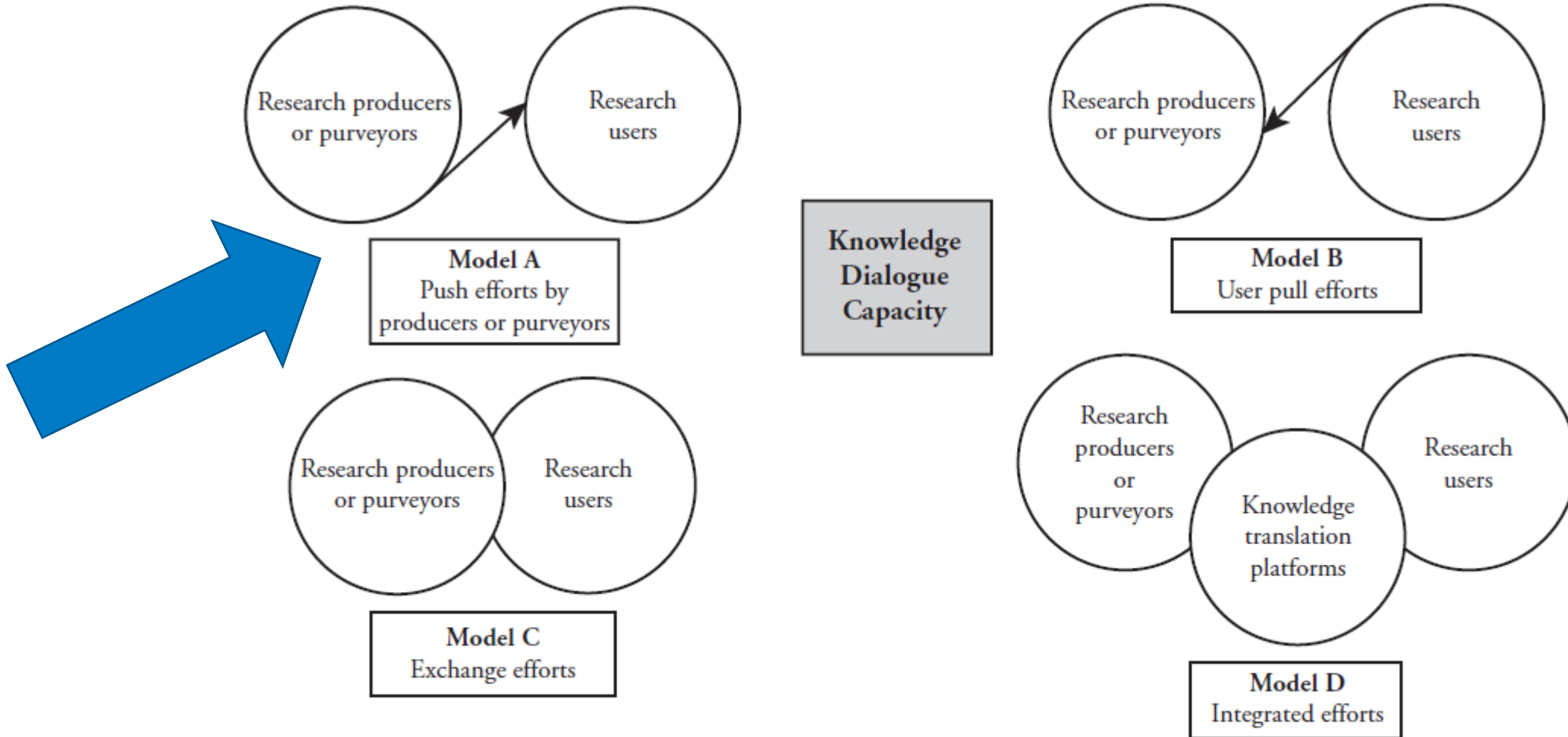# Infographics and the knowledge translation framework

Henk Hilderink

Cindy Deuning

Eveline van der Wilk

Models of Knowledge Translation

Source: Adapted from Lavis, J., J. Lomas, M. Hamid and N. Sewankambo. 2006. "Assessing Country-level Efforts to Link Research to Action." Bulletin of the World Health Organisation, 84: 620–628.

Burden of Disease

› Interpretation of Disability-Adjusted Life Years (DALY) is difficult

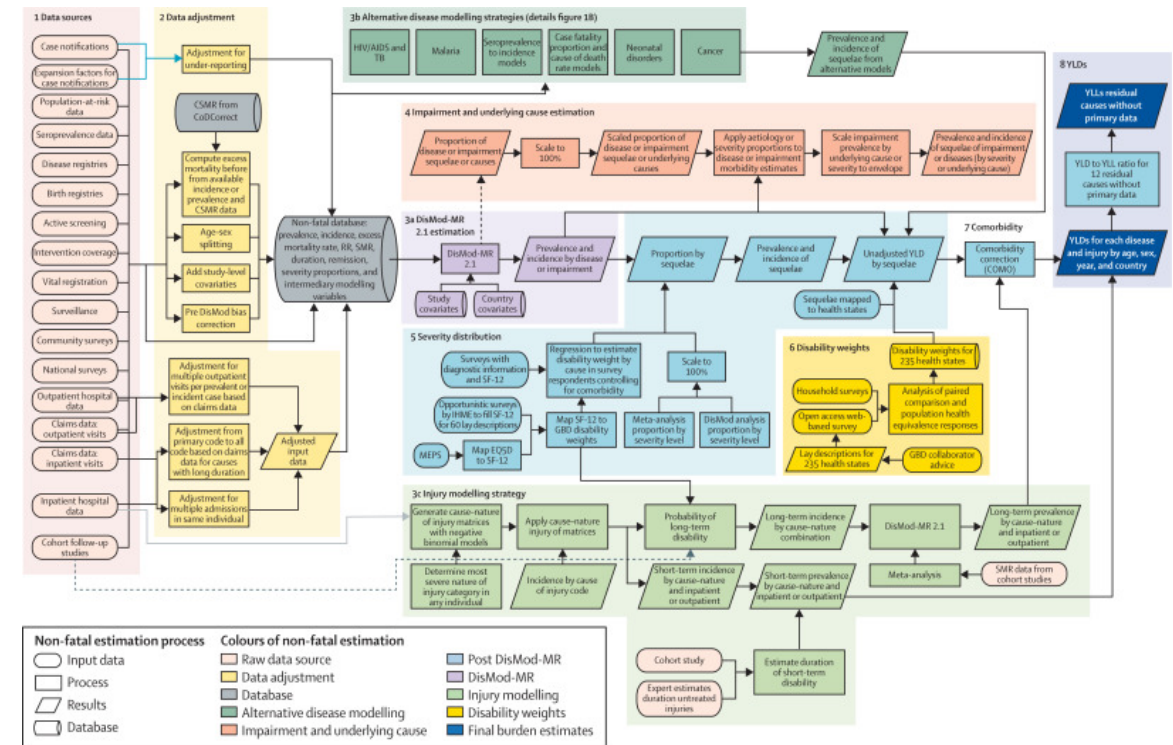 – Not only for policy makers

› Complex calculation of a DALY

  – Many choices to be made

› A lot of data

  – Needed for the calculations

  – And as a result

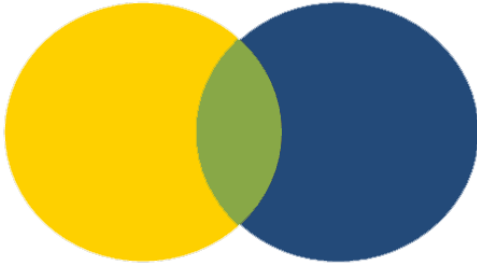   (sex, age, disease, risk factor, year, countries)

(GBD 2015)

Burden of Disease and push model of knowledge translation

› **When**: policy cycle

› **Who**: interaction with policy makers

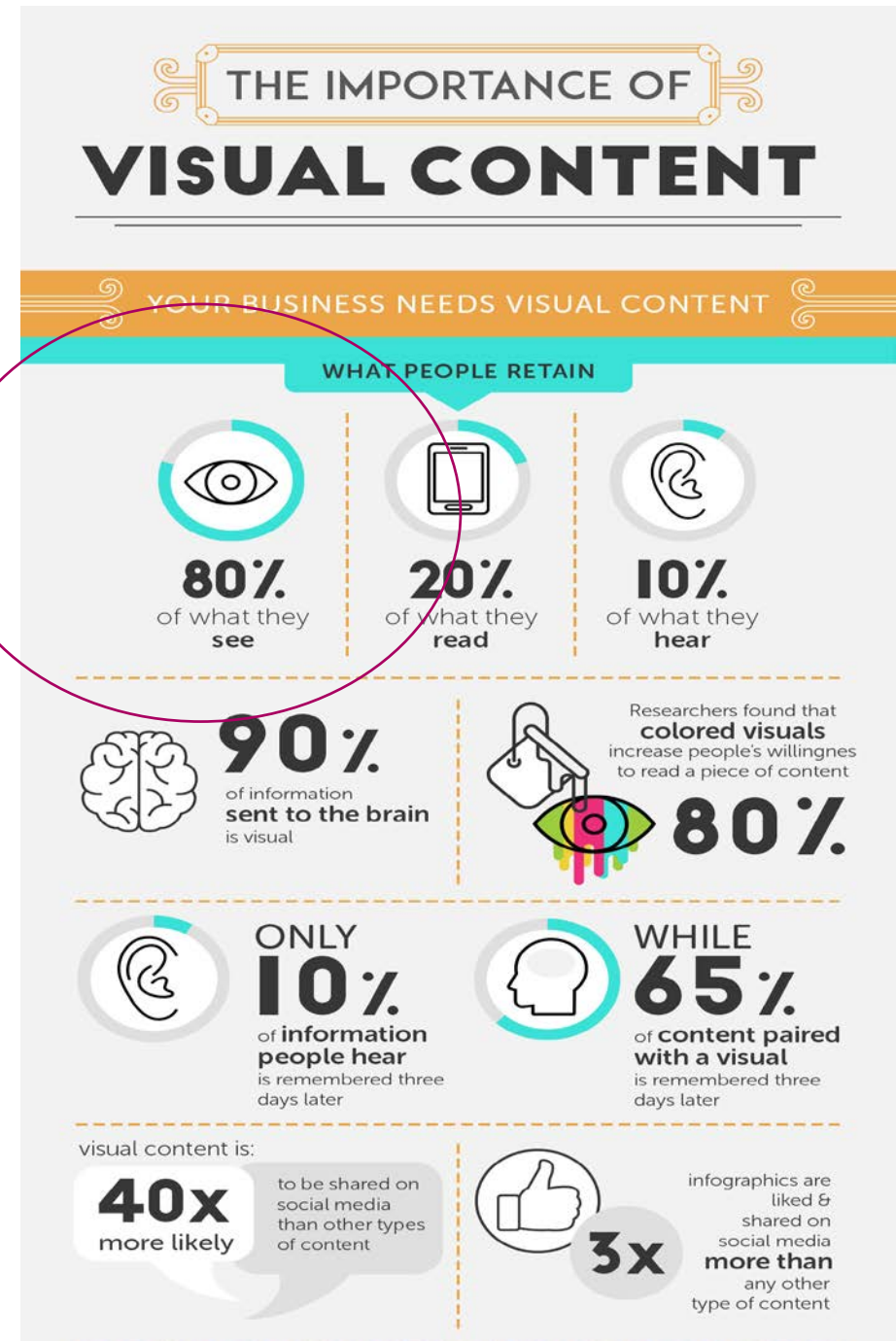› **What**: Data – Information – Knowledge - Wisdom pyramid

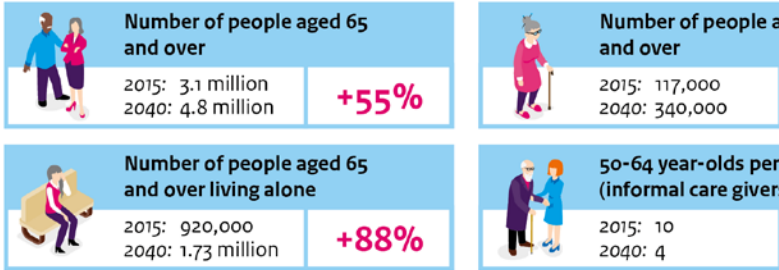› **How**: Products (data, dashboards, infographics, policy briefs)

Knowledge Translation products (How?)

› Simple to more complex (graphics – infographics – policy briefs)
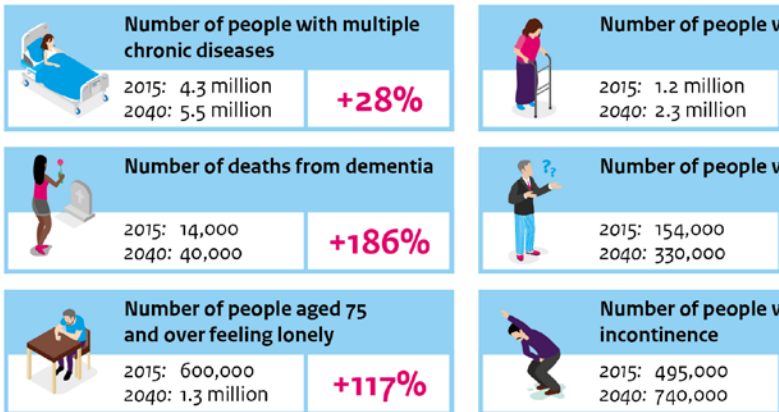
› Graphics and infographics

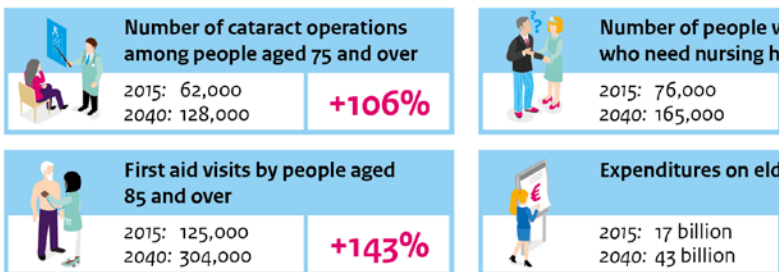› (Mis)communication

Impact of the ageing of the population

Socio-demographic changes in the population

Number of people aged 65 and over
2015: 3.1 million
2040: 4.8 million
+55%

Number of people a... and over
2015: 117,000
2040: 340,000

Number of people aged 65 and over living alone
2015: 920,000
2040: 1.73 million
+88%

50-64 year-olds per... (informal care givers)
2015: 10
2040: 4

Consequences for population health

Number of people with multiple chronic diseases
2015: 4.3 million
2040: 5.5 million
+28%

Number of people w...
2015: 1.2 million
2040: 2.3 million

Number of deaths from dementia
2015: 14,000
2040: 40,000
+186%

Number of people w...
2015: 154,000
2040: 330,000

Number of people aged 75 and over feeling lonely
2015: 600,000
2040: 1.3 million
+117%

Number of people w... incontinence
2015: 495,000
2040: 740,000

Consequences for healthcare

Number of cataract operations among people aged 75 and over
2015: 62,000
2040: 128,000
+106%

Number of people w... who need nursing h...
2015: 76,000
2040: 165,000

First aid visits by people aged 85 and over
2015: 125,000
2040: 304,000
+143%

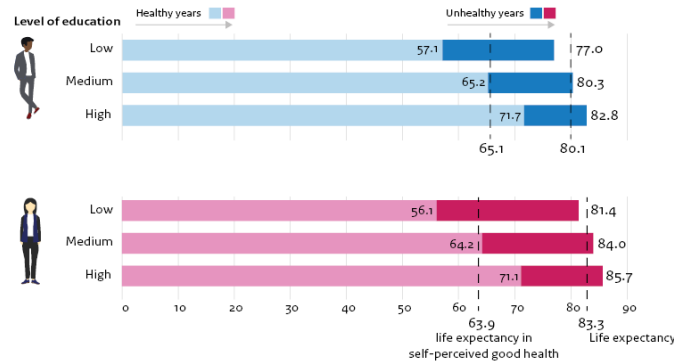**Expenditures on eld...**
2015: 17 billion
2040: 43 billion

This infographic shows how population health and healthcare in the Netherlands will develop if histo... trends continue without change and no new policies are implemented.

The National Institute for Public Health an...

Higher educated live longer and longer in better health
Life expectancy at birth, 2017-2020

Level of education | Healthy years | Unhealthy years

Low	57.1	77.0
Medium	65.2	80.3
High	71.7	82.8

65.1 | 80.1

Low	56.1	81.4
Medium	64.2	84.0
High	71.1	85.7

0 10 20 30 40 50 60 70 80 90

63.9
life expectancy in self-perceived good health

83.3
Life expectancy

Life expectancy is rising
Life expectancy at birth, 1950-2020

Years
84
80
76
72
68
64
1950 1960 1970 1980 1990 2000 2010 2020

Strong rise in life expectancy for women since 2002

Lower life expectancy during the COVID-19 pandemic

Strong rise in life expectancy still for men since 1970
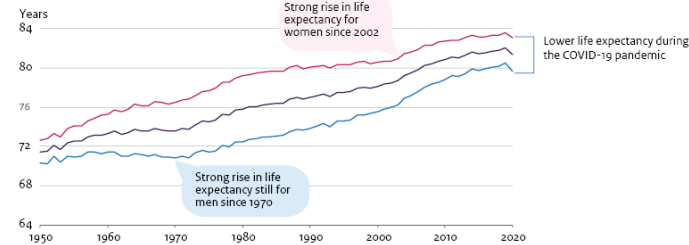
Life expectancy for Dutch men higher than EU average 2019

80,6 jaar
78.3 years
Malta
Latvia lowest LE
Switzerland highest LE

70.9 - 72.0 | 72.0 - 75.0 | 75.0 - 78.0
78.0 - 80.0 | 80.0 - 82.1 years
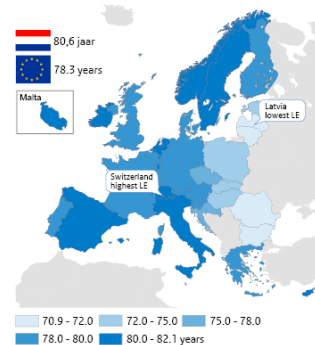
Life expectancy for Dutch women at EU average 2019

83,6 jaar
83.7 years
Malta
Spain highest LE
Bulgaria lowest LE

78.8 - 80.0 | 80.0 - 82.0 | 82.0 - 84.0
83.5 - 85.0 | 85.0 - 86.7 years
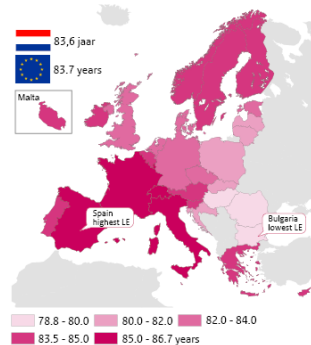
Life expectancy (LE) used in this infographic is the "life expectancy at birth". This is the expected number of years a new born would live given current sex- and age-specific mortality rates.

Sources: Statistics Netherlands-Statline, 2019, 2020 en 2021; Eurostat, 2021

More informatie
This infographic is made by Volksgezondheidzorg.info, RIVM-National Insitute for Public Health and the Environment, in the Netherlands. October 2021
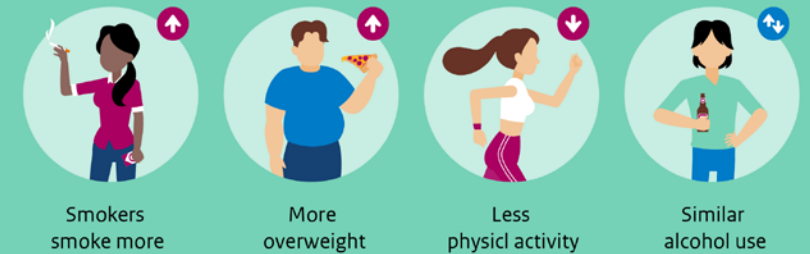

Indirect effects on health of coronavirus crisis

Impact on health care

- Lower levels of health care services
- Higher disease burden of cataract and arthrosis
- Cancer screening temporarily on hold
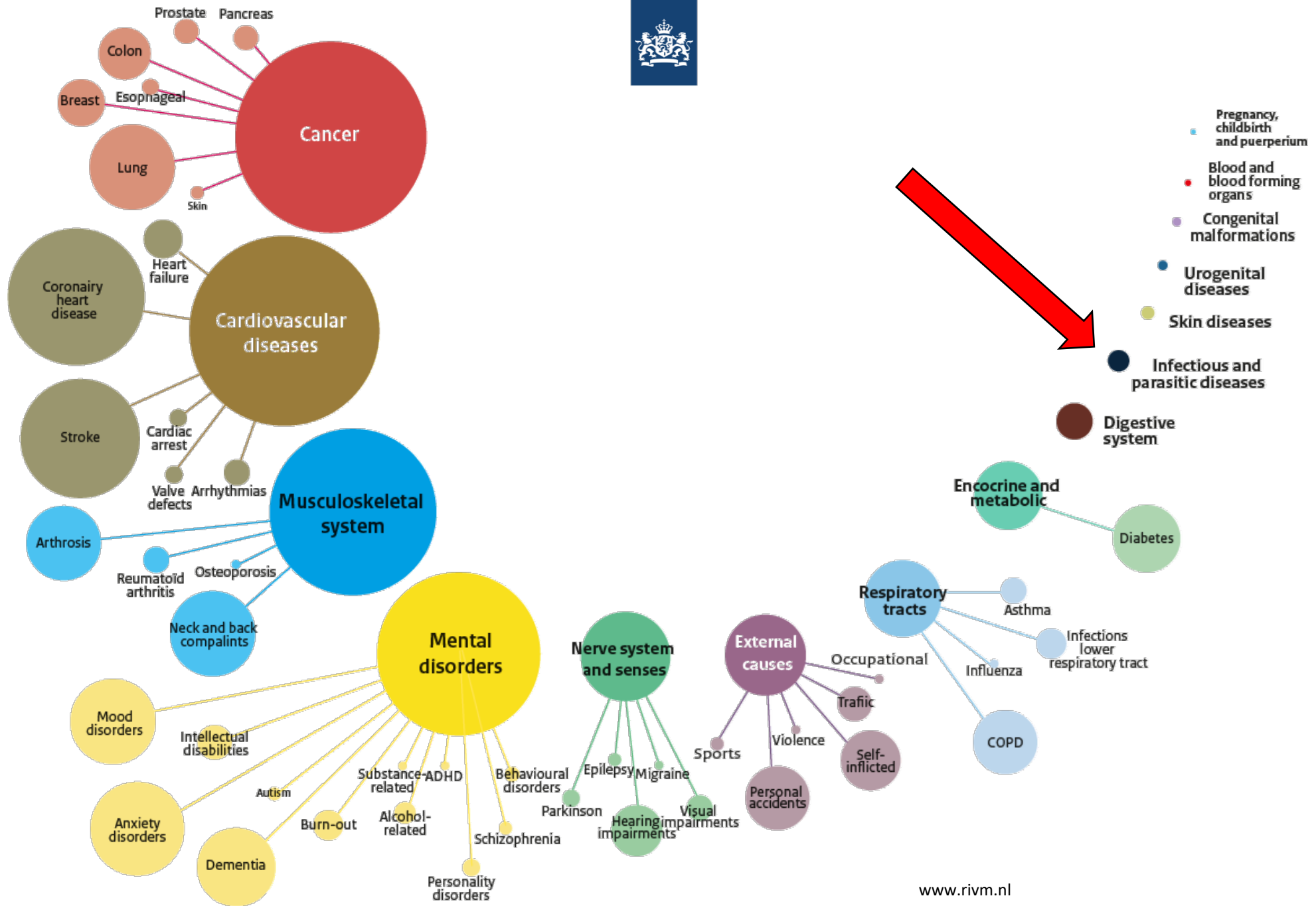
Changes in life style

- Smokers smoke more ↑
- More overweight ↑
- Less physicl activity ↓
- Similar alcohol use ↑↓

Impact of corona crisis on mental health

Negative
- Loneliness
- Fear
- Stress
- Sadness

Positive
- More tranquility
- Less commuting time
- More family time

Examples of Burden of Disease (info)graphics

Prostate Pancreas
Colon
Breast Esophageal
Cancer
Lung
Skin

Heart failure
Coronairy heart disease
Cardiovascular diseases
Stroke
Cardiac arrest
Valve defects Arrhythmias

Arthrosis
Reumatoïd arthritis Osteoporosis
Musculoskeletal system
Neck and back compalints

Mood disorders
Intellectual disabilities
Anxiety disorders
Autism
Dementia
Burn-out
Substance-related ADHD
Alcohol-related
Schizophrenia
Personality disorders
Behavioural disorders
Mental disorders

Nerve system and senses
Epilepsy Migraine
Parkinson
Hearing impairments Visual impairments

External causes
Occupational
Trafic
Sports
Violence
Self-inflicted
Personal accidents

Respiratory tracts
Asthma
Occupational
Influenza
Infections lower respiratory tract
COPD

Encocrine and metabolic
Diabetes

Pregnancy, childbirth and puerperium
Blood and blood forming organs
Congenital malformations
Urogenital diseases
Skin diseases
Infectious and parasitic diseases
Digestive system

www.rivm.nl

Burden of disease in Scotland, 2016

Mental and substance use disorders 211,300
- Alcohol dependence 28,900
- Anxiety disorders 46,000
- Schizophrenia 12,000
- Drug use disorders 48,000
- Depression 67,100

Self-harm and interpersonal violence 28,200
- Suicide and self-harm-related injuries 24,600
- Interpersonal violence 3,700

Cardiovascular diseases 201,300
- Stroke 56,300
- Other cardiovascular/circulatory 18,200
- Ischaemic heart disease 93,700
- Atrial fibrillation 14,000
- Heart muscle disorders 5,300

Musculoskeletal disorders 118,900
- Low back and neck pain 67,900
- Osteoarthritis 28,700
- Other musculoskeletal disorders 26,300
- Gout 600
- Rheumatoid arthritis 9,500

Other diseases and causes 3,900
- Other infectious and nutritional diseases 1,200
- HIV/AIDS and tuberculosis 1,500
- Other causes 1,200

Neurological disorders 135,000
- Alzheimer's and other dementias 49,000
- Migraine 48,000
- Epilepsy 13,100
- Multiple sclerosis 6,400
- Parkinson's disease 5,300
- Motor neurone disease 5,100
- Tension-type headache 5,300

Cancer 230,800
- Colorectal 25,200
- Breast cancer 23,300
- Oesophageal 11,900
- Prostate 11,100
- Pancreatic 10,300
- Lung 57,400
- Multiple myeloma 3,500
- Leukaemia 5,600
- Ovarian 6,200
- Stomach 6,200
- Bladder 6,200
- Kidney 6,300
- Non-Hodgkin lymphoma 7,500
- Liver 7,900
- Other malignant cancers 9,100
- Brain 9,800

Diarrhoea, lower respiratory and other common infectious diseases 28,900
- Lower respiratory infections 22,200
- Diarrhoea and other common infectious diseases 6,800

Diabetes, urogenital, blood and endocrine diseases 77,400
- Diabetes 30,000
- Chronic kidney diseases 13,900
- Urinary diseases and male infertility 8,800
- Endocrine, metabolic, blood and immune disorders 11,100
- Gynaecological diseases 10,400

Digestive 34,600
- Peptic ulcer disease 3,400
- Circulatory problems of bowel 3,800
- Pancreatitis 3,900
- Other digestive diseases 5,500
- Gallbladder disease 5,700
- Bowel inflammation (non-infectious) 6,100

Chronic liver diseases (including cirrhosis) 27,500

Neonatal disorders 6,900
- Preterm birth complications 3,303
- Birth asphyxia and birth trauma 1,400
- Other neonatal disorders 1,300
- Sepsis and other infectious disorders of the newborn baby 800
- Haemolytic (rhesus) disease 100

Other non-communicable diseases 87,800
- Sudden infant death syndrome 1,300
- Oral disorders 10,600
- Anomalies at birth 14,900
- Skin diseases 17,700
- Sense organ diseases 43,200

Chronic respiratory diseases 72,100
- COPD 47,600
- Asthma 15,000
- Lung disease 7,500
- Other chronic respiratory diseases 700
- Pneumoconiosis 500

Injuries 36,200
- Falls 14,600
- Road injuries 8,000
- Exposure to mechanical forces 2,200
- Adverse effects of medical treatment 1,300
- Foreign body 1,100

Nutritional deficiencies 4,200
- Iron-deficiency anaemia 3,500
- Other deficiencies 700

Note: The small bubbles show only the top 5 illnesses/diseases unless 80-90% of the total DALY, or a high-profile illness, was not captured. • DALY rounded to the nearest 100.

healthscotland.scot   Twitter 🐦 @NHS_HS   Instagram 📷 nhshealthscotland

IHME platform interactive use
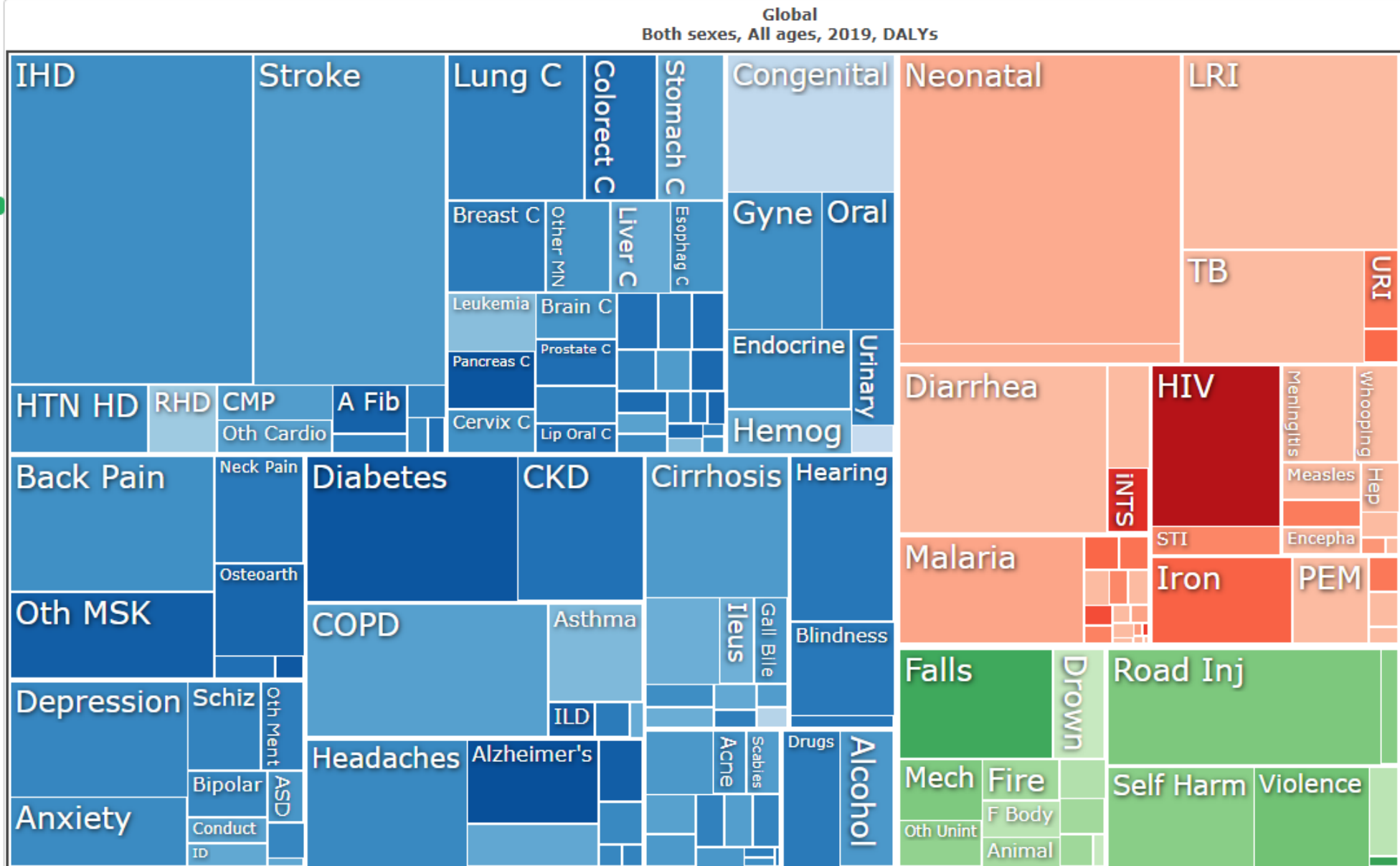
Ranking disease burden: changes over time

1990 rank

1 Respiratory infections & TB
2 Maternal & neonatal
3 Cardiovascular diseases
4 Enteric infections
5 Other infectious
6 Neoplasms
7 Other non-communicable
8 Unintentional inj
9 NTDs & malaria
10 Nutritional deficiencies
11 Chronic respiratory
12 Musculoskeletal disorders
13 Mental disorders
14 Transport injuries
15 Digestive diseases
16 Self-harm & violence
17 Neurological disorders
18 Diabetes & CKD
19 Sense organ diseases
20 Skin diseases
21 HIV/AIDS & STIs
22 Substance use

2019 rank

1 Cardiovascular diseases
2 Neoplasms
3 Maternal & neonatal
4 Other non-communicable
5 Respiratory infections & TB
6 Musculoskeletal disorders
7 Mental disorders
8 Diabetes & CKD
9 Unintentional inj
10 Chronic respiratory
11 Neurological disorders
12 Enteric infections
13 Digestive diseases
14 Transport injuries
15 Self-harm & violence
16 Sense organ diseases
17 NTDs & malaria
18 HIV/AIDS & STIs
19 Other infectious
20 Nutritional deficiencies
21 Skin diseases
22 Substance use

Communicable, maternal, neonatal, and nutritional diseases

Non-communicable diseases

Injuries
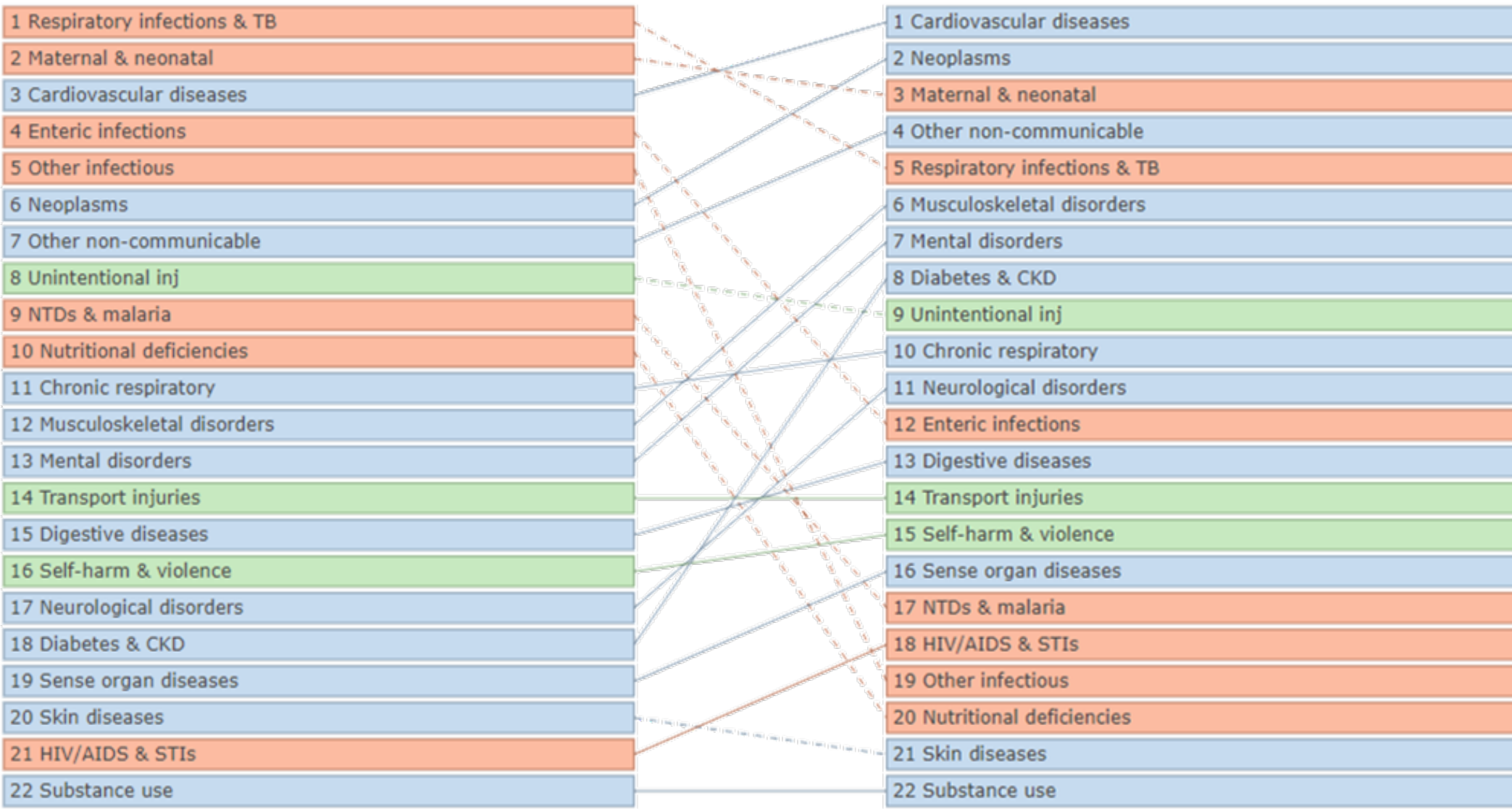
Disease burden over time: which level of results?

Individual diseases

Disease Burden in DALY's

2015   2040

338 200: Dementia

260 200

258 500: Coronary heart diseases
240 800: Arthrosis
240 200: Stroke
230 100: Diabetes

228 300

204 600: COPD

188 900
182 500
173 900
169 200
160 400

178 200: Anxiety disorder
176 200: Lung cancer
173 400: Neck en back
164 100: Mood disorder

145 800

129 800
129 100

ICD-10 Chapters

Burden of disease in DALYs

2015   2040

884 200: Cancer
869 900: Cardiovascular diseases

810 600
803 500

774 100: Mental disorders

710 800
691 800

699 100: Musculoskelet system

519 500: Nerves system and senses

452 600

409 400: Respiratory tracts

374 300

383 100: Other

338 400
322 600

360 400: External causes
330 200: Metabolic disorders

274 200

Link to risk factors: focus on smoking message
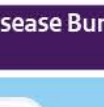
Contributions of various determinants to the total Dutch disease burden
(Percentages not to be added together)

Smoking — 13,1% of total disease burden is due to smoking

Overweight — 5,2%

Little physical activity — 3,5%

Excessive alcohol use — 2,8%

Too much salt — 1,9%

Too little fruit — 1,8%

High cholesterol — 1,6%

Too little fish — 1,5%

Too few vegetables — 0,5%

Too much saturated fat
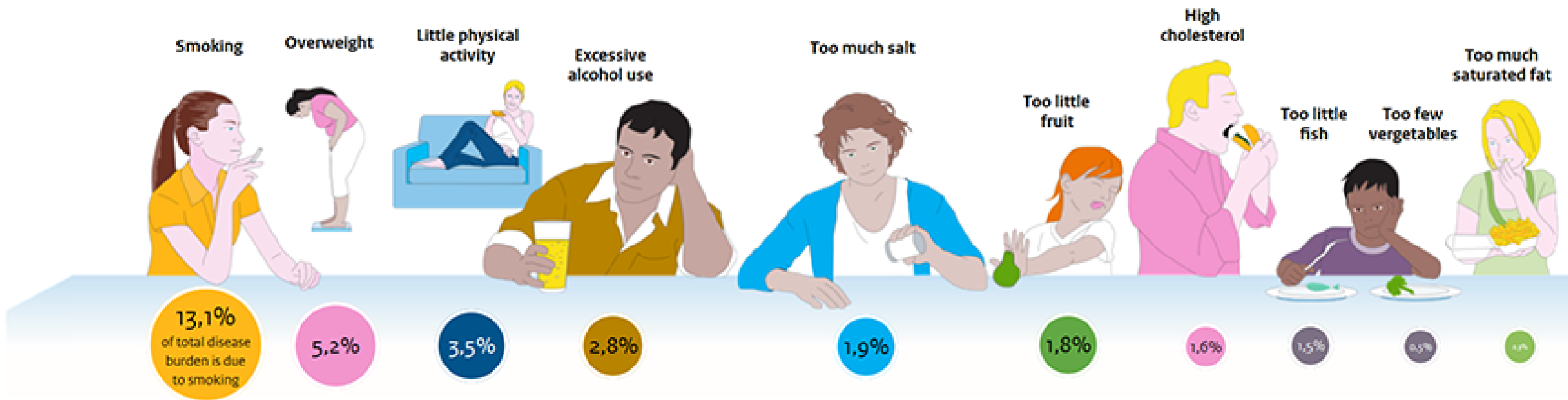
Link to risk factors: better balanced, less attractive

Behaviour	
BoD:	18.5 %
Deaths:	35,700
Expenses:	€ 8.6 billion

Metabolic	
BoD:	14.5 %
Deaths:	26,300
Expenses:	€ 9.9 billion

Occupational	
BoD:	4.6 %
Deaths:	4,100
Expenses:	€ 1.6 billion

Environment	
BoD:	4.0 %
Deaths:	12,800
Expenses:	€ 1.2 billion

	Disease Burden (%)
Smoking	9.4%
Unheallthy diet	8.1%
Insufficient physical activity	2.3%
Alcohol use	1.5%

	Disease Burden (%)
High blood pressure	6.7%
High fasting glucose	6.6%
Overweight	3.7%
Cholesterol	0.9%
Low mineral bone density	0.7%

	Disease Burden (%)
Work enviroment	3.0%
Psychosocial workload	0.9%
Physical workload	0.7%

	Disease Burden (%)
Outdoor enviroment	3.5%
Indoor enviroment	0.5%

(some) Findings

› Complexity of Burden of Disease concept remains and obstacle

  — Easy-to-digest and attractive results

  — And more detailed results for those interested

› Less is more

  — but less is also less

› Think carefully about the message that you want to communicate

  — And test it

› Be creative!!

National Institute for Public Health and the Environment
Ministry of Health, Welfare and Sport

Thank you

Henk.Hilderink@rivm.nl

See also:

WP Knowledge translation of www.burden-eu.net

Session 7.H. - Knowledge Translation and Burden of Disease, from theory to practice, 17:30-18:30