our health care system while bringing collective awareness to the problems they face. Burnout and fatigue, staffing shortages and salary issues, an increasingly violent patient population, and other factors challenge nurses and their employers. In North Carolina, over 100,000 registered nurses (RNs) and nearly 18,000 licensed practical nurses (LPNs) work in various settings. Half of the registered nurses entering the workforce each year are educated in North Carolina whereas the rest come from out of state.

How will the state’s nurse workforce look in the future? NC Nursecast, a web-based, interactive workforce model that forecasts the future supply and demand for RNs and LPNs provides insight [1]. The Cecil G. Sheps Center’s Program on Health Workforce Research and Policy team, which includes a nurse expert and a modeling expert, built Nursecast with funding and collaborative support from the North Carolina Board of Nursing (NC BON). The model provides an accessible and transparent tool for supporting nurse workforce planning.

## NC Nursecast Development

The Sheps Center began collaborating with the NC BON three years ago to build a nurse workforce model amid shifting national and state health care delivery and payment models [2, 3]. Using longitudinal BON nurse licensure data, state population data, survey data, and expert input from a nursing advisory committee, the Sheps workforce team built a model forecasting how many nurses will be available (supply) and how many will be required (demand) in North Carolina from 2019 to 2033.

Nursecast also contains a Graduate Diffusion tool that maps where nurses work two years after completing their training programs. This tool enables users to view the geographic footprint of public education programs in North

Carolina and descriptive information about program graduates’ employment—such as the setting, how far it is from the program, and the percent of graduates working in urban or rural settings—using information from NC Tower, a web-based system that provides aggregate information on public university and community college students in North Carolina.

## North Carolina Faces Sizeable Nurse Shortages Across Settings and Regions

Even before the pandemic, the state projected an estimated 12,500 RN and 5000 LPN shortage in 2033. The largest RN shortages (≈ 10,000 nurses) will occur in hospitals while the largest LPN shortages (≈ 3500 nurses) will occur in nursing home, extended care, and assisted living facilities (Table 1). These shortfalls reflect the primary employment settings for both professionals as well as the needs of an expanding and aging population.

Metropolitan areas, home to large medical systems, face larger RN shortages than rural areas. Nursecast pro-

**TABLE 1.**  
Nurse Workforce Shortage and Surplus Estimates for 2033 from NC Nursecast

Setting	RN Shortage or Surplus		LPN Shortage or Surplus	
	Count	Percent	Count	Percent
Total	-12,500	-11%	-5,000	-27%
Hospital	-9,927	-17%	-314	-32%
Nursing Home/Extended Care/Assisted Living	-1,888	-31%	-3,510	-49%
Home Health/Hospice	-1,535	-18%	-504	-14%
Nursing Education	-132	-9%	n/a	n/a
Correctional Facility	-128	-16%	-9	-2%
Mental Health Hospital/Facility	-26	-1%	-58	-9%
Community and Population Health	+86	+1%	n/a	n/a
Ambulatory Care	+363	+2%	-148	-7%

vides projections at the state level as well as by Medicaid region, AHEC region, and metro versus non-metro regions. One of Nursecast's greatest strengths is its ability to examine the nurse workforce by setting and region simultaneously. The entire state faces sizeable LPN shortages, with the largest occurring in Western North Carolina.

### Nurse Shortages Will Likely Worsen

Nursecast provides several "what if" scenarios to examine how the forecast may change if nurses exit the workforce early, remain longer, graduate in higher numbers, or come to the state in lower numbers. By 2033:

- If RNs exit the workforce five years early, the projected shortage nearly doubles from 12,500 to 21,000.
- If the graduate numbers increase by 10%, RN and LPN shortages will decrease from 12,500 to 11,500 for RNs and 5000 to 4500 for LPNs.
- If nurses delay their workforce exit by two years, the shortages for RNs and LPNs decrease minimally.

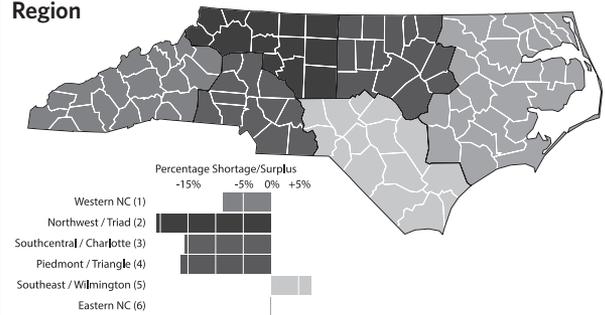
Nursecast contains a scenario to potentially capture the influence of the pandemic, although we do not yet know its short- and long-term influence on the workforce. However, in this scenario nurses exit the workforce five years early, out-of-state nurse flow decreases by 2.5%, and graduates increase 10% (hero effect). This scenario reflects the exit and burnout being reported from the field, the likelihood all states will face shortages and therefore the out-of-state nurse flow will likely decrease, and the potential increase in students going to school for nursing because the pandemic has highlighted their importance. The hero effect also occurred following 9/11, when emergency response fields saw an increase in young people entering these professions.

- In the "COVID estimate" scenario, the RN shortage increases from 12,500 to 18,600 and the LPN shortage increases from 5000 to 5800 by 2033.

### Solutions to Nurse Shortages Must be Multifaceted

North Carolina faces sizeable nurse shortages and addressing them will require multiple different responses. Education alone will not ameliorate nurse shortages, even though continuing to support education is crucial, particu-

**FIGURE 1.**  
RN Shortage and Surplus Projections for 2033 by Medicaid Region



Source. NC Nursecast

larly in the long term. Employers and policy makers need retention plans for current staff reflective of nurse needs over the course of a career, meaning a mid-career nurse may need child care support whereas an entry-level nurse may need educational opportunities. NC Nursecast can support various actors as they address nursing shortages by providing foundational, detailed workforce information for the state. NCMJ

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