

Does Allergy Immunotherapy Confer Healthcare Cost Benefits for Children with Allergic Rhinitis? A Large-Scale, Retrospective, Claims-Based Study

Allergic Rhinitis – Allergy Immunotherapy (AR-IT) Working Group

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BACKGROUND: U.S. RESEARCH

- Little known about U.S. allergy immunotherapy (IT) patterns of use and potential cost benefits for patients with allergic rhinitis (AR)
- Previously, only one U.S. study (1999)¹
 - Design
 - Retrospective study of HMO adult and child enrollees (1988-1992) with AR or asthma
 - Results
 - 2% of patients diagnosed with AR or asthma received IT
 - Patients receiving at least 3.5 years of IT cost more than those receiving < 3.5 years
 - Caveat
 - Study did not account for possibly higher disease burden in IT completers at enrollment



OVERVIEW OF OUR PREVIOUS RESEARCH

- Our recently published study examined pre-IT versus post-IT changes in healthcare use and costs among newly AR-diagnosed children enrolled in Florida Medicaid from 1997-2004.
- We reported that medical costs significantly decreased in the 6 months following IT discontinuation versus the 6 months prior to IT initiation, despite the fact that the average duration of therapy was 17 months.
- However, findings were limited by the study's short time frame (6 months)

Hankin C, et al. Allergy immunotherapy among Medicaid-enrolled children with allergic rhinitis: Patterns of care, resource use, and costs. *J Allergy Clin Immunol* 2008;121:227-32.

OBJECTIVE

- Drawing from the same Florida Medicaid database (with three additional years of data), we aimed to compare the health care utilization and costs of newly-diagnosed children with AR who received IT to matched controls with AR who did not receive IT

METHODS: FLORIDA MEDICAID DATASET

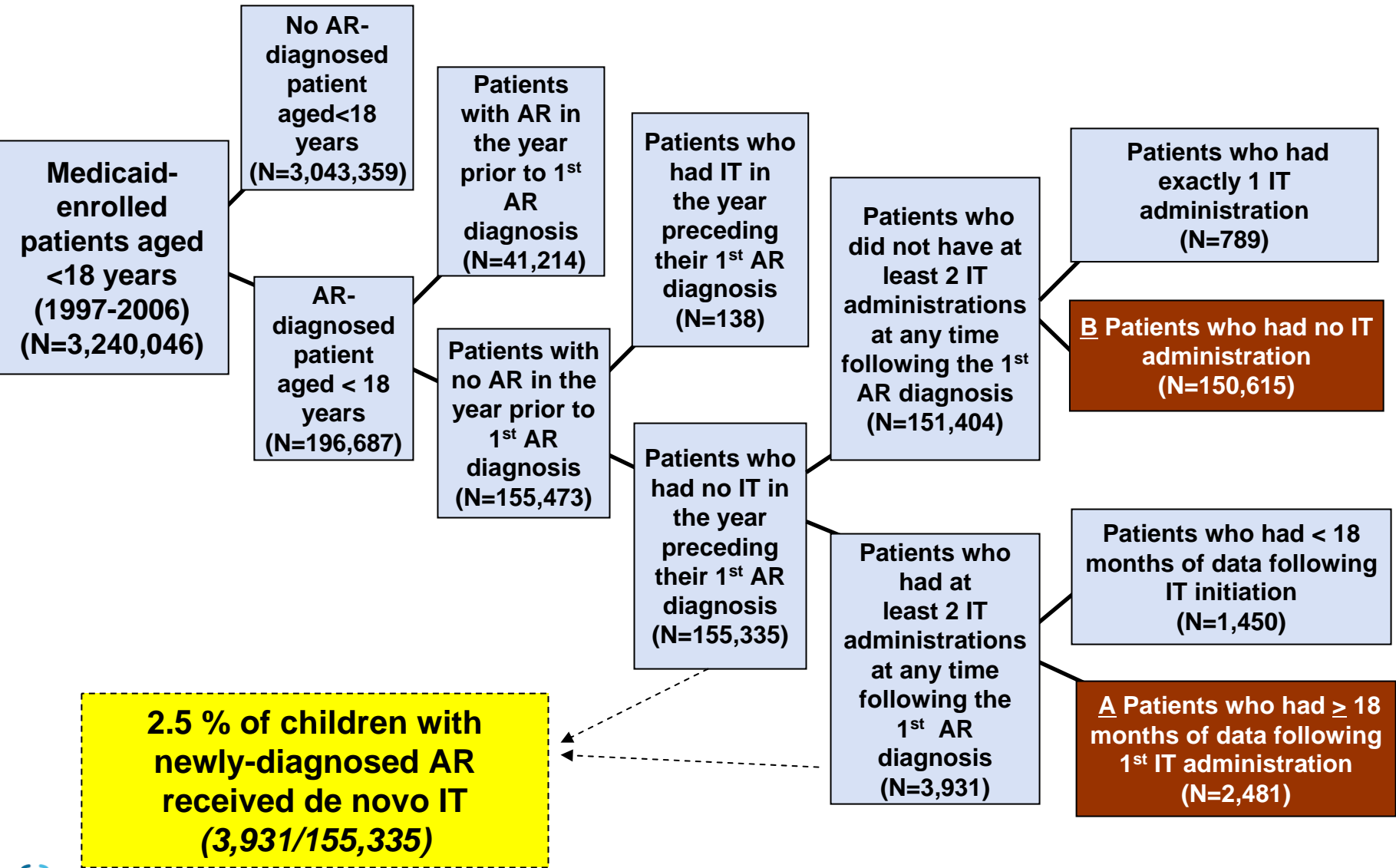
- Florida Medicaid: > 5 million enrollees
- Computerized claims records
 - Demographics
 - ICD-9 (diagnoses)
 - CPT (procedures)
 - NDC (drugs)
- Information patient de-identified and HIPAA compliant
- BioMedEcon obtained 9 years of data (1997-2006)

METHODS

- We examined 9 years (1997-2006) of Florida Medicaid paid claims to identify newly AR-diagnosed children (<18 years) who received IT and had 18 months of follow-up data (IT Group).
- These were matched, over the same period, to newly AR-diagnosed children who received no IT (No-IT Group) by
 - Age at AR diagnosis
 - Presence of asthma, atopic dermatitis, and conjunctivitis
 - Sex
 - Race
- Wilcoxon signed-rank tests were performed to compare median resource use and costs.

Results

RESULTS OF SAMPLE SELECTION



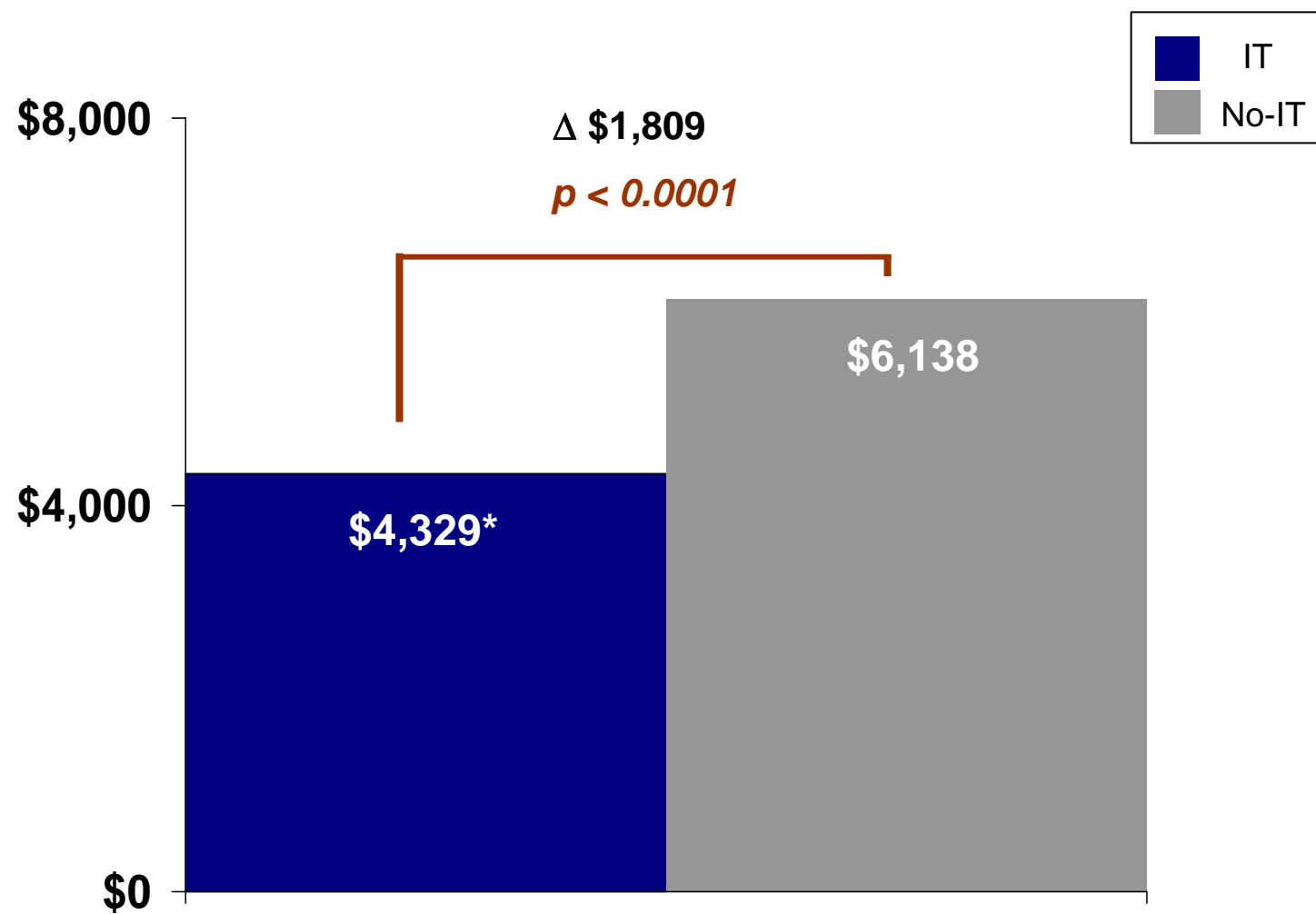
CHARACTERISTICS OF IT ADMINISTRATIONS OVER 18 MONTHS (N=2,291)^{a1}

| | Mean | SD | Median | Min | Max |
|---|-------|--------|--------|--------|---------|
| Number of IT Administrations over 18 Months | 23 | 19 | 18 | 2 | 122 |
| Gap (days) Between IT Administrations | 20.8 | 32.3 | 12.9 | 1 | 501 |
| Total Cost of IT Treatment Course over 18 Months | \$944 | \$1006 | \$565 | \$10.0 | \$6,209 |
| Cost per IT Administration | \$44 | \$35 | \$35 | \$5 | \$299 |

a1

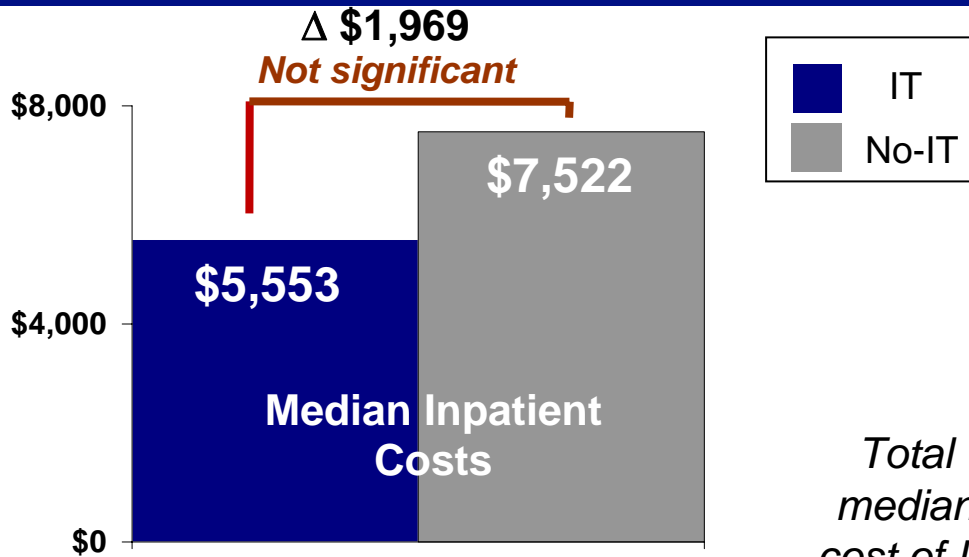
Why is this number less than total N who received IT (2,481)?
abronstone, 11/4/2008

COMPARISON OF 18-MONTH PER-PATIENT MEDIAN TOTAL HEALTHCARE COSTS*



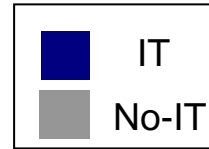
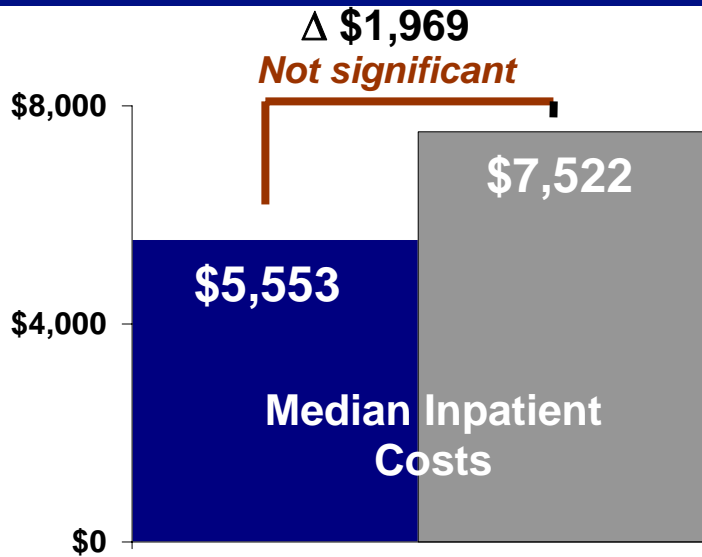
* Includes cost of IT (\$565)

COMPARISON OF 18-MONTH PER-PATIENT MEDIAN HEALTHCARE COSTS

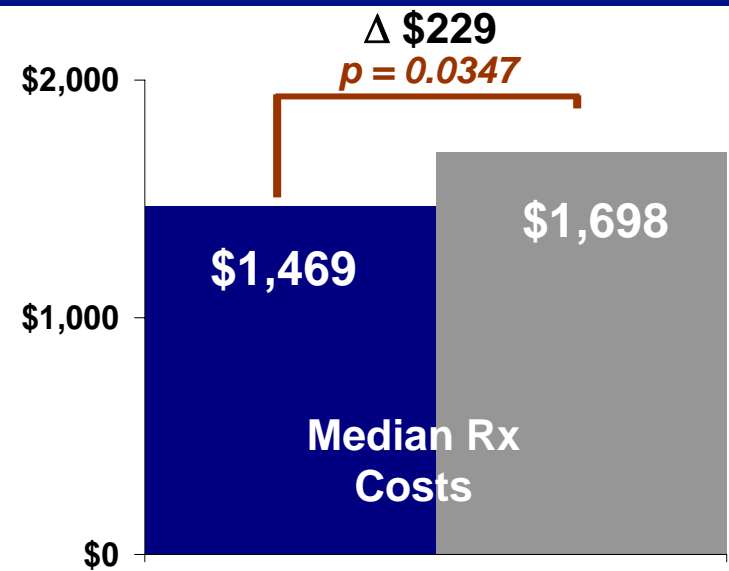


*Total
median
cost of IT
over 18
months
= \$565*

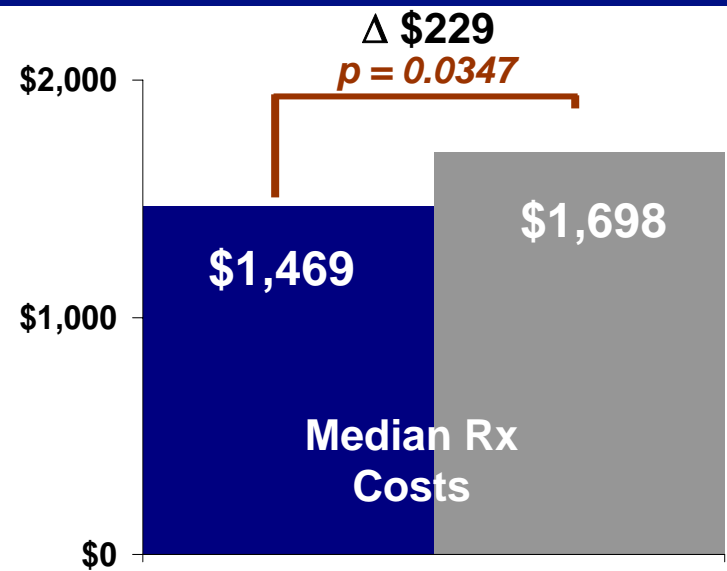
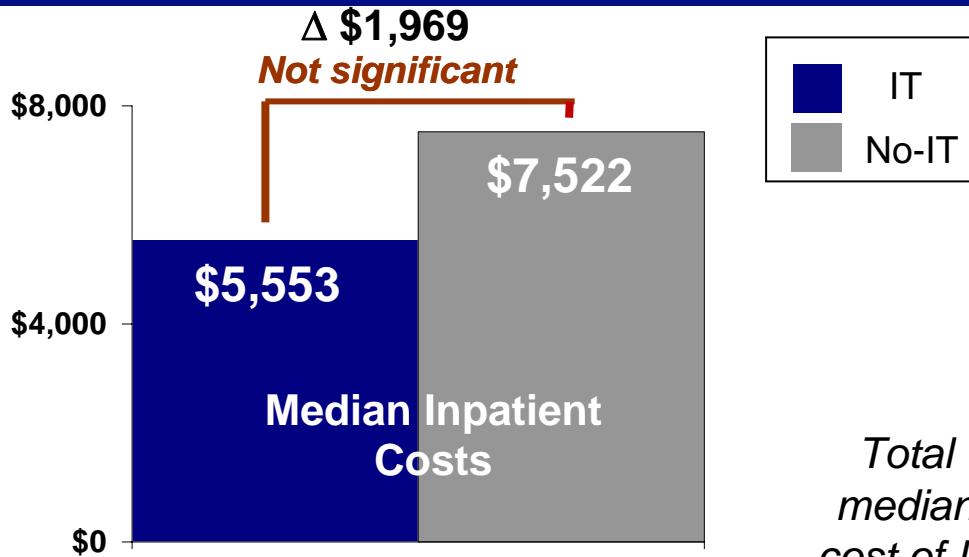
COMPARISON OF 18-MONTH PER-PATIENT MEDIAN HEALTHCARE COSTS



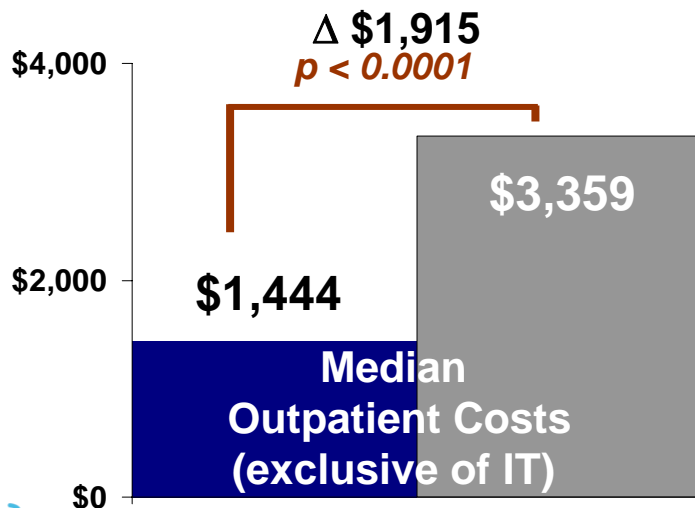
Total median cost of IT over 18 months = \$565



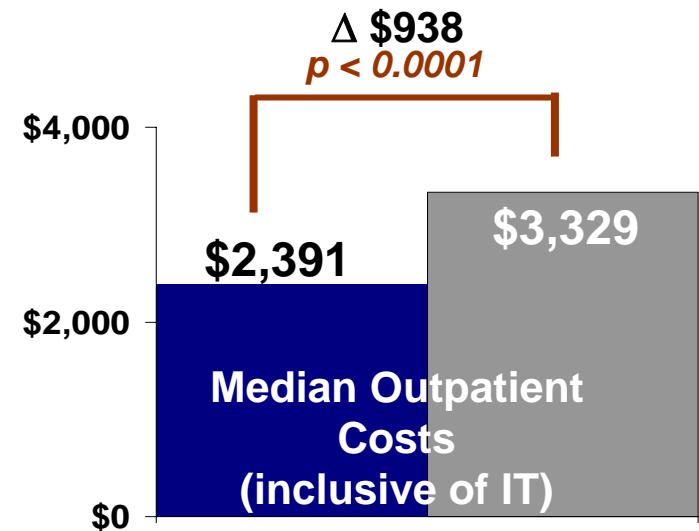
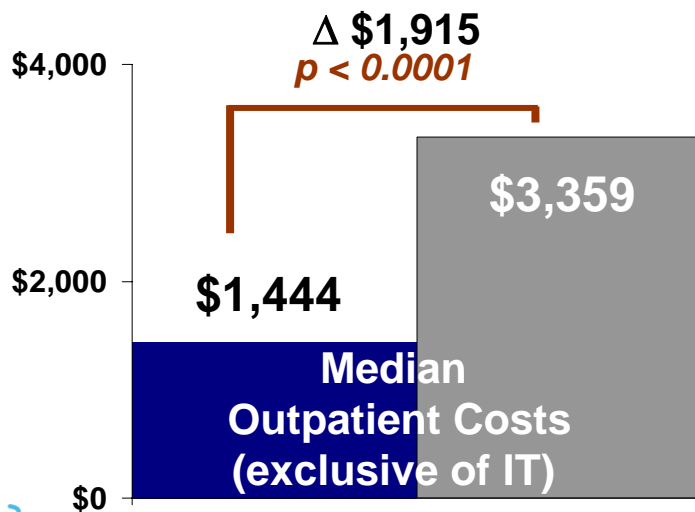
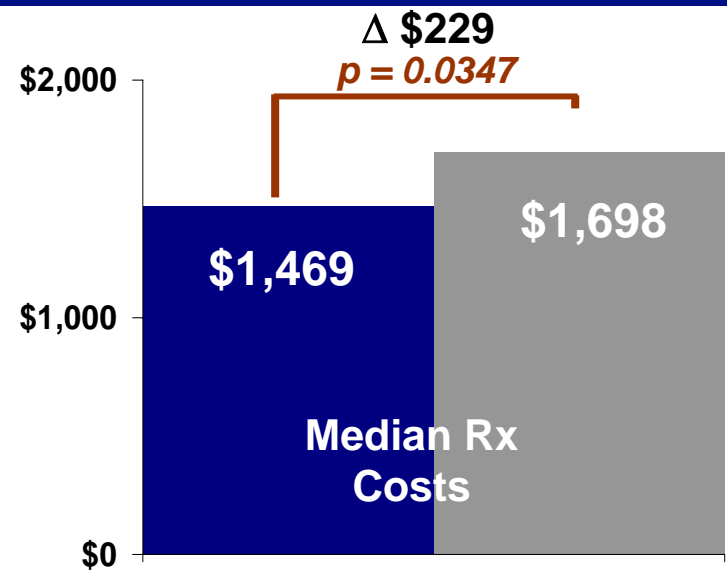
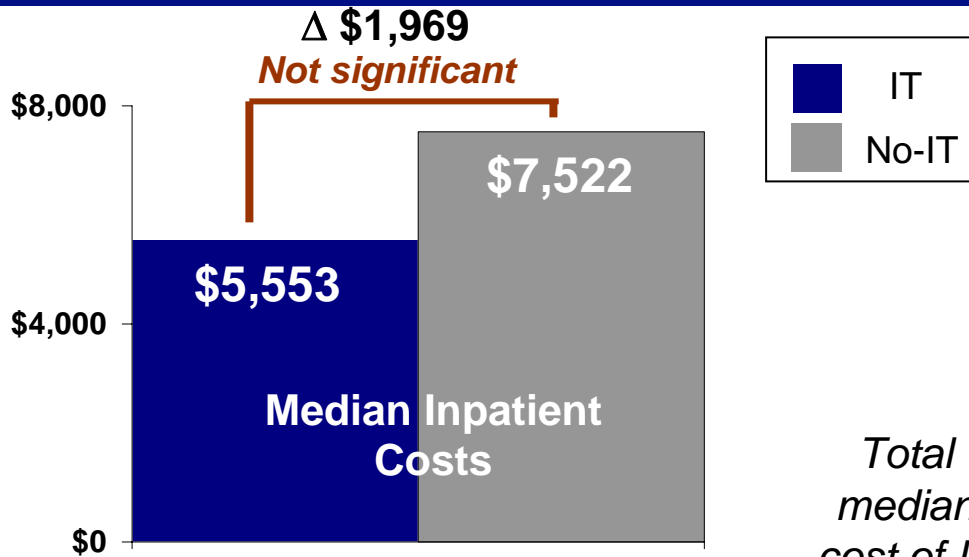
COMPARISON OF 18-MONTH PER-PATIENT MEDIAN HEALTHCARE COSTS



Total median cost of IT over 18 months = \$565

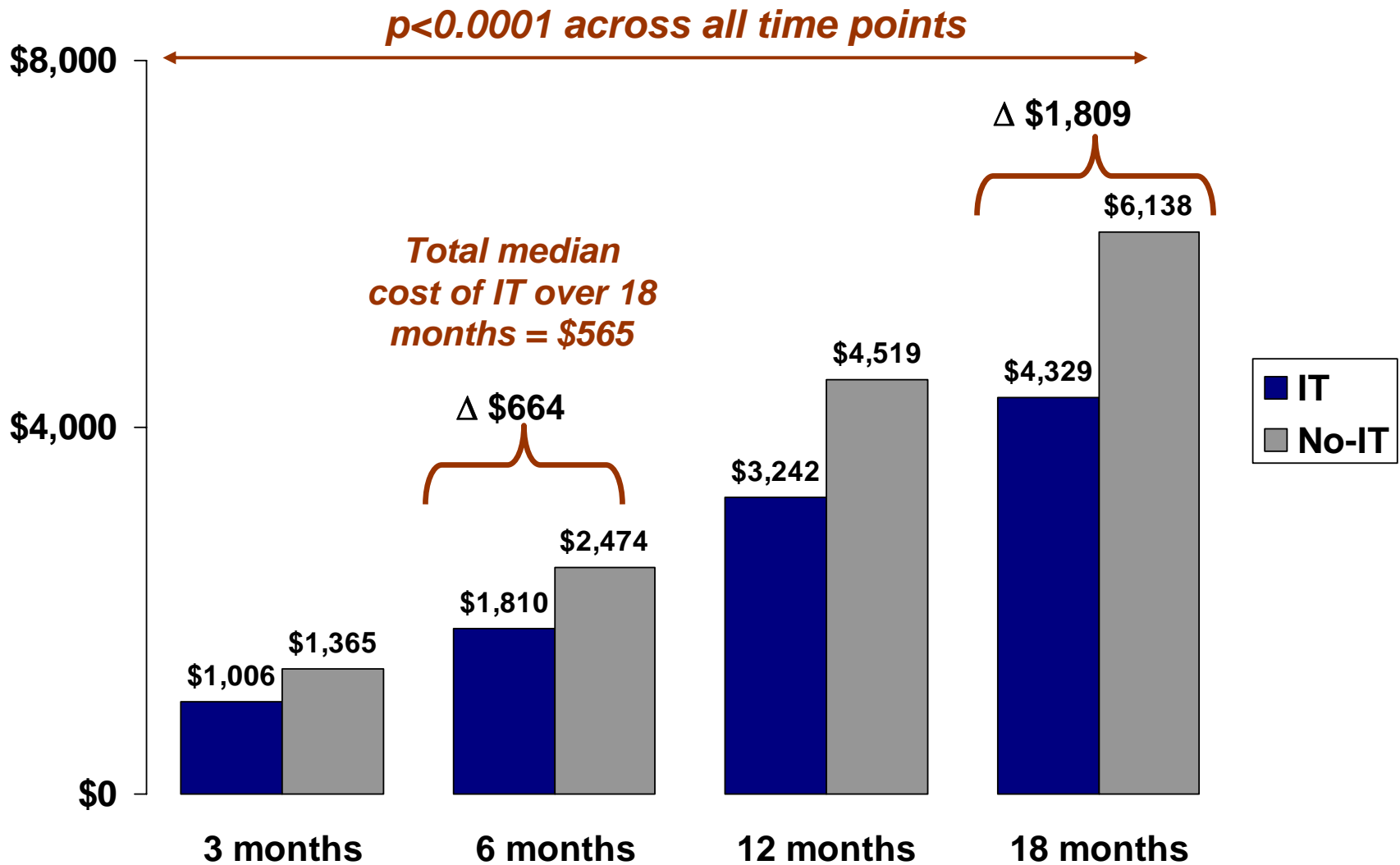


COMPARISON OF 18-MONTH PER-PATIENT MEDIAN HEALTHCARE COSTS



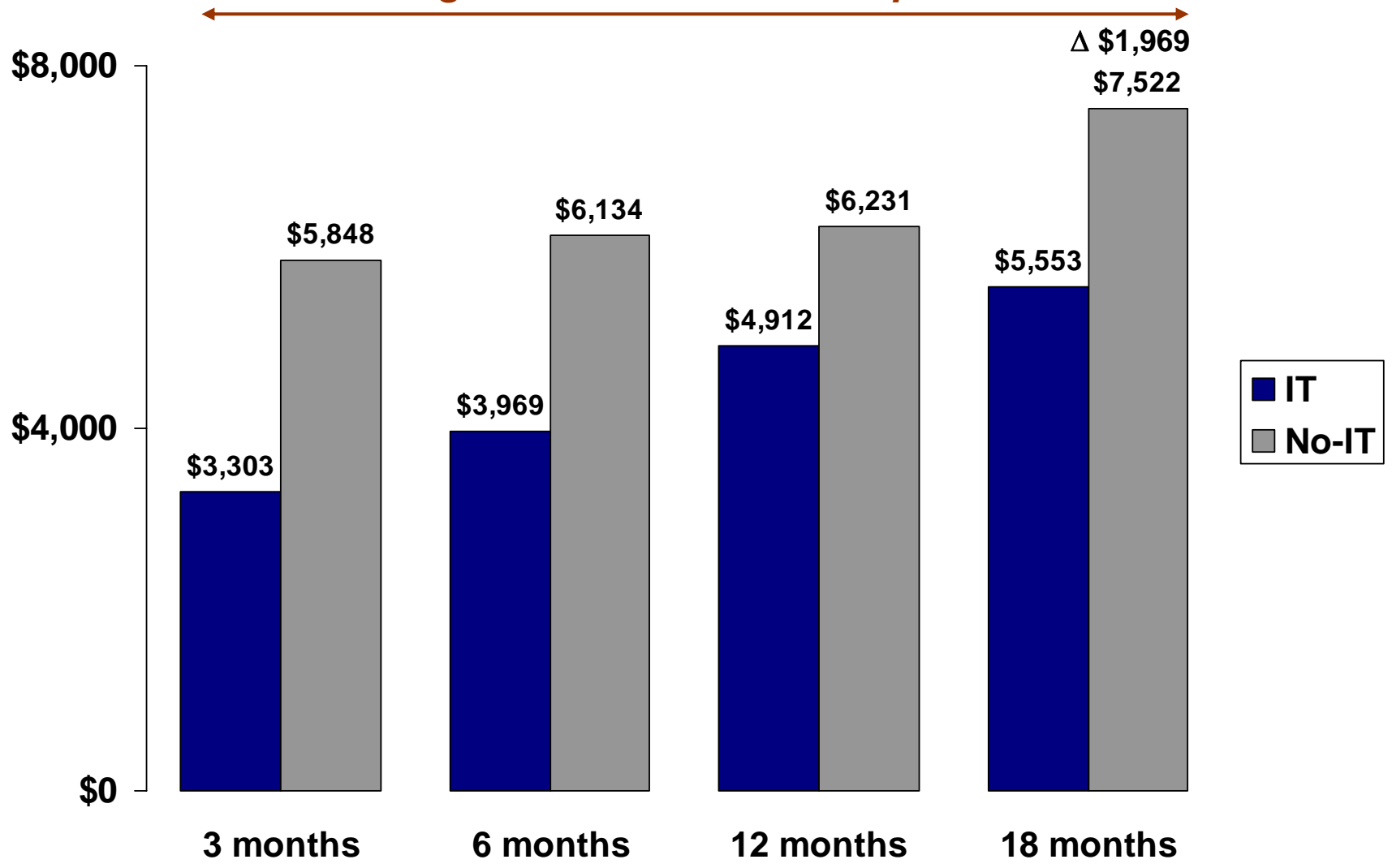
Total median cost of IT over 18 months = \$565

PER-PATIENT MEDIAN TOTAL HEALTHCARE COSTS: CHANGE OVER 18 MONTHS

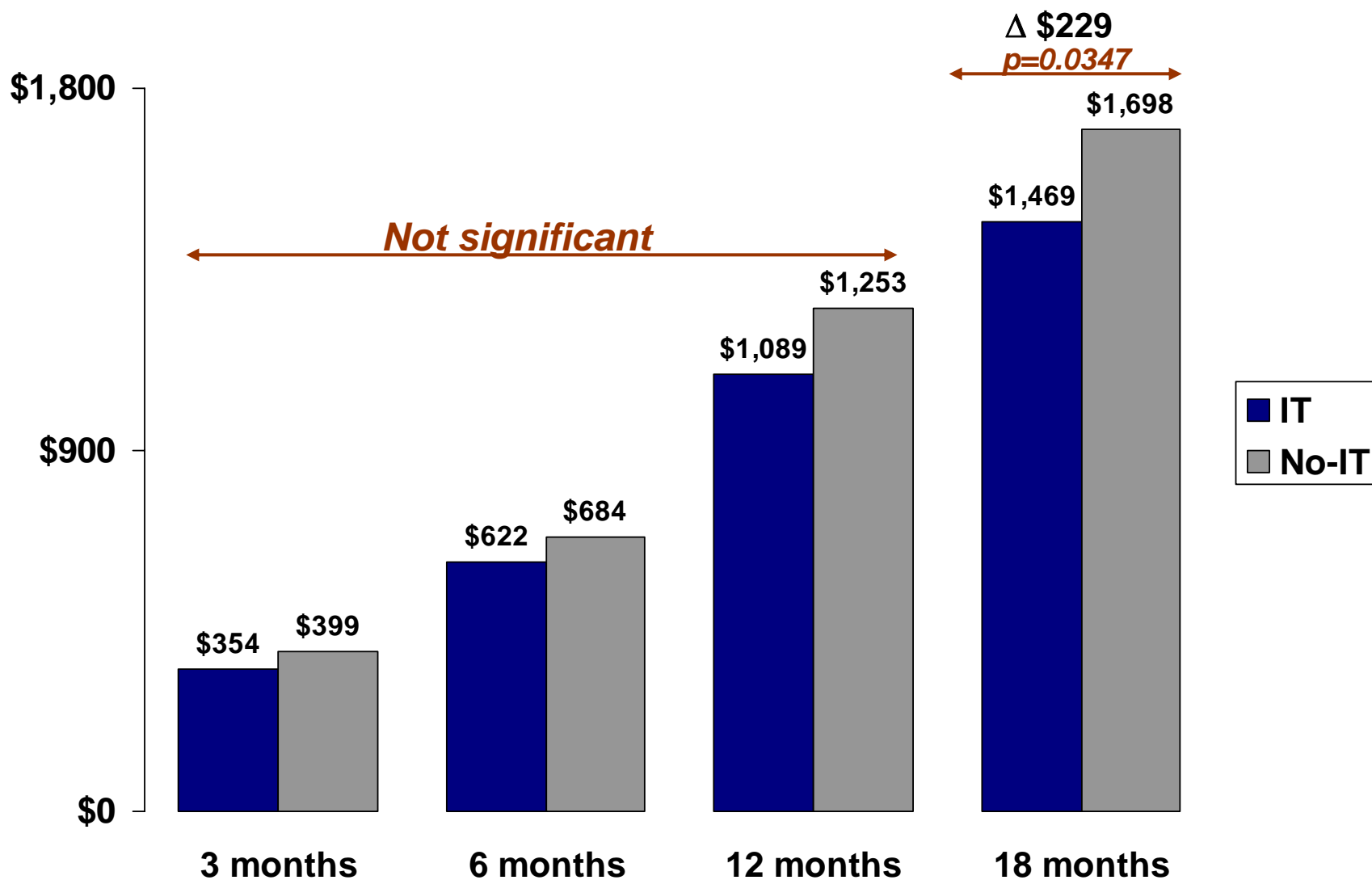


PER-PATIENT MEDIAN INPATIENT COSTS: CHANGE OVER 18 MONTHS

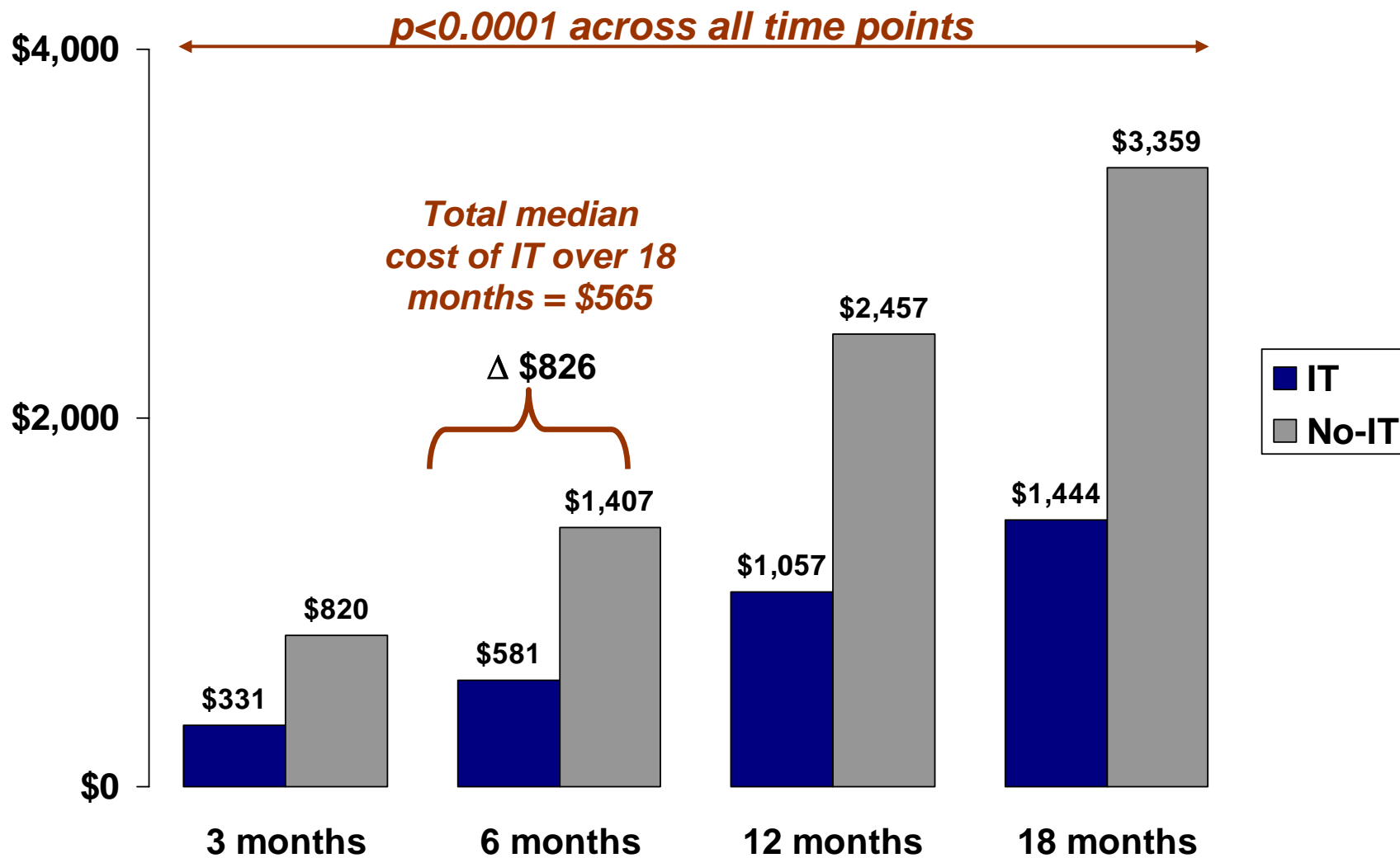
Not significant across all time points



PER-PATIENT MEDIAN PHARMACY COSTS: CHANGE OVER 18 MONTHS

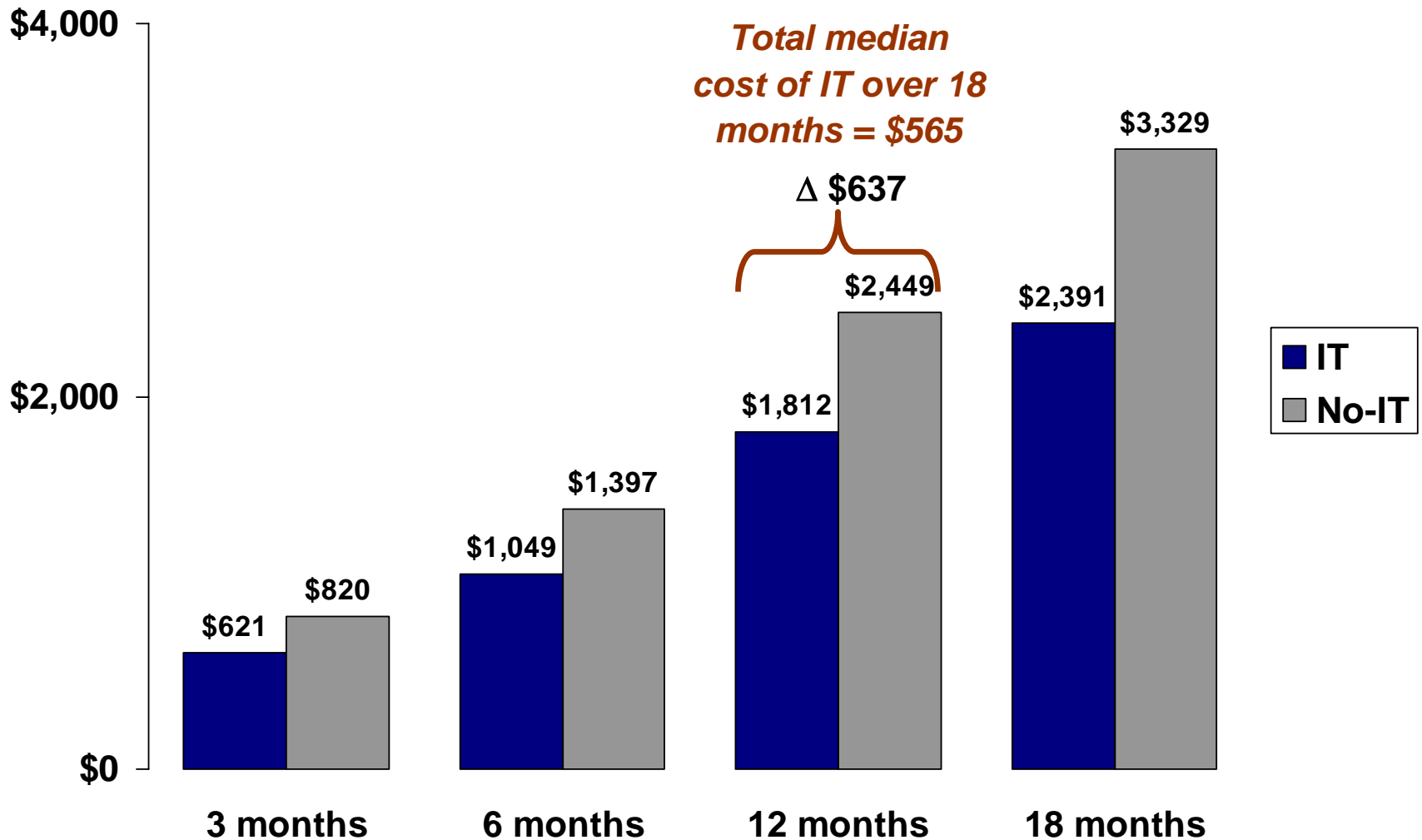


PER-PATIENT MEDIAN OUTPATIENT COSTS (EXCLUDING IT): CHANGE OVER 18 MONTHS



PER-PATIENT MEDIAN OUTPATIENT COSTS (INCLUDING IT): CHANGE OVER 18 MONTHS

$p < 0.0001$ across all time points



SUMMARY OF RESULTS

- Median cost per IT administration was \$35
- Median 18-month cost of IT treatment course was \$565

| | Total Costs Δ \$1,809 | Inpatient Costs Δ \$1,969 | Pharmacy Costs Δ \$229 | Outpatient Costs(a) Δ \$1,915 | Outpatient Costs (b) Δ \$938 |
|-----------------------------------|---------------------------------|-------------------------------------|----------------------------------|---|--|
| Time to Significant Effect | ↓ Within 3 months | ↔ NS | ↓ At 18 months | ↓ Within 3 months | ↓ Within 3 months |

a) *Exclusive of IT costs*
b) *Inclusive of IT costs*

Note:



= Costs for IT Group significantly lower than for No-IT Group



= Costs not significantly different between groups

CONCLUSIONS

- Although children newly diagnosed with AR were matched on demographic and illness characteristics,
 - Compared to those who did not receive IT, those who received IT incurred significantly lower 18-month, per-patient , median
 - Overall healthcare costs
 - Outpatient costs (inclusive and exclusive of IT costs)
 - Pharmacy costs
- Significant per-patient, median cost benefits were realized within 3 months of IT initiation for
 - Total healthcare costs
 - Outpatient costs (inclusive and exclusive of IT costs)

DISCUSSION

- Study Limitations
 - Findings based on Medicaid enrollees may not be generalizable to privately insured, higher income patients
 - Results limited to children and may not apply to adults
 - Limitations of claims data preclude knowing whether cost benefits correspond to patient-reported well-being or improved functioning
- However, retrospective analysis of claims data provides a valuable tool for examining “real world” impact of treatment

DISCUSSION

- Despite the apparent benefit of IT, only 2.5% of children newly-diagnosed with AR received this treatment
- Low IT initiation rate may reflect
 - Barriers to access of traditional care (i.e., subcutaneous allergy immunotherapy – SCIT), including
 - Painful (aversive) intervention
 - Clinician-administered, office-based procedure
 - Patient/family time off from work and/or school to receive clinician-administered, office-based treatment
- Innovations in treatment, such as sublingual allergy immunotherapy (SLIT), may remove some or all barriers to access of care, thereby
 - Increasing IT utilization
 - Reducing healthcare costs
 - Improving the health of children with allergic rhinitis

SUMMARY

- Results suggest that, among children with newly-diagnosed AR who receive IT, the 18-month cost outlay for IT (\$565) is offset within 6 months of treatment in terms of per-patient median total healthcare costs
 - **IT \$1810 versus No-IT \$2,474, $p < 0.0001$; Δ \$664**

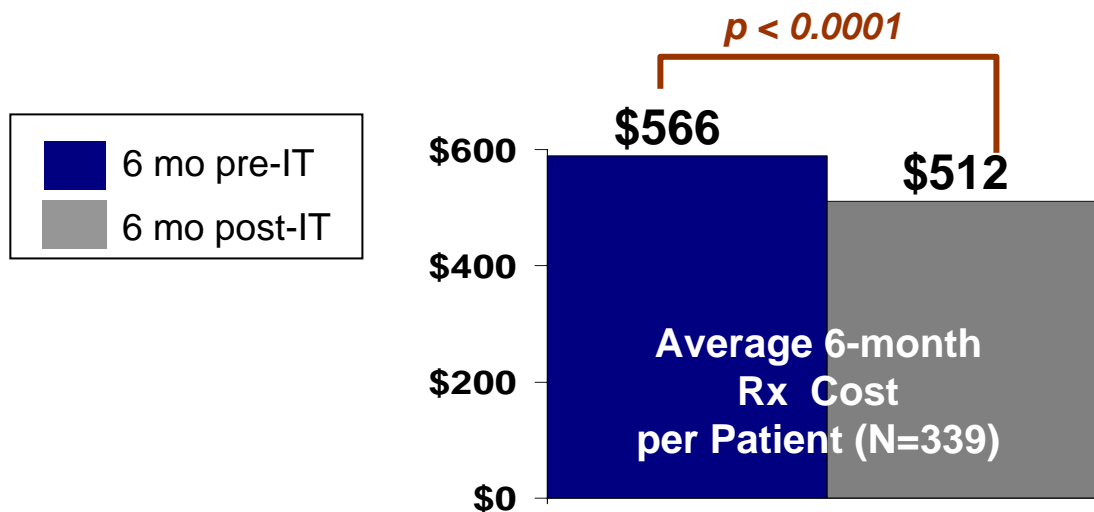
Thank you!

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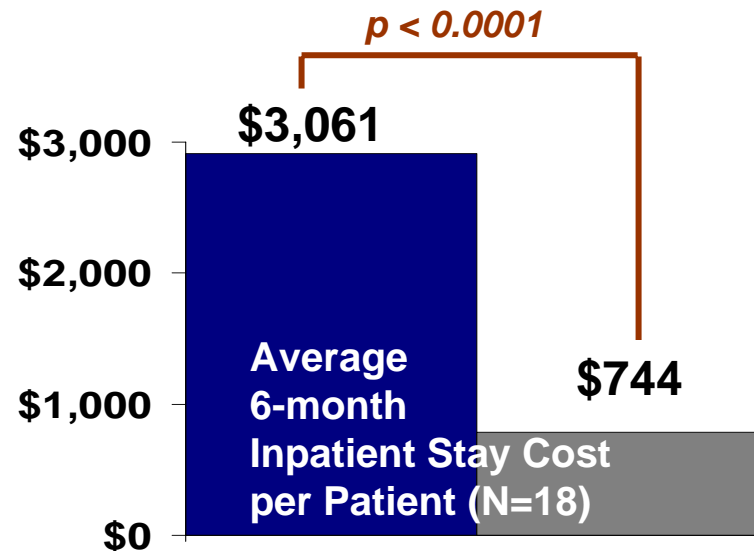
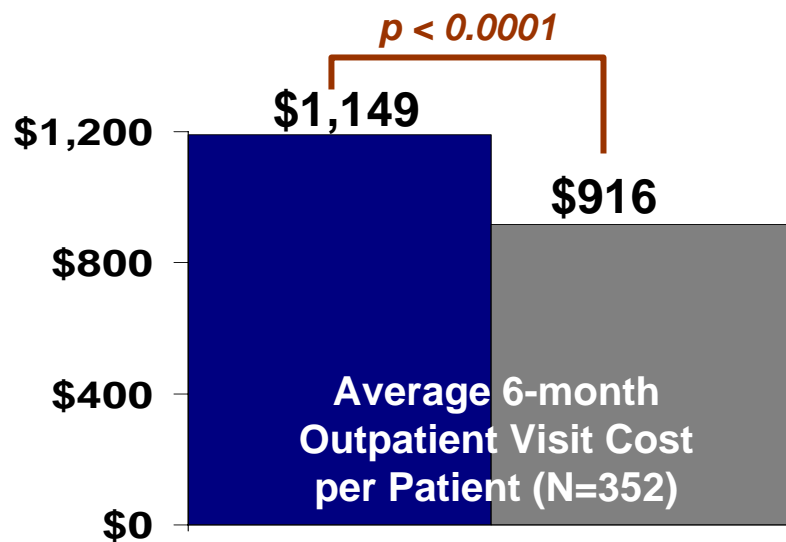
BACKUP



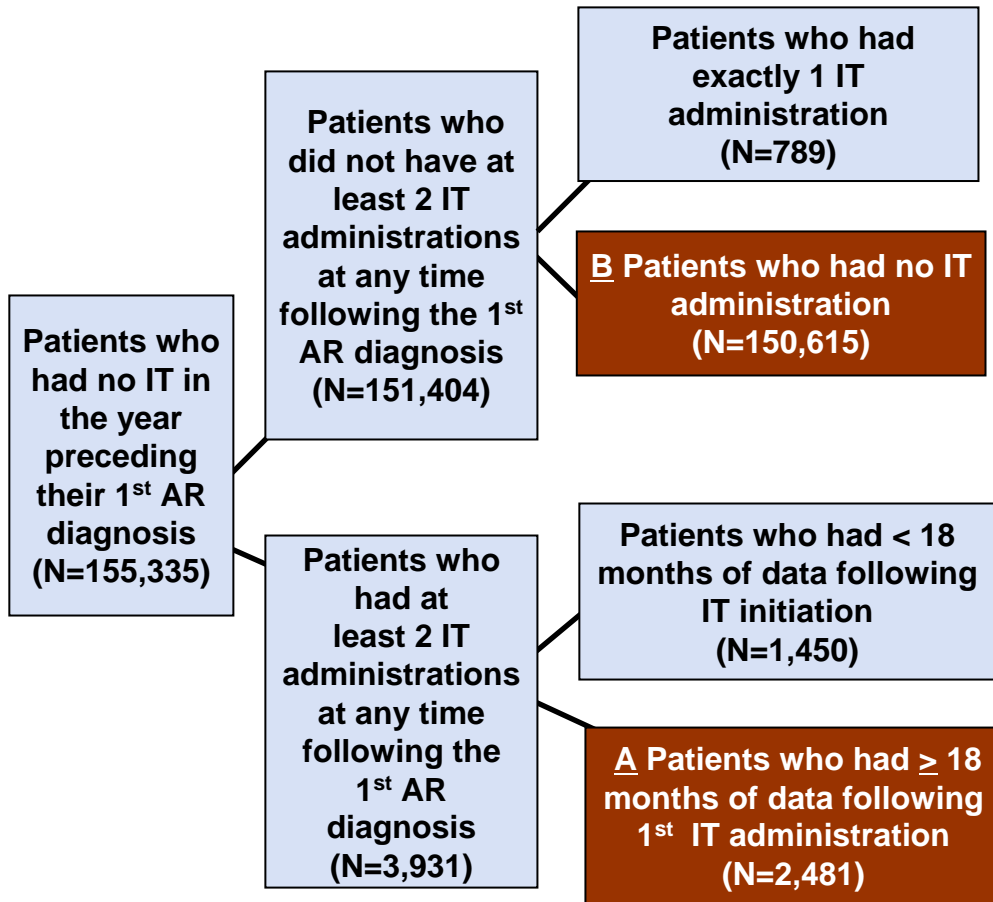
Findings: Previous Study



Medical costs significantly decreased in the 6 months following IT discontinuation versus the 6 months prior to IT initiation, despite the fact that the average duration of therapy was 17 months.



Results of Matching



Match B to A on:

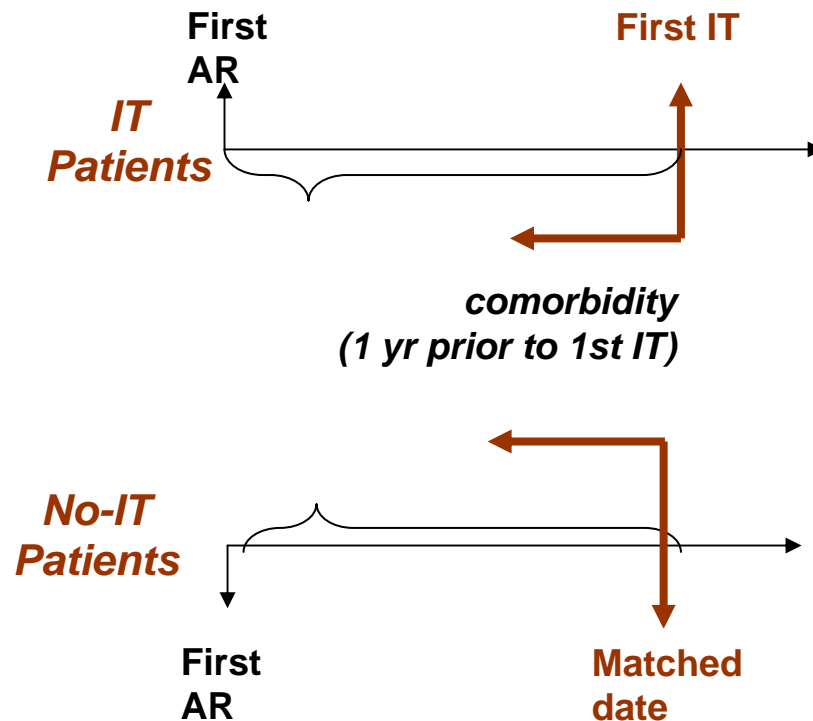
- (1) Age at 1st AR diagnosis (\pm 6 months)
- (2) Sex
- (3) Race
- (4) For Group A, identify period of time from 1st AR to 1st IT, & match Group B on same period
- (5) For Group A, examine comorbidity (asthma, atopic, conjunctivitis) 1 year prior to 1st IT, match Group B comorbidity for same 1-year period
- (6) For matched patients in Group B, select those who had \geq 18 month data following matched date

Matching Method

Match B to A on:

- (1) Age at 1st AR diagnosis (\pm 6 months)
- (2) Sex
- (3) Race
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Timeline



**2,771 patients matched to
89,733 NO-IT patients
1 to many match (1 to 1,636)**

One-to-Many Match

When cases and controls are both freely available then selecting equal numbers will make a study most efficient. However, the number of cases that can be studied is often limited by the rarity of the disease under investigation. In this circumstance statistical confidence can be increased by taking more than one control per case. There is, however, a law of diminishing returns, and it is usually not worth going beyond a ratio of four or five controls to one case.”

D. Coggan, G. Rose, DJP Barker. Epidemiology for the uninitiated. BMJ Website
<http://www.bmj.com/epidem/epid.html>; 1997.

Comparison of 18-month Per-patient Median Number of Healthcare Claims

