

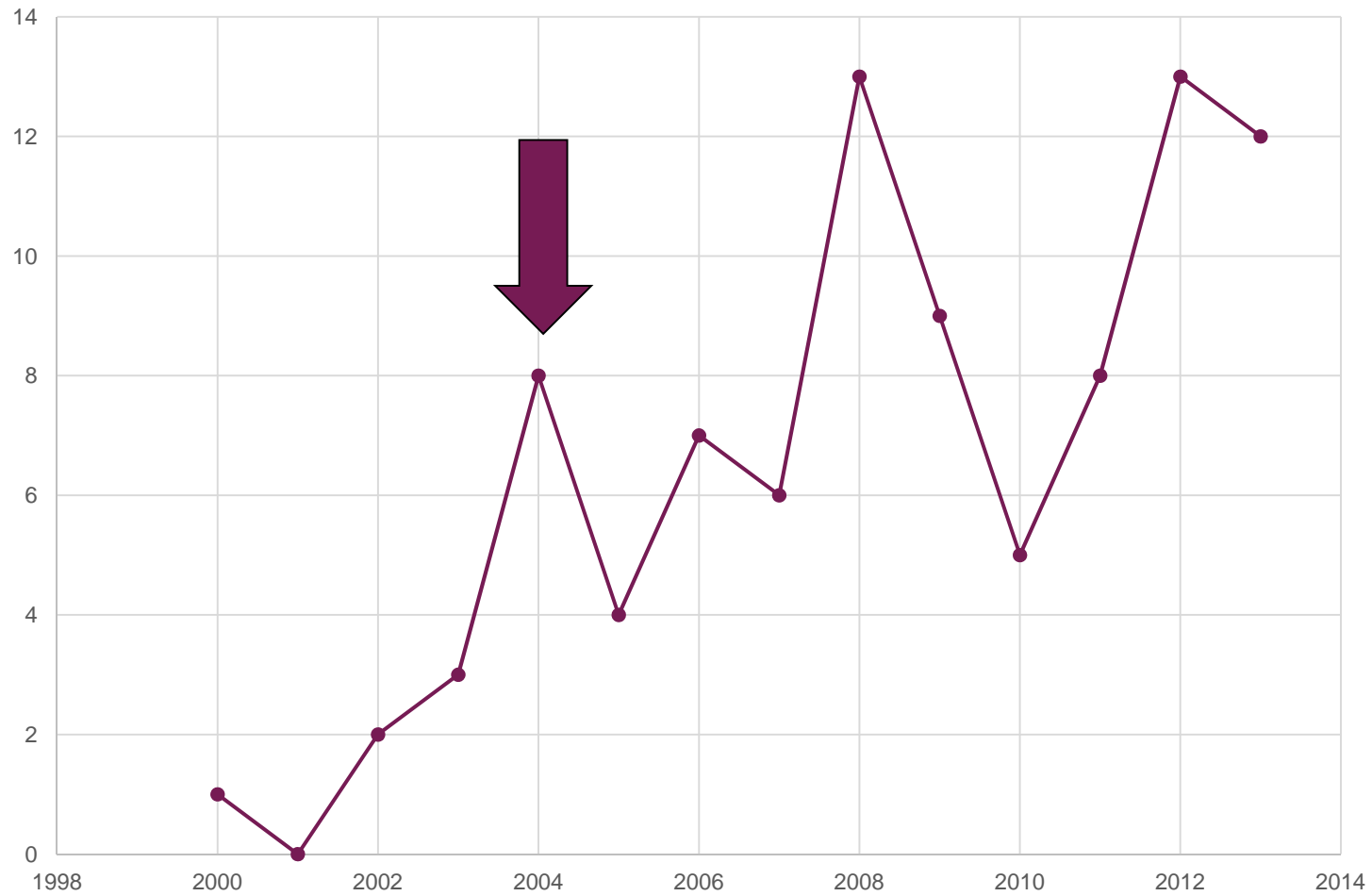


Methodological aspects in research on consequences of sickness absence/disability pension – quo vadis?

Ellenor Mittendorfer-Rutz
Associate Professor, PhD

Division of Insurance Medicine
Karolinska Institutet,
Stockholm, Sweden

Number of publications per year



Method



- Keywords: sickness absence, disability pension in PubMed
- Included: studies on consequences of sickness absence and disability pension (2000-2013)
- Excluded: studies on RTW, intervention studies, studies of a descriptive nature
- Major interest: methodology

Data

- Register
- Questionnaires
- Data from medical records or insurance records

Design



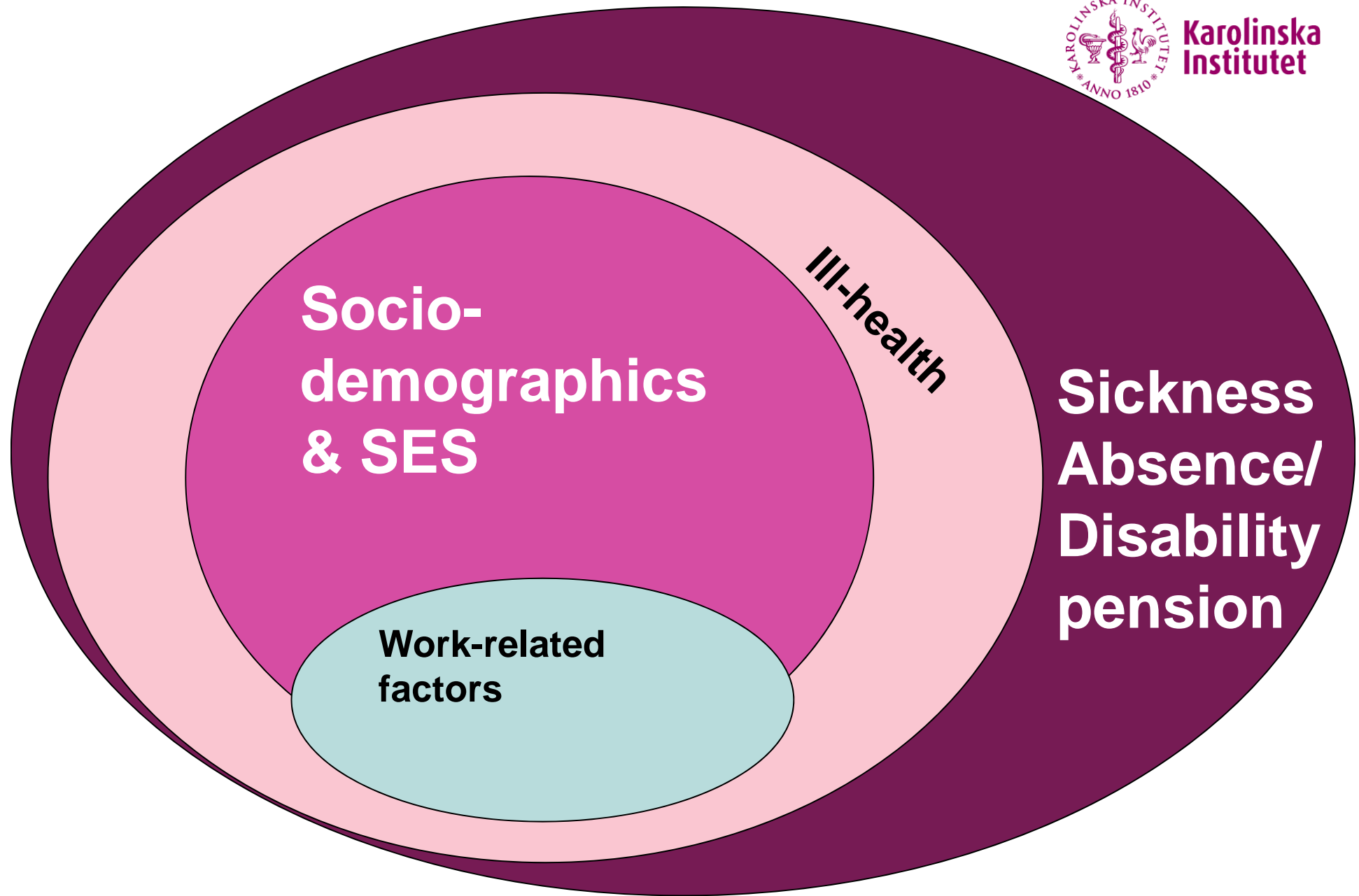
Mainly prospective cohort studies

Some case control/cross-sectional studies

Population based cohorts

Occupational cohorts (Gazel, Whitehall II etc.)





**Socio-
demographics
& SES**

Ill-health

**Sickness
Absence/
Disability
pension**

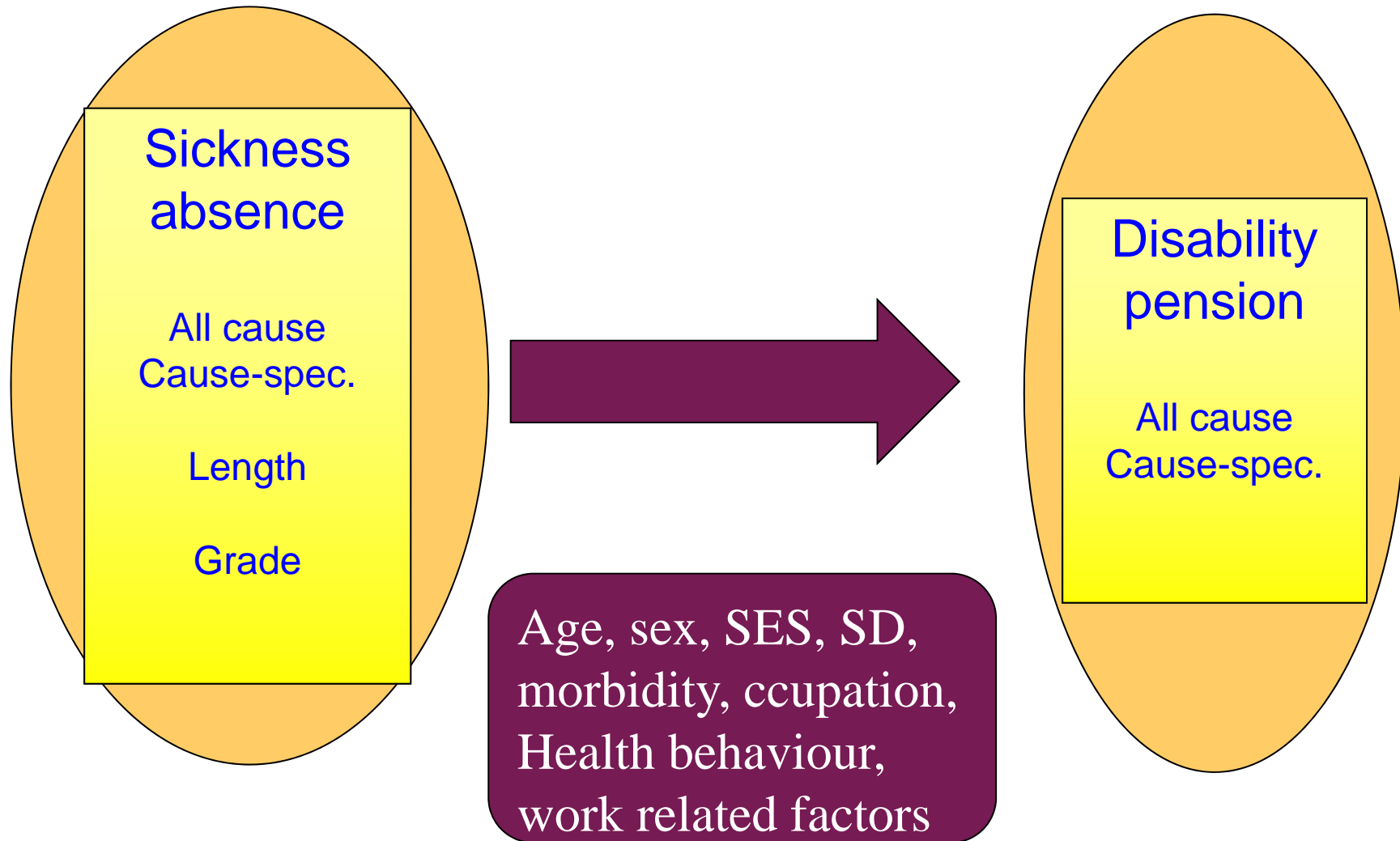
**Work-related
factors**



Methods



- Association studies
 - controlling and stratification

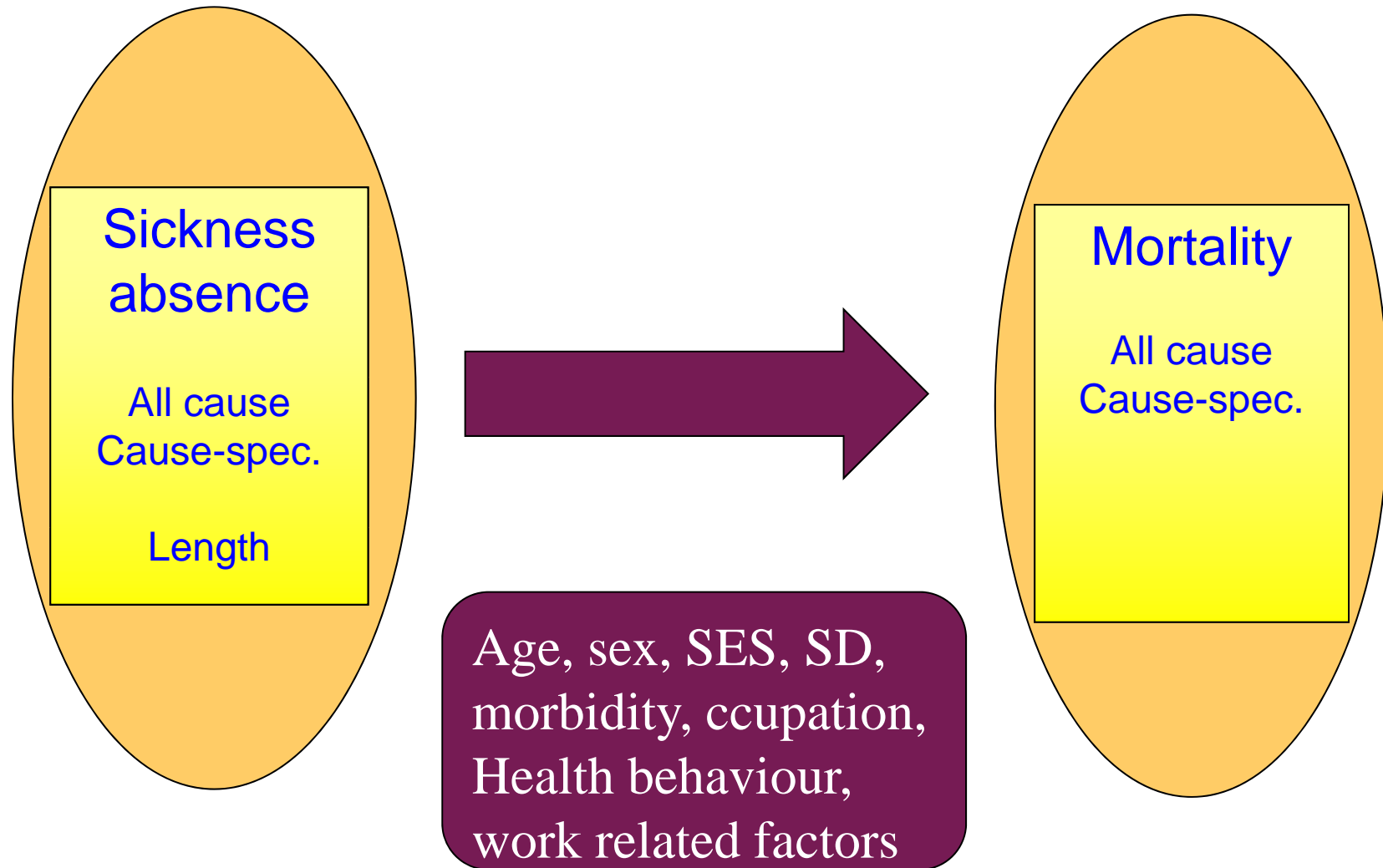


Sickness absence (SA) – Disability pension (DP)

| Author, year | Study aim |
|--------------------------|--|
| Gjesdahl et al. 2003 | SA diagnoses & duration, DP; men; ref. musk. SA |
| Gjesdahl et al. 2004 | SA>8d; DP; men mental; women CVD; ref. musk. SA |
| Alexanderson et al, 2004 | SA>28d (neck, shoulder, back); DP; women temporal DP |
| Borg et al, 2004 | SA>28d (neck, shoulder, back); DP; women, migrants |
| Kivimäki et al. 2004 | SA length, all-cause, diagn. spec. DP; increasing length |
| Alexanderson et al, 2005 | SA>28d (neck, shoulder, back); DP; women temporal DP |
| Labriola et al. 2007 | SA>6d self-reported, DP |
| Kivimäki et al. 2007 | SA>7d, DP; men, mental diagnoses |
| Vaez et al. 2007 | SA>90d, SA/DP |
| Karlson et al. 2008 | SA>56 d, DP; mental diagnoses (men); musk. (women) |

Sickness absence (SA) – Disability pension (DP) continued

| Author, year | Study aim |
|---------------------------|--|
| Lund et al. 2008 | SA length, DP; increasing length (men<40yrs) |
| Gjesdahl et al. 2008 | SA>8w (mental); DP; age, men, psychosis |
| Bratberg et al. 2009 | SA>8w (mental); DP; age, men, psychosis |
| Kausto et al. 2010 | SA (partial), DP; partial SA – partial DP |
| Kausto et al. 2012 | Partial SA – partial DP; propensity scores |
| Alexanderson et al. 2011 | SA>7d (diagn. spec.); DP; men, mental |
| Gjesdahl et al. 2011 | SA, DP; women, low SES |
| Gustafson et al. 2011 | SA otoaudiological, DP; women, age |
| Friberg et al. 2012 | SA otoaudiological, diagn. DP; tinnitus, DP mental |
| Alexanderson et al. 2012 | SA>7d, DP; SA mental, men |
| Jansson et al. 2013 | SA musk., diagn. spec. DP (cancer, CVD, musk) |

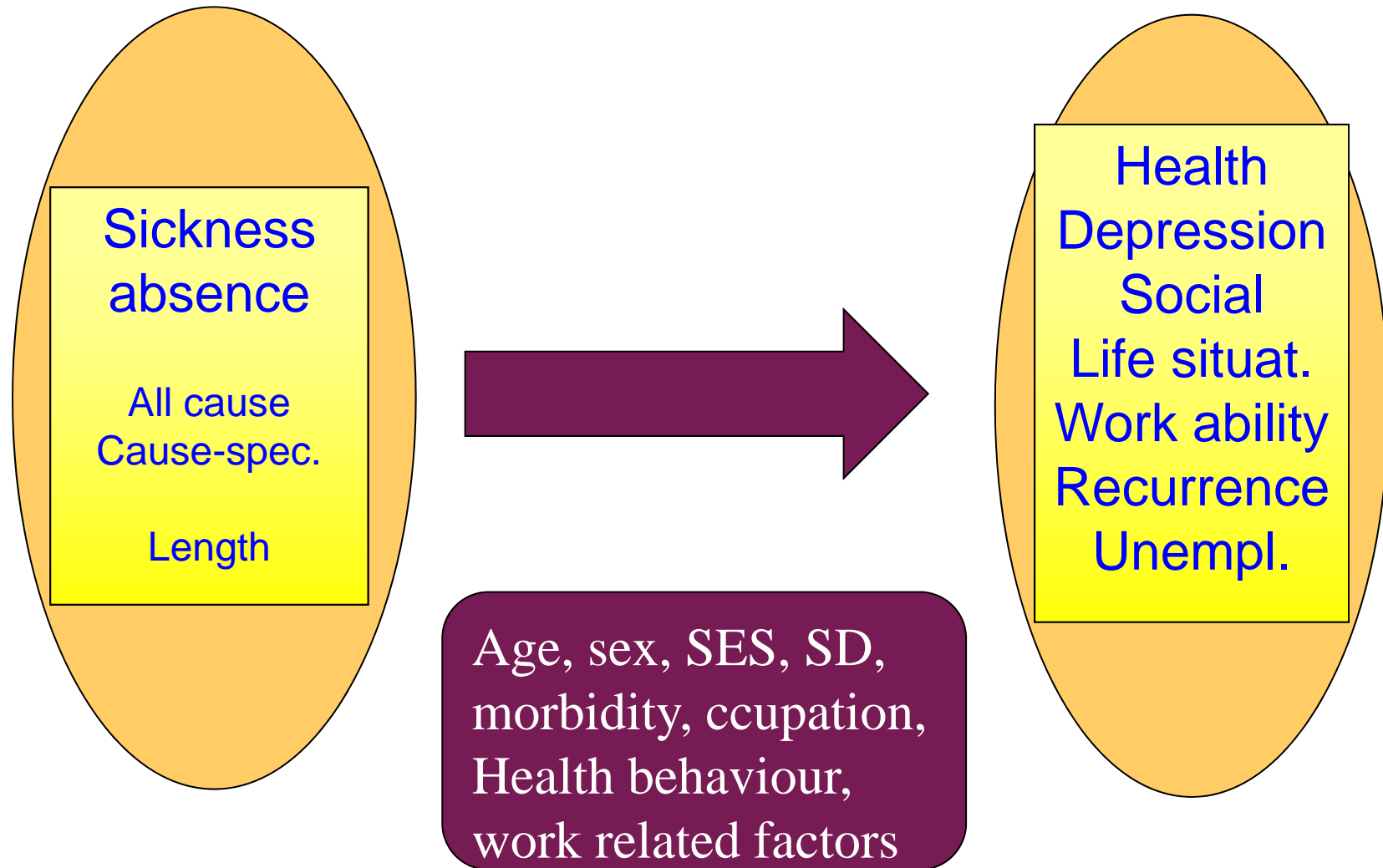


Sickness absence – mortality

| Author, year | Study aim |
|--------------------------|--|
| Qin et al. 2000 | SA>3w, suicide, only men |
| Qin et al. 2003 | SA>3w, suicide |
| Kivimäki et al, 2003 | SA>7d, mortality |
| Vahtera et al. 2004 | SA>3d, morality (suicide, CVD, cancer) |
| Gjesdahl et a. 2008 | SA>8w & diagn. spec. SA, mortality |
| Head et al. 2008 | SA>7d & diagn. SA; diagn. mortality |
| Lund et al. 2008 | Longer duration – higher mortality |
| Singh-Manoux et al. 2008 | Sex differences: SA - mortality |

Sickness absence – mortality continued

| Author, year | Study aim |
|-------------------------------|---|
| Kivimäki et al. 2008 | Diagn. SA; all cause mortality |
| Ferrie et al. 2009 | SA>7d, diagn.; mortality; |
| Melchior et al. 2010 | SA>7d, mental; diagn. spec. mortality |
| Mittendorfer-Rutz et al. 2012 | SA spec. mental diagn.; cause-spec. mortality |
| Bryngelson et al. 2012 | SA>90d mental diagn.; cause-spec. mortality |
| Jansson et al. 2012 | SA spec. musk. diagn.; cause-spec. mortality |
| Wang et al. 2013 | Diagn. spec. SA; suicide (attempt) |
| Lemogne et al. 2013 | SA>7d depression; cause-spec. mortality |
| Wedegaertner et al. 2013 | SA CMD – DP/mortality; effect of inpatient care |

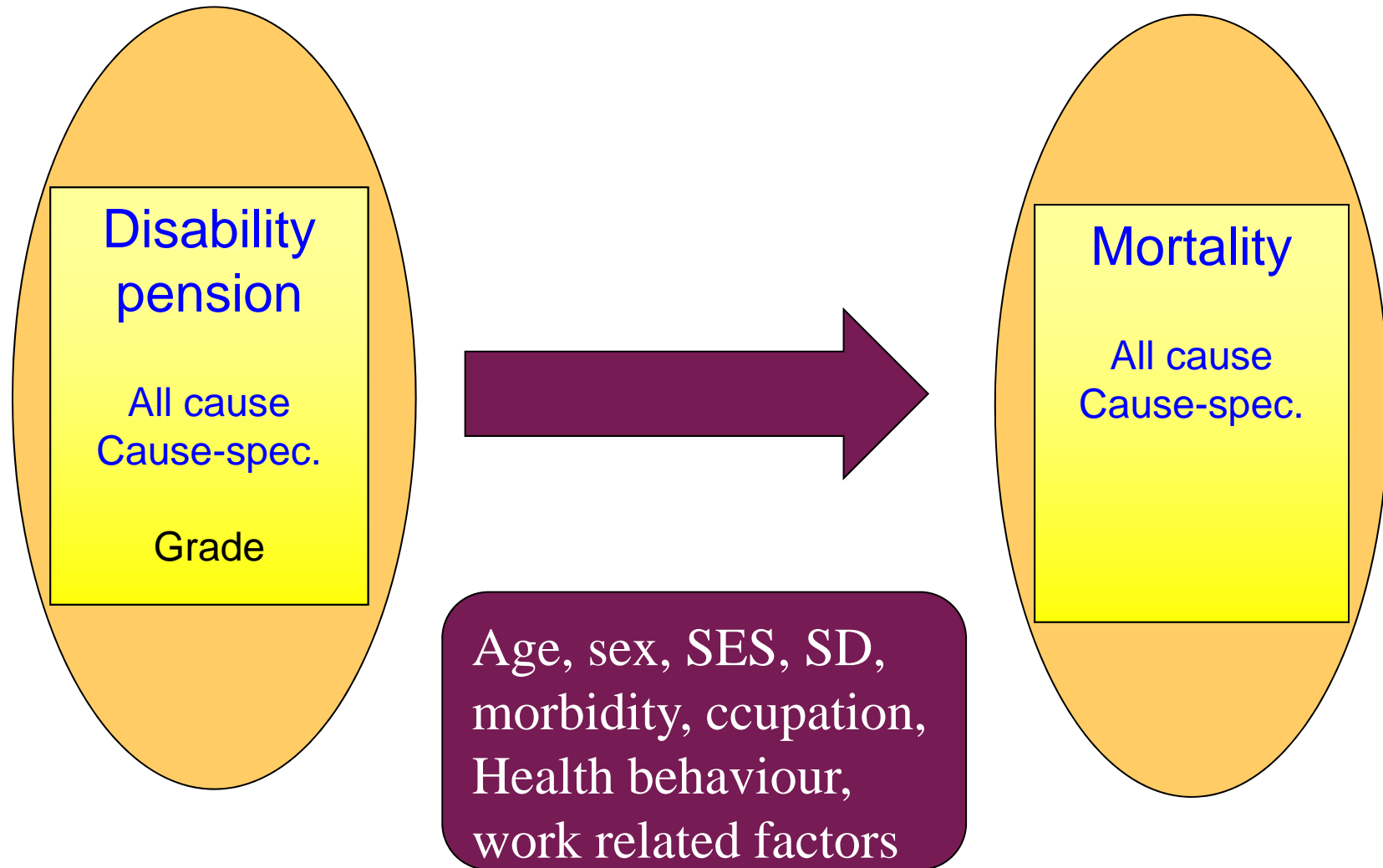


Sickness absence (SA) – different outcome measures

| Author, year | Study aim |
|---|--|
| Work ability and further health problems | |
| Gustafson et al. 2011 | SA – work ability and further health problems |
| Life situation | |
| Floderus et al. 2005 | Long-term SA – life situation (cross-sectional) |
| Depression | |
| Melchior et al. 2009 | SA diagnosis specific – depression |
| Job termination, unemployment, DP | |
| Virtanen et al. 2006 | SA, job term., unempl., DP (temporal, permanent empl.) |

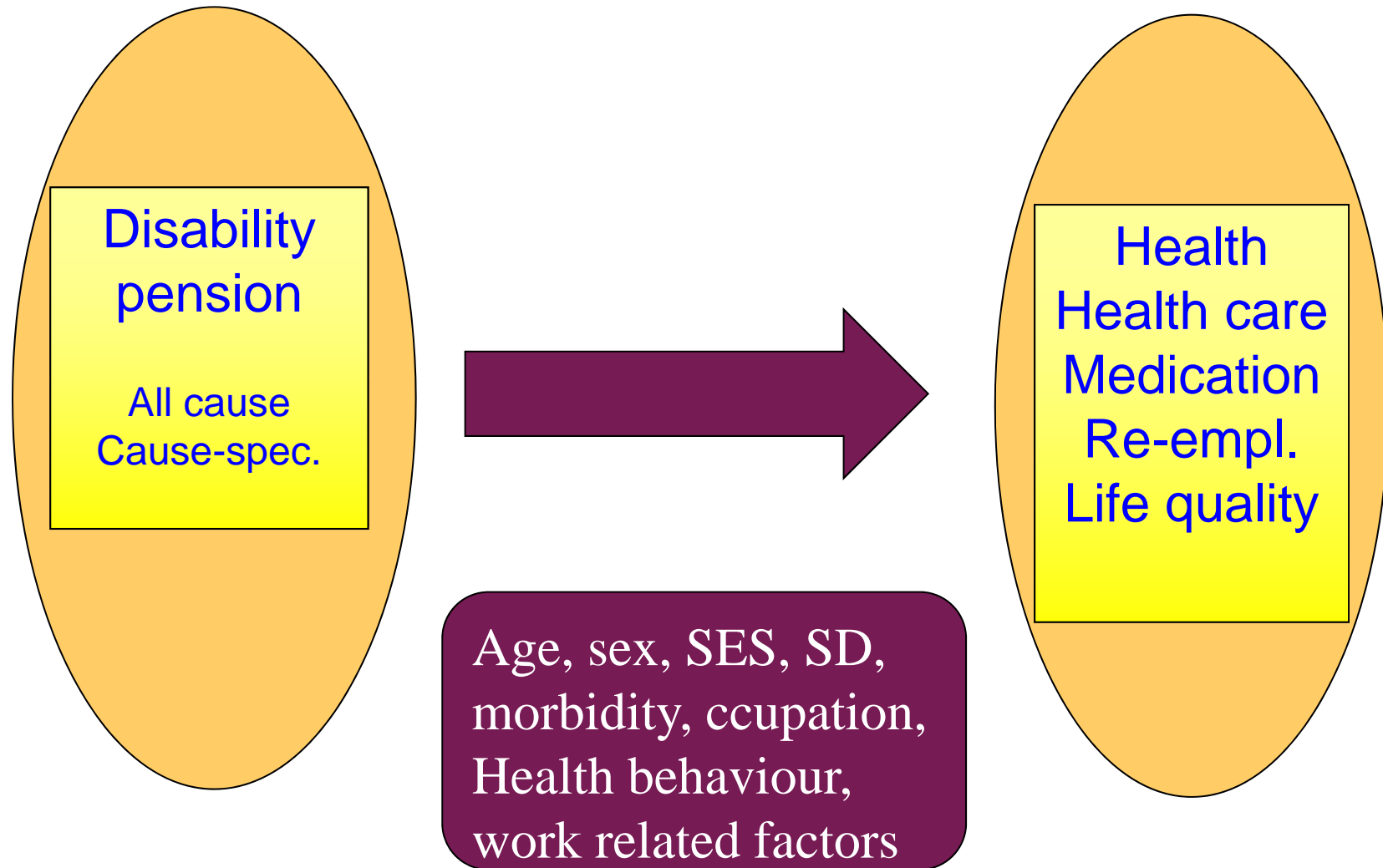
Sickness absence (SA) – different outcome measures continued

| Author, year | Study aim |
|---------------------------------------|---|
| Suboptimal health | |
| Eriksson et al. 2008 | Long-term SA, poor self-rated health, retrospective |
| Vahtera et al 2010 | SA>30d; subopt. self-rated health (all SA diagnoses) |
| Ferrie et al. 2011 | SA>30d, subopt. self-rated health, high occupational pos. |
| Recurrence of sickness absence | |
| Koopmans et al. 2011 | SA (CMD) – SA (CMD, in men SA depressive symptoms |
| Roelen et al. 2011, 2013 | Past 2 yrs SA - SA/ SA length and nr spells - SA |
| Laaksonen et al. 2013 | long SA – SA; short SA – long SA |
| Social outcome | |
| Bryngelson et al. 2009 | SA>60d, lack of excess cash; women, lack of close friends |



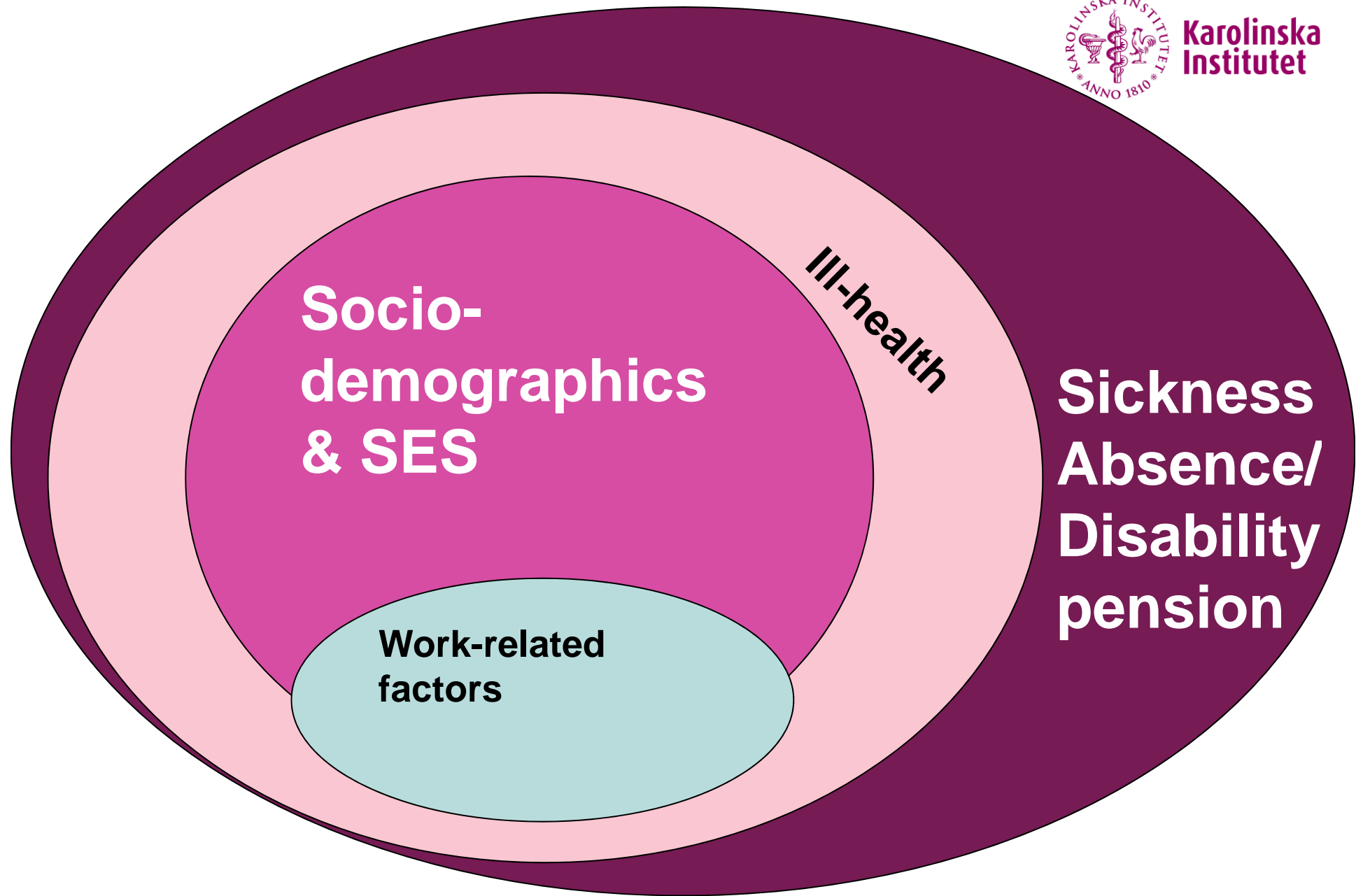
Disability pension – mortality

| Author, year | Study aim |
|---------------------|---|
| Qin et al. 2000 | DP suicide, only in crude analyses |
| Quaade et al. 2002 | DP, mortality |
| Qin et al, 2003 | DP suicide, also in multivariate analyses |
| Walman et al. 2006 | DP, all-cause and cause-spec. mortality (CVD, older age) |
| Bambra et a. 2006 | SA>1 yr all-cause and cause-spec. mortality |
| Karlson et al. 2007 | DP (spec. diagnoses), all-cause and cause-spec. mortality |
| Karlson et al. 2007 | DP (full & part time), all-cause mortality (older age) |
| Gjedahl et al. 2008 | DP (spec. diagn.), all-cause mortality; all except musk. |
| Gjedahl et al. 2009 | DP (spec. diagn.), all-cause mortality; men&mental diagn. |
| Hult et al. 2010 | DP all-cause mortality; ill-health explains difference |
| Jonsson et al. 2013 | DP (spec. diagn.), all-cause mortality; suicide, attempt |
| Leinonen et al 2013 | DP (mental disorders), cause spec. mortality |



Disability pension (DP) – different outcome measures

| Author, year | Study aim |
|--------------------------------------|---|
| Prescription of psychotropics | |
| Hartz et al. 2009 | DP-benzodiazepines |
| Health care utilisation | |
| Wallman et al. 2004 | DP – Health care utilisation |
| Self-reported positive health | |
| Eilertsson et al. 2002 | DP musk – positive self-reported health |
| Quality of Life, Reemployment | |
| Pattani et al. 2004 | DP – Quality of Life, Reemployment |



Approach I: Consequences of SA, self-rated

Challenges: retrospectively, recall bias

Possible solutions: prospectively, repeated measures

Example:

| Author, year | Study aim, design |
|-----------------------|---|
| Life situation | |
| Floderus et al. 2005 | Long-term SA – life situation (cross-sectional) |

Approach II: Control for morbidity

Challenges: Residual confounding

Possible solutions: Good measures of morbidity

Examples:

| Author, year | Study aim |
|---------------------------|--------------------------------------|
| Sickness absence | |
| Kivimäki et al. 2003 | SA/other health measures - mortality |
| Hultin et al. 2012 | Short SA – long SA, unemployment, DP |
| Hultin et al. 2012 | Long SA – unemployment, DP |
| Disability pension | |
| Hult et al. 2010 | DP/non DP - all-cause mortality |

Approach III: Effect of DP on health

Challenges: Health status prior to DP
Possible solutions: Trajectories

Examples:

| Author, year | Study aim |
|-----------------------|--|
| Overland et al. 2008 | Self-rated health status – DP – Self-rated health status |
| Oksanen et al, 2011 | Antidepressants-DP- Antidepressants |
| Laaksonen et al. 2012 | Psychotropic drugs – dp – psychotropic drugs |
| Leinonen et al. 2013 | Antidepressants- DP- Antidepressants, SES |

Approach IV: SA/DP as a prognostic factor

Challenges: Confounding by indication
Possible solutions: SA patterns, trajectories
Examples:

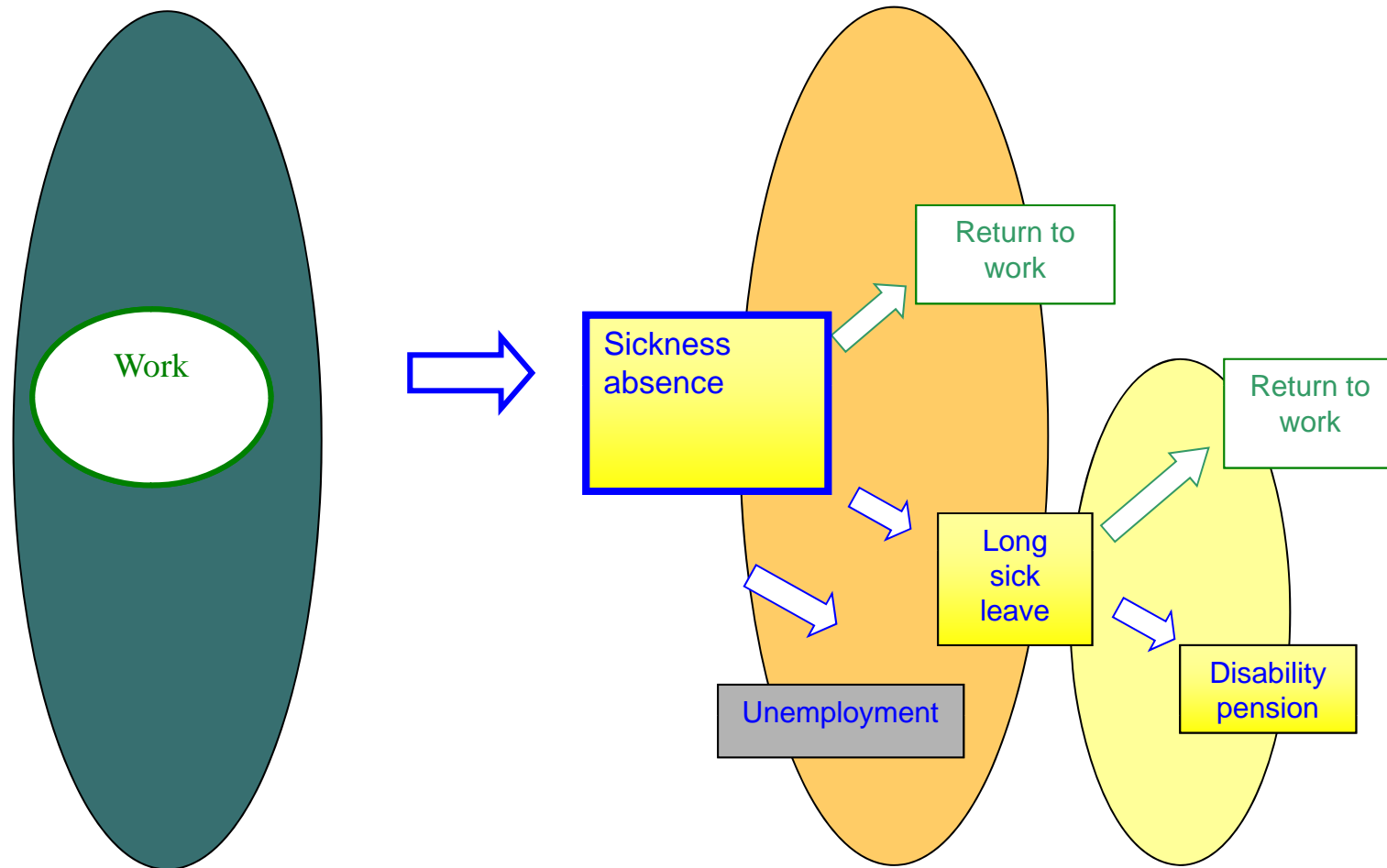
| Author, year | Study aim |
|-------------------------------------|---|
| SA- Specific disorders | |
| Enthoven et al. 2006 | LBP – SA - DP |
| Rytsälä et al. 2007 | MDD – SA (other predictors) - DP |
| Istiak-Ahmed et al. 2012 | SA SRMD – SA patterns – Suicide/attempt |
| SA - Change in health status | |
| Kivimäki et al. 2008 | Health status - SA - health status |
| Straland Nyman et al, 2009 | Self-rated health - SA - self-rated health; |
| DP | |
| Gjedahl et al. 2009 | Long-term SA - mortality, effect of DP |

Approach V: Factors affecting the outcome of SA/DP

Challenges: Predicting adverse health outcome
Possible solutions: Restriction to SA/DP

Examples:

| Author, year | Study aim |
|--|---|
| Sickness absence – predictors | |
| Gjesdahl et al. 2004 | Long SA – predictors - DP |
| Knapstad et al. 2013 | SA – shame - SA |
| Sickness absence – twin studies | |
| Narusyte et al. 2013 | SA – familial factors/shared environment - DP |
| Disability pension – predictors | |
| Hewitt et al, 2009 | DP – predictors - CVD/diabetes |



Approach I: considering several states

Challenges: Repetitive nature of SA
Possible solutions: Multistate models

Examples:

| Author, year | Aim |
|-----------------------|-------------------------------|
| Lie et al. 2008 | SA - SA/RTW/DP (intervention) |
| Carlsen et al. 2013 | Work – SA – RTW |
| Pedersen et al. 2012 | SA – work/unempl./DP |
| Oyeflaten et al. 2012 | SA-SA/work/rehab/DP (rehab) |

Summary



Challenges

- Sickness absence/disability pension per se or the underlying diagnoses
- SA and DP as an “intervention”
- Repetition of sickness absence
- Changes of “states” over time

Summary

Approaches



- Association studies – controlling and stratification
- Specific patient groups
- Specific risk factors among sickness absentees
- SA/DP as a prognostic factor
- Twin studies
- Trajectories

Summary

Statistics



- Regression models – controlling/stratification (Cox, Poisson, Logistic, Flexible parametric survival models; regression models with and without repeated measurements)
- Special prediction models
- Bootstrap

Summary



Statistics

- Propensity scores
- Methods related to twin studies
- Multistate models
- Repeated measures logistic regression with Generalised Estimating equations

Methodological aspects – quo vadis?

- Temporal variation of both sickness absence and covariates
- Sickness absence & disability pension as “interventions” in specific groups of patients



**Karolinska
Institutet**

Thank you for your attention!

**Division of Insurance Medicine
ellenor.mittendorfer-rutz@ki.se
www.ki.se/im**