
Emerging Trends in the Hospitalization of U.S. Children

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Emerging Trends in the Hospitalization of U.S. Children

- Speaker: Ted D. Sigrest, MD, FAAP
 - Disclosure Statement
 - Dr. Sigrest has documented that he has nothing to disclose
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Recognition & a Plug for AAP National Committees

- Thanks to Erin Stucky
 - Just retired as
Chair of the AAP Committee on Hospital Care
 - Consider volunteering to work on a national committee – AAP, APA, SOHM
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Problem Statement – AAP Chapter Forum Resolution passed in 2002

Pediatricians in Rhode Island noted an apparent trend

- **closure of multiple pediatric units in the local non-academic hospitals**
- **pediatric units being combined with adult inpatient services**
- **increased transport of patients with relatively simple illnesses to distant academic referral centers**

Investigation requested

- **Is this apparent trend a regional or a national phenomenon?**
 - **What are the implications for quality of care?**
 - **Can local pediatric inpatient services be preserved?
(Or should they be?)**
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Background

Initial literature search

- ❑ Minimal information on trends in pediatric hospitalization
- ❑ National discharge databases could not be used to analyze pediatric hospitalization trends (at that time)

Early findings

- ❑ Pediatric non-newborn admissions account for only 5% of total hospital admissions
(AHRQ National Inpatient Sample, 2003)
 - ❑ Pediatric inpatient units in small hospitals are costly
 - ❑ And, a tsunami of elderly inpatients is on the way
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Inpatient Projections 2002-2027

“The Changing Pediatric Environment” 2003 Solucient white paper

After years of decreases in the 1990's

- total hospital admissions are expected to grow by 41% over the next 25 years

Elderly admissions will increase by a whopping 78%

- Their bed requirements will grow to 59% of all beds

Pediatric (non-newborn) admissions will increase by just 4%

- Bed requirements will grow by less than 1%
- Total bedspace required by children ~ 4%

Result – greatly increased pressure on the inpatient resources devoted to pediatric services

Research Committee Hypotheses

- **There is a significant trend of pediatric admissions away from the smaller non-teaching hospitals toward the larger urban teaching hospitals**
 - **The primary admission trends are significantly different between adult and pediatric inpatients:
Pediatric inpatients should show a more significant migration toward the urban teaching centers**
 - **Closure of pediatric units should be more common in the smaller non-academic hospitals**
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Research Plan

- **Survey the Membership of the AAP**
 - **To clarify pediatricians experiences & perceptions of possible trends**
 - **Obtain Data on Bed Space Trends**
 - **To provide information on trends in pediatric inpatient bed space, including closures of pediatric units**
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Survey of the AAP membership

Methods – AAP Periodic Survey #62

- National representative sample of AAP membership
 - 2,088 surveys distributed in spring of 2005
 - 49% response rate after 5 mailings
 - 42% from office-based pediatricians who admitted to a local or regional community hospital
 - 58% from pediatricians who practiced in or had admitting privileges to academic referral centers
 - Separate sets of questions were directed to each group
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Results - AAP Periodic Survey #62

From Office-Based Pediatricians

- 7% had experienced unit closures within past 10 years
- 14% had experienced unit mergers with adult services
- 47% had admitted a smaller percent of their patients locally in the past 5 years

From Academic Pediatricians

- 64% reported rising occupancy rates in past 5 years
- 53% reported delays in admissions because of bed shortages, especially in medical units & PICU

Problems in Communication

- 61% of local pediatricians had problems getting info on patients referred to academic centers
 - But 92% were satisfied with the care given
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Obtaining Data on Bed Space Trends

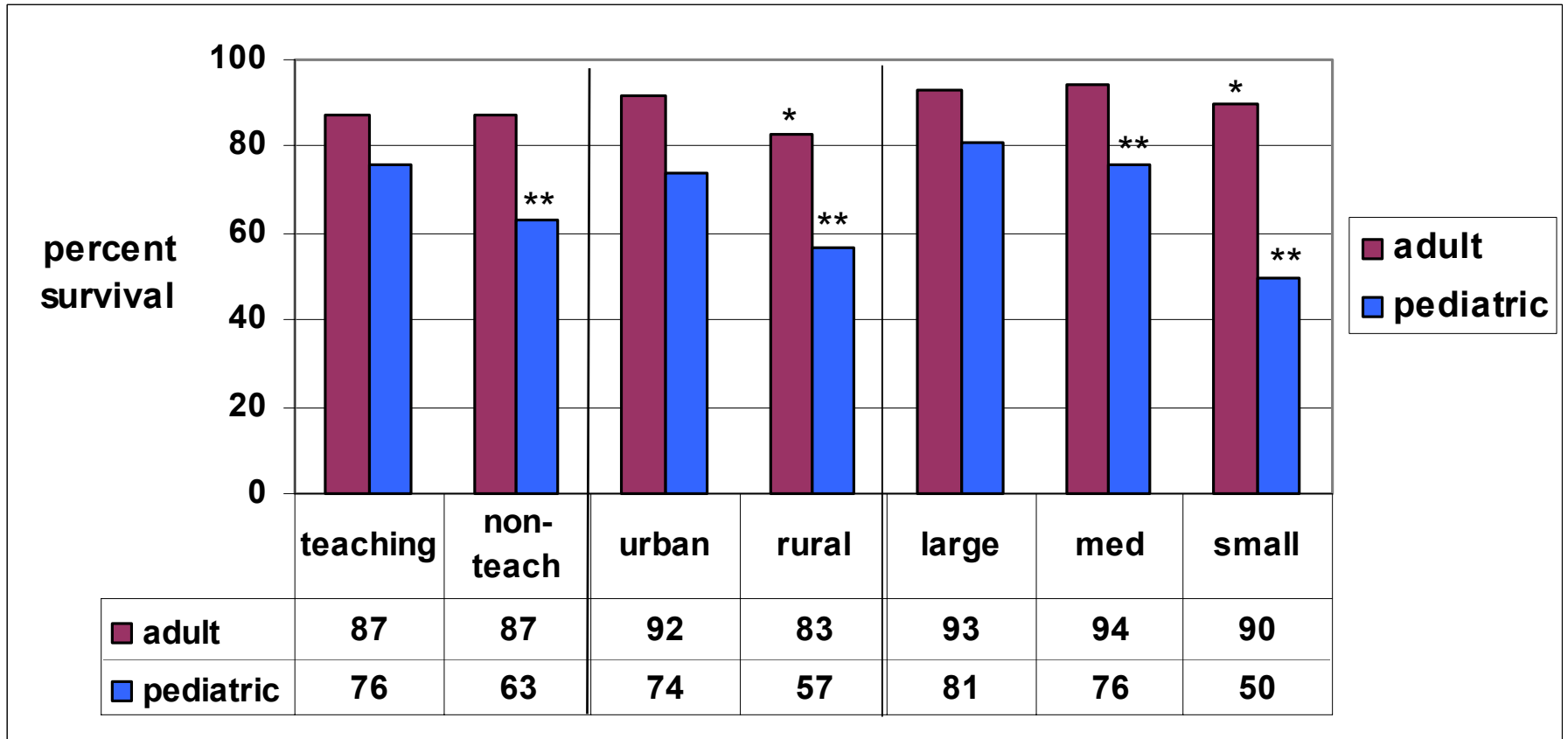
Methods – AHA Annual Survey

- Comprehensive survey sent to all U.S. community hospitals
 - Data obtained for 1992, 1996, 2000, 2004
 - Hospitals queried: 5,292 to 4,919
 - 7% of U.S. hospitals closed in this time interval
 - Response rate: 67% to 63%
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Adult v. Pediatric Bed Space

Mean Survival by category 1992 to 2004

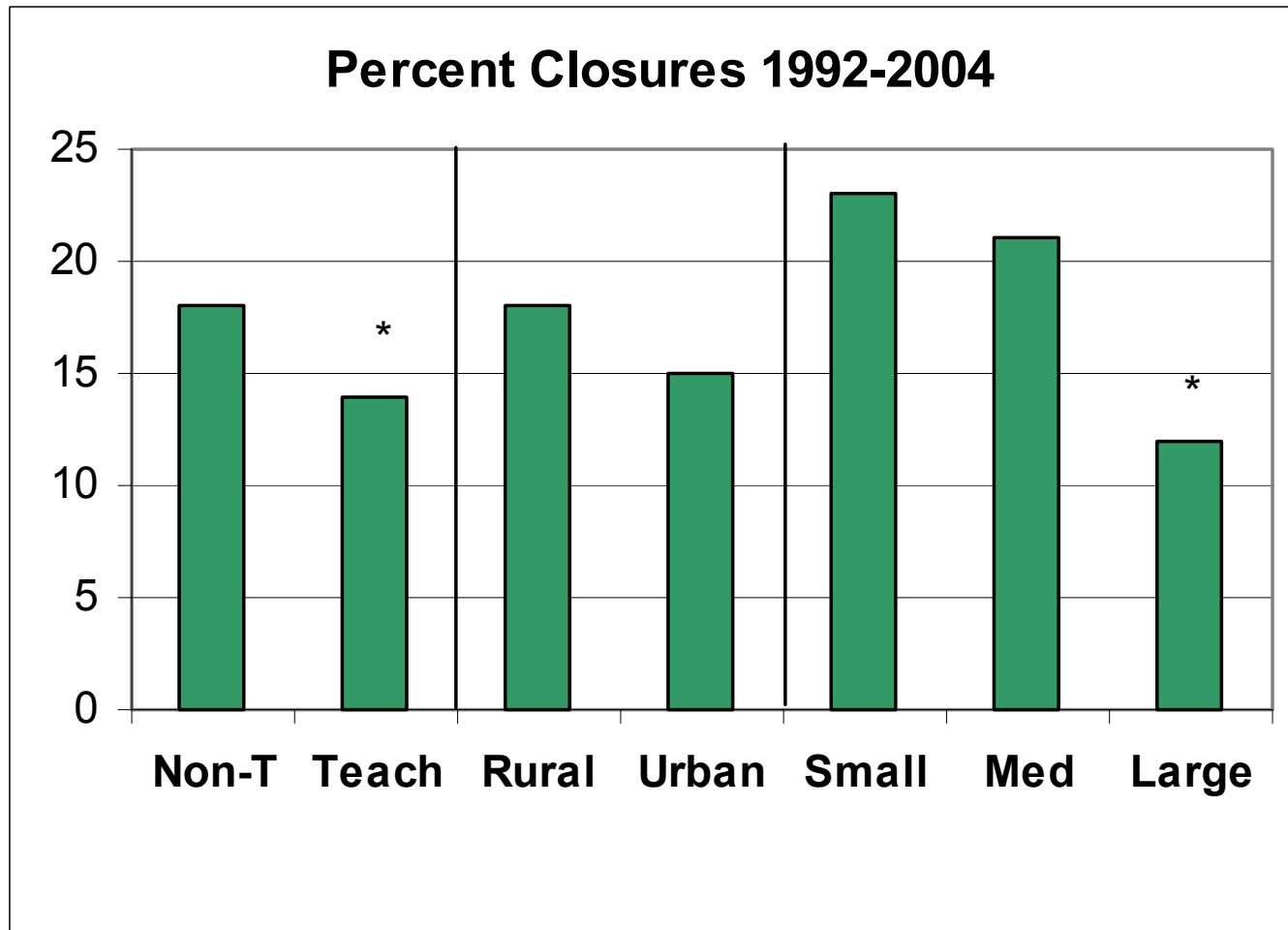
2,043 hospitals responding all 4 years



* p < .05 ANOVA procedure for mean change in survival over the 12 year interval

Closures of Pediatric Units

For 2,043 Hospitals Responding All 4 years



* $p < .05$ Chi Square

Fixed Effects Regression Model

For all responding hospitals in all 4 years

Dependent Variable

- number of pediatric med/surg beds

Independent Variables

- Children's Hospital Status
 - Teaching Status
 - Area – Urban v. Rural
 - Hospital Size (rating 1-9)
 - Services - PICU, NICU, Trauma Level, OB Level
 - Year
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Regression Model Results

- Teaching status and location dropped out
 - Significant factors in survival of pediatric hospital beds, ranked in order of estimated regression coefficients & p-values:
 - Children's hospital status
 - Hospital size
 - Level of services – PICU, Level ER, NICU, Level OB
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Conclusions

- A clear pattern of downsizing of pediatric bed space and closure of pediatric units was noted
 - The loss of pediatric bed space was significantly greater than that noted for adult bed space in all hospital categories
 - Additional services, larger hospital size, and children's hospital status helped preserve pediatric beds
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Implications

- Continued losses of pediatric bed space in the smaller hospitals that have fewer services can be expected
 - Overcrowding of pediatric services in referral hospitals, especially in med/surg floors and critical care units, can be expected to intensify.
 - The oncoming baby-boomer tsunami will likely accelerate the trends already noted
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Implications

- Well known problems related to the transfer of a child far from home such as lack of transportation, disruption of family support systems, and parental employment issues are already commonly encountered, and will increase in volume and intensity
 - Quality of care may be compromised
 - In the remaining pediatric beds in smaller hospitals and in the overcrowded larger hospitals
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Table of Regression Values

Rank	Indep Var	RegCoef	Std Err	T-value	Pr> t
1	Ch. Hosp.	93.7472	2.1804	42.99	<.0001
2	Hosp size	4.1797	.2036	20.53	<.0001
3	PICU	7.0677	.7147	9.89	<.0001
4	Level OB*PICU	4.6948	.5994	7.83	<.0001
5	Level ER*PICU	1.3308	.2907	4.58	<.0001
6	Teach* hosp size	1.3255	.3290	4.03	<.0001
7	Level ER	0.3759	.1262	2.98	.0030

Table of Regression Values

Rank	Ind.Var.	Reg Coef	Std.Err	t-value	Pr> t
8	NICU	1.5620	.5313	2.94	.0033
9	Level ER*NICU	.6717	.2498	2.69	.0073
10	teach*area	3.6802	1.3815	2.66	.0078
11	Level OB	.5771	.2680	2.15	.0315
12	teachstatus	.8539	.5422	1.57	.1200
13	Area	.3191	.6340	.50	.6148