



Marga und Walter Boll-Stiftung

VOLKSWAGEN AKTIENGESELLSCHAFT



# FORECAST BASED FINANCING FOR HEATWAVES IN HANOI



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## Objectives and Key components of Forecast-based Financing

Forecast-based Financing (FbF) aims to anticipate disasters and reduce human suffering and losses. FbF is the disaster relief strategy with the greatest **emphasis on science and research**, and is providing an opportunity to **use financial resources more efficiently** and help people more quickly and effectively. With FbF, the RCRC is taking disaster relief into a new era: **away from pure reaction and towards anticipation**.



### Triggers

Matching forecasts and risks (exposure, impact, vulnerability)



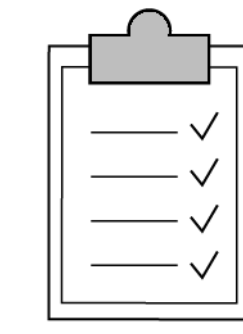
### Selection of Actions

Reducing the humanitarian impact



### Financing Mechanism

Automatic allocation of funds before the disaster strikes



### Early Action Protocol (EAP)

## Implementation Mechanism

### 1 RISK ASSESSMENTS

Surveys, context analysis to identify hazards, vulnerabilities, exposure and capacities of the population likely to be most impacted by heatwaves.

### 2 IDENTIFICATION OF FORECASTS

Assessment of weather forecasts to identify information gaps. Forecasts must provide sufficient **lead time** so that resources may be mobilized before disaster strikes.

### 3 DEFINITION OF IMPACT LEVELS

Levels of forecasted damage that will trigger early humanitarian action are established.

### 4 SELECTION OF EARLY ACTIONS

Design of a pre-determined package of support that will be provided at the time of a triggering forecast, aiming to reduce the humanitarian impact of heatwave.

### 5 DEVELOPMENT OF AN EARLY-ACTION PROTOCOL

A formal Early-Action Protocol (EAP) defines the roles and responsibilities of each organization, and describes the mutually agreed upon impact levels at which EAs are triggered.

### 6 VALIDATION OF THE EARLY-ACTION PROTOCOL

The proposed EAP is reviewed and approved by all involved parties including meteorological agencies, government, and national and international humanitarian partners.

### 7 FORECAST MONITORING

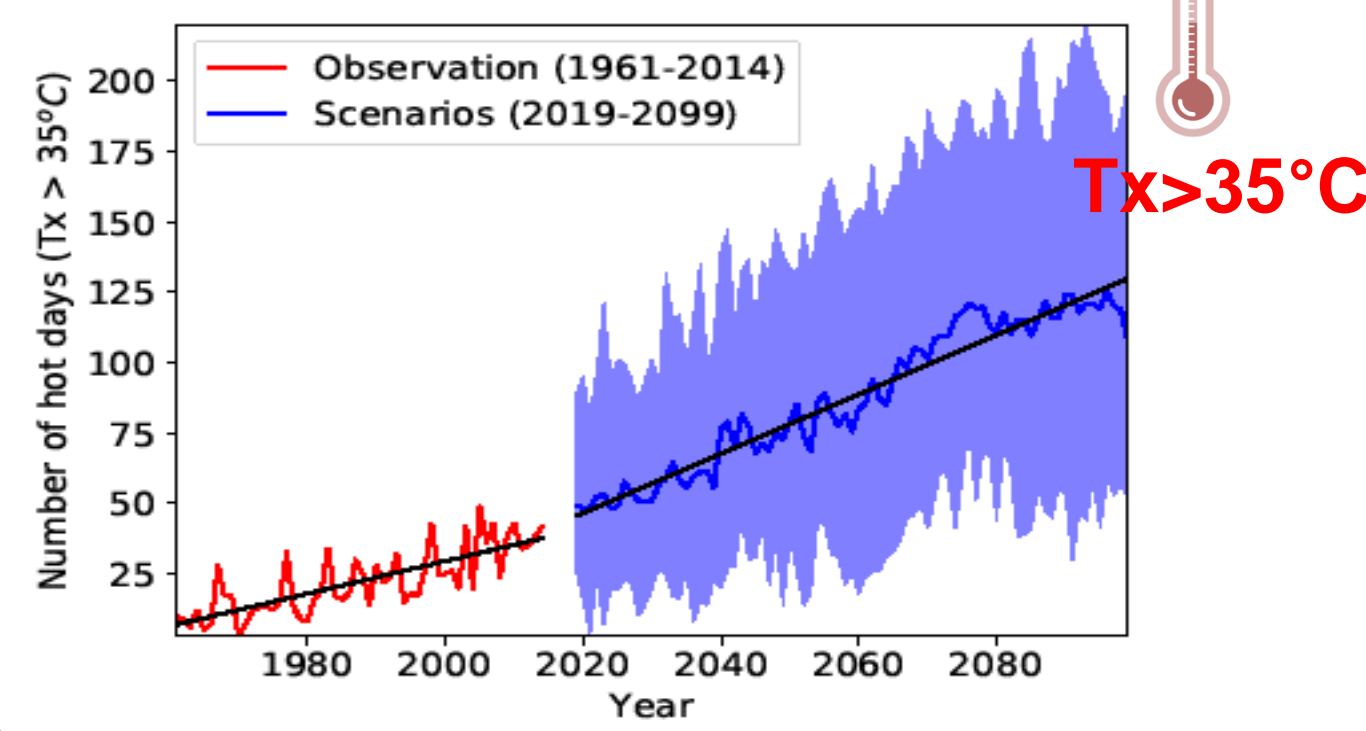
If the danger level **IS exceeded**, early actions are implemented.  
If the danger level **IS NOT exceeded**, monitoring continues.

To learn more about FbF, visit [www.forecast-based-financing.org](http://www.forecast-based-financing.org), and to follow the project on Heatwaves in Hanoi <https://tinyurl.com/fbfreead>

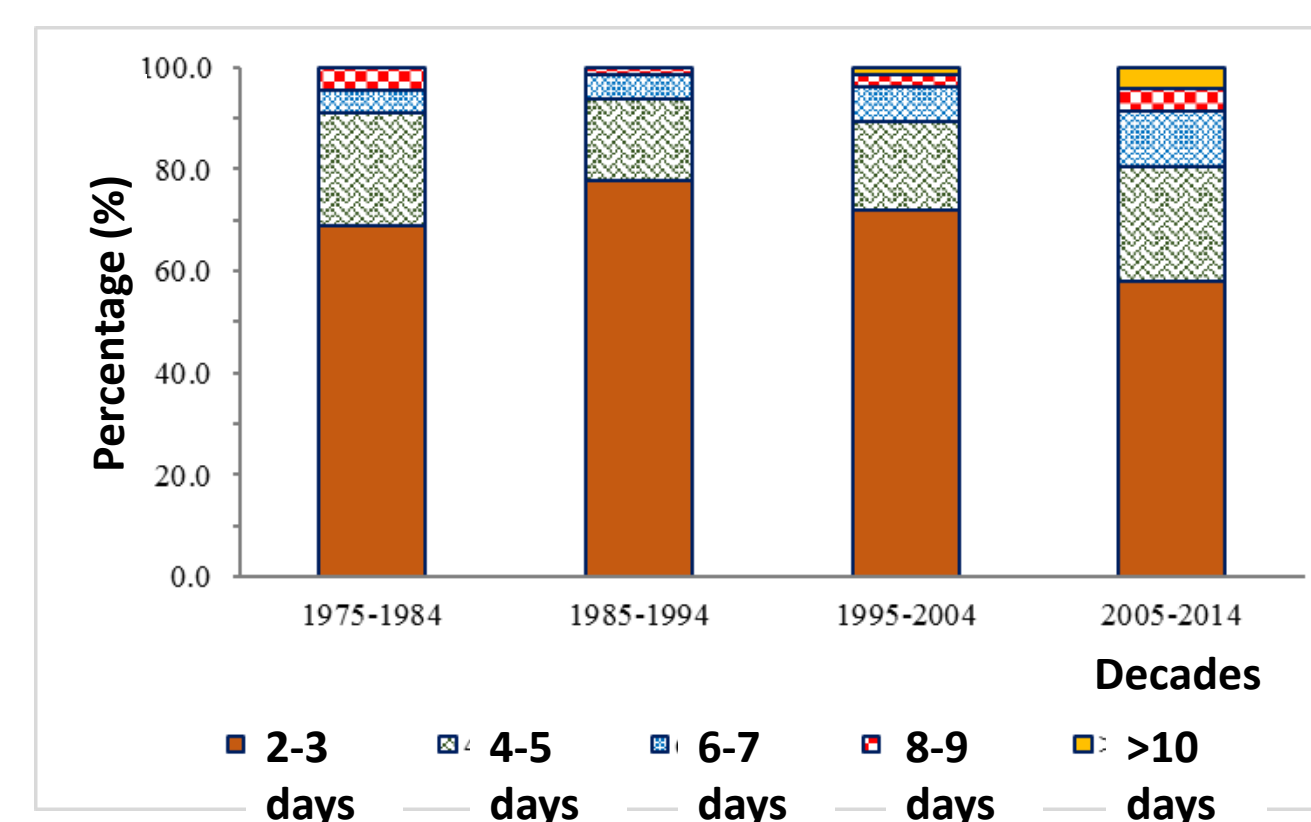
## Heatwaves in Hanoi

The study using observed daily maximum temperature (Tx) in Hanoi for period of 1975-2014 highlighted that:

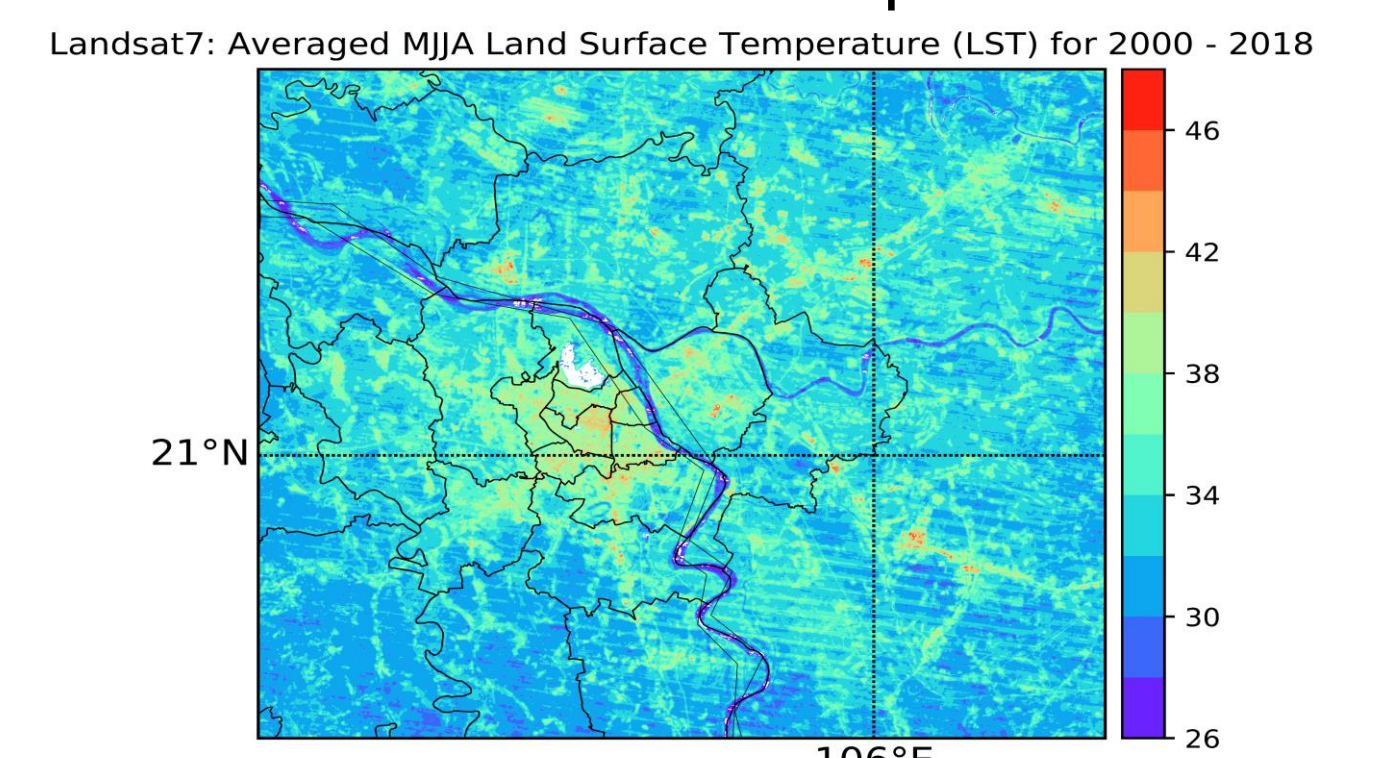
➤ Number of hot days increased significantly for the last 40 years and is projected to further increase



➤ Duration of heatwaves became longer during the last decade (2005-2014)



➤ "Urban heat island" effect should be considered in combination with map of current land used to determine hot spots in Hanoi (1)



## Heatwaves Impacts in Vietnam– Literature review



20% increase in hospitalisation and 45.9% for respiratory diseases<sup>2</sup>



15% increase in hospitalisation for people with mental disorders<sup>3</sup>



<1% of outdoor workers have sufficient knowledge on heat stress<sup>4</sup>

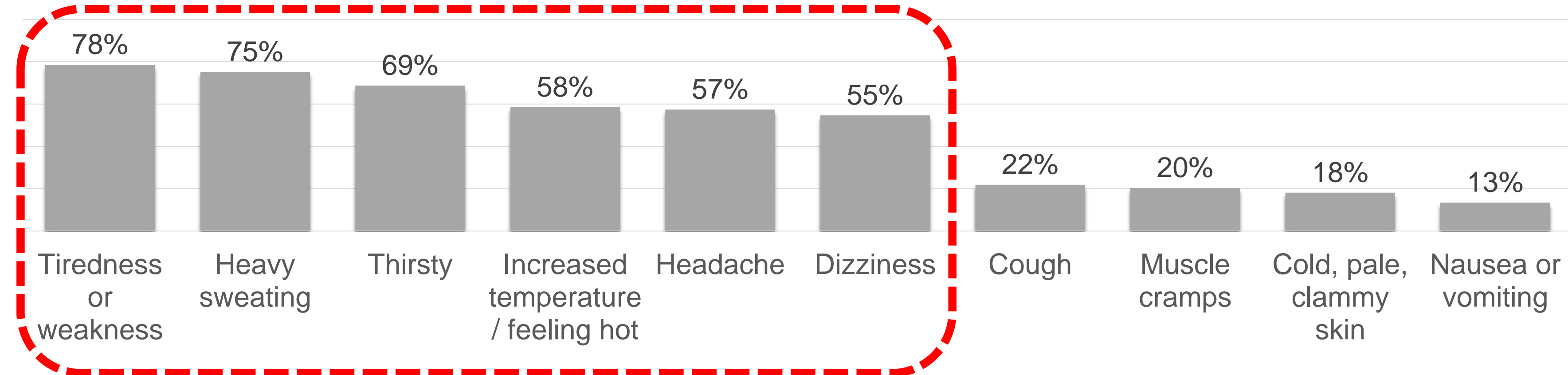


>35% loss in productivity for outdoor workers<sup>4</sup>

## Vulnerable Groups in Hanoi– Survey on Outdoor Workers:

Survey on the impacts of heatwaves on vulnerable groups (1,027 Shippers, Builders, Slum Dwellers, Street Vendors, Elderly persons) and their Knowledge, Attitudes and Practices to prepare and adapt to heatwaves (initial results).

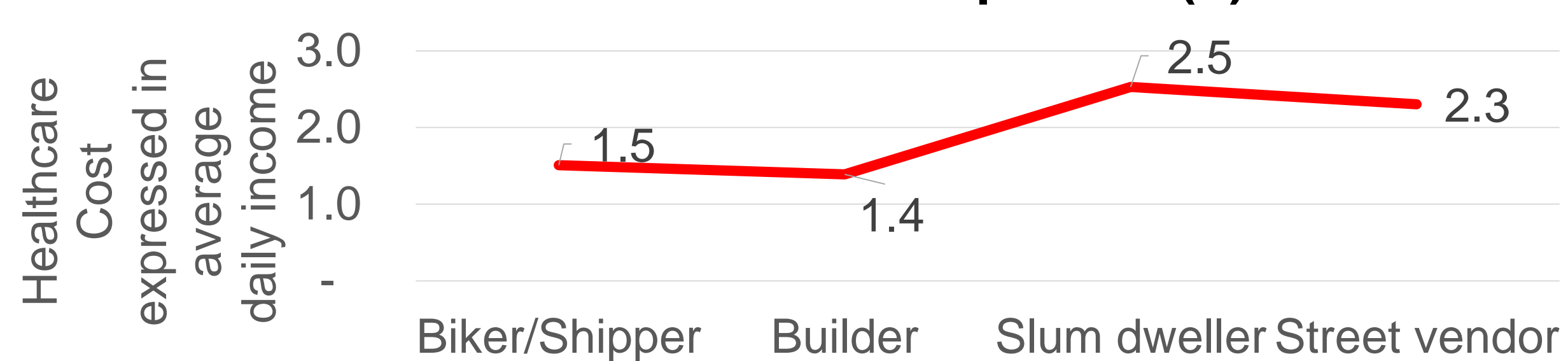
### IMPACTS: % of persons experiencing heat related symptoms during heatwaves (a)



The majority of the persons from vulnerable groups have experienced symptoms of Heat Exhaustion during heatwaves (a). However, **only 33% know some of the symptoms of Heat stroke**.

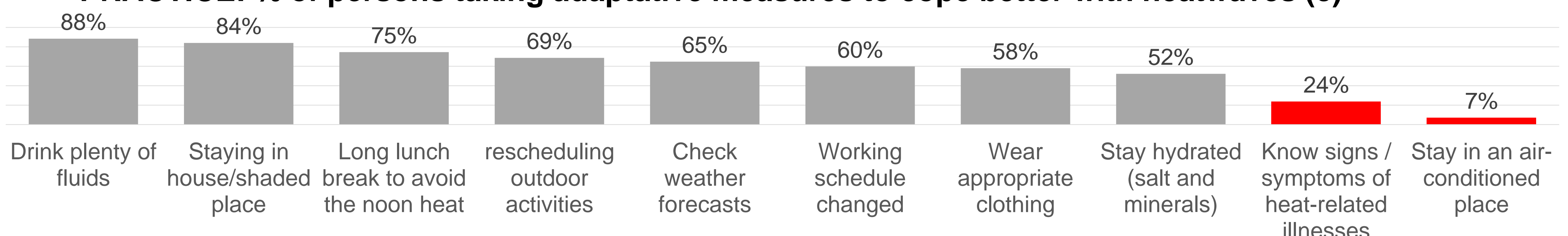
22% of vulnerable persons have been to doctor during heatwaves. Healthcare expenses (doctor + medicine) equal between 1.5 to 2.5 daily income (b).

### IMPACTS: Healthcare Expenses (b)



30% of the street vendors and shippers have seen their income reduced between 25% and 50%. 4% have seen their income reduced by more than 50%

### PRACTICE: % of persons taking adaptive measures to cope better with heatwaves (c)



The majority of vulnerable groups (Shippers, Builders, Slum Dwellers, Street Vendors, Elderly persons) state that they adopt key measures to better adapt to very hot weather (c). However **only 24% can recognize the signs of heat-related illnesses** and **only 7% cope by staying as long as possible in an air-conditioned place** (c). This result can be explained as for instance only 20% of slums dwellers and 12% of the builders have access to air-conditioning in their bedsit/room.

## References

- 1- Parastatidi, et al. (2017). Online global land surface temperature estimation from Landsat. Remote Sensing, 9(12), 1208.
- 2- Phung et al. (2016a). High temperature and risk of hospitalizations, and effect modifying potential of socio-economic conditions: a multi-province study in the tropical Mekong Delta Region. Environ. Int.
- 3 - Phan Minh Trang (2017). Weather and extreme heat in association to mental disorder. The case of Hanoi, Vietnam. Umeå University.
- 4 - Dao Thi Mai Hoa et al. (2013). Heat stress and adaptive capacity of low-income outdoor workers and their families in the city of Da Nang, Vietnam. Asian Cities Climate Resilience - Working Paper Series 3.