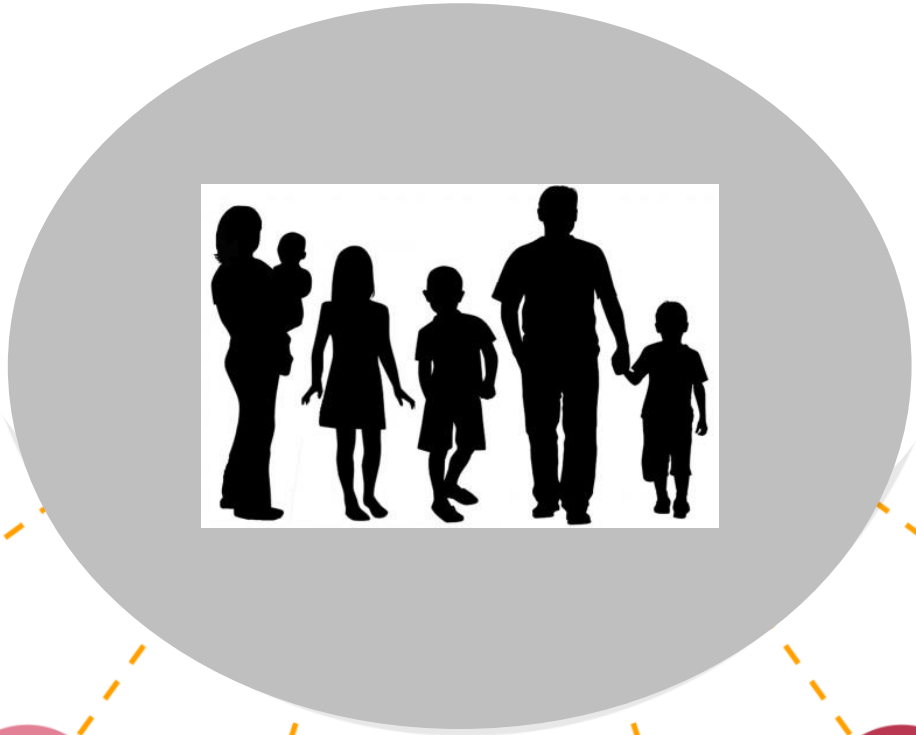

Monitoring and mitigating environmental health inequalities

Matthias Braubach, WHO European Centre for Environment and Health



European Region

Many environmental hazards affect all or parts of the population



AIR POLLUTION
including indoors and outdoors



CLIMATE CHANGE



INADEQUATE WATER, SANITATION
and hygiene



BUILT ENVIRONMENTS
including housing and roads



CHEMICALS
and biological agents



AGRICULTURAL PRACTICES
including pesticide-use, waste-water reuse



RADIATION
ultraviolet and ionizing



COMMUNITY NOISE



OCCUPATIONAL RISKS



What is EH monitoring?

The **Environmental Health Monitoring System** is a comprehensive system of regularly conducted collection of **exposure and health data**, and assessment of risks and effects on public health.

An **integrated environmental health surveillance system** is the systematic, ongoing collection and analysis of **information related to disease and environment**, and its dissemination to individuals and institutions.

Environmental health indicators describe the **link between the environment and health**. They are **based on known or plausible cause-and-effect relationships** between the environment and health.

What is EH monitoring?

EH Indicators are needed, for example:

- to help monitor trends in the **state of the environment** (...);
- to monitor **trends in health**, resulting from (...) environmental risk factors (...);
- to monitor and assess the **effects of policies** (...) on environmental health; (...)

https://iris.who.int/bitstream/handle/10665/66016/WHO_SDE_OEH_99.10.pdf;sequence=1

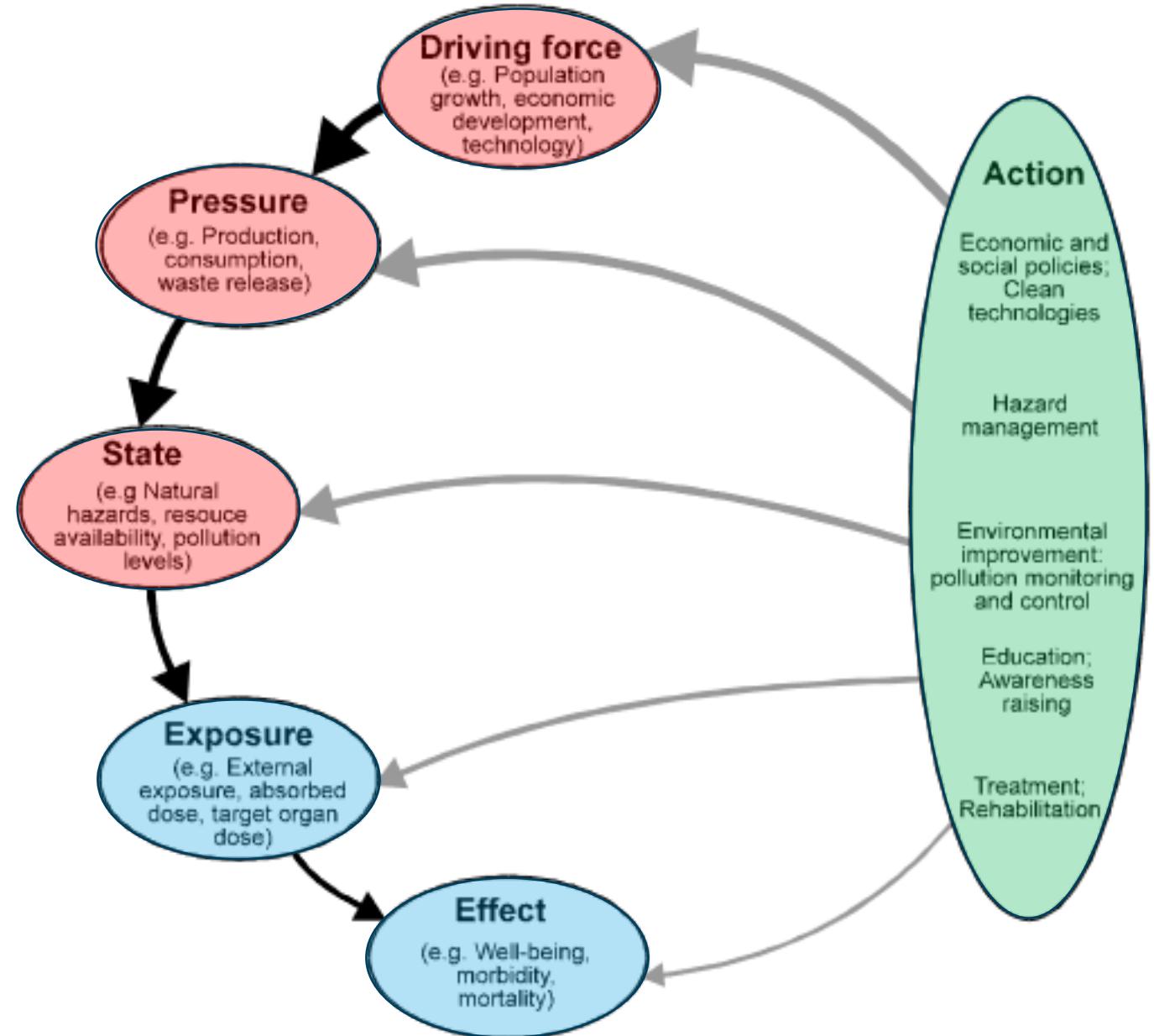


Figure 1. The DPSEEA framework

Where to go for EH monitoring?

Data sets that support environmental monitoring and surveillance



- Air pollution
- Noise
- Water quality
- Soil contamination
- Chemicals
- Climate change
- Emissions

...

- *Very little information on health impacts and consequences*
- *Often separate data sets*

Data sets that support health monitoring and surveillance



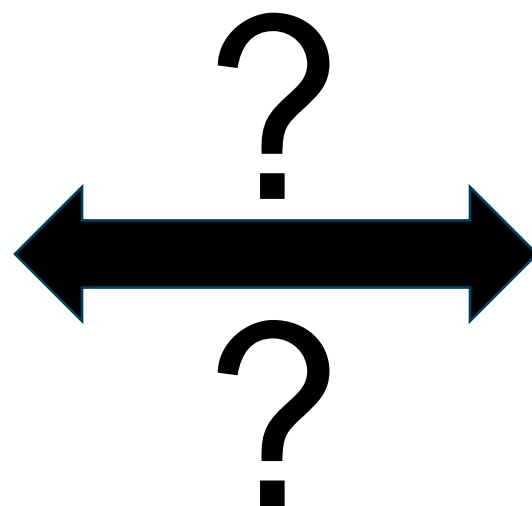
- Disease stats and health reporting
- Mental health outcomes
- Injuries
- Demographic information

...

- *Very little information on causes and determinants*
- *Often protected (individual data)*

Where to go for EH monitoring?

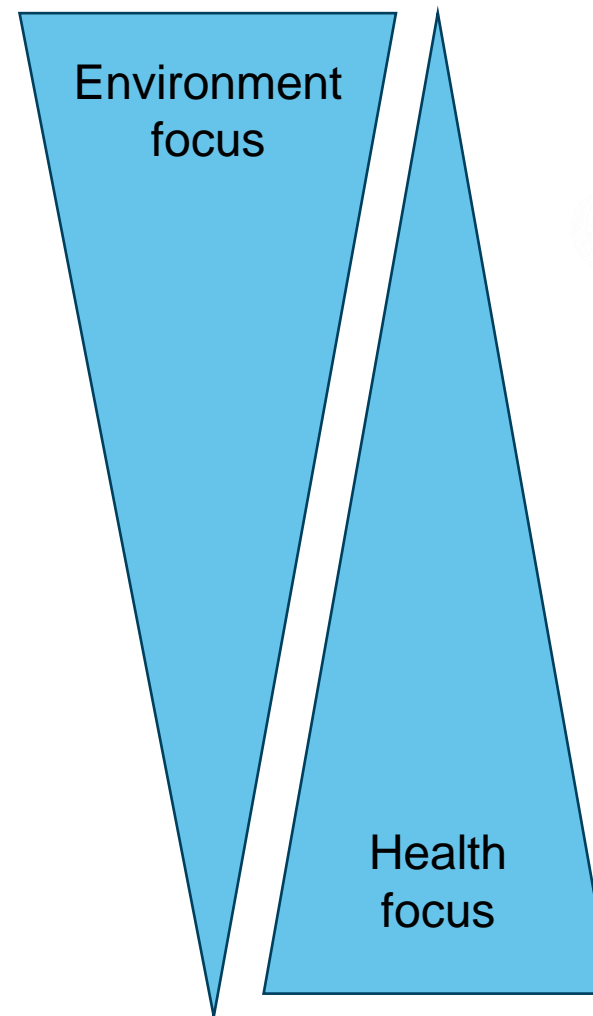
- Very few data source really monitor environment and health jointly
- Focus often on “monitoring environmental risks that have been proven to affect health”
- Focus on risks and harm, less attention to positive health determinants (“enablers”)



Where to go for EH monitoring? WHO and EEA data

- **European Environment Agency**
- **European Environment and Health Atlas**
- **European Climate and Health Observatory**

- **WHO Environmental Burden of Disease work**
- **WHO Global Health Observatory**
- **European Health Information Gateway**
- **WHO lead on SDG indicators**



Where to go for EH monitoring? Other sources

Europe

EU
JRC
Eurostat
Eurofound

Global

IHME Global Burden of
Disease

National

e.g.
Belgian Health Interview Survey

City

ISGlobal ranking
Urban Audit
URHIS
Healthy Cities network

EH inequality monitoring – increasing complexity and data requirements



Who we are ▾

Where we work ▾

What we do ▾

Publications & data



Home / News, Stories & Speeches / story

28 JUL 2022 | STORY | ENVIRONMENTAL LAW AND GOVERNANCE

In historic move, UN declares healthy environment a human right

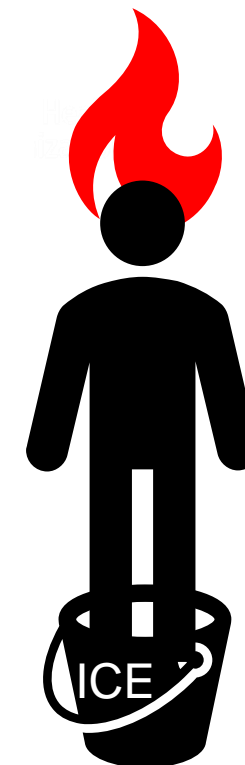
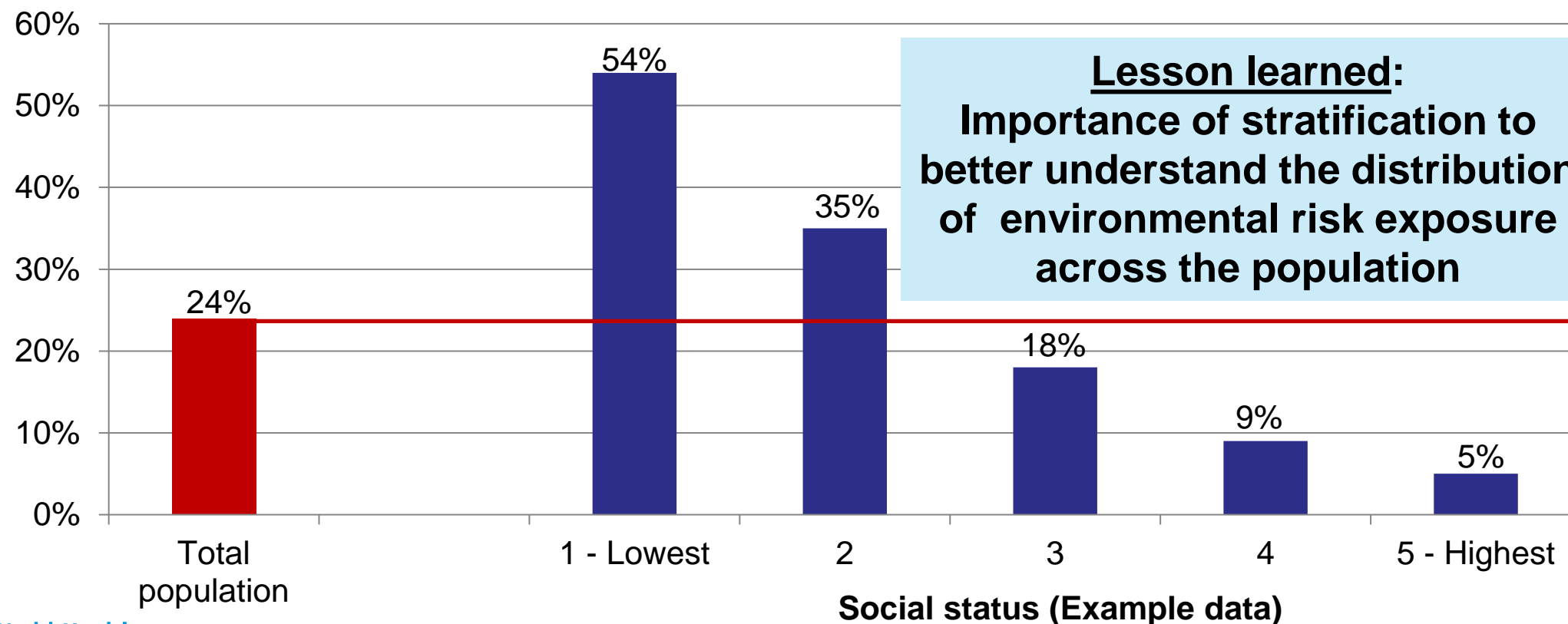
Photo by Abigail Keenan/Unsplash

The United Nations General Assembly declared today that everyone on the planet has a right to a healthy environment, a move backers say is an important step in countering the alarming decline of the natural world.



Monitoring inequalities: Exposure to environmental risks is not equal across the population!

Example data: Exposure to environmental risk in %
Total population and by social status



Lesson learned: Data sources for EH inequality monitoring are limited

National surveys and databases are very **diverse** (definition, categories / thresholds, survey coverage...)

⇒ International surveys preferred due to consistency (unless country focus)

Environmental or environmental health surveys often do not enable adequate **stratification** by income, sex, age, residential location etc. (esp. in combination)

⇒ Limited use of available surveys / data

⇒ Data often based on self-reported information, rather than measured data (*example: air pollution*)

Data limitations in Eastern part of the WHO European Region

⇒ western-European bias of data

HISIA: Belgian Health Interview Survey – Interactive Analysis enabling stratification



Belgian Health Interview Survey

Module: Environment - Update 2018

First select an indicator

Env risk factor

HE0201_1: Annoyance at home from air pollution

Select year

2018

Year (survey wave)

Select geographical level

Provincial level

All provinces

Spatial stratification

Select no/one/two parameter(s)

Income level

All income levels

Social stratification

--- Make your selection ---

Submit Query

Percentage of the population aged 15 years and over who was annoyed at home in the past 12 months from air pollution
All provinces , Belgium 2018

Province=Antwerpen

Province=Brussels

Income level	Year		N(*)
	Crude %	95% CI	
Quintile 1	26.7	(13.4-40.0)	90
Quintile 2	19.4	(9.5-29.3)	103
Quintile 3	19.8	(9.7-29.8)	148
Quintile 4	12.9	(6.8-18.9)	222
Quintile 5	15.3	(8.8-21.8)	244
Total	17.3	(13.6-21.1)	807

Income level	Year		N(*)
	Crude %	95% CI	
Quintile 1	29.4	(24.0-34.8)	426
Quintile 2	26.4	(21.0-31.9)	360
Quintile 3	?	29.1 (23.9-34.2)	429
Quintile 4	29.5	(23.5-35.5)	434
Quintile 5	26.8	(21.5-32.2)	483
Total	28.3	(25.8-30.7)	2132

Percentage of the population aged 15 years and over who was annoyed at home in the past 12 months from noise from road traffic
All provinces , Belgium 2018

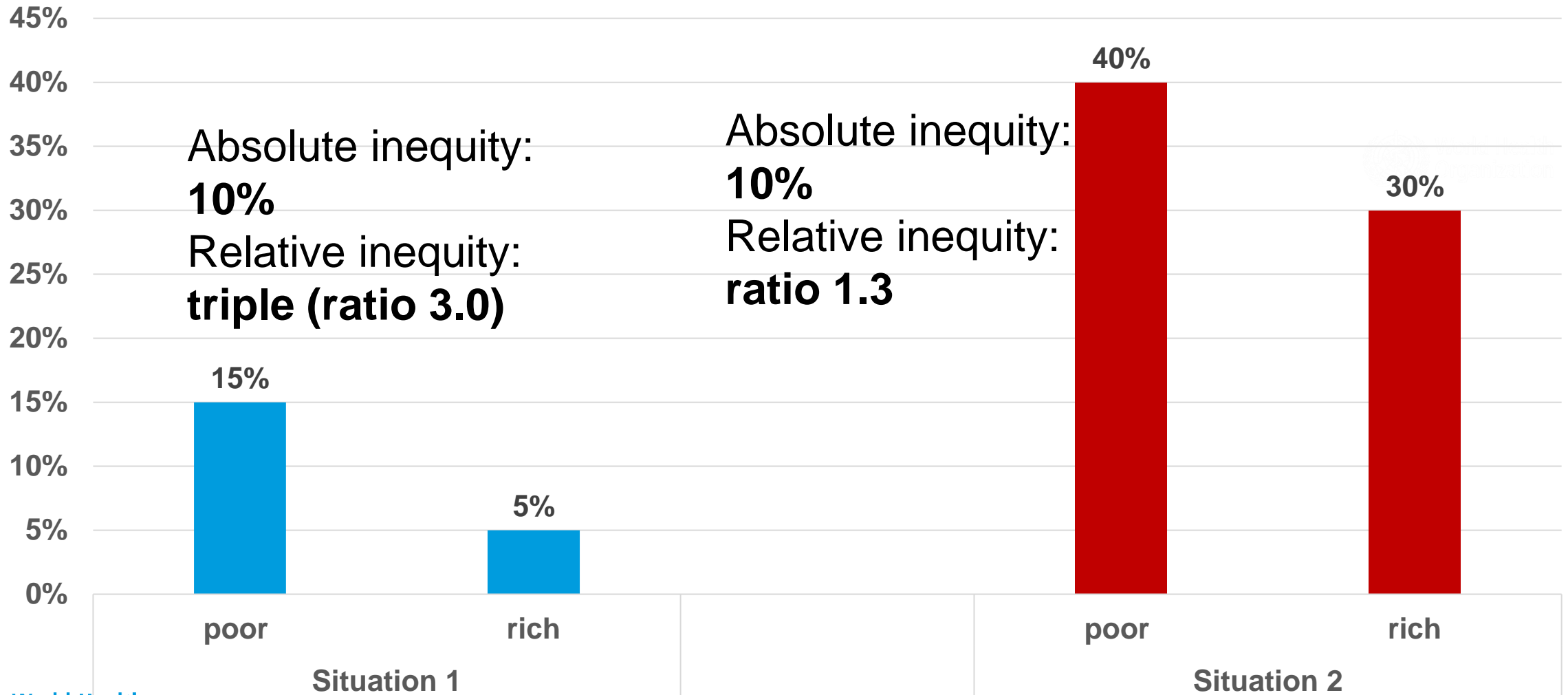
Province=Antwerpen

Province=Brussels

Income level	Year		N(*)
	Crude %	95% CI	
Quintile 1	26.4	(13.2-39.5)	91
Quintile 2	22.8	(11.8-33.7)	103
Quintile 3	16.3	(7.5-25.1)	148
Quintile 4	11.1	(5.5-16.6)	222
Quintile 5	11.0	(5.4-16.7)	244
Total	15.3	(11.8-18.8)	808

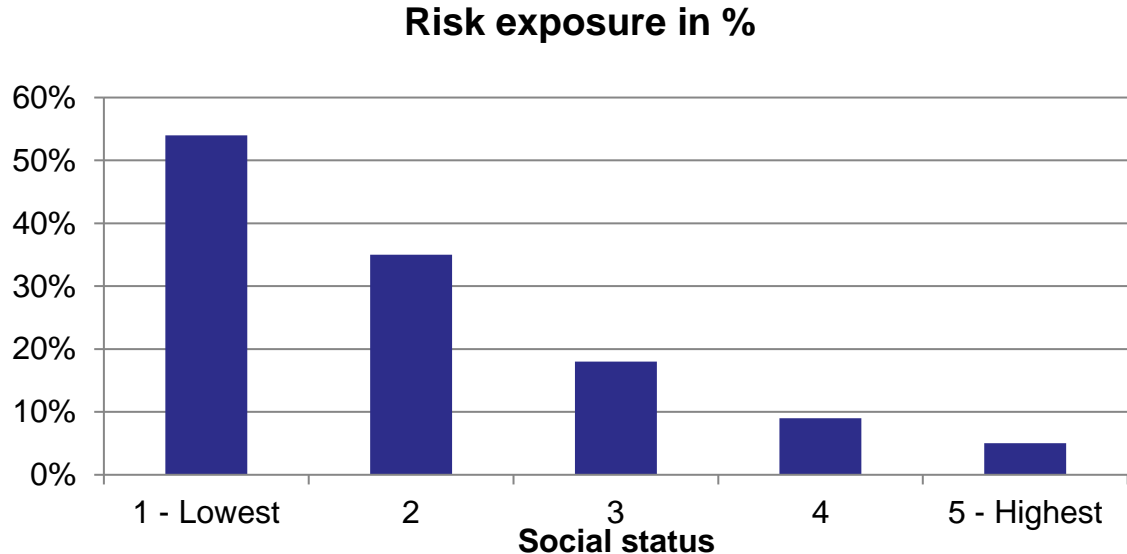
Income level	Year		N(*)
	Crude %	95% CI	
Quintile 1	23.9	(19.1-28.7)	428
Quintile 2	31.4	(25.4-37.3)	360
Quintile 3	?	26.4 (21.4-31.4)	431
Quintile 4	28.9	(22.9-35.0)	434
Quintile 5	21.3	(16.6-26.1)	487
Total	26.1	(23.7-28.5)	2140

Lesson learned: Relative or absolute equity dimensions? Both!



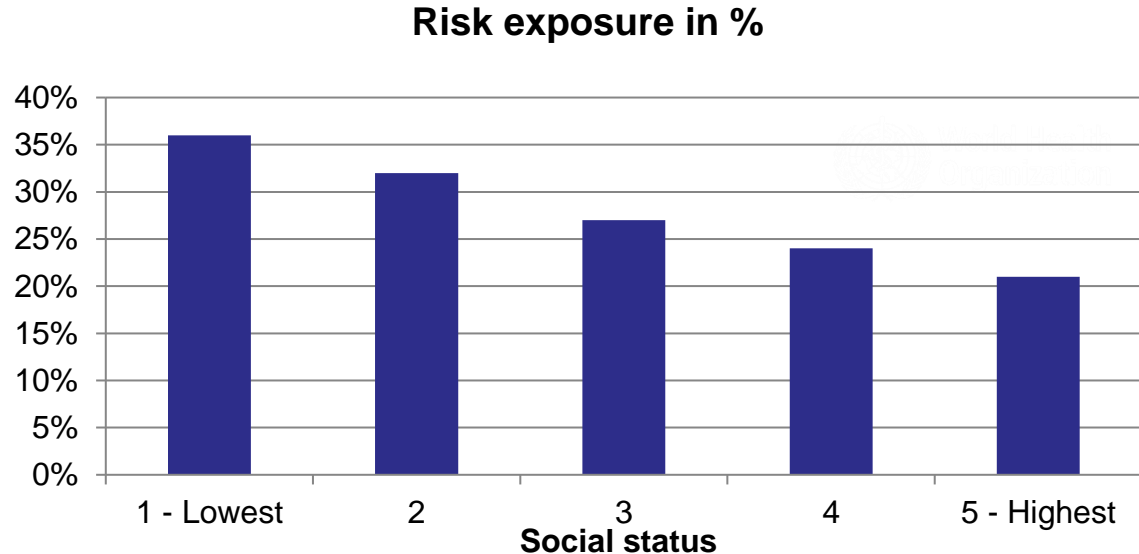
Lesson learned:

- > Intra-country inequality is important, not inter-country differences
- > National equity assessments can help to plan action



Strong inequality in risk exposure; low risk in advantaged group

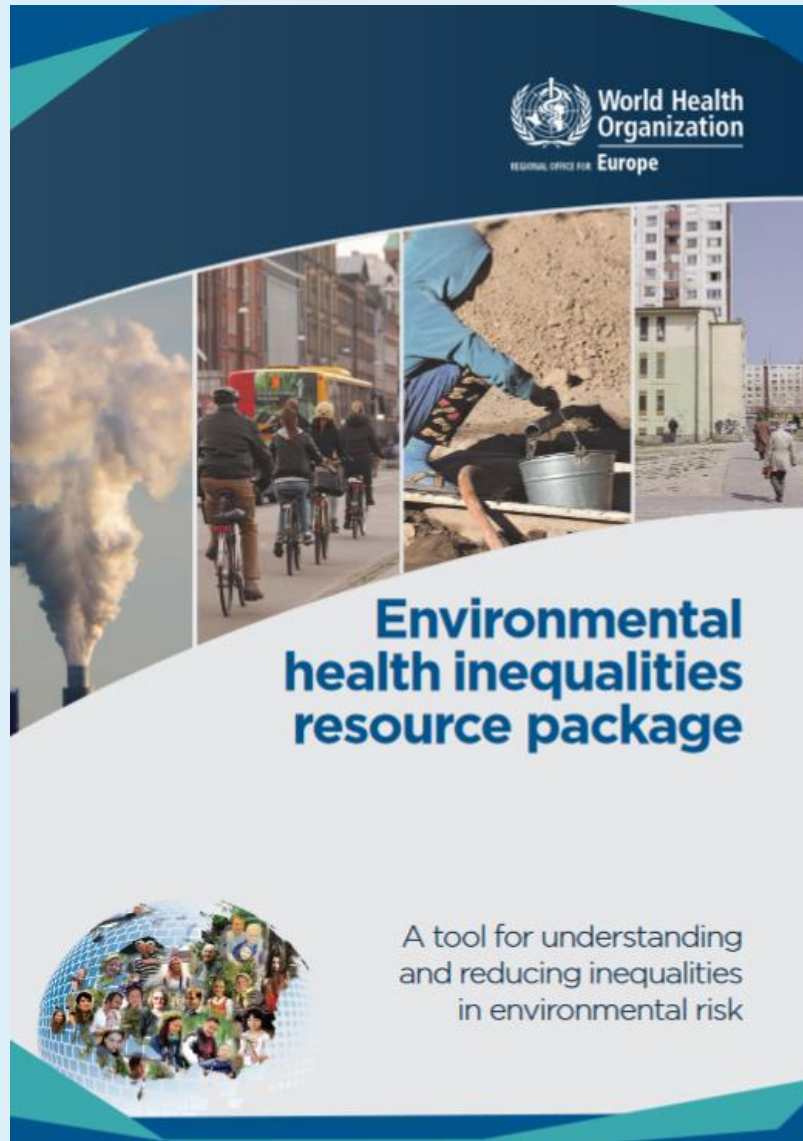
⇒ Action: targeting the most exposed / vulnerable subpopulations to ensure healthy environments for all



Inequality less strong; significant risk also in advantaged group

⇒ Action: general improvement of environmental conditions to ensure healthy environments for all

Environmental health inequalities



1. Introduction and objective	1
The relevance of equity for environment, health and well-being	1
No one left behind: preventing inequality nationally and locally.....	1
Terminology and definitions.....	2
2. Why environmental inequality has a critical effect on human health.	3
Example 1. Water supply and sanitation.....	3
Example 2. Air pollution	4
Example 3. Inadequate housing and fuel poverty.....	5
3. Defining the issue: key concepts and terminology	7
4. Monitoring and acting on environmental health inequalities	9
Step 1. Checking environmental standards	9
Step 2. Gathering environmental data.....	10
Step 3. Undertaking equity-sensitive analysis of exposure	11
Step 4. Using evidence for action.....	15
5. Guidance and tools on monitoring, assessment and governance	17
Key work on environment and health, with a focus on urban settings	17
Key work on environmental health and inequality	17
Tools, manuals and capacity-building resources	19
6. Environmental health action areas and municipal processes	21
Environmental health action areas and related interventions	21
Municipal processes and mandates to achieve environmental equality	23
7. Key messages on action and equitable policies.	25
8. Questions for further research and practice evaluation	26
Future research priorities	26
Priorities for evaluation of local interventions and practical lessons	26

Where to go for EH inequality monitoring?

Health equity

- WHO Health Equity Dataset with some env determinants
- European Quality of Life Survey with some env determinants

Environmental inequalities / Environmental justice

- EEA data and reports on env inequality / vulnerability
- Global Atlas of Environmental Justice (illustrative case studies)

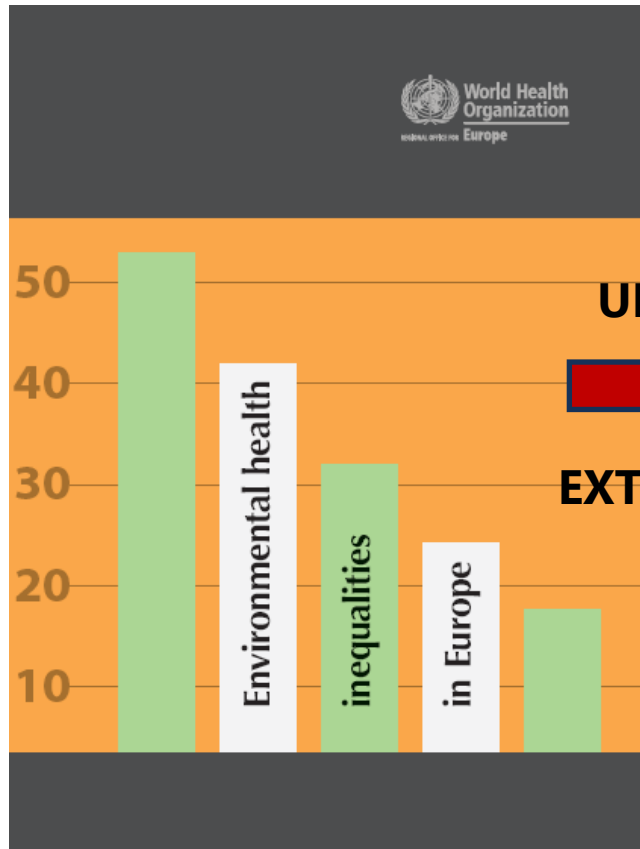
EH inequality

- WHO EH inequality reports, fact sheets, country profiles
- Environmental inequalities in national reporting on the 2030 Agenda for Sustainable Development

Special Rapporteur on the human right to a healthy environment

Monitoring of environmental health inequalities: from Assessment Reports to Fact Sheet series – for increased flexibility

2012



2019



2022 onwards



UPDATE

EXTENSION

WHO EH inequality fact sheets: data on environmental equity gaps within countries

Environmental health inequalities: fact sheet series

Inequalities in access to at least basic sanitation services

Conclusions and suggested mitigation actions

The inequality gap between rural and urban populations relying on less than basic – and therefore unsafe – sanitation services varies widely. Some countries show only marginal differences, while others show strong rural/urban inequalities, up to an absolute prevalence difference of 22 percentage points and an equity ratio of 17:1.

Improvements in access to at least basic sanitation services can be observed since 2000 in the Euro 3 and Euro 4 subregions, and since 2005 in the Euro 2 subregion. However, relative inequalities have increased slightly in the Euro 2 and significantly in the Euro 4 subregion.

Analysis of wealth inequalities reveals significant gaps between wealthier and poorer population groups. Across 12 of 16 countries with available data, reliance on less than basic sanitation services is highest in the poorest wealth quintiles and shows a clear social gradient.

The integrated analysis of socioeconomic and spatial inequalities suggests that poverty is the most important determinant of relying on less than basic sanitation services. In 10 countries, the most disadvantaged group is the rural poor and in six countries the urban poor. Interventions to close persisting inequality gaps in access to at least basic sanitation should therefore prioritize those disadvantaged groups.

Suggested mitigation actions are:

- systematically identifying inequality gaps and their potential causes at national and local levels;
- undertaking targeted assessments of inequalities related to drinking-water service provision and establishing and supporting equitable access action plans (8, 9);
- improving monitoring systems and data availability, particularly for socioeconomic and sociodemographic inequalities, to improve the evidence base and to target interventions effectively;
- setting and enforcing specific equitable access targets and implementation plans under the Protocol on Water and Health (4);
- improving the capacity of water operators to embrace and consider equity considerations in planning, management and operation of services;
- establishing procedures and capacities in rural communities to provide safely managed drinking-water services; and
- including equity considerations as a prerequisite in the formulation of new programmes and projects on drinking-water infrastructure and management.

References

1. Environmental health inequalities resource package: a tool for understanding and reducing inequalities in environmental risk. Copenhagen: WHO Regional Office for Europe; 2019 (<https://apps.who.int/iris/handle/10665/346223>, accessed 16 December 2021).
2. JMP global database [online database]. Geneva: World Health Organization and United Nations Children's Fund; 2021 (<https://washdata.org/data/household/>, accessed 1 July 2021).
3. Progress on household drinking water, sanitation and hygiene 2000-2020: five years into the SDGs. Geneva: World Health Organization and United Nations Children's Fund; 2021 (<https://apps.who.int/iris/handle/10665/345091>, accessed 24 September 2021).
4. Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes. Copenhagen: WHO Regional Office for Europe; 1999 (<https://www.euro.who.int/en/health-topics/environment-and-health/water-and-sanitation/protocol-on-water-and-health>, accessed 24 September 2021).
5. Kulinkina AV, Shinee E, Guzmán Herrador BR, Nygård K, Schroll O. The situation of water-related infectious diseases in the pan-European region. Copenhagen: WHO Regional Office for Europe; 2016 (<https://apps.who.int/iris/handle/10665/329534>, accessed 6 September 2021).
6. Safer water, better health. 2019 update. Geneva: World Health Organization; 2019 (<https://apps.who.int/iris/handle/10665/329905>, accessed 10 November 2021).
7. Environmental health inequalities in Europe: second assessment report. Copenhagen: WHO Regional Office for Europe; 2019 (<https://apps.who.int/iris/handle/10665/325176>, accessed 24 September 2021).
8. Guidance note on the development of action plans to ensure equitable access to water and sanitation. Geneva: United Nations Economic Commission for Europe; 2016 (<https://apps.who.int/iris/handle/10665/329563>, accessed 24 September 2021).
9. The Equitable Access Score-Card: supporting policy processes to achieve the human right for water and sanitation. Geneva: United Nations Economic Commission for Europe and WHO Regional Office for Europe; 2013 (<https://unicef.org/info/publications/pub21773>, accessed 24 September 2021).

Further reading on the subject is available at: <https://www.uni-bremen.de/en/who-collaborating-centre-for-environmental-health-inequalities>

Absolute and relative inequalities by – when possible - age, gender, income/wealth status, education, place of residence, ethnicity

Social gradient / equiplot over income or social groups

Time trends

Combination of social and spatial determinants

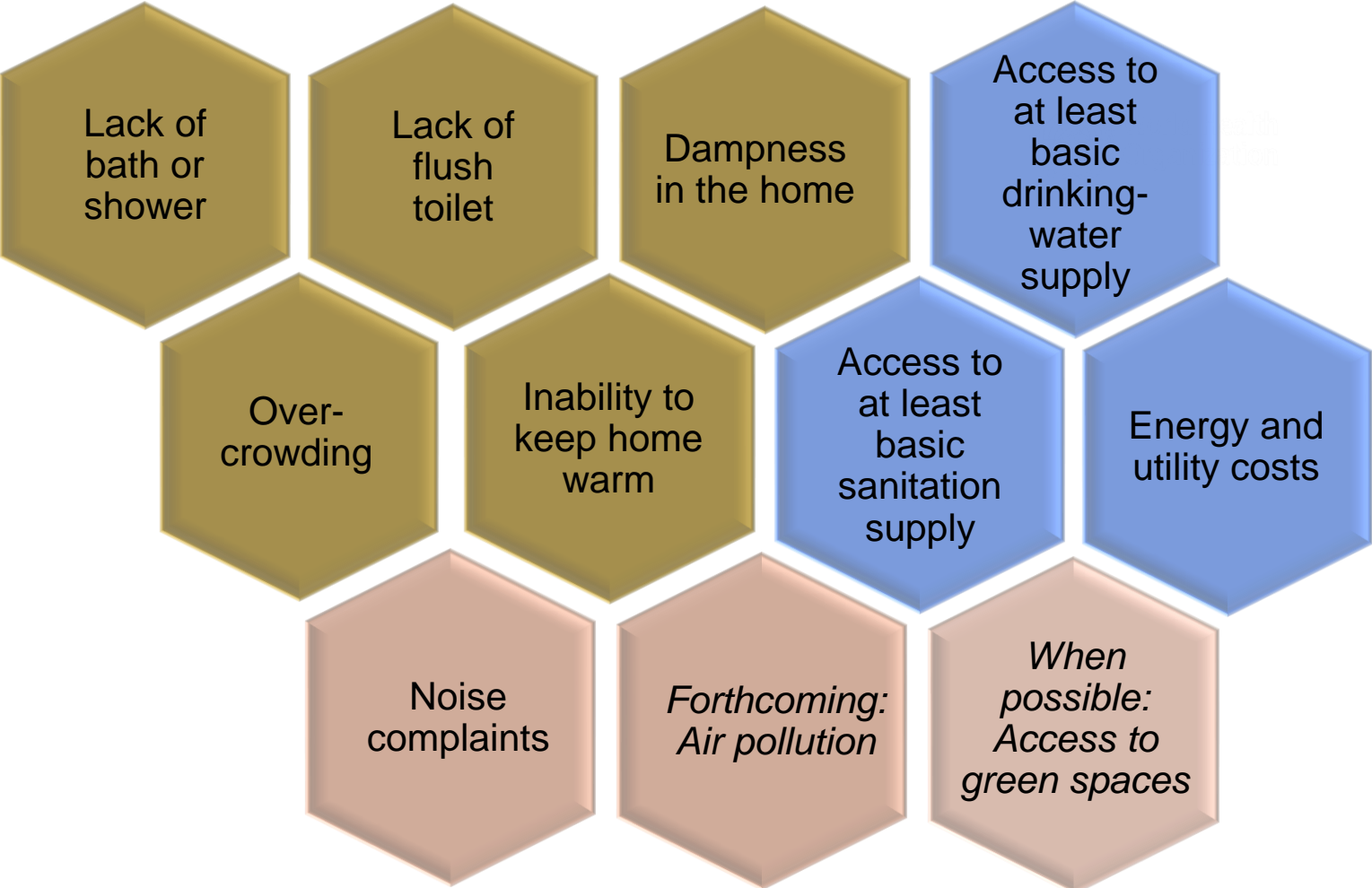
Environmental Health Inequalities Fact Sheets launched

Inequalities related to housing conditions

Inequalities related to basic service supply

Inequalities related to urban environments

***Forthcoming:
Injury-related inequalities***



Where environmental health inequalities can affect you

URBAN ENVIRONMENTS AND TRANSPORT

Air pollution

Noise annoyance

Fatal road traffic injuries

Recreational or green areas

Chemical exposure

Contaminated sites

HOUSING CONDITIONS

Flush toilet

Bath or shower

Overcrowding

Dampness in the home

Adequately warm

Adequately cool

BASIC SERVICES

Drinking-water

Sanitation

Energy poverty

INJURIES

Fatal poisoning

Fatal falls

WORK SETTINGS

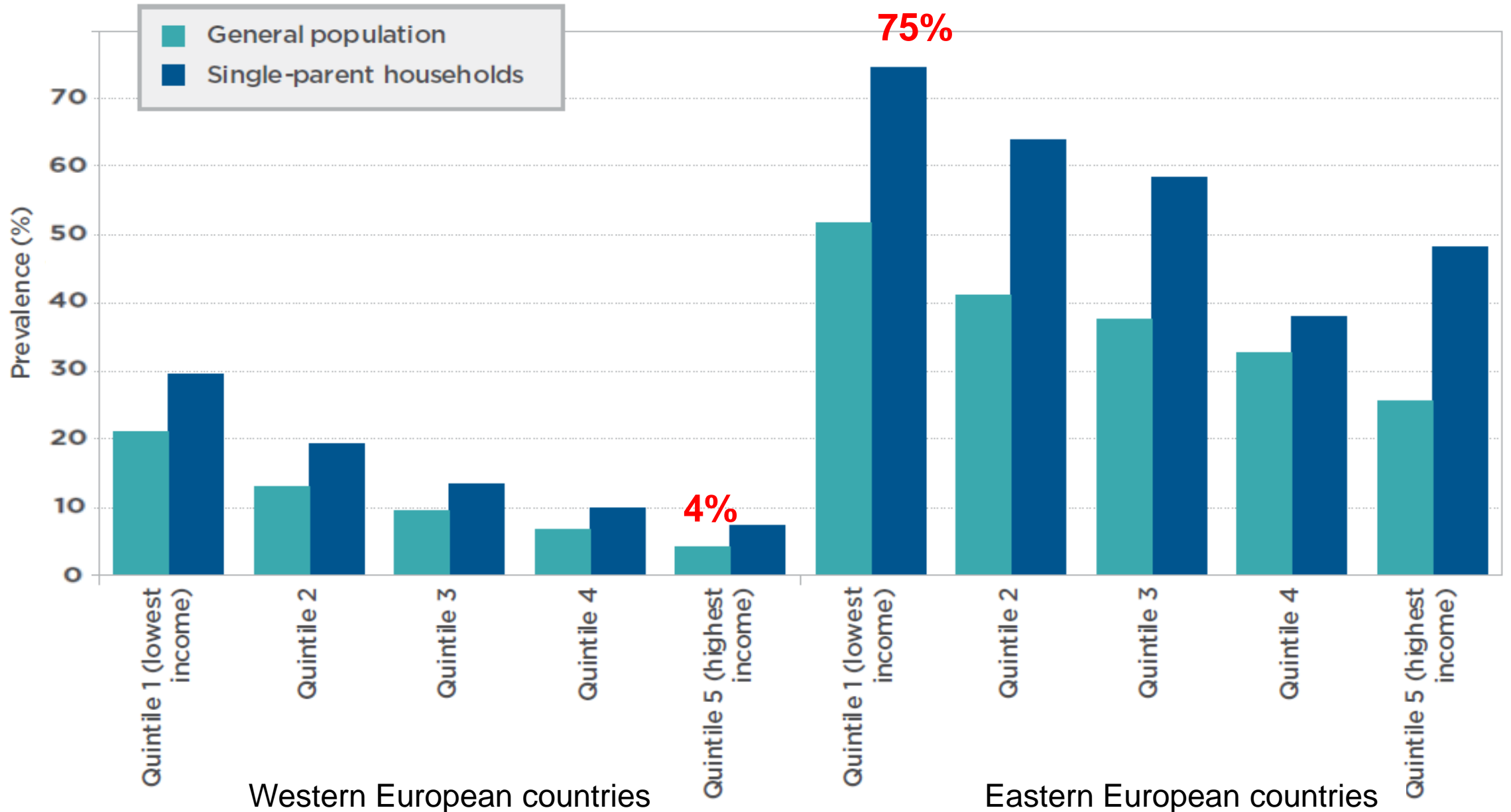
Fatal injuries

Working environments

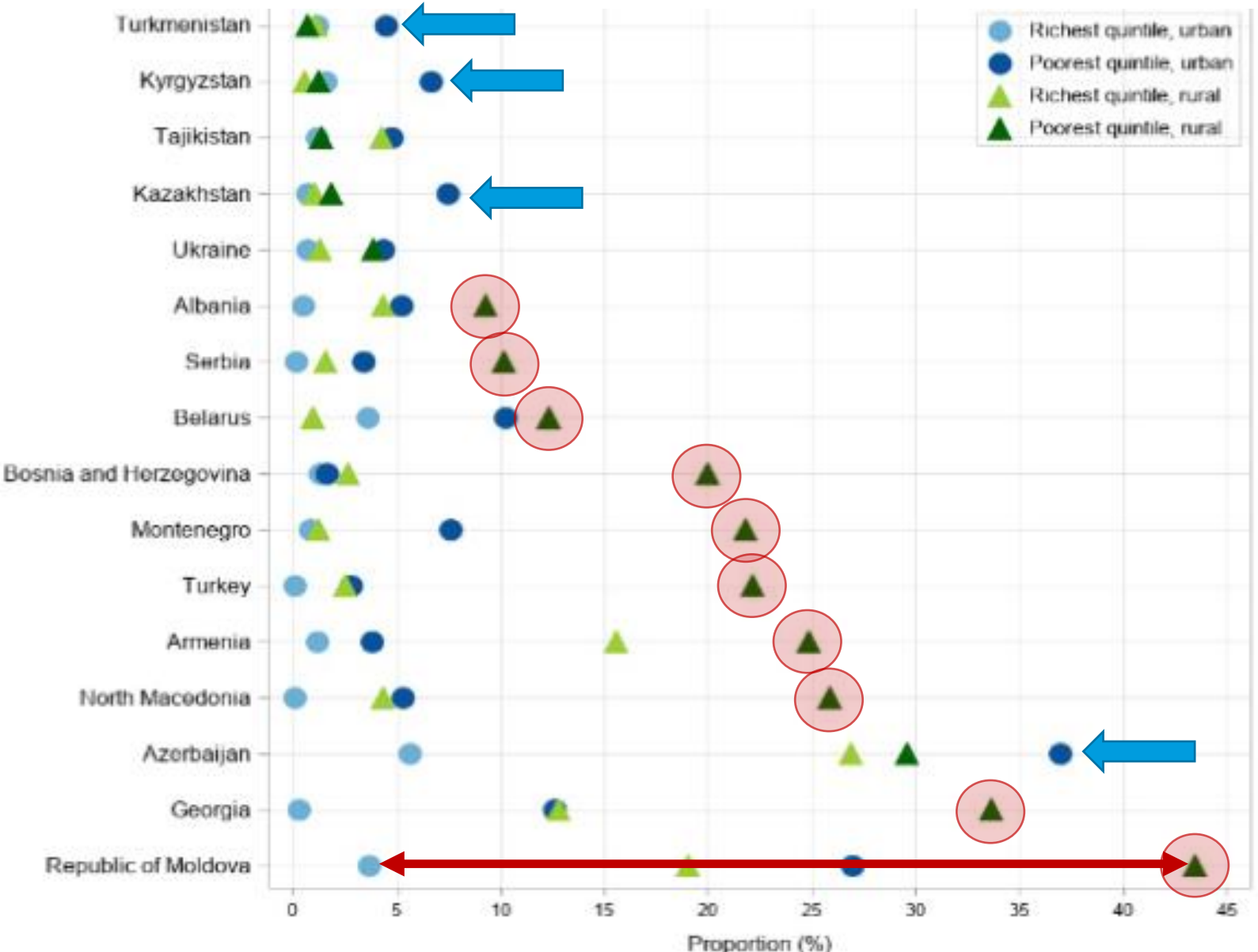
Lesson learned: Supporting priority-setting on vulnerable groups during urban COVID-19 lockdowns



Specific relevance of crowding during COVID-19 lockdowns: poor single-parent households with children (2016)



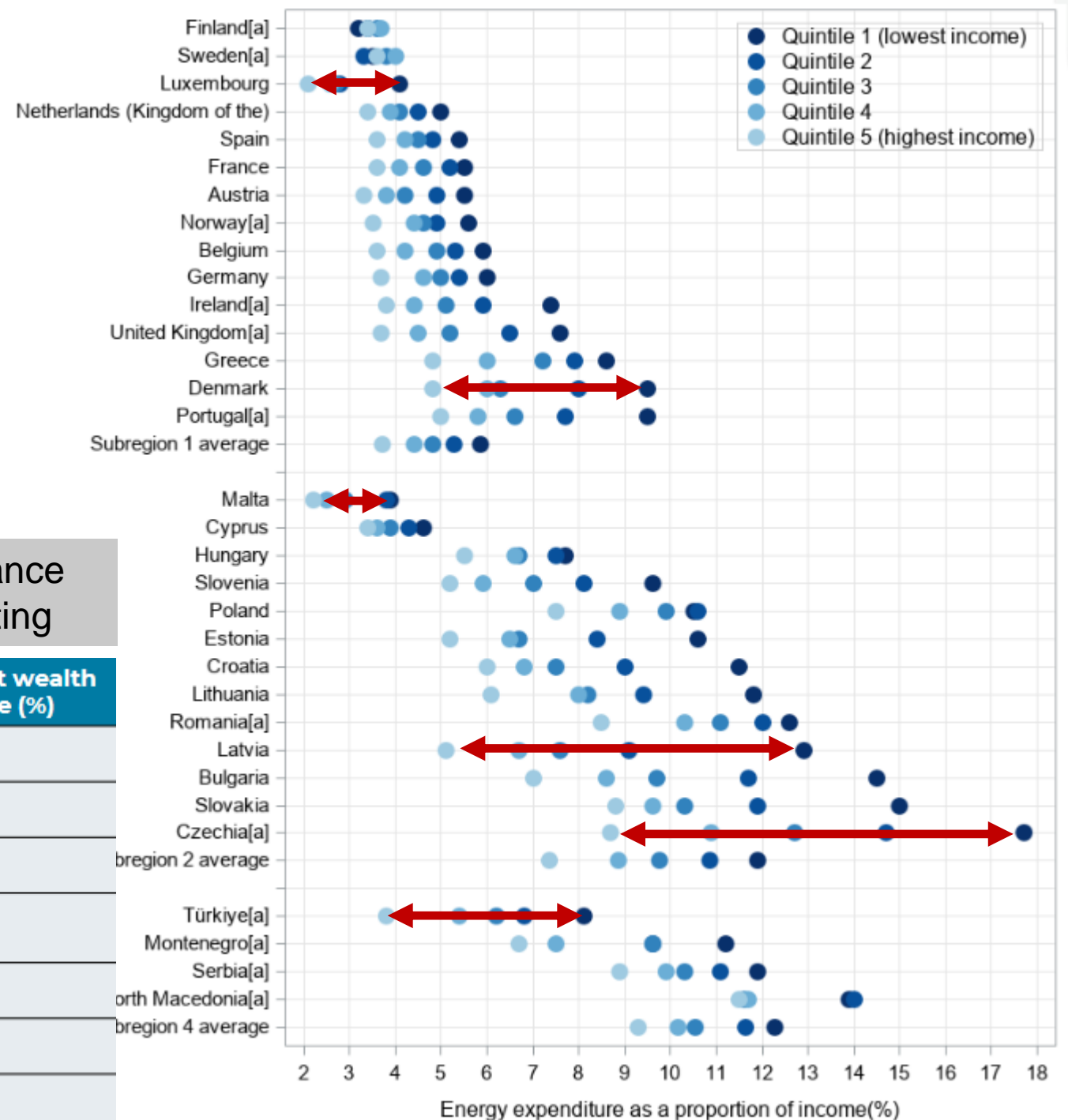
COVID-19: In almost all countries with data, poor rural households have highest rates of inadequate sanitation services (2020)



COVID-19: In almost all countries with data, lowest-income households pay a much higher share of their income for energy – sometimes double! (2020)

Prevalence of household members with primary reliance on polluting fuels for cooking, space heating and lighting

Country	National average (%)	Lowest wealth quintile (%)
Uzbekistan, 2021–2022 (Subregion 3)	43.4	89.7
Serbia, 2019 (Subregion 4)	47.6	93.9
Belarus, 2019 (Subregion 3)	15.6	74.8
North Macedonia, 2018–2019 (Subregion 4)	61.8	97.4
Kyrgyzstan, 2018 (Subregion 3)	80.8	99.0
Georgia, 2018 (Subregion 3)	41.2	92.7
Montenegro, 2018 (Subregion 4)	72.0	89.8



New Eurostat data on households' energy efficiency:

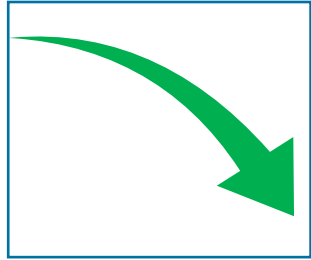
Persons living in private households by heating system used in the dwelling (2023, Eurostat)

↕ ↗ ✕	AMENITY	No fixed heating ↕		No heating ↕	
	GEO ↕	Not at risk of poverty or social exclusion		At risk of poverty or social exclusion	
	European Union - 27 countries (from 2020)	2.9	2.3	6.1	6.2
	Belgium	0.5	0.0	1.6	0.0 (n)

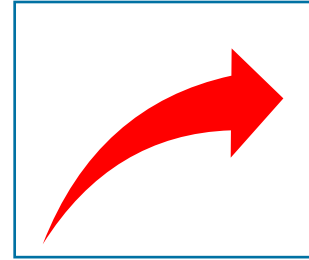
Persons living in dwellings whose energy efficiency had been improved in the last 5 years (2023, Eurostat)

↕ ↗ ✕	YN_AROPE	Total ↕	At risk of poverty or soci... ↕	Not at risk of poverty or s... ↕
	GEO ↕			
	European Union - 27 countries (from 2020)	25.5 (e)	17.8 (e)	27.5 (e)
	Belgium	31.1	19.2	33.0

Overall lessons learned on EH inequalities in the WHO European Region



Environmental pollution levels may decline...



...but inequalities in exposure often remain / increase



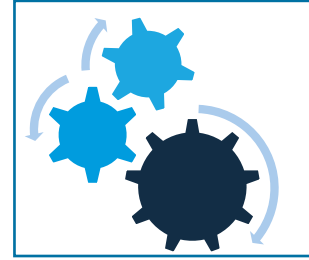
Risk can be 5 times higher for disadvantaged



Different inequality patterns require tailored action



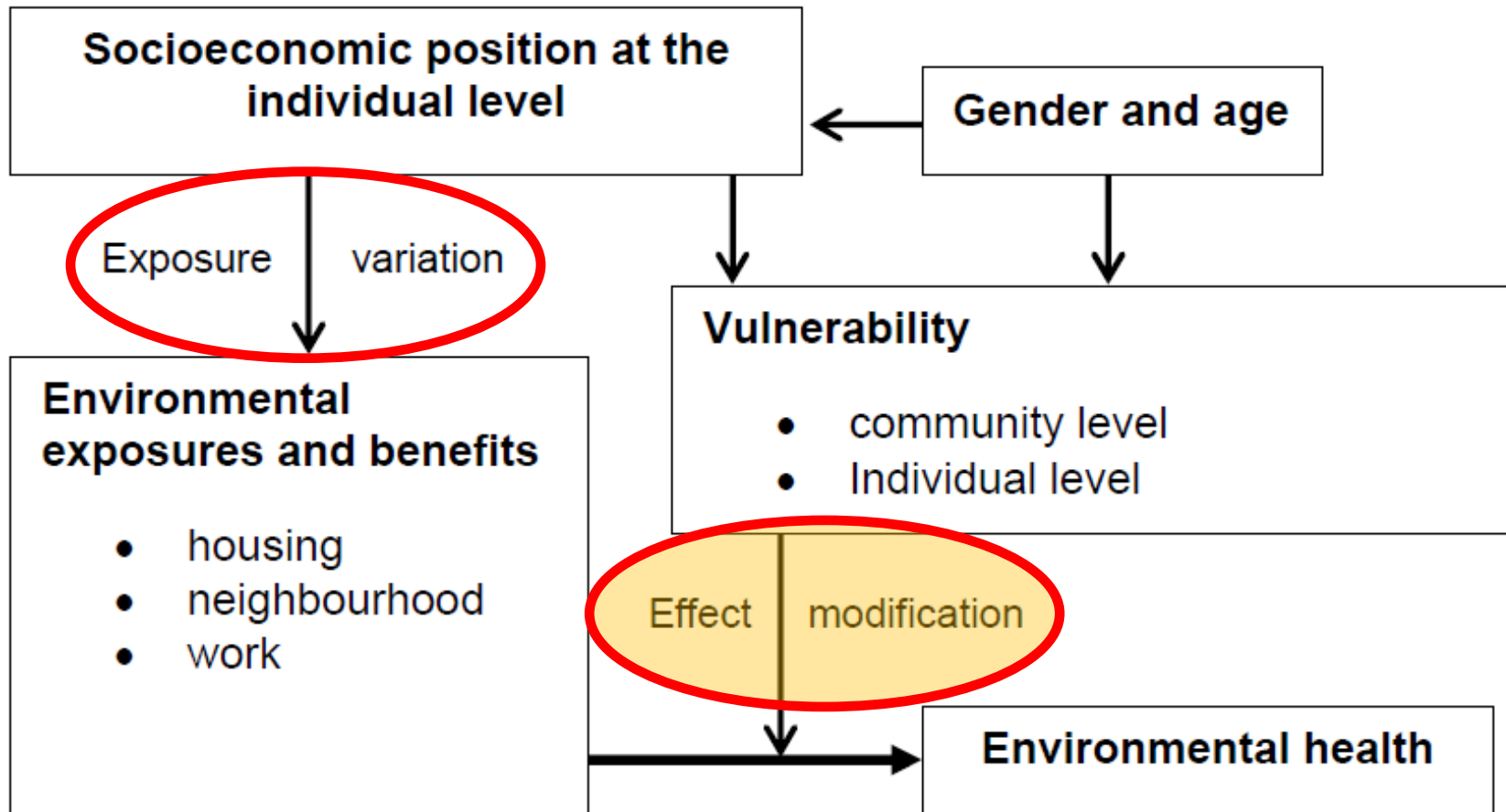
Lack of data on inequality is a key challenge



Intersectoral action across sectors is needed to tackle the identified inequalities

Social inequalities in environmental health: how to cover vulnerability?

Macroeconomic context: social disparities and stratification



Thank you very much!

Fact sheet link and further information:

<https://www.who.int/europe/activities/reducing-environmental-health-inequalities>

<https://www.uni-bremen.de/en/who-collaborating-centre-for-environmental-health-inequalities>

Contact:

Matthias Braubach - braubachm@who.int

WHO European Centre for Environment and Health



World Health
Organization

European Region



**Environmental
health inequalities
Fact sheet series**

What is EH monitoring?

The **Environmental Health Monitoring System** is a comprehensive system of regularly conducted collection of **exposure and health data**, and assessment of risks and effects on public health.

https://szu.gov.cz/wp-content/uploads/2024/01/Summary_report_2022.pdf

An **integrated environmental health surveillance system** is the systematic, ongoing collection and analysis of **information related to disease and environment**, and its dissemination to individuals and institutions.

<https://dta.cnr.it/wp-content/uploads/2019/12/PIAS-C5.pdf>

Environmental health indicators describe the **link between the environment and health**. They are **based on known or plausible cause-and-effect relationships** between the environment and health.

<https://www.ehinz.ac.nz/indicators/overview/about-the-indicators/>

EH Indicators are needed, for example:

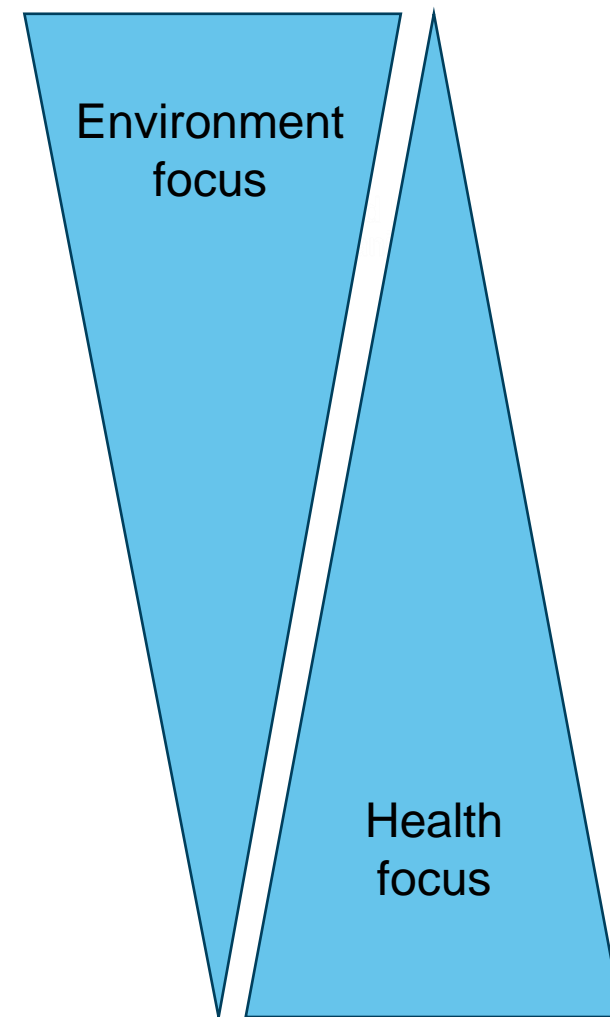
- to help monitor trends in the **state of the environment** (...);
- to monitor **trends in health**, resulting from (...) environmental risk factors (...);
- to monitor and assess the effects of policies (...) on environmental health; (...)

https://iris.who.int/bitstream/handle/10665/66016/WHO_SDE_OEH_99.10.pdf;sequence=1

Where to go for EH monitoring? WHO and EEA data

- **European Environment Agency**
<https://www.eea.europa.eu/en/topics/in-depth/environmental-health-impacts>
- **European Environment and Health Atlas**
<https://discomap.eea.europa.eu/atlas>
- **European Climate and Health Observatory**
<https://climate-adapt.eea.europa.eu/en/observatory>

- **WHO Environmental Burden of Disease work**
<https://www.who.int/data/gho/data/themes/public-health-and-environment>
- **WHO Global Health Observatory and European Health Information Gateway**
<https://www.who.int/data/gho> and <https://gateway.euro.who.int/en/>
- **WHO lead on SDG indicators**
<https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/world-health-statistics> (=> general SDG monitoring - <https://unstats.un.org/sdgs/dataportal>)



Where to go for EH monitoring? Other sources

EU - https://research-and-innovation.ec.europa.eu/research-area/health/environment-climate-and-health_en

JRC - https://joint-research-centre.ec.europa.eu/index_en

Eurostat - https://ec.europa.eu/eurostat/databrowser/explore/all/all_themes

Eurofound – <https://www.eurofound.europa.eu/en/data-catalogue/european-quality-life-survey>

IHME Global Burden of Disease - <https://www.healthdata.org/research-analysis/gbd>

National reporting

City level data

- ISGlobal rankings - <https://isglobalranking.org>
- Urban Audit - https://ec.europa.eu/regional_policy/policy/themes/urban-development/audit_en
- URHIS - <http://www.urhis.eu/healthprofiles/>
- Healthy Cities network (or other city networks) - <https://www.who.int/europe/groups/who-european-healthy-cities-network>

Where to go for EH inequality monitoring?

Health equity

WHO Health Equity Dataset with some env determinants

https://worldhealthorg.shinyapps.io/european_health_equity_dataset/

European Quality of Life Survey with some env determinants

<https://www.eurofound.europa.eu/en/data-catalogue/european-quality-life-survey>

Environmental inequalities / Environmental justice

EEA data and reports on env inequality / vulnerability

<https://www.eea.europa.eu/en/topics/in-depth/environmental-inequalities?activeAccordion=d588bf68-df23-481e-b27c-0ec547ae265a>

Global Atlas of Environmental Justice (illustrative case studies) - <https://ejatlas.org/>

EH inequality

WHO EH inequality reports, fact sheets, country profiles

<https://www.who.int/europe/activities/reducing-environmental-health-inequalities>

Environmental inequalities in national reporting on the 2030 Agenda for Sustainable Development

<https://www.who.int/europe/publications/i/item/WHO-EURO-2023-7590-47357-69524>

Special Rapporteur on the human right to a healthy environment

<https://www.ohchr.org/en/special-procedures/sr-environment>