

Department of Developmental Disability Neuropsychiatry

# Physical disorders in people with intellectual disability

– a systematic review

**Presenter: Peiwen Liao**

**Email address:** [Peiwen.liao@student.unsw.edu.au](mailto:Peiwen.liao@student.unsw.edu.au)

**Supervisors:**

Dr Simone Reppermund

A/Prof Claire Vajdic

Prof Julian Trollor

Dr Rachael Cvejic



**UNSW**  
SYDNEY



DEPARTMENT OF  
DEVELOPMENTAL  
DISABILITY  
NEUROPSYCHIATRY

# Introduction of intellectual disability

## Prevalence



Around 1% globally and up to 3% in Australia in 2012

## High burden



Most years living with disability (YLDs) for children under 5 years old

## Health outcomes



Many may experience poorer health outcomes

## Shorter life expectancy

- More potentially preventable death

## High morbidity rates

- Including physical and mental health conditions
- Does their disease pattern differ from other people?

# Introduction: what we know

## Why focus on physical disorders?

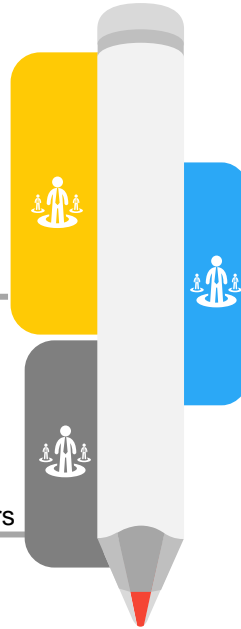
- Lack of research compared with mental disorders

## Research gap

- More on overarching disease categories
- Hard to compare between disorders
- Little evidence of excess risks of many physical disorders

## What is already known about physical disorders?

- High prevalence of neurological disorders, sensory impairments and so on
- Have lower risk of cancer



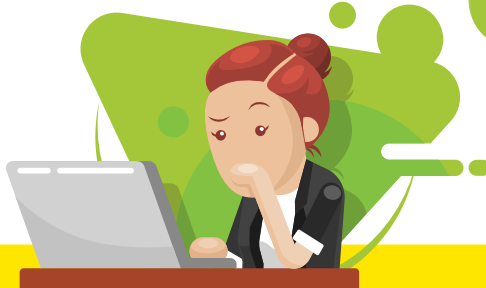
# Methodology

## Method

- Systematic review

## Platform

- Covidence



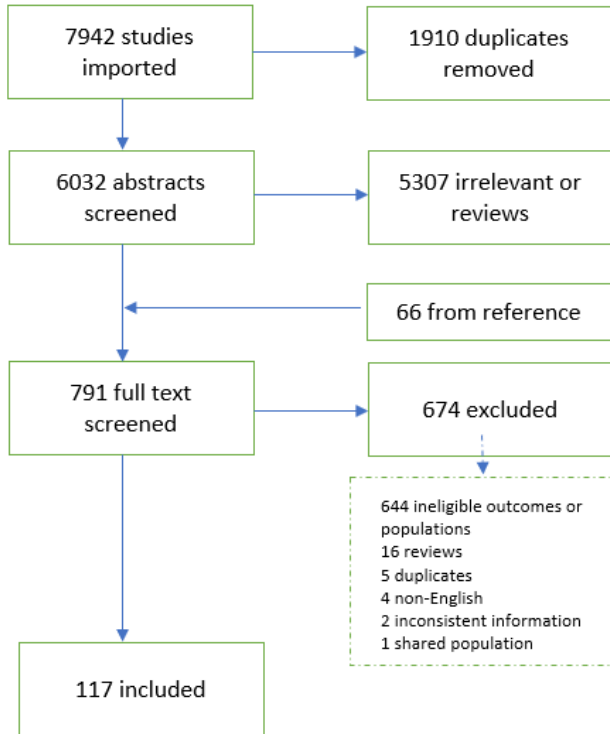
## Aim

- To synthesise the morbidity rates of physical disorders from population-based samples, and compare with the general population

## Database

- PsycINFO, Medline, EMBASE
- From reference of included studies

# Screening



## Screening by two reviewers

### Inclusion criteria:

- Population:  
Population-based (e.g. national/regional survey)
- Type of study:  
Cohort or cross-sectional studies
- Main outcomes:  
The prevalence and/or incidence of physical health disorders  
(ID-associated genetic syndrome excluded)

# Geographic characteristics of studies



**1** The UK **27**

**2** Scandinavia **26**

**3** North America **19**

**4** Australia & New Zealand **17**

# How many for intellectual disability

**Intellectual disability: n=59**

Down syndrome: n=46

Others: n=12

Angelman syndrome: n=1

Bardet-Biedl syndrome: n=1

Velocardiofacial syndrome: n=1

Fragile X syndrome: n=3

Prader-Willi syndrome: n=3

Rett syndrome: n=3



# Characteristics of studies

## Analysis methods

- Cross-sectional (n=55)
- Longitudinal (n=4)



## Sample size

43 in South Africa - 64008 in Canada



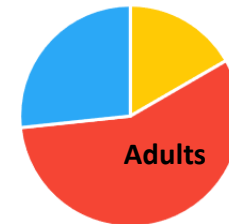
## Comparative studies

- In total: n=18
- 8 studies have included their own controls



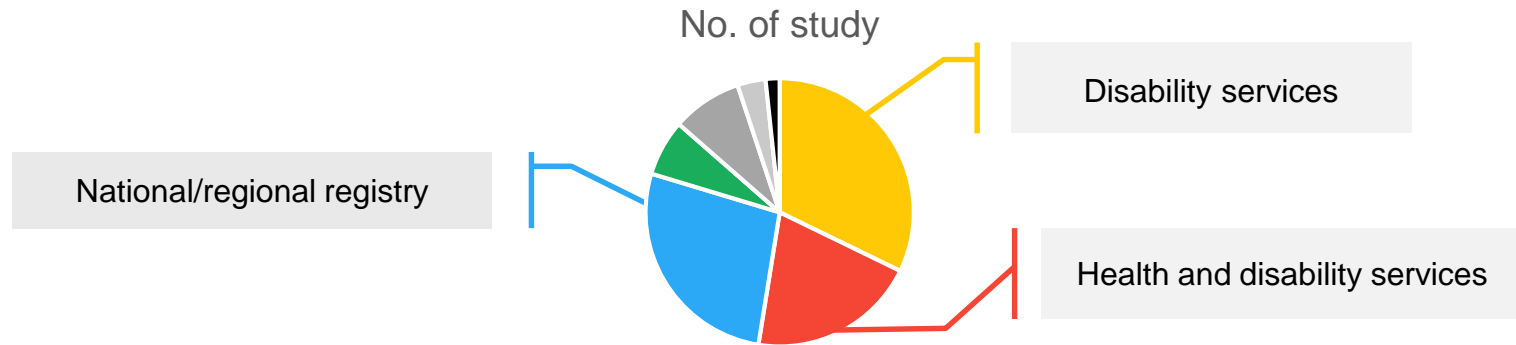
## Age groups of studies

No. of study



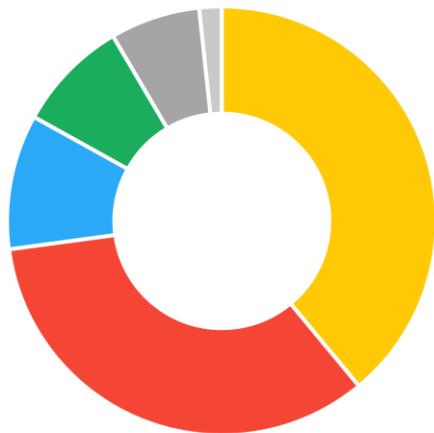
■ All age ■ Adults ■ Children and/or adolescents

# Participant source



- Disability services/pension recipients
- Health and disability services
- National/regional registry
- schools
- National/regional survey/census
- Birth cohorts
- Local agencies

# ID source



- Medical record/registry
- Not classifiable/no report
- Clinical examination
- Self or informant-reported
- Multiple methods
- Non-health administrative registry



# ID diagnosis



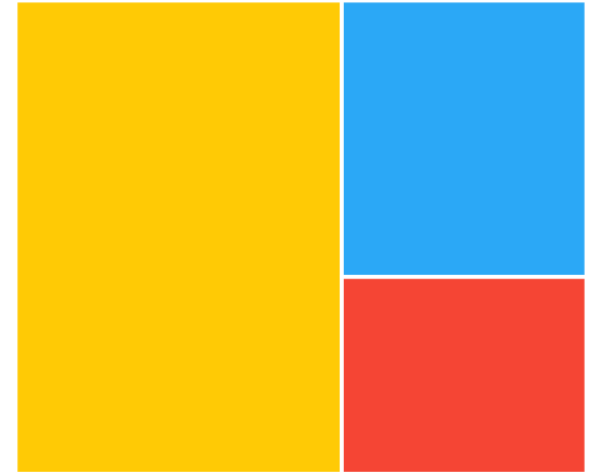
- Unclear of classification
- Others
- ICD coding

# Outcome source



- Self or informant-reported
- Medical record/registry
- Clinical examination
- Not classifiable/no report
- Multiple methods

# Outcome diagnosis

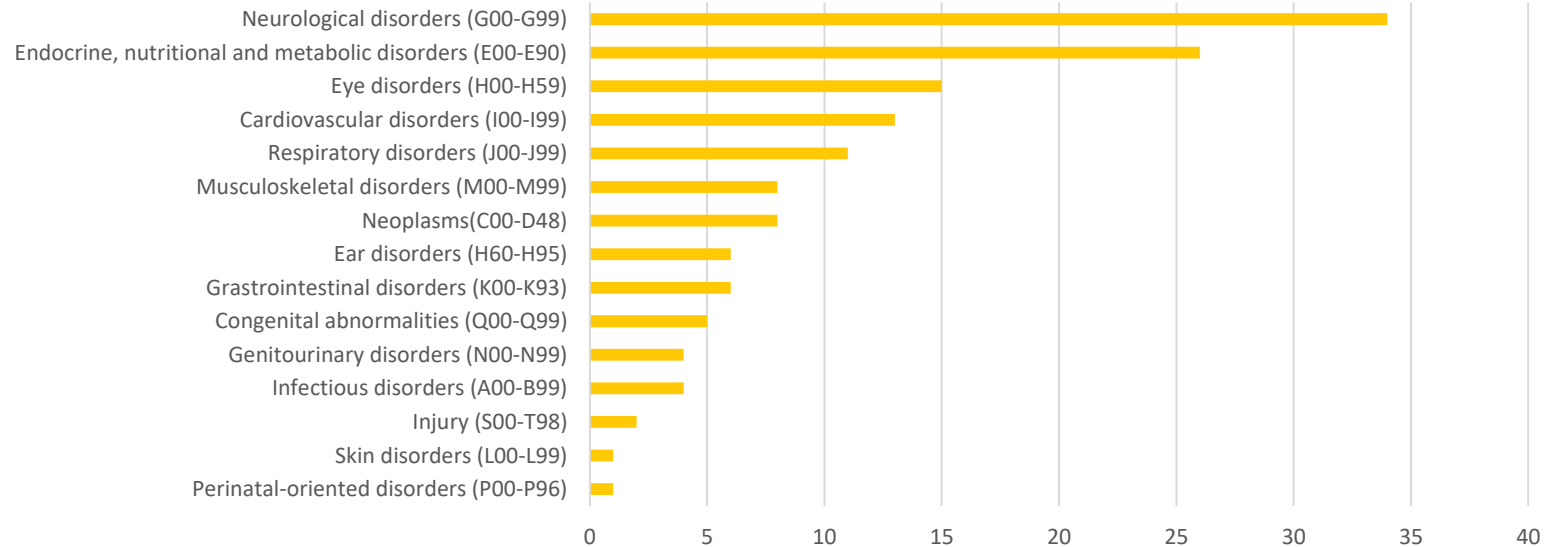


- Unclear of classification
- Others
- ICD coding or WHO criteria



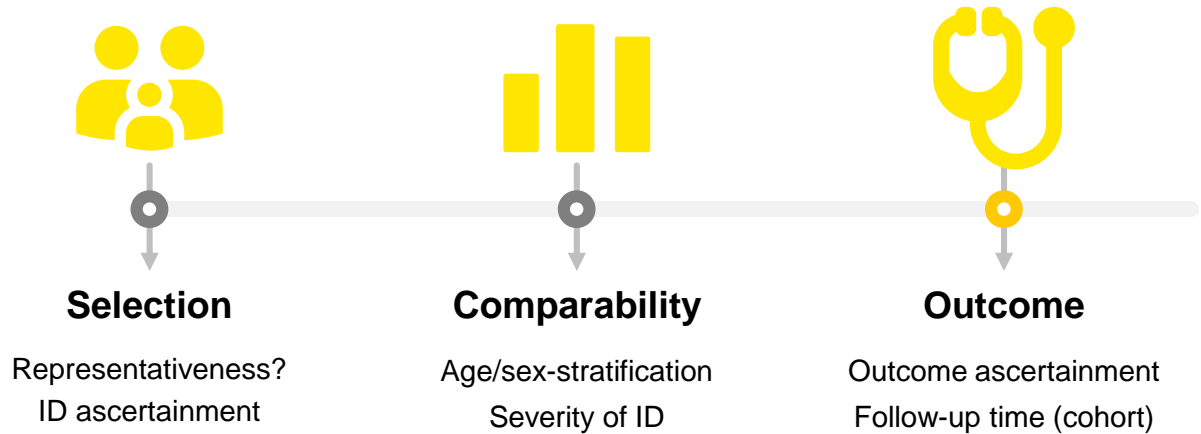
# Do we have enough studies?

No. of studies for each disease categories



# Quality assessment scale

## Newcastle-Ottawa Scale (NOS)



# Classification of quality

For prevalence/incidence of outcomes:

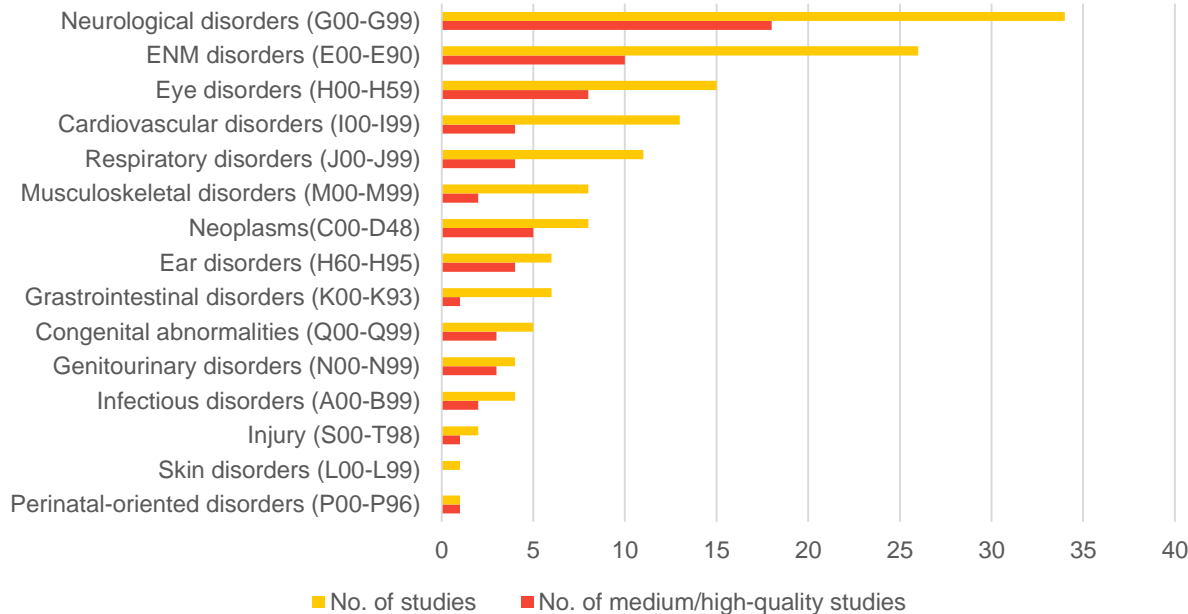
	Low quality	Medium	High	Total
Cross-sectional	0-4	5-6	7-8	8
Longitudinal	0-5	6-7	8-9	9

For relative risk/odds ratio:

	Low quality	Medium	High	Total
Cross-sectional	0-6	7-8	9-10	10
Longitudinal	0-7	8-9	10-11	11

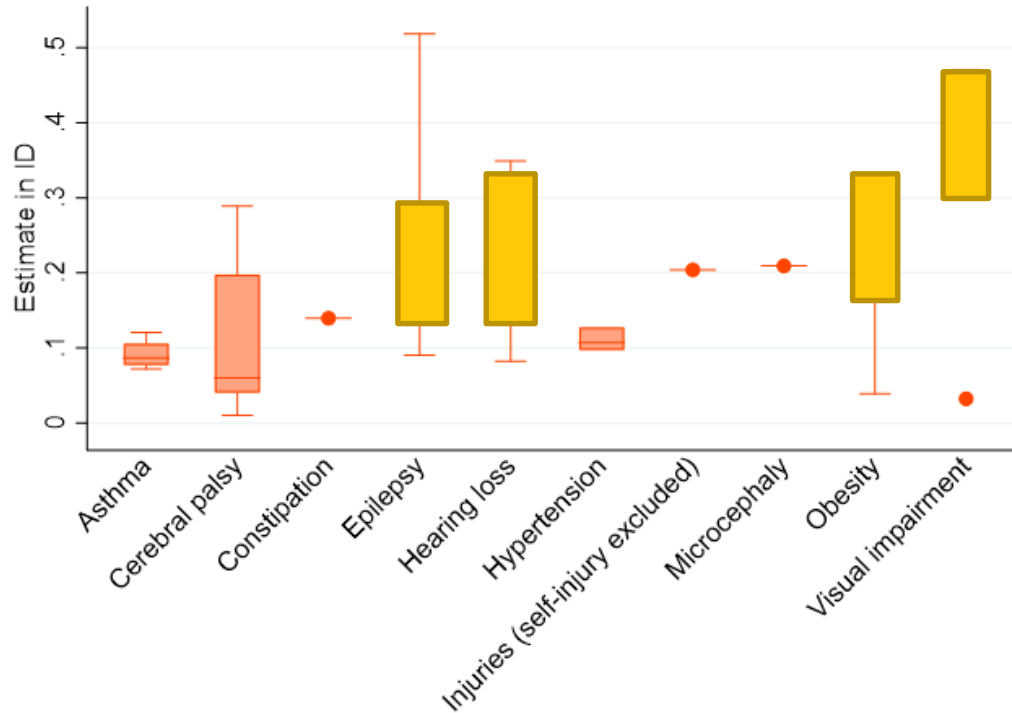
# Do we have enough studies?

No. of studies for each disease categories



- After removing studies of low qualities, 30 studies remained (N=59)
- Almost half of studies for some disease chapters go unused

# Disorders of high prevalence



Epilepsy: 9.00% - 51.84%

Hearing loss: 8.20% - 34.90%

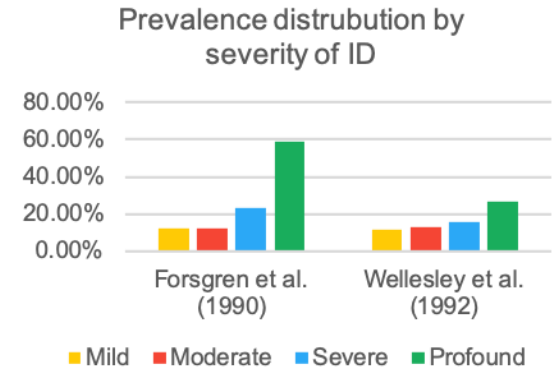
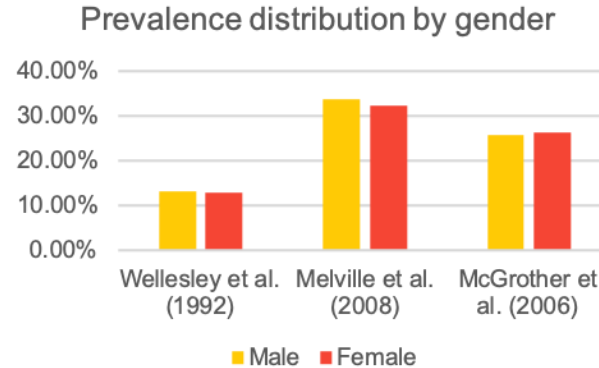
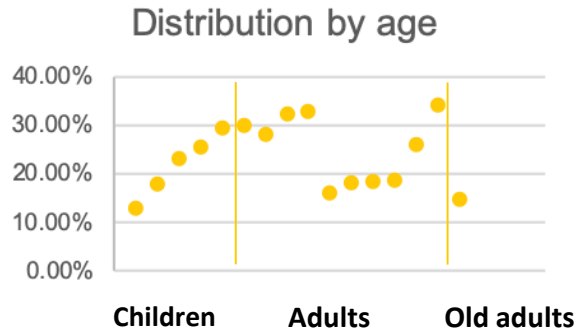
Visual impairment: 3.22% - 47.00%

Obesity: 3.90% - 33.14%

Cerebral palsy: 1.00% - 28.89%

# Epilepsy

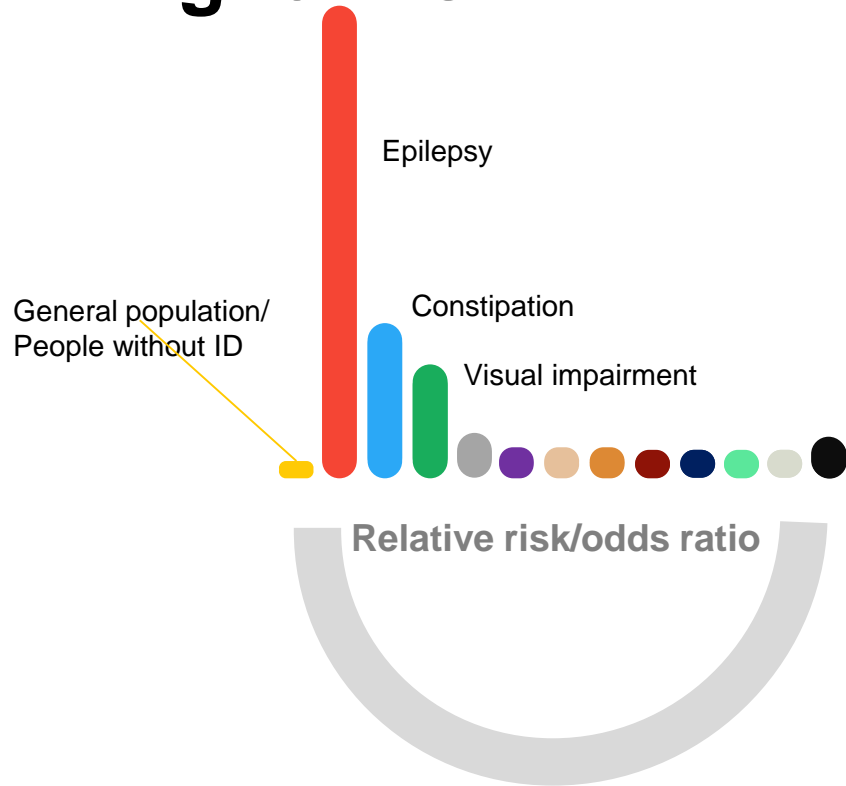
Prevalence extracted from 26 estimates: 9% - 52%



# Epilepsy – compare between populations

Study	Estimates in ID	Estimates in controls	Measurement	Effect size (95% CI)	Control variables
Cooper et al. (2018)	28.16%	0.82%	Rate ratio	34.35 (29.93-39.41)	Unclear
Morgan et al. (2003)	16.10%	No report	Age-standardised relative risk	23.73 (21.28-28.95)	Age and sex
Carey et al. (2016)	18.51%	0.73%	Prevalence ratio	25.33 (23.29-27.57)	Age, sex and practice
Cooper et al. (2015)	18.82%	0.77%	Odds ratio	31.03 (29.23–32.92)	Age, sex and deprivation score

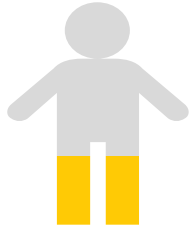
# Higher risk



- General population/people without ID
- Epilepsy (n=4): up to 34 times
- Constipation (n=1): 11 times
- Visual impairment (n=1): 8 times
- Hearing loss (n=1): 3 times
- Obesity (n=2): up to 2 times
- Injuries (self-injury excluded) (n=1): 2 times
- Asthma (n=3): up to 2 times
- Thyroid disorder (n=1): 2 times
- Diabetes (n=3): up to 2 times
- Gallbladder cancer (n=1): 2 times
- Osteoporosis (n=1): up to 2 times
- Parkinson's disease (n=1): 3 times

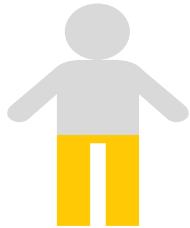


# Lower risk



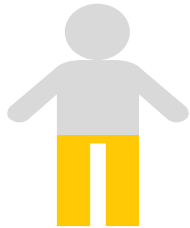
Cancer of urinary tract

70% less



Coronary heart disease

Up to 60% less



Chronic sinusitis

60% less



Diverticular disease

50% less



Inflammatory arthritis

40% less



Prostate disease

40% less

# Limitations of studies

- Different sample sources
- Different diagnostic methods
- Lack of consensus on definitions of diseases in some studies



*Inconsistent results*

*Limited evidence*



- Few studies for some disorders
- Lack of evidence in developing countries
- Suboptimal reporting



# In summary

- Prevalence estimates for diseases **vary** according to characteristics of the study population
- People with ID and the general population have **different** disease profiles
  - Higher risk of epilepsy, obesity, asthma and diabetes (more than two studies)
  - Lower risk of coronary heart disease and certain cancer
- The quality of studies tends to be suboptimal



# Implications for future study

Call for more well - designed studies to depict a comprehensive health profile of people with ID

- Use multiple sources or develop high-coverage registry to identify people with ID
- Try to include a control group – comparison tells something!
- Look at risk factors of some potentially preventable disorders (e.g. obesity)
- Detailed reporting of methods and results for research

# Thank you for listening!

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- A/Prof Claire Vajdic
- Prof Julian Trollor
- Dr Rachael Cvejic

# Reference List

1. Maulik PK, Mascarenhas MN, Mathers CD, Dua T, Saxena S. Prevalence of intellectual disability: a meta-analysis of population-based studies. *Research in developmental disabilities*. 2011 Mar 1;32(2):419-36.
2. AIHW. Disability in Australia: intellectual disability. 2008 and ABS statistics: <https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4433.0.55.003main+features102012>
3. Krahn GL, Hammond L, Turner A. A cascade of disparities: health and health care access for people with intellectual disabilities. *Mental retardation and developmental disabilities research reviews*. 2006 Jan;12(1):70-82.