The social costs of overweight and obesity in Switzerland

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The **social costs of diseases arise in different ways**
→ an «intuitive» naming of these cost categories

costs and burden of diseases / injuries
(social costs)

monetary costs 💲

health care costs
also called
direct medical costs
= costs within the health care system
- resource loss – as others spend their time to treat and take care of patients

costs outside the health care sector
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direct non-medical costs
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not assessed in our study

production losses
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= lost production (≈ income) due to lost working ability of patient
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lost healthy life-years 😊
also called
intangible costs
= lost health related quality of life and life-years of patient
- typically measured in disability-adjusted life-years (DALYs)
- no ressource loss

we use the results of the **Global Burden of Disease Study 2021**

If **obesity** is a **disease** as well as a **risk factor** we need different methods to assess the relative social costs

Obesity <u>**as disease**</u>

– **health care costs** assessed in **DEX3 project** (our new cost study for FOPH)
– no **DALYs** for obesity in Global Burden of Disease **GBD 2023** Study (large global study)

Obesity <u>**as risk factor**</u>

– health care costs based on a combination of
  - **obesity prevalence** → data from Swiss Health Survey 2022
  - **relative risks** of diseases attributable to risk factor obesity → **literature review** for **DEX3**
  - **health care costs** of specific diseases → results of **DEX3**
– DALYs of specific diseases attributed to obesity
  → <u>GBD 2023 Study</u> with results for Switzerland

Background of **Swiss Disease Expenditure Study – Swiss DEX3**

- Project on «**Costs of communicable and non-communicable diseases, and of the risk factors overweight/obesity and physical inactivity in Switzerland**»
- Commissioned by Federal Office of Public Health and carried out by ZHAW, BFH and University of Lucerne
- **Main objective:** Decompose total health care costs by an exhaustive and mutually exclusive classification of diseases
- Two previous Swiss-DEX projects (Wieser et al. 2018, Stucki et al. 2023)
- Similar studies in the USA, Norway and other countries
- **Swiss-specific challenge**: No diagnostic coding in outpatient care

Report published today!
13.11.2025

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We decompose health care cost by **multiple perspectives** …

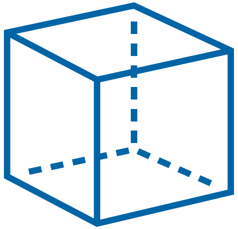
- **3** years (2012, 2017, 2022)
- **20** health services
- **66** conditions (diseases, injuries, … by Global Burden of Disease classification)
- **17** payers
- **20** age groups
- **2** sexes

>2.5 million potential cells
590,000 cells with positive spending

… using **multiple data sources**

Hospital inpatient registry
Inpatient somatic/psychiatric care
Inpatient rehabilitation
100% market share

Health insurance claims data
(CSS and SWICA with combined **28%** market share in 2022)
Accident insurance claims data
(Suva)



National Health Accounts
Total spending by health service and payer

Spitex home care &
BESA QSys nursing home data
InterRAI patient assessments
≈ **30%** market share in 2022

Further data sources
(disability insurance claims, IQVIA, Swiss Health Survey,…)

National Health Accounts provide the «envelope» for the spending decomposition

17 payers

20 health services

			Payer																	
			Government			MHI	Other social insurance						Out of pocket			Private			unknown	
			Federal	Cantonal	Municipal	MHI	AHV	IV	UV	MV	EL AHV	EL IV	Co-pay MHI	Co-pay private insurance	Other out of pocket	Private insurance	Foundations, donations	Funding by provider	unknown	Total
services	inpatient	Acute somatic care		8'783	208	5'388		265	593	20			360	56	437	2'275	128	281	861	19'654
		Psychiatric care		1'079	4	755		11	9	1			52	2	19	97	5	17	114	2'165
		Rehabilitative care		597	14	450		17	118	1			30	4	28	150	8	5		1'422
		Long-term care in nursing homes		2'431	1'612	1'932	455	43	4	2	1'575	709	61		5'153	0	116	327		14'420
	outpatient	Hospital outpatient		335	8	3'462		76	272	9			545	1	149	39	40	86	230	5'252
		General practitioners				1'981		13	106	3			565	8	38	319				3'032
		Specialists				2'857		32	57	5			812	11	260	464				4'497
		Psychiatry and psychotherapy		41	0	1'574		33	28	3			295	3	575	130	2	6		2'689
		Radiology		44	1	1'769		21	137	5			418	0	172	18	5	11		2'600
		Dental care				71		88	40	1	71	51	16	16	3'171	635				4'159
		Rehabilitative care		12	0	1'426		85	218	4			248	1	23	58	1	2		2'079
		Home care		823	565	1'234	165	657	17	1	61	41	60	1	119	35	21	0	145	3'946
		Rescue		93	24	150		0	34	1	27	19	22	1	19	23	196	124		733
		Laboratory	2	26	0	1'628		12	52	3			530	0	1'313	7	2	5		3'581
		Other				264		0	67	0			44	0	186	14				576
	products	Prescribed drugs		2	0	7'325	0	164	119	8			998							8'616
		Over-the-counter drugs												9	1'153	361	1	1		1'525
		Material and devices		4	0	503	95	246	76	4			59	5	1'699	195	0	1		2'886
	other	Prevention	2'052	609	163	44		0	197								225	391		3'682
		Administration	21	654	108	1'692	3	337	221	20						912				3'967
		Total	2'076	15'532	2'708	34'504	719	2'101	2'363	90	1'733	820	5'114	118	14'512	5'733	750	1'257	1'350	91'481

Due to **lack of diagnostic coding**, disease identification in outpatient care is mainly based on «**diagnostic clues**» in claims data

- **Specialization of treating and prescribing physician** (≈ 20 types)
- **Outpatient billing codes** (≈ 200 TARMED-, AL-, MiGeL-codes)
- **Drugs** according to their substance (≈ 850 ATC-codes)
- **Inpatient billing codes** (≈ 800 DRG-codes)
- « **Tessiner Code** » (≈ 250 simple diagnostic code used by physicians)

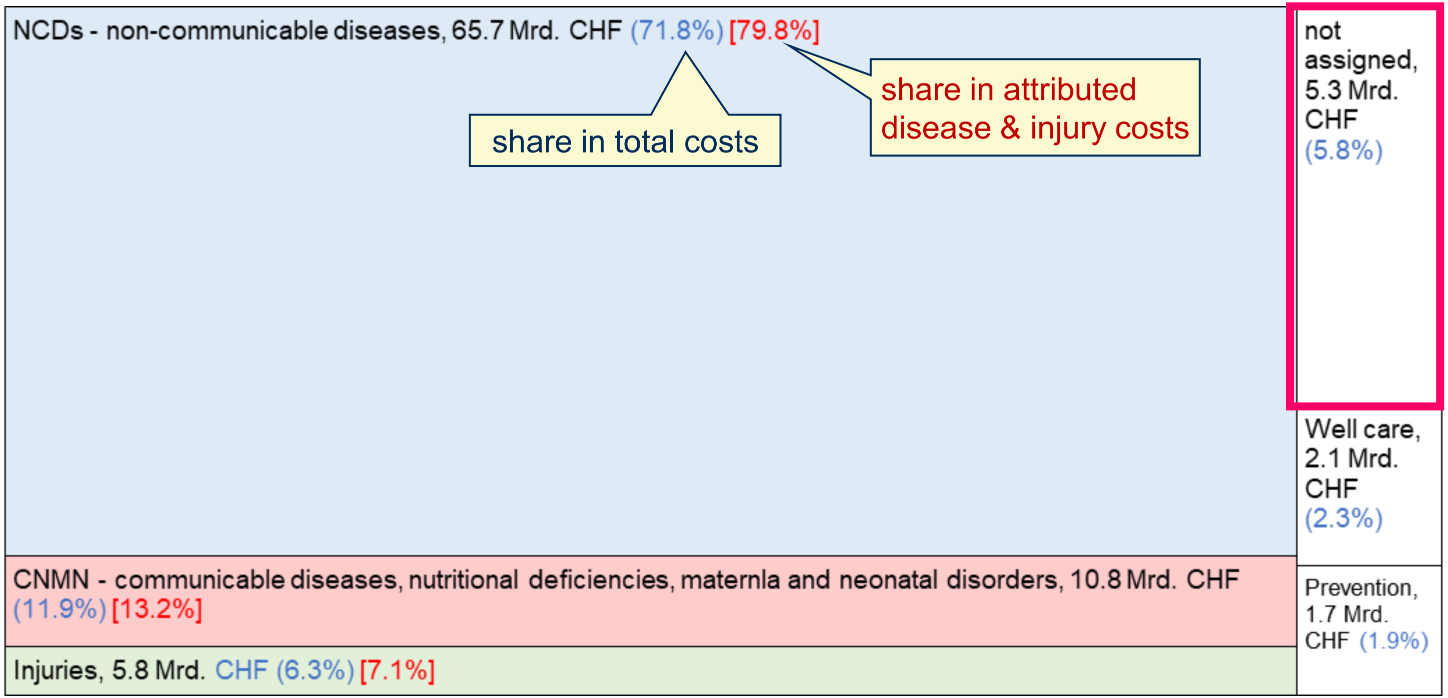
→ diseases are also identified with **combinations of codes**

Health care costs by **general disease categories** GBD-Level 1 (2022) → dominated by NCDs

non-communicable diseases in blue

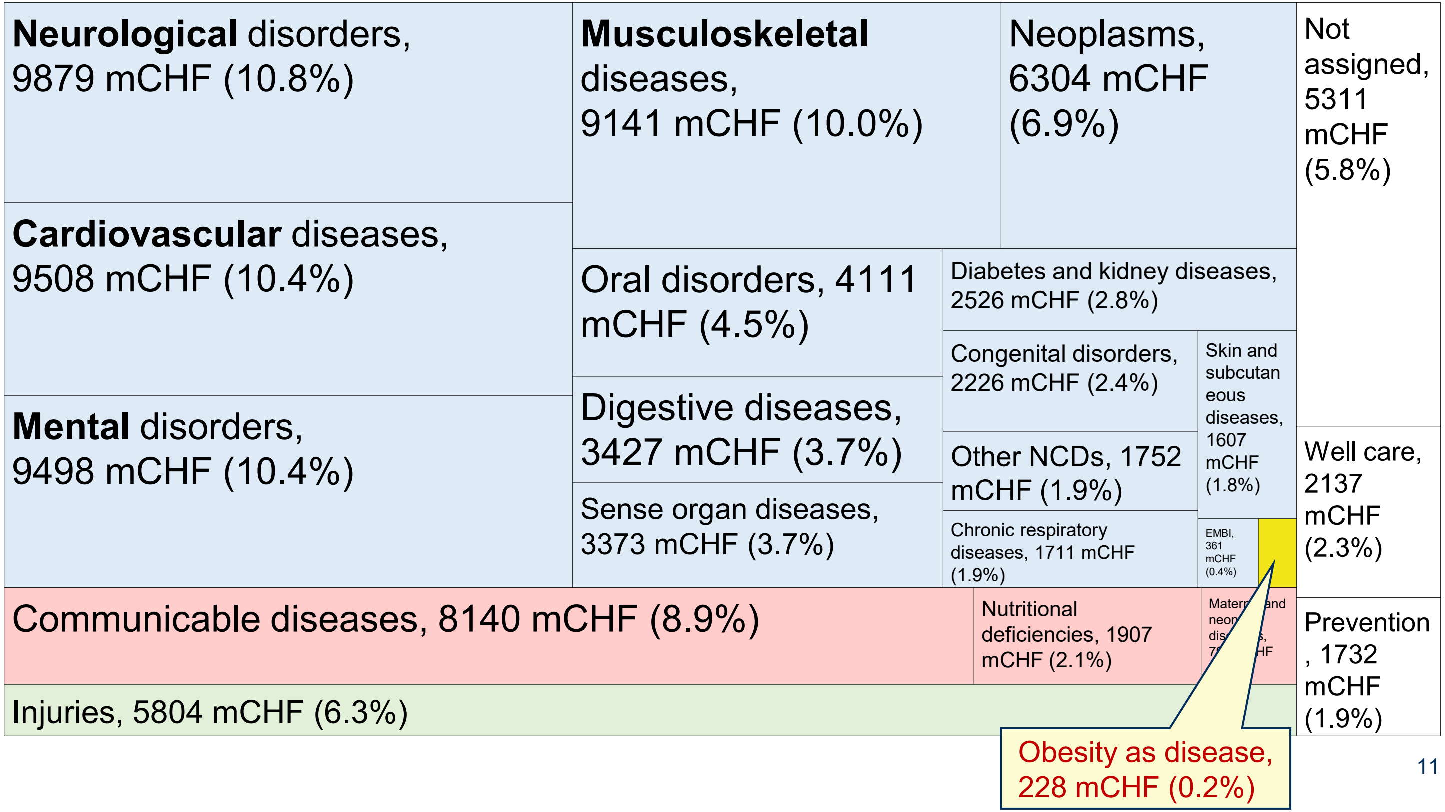
communicable, nutritional, maternal & neonatal. in red

injuries in green



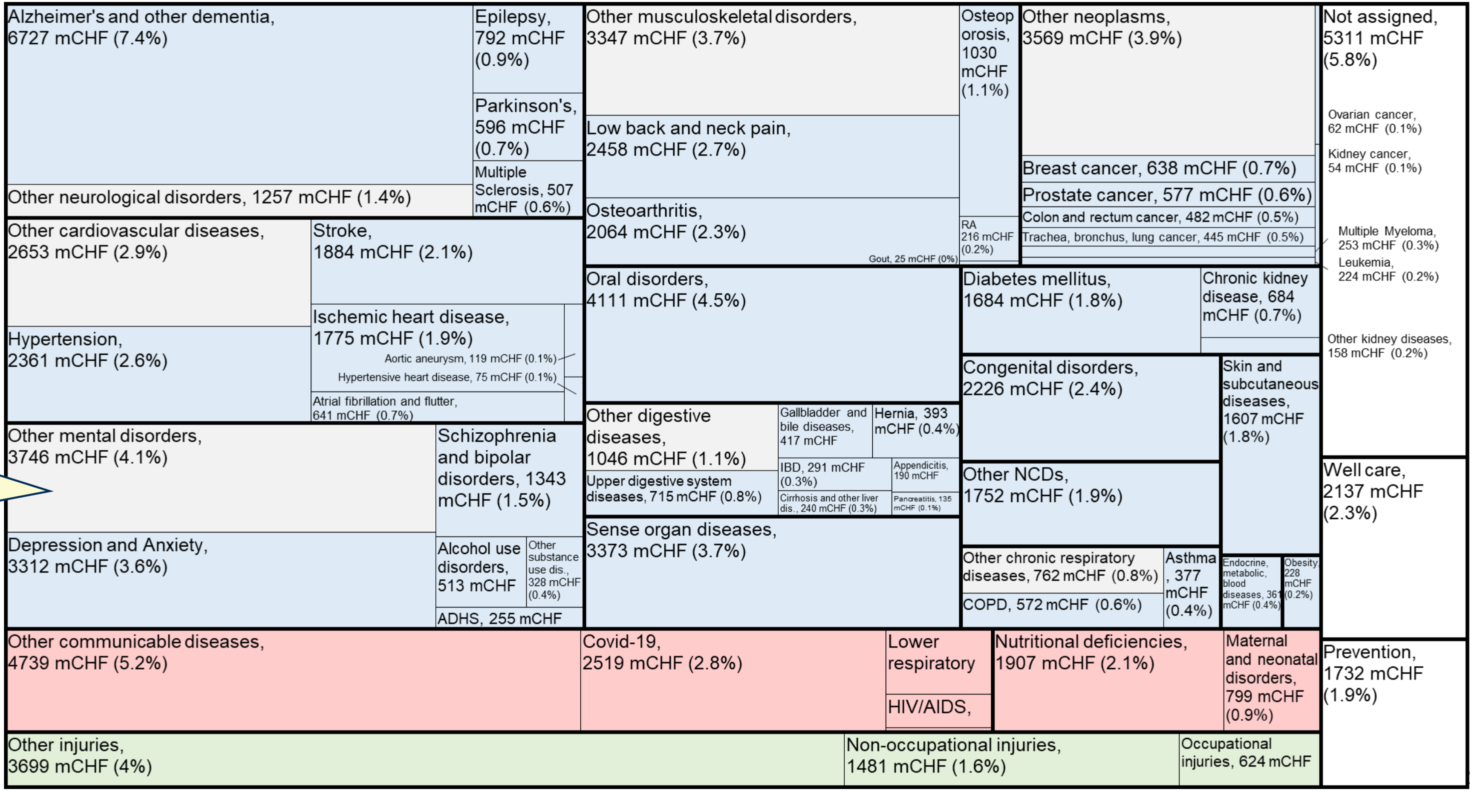
Health care costs by **disease groups** GBD-Level 2 (2022)
→ dominated by 4 often chronic diseases

These are the direct treatment costs (e.g. diabetes drugs for patients with diabetes) but not the costs of the diseases triggered by diabetes (e.g. costs of cardiovascular diseases triggered by diabetes)



Health care costs by **specific diseases** GBD-Level 3 (2022)
→ «other» diseases include true other diseases & diseases lacking strong clues

likely to include depression and anxiety costs without clear diagnostic clues



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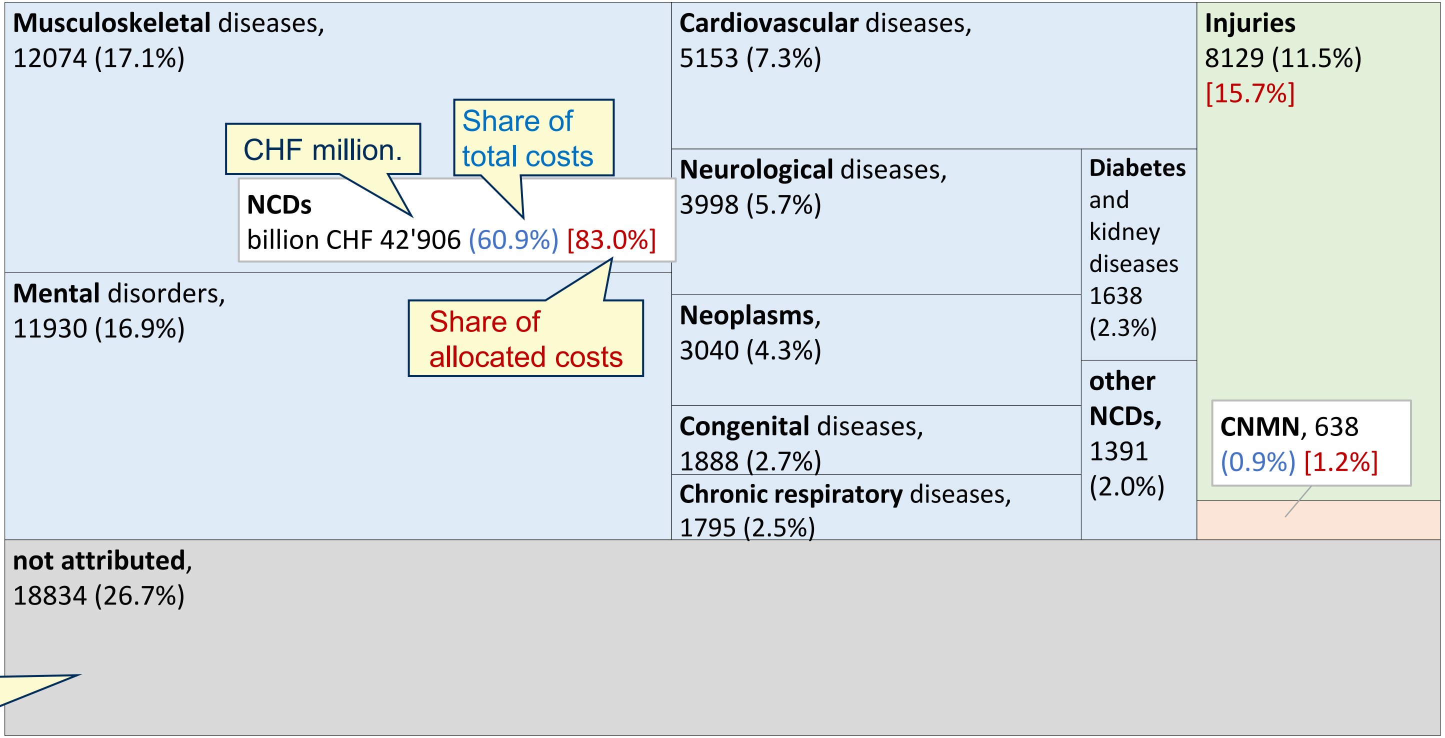
Total production losses (presenteeism, absenteeism, disability, premature death) Total CHF **70.5 billion** (GBD-Level 2, 2022)

Main causes: Musculoskeletal and mental diseases, injuries.



Over a quarter of cost **cannot be allocated** due to lacking information on causes.

GBD: Global Burden of Disease Studie
NCDs: non-communicable diseases
CNMN: communicable diseases, malnutrition, maternal and neonatal disorders

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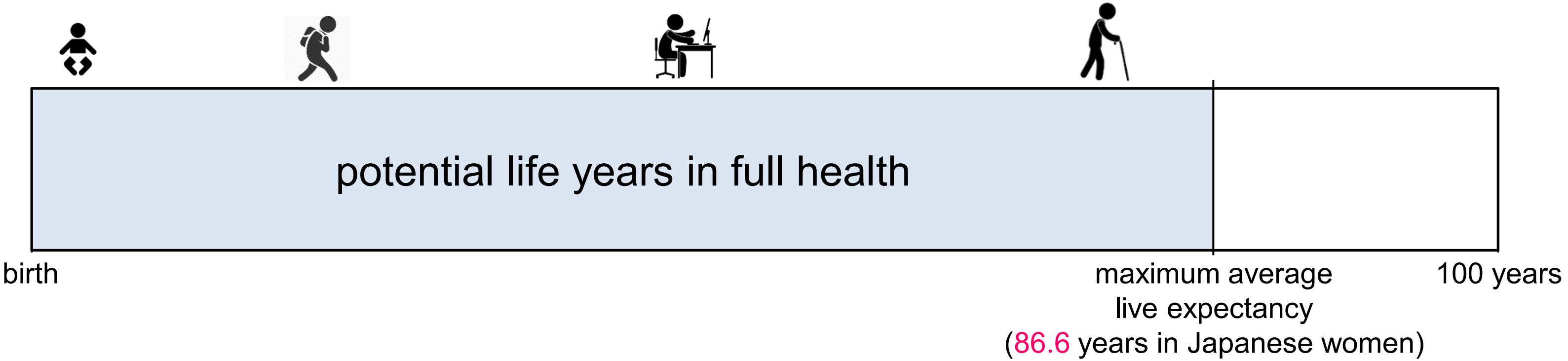
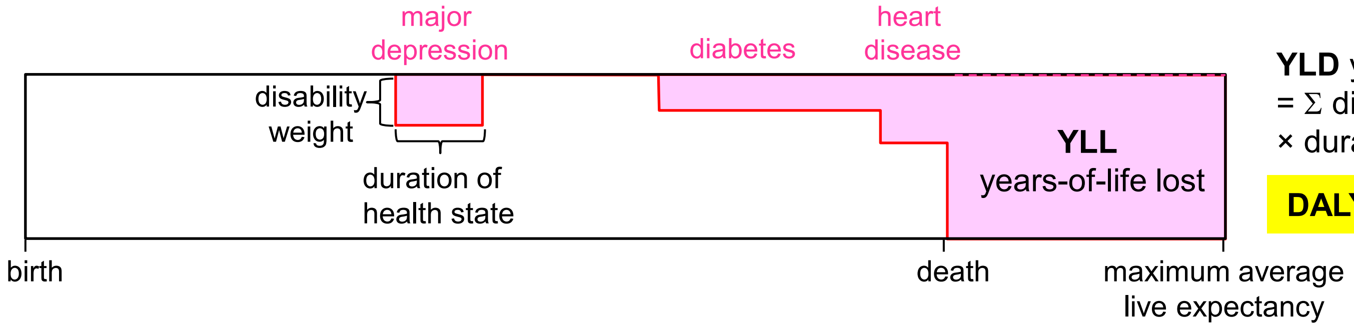
Disability-adjusted life-years (DALYs) combine the loss of life-years with the loss of health-related quality of life in one metric





YLD years lived with disability
= Σ disability weights
× duration of health states

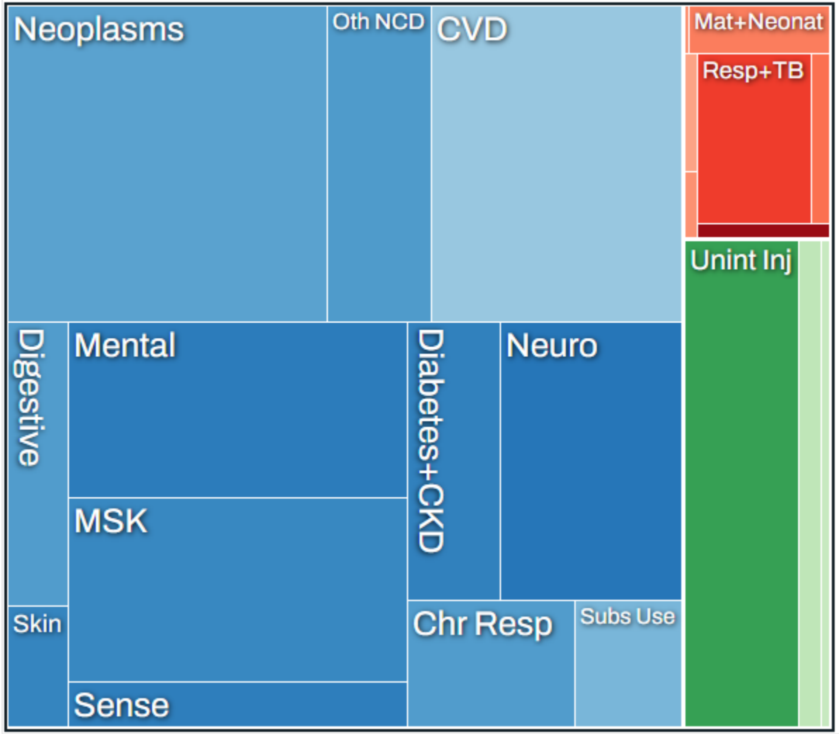
DALYs = YLD + YLL

☹ **DALYs = life years <u>lost</u> + quality of life <u>lost</u>**

The GBD-Study provides a detailed picture of the disease burden
→ but **obesity** considered **only as a risk factor** and **not as a disease**

Level 2

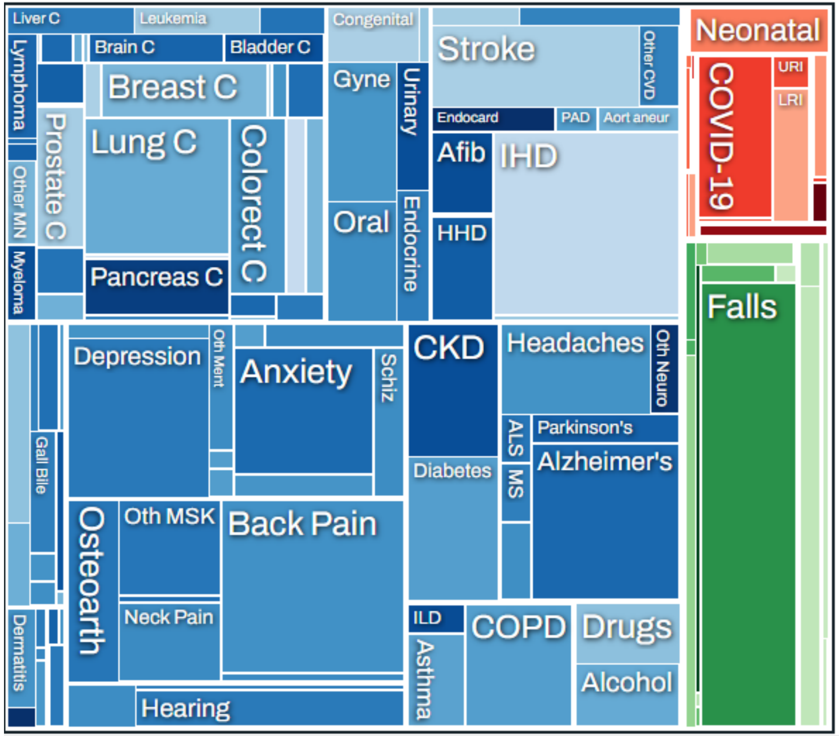
Switzerland
Both sexes, All ages, 2022, DALYs



http://ihmeuw.org/7ajf

Level 3

Switzerland
Both sexes, All ages, 2022, DALYs



http://ihmeuw.org/7aje

Obesity as risk factor

The **relative risks** of diseases **vary by obesity level**

overweight	25 $kg/m^2 \leq$ **BMI** $<$ 30 kg/m^2
obesity	**BMI** $\geq$ 30 kg/m^2

The **population attributable fraction (PAF)** combines the **relative risk** with the **prevalence of the risk factor**

Relative risk
of diseases attributable to risk factor
(according to findings from systematic reviews)

Prevalence
of risk factor
(according to Swiss Health Survey)

PAF
= share of disease cost attributable to risk factor

×

cost of disease
→ health care costs
→ production losses
→ DALYs

=

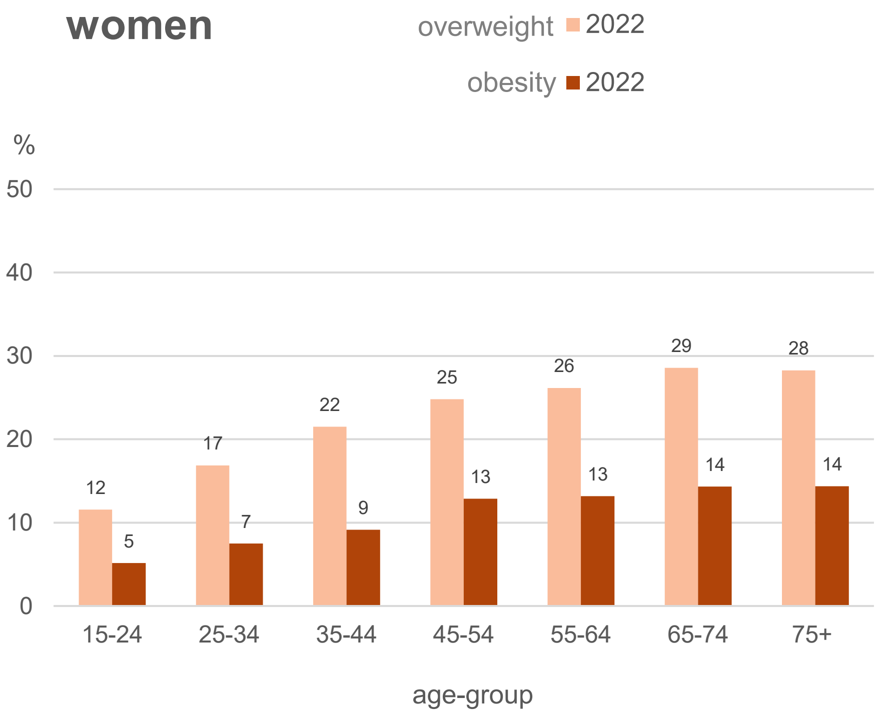
cost of risk factor

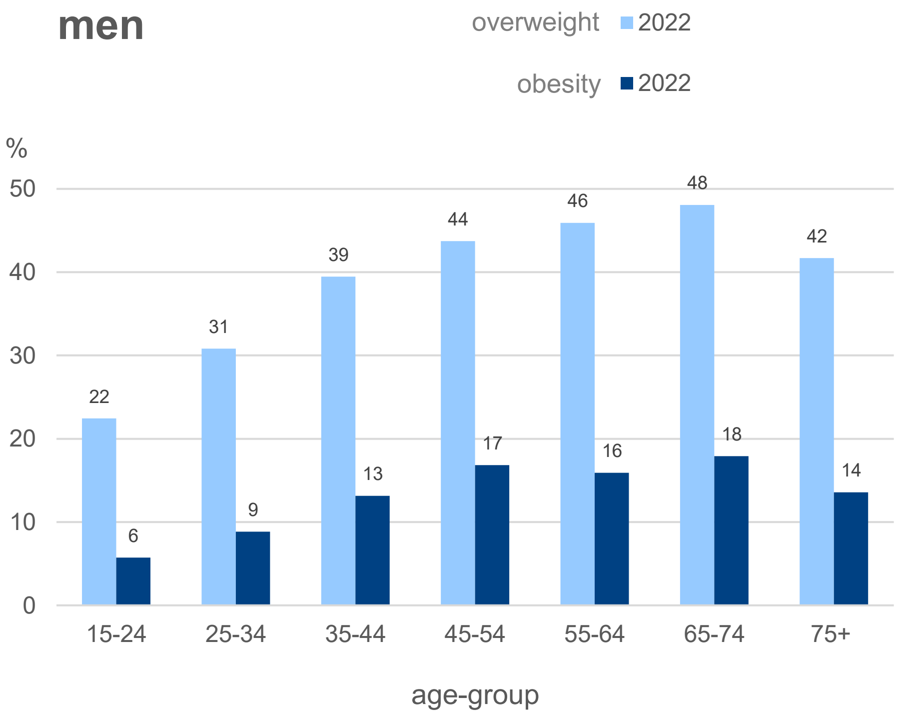
Calculation **by 10-year age-groups** and **sex** for **2012**, **2017** and **2022**

Relative risks of **overweight and obesity** in **men**

disease	overweight			obesity			source (systematic reviews)
	RR	UB	LB	RR	UG	OG	
neoplasms							
Oesophageal cancer	1.56	1.42	1.71	2.34	2.02	2.7	Tian et al., 2020
Kidney cancer	1.36	1.22	1.53	1.71	1.52	1.92	X. Liu et al., 2018
Thyroid cancer	1.29	1.06	1.57	1.53	0.89	2.64	Schmid et al., 2015
Colorectal cancer	1.20	0.96	1.44	1.40	1.12	1.68	Lobstein & Leach, 2010
Liver cancer	1.18	1.06	1.31	1.83	1.59	2.11	Chen et al., 2012
Pancreatic cancer	1.15	1.03	1.27	1.29	1.17	1.41	Shi et al., 2016
Stomach cancer	1.12	0.96	1.29	1.27	1.09	1.48	Lin et al., 2014
Multiple myeloma	1.12	1.07	1.18	1.21	1.08	1.35	Wallin & Larsson, 2011
Non-Hodgkin lymphoma	1.07	1.01	1.14	1.20	1.07	1.34	Larsson & Wolk, 2007
Gallbladder and biliary tract cancer	1.05	0.84	1.26	1.25	1	1.5	Lobstein & Leach, 2010
Leukaemias	1.05	0.99	1.13	1.40	1.24	1.57	Castillo et al., 2012
cardiovascular diseases							
Atrial fibrillation and atrial flutter	1.40	1.04	1.9	1.71	1.04	2.84	Wanahita et al., 2008
Ischaemic heart disease	1.35	1.08	1.62	2.00	1.6	2.4	Lobstein & Leach, 2010
Hypertension	1.28	1.1	1.5	1.84	1.51	2.24	Guh et al., 2009
Cerebrovascular diseases	1.20	0.96	1.44	1.50	1.2	1.8	Lobstein & Leach, 2010
musculoskeletal disorders							
Gout	1.87	1.29	2.69	3.50	2.3	5.32	Bhole et al., 2010
Osteoarthritis	1.47	1.41	1.54	2.14	2.04	2.24	L. Zhang et al., 2023
Back pain	1.03	0.93	1.14	1.21	1.04	1.41	Nilsen et al., 2011
oher diseases							
Diseases of the gallbladder and bile ducts	2.31	1.35	3.97	2.12	1.03	4.37	Banim et al., 2011
Type 2 diabetes	2.25	1.8	2.7	5.50	4.4	6.6	Lobstein & Leach, 2010
Covid-19	1.44	1.08	1.92	1.97	1.46	2.65	Ho et al., 2020
Depression	1.24	1.01	1.45	1.56	1.3	1.87	Paans et al., 2016
Asthma	1.20	1.08	1.33	1.43	1.14	1.79	Guh et al., 2009
Chronic kidney disease	1.15	1.03	1.29	1.23	1.06	1.42	Betzler et al., 2021

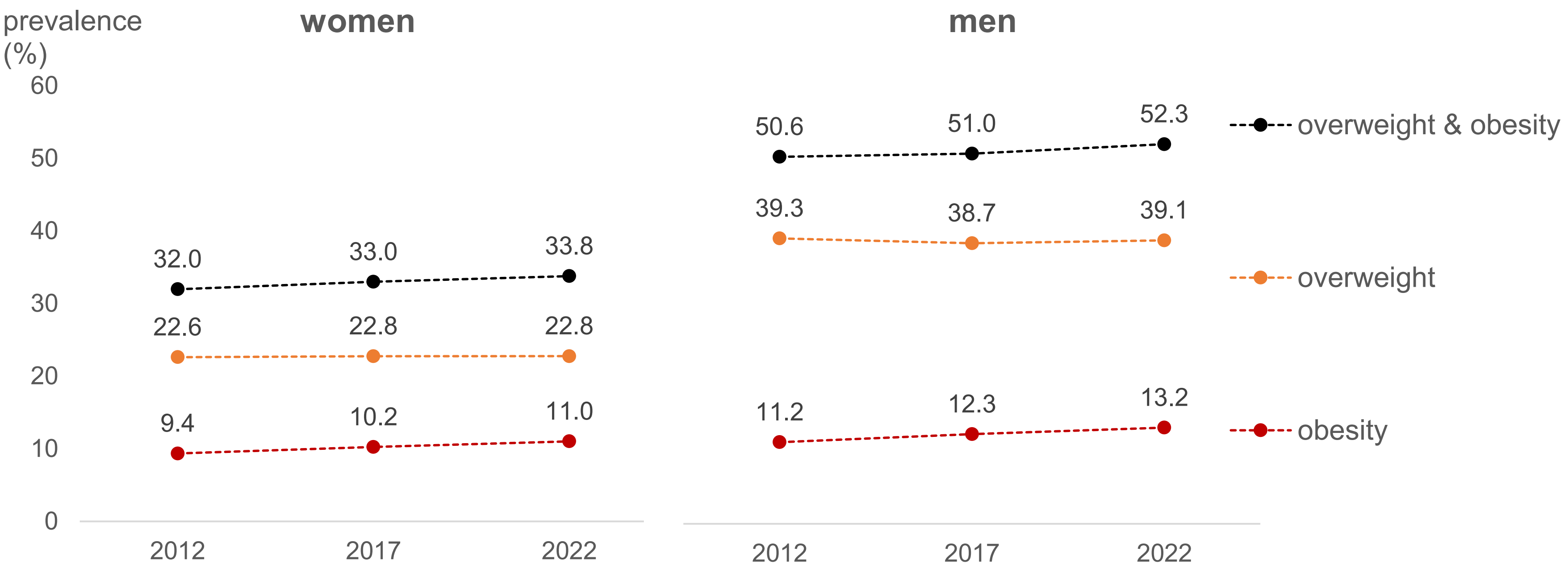
The the **prevalence** of overweight and obesity **increases with age** and is **higher in men**





source: Swiss Health Survey, own calculation

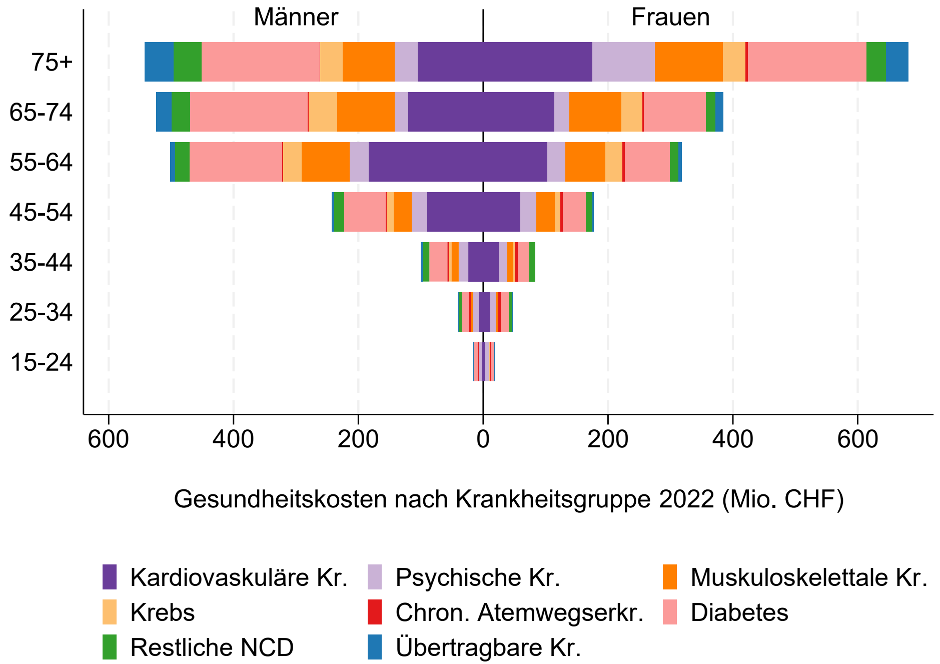
The **prevalence** of overweight and obesity has increased over 10 years but this is **mainly due to population ageing**



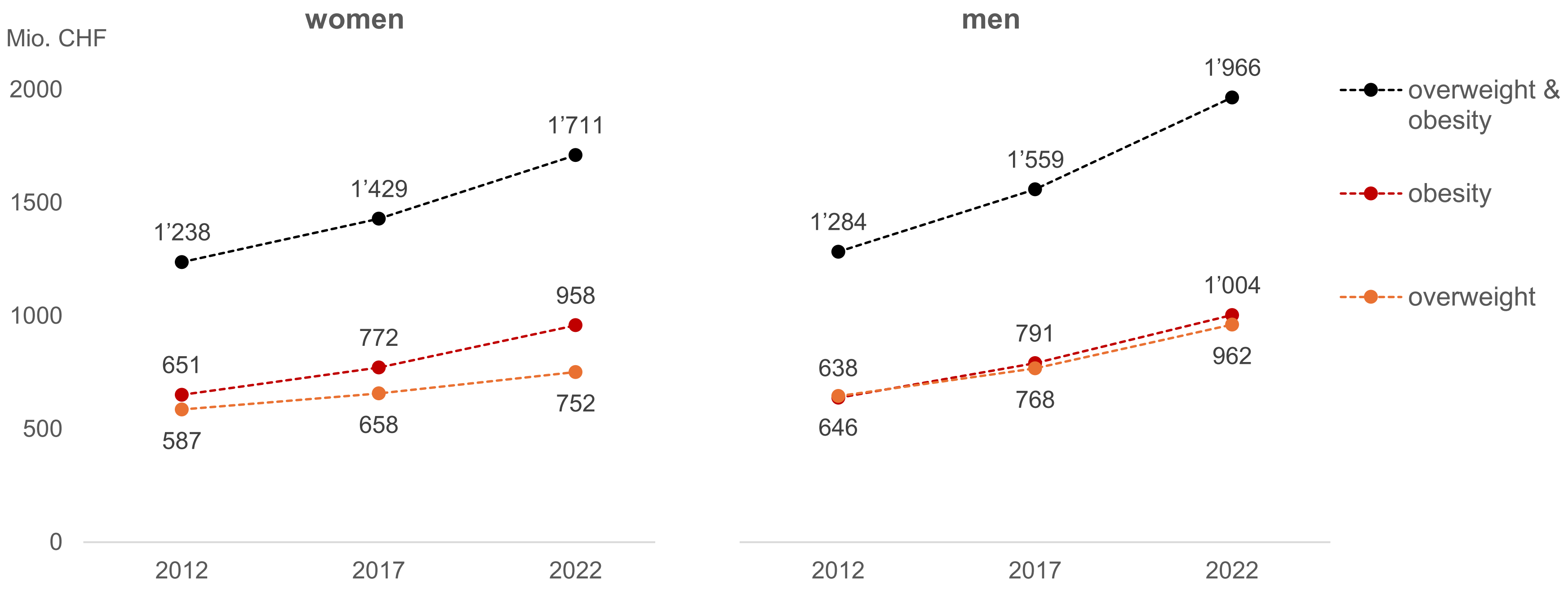
source: Swiss Health Survey, own calculation

The health care costs of **overweight and obesity** as **risk factor increase with age** and are **higher in men**

Diabetes, **cardiovascular and musculoskeletal diseases** dominate health care costs



Health care costs of overweight and obesity **increased by 46%** between 2012 bis 2022



DALYs due to overweight & obesity **by main diseases** (2022)

Diseases	**overweight**	**obesity**	**overweight & obesity**	**%**
Type 2 diabetes	24'033	34'259	58'293	38.8
Covid-19	11'057	9'781	20'838	13.9
Ischaemic heart disease	2'950	9'022	11'971	8.0
Depression	5'284	5'077	10'361	6.9
Osteoarthritis	4'880	4'958	9'838	6.5
Diseases of the gallbladder and bile ducts	3'073	2'078	5'151	3.4
Back pain	3'311	1'672	4'983	3.3
Oesophageal cancer	1'992	1'832	3'824	2.5
Chronic kidney disease	2'175	1'409	3'584	2.4
Atrial fibrillation and atrial flutter	1'933	1'649	3'582	2.4
Pancreatic cancer	1'501	1'194	2'695	1.8
Liver cancer	962	1'606	2'568	1.7
Asthma	1'106	1'239	2'346	1.6
Kidney cancer	945	804	1'749	1.2
Gout	752	822	1'575	1.0
other	1'518	5'441	6'959	4.6
	67'473	**82'842**	**150'315**	**100.0**

Overall social costs of overweight and obesity **by cost categories** in 2022

	total	**% of total**
health care costs (including obesity as disease)	CHF 3.7 billion	18 %
production losses	2.9 billion	14 %
lost healthy life years	150’315 DALYs	16 %

(billion = Milliarde)

Main results

- **Prevalence rates of overweight an obesity remain stable**
- **Strong increase of health care costs**

  → Due to overall increase of disease costs per case, population growth and ageing.
- Health care cost estimation is **lower than in previous studies**

  → Previous evaluations used single-disease cost-studies which tend to overestimate costs.

  → But we identified a **higher number relevant diseases** than they did.

  → And with **production losses** and **lost healthy life years** we include **additional cost dimensions**.

Thank you for your attention!