

## **UPTAP Meeting**

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# **Changes in disability and disease life expectancy in England, 1998-2004**

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# Background

## Increased life expectancy with disability in the UK

[Kelly, Baker, & Gupta 2000; Rasulo, Bajekal, Yar 2007; Robine, Jagger, Clavel, & Romieu 2004]

## Increased burden of diseases strain the health services

[Yach, Hawkes, Gould, & Hofman 2004]

Only due to “limiting” diseases?

## Comorbidity as an outcome of ageing

[Corroni-Huntely, Foley, Gurlanik 1991; Rijken, Kerkhof, Dekker et al. 2005 ]

## Decomposition method for morbidity life expectancy [Nussleder & Looman 2004]

## Health Survey for England

# Existing methodology

(Sullivan 1971; Nussleder & Looman 2004)

$$L_{\text{Dis}} = L_{\text{Life}} \pi_{\text{Dis}}$$

$$\Delta L_{\text{Dis}} = \left( \pi_{\text{Dis}}^{t+n} - \pi_{\text{Dis}}^t \right) \left( \frac{L_{\text{life}}^{t+n} + L_{\text{life}}^t}{2} \right) + \left( L_{\text{Life}}^{t+n} - L_{\text{Life}}^t \right) \left( \frac{\pi_{\text{Dis}}^{t+n} + \pi_{\text{Dis}}^t}{2} \right)$$

**Morbidity effect**

**Mortality effect**

# Health Survey for England 1991-2005

Questions	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
LT illness	[Shaded]															
List of illnesses if LT illness is present	[Shaded]															
LLT illness							[Shaded]									
Taking medicine for						[Shaded]										
1) Cardiovascular diseases						[Shaded]										
2) Digestive diseases						[Shaded]										
3) Respiratory diseases						[Shaded]										
4) Nervous system diseases						[Shaded]										
5) Infections						[Shaded]										
6) Endocrine diseases						[Shaded]										
7) Genitourinary diseases						[Shaded]										
8) Neoplasm						[Shaded]										
9) Blood diseases						[Shaded]										
10) Musculoskeletal diseases						[Shaded]										
11) Eye/Ear diseases						[Shaded]										
12) Skin diseases						[Shaded]										
Cardiovascular diseases	[Shaded]						[Shaded]						[Shaded]			
Blood pressure	[Shaded]															
Diabetes	[Shaded]						[Shaded]						[Shaded]			
Asthma					[Shaded]						[Shaded]				[Shaded]	
Bladder					[Shaded]						[Shaded]				[Shaded]	

# Project

Compute disability life expectancies over time in England

Compute life expectancies with morbidity limiting or not

Explain changes over time through a decomposition method

(Nussleder & Looman 2004)

Prior research did not separate the co-morbidity effect – the study aimed to separate the effect of single and multiple diseases (i.e. limiting or not)

# Data

Health Survey for England 1991-2005:

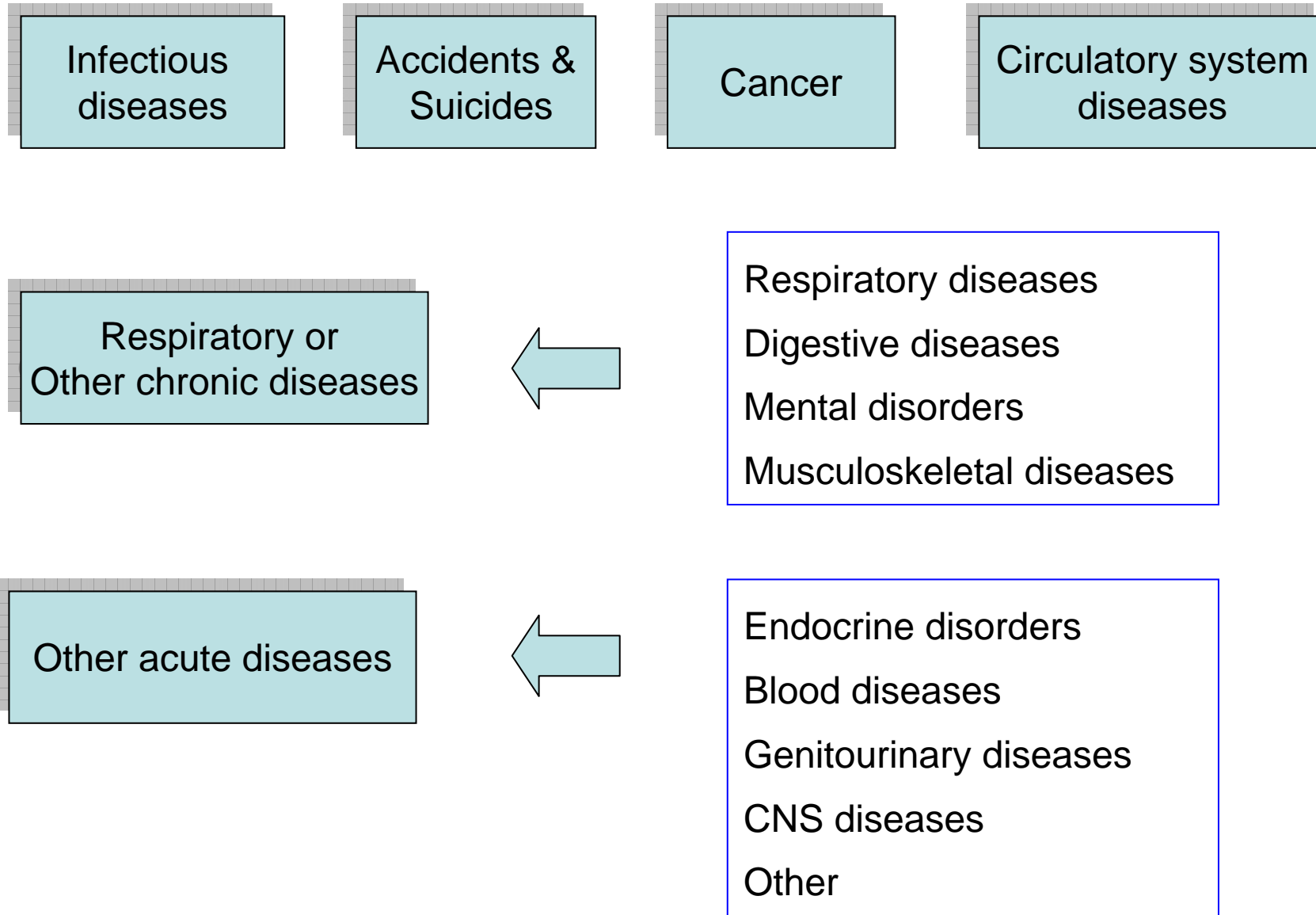
- Representative sample of the English population

Population and death counts by cause in England 1991-2005  
 (Source: Office for National Statistics)

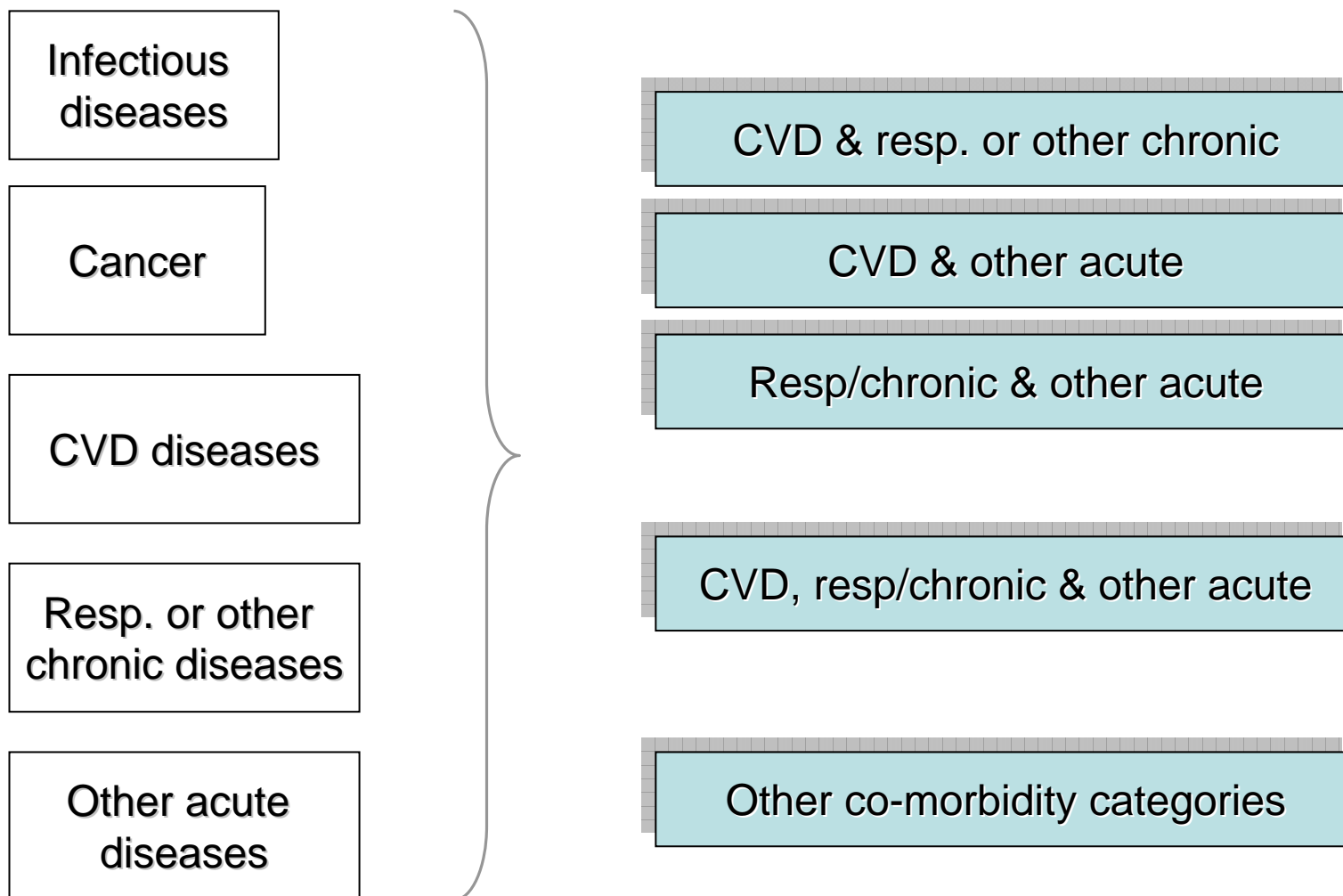
Data selection:

- Prevalence morbidity rates of people 16-year-olds and over
- Mortality rates of people 16-year-old and over

# Classification of diseases



# Co-morbidity (i.e. all the combinations)





# Mortality & Morbidity

## MORTALITY

## MORBIDITY

Accidents & Suicides



Infectious diseases

Cancer

CVD diseases

Resp. or other chronic diseases

Other acute diseases



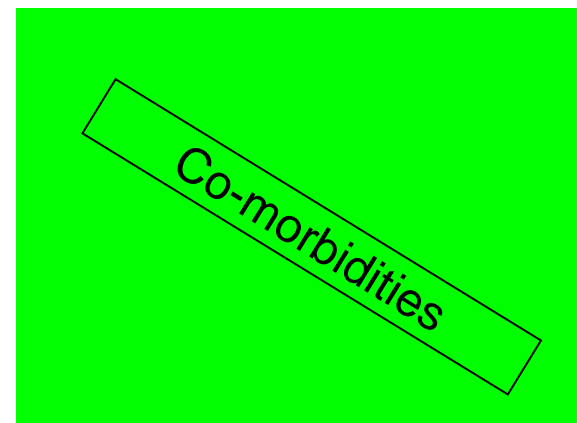
CVD & resp. or other chronic

CVD & other acute diseases

Chronic & other acute diseases

CVD & Chronic & Other acute

Other co-morbidities



# HSE 1991-2005

Questions	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	
LT illness	[Redacted]															
List of illnesses if LT illness is present	[Redacted]															
LLT illness	[Redacted]						[Redacted]									
Taking medicine for	[Redacted]					[Redacted]										
1) Cardiovascular diseases	[Redacted]					[Redacted]										
2) Digestive diseases	[Redacted]					[Redacted]										
3) Respiratory diseases	[Redacted]					[Redacted]										
4) Nervous system diseases	[Redacted]					[Redacted]										
5) Infections	[Redacted]					[Redacted]										
6) Endocrine diseases	[Redacted]					[Redacted]										
7) Genitourinary diseases	[Redacted]					[Redacted]										
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Cardiovascular diseases	[Redacted]				[Redacted]		[Redacted]		[Redacted]			[Redacted]		[Redacted]		
Blood pressure	[Redacted]															
Diabetes	[Redacted]				[Redacted]			[Redacted]			[Redacted]		[Redacted]			
Asthma	[Redacted]				[Redacted]			[Redacted]			[Redacted]		[Redacted]			
Bladder	[Redacted]				[Redacted]		[Redacted]			[Redacted]			[Redacted]			

1997-2005

# Change 1998-2004

	MALES 16 +			FEMALES 16 +		
	LE	LE with diseases	LE with LLTI	LE	LE with disease	LE with LLTI
<b>1998</b>	59.7	30.3	15.3	64.5	36.2	18.4
<b>2004</b>	61.5	31.9	15.4	65.7	37.1	18.7
<b>Change</b>	<b>1.8</b>	<b>1.6</b>	<b>0.1</b>	<b>1.2</b>	<b>0.9</b>	<b>0.3</b>

*Source: own analysis on HSE and ONS data*

# Disability life expectancy (M)

	LLTI LE	Change (yrs)	Morbidity	Single diseases	Co-morbidity
Males 1998	15.3	0.1	-0.8	-1.3	0.5
Males 2004	15.4				

**Mortality: 0.9 yrs**

Causes	Single diseases	Co-morbidity
Respiratory & other chronic	- 0.6 yrs	
Other acute diseases	- 0.4 yrs	
<b>3</b> CVD & chronic & acute		+ 0.3 yrs
Other co-morbidities		+ 0.3 yrs

# Disability life expectancy (F)

	LLTI LE	Change (yrs)	Morbidity	Single diseases	Co-morbidity
Females 1998	18.4	0.3	-0.3	-1.2	0.9
Females 2004	18.7				

**Mortality: 0.6 yrs**

Causes	Single diseases	Co-morbidity
Other acute diseases	- 0.7 yrs	
<b>3</b> CVD & Chronic & Other acute		+ 0.4 yrs
Chronic & Other acute		+ 0.3 yrs
CVD diseases	- 0.3 yrs	

# Life expectancy with disease(s) (M)

	DLE	Change (yrs)	Morbidity	Single diseases	Co-morbidity
Males 1998	30.3	1.6	0.2	-1.4	1.6
Males 2004	31.9				

**Mortality: 1.4 yrs**

Causes	Single diseases	Co-morbidity
Respiratory or other chronic	- 0.9 yrs	
CVD & other acute		+ 0.8 yrs
Other acute diseases	- 0.5 yrs	
<b>3</b> CVD & chronic & acute		+ 0.5 yrs

# Life expectancy with disease(s) (F)

	DLE	Change (yrs)	Morbidity	Single diseases	Co-morbidity
Females 1998	36.2	0.9	0.0	-1.5	1.5
Females 2004	37.1				

**Mortality: 0.9 yrs**

Causes	Single diseases	Co-morbidity
Other acute diseases	- 0.9 yrs	
<b>3</b> CVD & chronic & acute		+ 0.6 yrs
CVD & acute diseases		+ 0.6 yrs
Respiratory or other chronic	- 0.5 yrs	

# Conclusions

- Larger increase of life expectancy with diseases rather than with disabilities
- Longer life expectancy triggers longer years with morbidity
- Decreased burden of single morbidities and increased co-morbidity burden
- Without adjustment for co-morbidity, some morbidities would have been overestimated while others underestimated (e.g. CVD & chronic & other)



**Thank you**