

Growth in Australian ED demand 2004-2011

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DECLARATION

- **This study was funded by ACEM**
- **Carried out by Road Trauma & Emergency Unit at Australian National University Medical School**
- **Approved by both relevant ethics committees as quality assurance activity: formal ethics committee review not required**
- **Results presented today are a little different from the abstract submitted due to further study**

Introduction

- Emergency Physicians all report that their EDs are getting busier
- Not a new issue: Growth has been a long term part of the specialty
- Population data still rare

RESEARCH

The challenges of population ageing: accelerating demand for emergency ambulance services by older patients, 1995–2015

Judy A Lowthian, Damien J Jolley, Andrea J Curtis, Alexander Currell, Peter A Cameron, Johannes U Stoelwinder and John J McNeil

Over the past 20 years, there has been a sustained rise in demand for emergency ambulance services across the developed world.¹⁻⁴ Growth in emergency transportations is an important determinant of emergency department attendances.⁵ In particular, transport of older patients has a significant impact on acute hospital capacity because of high admission rates and long lengths of stay.^{6,7} Resultant pressure compromises access, quality of care and patient safety, with emergency department congestion and overcrowding reported regularly.⁸⁻¹¹ The strains on ambulance services, however, are less well documented.

Demand on ambulance services encompasses telephone requests via Triple Zero (000) to ambulance call centres, dispatch of paramedics and ambulance vehicles (road and air, emergency and non-emergency), treatment of patients at the scene without transportation, and an emergency department facility or the patient.

To date, researchers have focused on the increasing rate of ambulance response times.¹² Some have examined demographic and on the use of emergency services in recent reviews have

ABSTRACT

Objective: To measure the growth in emergency ambulance use across metropolitan Melbourne since 1995, to measure the impact of population growth and ageing on these services, and to forecast demand for these services in 2015.

Design and setting: A population-based retrospective analysis of Ambulance Victoria's metropolitan emergency ambulance transportation data for the period from financial year 1994-95 to 2007-08, and modelling of demand in the financial year 2014-15.

Main outcome measures: Numbers and rates of emergency ambulance transportations.

Results: The crude annual rate of emergency transportations across all age groups increased from 32 per 1000 people in 1994-95 to 58 per 1000 people in 2007-08. The rate of transportation for all ages increased by 75% (95% CI, 62%-89%) over the 14-year study period, representing an average annual growth rate of 4.8% (95% CI, 4.3%-5.3%) beyond that explained by demographic changes. Patients aged ≥ 85 years were eight times (incident rate ratio, 7.9 [95% CI, 7.6-8.3]) as likely to be transported than those aged 45-69 years over this period. Forecast models suggest that the number of transportations will increase by 46%-69% between 2007-08 and 2014-15, disproportionately driven by increasing usage by patients aged ≥ 85 years.

Conclusions: These findings confirm a dramatic rise in emergency transportations over the study period, beyond that expected from demographic changes. Rates increased across all age groups, but more so in older patients. In the future, such acceleration is likely to have major effects on ambulance services and acute hospital capacity. This calls

MEDICAL CARE

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Understanding the Growth of Emergency Department Utilization

STEPHEN M. DAVIDSON, PH.D.*

Much research on utilization of hospital emergency departments has been published over the past 10 to 15 years. It has failed to yield a coherent view of why the volume of use has increased, however, because most of it has focused on users of one or more ERs, ignoring the nonusers, and has provided insufficient detail about the local context in which the ER operates. The result has been large quantities of data which, when compared, produce inconsistencies which cannot be resolved without additional data from different studies. Yet, a tentative explanation of ER growth can be presented if the question of why people use ERs, which is usually thought of as being similar to the question of why people use medical care services, is restated as, why do people who want to use medical care choose the ER as the site of care? That question can best be answered by paying greater attention to enabling and illness factors than to the predisposing demographic factors upon which much research has focused. A tentative explanation of the growth of ER utilization is offered. Then, the support from the literature for it is presented and the remaining questions are identified for future research.

Aim

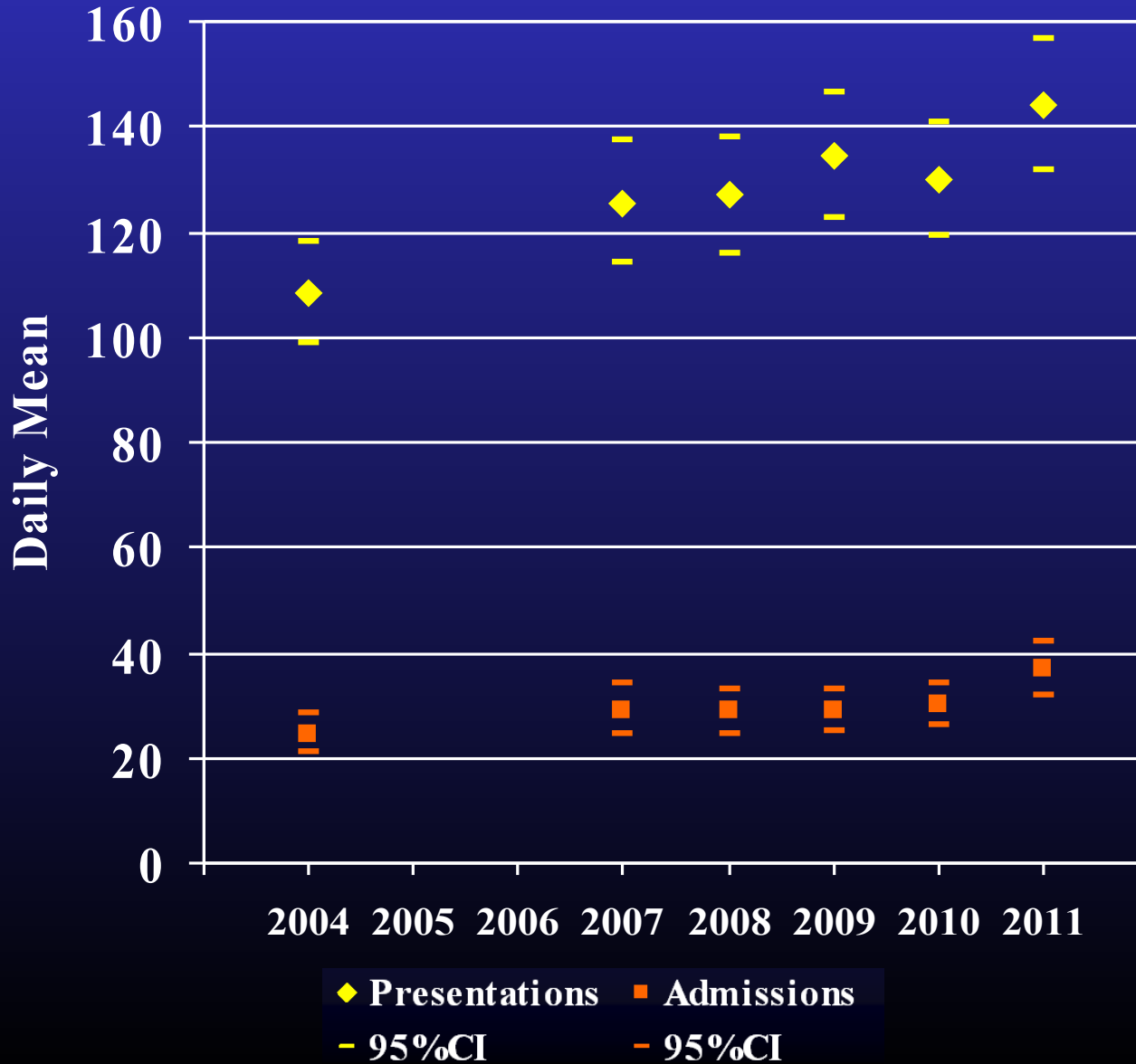
- **To describe the growth in demand at ACEM accredited EDs in the period 2004-2011**

Methods

- **Sub-study of the Access Block Point prevalence study which conducted surveys of presentation and admission numbers in 2004 and annually since 2007**
- **Separate analyses of all EDs which answered every May/Jun survey and all EDs which answered the Aug/Sep survey from 2007**
- **Means of daily reported figures were calculated, subdivided by role delineation and State, and compared using the paired t-test**

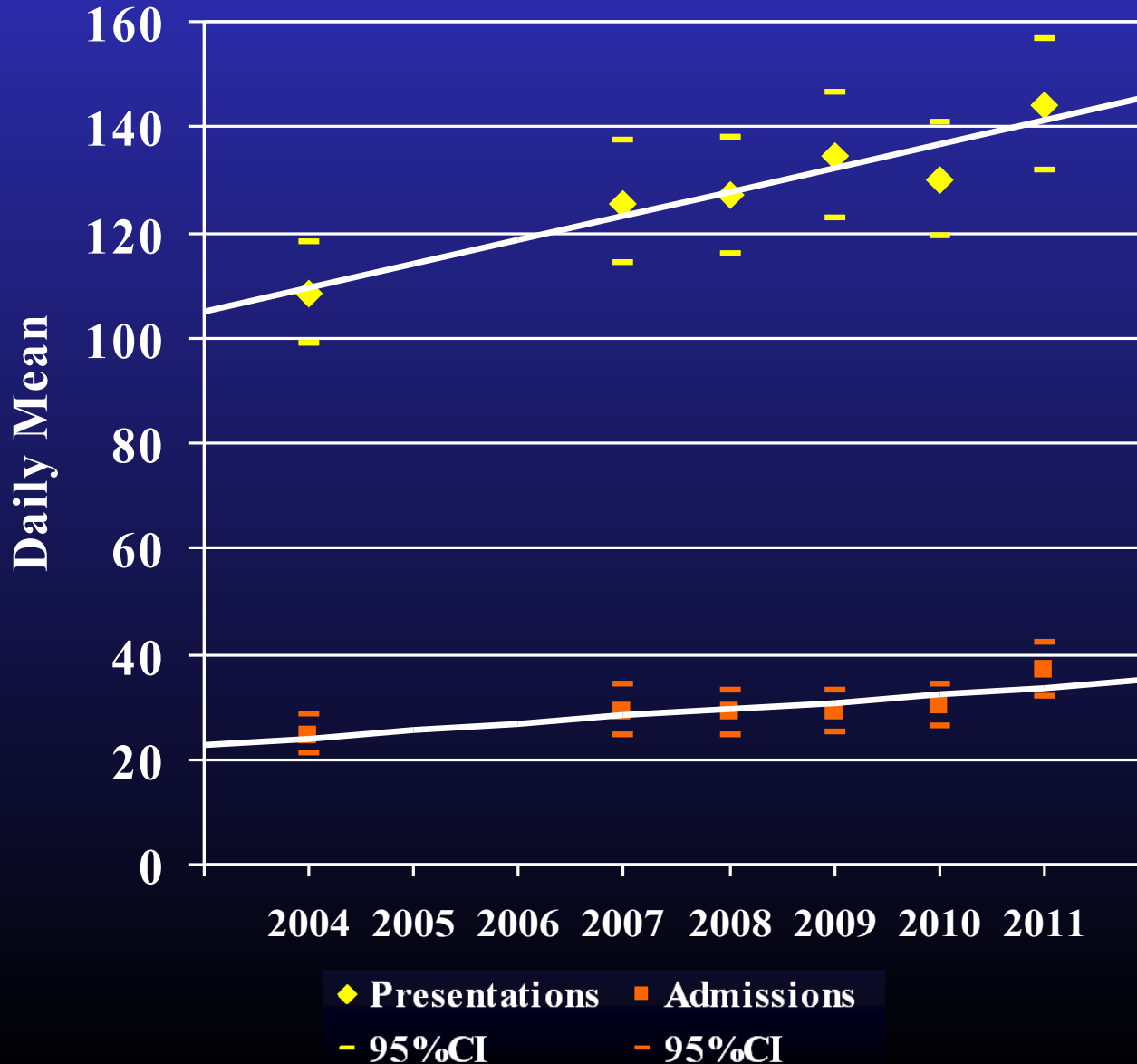
2.1	How many patients are under treatment in the ED as at 10:00 local time? (including patients awaiting admission to the wards but not those patients waiting to be seen)	
2.2	How many patients are waiting to be seen?	
2.3	How many of the patients under treatment are awaiting admission to the wards? (Admission decision made and admission process initiated)	
2.4A	How many of the patients awaiting admission have a total ED time of more than 8 hours? (Time of arrival/triage before 02:00 today)	
2.4B	How many of the patients awaiting admission have a total ED time of more than 16 hours? (Time of arrival/triage before 18:00 YESTERDAY)	
2.4C	How many of the patients awaiting admission have a total ED time of more than 24 hours? (Time of arrival/triage before 10:00 YESTERDAY)	
2.5	Is ambulance bypass used by your hospital? [Yes or No response]	
2.6	How many hours of bypass away from your hospital have you had in the last 24 hours?	
2.7	How many patients presented to your ED yesterday (ie 0000 to 2400)?	
2.8	How many of those presentations yesterday required admission to the wards? (ie 0000 to 2400 – include those still waiting for admission to the wards)	
2.9	How many patient spaces with oxygen and suction are there in your ED?	
2.10	How many of the patient spaces with oxygen and suction hours were occupied at 10:00?	
2.11	How many presentations were there to your ED last year? (circle range)	<15000 15-25000 25-35000 35-45000 >45000
2.12	Please complete the following for the patient waiting for a bed with the LONGEST total ED time, ie the earliest arrival still in your ED at 10AM	
2.12A	Date of Arrival:	2.12B Time of Arrival (24hr clock):
2.12C	Date Seen by Doctor:	2.12D Time Seen (24 hr clock):
2.12E	Date Bed request/Admission start:	2.12E Time Bed Request (24 hr clock):

Growth – May/Jun



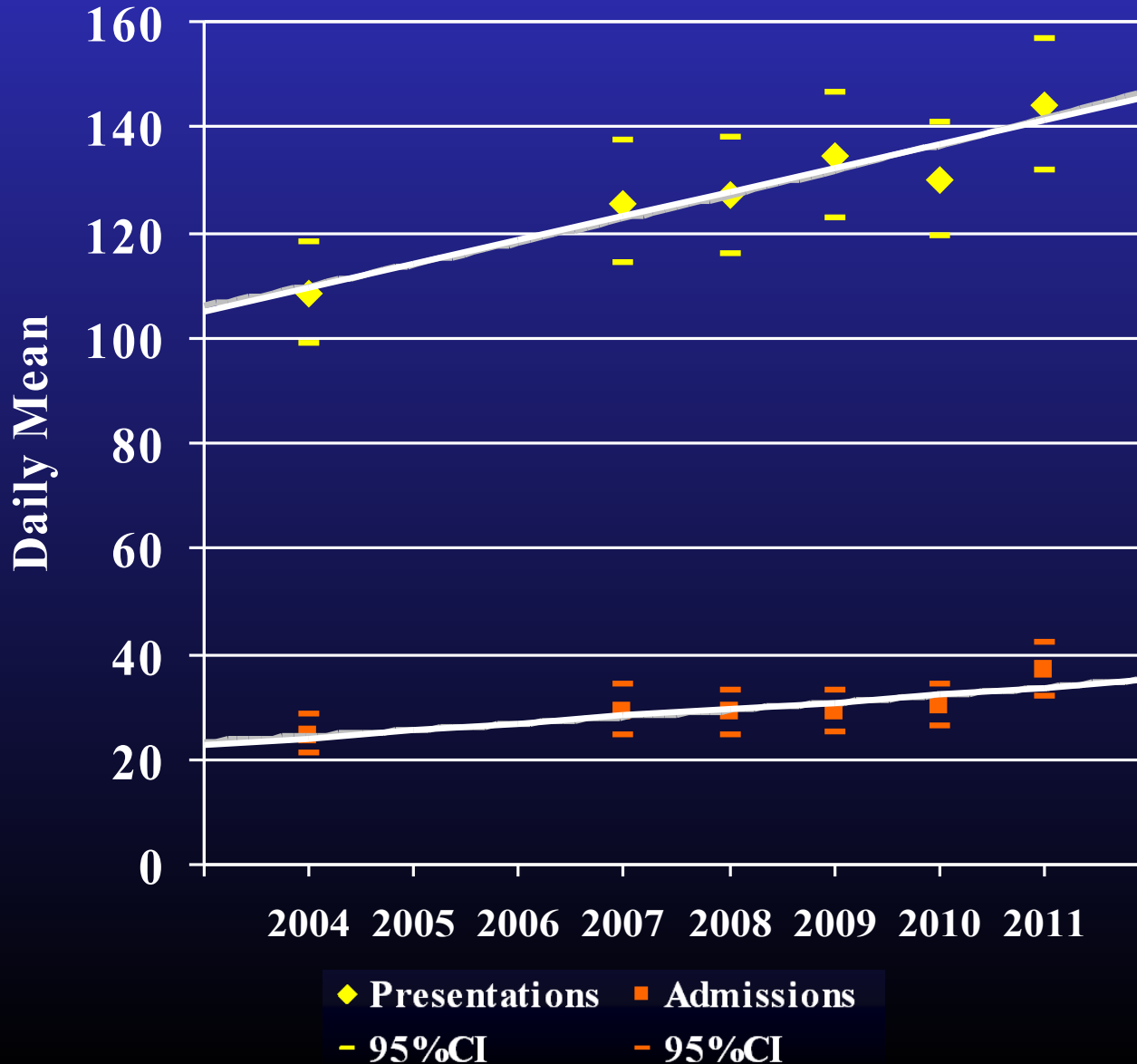
- **44 Hospitals**
- **No doubt there is an increase**
- **2 Models not statistically different**

Growth – May/June



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Growth – May/June



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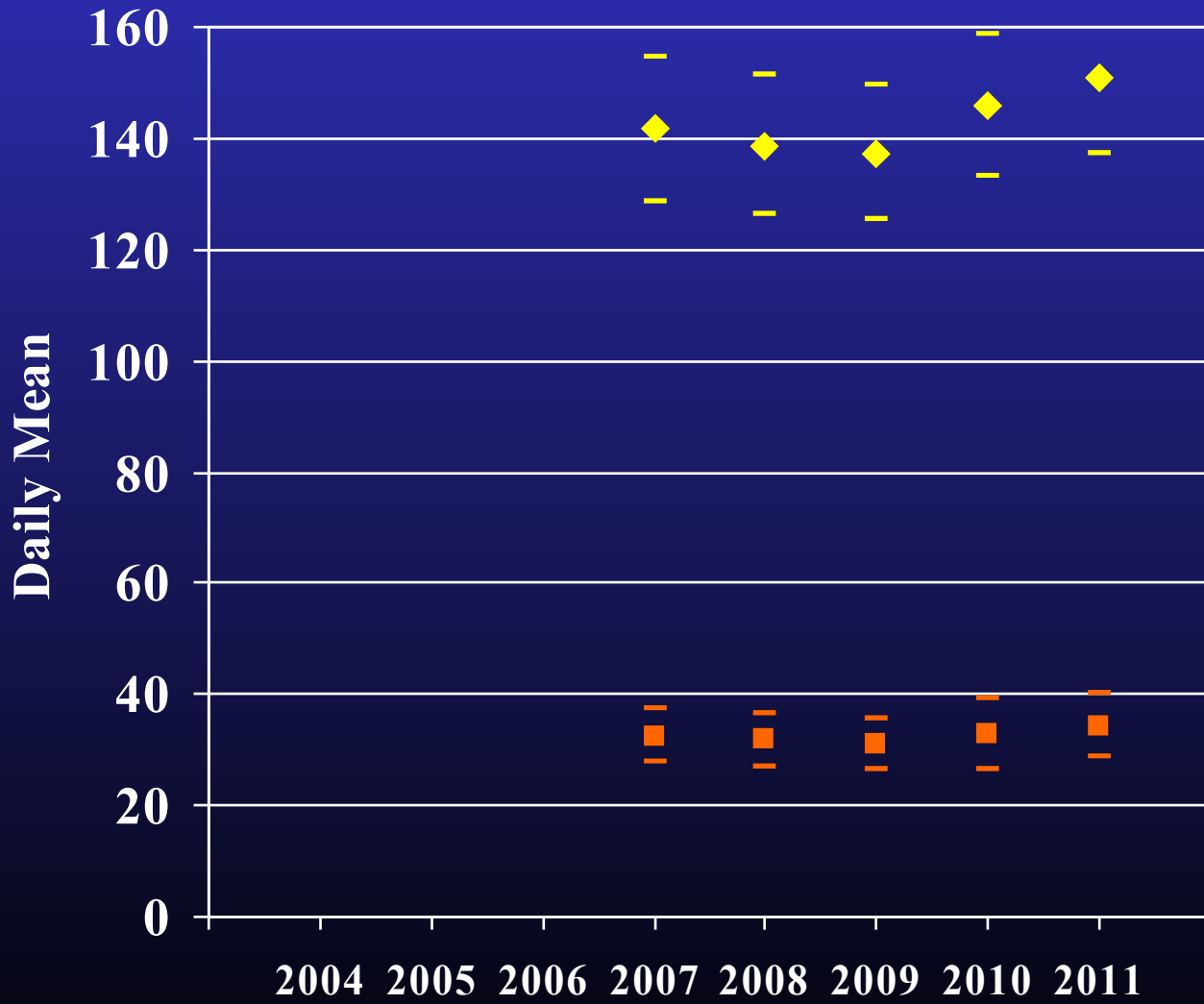
Results

- **A highly significant ($P < 0.0001$) increase in daily ED presentations**
 - 108.5 (95%CI 98.9-118.1) in 2004
 - 144.2 (95%CI 131.8-156.6) in 2011
- **4.5 additional/year (linear model)**
- **3.7% annually (exponential model)**
- **The increase was statistically robust and seen in every State grouping and role delineation (MR: 3.9%, UD: 2.9%, RR: 4.8%)**

Results

- **Similar increase in reported in admissions**
 - **24.7 (95%CI 21.1-28.2) in 2004**
 - **36.8 (95%CI 31.8-41.8) in 2011**
- **1.4 additional/year (linear model)**
- **4.7% annually (exponential model)**
- **But over half the increase occurred between the last two surveys (2010-2011)**
- **Possible to draw a line through all the 95% CI but not nearly as statistically robust**

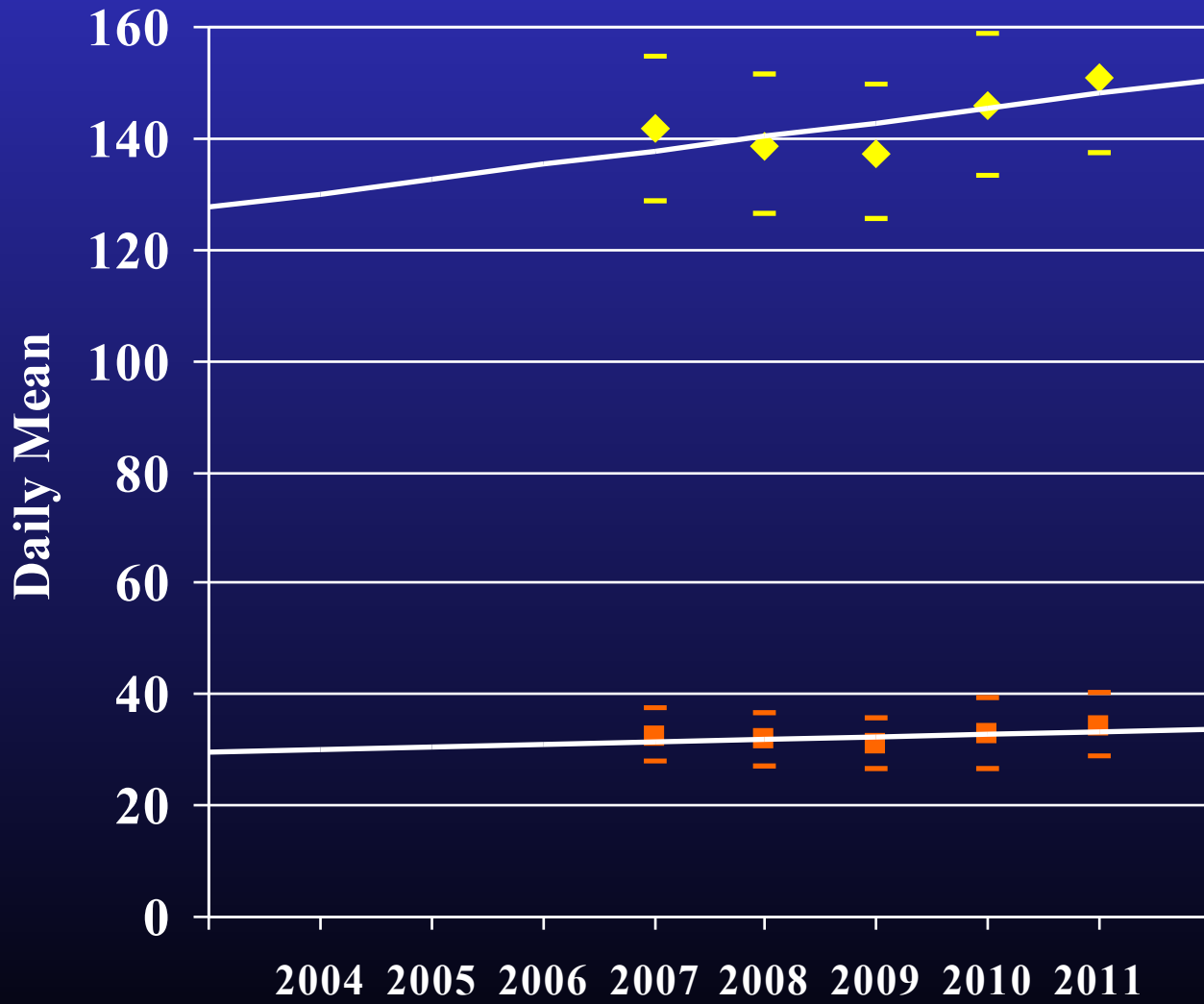
New data – Aug/Sep



- **41 Hospitals**
- **Similar pattern**
- **2 Models not statistically different**

◆ Presentations ■ Admissions
- 95%CI - 95%CI

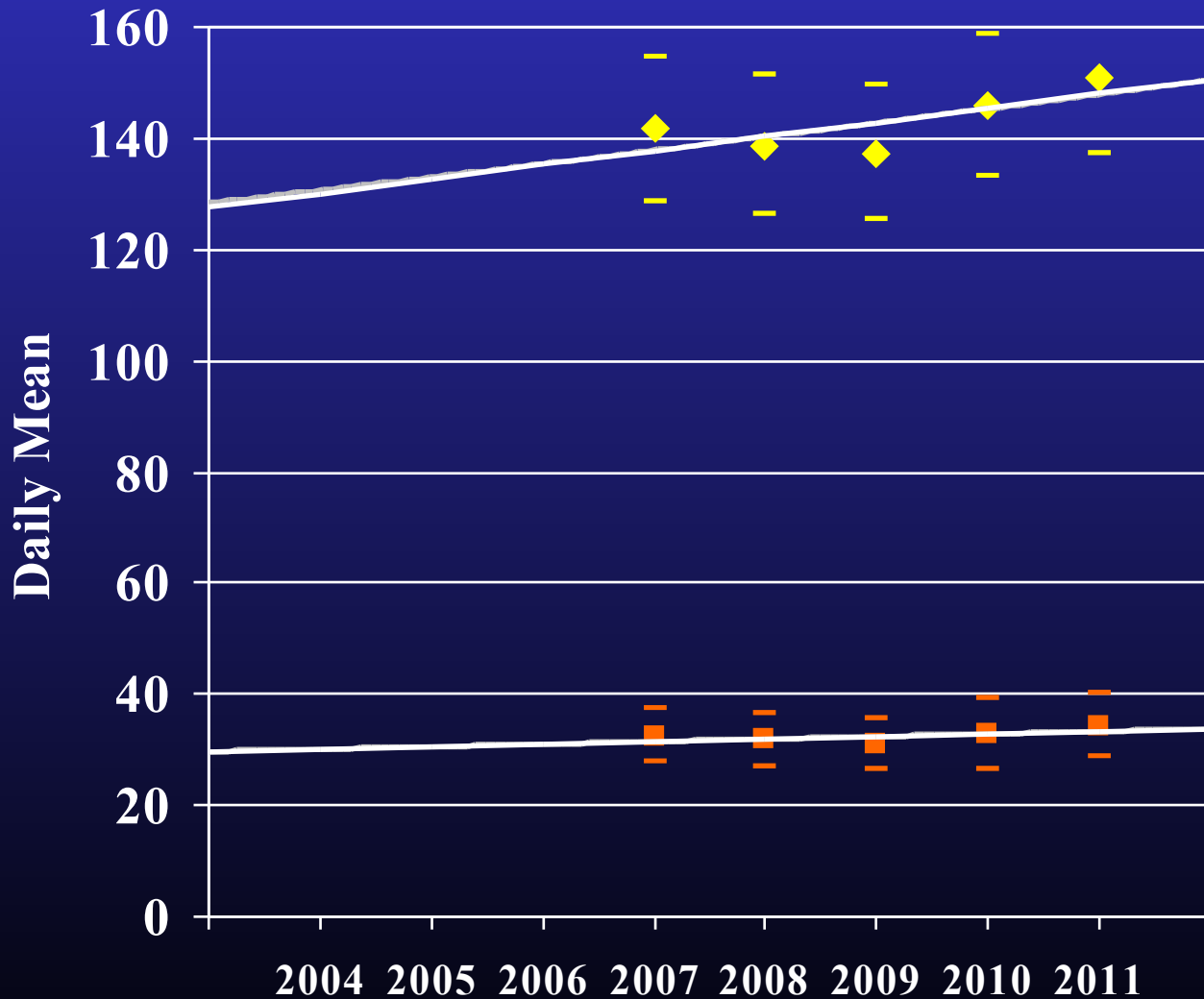
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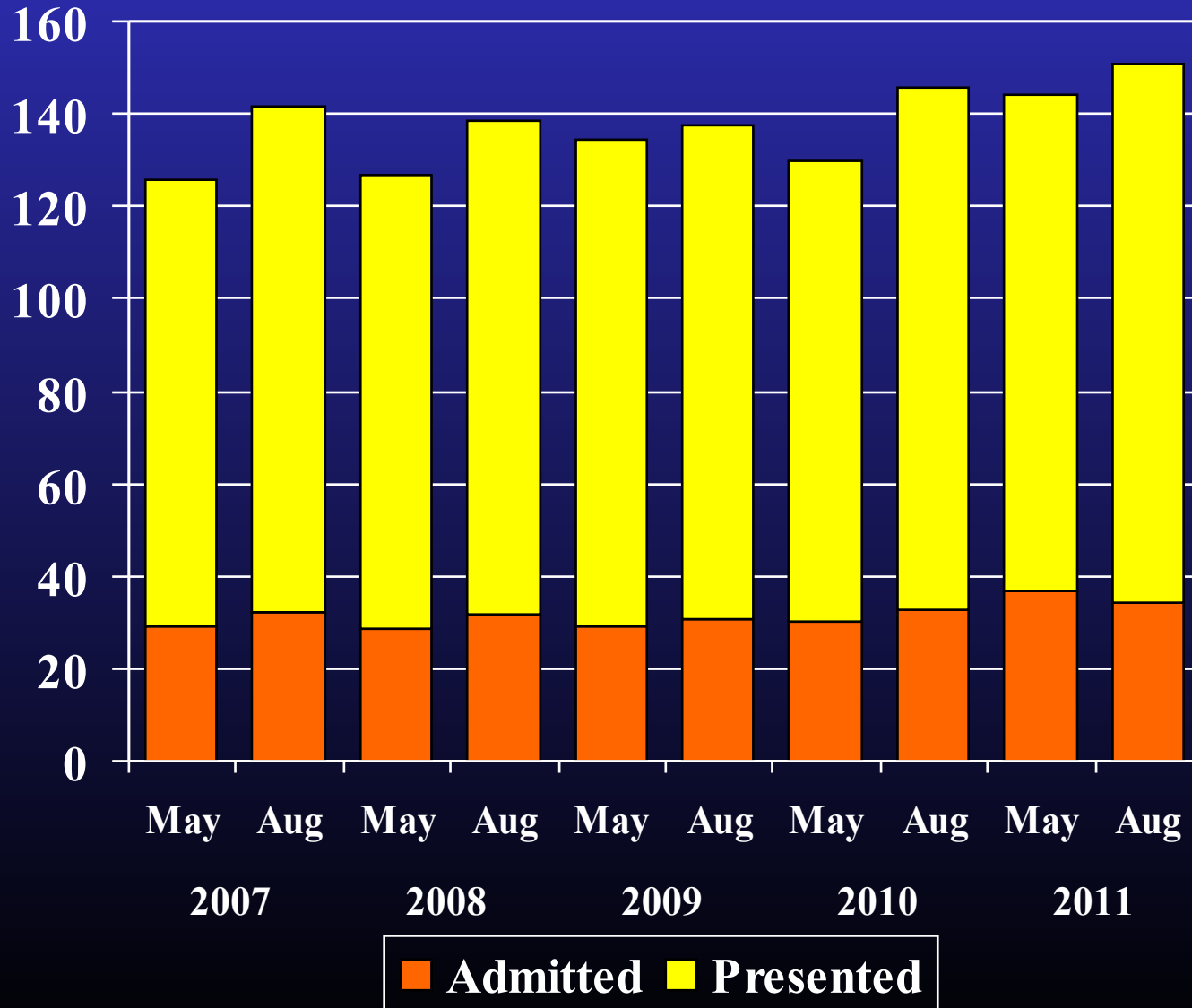
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Results

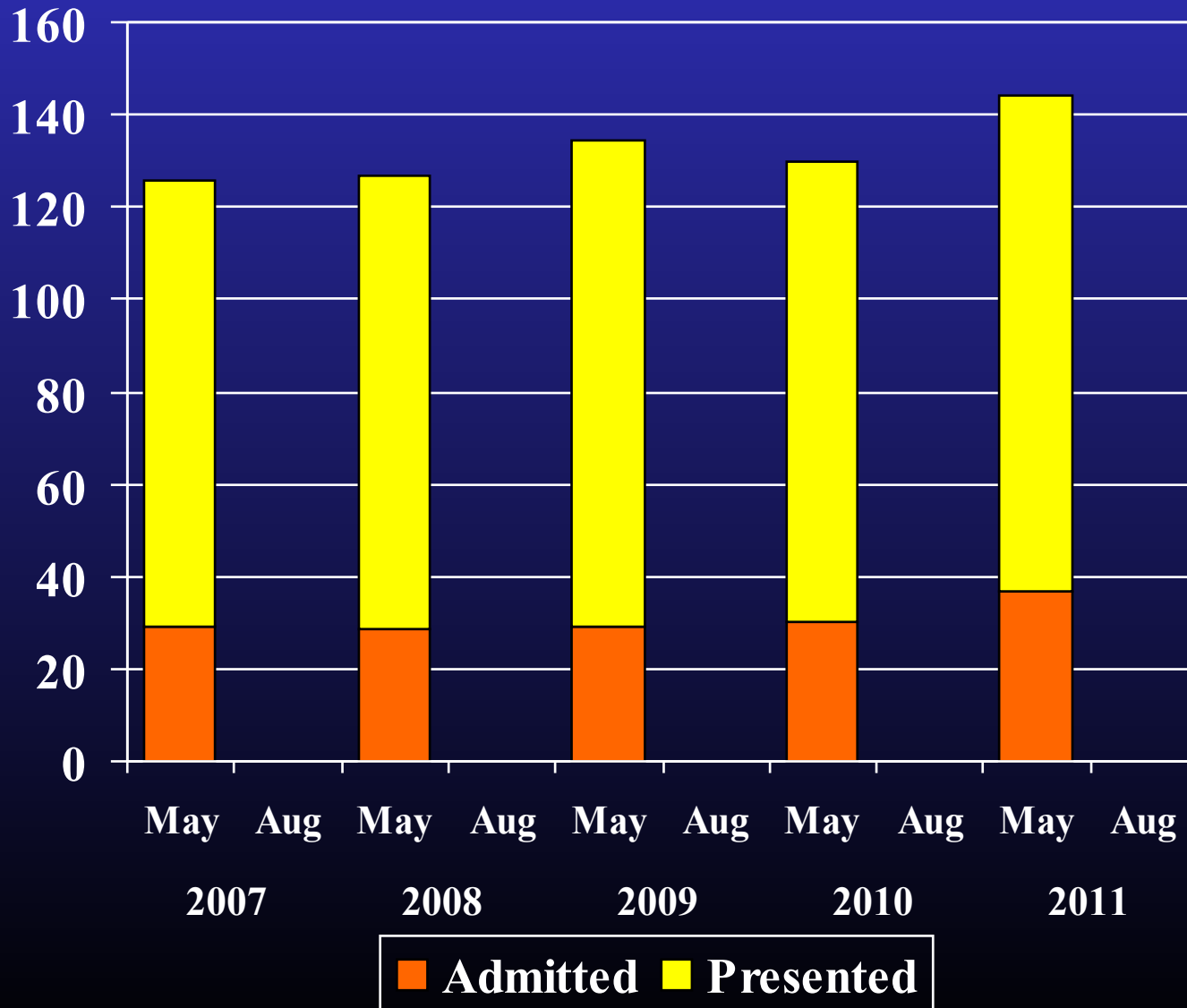
- **A highly significant ($P < 0.001$) increase in daily ED presentations**
 - 141.7 (95%CI 128.6-154.7) in 2007
 - 150.9 (95%CI 137.0-164.7) in 2011
 - 2.6 additional/year (linear model)
 - 1.7% annually (exponential model)
- **For admissions**
 - 0.5 additional/year or 1.5%
- **Confidence intervals wider, much more variability**

All data over time



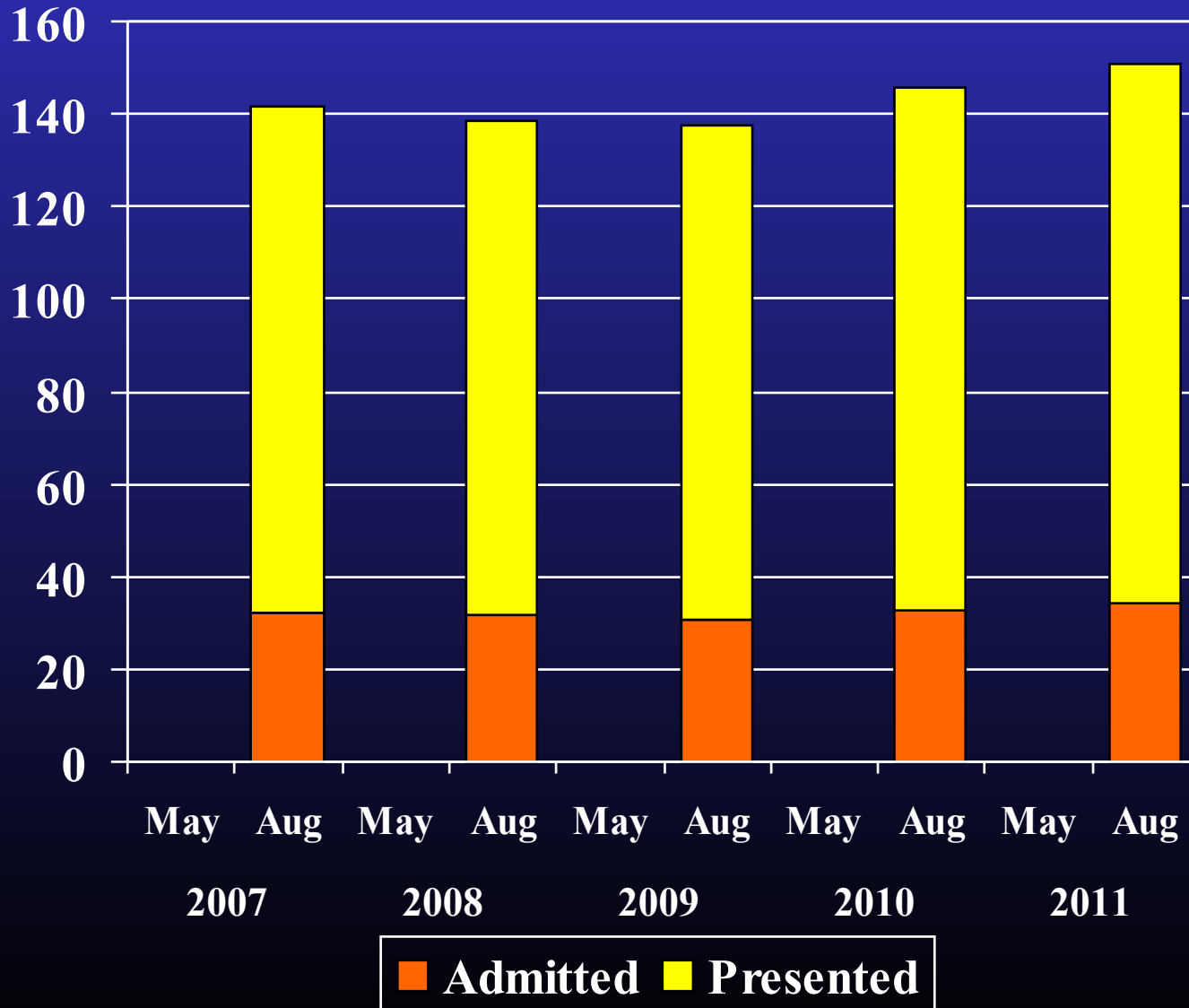
- **Strictly slightly different hospitals**

All data over time



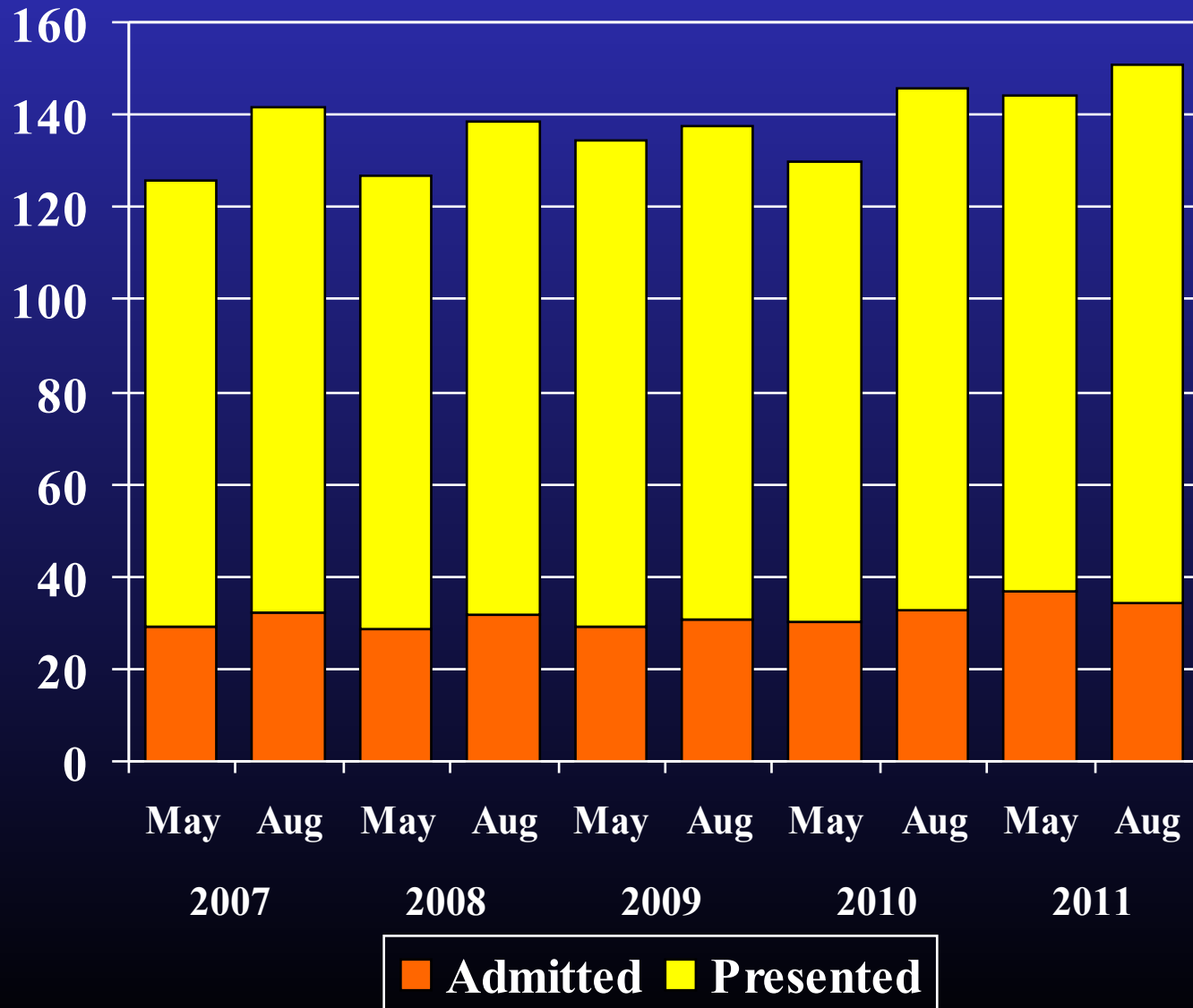
- **Strictly slightly different hospitals**
- **May Data on trend with one quiet year**

All data over time

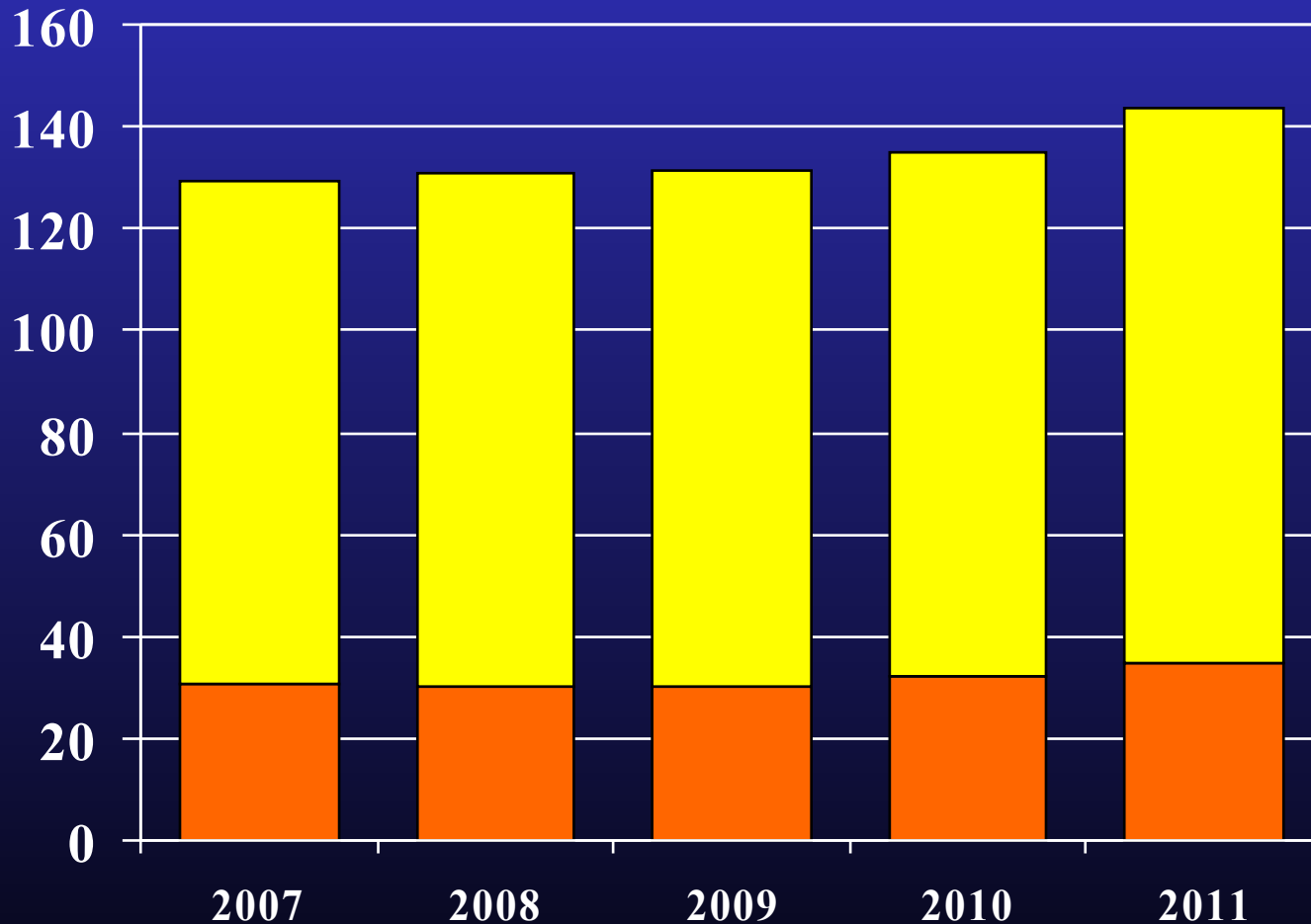


- **Strictly slightly different hospitals**
- **May Data on trend with one quiet year**
- **Aug data seasonally variable**

All data over time



Hospitals answering all



- **28 of you**
- **Average of two annual surveys**
- **2.7% and 3.3%**
- **Suggests recent increase**

Admitted **Presented**

Discussion

- **On the longer series, presentations to existing EDs are increasing at 3.7% per annum**
 - **Around twice the rate of general population growth**
- **This is comparable to AIHW figures for 2009-10 based on national reporting**
- **Non-linearity in admissions may reflect practice changes – observation medicine/targets**
- **Significantly greater variation in the 2007-11 Aug/Sep series but still an upward trend**

Discussion

- **Reported rate of growth similar to the national growth in 60-64 year olds**
 - Somewhat terrifying if trend followed in future
- **When new EDs built or accredited in the period are added growth must be even higher**
- **Limitation of the study is sample size**
 - Both hospitals and days sampled
- **Strength is the duration and independence**

Discussion

- **Reasons for growth are speculative but widely reported (and under investigation)**
 - **Aging population**
 - **Decrease in other services, esp hospital outpatients**
 - **Decrease in after-hours services**
 - **Hospital overcrowding forcing ED to be the site for semi-elective admissions**
- **Cannot ignore individual hospital effects of local demographic change**

Future Directions

- **Review of Point Prevalence Study underway**
- **Will be changes to questions next year**
 - **Notably distinguishing observation medicine**
- **Definition of admission has always been problematic**
 - **At least ACEM does not have to worry about the definition of a hospital**
- **Pre-notification will attempt to gain annual data, historical if available**

Conclusions

- **Presentations to existing EDs are increasing at around twice the rate of population growth**
- **When new services are included, population rate of ED use increasing even more**
- **Some of the increase in admissions may reflect practice change**
- **This is not sustainable long term without additional resources and has important implications in future ED planning**

