Current HRMP Methodology:

Med/Surg Bed Projections

September 4, 2013

Med/Surg Bed Projections:
The Basics

- As with all surveillance data, there is a data availability lag that determines the most up-to-date time period for which you can calculate projections
  - Most recently-available year of data referred to as "**base year**"
  - "Base year" data are used to project the subsequent 5-year med/surg bed need projection
- Delaware **med/surg** data:
  - Most recently-available data (i.e., "base year") = **2010**
  - Most up-to-date 5-year projection period = **2011-2016**

Med/Surg Bed Projections:
The Basics

- Calculated at the hospital-level
  - Each hospital has its own 5-year bed projection (*with the exception of A.I. DuPont)
- Additionally, one county-level projection is produced for NCC
  - County-level projections are not produced for Kent or Sussex
- A.I. DuPont is excluded from all analyses
  - There are no hospital-level projections for A.I.
  - Also, data from A.I. are not included in the county-level NCC projection

Med/Surg Bed Projections: *The Basics*

- Med/surg projections are calculated from patient day data for two age groups only:
  - 15-64 year olds
  - 65+ year olds

- In other words, pediatric med/surg data (<15 year olds) are excluded from each hospital's calculations

Med/Surg Projected Bed Need (PBN) :
2005-2010 vs. 2010-2015 vs. 2011-2016

	PBN: 2005-2010	PBN: 2010-2015	PBN: 2011-2016	Total Licensed Bed Supply (4/23/2013)*
Christiana Hospital	803	738	731	906
Wilmington Hospital	207	195	160	276
St. Francis Hospital	120	84	104	395
New Castle County	*1165*	*1026*	*1012*	*1577*
Kent General Hospital	238	199	190	234
Milford Mem. Hospital	131	121	127	168
Beebe Medical Center	131	135	145	210
Nanticoke Mem. Hosp.	111	62	80	139

Total Licensed Bed Supply

- Delaware Office of Health Facilities Licensing and Certification
- Licensed bed counts represent ALL* licensed beds for the facility (not broken down by type)
  - Licensed bed counts do NOT include labor/delivery/recovery beds or bassinets/isolettes (such as NICU or nursery)
- To obtain bed tallies by type (i.e., “med/surg beds”), each hospital must be contacted individually

Delaware Healthcare Association
Bed Category Definitions

- **Licensed Beds:** the maximum number of beds allowed by the hospital's license from DHSS, DPH, and HFLC. Not all licensed beds actually exist.

- **Built Beds:** total actual (physical) beds within a hospital. These beds may or may not be staffed, but could be opened and staffed within a few hours if necessary.

- **Staffed Beds:** actual (physical) beds within a hospital, open and staffed with medical personnel ready to treat patients immediately. Staffed bed numbers fluctuate daily based on current and anticipated patient load. If a hospital experiences an increase in patients beyond the anticipated number, additional medical staff are called into work and additional built beds are opened.

Med/Surg Calculation steps

Examples: **(1) Kent General Hospital (2011-2016)**

(2) Wilmington Hospital (2011-2016)

Med/Surg Calculation Steps: A Summary

Step 1: Calculate Base Year Average Daily Census (BYADC)

Step 2: Calculate Projected Average Daily Census (PADC)

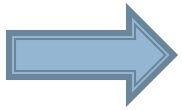
Step 3: Calculate Projected Bed Need (PBN)

Step 1: Calculate Base Year Average Daily Census (BYADC)

- Base year: most recently-available year of data
  - Base year is the year immediately prior to the start of the projection period you're calculating
  - Our base year is **2010**. Our projection period is **2011-2016**.
  - Note: you also need data for one year prior to the base year (i.e., "prior year data"). Our prior year is **2009**.

Step 1: Calculate Base Year Average Daily Census (BYADC)

Kent General Hospital Med/Surg Patient Days, All Ages		
	2009	2010
< 15 yrs	8,086	7,565
15-44 yrs	12,695	12,487
45-64 yrs	16,780	16,063
65+ yrs	27,398	26,399
Total	64,959	62,514

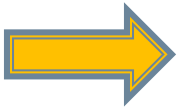


Kent General Hospital Med/Surg Patient Days, ≥15 Years		
	2009	2010
15-64 yrs	29,475	28,550
65+	27,398	26,399
Total ≥15	56,873	54,949

Eliminate Pediatric Cases & Create the 15-64 Age Category

Step 1: Calculate Base Year Average Daily Census (BYADC)

Wilmington Hospital Med/Surg Patient Days, All Ages		
	2009	**2010**
< 15 yrs	0	0
15-44 yrs	8,946	7,842
45-64 yrs	19,413	16,693
65+ yrs	26,684	24,994
Total	55,043	49,529



Wilmington Hospital Med/Surg Patient Days, ≥15 Years		
	2009	**2010**
15-64 yrs	28,359	24,535
65+	26,684	24,994
Total ≥15	55,043	49,529

Eliminate Pediatric Cases & Create the 15-64 Age Category

Step 1: Calculate Base Year Average Daily Census (BYADC)

$$\text{BYADC} = \frac{(\text{BY Med/Surg Patient Days Among} \geq 15 \text{ year olds})}{365}$$

PYADC (2009) and BYADC (2010)		
	2009	**2010**
Kent General Hospital	(56,873/365) = 155.8	(54,949/365) = 150.5
Wilmington Hospital	(55,043/365) = 150.8	(49,529/365) = 135.7

Med/Surg Calculation Steps: A Summary

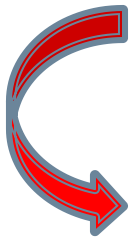
Step 1: Calculate Base Year Average Daily Census (BYADC)

Step 2: Calculate Projected Average Daily Census (PADC)

Step 3: Calculate Projected Bed Need (PBN)

Step 2: Calculate Projected Average Daily Census (PADC)

$$PADC = BYADC \times Population\ Change\ Factor\ (PCF)$$



$$PCF = Weighted\ Avg.\ of\ Projected\ Population\ Change\ (2011 - 2016)$$

Step 2: Calculate Projected Average Daily Census (PADC)

2a. Calculate Projected Population Changes

- Use Delaware Population Consortium Data *(available online)*
- Calculate projected population change for the 2011-2016 period

$$\text{Projected Pop. Change } (2011-2016) = \frac{(2016 \text{ Population})}{(2011 \text{ Population})}$$

Step 2: Calculate Projected Average Daily Census (PADC)

2a. Calculate Projected Population Changes

- Hospital projections are calculated using pop. statistics from the following geographic areas:

Christiana Hospital:	New Castle County
St. Francis Hospital:	New Castle County
Wilmington Hospital:	New Castle County
Kent General Hospital:	Kent County
Milford Memorial Hospital:	Kent and Sussex Counties*
Beebe Medical Center:	Sussex County
Nanticoke Hospital:	Sussex County

Step 2: Calculate Projected Average Daily Census (PADC)

2a. Calculate Projected Population Changes

Kent County	2011	2012	2013	2014	2015	2016
Total 15-64	108,602	109,547	110,047	110,680	111,418	112,240
Total 65+	22,961	23,617	24,694	25,720	26,607	27,377

Kent County	2011	2016	Proj. Pop Change (2016 / 2011)
Total 15-64	108,602	112,240	**1.03**
Total 65+	22,961	27,377	**1.19**

Step 2: Calculate Projected Average Daily Census (PADC)

2a. Calculate Projected Population Changes

New Castle County	2011	2012	2013	2014	2015	2016
Total 15-64	373,821	375,107	375,056	375,439	376,334	377,389
Total 65+	68,006	69,474	72,723	75,859	78,746	81,689

New Castle County	2011	2016	Proj. Pop Change (2016 / 2011)
Total 15-64	373,821	377,389	**1.01**
Total 65+	68,006	81,689	**1.20**

Step 2: Calculate Projected Average Daily Census (PADC)

2b. Calculate Population Change Factor (PCF)

$$PCF = \text{Weighted Avg. of Projected Population Change}$$

- **Important PCF Rule:**

- If the Base Year ADC (2010) is **< 95%** of the Prior Year ADC (2009), a PCF of **1.0** will be used to calculate the hospital's projected ADC…

- (Unless the PCF as calculated is < 1.0, in which case the lesser figure will be used).

Step 2: Calculate Projected Average Daily Census (PADC)

2b. Calculate Population Change Factor (PCF)

- Is the Base Year ADC (2010) > or < 95% of the Prior Year ADC (2009)? Let's see...

BYADC (2010) as a Percentage of PYADC (2009)			
	2009	**2010**	(2010 ADC) / (2009 ADC)
Kent General Hospital	155.8	150.5	(150.5 / 155.8) * 100% = **96.6%**
Wilmington Hospital	150.8	135.7	(135.7 / 150.8) * 100% = **90.0%**

Step 2: Calculate Projected Average Daily Census (PADC)

2b. Calculate Population Change Factor (PCF)

- Kent General Hospital has a base year ADC **>95%** of the prior year ADC.
  - The PCF will be calculated as usual for Kent General in Step 2b.

- Wilmington Hospital has a base year ADC **<95%** of the prior year ADC.
  - A PCF of 1.0 will be used for Wilmington Hospital Step 2b.

Step 2: Calculate Projected Average Daily Census (PADC)

2b. Calculate Population Change Factor (PCF)

$$PCF = \text{Weighted Avg. of Projected Population Change}$$

Kent General Hospital				
Age Group	**Med/Surg Pt Days (N) (2010)**	**Med/Surg Pt Days (%) (2010)**	**Pop Change (2016/2011)**	**Weights**
15-64	25,550	52.0	1.03	(52.0 * 1.03) = 53.5
65+	26,399	48.0	1.19	(48.0 * 1.19) = 57.2
		Weighted Avg. of Projected Pop Changes:		(53.5 + 57.2) = 111
			Kent General Hospital PCF:	(111 / 100) = **1.11**

Step 2: Calculate Projected Average Daily Census (PADC)

2b. Calculate Population Change Factor (PCF)

$$PCF = \text{Weighted Avg. of Projected Population Change}$$

Wilmington Hospital				
Age Group	**Med/Surg Pt Days (N) (2010)**	**Med/Surg Pt Days (%) (2010)**	**Pop Change (2016/2011)**	**Weights**
15-64	24,535	49.5	1.01	(49.5 * 1.01) = 50.0
65+	24,994	50.5	1.20	(50.5 * 1.20) = 60.6
		Weighted Avg. of Projected Pop Changes:		(50.0 + 60.6) = 110.6
			Wilmington Hospital PCF:	**1.0**

Step 2: Calculate Projected Average Daily Census (PADC)

2c. Use PCF to Calculate Projected ADC (PADC) for the 2011-2016 period

$$PADC = BYADC \times Population\ Change\ Factor\ (PCF)$$

	BYADC (2010)	PCF	PADC (2011-2016)
Kent General Hospital	150.5	1.11	(150.5 * 1.11) = **166.6**
Wilmington Hospital	135.7	1.00	(135.7 * 1.00) = **135.7**

Med/Surg Calculation Steps: A Summary

Step 1: Calculate Base Year Average Daily Census (BYADC)

Step 2: Calculate Projected Average Daily Census (PADC)

Step 3: Calculate Projected Bed Need (PBN)

Step 3: Calculate Projected Bed Need (PBN)

$$PBN = \frac{PADC}{Occupancy\ Factor}$$

- New Castle County: Occupancy Factor = **0.850**
- Kent and Sussex Counties: Occupancy Factor = **0.875**

- By setting the ideal occupancy rate for New Castle County hospitals to 85%, the med/surg bed need projections for NCC and the three NCC hospitals will be slightly more conservative

- Allows for more surge capacity in NCC hospitals

Step 3: Calculate Projected Bed Need

$$PBN = \frac{PADC}{Occupancy\ Factor}$$

	Projected ADC	Occupancy Factor	Projected Bed Need (2011-2016)
Kent General Hospital	166.6	0.875	(166.6 / 0.875) = **190**
Wilmington Hospital	135.7	0.850	(135.7 / 0.850) = **160**

Med/Surg Projected Bed Need (PBN) :
2005-2010 vs. 2010-2015 vs. 2011-2016

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Points for Consideration

Point for Consideration:
The Influence of Base Year ADC on Projections

- What are the main driving forces of year-to-year fluctuations in bed need projections?

1. Population Change
2. Base Year ADC

- But, because population projections for the 15-64 and 65+ age categories typically only INCREASE over time, population changes should always work to increase med/surg bed need

Point for Consideration:
The Influence of Base Year ADC on Projections

- What are the main driving forces of year-to-year fluctuations in bed need projections?

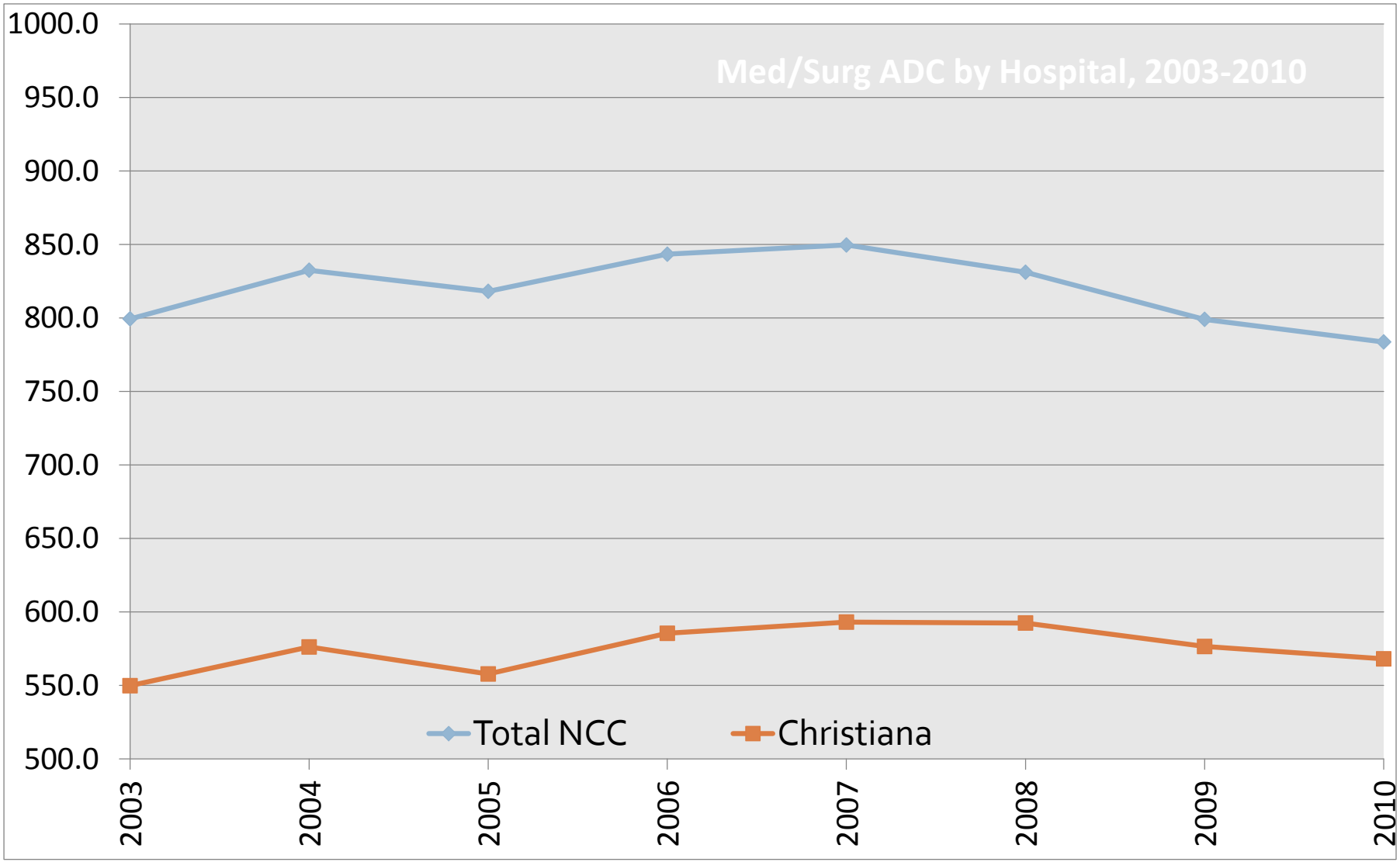
    1. Population Change
    2. Base Year ADC

- So, what causes the "up and down" med/surg bed need projections for some hospitals?

    - Base Year ADC is the <u>strongest</u> factor in determining if a hospital's med/surg bed needs will increase or decrease across projection periods.

Point for Consideration:

The Influence of Base Year ADC on Projections



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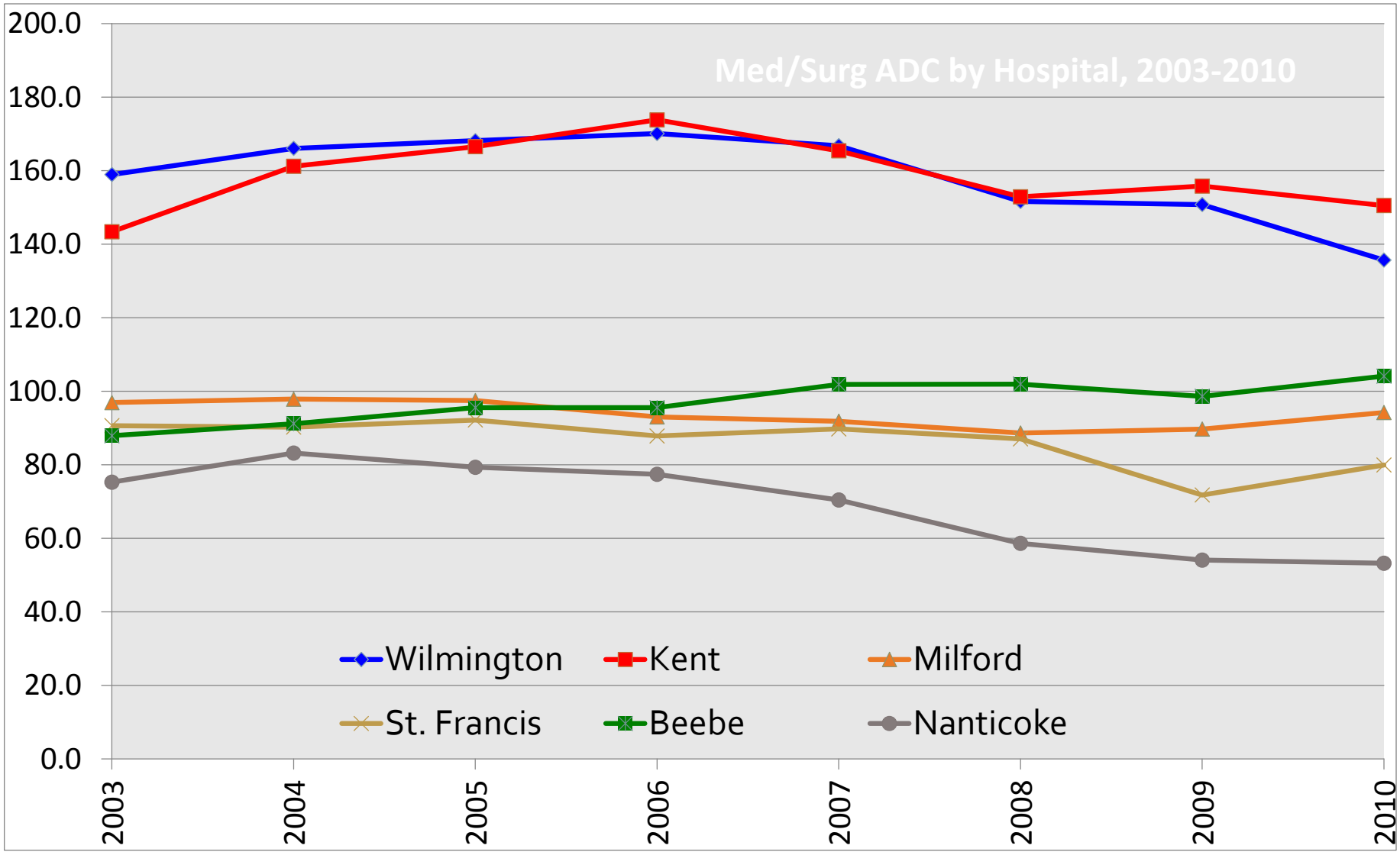

Med/Surg Bed Projections:
Points for Consideration

- Med/surg projections are calculated from patient day data for two age groups only:
  - 15-64 year olds
  - 65+ year olds

- Pediatric med/surg data (<15 year olds) are excluded from each hospital's calculations
  - However, as the next slide shows, most hospitals are treating a large number of pediatric med/surg cases

Point for Consideration:
Excluding Med/Surg Pediatric Patient Days

Pediatric (<15 years) Med/Surg Patient Days, by Hospital								
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
A.I. DuPont	35,223	38,797	37,446	37,694	38,550	38,898	40,552	40,840
Beebe Med Ctr.	2,001	1,869	2,102	2,166	2,083	2,213	2,073	1,928
Christiana	33,193	32,261	34,122	33,250	31,459	32,303	33,291	31,330
Kent General	7,153	6,491	6,514	7,599	7,800	7,603	8,086	7,565
Milford Memorial	1,144	1,079	1,283	1,363	1,301	1,017	1,176	913
Nanticoke	1,730	2,129	1,890	2,063	2,173	1,899	1,963	2,100
St. Francis	1,985	2,123	1,777	1,726	2,344	2,130	2,300	2,407
Wilmington	2	0	0	1	1	1	0	0
Total NCC	*70,403*	*73,181*	*73,345*	*72,671*	*72,354*	*73,332*	*76,143*	*74,577*
Total DE	*82,431*	*84,749*	*85,134*	*85,862*	*85,711*	*86,064*	*89,441*	*87,083*

- By excluding pediatric (<15 years) med/surg patient days, hospitals' ADCs and resulting bed need projections will be artificially low.

Point for Consideration:
Excluding Med/Surg Pediatric Patient Days

- Unlike the previous issue of excluding A.I. DuPont from med/surg projections, the decision to exclude pediatric med/surg patient days not only impacts New Castle County, but all individual hospitals.

  - This methodological step will disproportionately affect hospitals with relatively large pediatric med/surg loads

  - The larger a hospital's pediatric med/surg load, the more artificially low its bed need projections will be by the exclusion of pediatric med/surg patient day data

End