Cost of Inaction

Health and environmental costs of chemicals use

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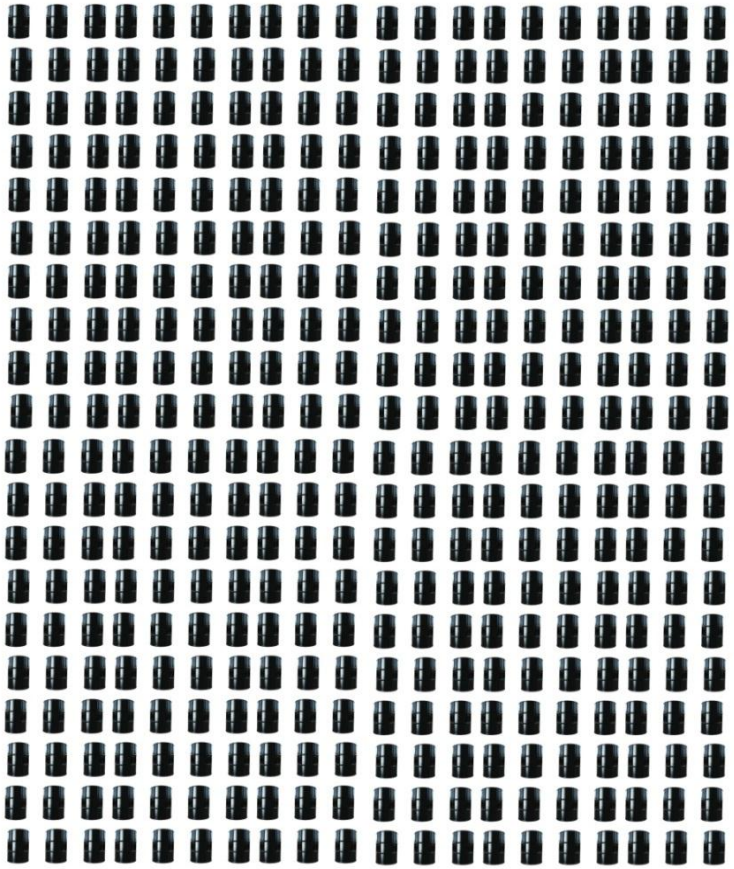
Global chemicals production

2000
400 million tonnes/year



1950
7 million tonnes/year

Källa: European Commission, 2001.

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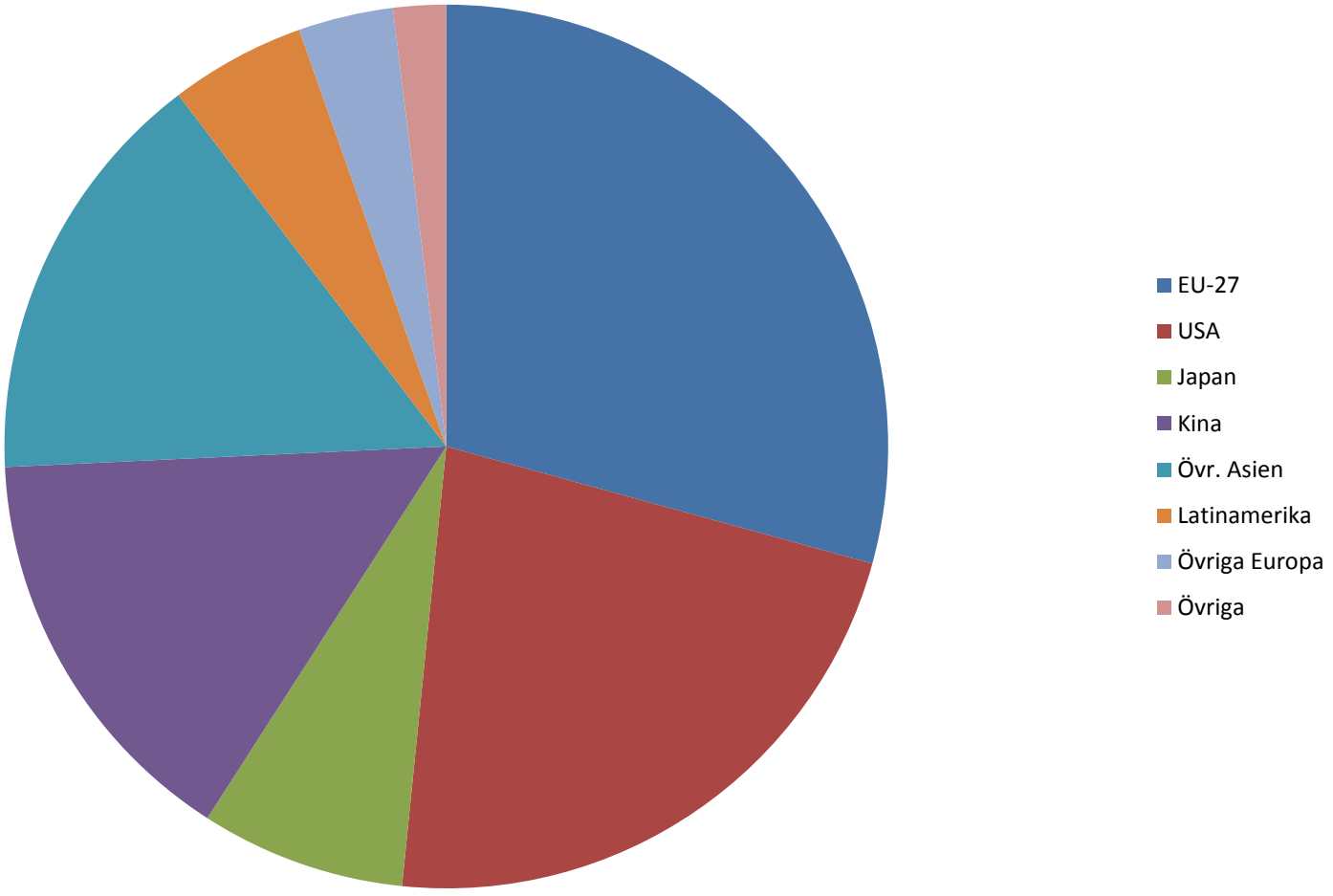
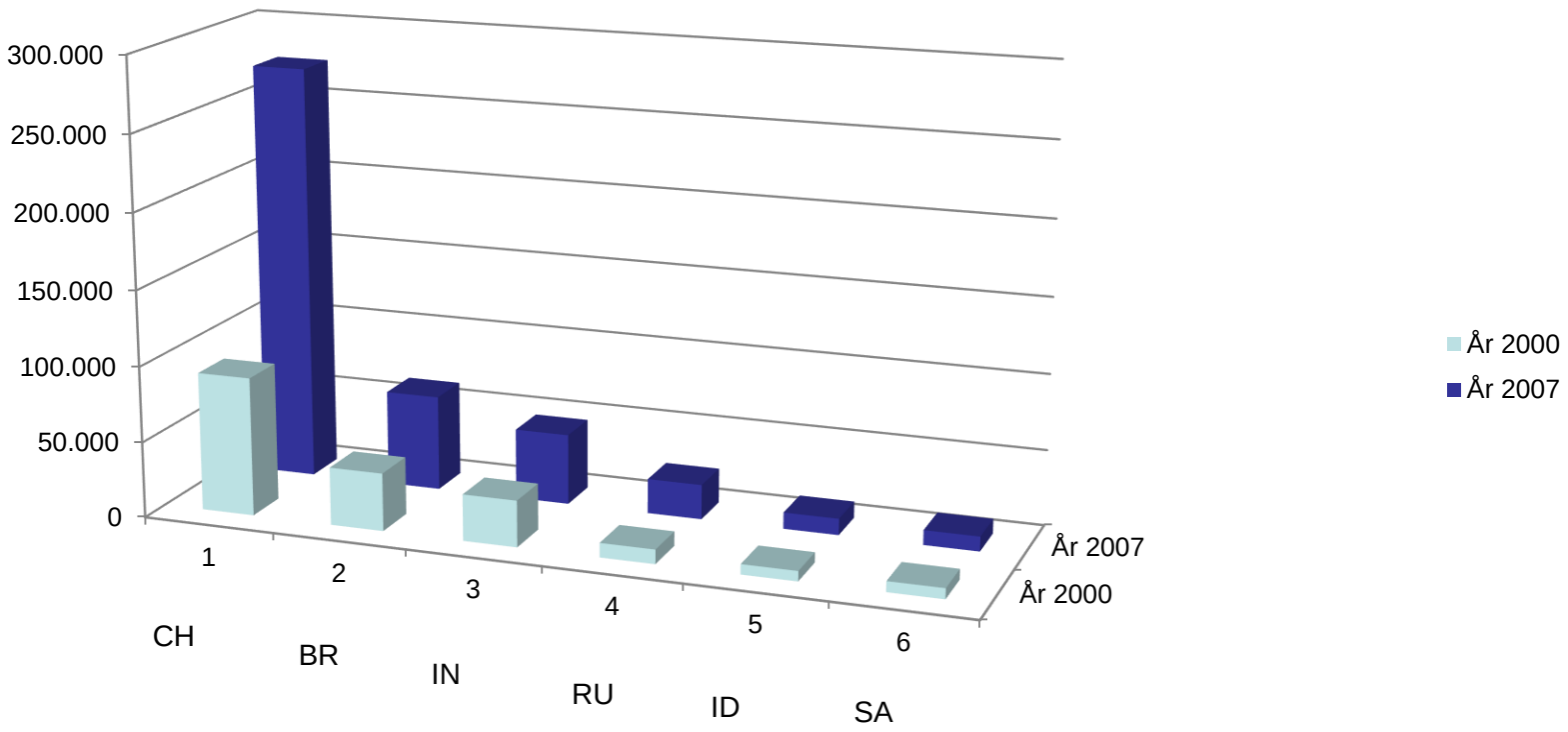
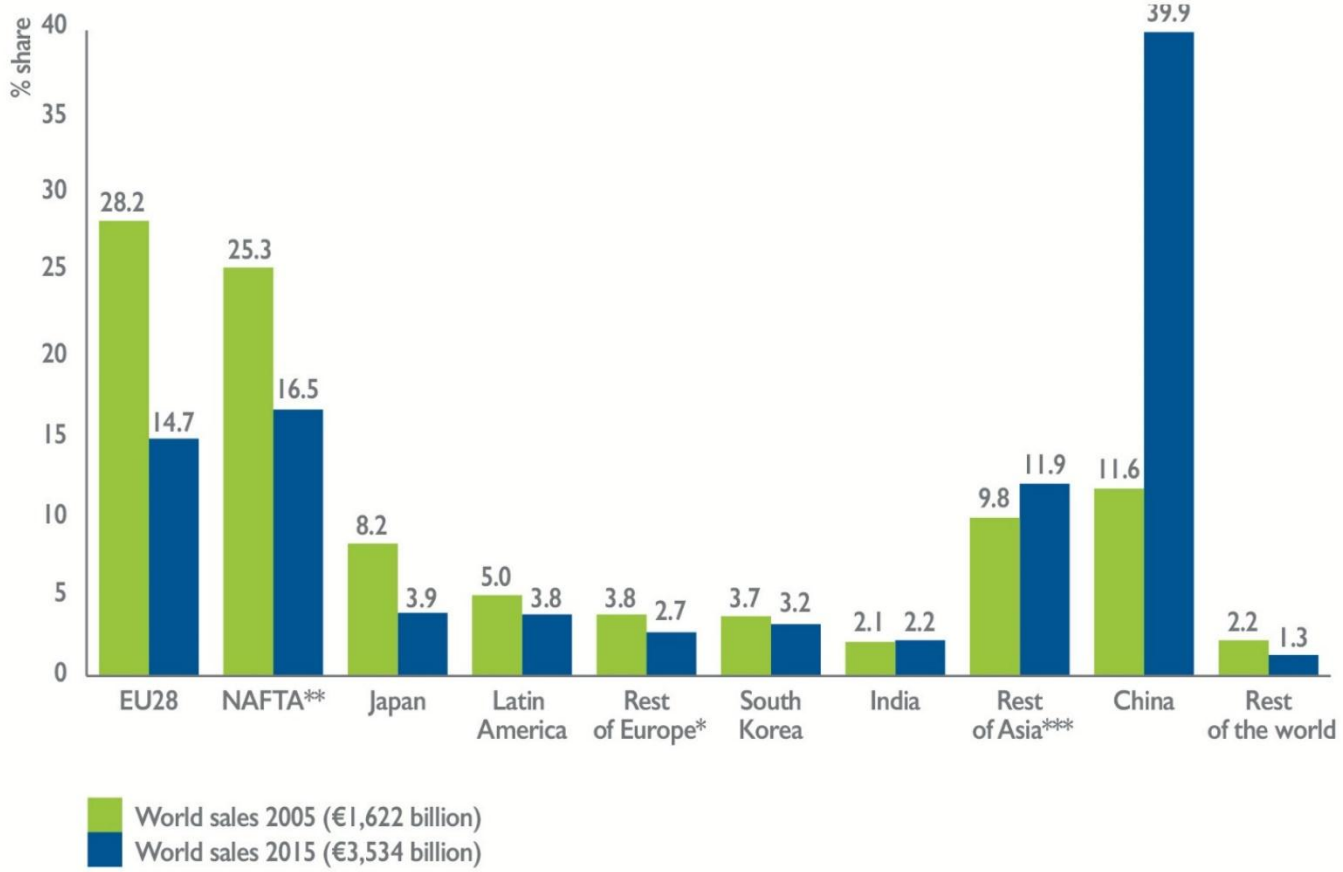
Economic turnover in countries/regions, chemicals production, 2007



Turnover of chemicals industry in BRIICS 2000 and 2007



World chemicals output doubles as emerging markets sales surge



Source: Cefic Chemdata International

* Rest of Europe covers Switzerland, Norway, Turkey, Russia and Ukraine

** North American Free Trade Agreement

Welfare?

Chemicals industry has large impacts on human welfare.

1. **Our lives are more comfortable with chemical products than without.**
2. **Human *health* is negatively affected by production and use of *some* chemicals**
3. **The *environment* is negatively affected by uncontrolled spreading of some chemicals.**

CHALLENGE: Goal conflict! How can we balance these positive and negative factors?

How much, how and for what should we use 200 out of 100 000 chemicals?

Calculating the costs of illness - children in the USA

- The number of children affected by each disease
- The costs per affected child
- The fraction of each disease attributable to environmental causes

- Increase in incidence (10-25 yrs): Cancer 32 %, Autism 273 % (diagn ?), Asthma 75 %.

Cost categories

- Treatment costs
- Lost school and parental work time
- Special education
- Home and institutional care
- Costs of related illnesses in adulthood
- Loss of projected future earnings
- Costs of suffering and death

Economic costs for diseases, children in the USA

- **Costs for Asthma, Cancer, Lead exposure and Neurobehavioral disorders caused by environmental factors:**

  estim. US$ 76.4 Bln/yr

  (Transande and Liu, 2010 $)

Some more examples of costs

- **Health and environmental costs of pesticides8-47 USD per hectare or 4.28 USD per kg of active ingredient. In China it was 186% of the cost of the pesticides.**

- **Unintentional ingestion, inhalation or contact with chemicals caused 346 000 deaths from acute poisonings in 2004.**

UNEP-study on Cost of Inaction

- 70 sources from 28 countries: 57 on health and 24 on environment
- Information is incomplete and several methods have been used
- The overall result is an underestimate

UNEP and WHO's estimates

Included:

- Industrial- and agricultural chemicals
- Acute health damages
- Deaths and reduced working capacity

Not included:

- Effects of dioxins, cadmium, mercury, long term effects of pesticides …..

UNEP and WHO´s estimates, Health

Impacts of chemicals use, globally per year:

0,96 M deaths (1,6 %)

21 M DALYs

(reduced working capacity, etc., Prüss-Üstün et al, 2011)

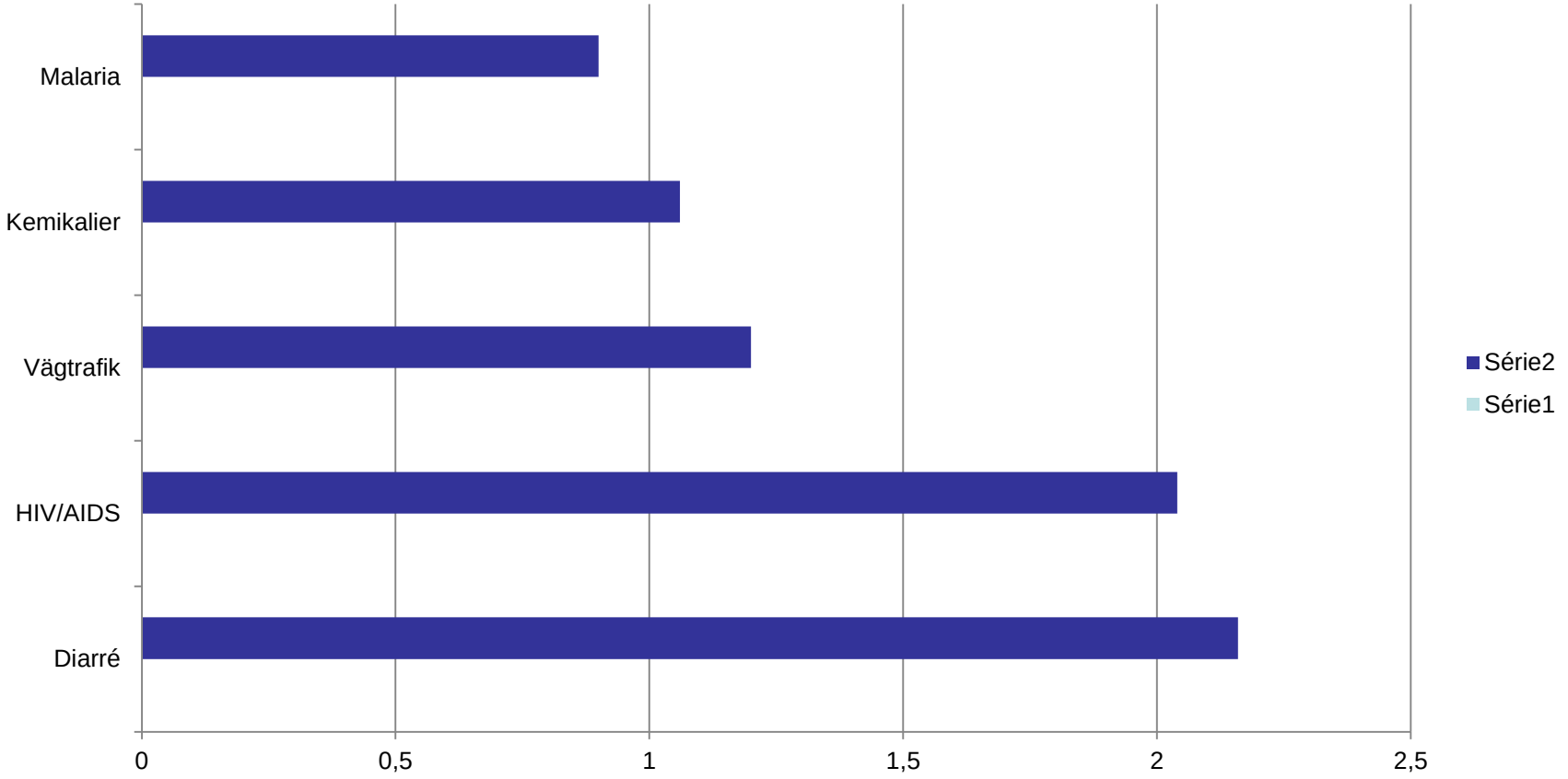
All health impacts related to chemicals:

4,9 M deaths (8,3 %)

(indoor smoke 2 M, ambient air poll 1,2 M, secondary smoking 0,6 M)

86 M DALYs

Causes of death globally – a comparison,
million deaths per year



Economic valuation

- Is it meaningful to compare in one dimension?
- Value of life – individual or statistical?
- All things that are valued by people should be included
- Very difficult to measure
- The Cost of Inaction group decided not to give the number in economic terms – I will

Economic valuation, Health

Own calculation (WHO, low values):

~ 2000 Bln USD per year

Turnover of chemicals industry:

~ 3-4000 Bln USD per year

(Based on: USA 7,4 M USD/lost life (EU 3,6 M, ECHA 2016 5 M for cancer!!) Global GDP/capita (PPP) is ¼ of that of USA)

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Economic valuation, Health

Phasing out lead in petrol globally:

- **2450 Bln USD per year**
- **Benefit cost quota 10/1**
- **“Benefit of Action”**

(Tsai o Hatfield, 2010, UNEP, 2011)

Economic valuation, **Health**

USA, pesticides:

787 M USD per år

(acute poisonings, cancer and other chronic effects, deaths)

(Pimental et al, 1992)

Economic valuation, Environment

VOCs: **236 Bln USD**

Mercury: **22 Bln USD**

(UNEP, 2010)

Economic health costs of pesticides in Africa south of Sahara

- Actual costs for hospital care, medicine and time lost from work
- Not deaths, suffering nor environmental effects

- Data from three countries extrapolated and corrected for local conditions.

- 4,4 Bln USD or 35 USD/capita for affected agricultural workers
- Aid to health care except HIV/AIDS was 4,8 Bln USD

(UNEP, 2012) Total hospital costs 70 USD/capita.

Impacts on economy and development

- Very fragmentary results
- Partly cost based calculations
- Lead in petrol 0,17-0,24 % of GDP in Lebanon
- Air pollution 1.8 % of GDP in Egypt

- Integrated Pest Management (IPM): production +17 % (estimated) in Bangladesh
- IPM pesticides -56 %: production +10 % (realised) in Indonesia

Cost of bone fractures due to Cadmium intake in Sweden

- **Based on calculation of cadmium content in different food. Two dissertations for women and men respectively analysing occurrence of fractures.**
- **PAR women 13 %**
- **PAR men, 7 %**
- **(PAR total, 11 %)**

Cost calculation

- **Total costs for fractures in Sweden:**

  (hospital, other care, reduced life quality, death)

  3.9 Bln € year

- **3.9 * 0.11 = 0.42**
- **Cost caused by intake of cadmium in food:**

  420 M € year

Swedish population is 0.001-0.0015 of global population

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Costs and benefits of REACH

- There are several studies of potential health benefits, and of administrative and adaption costs, of REACH
- The overall conclusion indicate benefit cost ratios at the level of 10/1
- Fees and administrative costs for chemicals industry resulting from Swedish chemicals policy is on the level of less than 1 in 500 of the chemicals industry's turnover, including affected downstream users.

Net value of a chemicals policy?

Negative health and environmental benefits are considerable and the costs for industry and consumers are lower

…. a well designed chemicals policy would increase human welfare!

How much, how and for what should we use 200 out of 100 000 chemicals?

Summary

- We depend on chemicals for our modern way of life
- Some chemicals cause severe health and environmental problems
- Chemicals need to be regulated
- Cost for industry resulting from a sound chemicals policy is much less than the benefits of such policy
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