

A Systematic Review of the Prognosis of Autism Spectrum Disorder

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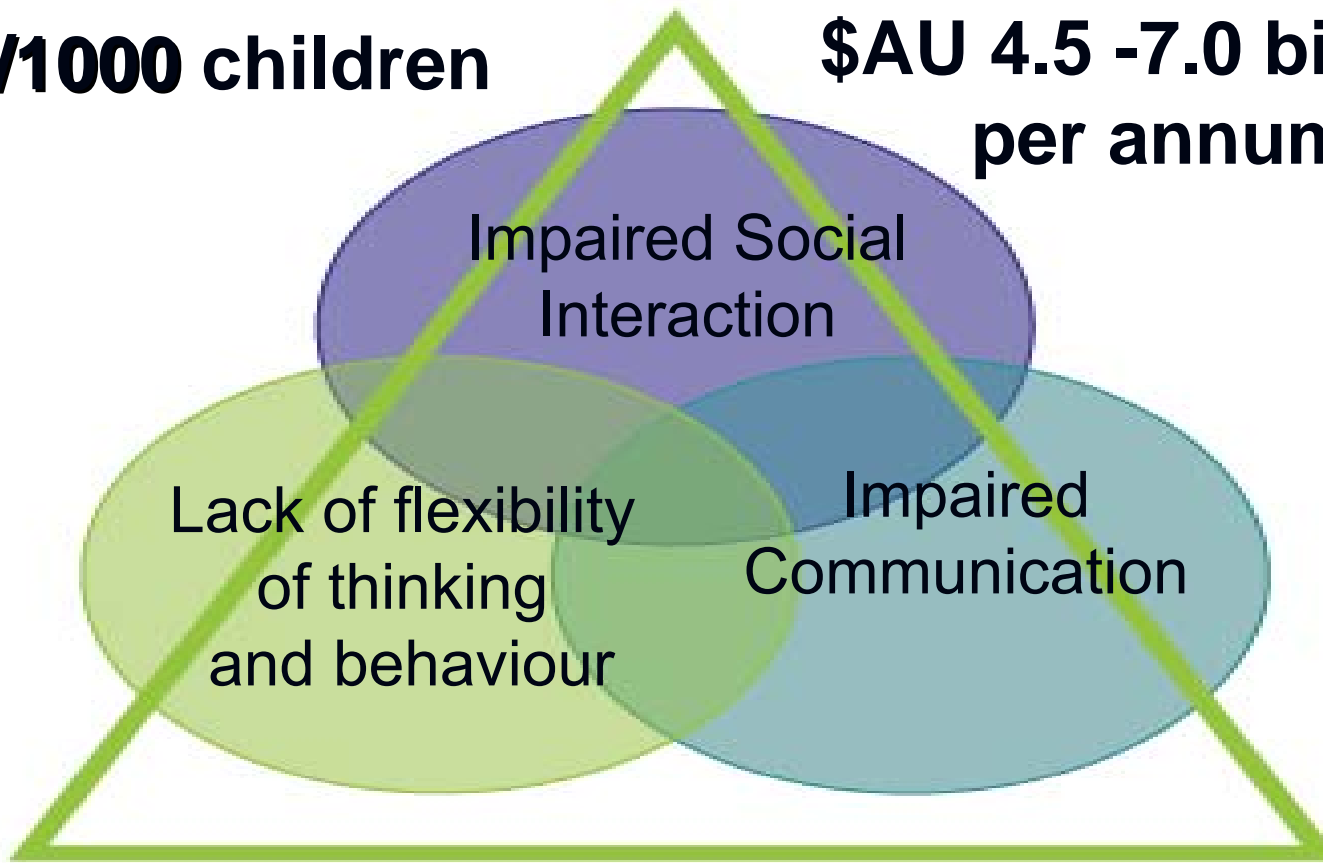
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Autism Spectrum Disorder

3- 6/1000 children

**\$AU 4.5 -7.0 billion
per annum**



DSM IV - Autistic Disorder, Asperger Syndrome, Pervasive Developmental Disorder Not Otherwise Specified

ICD10 – Childhood Autism, Atypical Autism

Children with ASD, parents, clinicians and service planners need best evidence regarding:

- Making the Diagnosis
 - Evidence Based Guidelines
- Treatment Options
 - 9 Cochrane reviews/protocols
- Their future -“prognosis”
 - no clear systematic review methods for prognosis



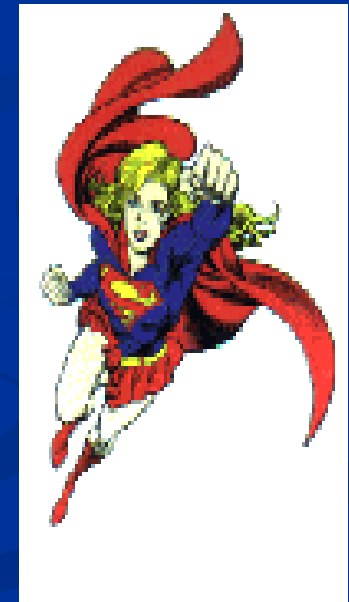
Research Question/Aim

QUESTION:

- What are the outcomes for children with an Autism Spectrum Disorder (DSM or ICD)
 - epilepsy, mortality, meaningful speech?

AIM:

- To conduct a systematic review of their prognosis



Study Type and Outcomes

■ Study Type

- “Prognosis” study
 - Defined population
 - Outcomes assessed longitudinally
 - Observation \geq 12 months
 - Retrospective and/or prospective



■ Outcomes

- At least one objective clinically relevant outcome

Method

- **6 databases** - EBM, medical and psychosocial up to March 2007. Currently updating
- **Search strategies** for ASD and prognosis using a “prognosis sensitive” filter
- **Reference** list of articles; contact with **experts**
- **2 reviewers independently** review eligible studies for inclusion, extracted data and study quality
- **Consensus** with third reviewer

Initial search

9192

Inclusion criteria :

Title/abstract screen:
DSM and/or ICD criteria for ASD
≥12 months follow-up

1256

Strict paper screen:
≥30 participants in an
original study

69

**Epilepsy, Mortality and
Presence/Absence of Meaningful
Speech**

19

Quality of Included Studies (n=19)

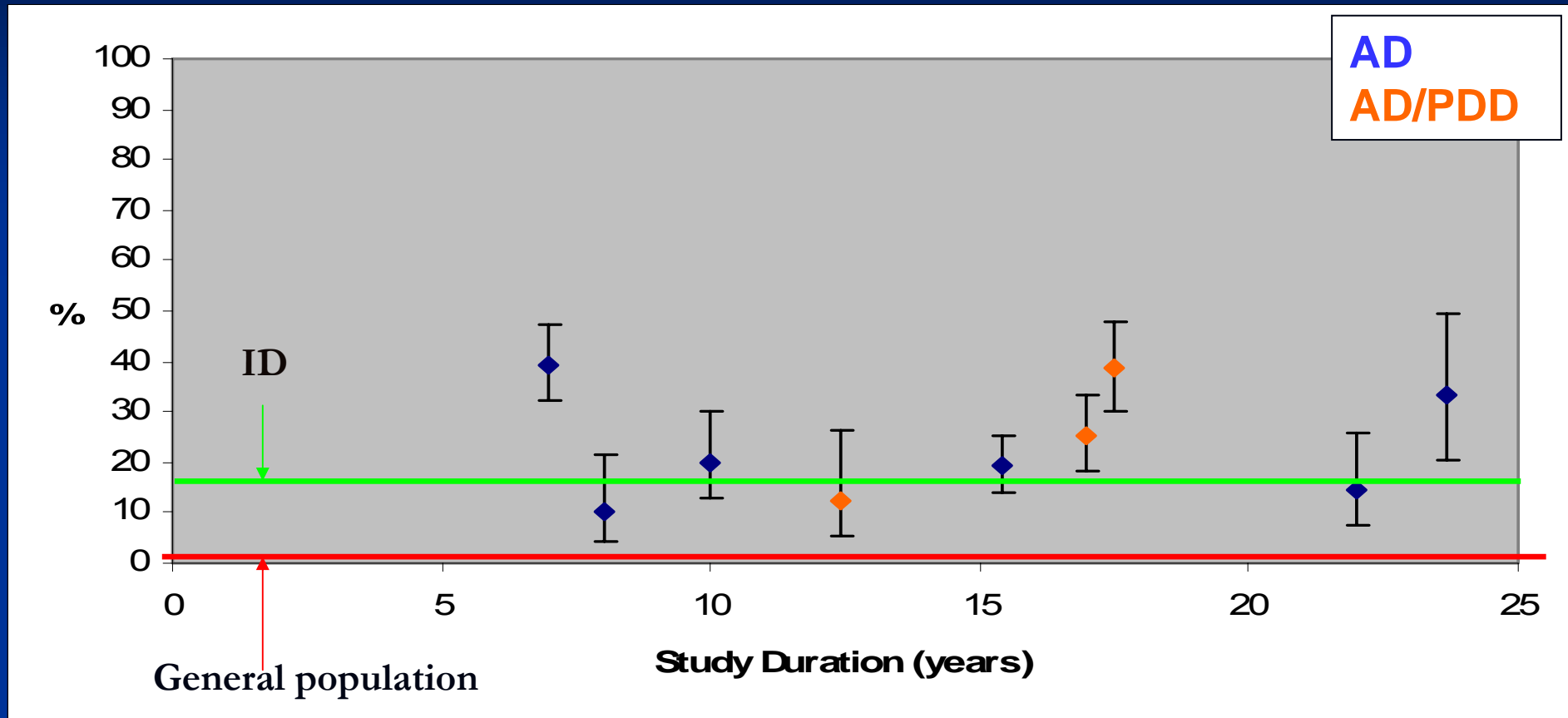
Diagnostic Criteria	AD/PDDNOS	AD
	5(26%)	14 (74%) 2 studies “high functioning”AD
Selection of Participants	Clinic Based 14 (74%)	<u>Population*</u> <u>5 (26%)</u>
Case Definition	Old information 13 (68%)	<u>At start of study*</u> <u>6 (32%)</u>
Measurement of outcomes	Retrospective 10 (53%)	<u>Prospective*</u> <u>9 (47%)</u>
% Follow Up	<75% 3 (16%)	<u>>75%*</u> <u>16(84%)</u>

Statistical Methods of the Review

- **Limited analysis**
 - **Heterogeneity of studies, outcomes, follow up = no meta-analysis**
 - **Dichotomous data only** for epilepsy and mortality and speech
- **Descriptive statistics** - most studies results expressed as **proportions**
- To take **duration of the study** into account proportions were **converted to rates**



Percent with epilepsy at the end of follow-up period



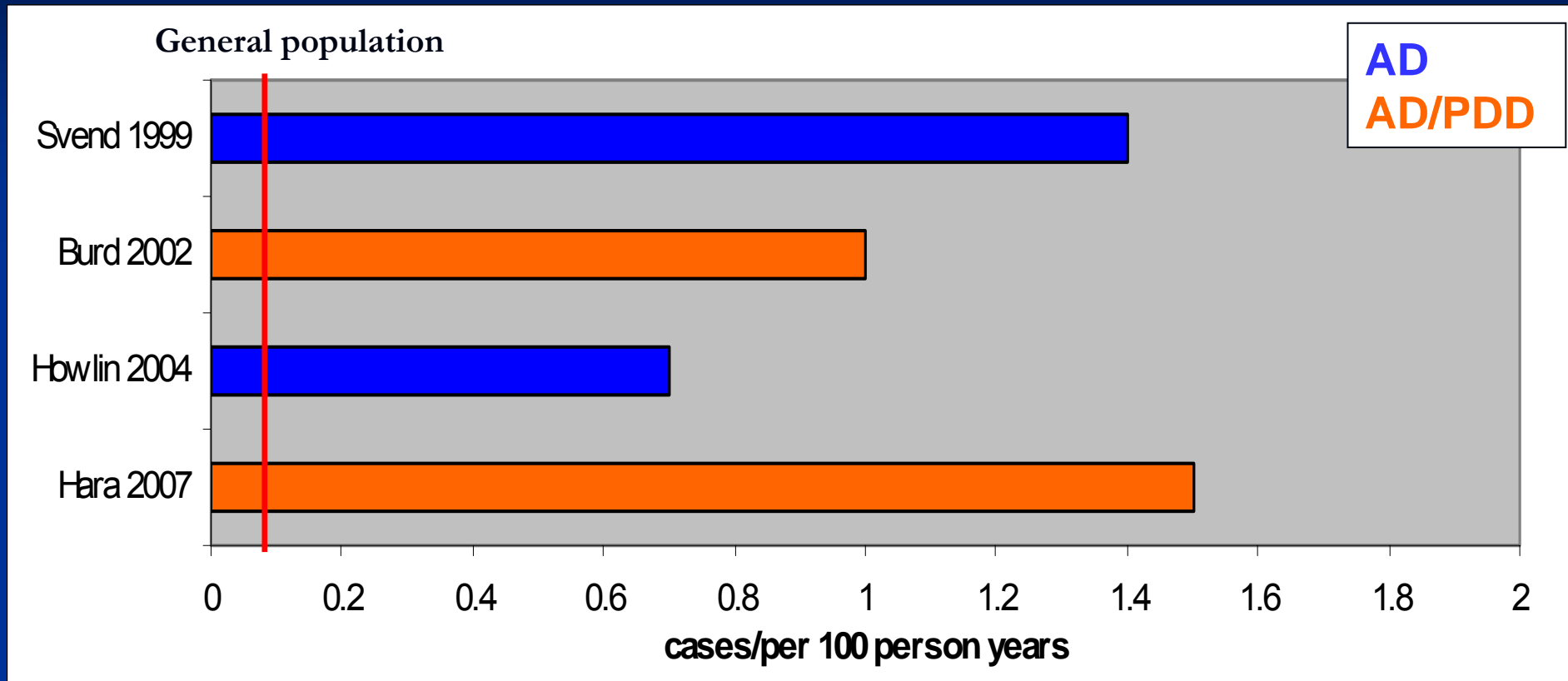
9 studies, n = 869

10-39% epilepsy by end of follow up (mid teens – late 20s)

20 – 50x higher than general population

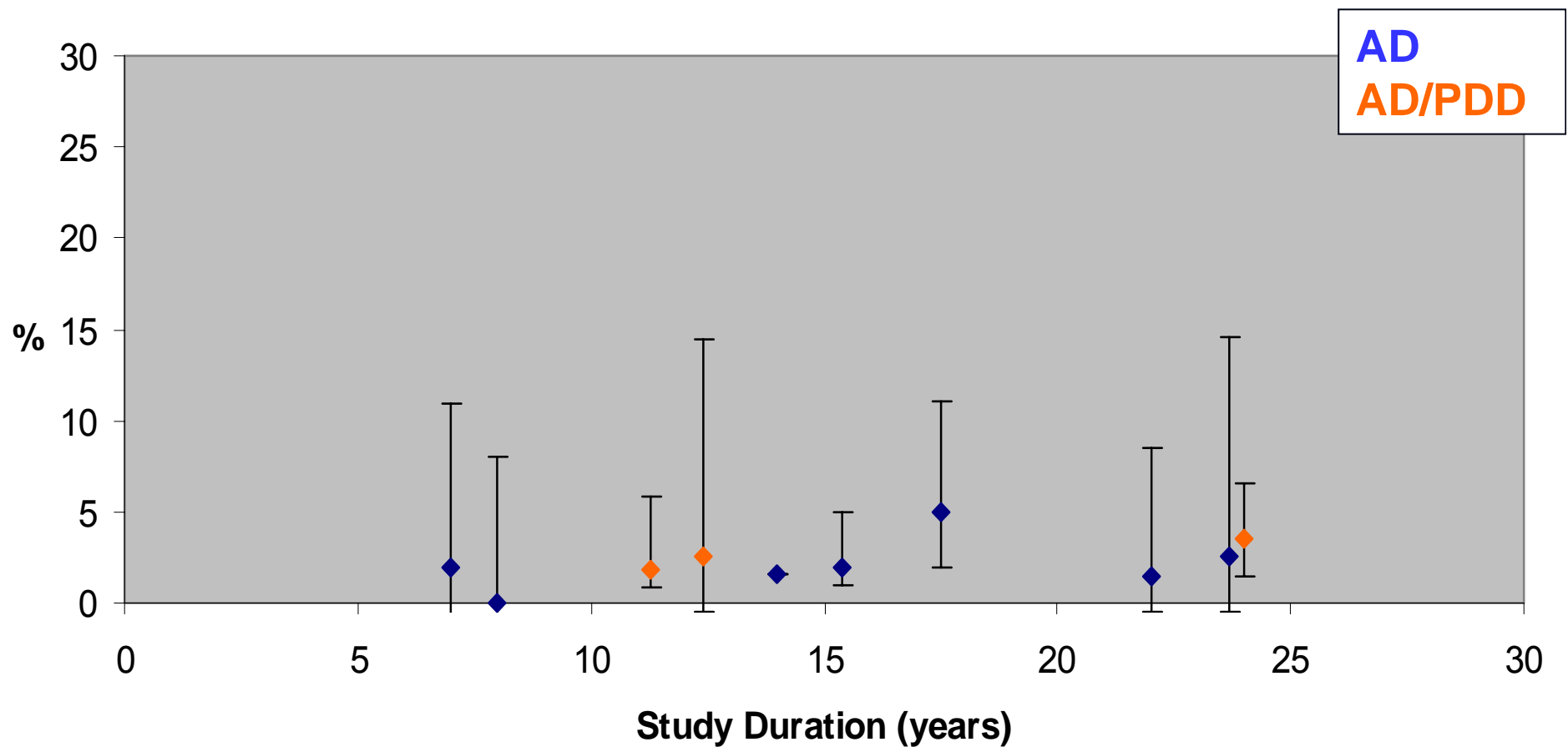
Similar to prevalence of epilepsy in intellectual disability

Incidence of Epilepsy



- **4 studies**
- **New cases 0.7-1.5% per year of FU (0.7-1.5/100 person years)**
- **7-30 X higher than general population**

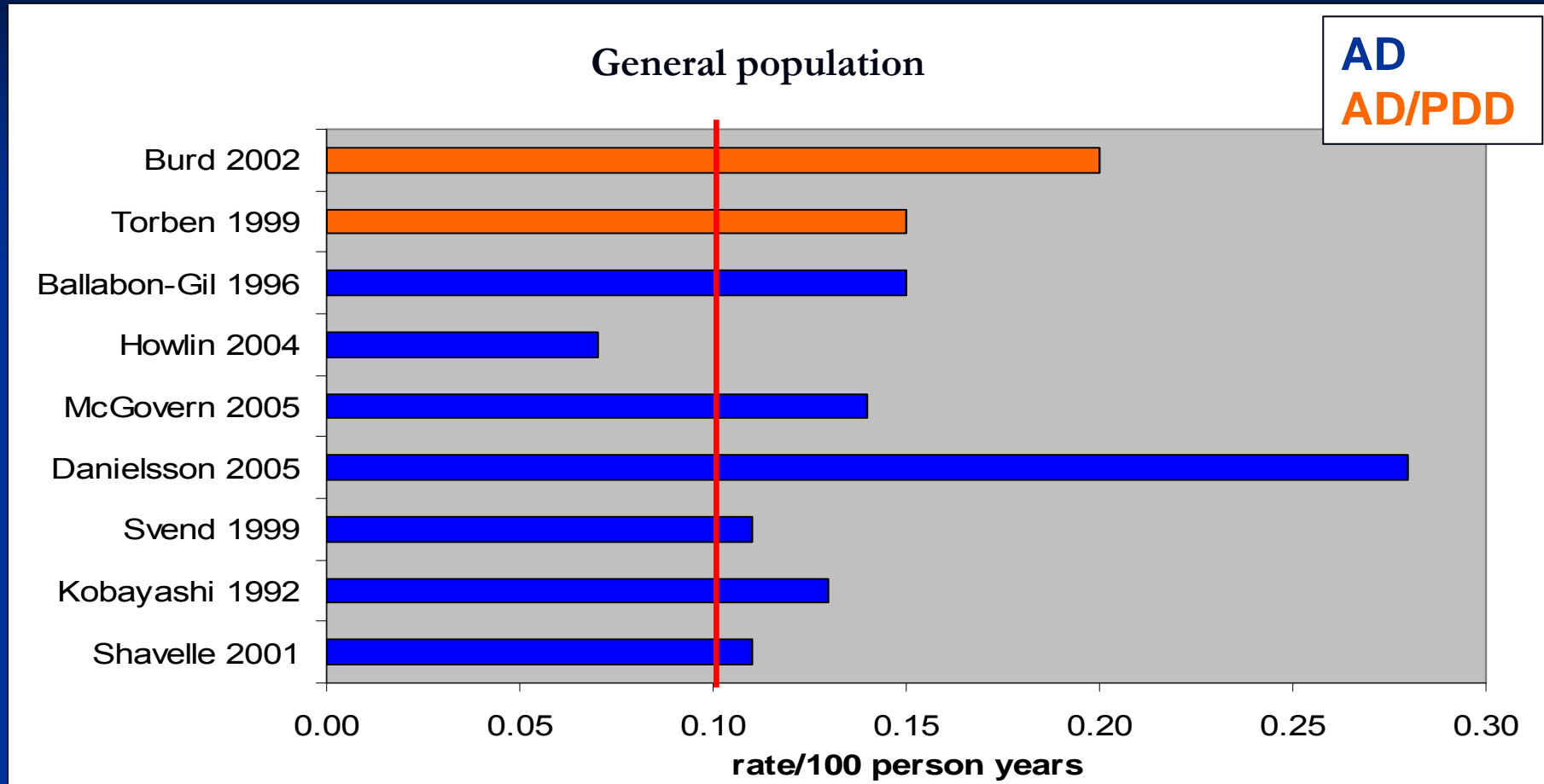
Mortality



10 studies N = 14192

0-5% deaths by end of follow up (late teens to early 30s)

Mortality Rate

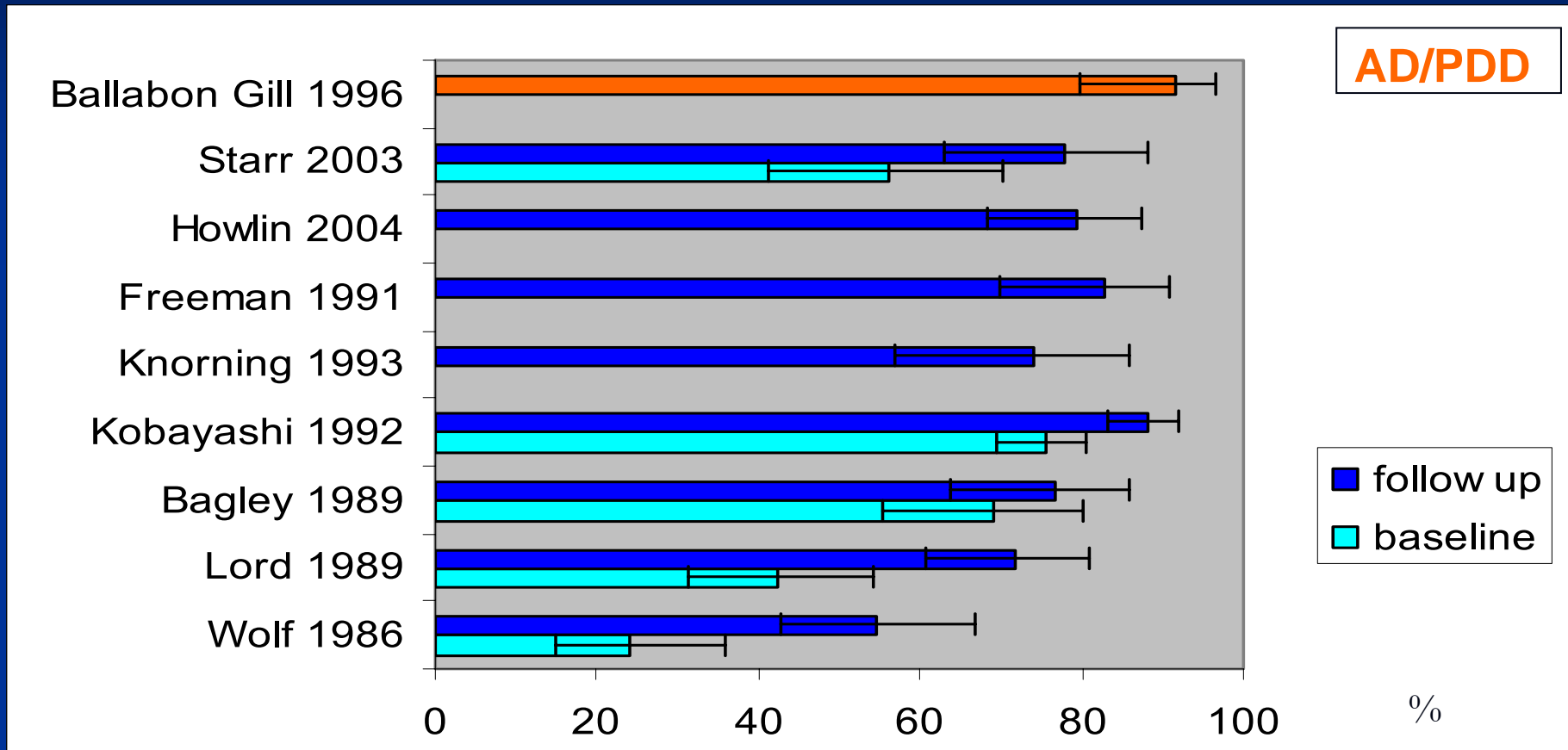


9 studies

Mortality Rate 0.07 – 0.28%/year of FU (0.07-0.28/100 person years)

SMR 2.4 (1.4-3.1) in study of 13111 individuals

% Meaningful Speech

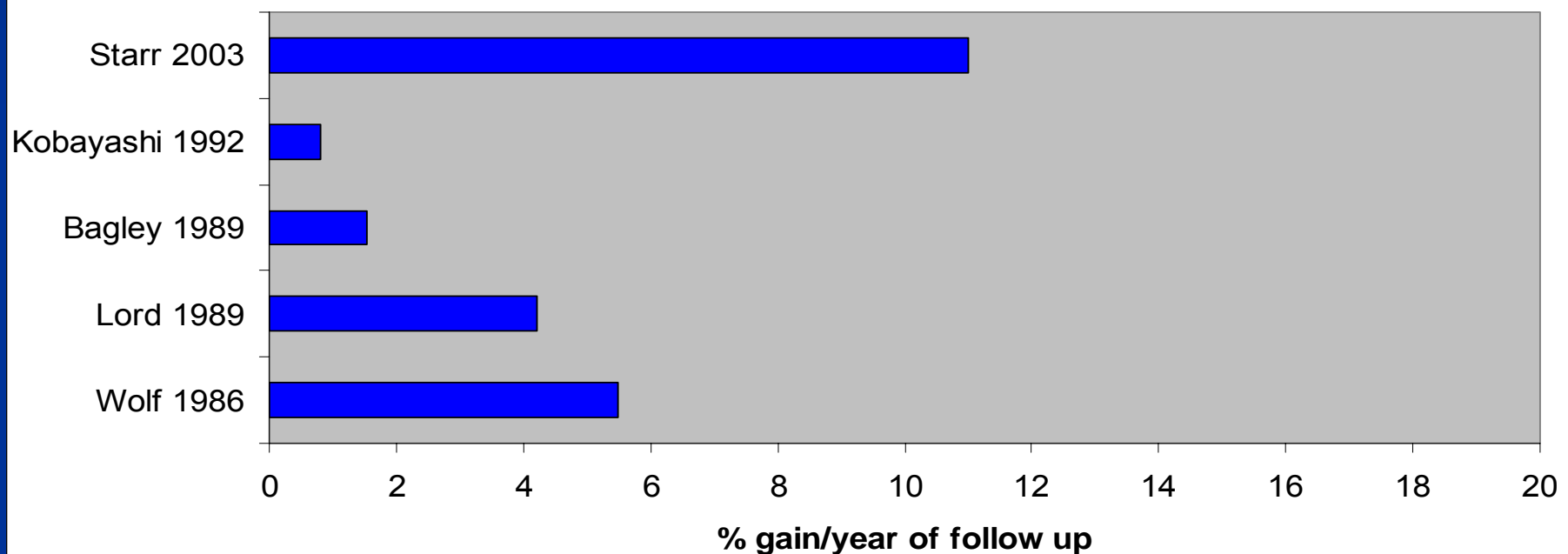


•9 studies, N= 632

•54 – 92% meaningful speech by end of follow up (late primary to late 20s)

Gain in Meaningful Speech per year of follow up

AD



5 studies baseline and follow up data

1-11 % gain meaningful speech per year of FU

Gain dependent on baseline percentage and FU duration

Conclusion

- In ASD children followed to early adulthood
 - 10-39% developed Epilepsy
 - 0-5% Died
 - Overall Mortality and Epilepsy rates higher than non ASD individuals, but similar to rates for intellectual disability
 - Majority gained some Meaningful Speech
- A step forward in consolidating existing prognostic evidence for patients, clinicians and health service planners

Conclusion

- **BUT we have a *long* way to go**
 - **Any systematic review is limited by the quality and outcomes of primary studies.**
 - **This review should benefit future studies in terms of**
 - **Study design and analysis that takes into account age and duration of follow-up**
 - **Outcome data that is useful to families and clinicians**
 - **Reporting data**

Acknowledgments

Financial Markets Foundation

Ms Danielle Wheeler for advise on systematic review process

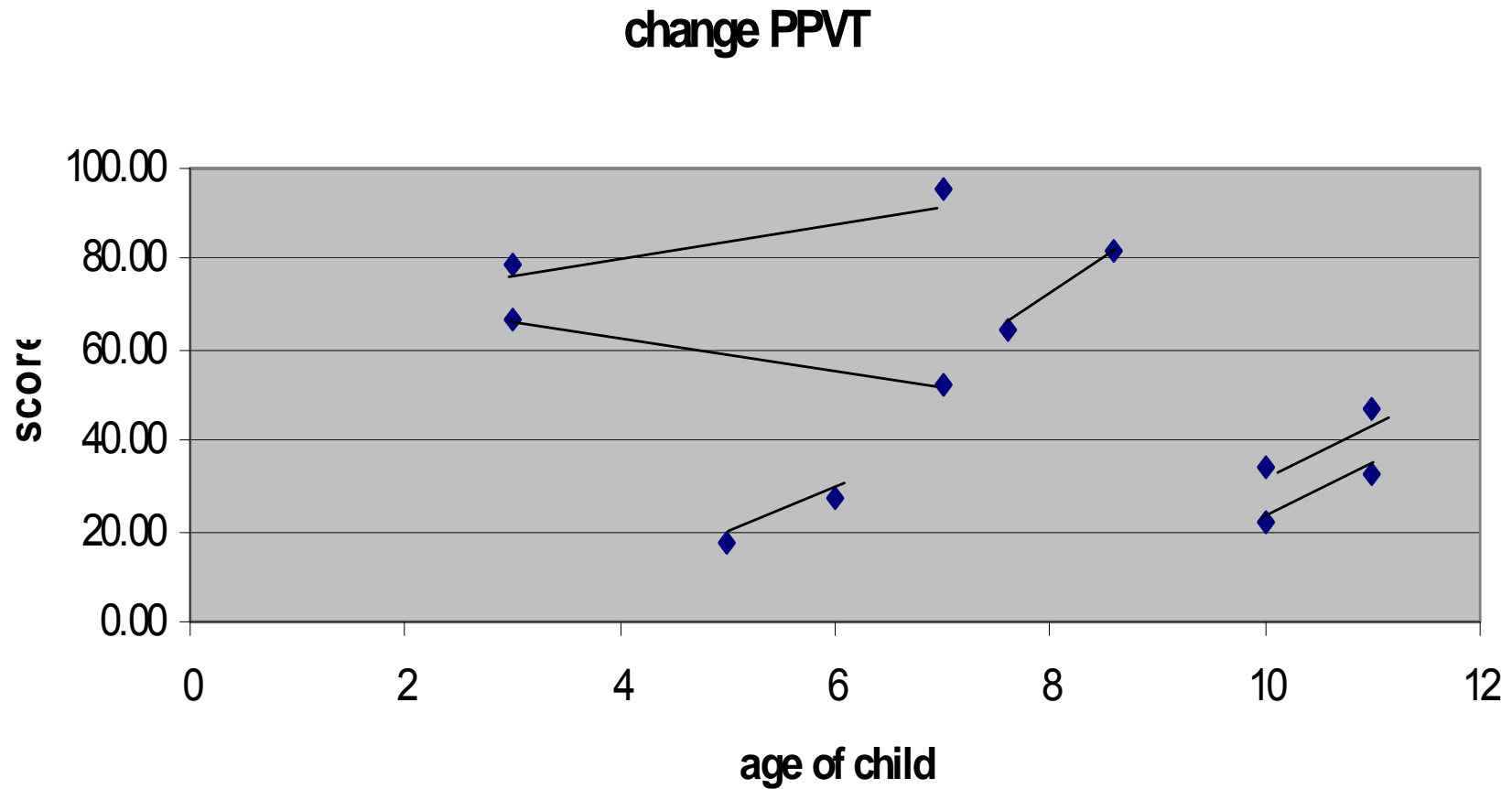
Prognosis Review Network

Q's

Continuous speech outcomes

- 11 additional papers
- Different baseline ages and follow up
- Different measures- how compare in a clinically relevant way
- Measures – PPVT, DQ's, VABS none in terms of percentiles or diagnosis only one used CELF.

Eg PPVT



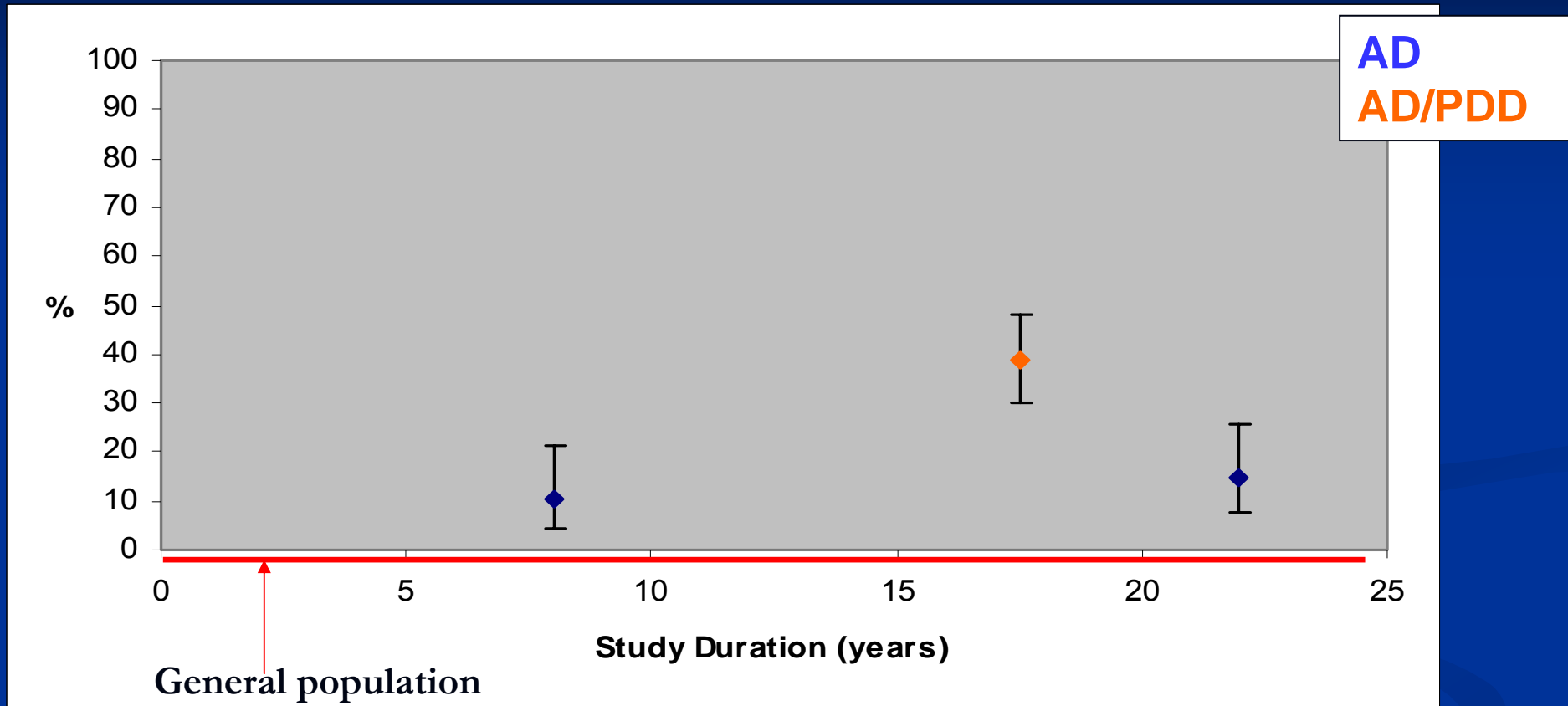
What did people die of

- shavelle - seizures, drowning and suffocation being much higher than the general population
- kobyashi - encephalopathy causing sudden death, head injury secondary to self injurious behaviour a, nephrotic syndrome , bronchial asthma
- Daniellson seizure
- Ballabon gil - secondary to complication of chronic administration of psychotropic medications, 1 aspiration pneumonia and 1 drowning
- Burd - congenital heart condition
- Howlin -

Quality issues

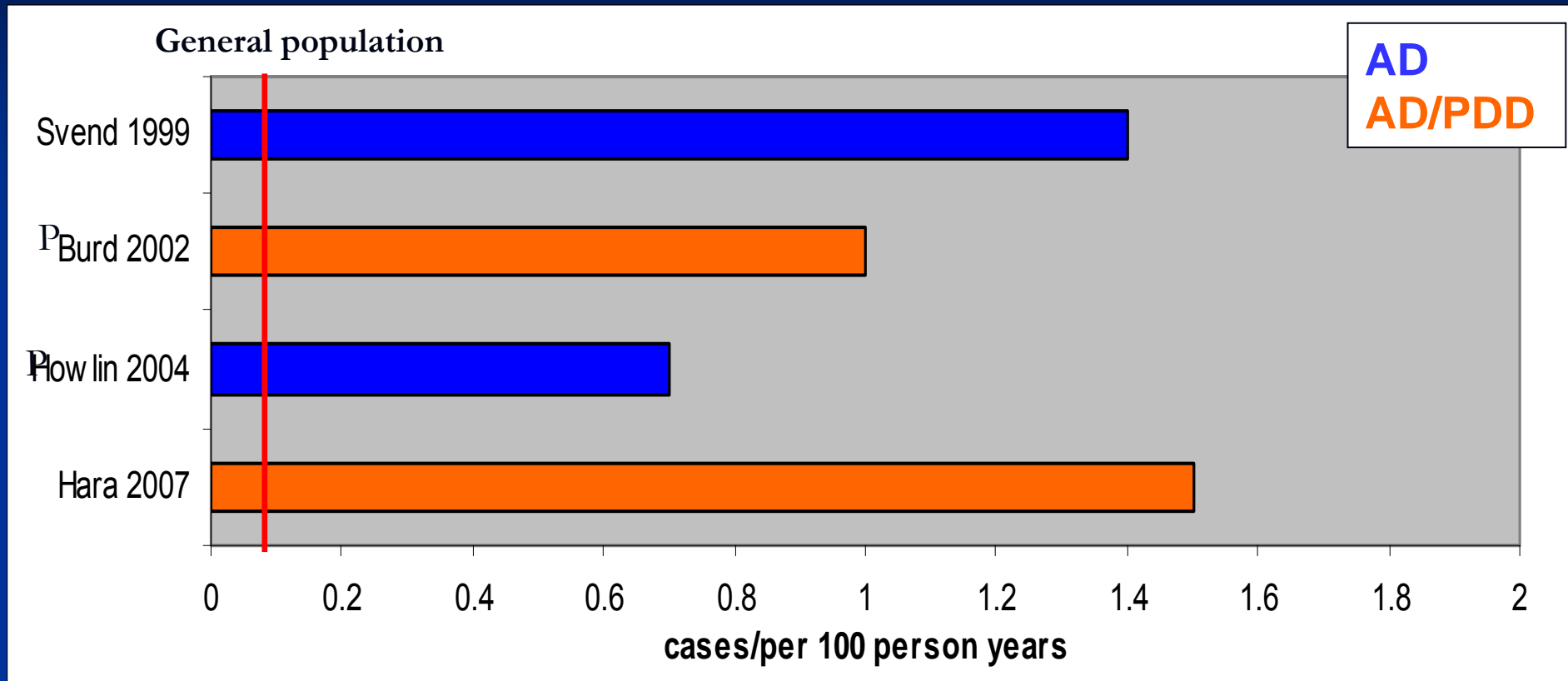
- What happens if only look at prospective data, and adequate follow up

Percent with epilepsy at the end of follow-up period



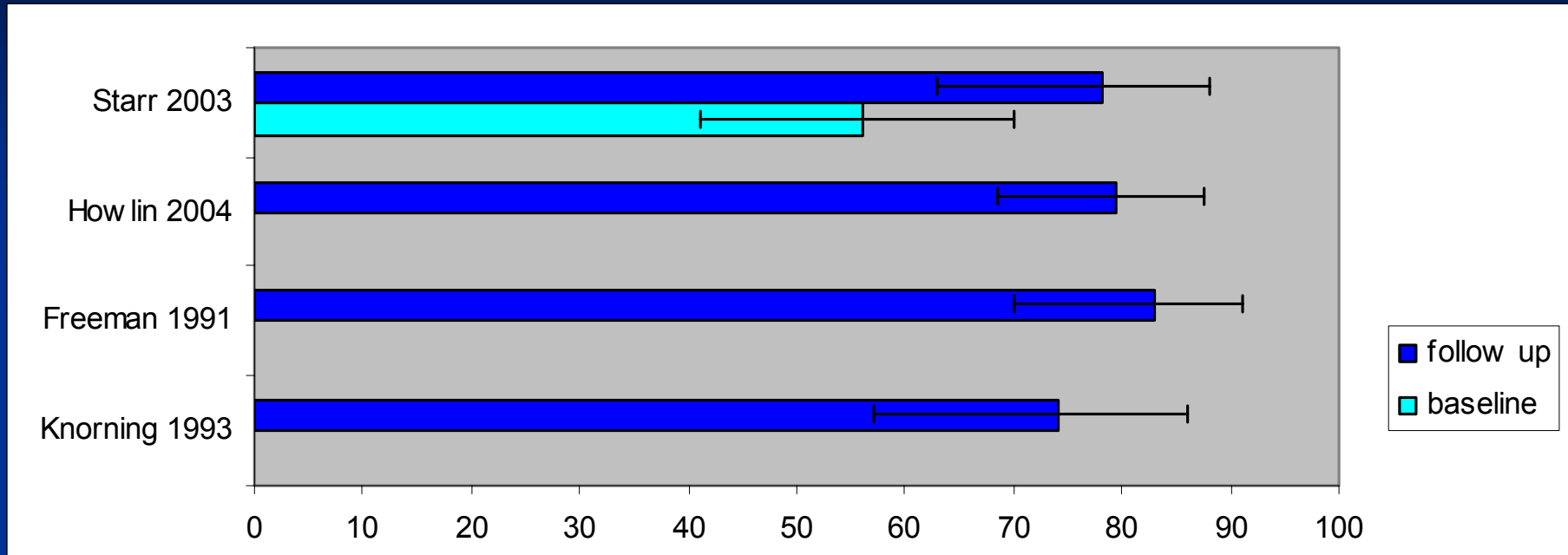
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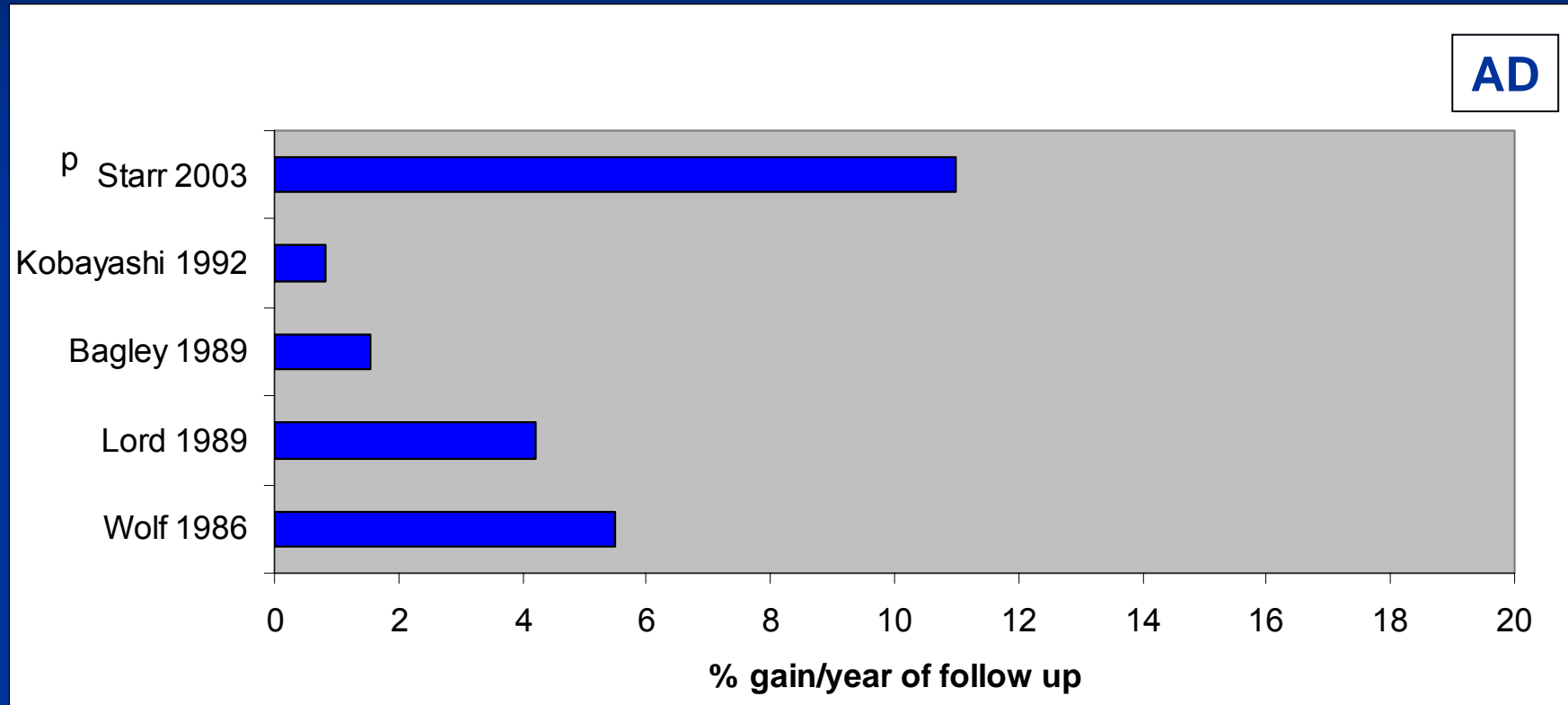
% Meaningful Speech



%

•73 – 85% meaningful speech by end of follow up (late primary to late 20s)

Gain in Meaningful Speech per year of follow up



5 studies baseline and follow up data

1-11 % gain meaningful speech per year of FU

Gain dependent on baseline percentage and FU duration