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NURSES INVESTING IN THE FUTURE OF MAINE'S HEALTH

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The Nursing Workforce in Maine: Trends & Forecasts 2015-2020/21

Update, January 21, 2022

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Table of Contents

Introduction	3
Nurse Workforce in Maine, 2020/21	7
Model Inputs: RN (non-APRN) Workforce in Maine, 2020/21	11
Model Predictions, 2016-2025 (The Forecast)	18
Summary and Recommendations	20

Introduction

Objective

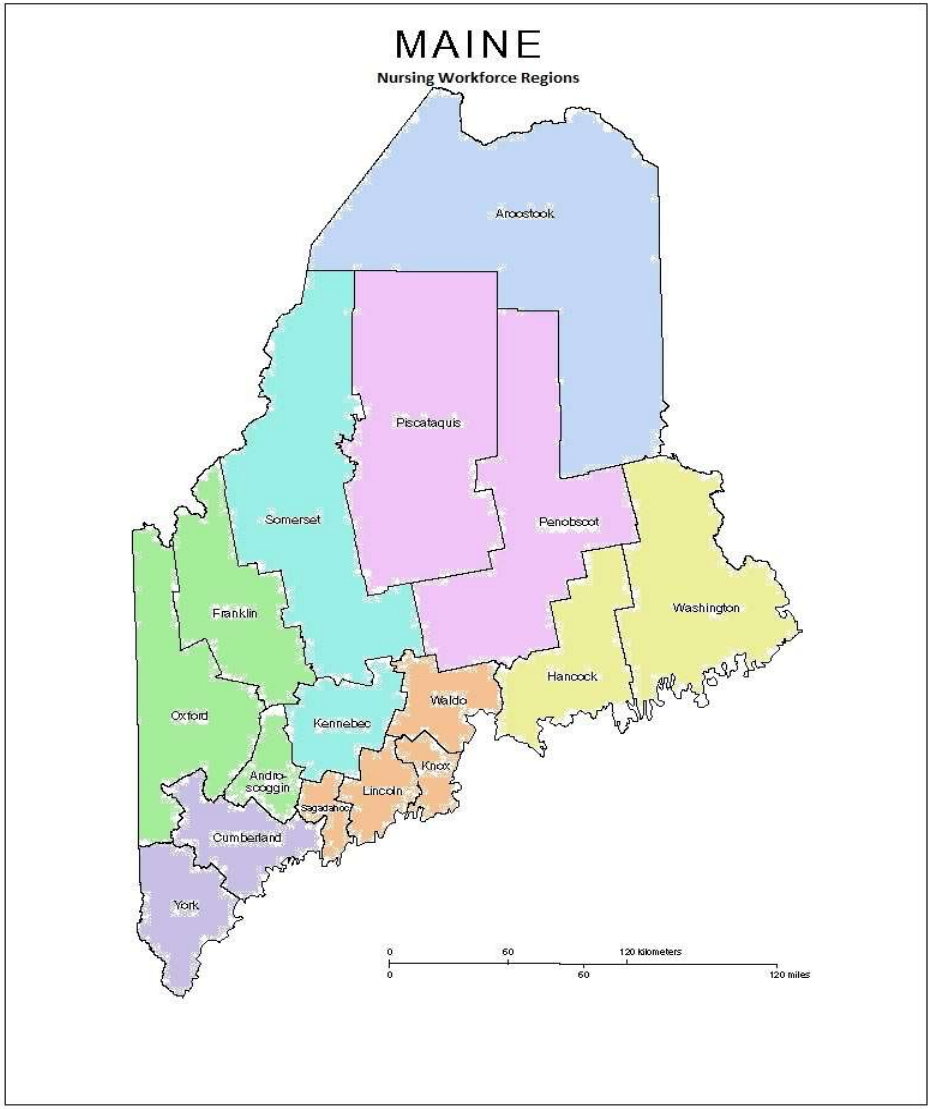
- Update the nurse (RN) forecast for Maine using the most recent (2020/21) registration data.
- Determine if recent efforts to minimize a nursing shortage were successful.
- Update the forecast for 2025, if needed.
- Identify areas of concern regarding trends in the RN workforce in Maine.

Methods

- A dynamic model for estimating the supply of and demand for RNs in the state of Maine was initially developed in 2016 (using 2015 state RN registration data). That model was designed to allow for a modification of any assumptions made in 2016 at any time during the period of 2016 to 2025.
- The current effort is an update of the assumptions of that model to see if the forecast for 2025 should be modified to reflect recent changes in the RN workforce and/or demand for nursing services.
- The forecast is comprised of two main components:
  - **The 'supply' of RNs**; we measure this directly via the required RN biennial registration process for RNs practicing in the state of Maine.
  - **The 'demand' for RNs**: we estimate this based on the composition of the generation population (older people use significant more healthcare than younger people) and how many RNs are required to provide a 'unit' of healthcare services ('intensity factors').
    - For this update, we used the same intensity factors as in the initial forecast (2016). Intensity factors tend to not change dramatically over time yet, normally we still re-examine intensity factors to update forecasts, as they could change. However, the current COVID-19 pandemic no doubt has impacted intensity factors heavily, but probably temporarily; assuming the pandemic will soon come to an end, we would expect intensity factors to revert back to close to what they were in 2016. If that is not true and the intensity factors change on a more permanent (or very long term) basis, the current estimates would likely be inaccurate and undercount the number of RNs needed in the state.

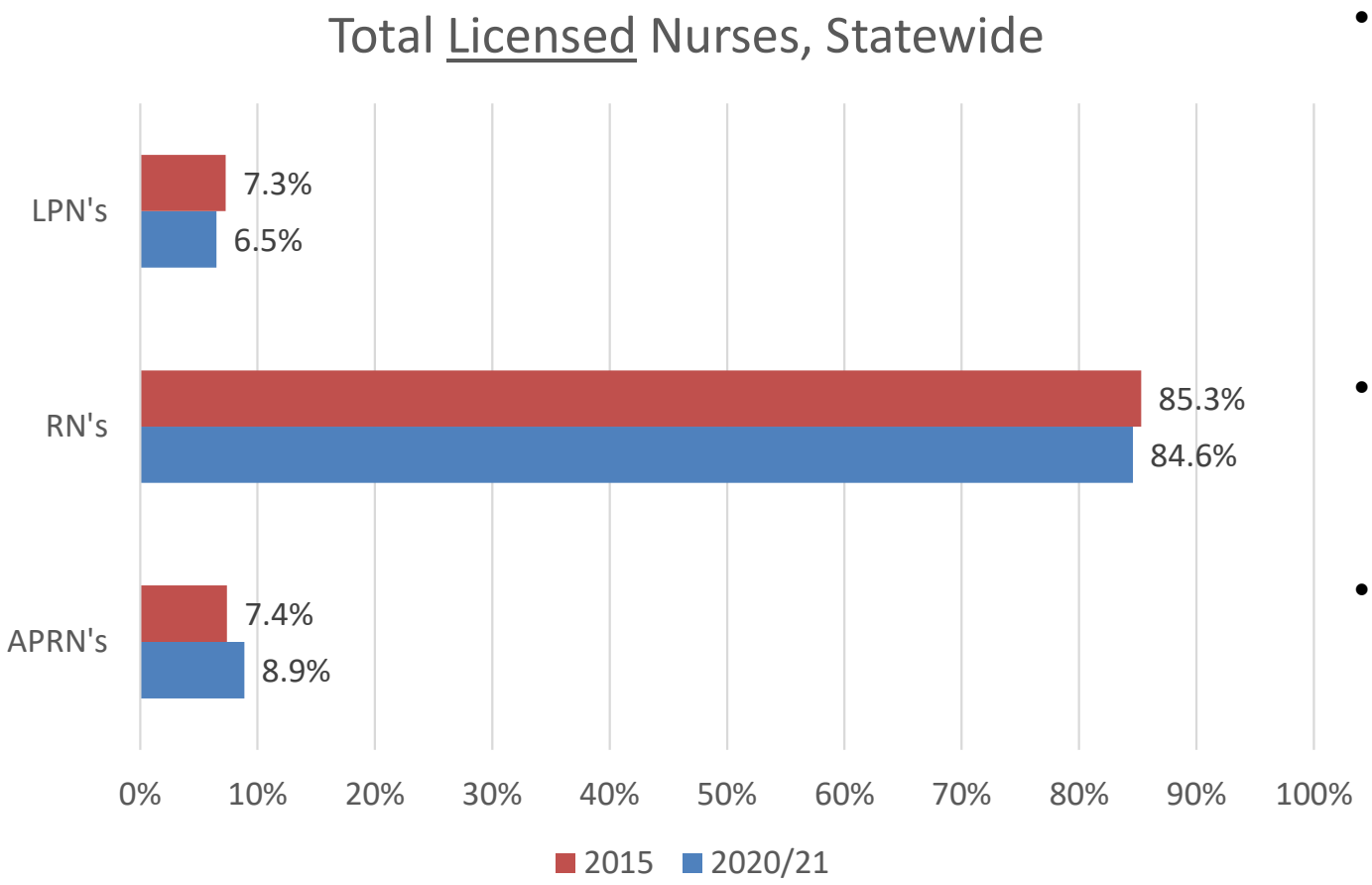
Maine's Regions

- The forecast for the state is built at the regional level and then summed for state-wide numbers.
- **Seven Regions**
  - York/Cumberland Counties
  - Sagadahoc/Lincoln/Knox/Waldo
  - Hancock/Washington
  - Oxford/Franklin/Androscoggin
  - Somerset/Kennebec
  - Piscataquis/Penobscot
  - Aroostook



Nurse Workforce in Maine, 2020/21

Maine's Nurses



- In 2015, there were approximately 27,000 (RNs/APRNs/LPNs) licensed in the state. This increased slightly to 27,888 in 2020/21,
- The great majority are RNs (85% in both periods).
- Proportionally, the number of LPNs has decreased and the number of APRNs has increased from 2015 to 2021

- LPNs make up a smaller proportion of the nurse workforce in 2021 than 2015 in most of Maine's regions.
- In contrast, APRNs make up a greater proportion of the nurse workforce in 2021 compared to 2015 in all but one region (Aroostook).

	York; Cumberland		Sagadahoc; Lincoln; Knox; Waldo		Hancock; Washington		Oxford; Franklin; Androscoggin		Somerset; Kennebec		Piscataquis; Penobscot		Aroostook	
	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21
LPNs	6%	5%	6%	6%	8%	7%	8%	8%	6%	6%	6%	5%	4%	8%
RNs	87%	84%	85%	83%	84%	83%	85%	83%	88%	85%	86%	85%	85%	82%
APRNs	8%	11%	8%	11%	8%	10%	7%	9%	6%	9%	8%	10%	10%	10%

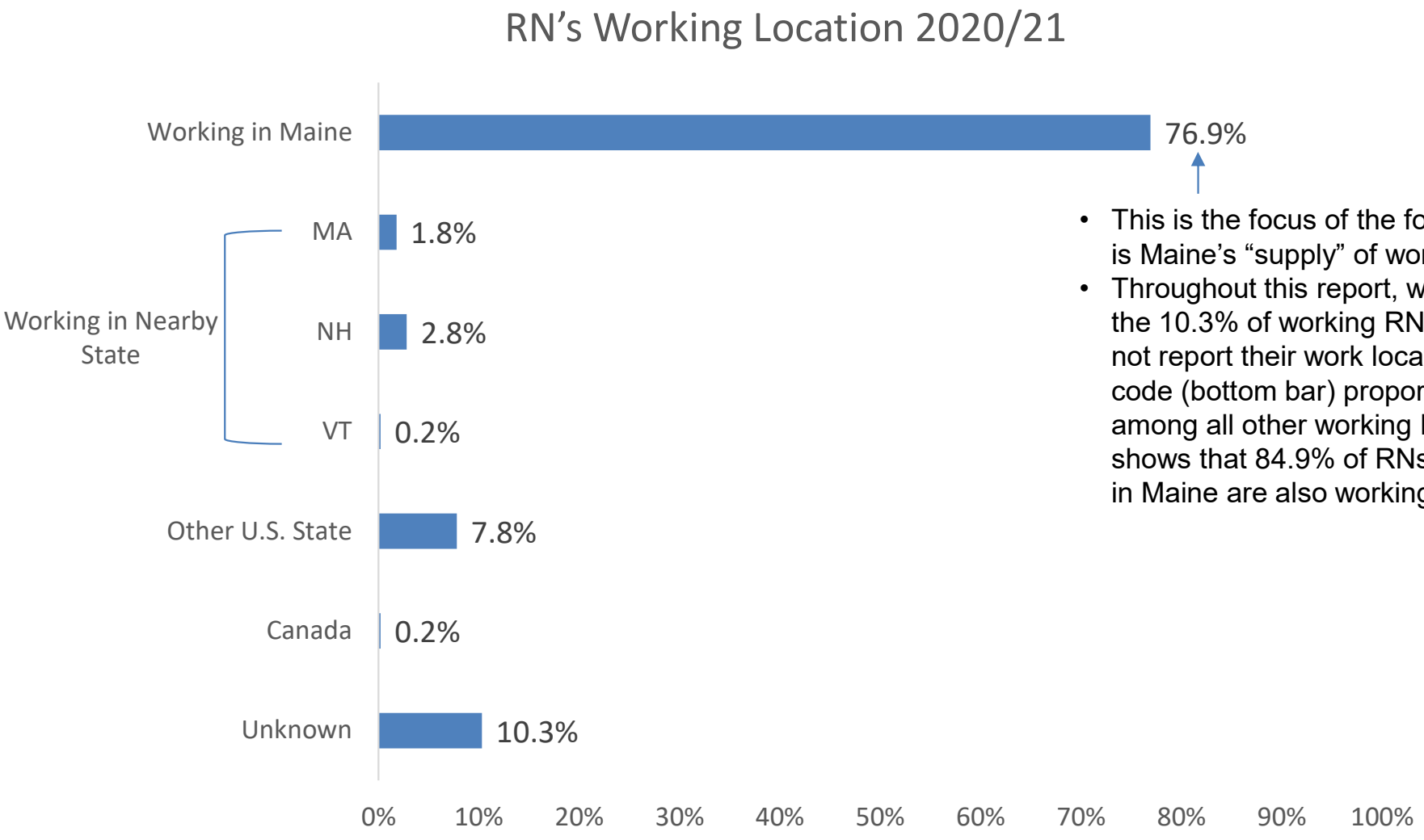
Maine's Licensed Nurses, 2020/2021 Work Status

- Almost 9 in 10 of the licensed RNs in Maine are working as nurses, either full-time (69.6%), part-time (10.0%) or *per diem* (7.1%).
- Unemployment among RNs is *very low (*1.9%). This is below normal limits for a full employed labor force – there are always some members of the workforce who are in transition, for many reasons. There are likely hundreds of openings for nurses in multiple settings throughout Maine.

	LPN	RN	APRN
Workforce			
Actively employed in nursing or in a position that requires a nurse license – FT	57.6%	**69.6%**	79.7%
Actively employed in nursing or in a position that requires a nurse license - Part-time	8.2%	**10.0%**	11.3%
Actively employed in nursing or in a position that requires a nurse license - *Per diem*	7.8%	**7.1%**	4.3%
Unemployed - Seeking work as a nurse	3.7%	**1.8%**	1.3%
Non-Workforce			
Working in nursing only as a volunteer	0.7%	**0.7%**	0.7%
Actively employed in a field other than nursing - Full-time	3.9%	**1.6%**	0.7%
Unemployed - Not seeking work as a nurse	6.1%	**2.7%**	0.8%
Retired	10.2%	**5.8%**	1.1%
Actively employed in a field other than nursing - Part-time	1.2%	**0.5%**	0.1%
Actively employed in a field other than nursing - Per diem	0.6%	**0.2%**	0.1%

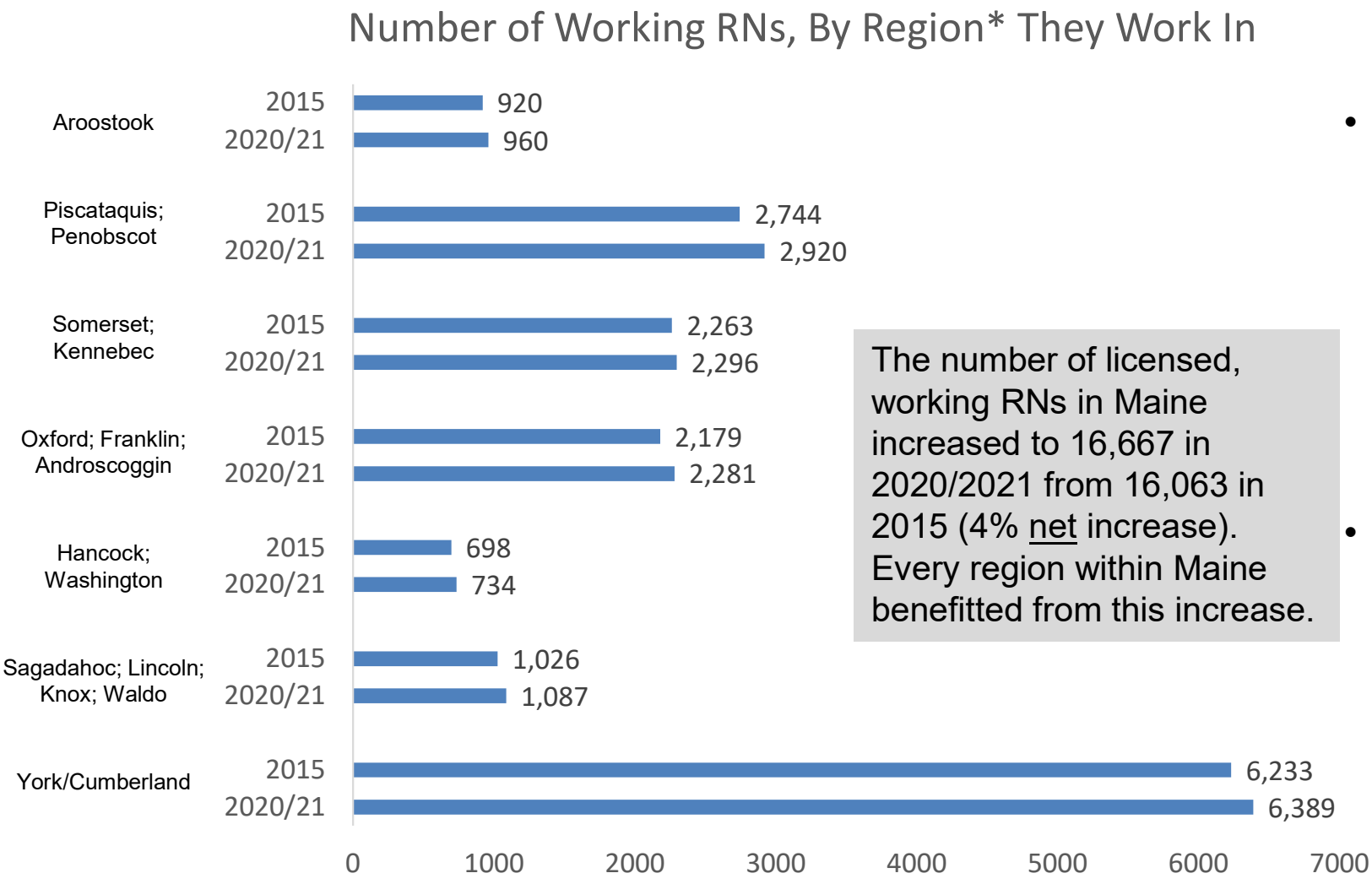
Model Inputs: RN (non-APRN) Workforce in Maine, 2020/21

Maine's Licensed RNs, 2020/2021
Work Location



- This is the focus of the forecast. It is Maine's "supply" of working RNs.
- Throughout this report, we allocate the 10.3% of working RNs who did not report their work location zip code (bottom bar) proportionately among all other working RNs, this shows that 84.9% of RNs licensed in Maine are also working in Maine.

Maine's RN Workforce

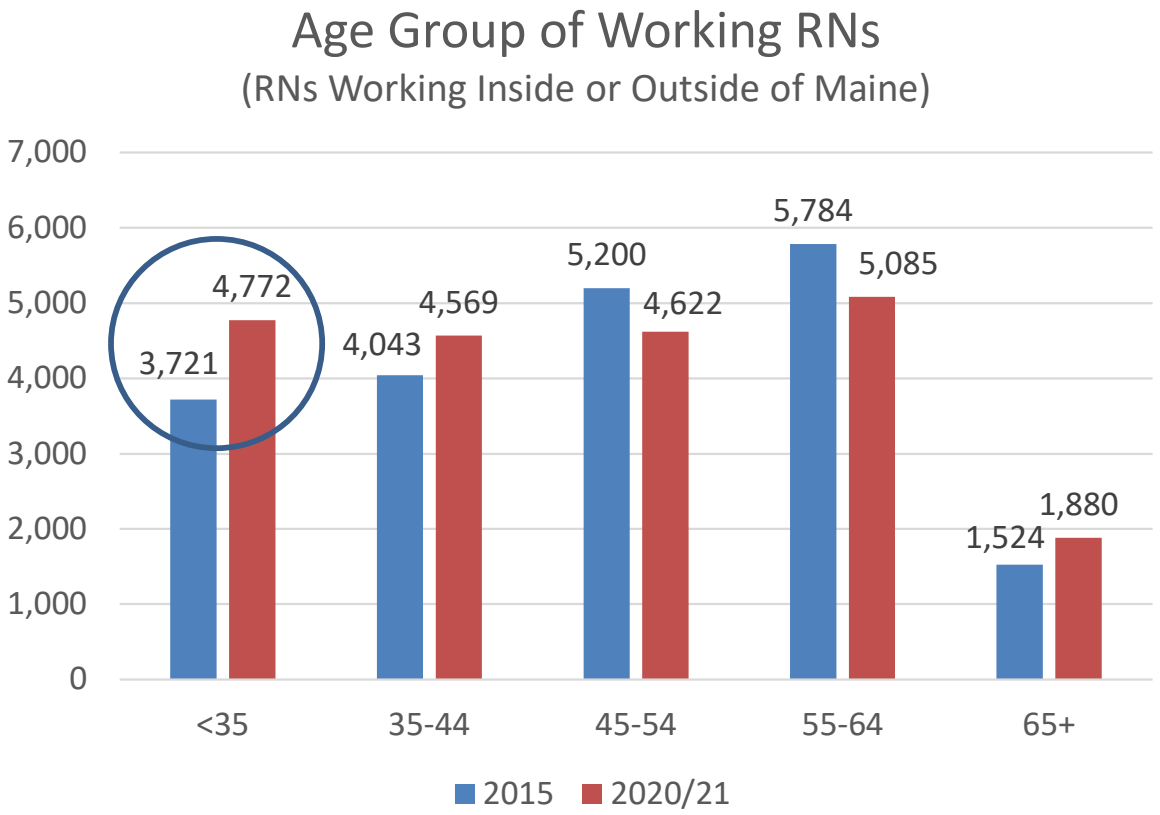


The number of licensed, working RNs in Maine increased to 16,667 in 2020/2021 from 16,063 in 2015 (4% net increase). Every region within Maine benefitted from this increase.

- The sole focus of the forecast is on RNs. Here we show the number of *licensed RNs* in the workforce, by region, in both periods.
- This increase in the number of working RNs reverses the trend of the prior 10 years.

*The approximately 10% of nurses who did not report their work location (zip code) were proportionately distributed among all of the locations).

Age Trends for Maine's RN Workforce



- Many things could have led to this net increase in the number of working RNs in Maine over the past five years. This figure demonstrates what drove that trend. Between 2015 and 2020/21 we see a dramatic shift in the ages of RNs, as a group. The number of working RNs younger than 35 grew by over 1,000. No other cohort saw this level of an increase. The cohorts age 45 and over decreased in size (as predicted in the original forecast).

Age Trends for Maine's RN Workforce

Region	Median Age of Working RNs	
	2015	2020/21
York; Cumberland	49	46
Sagadahoc; Lincoln; Knox; Waldo	53	52
Hancock; Washington	53	51
Oxford; Franklin; Androscoggin	48	47
Somerset; Kennebec	50	48
Piscataquis; Penobscot	46	45
Aroostook	45	46
Total:	49	47

- We see a younger RN workforce across all regions in Maine with the exception of Aroostook.

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Work Setting, By Region

- The proportion of RNs working in the various settings has remained quite stable over the past five years. Hospitals remains the dominant setting; however, in two regions (Oxford/Franklin/Androscoggin and Aroostook) the proportion of hospital-based RNs working in that region dropped by several percentage points.

	York; Cumberland		Sagadahoc; Lincoln; Knox; Waldo		Hancock; Washington		Oxford; Franklin; Androscoggin		Somerset; Kennebec		Piscataquis; Penobscot		Aroostook	
	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21
Hospital	50.0%	48.5%	47.8%	47.1%	54.8%	52.2%	54.5%	47.2%	49.0%	47.1%	62.6%	61.9%	53.9%	47.0%
Ambulatory Care Setting	12.0%	15.8%	11.4%	13.4%	9.9%	11.5%	8.3%	13.3%	10.9%	14.0%	9.9%	10.8%	7.2%	10.4%
Nursing Home/Extended Care/Assist. Living	9.4%	7.4%	13.9%	12.9%	14.3%	11.2%	12.1%	11.5%	12.1%	9.9%	7.6%	7.6%	15.9%	16.9%
Home Health	7.1%	7.1%	8.9%	4.7%	4.6%	6.4%	9.2%	9.2%	8.8%	9.4%	5.2%	5.3%	6.9%	8.3%
Insurance Claims/Benefits	4.0%	3.5%	0.3%	0.5%	0.5%	0.7%	1.1%	1.9%	0.6%	0.9%	0.6%	0.6%	0.2%	0.6%
School Health Service	3.0%	2.7%	5.9%	7.0%	3.9%	3.6%	3.3%	3.8%	3.0%	2.8%	1.7%	1.5%	3.5%	3.5%
Community Health	2.6%	3.3%	1.5%	3.1%	3.6%	6.2%	1.8%	2.3%	3.6%	3.8%	2.0%	2.6%	2.0%	2.2%
Academic Setting	2.2%	1.9%	1.0%	0.7%	0.9%	1.6%	1.6%	1.9%	1.6%	1.9%	1.7%	1.8%	2.8%	3.3%
Public Health	0.7%	1.0%	0.1%	0.7%	0.5%	0.1%	0.7%	0.9%	1.2%	1.0%	2.8%	0.8%	2.5%	0.9%
Occupational Health	0.8%	0.7%	0.6%	0.9%	0.8%	0.4%	0.8%	0.9%	0.7%	0.9%	0.4%	0.4%	0.7%	0.6%
Correctional Facility	0.4%	0.6%	1.5%	2.4%	0.2%	0.1%	0.2%	0.3%	0.4%	0.7%	0.5%	0.9%	0.2%	0.3%
Policy/Planning/ Reg./Licensing Agency	0.2%	0.1%	0.1%		0.0%		0.1%	0.1%	1.1%	1.0%	0.0%	0.2%	0.2%	0.1%
Other	7.5%	7.4%	6.8%	6.7%	6.0%	5.8%	6.5%	6.6%	7.0%	6.6%	6.9%	5.7%	4.2%	5.9%

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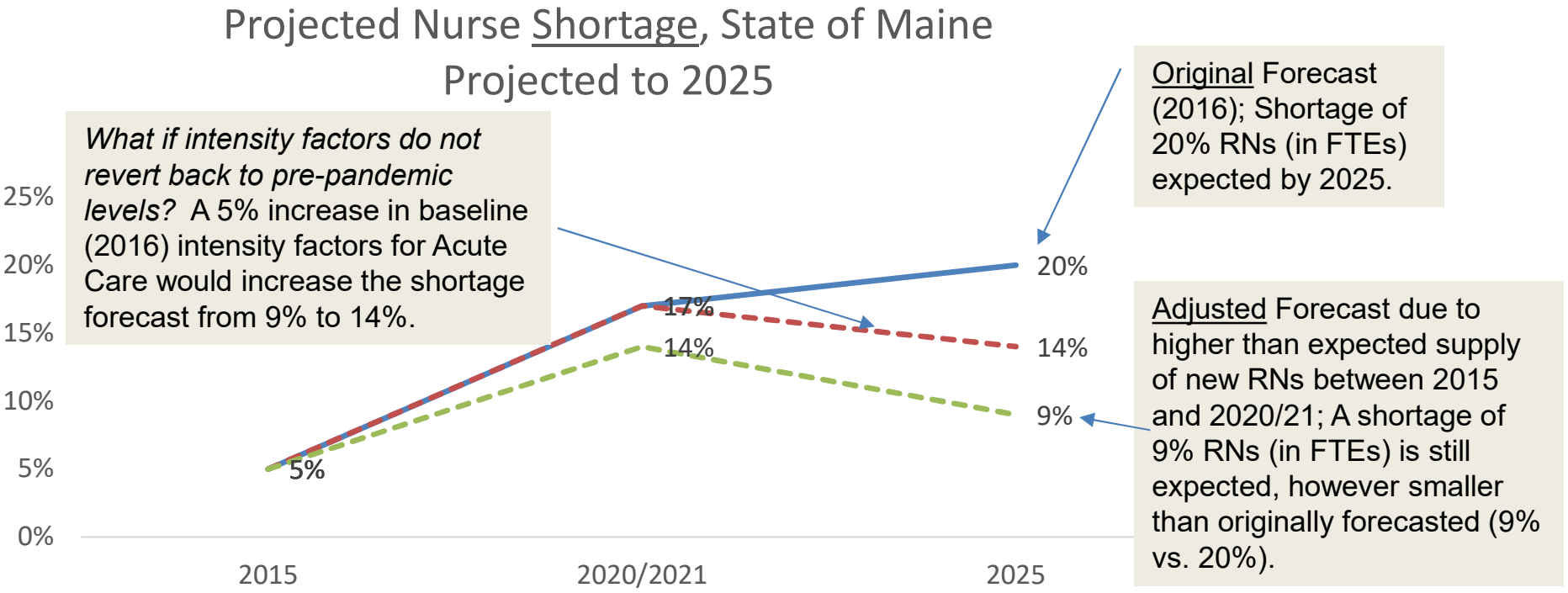
RN Specialization, by Region

- No change in the proportion of RNs working in any specialization which crosses all regions. Exceptions (+/- 1.5%) within specific regions are highlighted, but across all regions, the changes were few and small.

	York; Cumberland		Sagadahoc; Lincoln; Knox; Waldo		Hancock; Washington		Oxford; Franklin; Androscoggin		Somerset; Kennebec		Piscataquis; Penobscot		Aroostook	
	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21	2015	2020/21
Acute/Critical care	19.2%	18.8%	17.4%	18.7%	23.4%	21.4%	21.6%	21.8%	17.0%	16.0%	25.7%	25.7%	20.9%	19.9%
Medial Surgical	10.9%	11.5%	12.4%	9.6%	14.7%	13.0%	9.7%	9.5%	10.0%	10.7%	12.1%	12.2%	10.8%	7.6%
Geriatric/Gerontology	7.1%	5.6%	9.6%	10.3%	11.3%	8.2%	8.8%	8.4%	10.0%	8.3%	5.3%	5.2%	11.4%	13.5%
Home Health	5.8%	5.7%	7.7%	5.3%	4.1%	5.3%	7.1%	7.9%	8.1%	7.8%	4.6%	4.5%	6.8%	7.3%
Psychiatric/Mental Health/Sub. Abuse	3.8%	4.2%	3.0%	3.3%	0.8%	1.2%	5.0%	4.3%	8.0%	8.1%	7.7%	7.8%	2.1%	3.1%
Maternal-Child Health	4.5%	3.7%	4.1%	4.0%	4.4%	3.8%	5.0%	4.2%	4.7%	4.1%	3.1%	3.1%	5.9%	4.4%
Adult Health/Family Health	4.6%	5.2%	4.3%	5.4%	5.4%	8.0%	4.7%	5.3%	4.2%	5.1%	2.7%	3.2%	3.9%	5.0%
Rehabilitation	4.1%	2.3%	3.4%	1.8%	1.1%	0.7%	2.8%	2.9%	3.1%	2.5%	3.1%	2.1%	2.8%	3.0%
School Health	3.3%	2.9%	6.1%	6.5%	4.7%	5.3%	3.6%	4.1%	3.1%	2.9%	1.7%	1.8%	3.8%	4.0%
Oncology	2.6%	3.3%	2.7%	4.0%	1.8%	2.0%	3.3%	3.2%	3.3%	2.5%	3.3%	2.7%	2.3%	2.1%
Pediatrics/Neonatal	4.1%	4.8%	1.5%	1.1%	1.0%	1.1%	1.7%	1.6%	0.8%	1.1%	2.7%	2.9%	0.6%	0.3%
Community	1.2%	1.7%	0.9%	1.4%	1.8%	2.6%	1.1%	1.6%	1.7%	2.0%	1.1%	1.1%	1.0%	2.0%
Trauma	1.2%	1.2%	0.8%	1.1%	1.3%	0.8%	1.7%	1.0%	0.5%	1.1%	1.6%	0.9%	1.1%	1.8%
Womens Health	1.2%	1.9%	1.0%	1.5%	1.8%	1.8%	0.8%	0.9%	0.6%	0.4%	1.3%	1.4%	0.6%	0.5%
Palliative Care	1.1%	1.2%	1.1%	0.6%		0.5%	1.4%	1.5%	1.3%	1.5%	0.6%	0.8%	0.1%	0.1%
Occupational health	1.1%	0.8%	1.0%	1.3%	0.5%	0.5%	0.9%	1.0%	0.9%	1.0%	0.6%	0.6%	0.9%	0.5%
Public Health	0.9%	1.2%	0.7%	0.8%	0.3%	0.7%	0.7%	0.8%	0.8%	1.7%	1.0%	0.9%	1.6%	0.5%
Anesthesia	0.9%	1.2%	0.7%	0.9%	0.2%	0.4%	0.5%	0.6%	0.5%	0.6%	1.3%	1.5%	0.3%	0.8%
Other	22.4%	22.8%	21.6%	22.5%	21.4%	22.8%	19.6%	19.6%	21.7%	22.7%	20.5%	21.8%	23.2%	23.6%

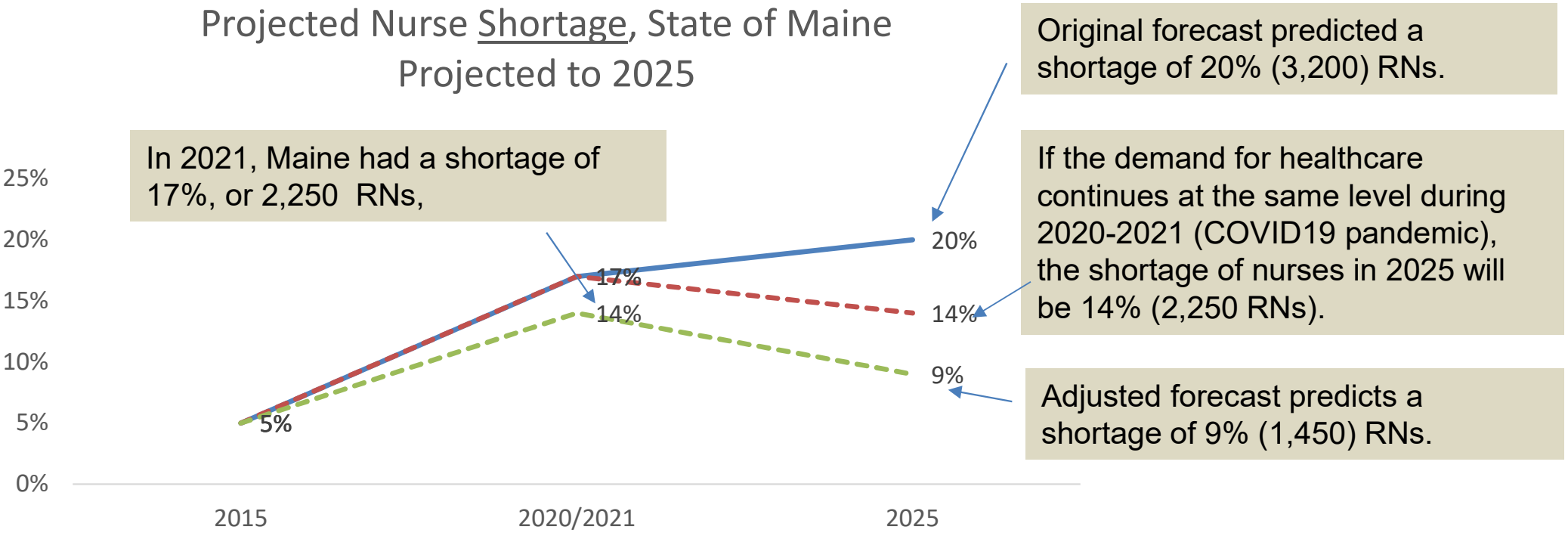
Model Predictions, 2016-2025

Forecast



- The 2025 forecast required adjustment because numerous efforts, in particular the large increase in the number of RNs early in their careers (due to increased number of RN/BSN graduates). The forecast to 2025 assumes that, and all other impactful factors remain the same from 2021 to 2025: entry of new RNs into the workforce, use of nurses (intensity factors), population size, nurses work patterns (retention rates, retirement rates, etc.) and demand for healthcare by age groups.
  - Of most concern is an increase in intensity factors if the pandemic, with its increased reliance on critical/ICU care, and ambulatory care, continues through 2022 and beyond. This will worsen the current shortage, as shown above.

Forecast – Number of Additional RNs Needed



- The improved projected shortage of RNs in Maine for 2025 was mostly driven by an annual increase in the number of early-career, newly educated and trained RNs by about 175 additional RNs (from a baseline of about 700 in 2016). Assuming all other things remain the same (retention rates, retirement levels, choice of setting and choice of practice by working RNs, etc.), the state would need to have **an additional 147 early-career RNs each year** in order to mitigate the expected shortage in 2025.

Summary and Recommendations

A dynamic model allows us to change the basic assumptions about the future, both in terms of the size of the RN workforce in Maine and the amount of healthcare Maine residents require. In 2016 we predicted a 17% shortage of RNs in 2021; the actual size of that shortage is difficult to pinpoint due to the pandemic and its ever-changing impact on the healthcare system's workforce needs. In the last five years, a very successful effort to increase the number of RNs educated in Maine resulted in a measurable and important change in the workforce size and average age. With that, we modified our forecast for 2025 to show a 9% shortage of RNs instead of a 20% shortage. This effort to increase the number of RNs educated in Maine will pay off for years, as most of the new RNs are young and can be expected to be a part of the workforce for decades to come.

However, 2021 is a highly unusual period. At the end of 2021, the healthcare system was heavily overloaded because of the pandemic. We do not know how long that will last, nor do we know what sort of lingering new demands there will be on the healthcare sector (ambulatory care for long-term COVID effects, etc.?). Our assumption for the 2025 forecast is that the demand for healthcare will revert back to pre-pandemic levels; that could be very wrong.

Another concern is changes to the RN workforce after the crisis stage of the pandemic fades. RNs in Maine, as a group, worked at full tilt throughout the pandemic (the great majority of licensed RNs were working, and the great majority of them were working full-time). This is not normal, and we could reasonably expect the workforce to revert back to 'non-crisis' levels of working (fewer working at all, and fewer working full-time).

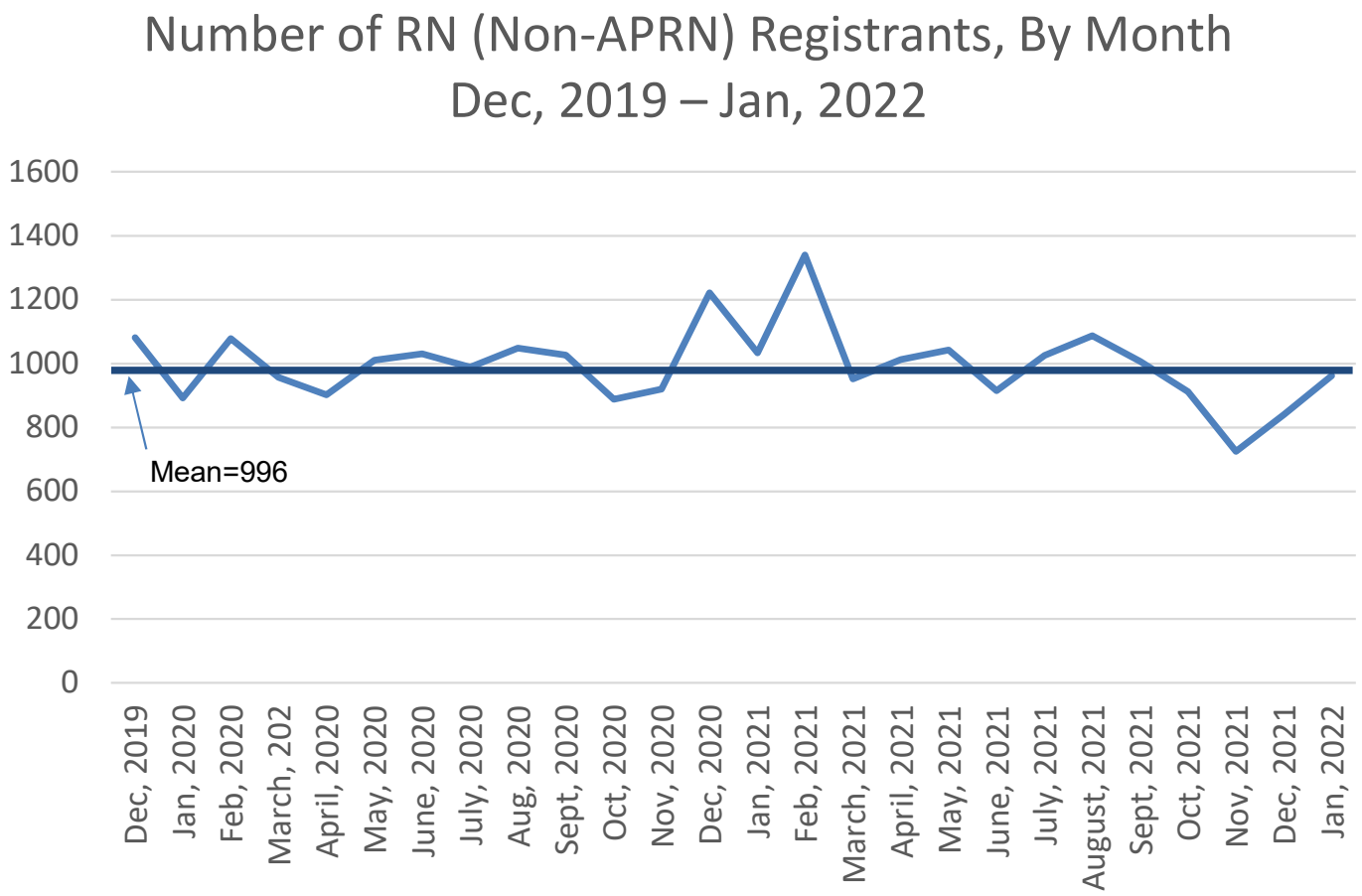
An additional concern is retention levels. We as yet do not know how many currently working RNs have been negatively impacted by the pandemic enough to impact retention levels. Lower than normal retention levels, too, will add to the nurse shortage in Maine.

Therefore, we strongly recommend that these key metrics are monitored, along with the number of nursing school graduates:

- Proportion of RNs who are working part-time, by age group and by region;
- Retention of nurses as working nurses in the state, by work setting, region and age group;
- Retirement levels, by setting and by region;
- Overall registration levels, by month, for LPNs, RNs and APRNs. While month-to-month variation is expected, the overall trend should be monitored. This would identify a net change in RNs which could alleviate or exacerbate a shortage.

Each of these can be monitored via the Minimum Data Set, captured at desired intervals over the next couple of years in order to potentially properly react to change in the workforce overall and sharpen our forecast to 2025.

Summary and Recommendations (continued)



- Because nurses register based on their birthdays, we would expect only random variation each month.
- What is important is the trend; registration levels need to be monitored over time to watch for any trend.
- While November 2021 showed an unusually low number of RN registrants, that volume reverted to close to average numbers by January, 2022.