The Center for Health Affairs workforce initiative, NEONI

**Project Methodology**

**Supply:** Maine’s Nurse Workforce

**Demand:** Maine’s Populations

**Bringing it Together – How Future Supply & Demand Will Trend**

**Questions and Answers**
Maine’s Regions

- Definition of ‘region’ is where most patients live and where most of the workforce lives.
  - Seven Regions
    - York/Cumberland Counties
    - Sagadahoc/Lincoln/Knox/Waldo
    - Hancock/Washington
    - Oxford/Franklin/Androscoggin
    - Somerset/Kennebec
    - Piscataquis/Penobscot
    - Aroostook
Data Sources

• **Nurse registration data, 2015**
  
  – In Maine, nurses licenses are renewed before their birthdays, and expire after two years.

  – Nurses renew their licenses based on their year of birth (odd or even numbered year).

  – The ‘Minimum Data Set,’ captured during the renewal process, is a rich source of information on nurses, including key information needed for a forecast (age, working status, work setting, area of practice, county of residence and county of employment).

• The State of Maine provides **population projection estimates**

• **Hospital annual reports** provide volume statistics which allow us to estimate the number of nurses needed, for hospital care, based on population size.
Maine’s Nurse Workforce
Maine’s Nurse Workforce

- In 2015, there were approximately 27,000 (RNs/APRNs/LPNs).
- 85.8% of all licensees are working.
- The great majority are RNs (85.3%).
- LPN programs have all closed, and LPN workforce is expected to be very small by 2027.
Maine’s Population
Maine’s Population

- What a difference ten years will make.

Maine Population, By Age Groups, 2017 - 2027

Somewhat similar in 2017 and 2027

Very different story for older cohorts: Significantly more people aged 65+ in 2027 than in 2017.
Same issue among the RN Workforce

- 30% of the current RN (FTE) workforce is between the age of 55 and 64.
- There are currently about 8,000 RNs which need to eventually take the place of approximately 11,000 RNs.
IMPACT OF AGE ON INPATIENT DEMAND – Hospital Setting
Orientation to Model
Timeframe of Model

• 2015 is the ‘baseline’
  – The most recent supply data for RNs
• We project to 2027 because the State’s demographers report population projections for five year periods: 2017, 2022, and 2027.
What the model accounts for….

• There is a separate model for each region and results are summed to create the totaled state projections.

- Number of newly licensed nurses each year
- Retention rates and FTE equivalence
- Number of nurse recruits into each region
- ‘Export rate’ (providing care to those outside of region)
- Utilization Factors (variable by healthcare setting)
- Population demographics
- Population Migration (into the region)
- Nurse workforce demographics, work patterns [updated each year]
- Number of new (net) hospital beds anticipated
- Proportion of healthcare which is provided in hospitals, vs. LTC vs. homecare, etc.
“Demand Factors”

Demand Factors Based on 2015 Nurse Registration Data

<table>
<thead>
<tr>
<th>Setting</th>
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<tbody>
<tr>
<td>Inpatient/Per patient days</td>
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<tr>
<td>Emergency Visits/1,000 people</td>
</tr>
<tr>
<td>Ambulatory Visits/ per day</td>
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<tr>
<td>Nursing Facilities/1,000 people</td>
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<td>Home Health/1,000 people</td>
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<td>Community Health*</td>
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<tr>
<td>Public Health*</td>
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<tr>
<td>Nursing Education*</td>
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*Estimated from nurse registrations and 2010 census

These **will likely** change in the next several years.

*Based on widely-used HRSA figures
Dynamic vs. Static Model

This is a forecasting tool, not a forecast. That is, we know that demand for healthcare can shift, sometimes dramatically, over time, so the tool accommodates that.

Trends in healthcare (new treatments, technologies), economic conditions and patient acuity all play a part in the demand for healthcare.

Therefore, this tool is designed to allow for adjustments of the assumptions to reflect changes in demand (and supply).
The Basic Math Behind The Model

**Supply Model**
- How Many Nurses We Have
  - Number of newly licensed nurses (RNs and APRNs)
  - Demographics of the nurse workforce (in particular, age)
  - Work patterns of the nurse workforce (in particular, the number of hours worked)

**Demand Model**
- How Many Nurses We Need
  - Size of the population
  - Amount of healthcare (by setting) required by the population
  - Number of nurses required to provide each ‘unit’ of healthcare
  - Trends in healthcare, economic conditions, patient acuity
Within each model, there are “input cells” where the user can make changes to the various factors in order to view what sort of impact those changes have on the supply/demand gap.

- This is what makes this modeling process different than most. We did not just predict numbers, we created a tool where you can predict the future if something unexpected happens. This model is designed to be used for the next 10 years.
Model Characteristics and Function

Excel Platform

• Spreadsheet series of databases connected by unique mathematical relationships.

Adjustable Settings

• Several settings that can be adjusted to create supply and demand hypothetical situations.
Simulations: Examples

How many new nurses would we need to educate to avoid a shortage?

What if a population in a region experiences a large shift (in size or in composition)?

What if nurses retire at a different rate? Leave the region at a different rate?

What if employers are using those nurses differently?
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