

PRE-ALERT GUIDANCE NOTE

HEATWAVE



The Start Fund Crisis Anticipation Window enables members to begin responding before a crisis turns into a disaster. Acting in anticipation of humanitarian crises is new for many agencies. It can be difficult to decide when to trigger an anticipatory alert through the Start Fund and what activities are the most effective. This document is designed to make it easier for agencies to raise Start Fund anticipatory alerts for a heatwave, or to submit Start Fund project proposals when an alert has been activated. You can find a Start Fund anticipation alert template [HERE](#).

SECTION 01 ANTICIPATING HEATWAVES

Many different definitions of “extreme heat” and “heatwave” exist, which make it hard to compare studies with each other. Daytime maximum temperatures are the most strongly linked to humanitarian impact, especially where they are extended over consecutive days and where they are more unusual for the area in question.

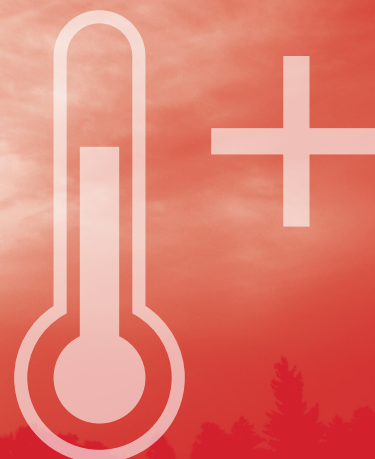
THE HUMANITARIAN IMPACT ALSO DEPENDS ON OTHER PHYSICAL FACTORS SUCH AS:

- ◆ **High night-time temperatures** are strongly linked to increased death rates, but if the temperature drops overnight this offers cooling opportunities
- ◆ **High humidity** and **low wind speed** each make it harder to stay cool by evaporation
- ◆ **Low soil moisture** increases the impact of extreme heat, especially in rural areas.
- ◆ Large urban areas of concrete and metal contribute to an **urban heat island effect** which gets hotter during the day and retains more heat at night.

Of course, the potential impact also depends on many human factors such as:

- **WORKING PATTERNS**
- **RELIGIOUS OBSERVANCE**
- **POWER AVAILABILITY**
- **POPULATIONS ENGAGED IN OUTDOOR MANUAL LABOUR**
- **ACCESS TO COOLING SPACES**
- **COMMUNITY VULNERABILITY**
- **ACCESS TO MEDICAL CARE**

These should be taken into account in the preparation of an alert note.



WHAT LEVELS OF HEAT MAY BE DANGEROUS IN THIS REGION?

Some regions and cities have pre-defined heatwave management plans or heat health action plans, which define conditions for action on the part of local or national government. These can be used as an indication of suitable thresholds for an anticipatory alert.

KARACHI NOW HAS A HEATWAVE MANAGEMENT PLAN WHICH SPECIFIES TEMPERATURE LEVELS FOR ADVISORY, WARNING & EMERGENCY STATES.

TYPE OF ALERT	CRITERIA
HEATWAVE EMERGENCY	<p>≥42°C FORECAST AND MINIMUM TEMPERATURE ≥30°C FOR 2 OR MORE DAYS</p> <p>When there are significant levels of heat related illness & even mortality there must be the declaration of a Heatwave Emergency & a rapid response regardless of specific weather criteria</p>
HOT DAY WARNING	FORECAST ≥42°C
HOT DAY ADVISORY	FORECAST 40°C - 41.9°C

MACEDONIA'S HEAT HEALTH ACTION PLAN USES ALERT THRESHOLDS DEFINED BY REGION AND MONTH. FOR SKOPJE IN JULY, THE THRESHOLDS ARE:

TYPE OF ALERT	TEMP. THRESHOLD °C
EMERGENCY	≥44°C
HEATWAVE	39°C
ALERT/PREPAREDNESS	37°C

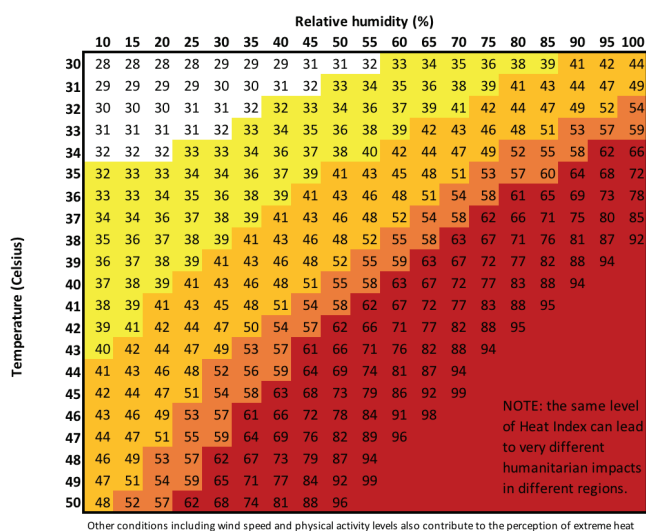
Other information providers that may be helpful to consider are:

♦ START NETWORK IRI MAPROOMS

for climate forecast information on seasonal and subseasonal timescales. Some of these forecasts are still active areas of research. <http://iridl.ldeo.columbia.edu/maproom/START/index.html>

♦ NATIONAL METEOROLOGICAL SERVICES

National weather services almost always have access to more and better data than global commercial sites, although they may present information in a less familiar way. Using national weather forecast services where possible will also improve communication with government agencies in the event of an official declaration of a heatwave or emergency event.



This Heat Index takes into account both temperature and relative humidity levels to give a “feels like” temperature in these conditions. Calculated using NOAA published formula, with colour shading chosen to approximately match alert criteria above. Note that there is no single accepted “Heat Index” and different providers may use different formulas. In areas which are typically cooler, health and other impacts will begin at a lower level. Consider what a “normal hot day” in the region would be like, for comparison.

Date	Location	T	RH	Heat index	Associated deaths
20/06/15	Karachi	45	50	73	2000 across Pakistan
23/07/17	Shanghai	42	59	70	
08/08/03	Paris	40	57	58	2000 across central Europe
05/07/12	Chicago	39	50	52	over 80 in US and Canada

Examples of temperature (T) and relative humidity (RH) measurements used to determine a Heat Index (“feels like” temperature) for some historical extreme heat events. Note that relative humidity often goes down as temperature goes up.

WHEN SHOULD I RAISE AN ALERT FOR ANTICIPATED HEATWAVE?

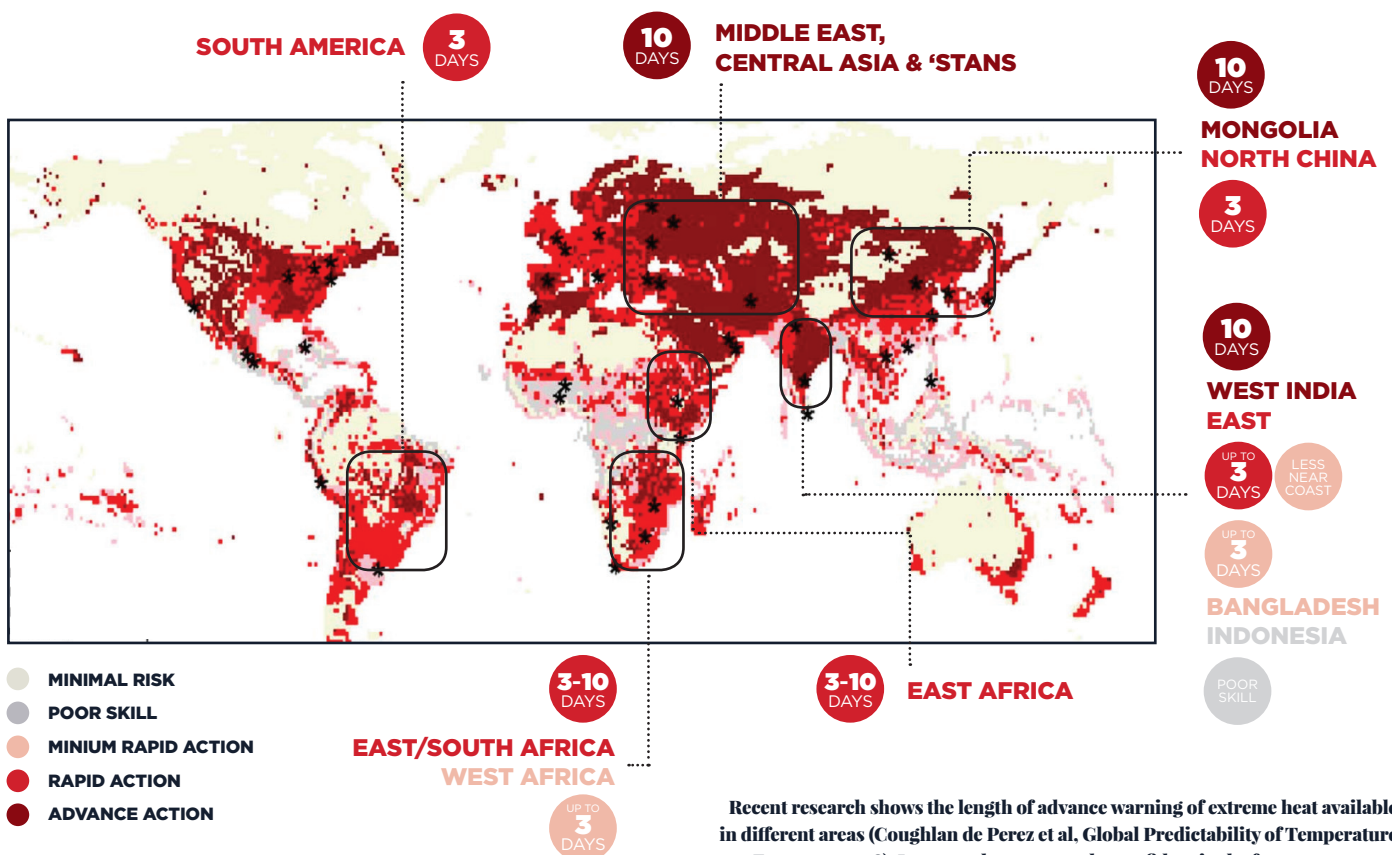


In some regions heatwave conditions can be forecast well in advance (dark red and red areas on map below), whereas in other areas only responsive action is likely to be possible (pink and grey areas). It's important to remember that it is normal for there to be a certain level of uncertainty when your agency is acting on the basis of a forecast, and therefore, timelines are flexible for anticipatory alerts. For example, an agency could build in flexibility by submitting an alert early but choosing to trigger the allocation stage a few days later while continuing to monitor weather forecasts. If doing this, it's important to identify key trigger conditions and make sure that plans are in place to respond.

For example: An alert submitted on 15th July could identify the possibility of a heatwave and phrase the allocation request as follows:

WE EXPECT TO REQUIRE £ (AMOUNT) FOR (CLEARLY-DEFINED ACTIONS) AND WILL BE READY TO ACT ON 18TH JULY IF THE FORECAST ON 17TH JULY STILL INDICATES TEMPERATURES OF OVER 36C DURING 19-22 JULY.

WHERE DO WE EXPECT TO BE ABLE TO ANTICIPATE HEATWAVES? HOW LONG IN ADVANCE?



Recent research shows the length of advance warning of extreme heat available in different areas (Coughlan de Perez et al, Global Predictability of Temperature Extremes, 2018). In some places we can be confident in the forecast up to ten days in advance, giving time for anticipatory action.

Source: <http://iopscience.iop.org/article/10.1088/1748-9326/aab94a>

MORE DETAIL ABOUT HOW THIS MAP WAS PRODUCED AND WHAT DEFINITIONS WERE USED CAN BE FOUND IN THE PAPER ON GLOBAL PREDICTABILITY OF TEMPERATURE EXTREMES BY ERIN COUGHLAN DE PEREZ ET AL, 2018: <http://iopscience.iop.org/article/10.1088/1748-9326/aab94a>

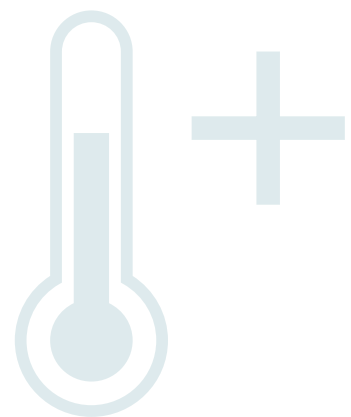
IS THE START FUND CRISIS ANTICIPATION WINDOW APPROPRIATE TO USE FOR THIS ANTICIPATED CRISIS?

The Start Fund Crisis Anticipation Window can be used when there are signals that a heatwave is coming. Ideally, agencies should already be engaging in ongoing preparedness activities for areas that experience annual/cyclical heatwave risks and the Crisis Anticipation Window shouldn't be used to fund these preparedness activities.

The Crisis Anticipation Window should be used to respond to a significant shift in risk relating to a forecast heatwave that goes beyond annual and cyclical cycles. Or, the Crisis Anticipation Window can also be used when communities are more vulnerable due to other factors such as shocks and stresses, extensive use of negative coping strategies, low preparedness of agencies/communities etc.

WHEN AGENCIES ARE CONSIDERING COMMUNITY VULNERABILITY, SOME IMPORTANT QUESTIONS TO CONSIDER ARE:

- ◆ Who are the most vulnerable groups?
- ◆ What are the current coping strategies?
- ◆ What are the current response capacities?
- ◆ What are the current WASH, health, food and protection capacities?
- ◆ How would these sectors be implicated?
- ◆ What other funding mechanisms are available to respond?
- ◆ What Urban areas are likely to be affected?
- ◆ What are the aggravating factors? (eg. lack of access to water and cooling facilities, cramped high-density living conditions, isolation, poor public health information, & poor health services etc)
- ◆ How will infrastructure, agriculture, public health, and the environment be impacted?



WHAT IS THE APPROPRIATE ALLOCATION AMOUNT?

Anticipation activities are designed to mitigate the financial and humanitarian impacts of crises and should reflect this in the allocation amount. As a benchmark, past anticipatory heatwave funding allocation amounts are:






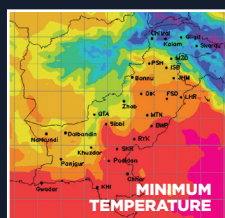
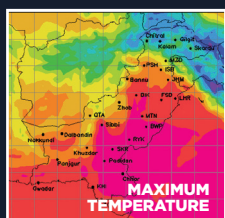
FOR MORE INFORMATION ON THIS ALERT, CLICK ON THE ALERT ABOVE TO ACCESS THE START FUND PORTAL.

HOW CAN I USE FORECASTS TO SUPPORT ANTICIPATORY ACTION?

01 Look at your preferred weather forecast provider for the next 5-10 days in areas of interest.

Is there any sign of temperatures increasing to extreme levels? If so, check the “Feels like” temperature as well.

TODAY	TOMORROW	FRI 13TH APR
39°C 25°C	39°C 24°C	35°C 24°C
		



02 Look at daily maximum and minimum temperature forecasts for the region, if available.

Do these also show extreme heat developing?
Where are the most affected areas/cities?

03 Consider raising an anticipatory alert. In addition to the humanitarian factors, useful contributory information could include:

- Forecast maximum daytime and minimum night-time temperatures and the expected duration of the extreme heat;
- City-level detailed forecasts (where available);
- Humidity and wind speed forecasts (where available), and an approximate Heat Index as above;
- Comparison with Heat Index for previous events in the region;
- Has a national weather service or disaster management authority raised a warning?;
- Are there any warnings in neighbouring regions or countries?

04 RAISE ANTICIPATORY ALERT BASED ON YOUR UNDERSTANDING OF THE HUMANITARIAN SITUATION AND ON WEATHER FORECAST INFORMATION AS ABOVE.



FURTHER READING

PMD Technical Report on Karachi Heatwave 2015, PMD, July 2015

Karachi Heatwave Management Plan, Karachi Commissioner Office, 2017.

Ahmedabad Heat Action Plan 2018, NRDC, 2018.

Defining and Predicting Heat Waves in Bangladesh

2017 study by IRI scientists looked at which types of heatwave conditions are most linked to death rates in Bangladesh, confirming that both maximum daytime temperatures and minimum night-time temperatures are important.

SECTION 02 AN ANTICIPATORY ALERT FOR A HEATWAVE HAS BEEN ACTIVATED, WHAT KINDS OF PROJECTS WOULD BE EFFECTIVE?

WHAT ARE EXAMPLES OF PROJECTS TO ADDRESS AN ANTICIPATED HEATWAVE?

There are a wide variety of effective project activities that can reduce the impact of a forecast heatwave. Timely interventions can prevent households from engaging in negative coping strategies at an unsustainable rate, which leaves them more at risk after the heatwave. Start Members have highlighted examples of activities which mitigate the impacts of a forecast heatwave:

ADVOCACY AND COMMUNICATION:

- ♦ Conducting awareness campaigns amongst vulnerable areas using SMS and local radio (it's important to run advocacy campaigns in local languages)
- ♦ Identifying and mapping the most vulnerable community members and organising community action to assist the most vulnerable community members
- ♦ Educating community members on heatstroke prevention and how to identify symptoms of heatstroke

INFORMATION MANAGEMENT:

- ♦ Conducting mapping and analysis to identify the areas that are likely to be the most affected and then share this information with all stakeholders
- ♦ Working with local authorities to ensure that anticipatory heatwave interventions are aligned in order to have the greatest impact; ensuring that local authorities are aware of the situation and are circulating information

DISTRIBUTIONS AND CASH PROGRAMMING:

- ♦ Distributing bottled water to community members facing the highest risk eg. isolated or house bound community members
- ♦ Providing cash transfers for drinking water

EMERGENCY TREATMENT CENTRES:

- ♦ Ensuring that community emergency treatment centres are set- up in advance in order to reach the most at-risk populations to prevent negative health impacts



WHAT GEOGRAPHIC AREAS SHOULD MY AGENCY FOCUS ON?

Agencies are encouraged to coordinate their activities effectively according to the geographical areas at risk in order to mitigate the impacts of a forecast heatwave. It's important to consider potential geo support with Start Network partners. The Start Fund team can help to facilitate and broker support for this from mapping organisations such as:

MapAction

If you require maps please contact Emma Mumford, MapAction Operations Director emumford@mapaction.org and please see <http://guides.mapaction.org/> for examples of mapped products available

<http://iopscience.iop.org/article/10.1088/1748-9326/aab94a>



Supported by



IF YOU HAVE ADDITIONAL QUESTIONS, PLEASE CONTACT THE START FUND TEAM: startfund@startnetwork.org

IF YOU WANT TO MOVE FORWARD WITH AN ANTICIPATION ALERT, PLEASE SUBMIT AN *anticipation alert note*.

The Start Fund has collaborated with the London School of Economics (LSE) to explore the best sources of useful information to look at when considering anticipatory humanitarian action in advance of extreme heat in Pakistan. For more information, click [HERE](#)