Understanding & Using HRSA's New Nursing Supply & Demand Model

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Background

- "Future of the Nursing Workforce: National- and State-Level Projections, 2012-2025"
- In 2004, HRSA released projections of RN supply and demand
- These projections provide an estimate or a forecast of the future RN and LPN nursing workforce.
- Less emphasis should be placed on the projected supply and demand numbers, and instead focus more on the factors that have been identified as influencing the growth and reduction of the nursing workforce.

Nursing Model

- Microsimulation model assumptions
  - Supply equals demand at baseline
  - Future production of nurses remains consistent with the current rate
  - Nurses practice in the state where they were trained
  - Current delivery systems
- Supply components
  - New entrants
  - Attrition
  - Average work hours
- Demand components
  - Changing demographics
  - ACA – number of insured

Key Findings

- National Findings
  - Supply of both RNs and LPNs will exceed demand in 2025.
  - RN and LPN supply is expected to grow by 952,000 FTEs and 260,900 FTEs respectively.
  - RN and LPN demand is expected to grow by 612,000 FTEs and 201,000 FTEs respectively.
- State Level Findings
  - Distributional imbalances exist
  - State shortages / surpluses

Alternative Scenarios

- Combination of 10% decrease in graduation rates and early retirement (2 years)
  - Shortfall of 86,000 RNs
- Adjusting number of new graduates to approximately 126,000 to 133,000 per year
  - Supply and demand balanced

Implications

- Adequate supply of nurses to meet the increased numbers of individuals receiving care due to the ACA.
- Greater flexibility to fill expanding roles.
- Greater need to focus on distribution and diversity of the RN and LPN workforce.
- HRSA's investments in Nursing programs.

Conclusions

- Projections are a planning tool for nursing leaders.
- Supply and demand will continue to be affected by numerous factors including population growth and the aging of the nation's population, overall economic conditions, aging of the nursing workforce, and changes in health care delivery and reimbursement.
- HRSA will refine the health workforce projection models on a regular basis to continue to assess the impacts on the nursing workforce.
- Next set of projections is expected to be released in 2016.
- Nursing web-based model is expected to be live in summer 2015.

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Understanding HRSA's 2012-2025 Supply & Demand Nursing Projections

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Historical Background on HRSA Workforce Modeling

- Siloed models (separate models for different occupations)
- Different contractors built different models using different platforms, methods and assumptions
- Static models—parameters constant over time and across states
- Separate supply and demand models
- Infrequently updated
- Limited capability to analyze policy or emerging care delivery models
- Limited ability to capture geographic variation in population risk factors

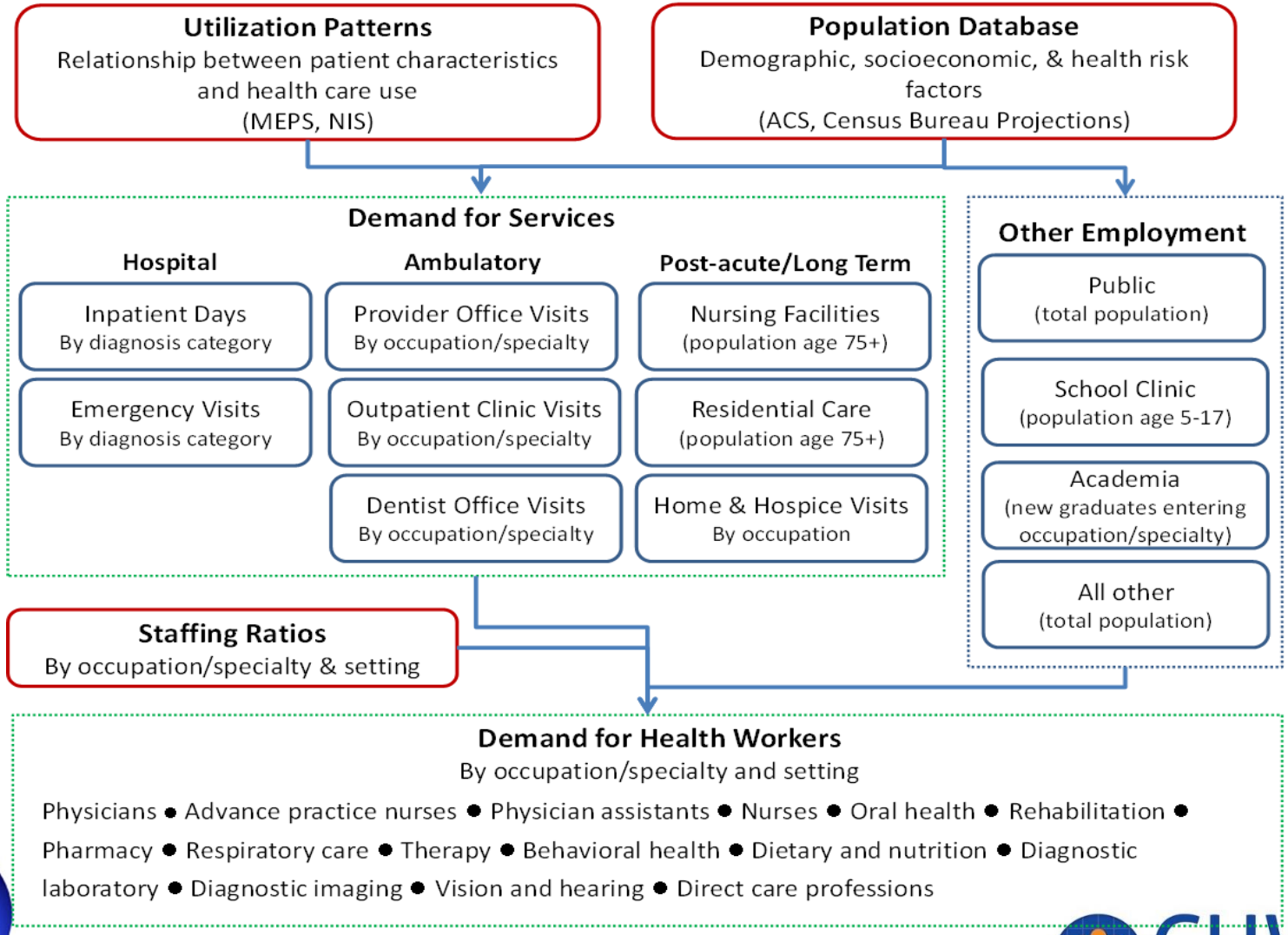
Health Workforce Simulation Model: Design Criteria

- Built on solid theoretical underpinnings
- Dynamic model that can integrate professions and link supply with demand
- Can account for both current and future availability of data
- Can be adapted for analysis at state or local levels
- Easy to maintain/update as new data becomes available
- Can model a wide range of scenarios—reflecting uncertainties in future trends

Conceptual Model, Methods and Data for Projecting Nursing Workforce Demand

HWSM version

Conceptual Model for Projecting Workforce Demand



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Microsimulation Approach for Modeling Workforce Demand

- Individual patients are the unit of observation
  - Predict use of health care services by individual
  - Determine how care will be provided to individuals
  - Sum across individuals to produce aggregate statistics
- Approach
  - Develop population health database with health profile for representative sample of the population
  - Develop predictive equations (using regression analysis) to model health care use
- Translate health care encounters into demand for practitioners
    - Use data on how practitioners divide their time between care delivery settings and patient encounters to create estimates of patient encounters per full time equivalent

Care Delivery Patterns: Converting Service Demand to Health Profession FTEs

- Estimate current number of nurses by care delivery setting
- Estimate current national use of care by delivery setting
- Divide care use by number of nurses to estimate use-per-nurse ratios
- Implicit assumption that supply & demand roughly in equilibrium nationally

Nursing Workload Drivers by Work Setting

Work Setting	Workload Driver
Hospital inpatient	Inpatient days
Emergency	Emergency visits
Offices	Office visits
Outpatient	Outpatient visits
Home health	Home health visits by a nurse
Government	Overall population
Nursing care facilities (skilled/long term)	Population age 75 and older
Residential care facilities	Population age 75 and older
Nurse education	Nurses educated
School health	Population age 5 to 18
Other	Overall population

Distribution (%) of Nurses Across Employment Settings

Work Setting	RNs				LPNs
	OES [a]		2008-10 ACS [b]	2008 NSSRN [c]	2008-10 ACS [b]
	2012	2010			
Hospitals	62.0	60.4	63.2	62.2	29.3
Inpatient [e]	55.6	54.1	56.6	55.7	
Emergency [e]	6.4	6.3	6.6	6.5	
Offices	7.4	9.8	5.1	10.5	8.6
Outpatient	4.0	4.5	4.6		5.7
Home health	6.2	5.5	3.8	6.4	6.3
Government	5.6	5.8			
Nursing care facilities (skilled/long term)	5.3	5.1	7.4	5.3	30.7
Residential care facilities	1.7	1.6	0.4		1.3
Nurse education	3.1	1.2	0.6[d]	3.8	0.3 [d]
School health	1.9				
Social work	0.7	0.7			
Public/community health				7.8	
Other	2.2	5.4	14.9	3.9	17.8
Total [f]	**100**	**100**	**100**	**100**	**100**

Sources and notes: [a] Occupational Employment Statistics. [b] 2008-2010 pooled files of the American Community Survey, reported in HRSA 2013 nursing report. [c] 2008 National Sample Survey of Registered Nurses. [d] Nurses in teaching positions might be recorded in the ACS under teaching rather than under nursing. [e] Estimated based on estimate that 89.6% of hospital nurses are working in inpatient settings and 10.4% are working in emergency settings, with nurses in administration allocated proportionately across settings (from the 2008 NSSRN). [f] Numbers might not sum to 100% because of rounding

Annual Health Care Use per RN and LPN

- Example: every 4,469 visits to a physicians office translates to 1 full time equivalent RN
  - Notes: Estimate reflects that not all physician offices employ RNs
  - Estimate does not reflect that care provided by nurses differs within settings (e.g., in a cardiologist office versus a primary care provider office)

	Registered Nurse	Licensed Practical Nurse
Office visits	4,469	15,258
Outpatient visits	382	1,065
Inpatient days	106	802
Emergency visits	612	
Home Health Visits	63	246
Nursing Home Residents	125	86
School Health	900	
Residential	389	2,021

HWSM
CONCEPTUAL MODEL AND CHARACTERISTICS OF NURSING SUPPLY

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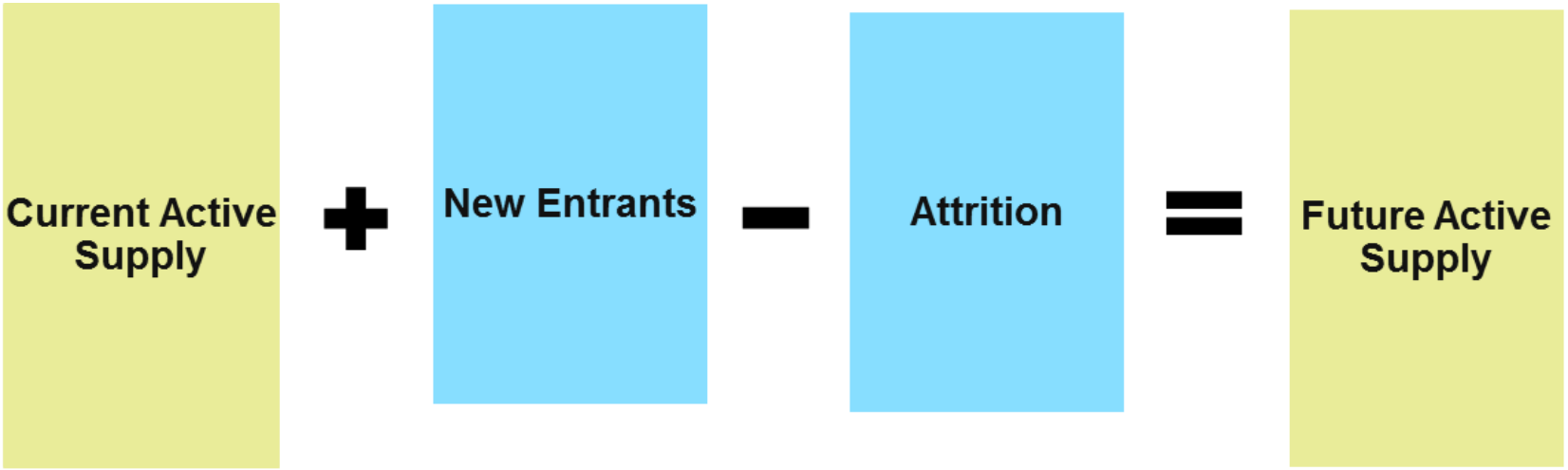
Nursing Workforce Simulation Model: Supply Component

- Simulate likely career choices of individual clinicians
  - Microsimulation—modeling workforce decisions of individual clinicians, rather than stock-and-flow models that simulate groups of clinicians
- Dynamic modeling
  - Environmental and market factors—clinicians respond to changes in the economy, healthcare operating environment, and policy
  - Shortages/surpluses affect clinician workforce decisions
- Workforce activities: what, where, how, when
  - What type of work will I do?
  - Where will I work (e.g., state of practice)?
  - How many hours will I work?
  - When will I retire?

Nursing Workforce Simulation Model: Supply (cont.)

- Model process
  - Start with database containing starting supply of RNs and LPNs
  - Each year, model:
    - New entrants to the workforce
    - Attrition (retirement, mortality)
    - Other activities (labor force participation, hours worked, education, geographic mobility)
  - End of year supply = starting supply for subsequent year
- Scenarios: vary number of new graduates, retirement patterns, hours worked

Conceptual Model for Nurse Workforce Supply



Workforce Participation

Hours Worked

Change in Occupation, Specialty, or Education Level

Health Workforce Simulation Model

- Designed to be easily updated
  - Annual updates from the American Community Survey, Behavioral Risk Factor Surveillance System, Medical Expenditure Panel Survey, Nationwide Inpatient Sample, Census Bureau/state population projections, etc.
  - Incorporate latest research
    - Nurse migration patterns
    - Emerging care delivery models (e.g., Accountable Care Organizations, team-based care)
    - Evolving scope of practice, changing technology
    - Economic conditions that might affect labor force participation rates
  - Recognized that individual states have more complete supply data than available at the national level
    - HRSA decision to create web-based version of the HWSM that allows states to run their own supply numbers/scenarios
    - Underscores importance of Nursing Minimum Dataset (MDS)