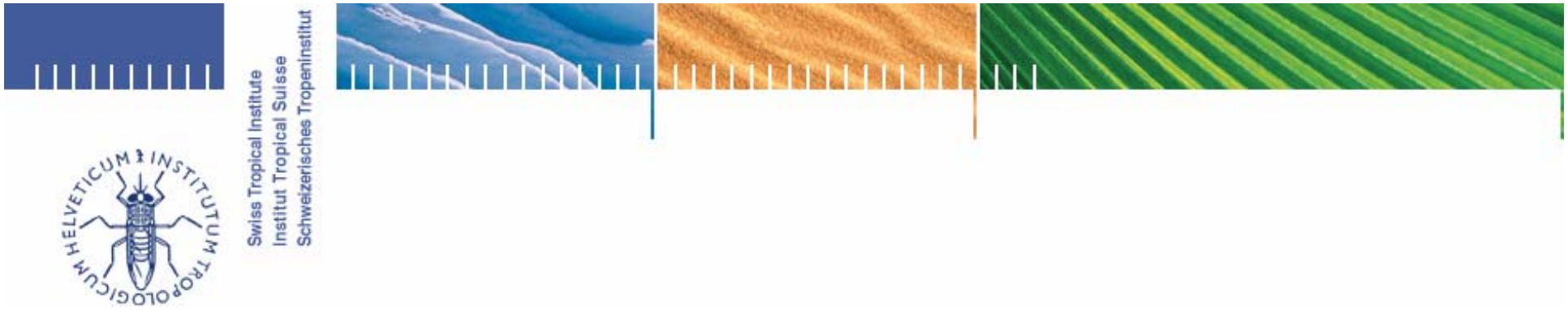

Unsafe water and lack of sanitation

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Presentation Overview

- The problem
- The range of solutions
- The costs of selected solutions
- The benefits of selected solutions
- Benefit-cost ratios
- Interpretation of results
- Issues in scaling up the solutions

The problem: the numbers

- In 2000 people lacking
  - safe accessible water supply **1.1 billion**
  - access to a near-by sanitary latrine **2.6 billion**
- More than 90% live in **Asia** and **Africa**
- >70% live in **11 countries**
  - India, China, Indonesia, Nigeria, Bangladesh, Pakistan, Ethiopia, Vietnam, Brazil, Democratic Republic of Congo, Afghanistan

The problem: unsafe water

- Water cuts across many development activities
  - agriculture, fishing, large-scale industry, home industry, energy ...
- Increasing freshwater scarcity
  - Population density & unsustainable consumption
  - Rainfall patterns and evaporation
  - Glaciers melting
  - Water pollution
    - agriculture, aquaculture, industry, household waste

The problem: unsafe water

- Consequences of lack of access to safe water
  - Diseases
    - Water-based: micro-organisms and chemicals
    - Water-related (water hosts disease vectors)
  - Access
  - Stifling the ability to develop
    - Production decisions
    - Healthy time available and time use
  - Intangible impacts

The problem: inadequate sanitation

Sanitation

Safe treatment and/or disposal of human waste and domestic waste water (grey water)

The problem: inadequate sanitation

- **Impacts**
  - Health
  - Water resources
  - Land quality
  - Access time
  - Intangibles: comfort, prestige, security...
  - Life decisions
  - Fertiliser or biogas
  - Tourism and FDI

Water & sanitation in the Millenium Development Goals

- W&S MDG targets — goal 7
- Health and nutrition targets — goals 1, 4, 5, 6
- Environmental sustainability — goal 7
- Gender equality — goal 3
- Primary school attendance — goal 2
- Overall poverty rates — goal 1

The solutions: Joint Monitoring Programme definitions

Inter-vention	Improved	Unimproved
Sanitation	• Flush to piped sewer system or septic tank • Pit latrine • Ventilated Improved Pit-latrine (VIP) • Pit latrine with slab • Composting toilet	• Flush to elsewhere • Pit latrine w/o slab, or open pit • Bucket • Hanging toilet or latrine • No facilities, bush or field

The solutions: Joint Monitoring Programme definitions

Inter-vention	Improved	Unimproved
Water supply	• Piped water into dwelling, plot, or yard • Public tap / standpipe • Tubewell / borehole • Protected dug well • Protected spring • Rainwater collection	• Unprotected dug well • Unprotected spring • Cart with small tank / drum • Tanker truck • Bottled water • Surface water (river, dam, lake, pond, stream, canal, irrigation)

Four sides of the solution

1. **Hygiene**
   - Hand washing
   - Education
2. **Sanitation**
   - Sanitary pit latrine
   - Septic tank
   - Household sewer connection
3. **Water supply**
   - New water supply
   - Improved water distribution in community
   - Piped household water supply
4. **Water quality**
   - Treatment at community source
   - Treatment at water plant for household piped water supply
   - Treatment at point of use using chemical, pasteurization, filter, boiling, or solar disinfection techniques
   - Combined with safe water storage

Costs and benfits of the solution

- Few cost-benefit studies
- WHO study
  - Global and regional costs and benefits of selected W&S interventions
    - Water supply
    - Water supply and sanitation
    - Water supply and sanitation + low-cost, simple intervention to improve drinking water quality
  - Evaluation for MDG target and universal access

Unit costs of solutions (US$)

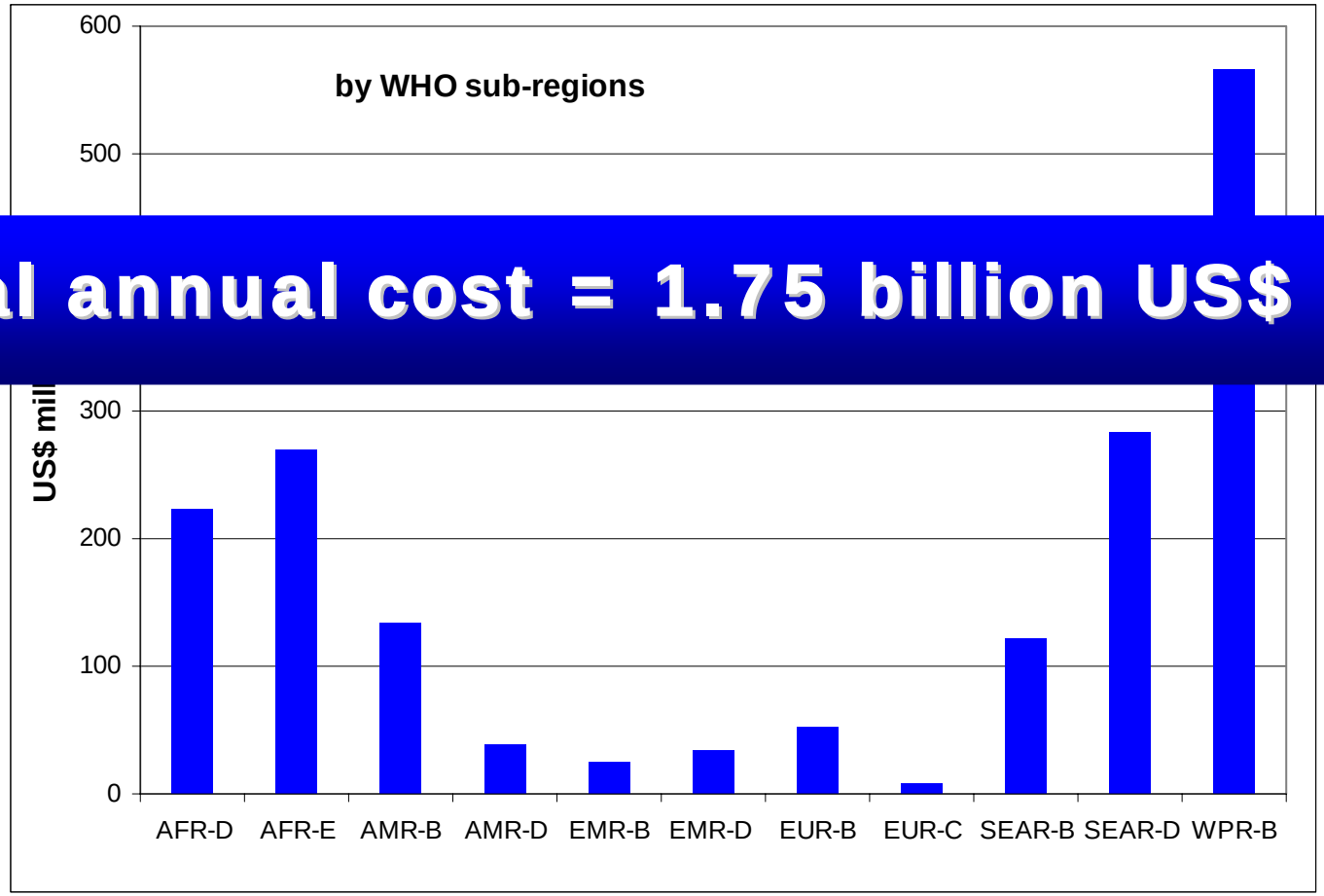
Water supply	Region	Investment costs / capita	Annual total costs / capita
Basic improvement *borehole, standpost, dug well, rainwater harvesting*	Asia	17 – 64	1.26 – 4.95
	Africa	21 – 49	1.55 – 3.62
	LA&C	36 - 55	3.17 – 4.07
Household connection	Asia	92	4.78 – 9.95
	Africa	102	5.30 – 12.75
	LA&C	144	7.48 – 15.29

Unit costs of solutions (US$)

Sanitation	Region	Investment costs / capita	Annual total costs / capita
Basic improvement *VIP, small pit latrine, pour flush*	Asia	26 – 50	3.92 – 5.70
	Africa	39 – 91	4.88 – 6.21
	LA&C	52 – 60	5.84 – 6.44
Septic tank	Asia	104	9.10
	Africa	115	9.75
	LA&C	160	12.39
Household connection	Asia	154	8.99 – 11.95
	Africa	120	7.01 – 10.03
	LA&C	160	9.34 – 13.38

Total costs of solutions (US$)

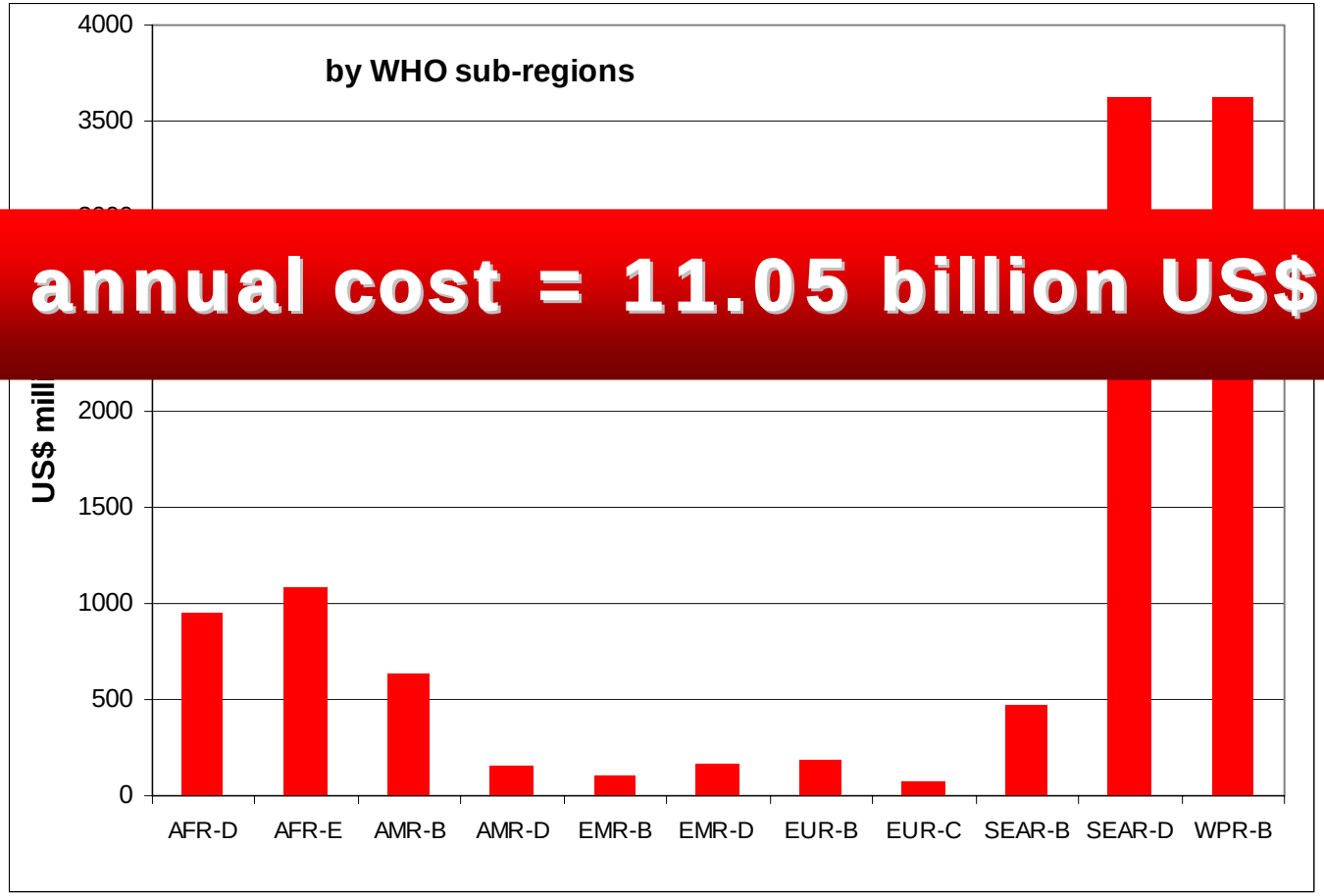
Water Target MDG (basic)



Global annual cost = 1.75 billion US$

Total costs of solutions (US$)

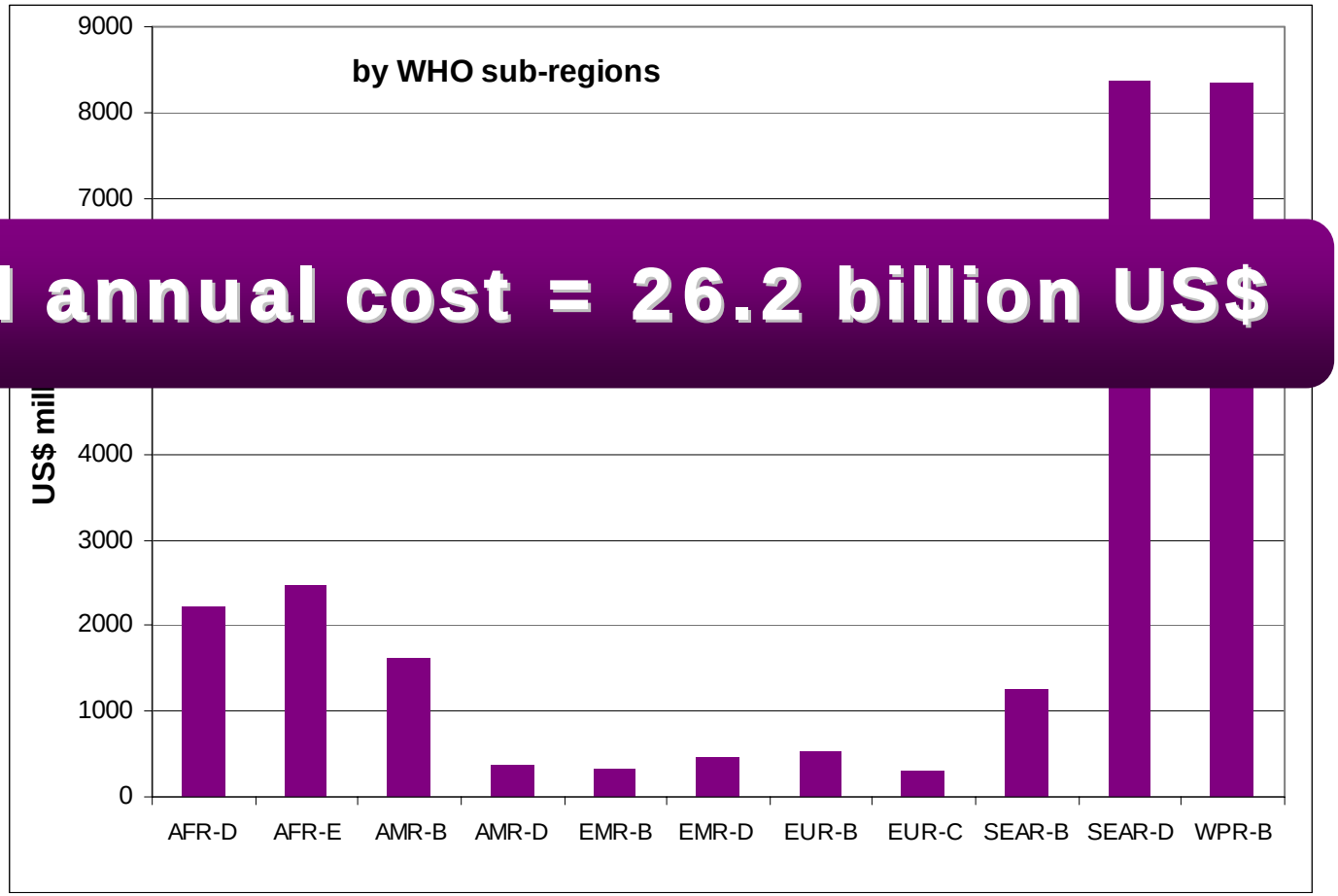
W&S Target MDG (basic)



Global annual cost = 11.05 billion US$

Total costs of solutions (US$)

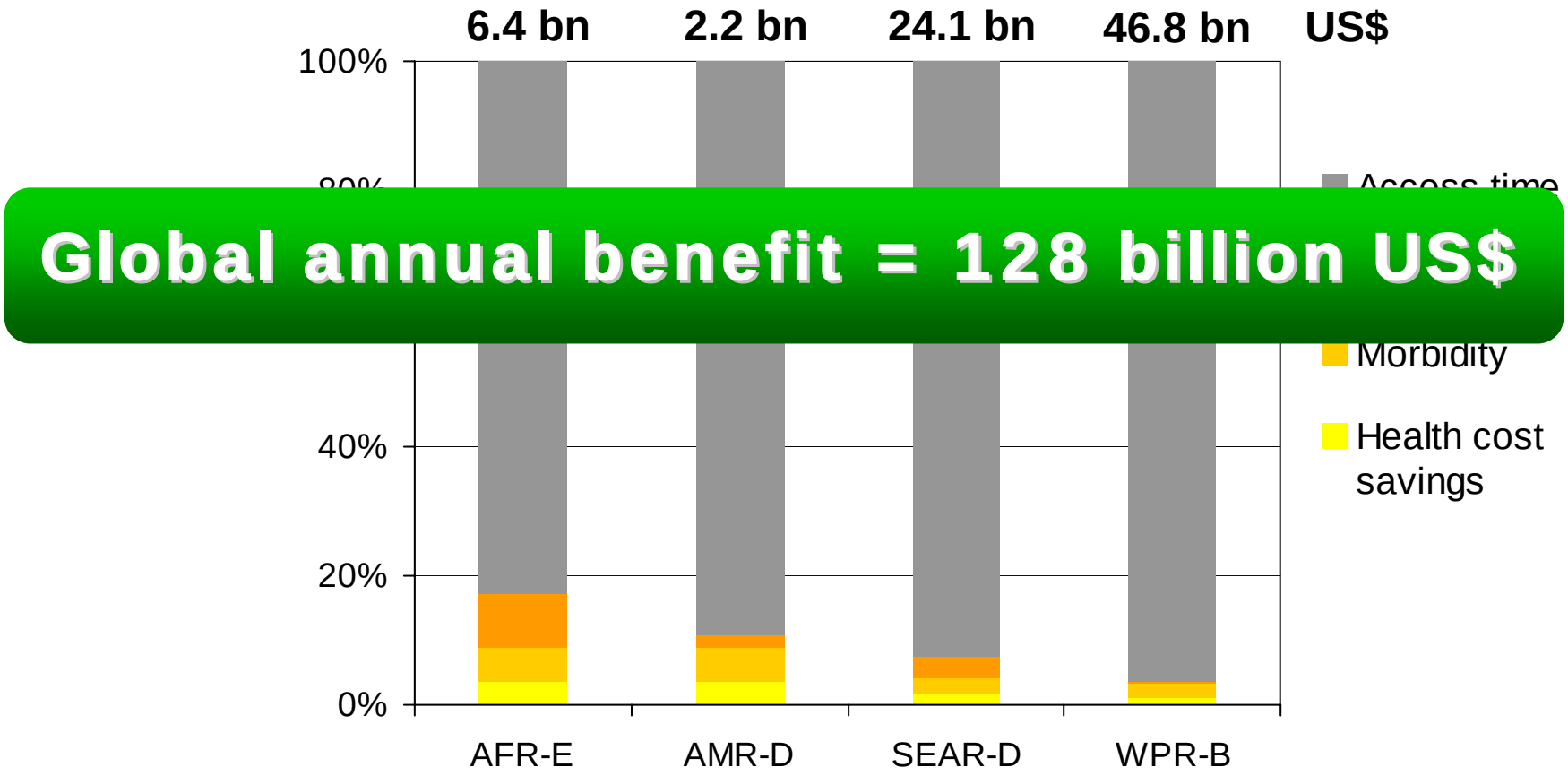
W&S 100% Coverage + Water Treatment (basic)



Global annual cost = 26.2 billion US$

Total benefits of solutions (%)

W&S Targets MDG (basic)

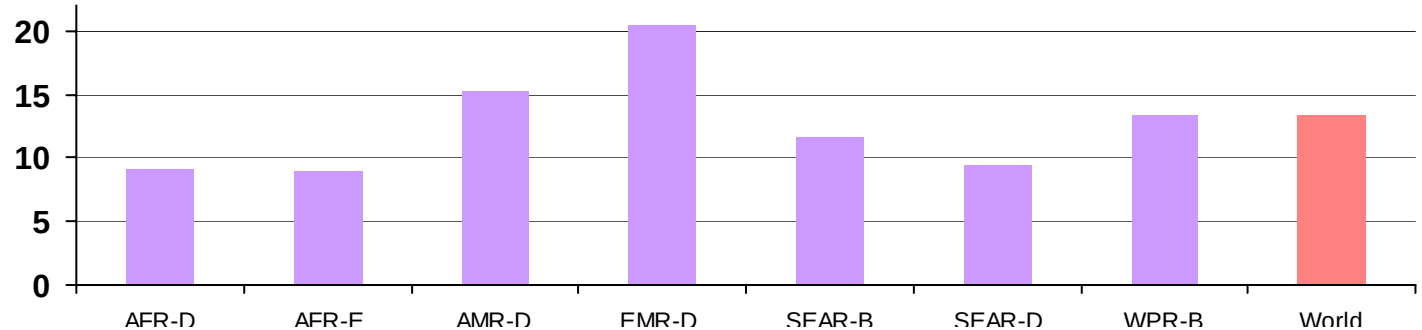


Global annual benefit = 128 billion US$

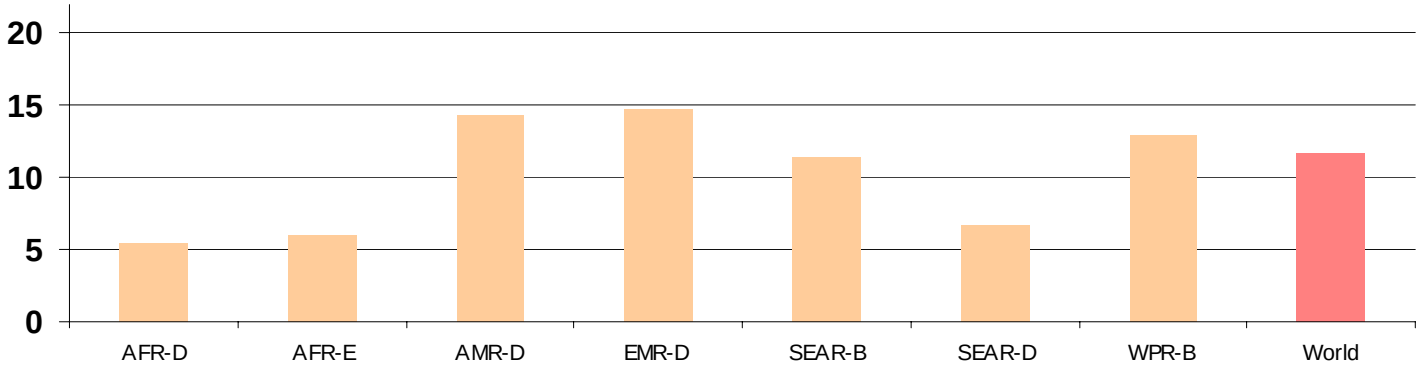
Benefit-cost ratios: W&S MDG

DALY = US$ 1,000

DALY = US$ 5,000



Value Productivity & VOSL



Interpreting the results

General findings

- Per capita costs: sanitation > water, but
- Benefit-cost ratio for sanitation > water
  - Additional health benefits
  - Time benefits spread across more population
- Water treatment brings more health benefits, but limited impact on benefit-cost ratio

Interpreting the results

Conservative	Optimistic
• Decision makers prefer financial measures • Main benefit time savings • Cost results based on lowest cost improvements	• Many benefits excluded ➢ e.g. water cost savings, less direct, intangible and social benefits, etc. • Focus on quick-win interventions

Scaling up the solutions

- **Priority setting processes**
  - Are cost-benefit results disseminated widely?
  - Do decision makers understand and appreciate cost-benefit analysis?
- **Financing**
  - Who is able and willing to fill the financing gap?
  - How much can households benefit financially from the interventions?

Scaling up the solutions

- **Other issues**
  - Institutional support
  - Gaining the full developmental benefits
  - Integrating with other water resource development activities
- **Natural constraints**
  - Availability of new water sources?
  - Sustainability of existing and new water sources?