International Institute for
Applied Systems Analysis
IIASA www.iiasa.ac.at

Identifying archetypes of climate vulnerability: A mixed-methods approach for heat related risk in Austria

DISCC-AT

15th April | 2024

Julia Beier, Eva Preinfalk, Susanne Hanger-Kopp

Intersectional social vulnerability

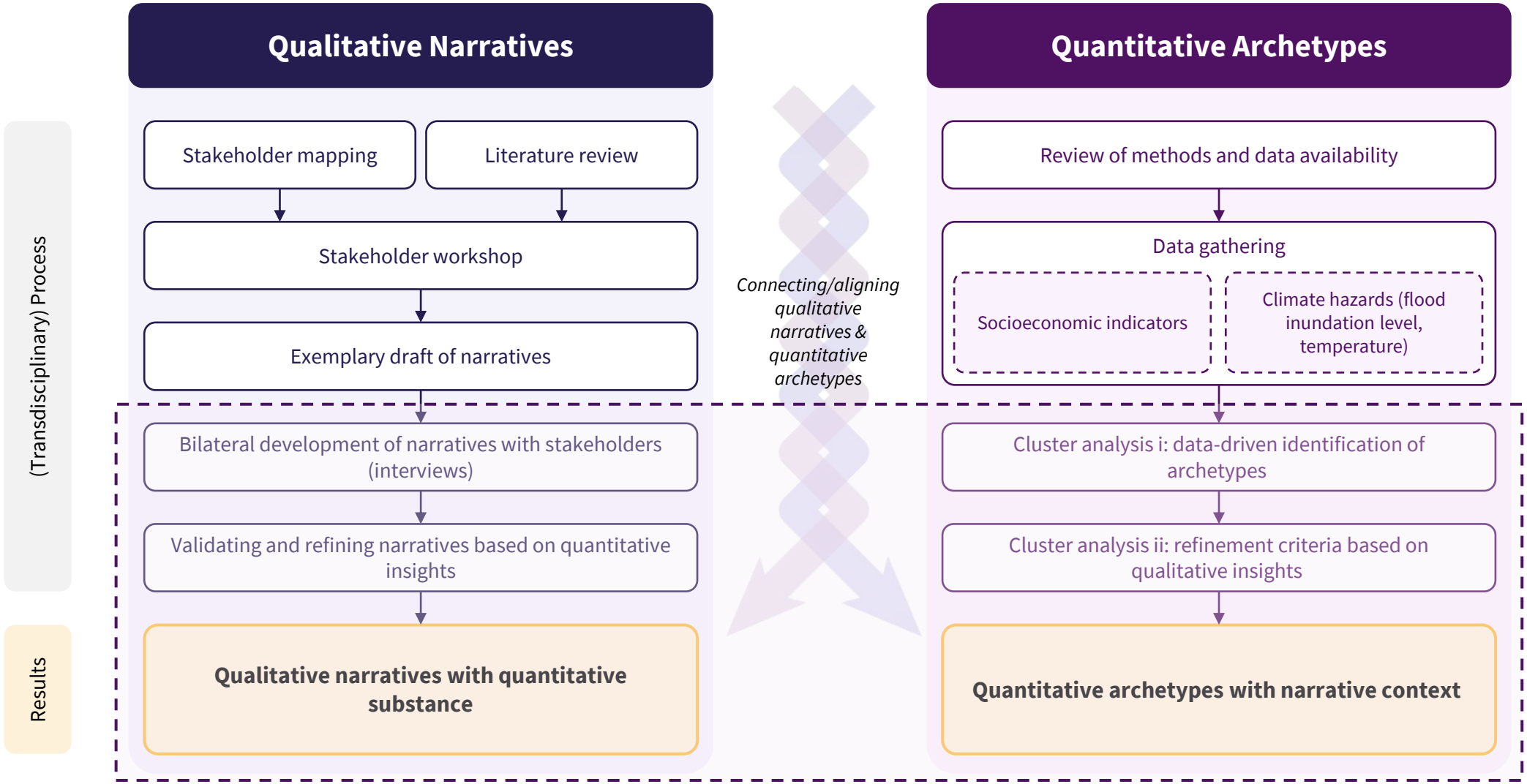
Increase in heatwaves in Austria due to climate change, which do not affect all households equally

IPCC definition of vulnerability: the propensity or disposition to be adversely affected; susceptibility to harm and lack of capacity to adapt and cope

Drivers of vulnerability are often homogenized without regard to overlapping (intersectional) characteristics

Intersectionality enables a more nuanced view of vulnerability, and equitable and efficient adaptation measures

Methodology



Overview of results | Qualitative

powered by klima+ energie fonds DISCC.at

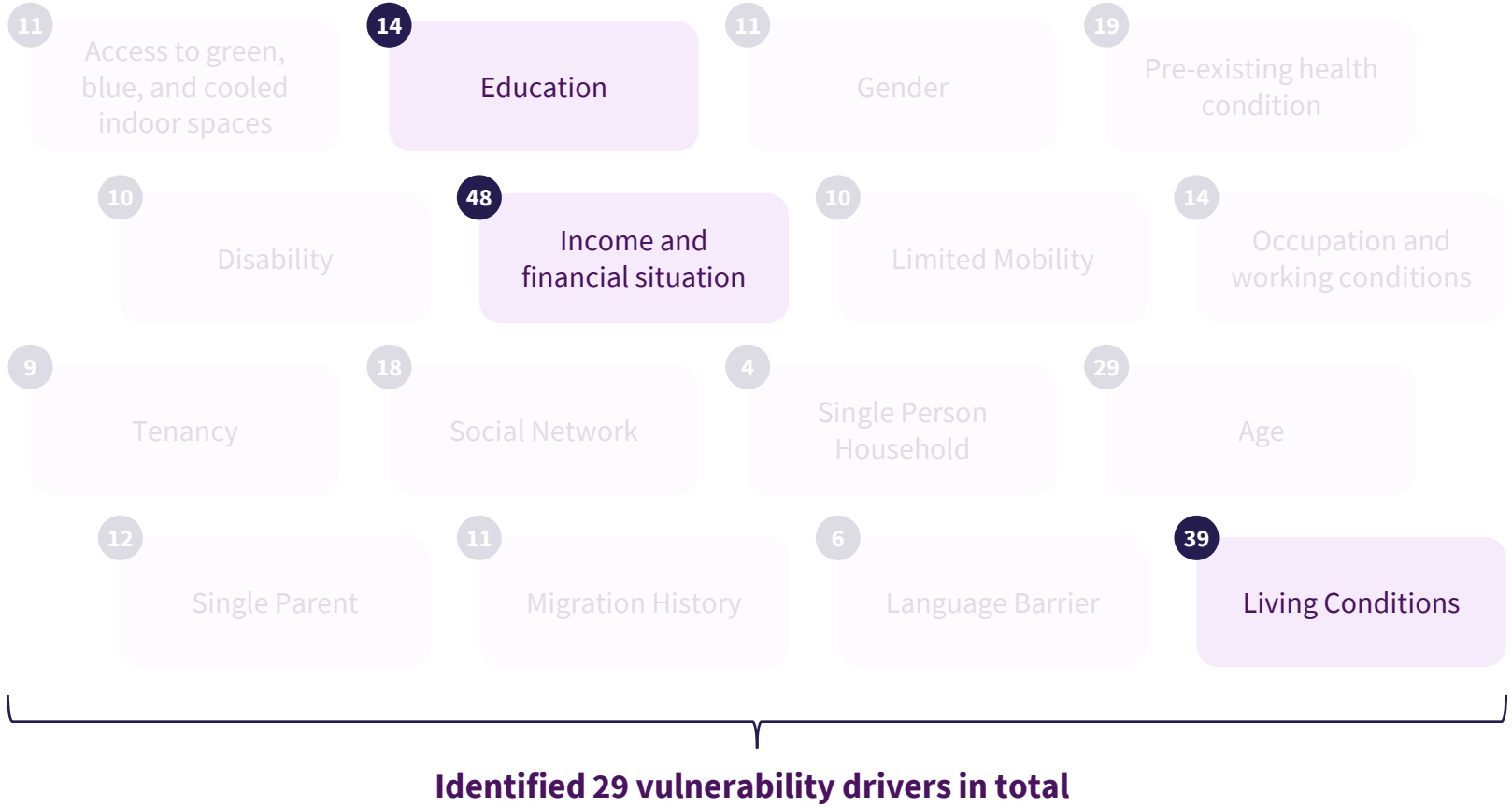
Process/Input

Conducted a workshop & interviews to identify vulnerability drivers

17 different participating organizations

Identified indicator combinations which showcase the intersectionality - stakeholder mental models

Common vulnerability drivers



Identified 29 vulnerability drivers in total

n Frequency of mention in interviews

Overview of results | Qualitative

powered by klima+ energie fonds

DISCC.at

Process/Input

Conducted a workshop & interviews to identify vulnerability drivers

17 different participating organizations

Identified indicator combinations which showcase the intersectionality - stakeholder mental models

Common vulnerability drivers

- 11 Access to green, blue, and cooled indoor spaces
- 14 Education
- 11 Gender
- 19 Pre-existing health condition
- 10 Disability
- 48 Income and financial situation
- 10 Limited Mobility
- 14 Occupation and working conditions
- 9 Tenancy
- 18 Social Network
- 4 Single Person Household
- 29 Age
- 12 Single Parent
- 11 Migration History
- 6 Language Barrier
- 39 Living Conditions

Identified 29 vulnerability drivers in total

n Frequency of mention in interviews

Overview of results | Qualitative

powered by klima+ energie fonds

DISCC.at

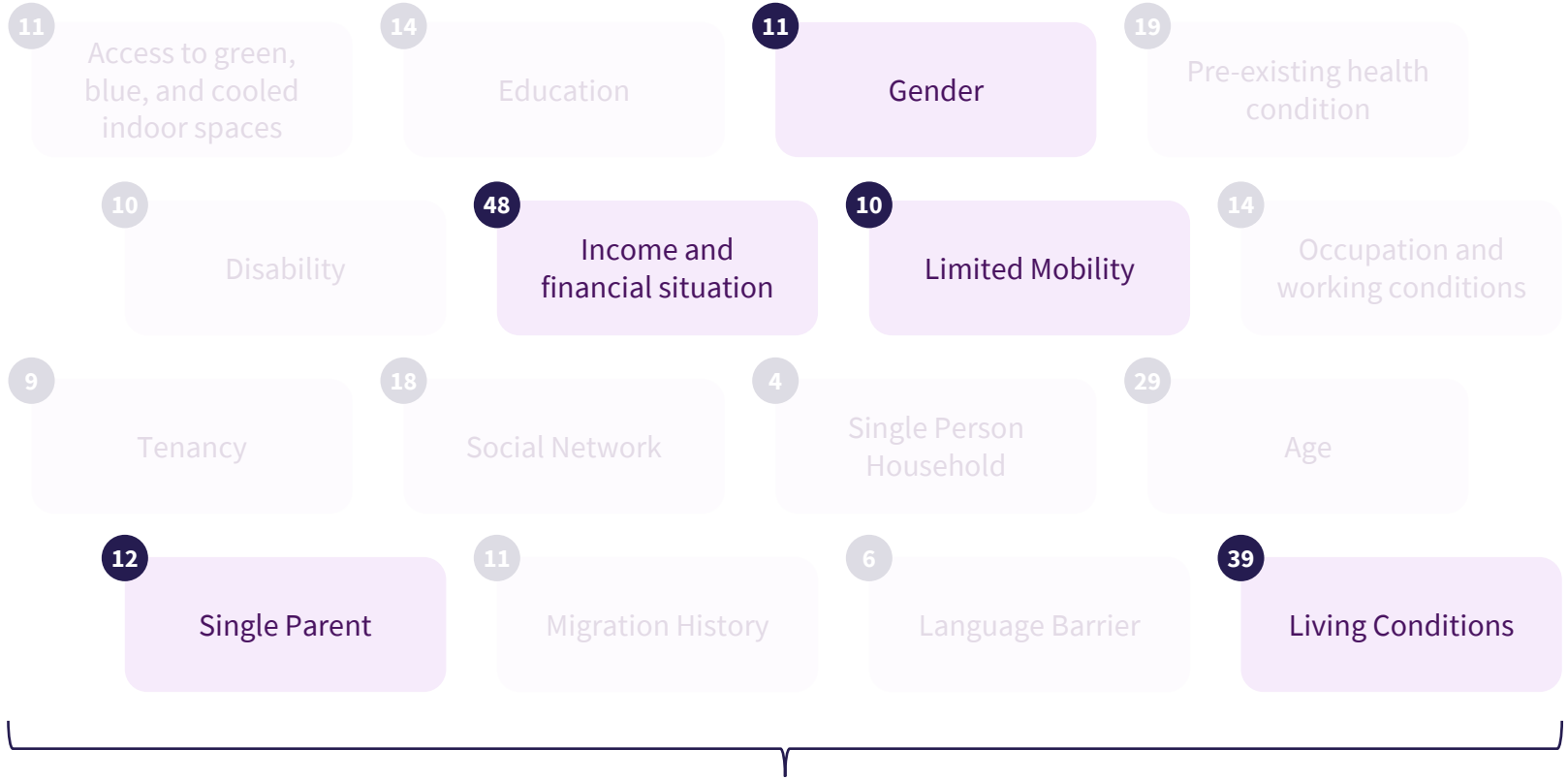
Process/Input

Conducted a workshop & interviews to identify vulnerability drivers

17 different participating organizations

Identified indicator combinations which showcase the intersectionality - stakeholder mental models

Common vulnerability drivers



Identified 29 vulnerability drivers in total

n Frequency of mention in interviews

International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

Overview of results | Quantitative

Data

Socio-economic data

Variable		Type	Mean	Median	Share of total sample
Income (in EUR)		Continuous	30184	24690	n.a.
Age > 65		Binary	n.a.	n.a.	22%
Blue collar worker		Binary	n.a.	n.a.	20%
Sector of employment	Manufacturing	Binary	n.a.	n.a.	23%
	Outdoor: agriculture, forestry, construction	Binary	n.a.	n.a.	5%
	Other		n.a.	n.a.	72%
Population density (inhabitants per grid cell, population weighted)		Continuous	4142	1198	n.a.
Average annual income of 1x1km cells by inhabitant (in EUR)		Continuous	27842	27158	n.a.

Climate impact data

Average number of Kysely days experienced annually by a person in our sample (2012-2022) (SPARTACUS)

Clustering

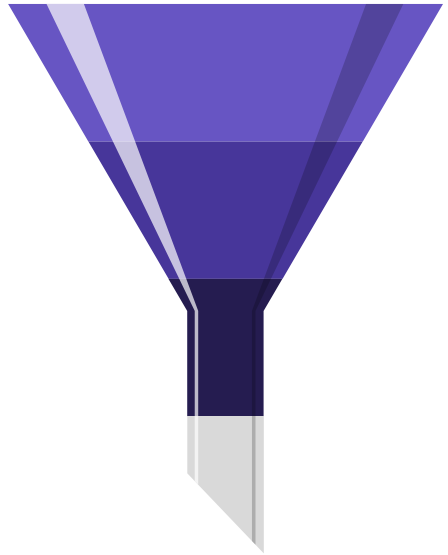
Multivariate statistical analysis (clustering) to identify risk profiles (clusters)

↓

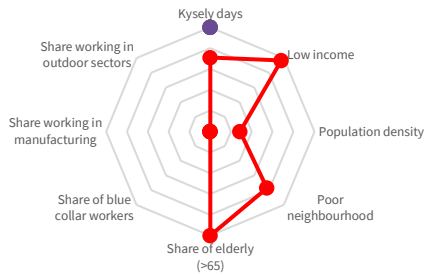
Input qualitative research: to identify key vulnerability drivers (individually and intersectionally)

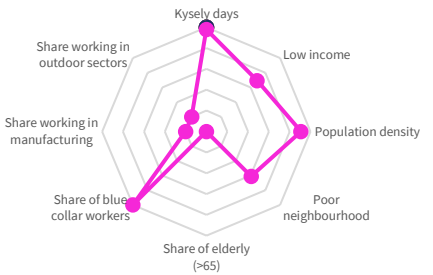
↓

Result: **23 high-risk clusters,** characterized by similar patterns within the clusters



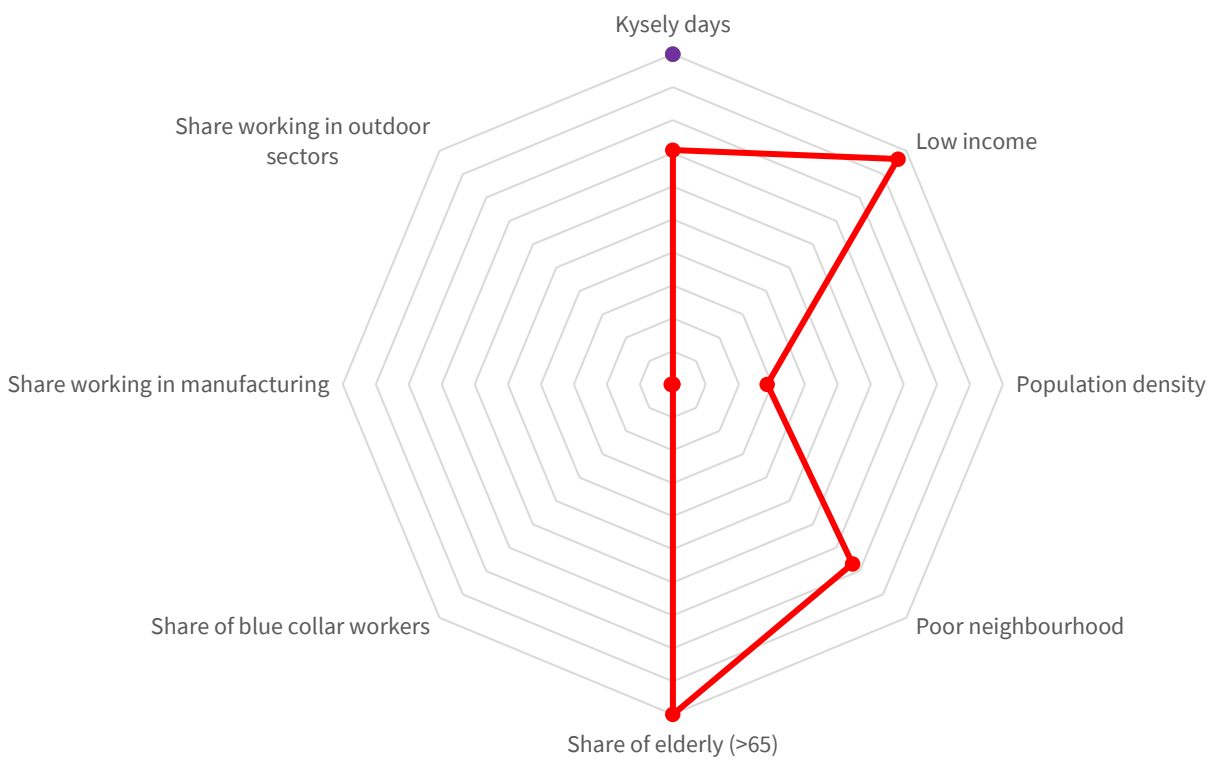
Results





Overview of results | Example 1

Cluster 1: Minimum pension recipient (suburban, rural)

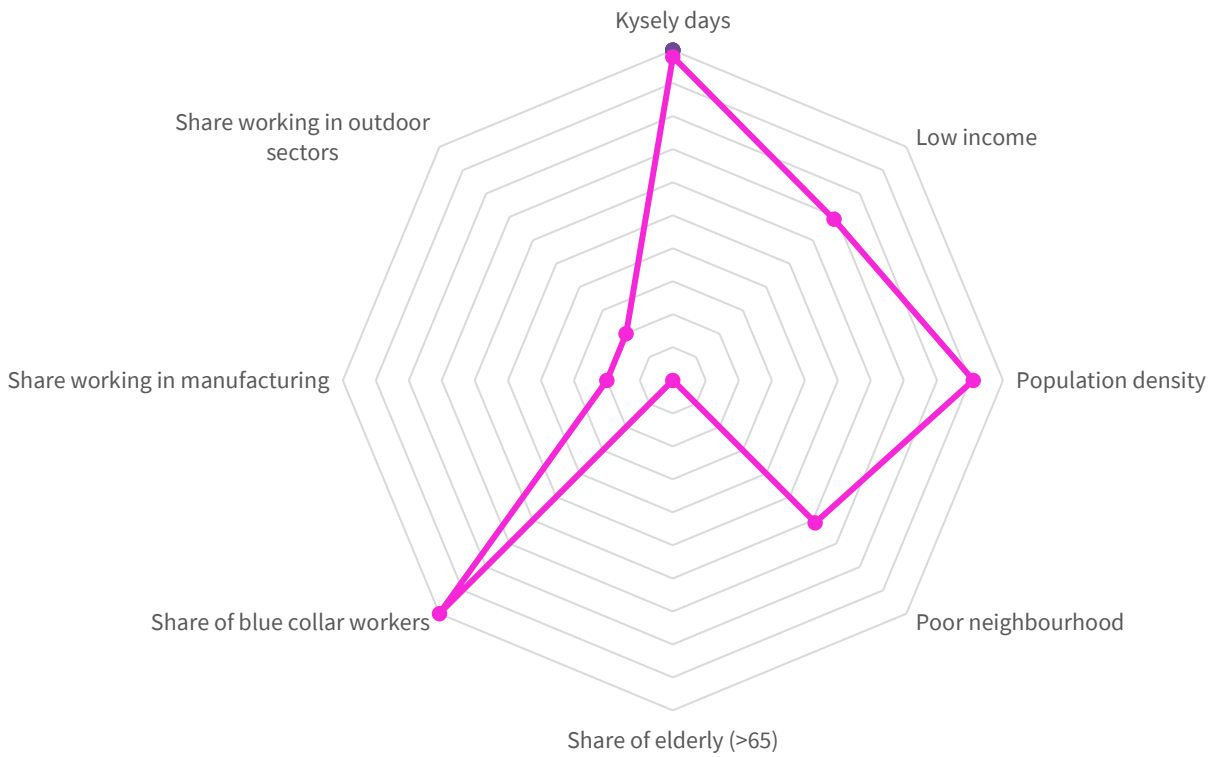


Additional qualitative drivers

- Single Person Household
- Pre-existing health conditions
- Limited mobility
- Social network and participation
- Language barrier
- Tenancy
- Living conditions

Overview of results | Example 2

Cluster 2: Blue collar worker (high population density, urban area)



Additional qualitative drivers

- Age of children
- Care work
- Stress
- Equipment of residual surroundings
- Access to recreational activities
- Tenancy
- Living conditions

Conclusion

Multiple burdens/inequalities increase vulnerability and inhibit households' ability to adapt

Integration of social and intersectional vulnerability in adaptation plans important to address distribution and justice aspects of climate risks

Iteratively integrating qualitative with quantitative, and quantitative with qualitative results provides more nuance on social vulnerability

International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

Thank you.

International Institute for Applied Systems Analysis (IIASA)
Schlossplatz 1, A-2361 Laxenburg, Austria

iiasa.ac.at
iiasa.ac.at/contact
IIASA
iiasa-vienna
@IIASAVienna
@IIASALive
@iiasavienna

Julia Beier
beier@iiasa.ac.at

Eva Preinfalk
eva.preinfalk@uni-graz.at

Susanne Hanger-Kopp
hanger@iiasa.ac.at